

ISSN-0976-0245 (Print) • ISSN-0976-5506 (Electronic)

Volume 13

Number 3

July-September 2022



Indian Journal of Public Health Research & Development

An International Journal

Website:

www.ijphrd.com

Indian Journal of Public Health Research & Development

EXECUTIVE EDITOR

Vidya Surwade

Associate Professor, Dr Baba Saheb Ambedkar, Medical College & Hospital, Rohinee, Delhi

INTERNATIONAL EDITORIAL ADVISORY BOARD

1. **Dr. Abdul Rashid Khan B. Md Jagar Din**, (*Associate Professor*)
Department of Public Health Medicine, Penang Medical College, Penang, Malaysia
2. **Dr. V Kumar** (*Consulting Physician*)
Mount View Hospital, Las Vegas, USA
3. **Basheer A. Al-Sum**,
Botany and Microbiology Deptt, College of Science, King Saud University,
Riyadh, Saudi Arabia
4. **Dr. Ch Vijay Kumar** (*Associate Professor*)
Public Health and Community Medicine, University of Buraimi, Oman
5. **Dr. VMC Ramaswamy** (*Senior Lecturer*)
Department of Pathology, International Medical University, Bukit Jalil, Kuala Lumpur
6. **Kartavya J. Vyas** (*Clinical Researcher*)
Department of Deployment Health Research,
Naval Health Research Center, San Diego, CA (USA)
7. **Prof. PK Pokharel** (*Community Medicine*)
BP Koirala Institute of Health Sciences, Nepal

NATIONAL SCIENTIFIC COMMITTEE

1. **Dr. Anju D Ade** (Professor)
Community Medicine Department, SVIMS, Sri Padamavati Medical College, Tirupati,
Andhra Pradesh.
2. **Dr. E. Venkata Rao** (*Associate Professor*) Community Medicine,
Institute of Medical Sciences & SUM Hospital, Bhubaneswar, Orissa.
3. **Dr. Amit K. Singh** (*Associate Professor*) Community Medicine,
VCSG Govt. Medical College, Srinagar – Garhwal, Uttarakhand
4. **Dr. R G Viveki** (*Associate Professor*) Community Medicine,
Belgaum Institute of Medical Sciences, Belgaum, Karnataka
5. **Dr. Santosh Kumar Mulage** (*Assistant Professor*)
Anatomy, Raichur Institute of Medical Sciences Raichur(RIMS), Karnataka
6. **Dr. Gouri Ku. Padhy** (*Associate Professor*) Community and Family
Medicine, All India Institute of Medical Sciences, Raipur
7. **Dr. Ritu Goyal** (*Associate Professor*)
Anaesthesia, Sarswathi Institute of Medical Sciences, Panchsheel Nagar
8. **Dr. Anand Kalaskar** (*Associate Professor*)
Microbiology, Prathima Institute of Medical Sciences, AP
9. **Dr. Md. Amirul Hassan** (*Associate Professor*)
Community Medicine, Government Medical College, Ambedkar Nagar, UP
10. **Dr. N. Girish** (*Associate Professor*) Microbiology, VIMS&RC, Bangalore
11. **Dr. BR Hungund** (*Associate Professor*) Pathology, JNMC, Belgaum.
12. **Dr Sartaj Ahmad**, PhD Medical Sociology, *Associate Professor*,
Swami Vivekananda Subharti University Meerut UP India
13. **Dr Sumeeta Soni** (*Associate Professor*)
Microbiology Department, B.J. Medical College, Ahmedabad, Gujarat, India

NATIONAL EDITORIAL ADVISORY BOARD

1. **Prof. Sushanta Kumar Mishra** (Community Medicine)
GSL Medical College – Rajahmundry, Karnataka
2. **Prof. D.K. Srivastava** (*Medical Biochemistry*)
Jamia Hamdard Medical College, New Delhi
3. **Prof. M Sriharibabu** (*General Medicine*) GSL Medical College, Rajahmundry,
Andhra Pradesh
4. **Prof. Pankaj Datta** (*Principal & Prosthodontist*)
Indraprastha Dental College, Ghaziabad
5. **Prof. Samarendra Mahapatro** (*Pediatrician*)
Hi-Tech Medical College, Bhubaneswar, Orissa
6. **Dr. Abhiruchi Galhotra** (*Additional Professor*) Community and Family
Medicine, All India Institute of Medical Sciences, Raipur
7. **Prof. Deepti Pruthvi** (*Pathologist*) SS Institute of Medical Sciences &
Research Center, Davangere, Karnataka
8. **Prof. G S Meena** (*Director Professor*)
Maulana Azad Medical College, New Delhi
9. **Prof. Pradeep Khanna** (*Community Medicine*)
Post Graduate Institute of Medical Sciences, Rohtak, Haryana
10. **Dr. Sunil Mehra** (*Paediatrician & Executive Director*)
MAMTA Health Institute of Mother & Child, New Delhi
11. **Dr Shailendra Handu**, *Associate Professor*, Phrma, DM (Pharma, PGI
Chandigarh)
12. **Dr. A.C. Dhariwal**: *Directorate* of National Vector Borne Disease
Control Programme, Dte. DGHS, Ministry of Health Services, Govt. of
India, Delhi

Print-ISSN: 0976-0245-Electronic-ISSN: 0976-5506, Frequency: Quarterly

(Four issues per volume)

Website : www.ijphrd.com

©All right reserved. The views and opinions expressed are of the authors and not of the Indian Journal of Public Health Research & Development. The journal does not guarantee directly or indirectly the quality or efficacy of any product or service featured in the advertisement in the journal, which are purely commercial.

Published at

Institute of Medico-legal Publications

Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)



Indian Journal of Public Health Research & Development

www.ijphrd.com

Contents

Volume 13, Issue 3

July-September 2022

1. Treatment of Fracture Distal End Humerus with open Reduction and Internal Fixation with Plate Osteosynthesis..... 1
A. Krishna Naik, G. Umakanth, Nagaraju Koppula
2. Clinical Evaluation of Depression and Anxiety in Pregnancy and their Impact on Maternal and Fetal Outcome..... 7
Aisha Salma
3. Effectiveness of Structure Teaching Programme on Knowledge Regarding Genetic Disorders and Attitude Towards Preventive Measures for Genetic Disorders among Undergraduates at Higher Educational Institute..... 13
Ajay Kolage, Yogita Autade, Krishnali Garje
4. Control at the sewers to curb the COVID-19 pandemic in India- is the negligence perilous? 19
Anu V F, Nagarathna J2, S K Srinath
5. Evaluation of Hemodynamic changes in Elective Cesarean section under Spinal Anesthesia 24
Arzoo Ralhan, Muskan Sodhi
6. KAP Study on Social Distancing and Utility Sharing among Students of Bhadrak Autonomous College, Odisha, India during the First COVID-19 Wave: Implications for Policy Decisions in Subsequent Waves 28
Asima Tripathy
7. Acromegaly with Predisposition towards Cardiac Failure 34
Bhardwaj CM
8. A study to assess the effectiveness of Self-Instructional Module on knowledge regarding Multi Drug Resistance Tuberculosis among staff nurses in s elected hospital of Gurugram..... 37
Bharti Sachdeva, Nisha, Nidhi
9. Disability Adjusted Life Year (DALY) loss in open tibia fracture treated with External vs Internal fixation 40
Bhukya Tejkumar
10. Management of Tibial Plateau Fractures in a Tertiary Care Hospital..... 44
Bhukya Tejkumar
11. Factors Influencing the use of Antenatal Care Service among Pregnant women in Nasarawa Local Government Area, Kano State, Nigeria..... 49
Bilkisu Yakubu Indabo, Deepak Vishwakarma, Rejoice P. Ravi

12. Situation of Consumer Protection for Health Establishments A Case Study of Phetchabun Province, Thailand	54
<i>Boadsaporn Anusornpanichakul, Tiwaporn Junkhaw</i>	
13. Effect of Maternal Body Composition and Hemoglobin Percentage at Term Gestation on Labour and Neonatal Outcome	60
<i>Bushra Fatima, B Sandhya</i>	
14. Effects of Traditional Way of Fish Consumption in Sri Lanka on Cardiovascular Risk Profiles.....	67
<i>C.G. Devadason</i>	
15. A Cross Sectional Study to Assess Prevalence, Pattern,Trend and Impact of Substance Abuse among Medical Students	73
<i>Dattatraya Dinna Bant, Sushma H R, A Akshay Subramanian, Bushra Jabeen</i>	
16. Comparative Assessment of Academic Performance among Kims Medical Students before and during Lockdown:a Cross Sectional Study.....	78
<i>Dattatraya Dinna Bant, A Akshay Subramanian, Sushma H R</i>	
17. Descriptive study on Awareness and utilization of Mission Indradhanush in urban slums of kalaburagi, Karnataka.....	83
<i>Dayalaxmi. T. Shedole, Pavan Kalaskar, Jaya Suryavanshi</i>	
18. Comparisons of Transdermal Buprenorphine Patch versus Transdermal Fentanyl patch for postoperative analgesia in lower limb orthopedic surgery	91
<i>Dilshad Kauser, Deepraj Singh</i>	
19. Comparison of 0.2% Ropivacaine with 0.25 % Levobupivacaine in Ultrasound Guided Transverse Abdominis plane block for Postoperative Analgesia in LSCS	95
<i>Dilshad Kauser, Sherry Mathew</i>	
20. Role of usg in Ectopics: Recent Update	99
<i>Arzoo Ralhan, Muskan Sodhi</i>	
21. Hypertension and Diabetes Mellitus: Coprediction and Time Trajectories.....	102
<i>Himanshu Garg, Nikhil Batra, Gaurav Singh, Anshaj Mujral</i>	
22. A Comparative Study of Personality Profile among Patients with Alcohol use Disorder and Opioid use Disorder	107
<i>Sulagna Saha, S omsubhra Chattopadhyay, Subhendu Datta, Ningomban Heramani Singhd</i>	
23. Knowledge Towards the Impact of Indoor Environment and Lifestyle on Dry Eye	114
<i>Eman Abdollah Aboulqasim Gaber, Mohd Zaki Awg Isa, Asma Ali Budalal</i>	
24. Treatise on the Distribution of the use of a Follow-Up Midwife by Academically Educated Mothers Compared to Non-Academically Educated Mothers.....	119
<i>Friederike Harrich</i>	
25. Study of Efficacy and Outcome of Nasal Cpap in Preterm Neonates with Hyaline Membrane Disease.....	122
<i>G Karthik Raj, Bolishetti Kalyan Kumar, M. C. Vennela</i>	
26. Impact of dental Fluorosis on quality of life of a group of Children in a Rural area in Nubia Region.	127
<i>Ghada Tawfik , Nancy Khattab, Mohamed A. El-Yazeed, Ehab M. Radwan4, Marwa Saber Abd El Salam.</i>	

27. A Case report of Hypersensitivity Pneumonitis presenting with Pneumomediastinum	134
<i>Godbole Manas Shailesh, Manvi Sharma, Monika Sharma</i>	
28. Vascular and Pathological Complications in Diagnosed Type 2 Diabetes Mellitus in Ent Patients	137
<i>Harsimrat Singh, Hitesh Marwaha</i>	
29. Role of Delayed Primary Skin Closure in Preventing Superficial Abdominal Wound Infections in Peritonitis Patients	143
<i>Jadhav Parthasarathi, D Ravisundar, M Praveen, Santhosh Babu Chintakindi</i>	
30. Role of Radiology in Mucormycosis: Recent Update	148
<i>Kushpreet Kaur, Sandeep Singh, Harsimrat Singh, Mandeep Kour</i>	
31. Water, Sanitation and Hygiene Status in the Schools of a District in Karnataka.....	151
<i>Malingu, Pallavi Sarji Uthkarsh, Gangaboraiah</i>	
32. Relationship between Hypothyroidism and Non-Alcoholic Fatty Liver Disease: A Systematic Review and Meta-analysis.....	156
<i>Manvi Sharma, Mayank Nangru, Godbole Manas Shailesh</i>	
33. The Influence of Age, Gender, Type of Pregnancy, and Climatic Variations on the Serum T3 and T4 Hormones Profile in Growing Awassi Sheep	160
<i>Mashair Z Ismail, Najlaa K. Al-Hamdi</i>	
34. A Scoping Review on Design Modifications of Lingual Holing Arch appliance.....	165
<i>Mathias Merlyn R, Pawar Madhura, Lath Tripti</i>	
35. Breast Symptoms Among Women Attendant's to Early Detection Breast Clinic	171
<i>May Abdul Salam, Jawad K. Al-Diwan</i>	
36. To Evaluate the Effectiveness of Dpp4 Inhibitors in Relation to Blood Sugar and Lipid Profile.....	175
<i>Megha Sharma, Amit Varma, Kiran Bhat, Rohit Rakholia</i>	
37. Adrenal Insufficiency due to Total Primary Empty Sella Syndrome.....	180
<i>Monika Sharma, Yatharth Bansal, Tejinder Talwar</i>	
38. Correlation between Academic achievement, Clinical Performance and Clinical Competency in Midwifery	184
<i>Blaze Asheetha Maria Rosario, .Sr. Mariam O.J (Sr. Celcy Mary)</i>	
39. Awareness and Attitude about Nurse Led Clinic (NLC) among Health Care Professionals	190
<i>Kavita Bhoknal, T Sivabalan</i>	
40. A study of Clinical Profile of Patients with Traumatic Cataract.....	195
<i>Nalini Jayanthi. B, Sujatha Asadi</i>	
41. Macrovascular and Microvascular Complications in Newly Diagnosed Type 2 Diabetes Mellitus	199
<i>Nikhil Batra, Himanshu Garg, Gaurav Singh, Anshaj Mujral</i>	
42. Prevalence and Associated Factors in Practice of Self-Medication in Urban Slums of Southern Rajasthan	205
<i>Nitesh Mangal, Matariswa Samanta, Mehul Patel, Dilip Kumar L, K. A. Varghese, Mansi Sharma</i>	

43. A Successful Prototype of a Multipronged Helmet Campaign in a District of South India	211
<i>Pallavi Sarji Uthkarsh, Namratha B Reddy, Utkarsha Lokesh</i>	
44. A Cross Sectional Study on Functional and Psychological Status of Geriatric Population in Urban Areas of Perambalur	216
<i>Parthasarathi Ramanathan, Rock britto, Ram Prabhakar, Maniprabhhu, Kishorekumar, Lakshmi Naryanan, Lakshmi Priya</i>	
45. A Study to Compare the Effectiveness of Active Release Technique Versus Deep Friction Massage on Pain, Grip Strength and Functional Performance in Patients with Chronic Lateral Epicondylitis	222
<i>Priyanka Dabkara, Jeban Daniel, Mayuri Sharma, Arindam Bose</i>	
46. Neutrophil - Lymphocyte ratio as a predictive marker for Early Stage Diabetic Nephropathy	228
<i>Raghavendar Reddy Gundepalli, Veeda Mohan Kumar, A. Raghuram Bhargavi</i>	
47. Effects of Prolonged Use of Face Masks among Healthcare Workers Working in a Tertiary level Hospital in Kathmandu, Nepal	233
<i>Rajesh Karki, Asmita Lamicchane, Aarati Timsina</i>	
48. Recurrence Rate after Marginal Excision of Lipomas.....	238
<i>Ramesh Chhaganbhai Badhiya, R. M Jitia, Dr.Haresh B. Vala</i>	
49. Beyond the Pandemic: Masking-Behaviour, Practices, Skin problems and Attitude among Healthcare workers and Medical students of South India	242
<i>Reshmi Subramaniam, Kavitha K, Neetha L, C. Raghuvveer, Jisharaj V R</i>	
50. Does Rhino-genic Headache Improve after Endoscopic Concha Bullosa Surgery in the Adult Patients?	248
<i>Ahmed Muhei Rasheed, Ahmed Salah Ahmed, Mustafa Salman Hamed</i>	
51. A study of Association of Blood Groups with Anemia in healthy Young Adults	254
<i>Retash Shan, Shomalla Jan, Bharti Devi Thaker, Kailash Singh, Mrityunjay, Sunil Sachdev</i>	
52. Evaluation of Virtual Classes Teaching among first-year MBBS students during COVID-19 era in GMC Jammu	261
<i>Retash Shan, Shomalla Jan, Sunita Kumari, Mrityunjay, Sunil Sachdev, Dev Raj</i>	
53. A Cross-Sectional Study to Estimate the Proportion of Early Initiation and Exclusive Breastfeeding Practices in Rural Field Practice Area, Mysore.....	265
<i>Roopadevi V, Dayanand M, Aravind K, Sampat Kumar</i>	
54. Assessment of the prevalence of Hypertension and its association with various risk factors in the rural population of the district Muzaffarnagar	270
<i>Sangeeta Jain Sharma, Lubna Zarin, Umer Farooq, Dheeraj sharma, Santosh Raghav5</i>	
55. A Case Series of Uterine Prolapse in Pregnancy	278
<i>Shreedevi S Kori, Dayanand S Biradar, Rajasri G Yaliwal, Subhashchandra R Mudanur, Vaishnavi Malji</i>	

56. Assessment of Third Molar Impaction Pattern in the Mandible and in the Maxilla	282
<i>Pratik Rupakar, Jignesh Maheswari, Sanjay Yadav, Darshan Dudhat, Krishna Shah, Shrikant Patel</i>	
57. To Assess the Practices of Nurses Towards Catheter Care for Prevention of Catheter Associated Urinary Tract Infection Among Patients Admitted in Tertiary Care Hospital Bathinda (Punjab).....	288
<i>Simaranjit Kaur, Rajwant Kaur Randhawa, Deepika R Singh</i>	
58. Do adolescent girls of Coastal Karnataka, India have Knowledge of Integrated Child Development Services (ICDS) Scheme? What is their perception and utilization rate? – A cross sectional study	293
<i>Sivanesan S, Kumar A, Kulkarni M M, Kamath A</i>	
59. Body Image Perception and Its Relationship with Adolescents Nutritional Status in Pekanbaru City during the Covid-19 Pandemic	298
<i>Sofya Maya, Yanti Ernalina, Nofvitri Syuryadi, Nur Pelita Sembiring, Tahrir Aulawi1</i>	
60. High Prevalence of Nasal carriage of Methicillin Resistant Coagulase Negative Staphylococci among Medical Students in a Tertiary Care Institution in North India	304
<i>Sonia Khatter, Awadhesh Kumar, CV Madhumidha, Shruti Yadav, Iqbal R Kaur</i>	
61. Psychological Health and Its Determinants among Elderlies of Prayagraj.....	309
<i>Sucheta Singh, Khurshid Parveen, Gyan Prakash, Richa Singh</i>	
62. Personality profile of patients with alcohol related disorders: A cross sectional study in a Medical College of Eastern India.....	315
<i>Sulagna Saha, Somsubhra Chattopadhyay, Subhendu Datta, Ningomban Heramani Singh</i>	
63. Clinical and Diagnostic Profile of Interstitial Lung Disease.....	321
<i>Syed Abdul Aleem</i>	
64. Effect of Yoga and Exercises to improve Physical Function and Quality of Life in Elderly: A Systematic Review of Randomized Controlled Trials	327
<i>Kumari B N P, K.K. Shiny John, Manikya Latha J, Divya P D, A Maria Therese, Judie Arulappan</i>	
65. A Study on Socio-Economic Status and Consumption Pattern of Tibetan Refugee Households in Ladakh Settlement, India.....	332
<i>Tenzin Namgha, Tsering Dolkar</i>	
66. Clinicohematological profile of patients with Pancytopenia	338
<i>Vineet Chaturvedi, Jasvinder Kumar, Roopak Aggawal, Granth Kumar, Pinki Pandey</i>	
67. Effect of Antihypertensive Drugs Therapy on Cognitive Functions and Asymmetric Dimethylarginine (Adma) Levels In Hypertensive Patients	343
<i>Yavatesh Joshi T, Riddhi Gor</i>	
68. Cervical Pap smear: A retrospective study on symptomatic women in a tertiary care hospital	349
<i>Vidhu Mahajan, Virender Mohan Rana, Anil Raina, Nipun Kalsotra, Nidhi Gupta, Surinder K Atri</i>	

Treatment of Fracture Distal End Humerus with open Reduction and Internal Fixation with Plate Osteosynthesis

A. Krishna Naik¹, G. Umakanth², Nagaraju Koppula³

^{1,2,3}Assistant Professor, Department of Orthopaedics, Government Medical College/Government General Hospital, Nalgonda, Telangana state, India

How to cite this article: A. Krishna Naik, G. Umakanth, Nagaraju Koppula et al Treatment of Fracture Distal End Humerus with open Reduction and Internal Fixation with Plate Osteosynthesis. Volume 13 Issue 3 July-September 2022

Abstract

Background: Fractures of distal humerus represent one of the most complicated and challenging fractures in the upper extremity. These are rare fractures. Most fractures involve the joint surface, significant proportions are open, and the complex three-dimensional geometry of the distal humerus poses a considerable challenge to reconstruction.

Objectives: To study the treatment of fracture distal end humerus with open reduction and internal fixation with plate osteosynthesis

Methods: A prospective study of 15 consecutive cases of intercondylar fractures of humerus treated by open reduction and internal fixation over two and half years was conducted. These included 12 fresh cases and 3 old cases. Case wise detailed study was done in 12 cases by noting the age, sex social status, nature of violence and the duration of injury, information regarding medical problems and any local problems, in relation to bone and joint.

Results: At follow up, patients were assessed clinically and radiologically, most patients regained fair to good range of motion obtained in 3 months time fracture was united in an average of a 10 weeks and olecranon osteotomy in an average of 8 weeks. Patients were followed up for an average of 9 months, excellent results were found in five cases (33.33%). Good results in five cases(33.33%) and fair results were obtained in three (20%) cases, poor results in two cases(13.33%)

Conclusion: Comminuted fractures of distal humerus in the hands of competent surgeon with open reduction, anatomic assemblage and internal fixation of the fragments offer better results in majority of the cases. In young patients the results are good and in old patients results fair probably because of good physiotherapy in young and also cartilage changes limit the functional outcome in the old. Physiotherapy has a great role in the outcome of functional result.

Keywords: Comminuted fractures, distal humerus, Open reduction, internal fixation

Introduction

Fractures of distal humerus represent one of the most complicated and challenging fractures in the upper extremity. These are rare fractures. Most fractures involve the joint surface, significant proportions are open, and the complex three-dimensional geometry of the distal humerus poses a considerable challenge

to reconstruction.¹ The goal of treatment is to re-establish the articular congruity and alignment and begin active motion as soon as possible. In most cases, open reduction with rigid internal fixation is preferred.

The treatment of severely comminuted fractures of the elbow long has been a subject of controversy.²

Recommendations for treatment have ranged widely, from essentially no treatment to operative reduction and extensive internal fixation, the problem of management has been made more difficult by the fact that the fracture is relatively uncommon, which prevents the individual surgeon from accumulating sufficient personal experience to critically evaluate the results of treatment.³

In some of these fractures, particularly those with intra-articular comminution, anatomical restoration of the articular surface cannot be adequately achieved or maintained through manipulative reduction alone.⁴ Critics of open reduction have argued that the additional surgical trauma and the inherent difficulty in securely stabilizing the small intra articular fragments will lead to added fibrosis and a less satisfactory result. Even authors who have recommended open reduction differed widely in their opinions with regard to the extent of ad type of internal fixation to be used, as well as when post operative mobilization can be started.⁵ Do the recent advances in surgical techniques and equipment designed to make possible rigid Osteosynthesis of smaller intra articular fracture now permit early post operative rehabilitation. Does the possibility now exist to achieve improved and more predictable results with the operative treatment of even the comminuted intercondylar fracture. Many Orthopaedic surgeons stress on preserving the architecture of any joint for its normal restoration of function. The recent trend has been immediate open reduction and stable internal fixation, and early post operative active range of motion. The anatomic complexity of the distal humerus has made surgical reconstruction difficult. The Fabrication of new implants, however, has increased the rehabilitatee of operative stabilization, while placing additional demands upon the surgeons expertise.⁶

Injuries of the elbow lead to chronic pain and permanent restriction of motion limit use of the hand in most activities. Positioning of hand for grip and apprehension is dominated by freedom of motion at the elbow. Basic daily activities from eating to perineal hygiene, require a wide range of positions and movements at the elbow in both flexion and extension and forearm rotation. Any restricted motion of the neck, shoulder or wrist magnifies impairment of elbow. More complex tasks, at the work place or recreation, require greater functional demands.

Materials and Methods

Study Duration: January 2019 to December 2019

A prospective study of 15 consecutive cases of intercondylar fractures of humerus treated by open reduction and internal fixation. These included 12 fresh cases and 3 old cases. Case wise detailed study was done in 12 cases by noting the age, sex social status, nature of violence and the duration of injury, information regarding medical problems and any local problems, in relation to bone and joint.

A thorough general examination and local examination was performed. Radiological examination of the part and routine investigations were carried out. Patients were taken up for surgery as early as possible in all the fresh cases. In old people with medical problems after thorough work up were taken up for surgery, once patient is fit for surgery for anesthesia. Preoperatively all patients were immobilized in above elbow POP slab with elevation of the limb. Associated injuries were dealt simultaneously or at a later date depending upon convenience. But every effort was made to operate as early as possible because of intra articular fracture and mobilized as possible. Selection of cases:

Criteria taken are history, clinical and radiological. All people below 70 years, who had type A,B and C closed fractures are taken up for surgery. Even patients who came late with stiffness are taken up for surgery. Patients with external wounds and associated injuries waited till the conditions permit for surgery. Indications for surgery

Inclusion Criteria

The indications for operative intervention, anatomic reduction, rigid fixation and early active mobilization are:

- Intra articular displacement greater than 2 mm
- Marked supracondylar comminution and displacement.
- Open fractures
- Neurovascular injury / compartment syndrome
- The floating elbow
- The multiply injured
- Young people
- Exclusion criteria:
- Unwilling to participate in the study

It is important to differentiate the fracture indications listed above from the patient indications, or rather, contraindications. The patient age, expectations, and medical status must be carefully considered. The biology of bones must be taken into account, especially the degree of osteopenia, the fracture configuration and also the associated soft tissue trauma, i.e. the fracture personality. Another factor is an honest assessment by the surgeon of his or her ability to perform stable internal fixation without the necessity for prolonged post operative immobilization.

Treatment

In all cases open reduction and internal fixation was done using 4mm cancellous screws, 3.5 mm recon plates, or 1/3 tubular plates or precontoured dynamic compression plates or locking compression plates depending upon fracture pattern, age of pt, affordability, and bone stock. In few cases olecranon osteotomy was performed where there is difficulty in visualising the articular surface. Tension band wiring with k wire or cancellous screw fixation of osteotomy performed.

Follow up

Most of the patients were followed up every 4 weeks following discharge. Maximum period of follow up was 2 years, minimum period of follow up was six months. All patients were followed up. All patients could able to execute routine normal work after 3 months. During review they were assessed clinically for complaints of pain and range of movements. They were educated regarding physiotherapy. For all cases radiological examination to access the progress of union of osteotomy and fracture site was done regularly.

Statistical analysis: The SPSS 22 software was used to do the statistical analysis and the data was presented in the form of graphs and tables.

Observation and Results

15 cases of fractures of distal humerus were treated in the orthopedics department.

All the cases were treated by open reduction and internal fixation with or without olecranon osteotomy.

In the present series all the cases had history of trauma either direct or indirect type.

Table 1: Distribution based on demographic and associated injury parameters

Gender	No. of cases	Percent
Male	12	80%
Female	3	40%
Age group (yrs)		
10-20	1	6.6%
21-30	4	26.6%
31-40	6	40.0%
41-50	1	6.6%
51-70	3	20%
Type of injury		
Road Traffic Accident	7	46.6
Fall on point of elbow from height	5	33.3
Slipped and fell down	3	20
Laterality		
Right	8	53.33
Left	7	46.66
Duration		
Old	3	20
Fresh	12	80

In this series Males sustained more no. of injuries than females, both in RTA and fall due to slips. Open reduction and internal fixation was done for fractures of the distal humerus between 20 years (youngest) and 65 years (oldest) in this series. It is apparent that 6 cases (40%) were in the active productive age group. Average age was 37.4 years

Therefore, it is apparent that 8 cases are due to high velocity injuries and 7 cases moderate to low velocity injuries. The cases approached our institute as early as a day (some within hours) from time of injury to as late 2 months.

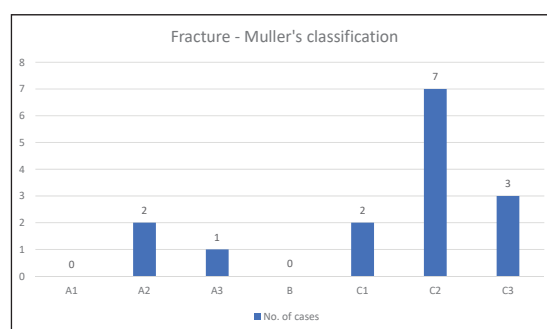


Figure 1: Type of fracture incidence - Muller's et al classification

Around 46.66% of the cases had Complex segmental (C2) type of fracture, 20% of the cases had Complex irregular (C3) fracture, 13.33% of the cases each had Complex spiral C1) and Simple Oblique (A2) fracture, 6.66% of the cases had Simple transverse fracture.

Two cases were on with native treatment and massages and the other case closed reduction and percutaneous fixation with k wires done outside.

Table 2: Radiological assessment

	No. of Cases	Union	Average	Range
Osteotomy (olecranon)	1	1	8 weeks	8 Weeks
Fracture	14	13	10 weeks	8-12 weeks

Table 3: Distribution based on complications

Complications	Frequency	Percentage
Infection (deep)	1	6.66%
Infection (superficial)	1	6.66%
Hypertrophic ossification	1	6.66%
Non-union of fracture	1	6.66%
Non-union of osteotomy (olecranon)	0	0%
Hardware pain	3	20%
Torniquet palsy	1	6.66%
Implant Failure	1	6.66%

Majority had satisfactory functional results. Mild pain on excessive work in excellent and good functional cases mild to moderate in fair range of motion functional cases mild pain ever at rest in a case of non union.

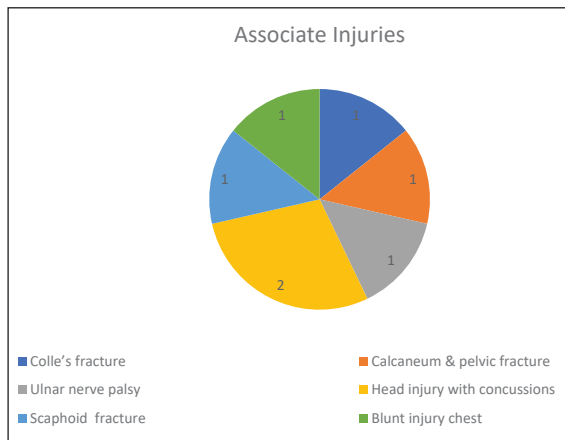


Figure 2: Associated injuries

Head injury with concussions was seen in 2 cases, while colle's fracture, ulnar nerve palsy, Calcaneum & pelvic fracture, Scphoid fracture and blunt injury chest was seen in 1 case each.

Table 4 : CASSEBAUM SCALE

Rating	Motion	Pain	Disability	No. of cases
Excellent	Normal 1 or near normal	None	None	5
Good	Slight Limitation	Occasional	Minimum	5
Fair	Moderate Limitation	With Activity	Moderate	3
Poor	Marked Limitation	Variable	Severe	2

The data on elbow motion was combined with the patients subjective symptoms to provide an overall functional rating. An excellent rating was given for a symptom free elbow with a normal or early normal range of motion;a good rating for good or excellent elbow with some subjective symptoms; a fair rating for a fair range of motion of the elbow with or without symptoms; and a poor rating for both limited mobility and limited function.

Discussion

Fractures of the distal humerus are difficult to treat both by the nature of the injury and because most surgeons don't have a great experience to deal with them. The Management of distal humerus fractures has been controversial. Advocates of closed treatment felt that operative treatment was technically difficult with complications and inconsistent results and those of operative management stressed the importance of anatomic restoration of the elbow joint for stability and function.^{7,8}

While there have been numerous studies regarding the management of this uncommon fracture, the overall number of reported cases has been small, the fracture has been classified by varying criteria, and the results have been judged by wide range of methods of functional evaluation.⁹ Diversity has been found even within individual series, as different treatment recommendations were proposed for selected types of fractures patterns.¹⁰ Accurate comparisons between operative and non-operative treatment remain difficult, even with in the series of individual authors. In some previous series, open reduction and internal

fixation was attempted only after conservative methods had proved unsatisfactory.^{11,12} Utilizing trans olecranon approach and rigid internal fixation, acceptable results were still achieved in many patients who had the surgery delayed.

Post operative period was uneventful in all patients. Early mobilization started in many cases, delayed only in inadequate fixation in two cases, osteoporosis in two cases. Patients were discharged with advice of active, assisted active range of motion exercises. The above elbow posterior slab was continued for 3 weeks.

At follow up, patients were assessed clinically and radiologically, most patients regained fair to good range of motion obtained in 3 months time fracture was united in an average of a 10 weeks and olecranon osteotomy in an average of 8 weeks. Patients were followed up for an average of 9 months, excellent results were found in five cases (33.33%). Good results in five cases(33.33%) and fair results were obtained in three (20%) cases, poor results in two cases(13.33%)

Deep infection was found in one case associated with sinuses, implant removal was done later infection has controlled but resulted in a poor range of motion. In another case superficial infection is found which subsided with antibiotics and implant extraction at later date and fair range of motion is obtained. In one case heterotrophic ossification was found, this case has been given indomethacin for 3 months hoping to reduce or prevent the further progress. This has resulted in limitation of her range of motion and resulted in fair range of motion. In four case; range of motion was delayed because two cases have inadequate fixation and the other two because of osteoporosis. After 5-6 weeks these patients were advised vigorous physiotherapy. One patient developed non-union and Implant Failure . This case was operated after 2 months of injury and had prior massages and native treatment and the patient compliance was also poor. No post operative permanent nerve palsies were found except for a transient radial nerve palsy in one case. Hardware pain was noticed in 3 patients, in three cases their implants were removed after union.

In summary, the concept of Open Reduction and Internal Fixation of Fractures of the Distal end of Humerus with Plate Osteosynthesis is very valuable, in restoring articular surface and early rehabilitation decreasing morbidity resulting in good results.

Conclusion

Comminuted fractures of distal humerus in the hands of competent surgeon with open reduction, anatomic assemblage and internal fixation of the fragments offer better results in majority of the cases. In young patients the results are good and in old patients results fair probably because of good physiotherapy in young and also cartilage changes limit the functional outcome in the old. Physiotherapy has a great role in the outcome of functional result.

Ethical Clearance: Ethical Clearance was obtained from the institutional ethics committee of Government Medical College, Nalgonda prior to the commencement of study.

Source of funding: Self

Conflict of interest: Nil

References

1. Robinson CM, Hill RM, Jacobs N, Dall G, Court-Brown CM. Adult distal humeral metaphyseal fractures: epidemiology and results of treatment. *J Orthop Trauma* 2003;17:38-47.
2. Palvanen M, Kannus P, Niemi S, Parkkari J. Secular trends in distal humeral fractures of elderly women: nationwide statistics in Finland between 1970 and 2007. *Bone* 2010;46:1355-1358.
3. Korner J, Lill H, Muller LP, et al. Distal humerus fractures in elderly patients: results after open reduction and internal fixation. *Osteoporos Int* 2005;16:S73-79.
4. Pajarinen J, Bjorkenheim JM. Operative treatment of type C intercondylar fractures of the distal humerus: results after a mean follow-up of 2 years in a series of 18 patients. *J Shoulder Elbow Surg* 2002;11:48-52.
5. Lee SK, Kim KJ, Park KH, Choy WS. A comparison between orthogonal and parallel plating methods for distal humerus fractures: a prospective randomized trial. *Eur J Orthop Surg Traumatol* 2014;24:1123-1131.
6. Galano GJ, Ahmad CS, Levine WN. Current treatment strategies for bicolunar distal humerus fractures. *J Am Acad Orthop Surg* 2010;18:20-30.
7. Henley MB, Bone LB, Parker B. Operative management of intra-articular fractures of the distal humerus. *J Orthop Trauma* 1987;1:24-35.
8. O'Driscoll SW. Optimizing stability in distal humeral fracture fixation. *J Shoulder Elbow Surg* 2005;14(suppl S):186s-194s.

9. Sodergard J, Sandelin J, Bostman O. Postoperative complications of distal humeral fractures. 27/96 adults followed up for 6 (2-10) years. *Acta Orthop Scand* 1992;63:85-89.
10. Pereles TR, Koval KJ, Gallagher M, Rosen H. Open reduction and internal fixation of the distal humerus: functional outcome in the elderly. *J Trauma* 1997;43:578-584.
11. Lawrence TM, Ahmadi S, Morrey BF, Sanchez-Sotelo J. Wound complications after distal humerus fracture fixation: incidence, risk factors, and outcome. *J Shoulder Elbow Surg* 2014;23:258-264.
12. Woods BI, Rosario BL, Siska PA, Gruen GS, Tarkin IS, Evans AR. Determining the efficacy of screw and washer fixation as a method for securing olecranon osteotomies used in the surgical management of intraarticular distal humerus fractures. *J Orthop Trauma* 2015;29:44-49

Clinical Evaluation of Depression and Anxiety in Pregnancy and their Impact on Maternal and Fetal Outcome

Aisha Salma

Resident, Department of Obstetrics and Gynaecology, Muslim Maternity and Children's Hospital, Hyderabad.

How to cite this article: Aisha Salma et al. Clinical Evaluation of Depression and Anxiety in Pregnancy and their Impact on Maternal and Fetal Outcome. Volume 13 Issue 3 July-September 2022

Abstract

Background: Anxiety and depression are more likely to occur during pregnancy. Anxiety during pregnancy is associated with negative outcomes in mothers and babies. Unfortunately, because anxiety is frequently used interchangeably with depression, research focused purely on anxiety during pregnancy are not as extensive as those focusing on depression.

Objectives: To evaluate the depression and anxiety during pregnancy and post pregnancy up to 3 months and also to study its impact on maternal health and foetal outcomes.

Methods: All women presenting to antenatal outpatient are included in this study with standard questionnaire method. All those are followed up further for 3 months, post-pregnancy to evaluate the maternal and foetal health. A standard questionnaire of depression and anxiety using Hospital anxiety and depression scale-HADS is given and the women at risk are further evaluated with Edinburg post-natal depression scale-EPDS. Follow up is done to check foetal growth, any pre-term delivery, mode of delivery, birth weight and maternal complications to additionally evaluate maternal and foetal outcomes.

Results: According to HADS Score , Overall Anxiety was reported in 26% of the cases, in 8% it was borderline and in 18% it was severe anxiety. Overall Depression according to HADS was 30%, It was borderline in 8% and in 22% of the cases it was severe depression. The EPDS score in comparison with Gravida, Depression, HADS score for Anxiety and depression, Maternal and neonatal complications was statistically significant. HADS and EPDS reported similar percentage of depression.

Conclusion: Properly identifying the women who are at risk of developing prenatal anxiety and depression would allow us to target those who might benefit from preventative and supportive measures. Furthermore, identifying the women at risk would allow us to monitor them throughout their pregnancy and recognise early signs of depression and anxiety as they develop, allowing us to intervene therapeutically if necessary.

Keywords: Antepartum, Post-partum, Anxiety, Depression, EPDS

Introduction

Depression and anxiety that remain untreated and undiagnosed can have negative consequences for both mother and child. Suicide is the most serious conceivable consequence of untreated depression. Depressed women are also more prone to engage in harmful behaviours during pregnancy, such as smoking and abusing illicit substances.¹ These women have a greater prevalence of poor nutrition,

which is caused in part by a lack of appetite, resulting in poor weight gain throughout pregnancy as well as the risk of intrauterine growth retardation.

Antenatal depression increases the chance of low birth weight, preterm delivery, and insecure mother-infant attachment, as well as having a detrimental influence on the physical and mental development of the child.² Relapse rates are high in pregnant women with a history of recurrent mood disorders, at around

50%.³ There is a risk of long-term consequences on the child if depression continues into the postpartum period, such as poor mother-infant bonding, delayed cognitive and language abilities, decreased emotional development, and behavioural difficulties. When a baby is exposed to a depressive and anxious maternal environment during early infancy, the kid's neuroendocrine functioning alters, and the child has greater behaviour issues when they begin school.⁴ As these youngsters grow, they are more likely to develop emotional instability and behavioural disorders, attempt suicide, and seek mental health care, either as a result of early exposure or a continuous stressful family situation.

According to research, the presence of stressful life events, such as a family history of substance abuse, a past personal history of sexual, physical, or emotional abuse, current exposure to intimate partner violence, and current social adversity, has a significant impact on the occurrence of psychiatric morbidity in pregnancy. Women who have poor social support, are single or adolescent, have an unexpected or early pregnancy, and are single or adolescent are more likely to experience anxiety and depression during pregnancy.⁵

Because of its influence on the mother, child, and family as a whole, maternal mental health has become a public health priority. The high incidence of depression and anxiety during pregnancy, as well as the numerous problems and consequences connected with it, provide the basis for this study.

Materials and Methods

Study setting: Department of Obstetrics in Muslim maternity Hospital

Study Design: Prospective observational study

Study Duration: October 2020 to September 2021

Inclusion Criteria

- Booked pregnant women attending antenatal outpatient department of obstetrics

Exclusion Criteria

- Pregnant women with medical disorders.

Sample size: 100

Sample size $n = 4pq / L^2$

Where, n = required sample size, p = prevalence of the disease in the pilot study,

$q = (1 - p)$, L = allowable error in the study.

Substituting $p = .025$ % from pilot study .

And $L = 5$ % we get $n = 39$.

Hence, we decided to include 100 patients in our study.

All women presenting to antenatal outpatient are included in this study with standard questionnaire method. All those are followed up further for 3 months, post-pregnancy to evaluate the maternal and foetal health. These women are evaluated with detailed obstetric history which includes history of psychiatric illness in previous pregnancy, history of medical disorders in past, routine antenatal laboratory profile and assessment chart at booking is done to rule out medical disorders and high-risk pregnancy.

A standard questionnaire of depression and anxiety using Hospital anxiety and depression scale-HADS is given and the women at risk are further evaluated with Edinburg post-natal depression scale-EPDS. Follow up is done to check foetal growth, any pre-term delivery, mode of delivery, birth weight and maternal complications to additionally evaluate maternal and foetal outcomes.

Statistical Analysis: Data was analysed using SPSS 22 software and the outcomes were presented in the form of graphs and tables. Chi-square was used to correlate the outcome percentages and find p-value and ANOVA with Post Hoc Tukey was calculated for EPDS and HADS. The p-value of <0.05 was considered statistically significant.

Observation And Results

A total of 100 patients were enrolled for the study. Each parameter has been studied separately in women diagnosed with depression and anxiety [Cases ($n=30$)] and compared with women without depression and anxiety [Controls ($n=70$)]

Table 1: Distribution based on Age group and BMI

Age group	Cases $n=30$	Control $n=70$	Frequency(%)
<20	1	3	4(4%)
21 - 30	28	56	84(84%)
31 - 40	1	11	12(12%)

Conti...Table 1: Distribution based on Age group and BMI

Age group	Cases n=30	Control n=70	Frequency(%)
BMI			
<18.5	6	7	13(13%)
18.5 - 24.9	20	48	68(68%)
25.0 - 29.9	4	15	19(19%)
Pregnancy Outcome			
LSCS	17	49	66(66%)
Vaginal delivery	13	21	44(44%)

Majority of the females around 84% belonged to the age group of 21 to 30 years followed by 12% in 31 to 40 years age group and 4% in <20 years age group. The youngest patient was 18 years old. The overall mean age was 26.09 ± 3.81 years.

13% of the women were underweight having a BMI <18.5. 19% of the women were Overweight, having a BMI in between 25.0 - 29.9 and 69% of the women had a normal BMI between 18.5-24.9. The lowest BMI recorded was 17.05. The mean BMI was 21.90 ± 3.20

Vaginal delivery was done in 44% of the patients. LSCS was done in 66% of the patients out of which repeat LSCS was done in 19% of the patients.

Majority of the sample size gestational age was in between 39.1 - 40.0 weeks for 53.33% of the cases, 32% of the cases had gestational age between 38.1 - 39.0, 37 to 38 weeks gestational age was seen in 17% of the cases, 9% of the cases had gestational age between 40.1 - 41.0 and 1% had gestational age of >41.1 weeks. The mean gestational age was $38.92 + 0.96$ weeks

Cases: Majority of the sample size gestational age was in of the depression patients was in between 39.1 - 40.0 weeks for 41% of the cases, 38.1 - 39.0, 37 to 38 weeks gestational age was seen in 16.66% of the cases, 13.33% of the cases had gestational age between 40.1 -

41.0. The mean gestational age was $39.07 + 1.01$ weeks

Controls: Majority of the sample size gestational age was 38.57% of the cases had gestational age between 38.1 - 39.0, for 39.1 - 40.0 weeks it was 35.71, 37 to 38 weeks gestational age was seen in 17.14% of the cases, 7.14% of the cases had gestational age between 40.1 - 41.0 and 1.42% had gestational age of >41.1 weeks. The mean gestational age was $38.85 + 0.93$ weeks

Low birth weight <2.5kgs was seen in 6% of the cases, 2.5 - 3.5 kgs was seen in 79% of the infants, >3.5kgs was seen in 15% of the infants. The mean birth weight was 3.08 ± 0.38 kgs.

Cases: Low birth weight <2.5kgs was seen in 6.66% of the infants of depressed mothers, 2.5 - 3.5 kgs was seen in 73.33% of the infants, >3.5kgs was seen in 20% of the infants. The mean birth weight was 3.11 ± 0.41 kgs

Controls: Low birth weight <2.5kgs was seen in 5.71% of the cases, 2.5 - 3.5 kgs was seen in 81.42% of the infants, >3.5kgs was seen in 12.85% of the infants. The mean birth weight was 3.07 ± 0.36 kgs

The chi-square statistic is 32.7829. The p-value is < .00001. The result is significant at $p < .05$

Anaemia was reported in 5% of the patients and blood transfusion was required for the same. Pregnancy induced hypertension was seen in 3%, Eclampsia in 1%, Post-partum haemorrhage PPH in 1% of the patients.

Cases: Anaemia was reported in 13.33% of the depression patients and blood transfusion was required for the same. Pregnancy induced hypertension was seen in 10% of the depression patients, Eclampsia and Post-partum haemorrhage PPH were seen in 3.33% of the depression patients each.

Controls: Anaemia was reported in 1.42% of the cases.

Table 2 : Distribution based on EPDS score initial vs 3 months

EPDS Score	1 month		3 months(post-partum)	
	Frequency	Percentage	Frequency	Percentage
≤8 (No depression)	70	70%	88	88%
9 - 11 (Depression Possible)	8	8%	6	6%
12 - 13 (High possibility of depression)	6	6%	5	5%
≥14 (Probable depression)	16	16%	1	1%
Total	100	100%	100	100%

By using EPDS scale, The Overall prevalence of depression was observed in 30% of the cases.

In 70% of the cases ≤ 8 score (no depression) was reported. In 16% of the cases ≥ 14 (probable depression) was reported. In 8% of the cases 9 - 11 (Depression Possible) was reported and in 6% of the cases 12 - 13 (High possibility of depression) was reported. The mean EPDS score was 8.22 ± 4.37

By using EPDS scale at 3 months post-delivery, in 88% of the cases ≤ 8 score (no depression) was reported. In 1% of the cases ≥ 14 (probable depression) was reported. In 6% of the cases 9 - 11 (Depression Possible) was reported and in 5% of the cases 12 - 13 (High possibility of depression) was reported. The mean EPDS score was 5.14 ± 3.08 .

The chi-square statistic is 15.6626. The p-value is .00133. The result is significant at $p < .05$.

Table 3: Distribution based on HADS score - Anxiety and depression

Anxiety - HADS Score	Total
0 to 7	74(74%)
8 to 10	8(8%)
11 to 21	18(18%)
Depression - HADS Score	
0 to 7	70(70%)
8 to 10	8(8%)
11 to 21	22(22%)

HADS Score - Anxiety: Overall Anxiety was reported in 26% of the cases, in 8% it was borderline and in 18% it was severe anxiety.

HADS score - Depression:

Overall Depression according to HADS was 30%, It was borderline in 8% and in 22% of the cases its severe depression

Table 4: Correlation of HADS Score for Anxiety and Depression

Anxiety - HADS Score	Depression - HADS Score		
	0 to 7	8 to 10	11 to 21
0 to 7	69	1	-
8 to 10	5	3	-
11 to 21	-	4	18

The correlation of Anxiety and Depression based on HADS score was statistically significant.

The mean HADS - Anxiety Score was 5.42 ± 4.62

The mean HADS - Depression Score was 7.46 ± 3.70

The chi-square statistic is 54.8602. The p-value is < 0.00001 . The result is significant at $p < .05$.

Table 5: Distribution based on Correlation of EPDS with HADS and other variables

EPDS Variables correlation	≤ 8	9 - 11	12 - 13	≥ 14	X ²	p-value
Gravida						
PRIMI	34	5	3	10	34.6912	< 0.0001 (S.S)
Multi	36	3	3	6		
BMI						
Underweight	10	-	1	5	16.806	0.010023(S.S)
Normal	48	7	4	9		
Overweight	12	1	1	2		
Delivery outcomes						
LSCS	27	2	1	8	3.3459	0.7643(N.S)
Repeat LSCS	12	2	1	4		
Vaginal delivery	31	4	4	5		
Maternal Complications						
None	70	7	5	7	38.3759	< 0.0001 (S.S)
Anaemia	1	-	-	5		
Pregnancy induced hypertension	-	-	-	3		
Eclampsia	-	1	-	-		
Postpartum Haemorrhage PPH	-	-	-	1		
Anxiety - HADS						
0 to 7	70	4	-	-	51.532	< 0.0001 (S.S)
8 to 10	-	4	4	-		
11 to 21	-	-	2	16		
Depression - HADS						
0 to 7	68	2	-	-	57.8895	< 0.0001 (S.S)
8 to 10	2	5	1	-		
11 to 21	-	1	5	16		
Total	70	8	6	16		

The EPDS score in comparison with Gravida, Depression, BMI, HADS score for Anxiety and depression and Maternal complications was statistically significant. HADS and EPDS reported similar percentage of depression

Discussion

Mental health issues during pregnancy are becoming more common. Due to lack of awareness, this public health issue has not been given importance. Pregnancy is a stressful experience for a female; in addition to the physiological changes, the anxiety of the uncertainty is a major stressor.⁶

The purpose of this study was to look at the impact of comorbid anxiety and depression on delivery outcomes during pregnancy. The sociodemographic and psychiatric correlates of anxiety and depression in nonpregnant women are well documented, but less is known about pregnant women. In our study, women's increasing age, paucity of live births, previous negative pregnancy outcomes and lack of involvement in family decision-making were all associated with anxiety or depression. Unplanned pregnancy and obstetric complication history were also found to be significant predictors of prenatal depression. Stress or depression may be exacerbated by a notion of increased economic burden and a diminished capacity to cope with possible societal stigma. Adverse pregnancy and delivery outcomes are frequently stressful circumstances, and a history of such complications may elevate stress levels in subsequent pregnancy. In this study, the prevalence of Depression and anxiety was 30%.

Low birth weight <2.5kgs was seen in 6.66% of the infants of depressed mothers, 2.5 – 3.5 kgs was seen in 73.33% of the infants, >3.5kgs was seen in 20% of the infants. The mean birth weight was 3.11 ± 0.41 kgs.

Birthweight	This study	Asaya et al ⁷
<2.5Kgs	6.66%	34.88%
>2.5kgs	93.33%	65.11%

Simultaneously, when the influence of maternal prenatal depression and anxiety was taken into account, a substantial independent effect of prenatal maternal anxiety on important indicators of new-born development outcomes was established. The weight of prenatally nervous mother's babies was lower at delivery than the weight of non-anxious mothers' babies. These findings are consistent with previous study that revealed that nervous mother's babies were born with lower weight.⁸

According to HADS Scale, Overall Anxiety was reported in 86.66% of the cases, in 26.66% it was borderline and in 60% it was severe anxiety. Overall Depression according to HADS was 93.33% in

depressed mothers, it was borderline in 26.66% and in 73.33% of the cases its severe depression. The internal consistency of the anxiety and depression subscales were found to be good, indicating that the HADS is reliable. There was, however, a substantial correlation between the anxiety and depression subscales. This might be seen as indication that the scale is a broad measure of distress rather than a measure of anxiety or depression. The correlation of anxiety and depression was similar.

The World Health Organization (WHO) considers depression to be one of the most debilitating diseases in the world. By 2030, depression is expected to be the leading cause of morbidity.⁹ It's prevalent during pregnancy, with 30 % of females experiencing depressive symptoms out of which 53.33% were experiencing a severe depressive episode in our study.

EPDS	This study	Pinto et al ¹⁰
<10	77%	75.8%
≥10	23%	24.2%

The correlation of anxiety and depression was similar, in 30% of the patients with depression 25% had anxiety. which is similar to Previous study.

Anxiety and depression are prevalent throughout pregnancy, as a corollary, prenatal programmes should include screening for anxiety and depression, as well as practical assistance for women during pregnancy, particularly those with a history of depression and poor family relationships. In order to protect the health of both mother and child, the research recommends incorporating mental health into existing maternity and child health programmes.

Limitations

- Ideally, post-natal follow up should have been done for 12 months. But due to time constraints we were able to follow for only 3 months in the current study.
- No standardized Indian rating scale is available for post-natal setting. EPDS scale has been used widely in western settings, where the cultural context and family dynamics are largely variable.
- This study was not a community-based study hence generalizing to the population cannot be done. Future studies are needed to identify more cases of mental health issues.

Conclusion

There was a significant association between mental health issues between prenatal and postpartum depression. An individual with any of the antepartum mental morbidities, such as anxiety, irritability, sleep problems, somatic symptoms, tiredness, stress about physical health, or worry about the child, was found to have a greater chance of developing anxiety and depression. Pregnant women from low socioeconomic backgrounds, as well as those with strained relationships with parents, siblings, and spouses, were shown to be at a greater risk of depression.

Properly identifying the women who are at risk of developing prenatal anxiety and depression would allow us to target those who might benefit from preventative and supportive measures. Furthermore, identifying the women at risk would allow us to monitor them throughout their pregnancy and recognise early signs of depression and anxiety as they develop, allowing us to intervene therapeutically if necessary.

Conflict of Interest: Nil

Source of funding: Self

Ethical Consideration: Ethical approval was taken from the institutional ethics committee of Muslim Maternity and Children's Hospital prior to the commencement of the study.

References

1. Shashi Rai, Abhishek Pathak, Indira Sharma Postpartum psychiatric disorders: Early diagnosis and management .Indian J Psychiatry. 2015 July; 57: S216-S221.
2. O'Hara MW, Schlechte JA, Lewis DA, Wright EJ. Prospective study of postpartum blues. Biologic and psychosocial factors. Arch Gen Psychiatry. 1991; 48:801-6.
3. Stein G. The maternity blues. In: Brockington IF, Kumar R, editors. Motherhood and Mental Illness. London, UK: Academic Press; 1982. pp. 119-54. 7.
4. Kendell RE, McGuire RJ, Connor Y, Cox JL. Mood changes in the first three weeks after childbirth. J Affect Disord. 1981; 3:317-26. 8.
5. Mills EP, Finchilescu G, Lea SJ. Postnatal depression - an Examination of psychosocial factors. S Afr Med J 1995; 85:99-105. 9.
6. Shahhosseini Z, Pourasghar M, Khalilian A, Salehi F. A Review of the Effects of Anxiety During Pregnancy on Children's Health. Mater Sociomed. 2015 Jun;27(3):200-2. doi: 10.5455/msm.2015.27.200-202. Epub 2015 Jun 8. PMID: 26236168; PMCID: PMC4499279.
7. Asaye, Mengstu & Muche, Haymanot & Zelalem, Eyerusalem. (2020). Prevalence and Predictors of Postpartum Depression: Northwest Ethiopia. Psychiatry Journal. 2020. 1-9. 10.1155/2020/9565678.
8. Matthey S, Barnett B, Howie P, Kavanagh DJ. Diagnosing postpartum depression in mothers and fathers: whatever happened to anxiety? Journal of Affect Disorders. 2003 Apr; 74(2):139-47.
9. World Health Organization (2021) Depression: fact sheet Depression (who.int), Accessed 24th February 2022.
10. Pinto TM, Caldas F, Nogueira-Silva C, Figueiredo B. Maternal depression and anxiety and fetal-neonatal growth. J Pediatr (Rio J). 2017 Sep-Oct;93(5):452-459. doi: 10.1016/j.jped.2016.11.005. Epub 2017 Feb 20. PMID: 28219626.

Effectiveness of Structure Teaching Programme on Knowledge Regarding Genetic Disorders and Attitude Towards Preventive Measures for Genetic Disorders among Undergraduates at Higher Educational Institute.

Ajay Kolage¹, Yogita Autade², Krishnali Garje³

¹Ind Year M.Sc. Nursing, Vithalrao Vikhe Patil Foundation's College of Nursing, Ahmednagar, Maharashtra, India

²Associate Professor, Department of Community Health Nursing, Vithalrao Vikhe Patil Foundation's College of Nursing, Ahmednagar, Maharashtra, India.

³Ind Year M.Sc. Nursing, Vithalrao Vikhe Patil Foundation's College of Nursing, Ahmednagar, Maharashtra, India

How to cite this article: Ajay Kolage , Yogita Autade, Krishnali Garje et al. Effectiveness of Structure Teaching Programme on Knowledge Regarding Genetic Disorders and Attitude Towards Preventive Measures for Genetic Disorders among Undergraduates at Higher Educational Institute. Volume 13 Issue 3 July-September 2022

Abstract

Genetic disorders may be hereditary or non-hereditary meaning that they are transfers from the parent's genes. But in some genetic disorder's defects may be caused by new mutations, altered phenotype or changes to the DNA. A change may occur that brings about changes in the number or position of any or more genes. This changing of the structure of particular chromosomes is also called chromosomal mutation or chromosomal rearrangement. An evaluative approach with simple random sampling technique were used for the study. The study sample consisted of (n=54) in selected higher educational institute. Pre-test were taken on first and total 2 hours intervention programme was administered on the genetic disorders. Post -test was conducted after completion of intervention programme.

Findings of Study

In the present study it was found that all students (100 %) are in the age group of 18-21 years. Gender of students are 50% male and 50% female. Study shows the student had average knowledge regarding genetic disorders and strong positive attitude towards preventive measures for genetic disorders and after implementing intervention programme the knowledge level is increased and the very strong positive attitude was developed. There is a significant association of attitude score with demographic variables such as previous history of genetic counseling. Study shows there is significant difference in knowledge score between males and females. About attitude part After implementing intervention programmed. It shows males had more positive attitude than females about preventive measures for genetic disorders and there was no any significant difference in attitude score between males and females.

Keywords: Genetic disorders, structured teaching programme, preventive measures, undergraduate students, questionnaire, attitude scale.

Introduction

A genetic disorder is a genetic problem caused by one or more abnormalities formed in the genome. Most of genetic disorders are quite rare and affect one person in every several hundred thousand. The prompt known genetic condition in a hominid was

in the fossil species *Paranthropus robustus* with over a third of individuals displaying *Amelogenesis imperfecta*.^[1]

Genetic disorders may be hereditary or non-hereditary meaning that they are transfers from the parent's genes. But in some genetic disorder's defects

Corresponding Author:

ajaykolage1234.ak@gmail.com

may be caused by new mutations, altered phenotype or changes to the DNA. A change may occur that brings about changes in the number or position of any or more genes. This changing of the structure of particular chromosomes is also called chromosomal mutation or chromosomal rearrangement. Those changes result in phenotypic character of the individuals. In those cases, the defect will only be passed down if it occurs in the germline. Genetic disorders can be monogenic, multifactorial or chromosomal.^[2]

A genetic disorder is an illness caused by one or more abnormalities in between the genome specifically a condition that is present from birth (congenital). Mostly genetic disorders are quite rare and affect one in every several thousand or million persons. Genetic disorders may or may not be hereditary i.e., transfer from the parent's gene. In non- hereditary genetic disorders, defects may cause by new mutation or changes to the DNA. The defect will only be hereditary if the genetic disorder occurs in the germ line.^[3]

Methods and Materials

In this study, 54 Male and females in the age of 18 to 25 years. in Selected higher educational institute. A total of 54 students in that (27 male and 27female in the age of 18 to 25b). They were selected using a Probability simple random sample technique. and an evaluative approach. The study was conducted as a descriptive study. Exclusion Those who are visually or hearing impaired. The study was performed after obtaining written informed consent from study participants. Knowledge structures questioner for check knowledge score and Attitude Towards Preventive Measures For Genetic Disorders. Descriptive and inferential statistics were used to analyses the data.

Statistical Analysis: Statistical analysis was done by the SPSS statistical package. The Chi-square test was performed to compare individual characteristics, and the t- test was performed to compare the two groups. Fisher's exact test P-value was considered statistically significant if it was 0.05. A Pearson correlation test was used to determine the significant correlations between variables.

Section I: Frequency and percentage distribution of socio-demographic variables of male and female students.

(1) AGE : Finding shows the age distribution of the study subject, there are 54 (100%) are belong to age group of 18-21 and 0 (0%) are belong to age group of 21-24.

(2) GENDER: Finding shows the gender distribution of the study subject were 27 (50%) are male and 27 (50%) are female students.

(3) EDUCATION: Finding shows the Education distribution of the study subject where 12th science are 53 (98.1%) participants and participants from another diploma is 1 (1.9%).

(4) MARITAL STATUS: Finding shows the Marital Status distribution of the study subject where married are 1 (1.9 %) participant, widow are 0 (0.0%) participants, single are 53 (98.1 %) participants and divorced participant that is 0 (0.0 %) participants according to marital status .

(5) LIVING AREA : Finding Shows the living area distribution of the study subject where the 20 (37%) participants are live in urban and 34 (63%) participants are live in rural area.

(6) SOURCE OF INFORMATION : Finding Shows the Source of information distribution of the study subject where the 7 (13%) participants are got information by journal, 45 (83.3%) participants are got information by from newspapers and 2 (3.7%) participants are get information by magazines.

(7) ATTAINED WORKSHOP/ SEMINAR: Finding shows attained seminar/ workshop on genetic disorders that is 8 (14.8%) participants attained seminar/ workshop and 46 (85.2%) participants did not attained any seminar/ workshop.

(8) FAMILY HISTORY OF DISEASE: Finding shows the history of Genetic disorders that is 4 (7.4%) participants have family history of genetic disorders and 50 (92.6%) participants have no any family history of genetic disorders.

(9) PREVIOUS HISTORY OF GENETIC COUNSELING: Finding shows the previous history of Genetic counseling that is 4 (7.4%) participants have previous history of Genetic counseling and 50 (92.6%) participants have no any previous history of Genetic counseling.

Section II: Description of pre-test and post-test knowledge on genetic disorders among male and female students.

Table No 1: Distribution of Pre-test and Post-test knowledge on genetic disorders among students.

Pre-test knowledge on genetic disorders among male and female students.			
		Frequency	Percent
	Good	2	3.7%
	Average	44	81.5%
	Poor	8	14.8%
	Total	54	100.0%

Post-test knowledge on genetic disorders among male and female students.			
		Frequency	Percent
	Good	43	79.6%
	Average	11	20.4%
	Poor	0	0.0%
	Total	54	100.0%

Above table shows in pre-test the knowledge of 44 (81.5) students had average level of knowledge, 8 (14.8%) students had poor knowledge and only 2 (3.7%) students had good knowledge regarding genetic disorders. The finding shoes that after the intervention program, the knowledge level was improved. i.e., after post-test 43 (97.6%) students' knowledge improved to good level and the other 11 (20.4%) get average level of knowledge regarding genetic disorders.

Table No. 2: shows the distribution of all pre-test and post-test data

(n= 54)

	Mean	Std. Deviation	Median	Mean (%)
Pre-test knowledge on genetic disorders among male and female students.	8.04	2.628	8.00	42.3
Post-test knowledge on genetic disorders among male and female students.	14.56	3.196	15.00	76.6

Finding shows that mean percentage of Pre-test knowledge on genetic disorders among male and female students 42.3% by applying intervention it improved to 76.6% that means it increased by 34.31% . In pre-test the student had moderate level of knowledge regarding genetic disorders, after the implementation of teaching program it increases to adequate level of knowledge about genetic disorders.

Section III: Description of pre-test and post-test attitude towards preventive measures for genetic disorder among male and female students.

Table No.3 : Frequency percentage distribution of Pre-test and Post-test attitude towards preventive measures for genetic disorder among students.

(n=54)

Pre-test attitude towards preventive measures for genetic disorder among male and female students			
		Frequency	Percent
	Negative	4	7.4%
	Positive	50	92.6%
	Total	54	100.0%

Post-test attitude towards preventive measures for genetic disorder among male and female students			
		Frequency	Percent
	Negative	1	1.9%
	Positive	53	98.1%
	Total	54	100.0%

Above table shows in pre-test the attitude of 4 (7.4) undergraduate students was negative towards preventive measures of genetic disorders and remain 50 (92.6) was positive towards preventive measures of genetic disorders . The finding shoes that after the intervention program, the attitude level was improved. After post-test 53 (98.1%) undergraduate students had positive attitude towards preventive measures of genetic disorders and the only 1 (1.9) had negative attitude.

Section IV: To find out the association between selected demographic variables and knowledge on genetic disorder and attitude towards preventive measures for genetic disorder among undergraduate students.

Table No. 4 : To find out the association between selected demographic variables

Variable	p value	Association
Age	-	No association
Gender	.276	No association
Marital status	.519	No association
Educational Stream	.481	No association
Residence area	.138	No association
Source of information	.543	No association
Attain workshop/seminar	.787	No association
Family history of genetic disorders	1.000	No association
Previous history of genetic counselling	.047	Association

p value > 0.05, NS (Not significant) accept H₀

p value < 0.05, sig(significant)- reject H₀

0 < p value < 0.01, HS(highly significant)

The above table shows that demographic variable has significant association with a group of students with previous history of genetic counselling. here calculated fisher exact test value (0.047, p< 0.05) ,were found statistically significant at 5% level (i.e. p

<0.05) hence null hypothesis is rejected and research hypothesis is accepted.

Section V: To compare knowledge on genetic disorder and attitude towards preventive measures for genetic disorder among male and female students.

Table No. 5: To compare knowledge on genetic disorder and attitude towards preventive measures for genetic disorder among male and female students.

Gender	N	Mean	Std. Deviation	t value	d.f	p value	Difference
Pre-test knowledge on genetic disorders among male and female students.	2.1	27	7.81	-0.618	52.000	0.539	No significant difference
	2.2	27	8.26				
	Total	54	8.04				
Post-test knowledge on genetic disorders among male and female students.	2.1	27	15.63	2.600	52.000	0.012	There is significant difference
	2.2	27	13.48				
	Total	54	14.56				
Pre-test attitude towards preventive measures for genetic disorder among male and female students	2.1	27	58.22	0.471	52.000	0.640	No significant difference
	2.2	27	57.33				
	Total	54	57.78				
Post-test attitude towards preventive measures for genetic disorder among male and female students	2.1	27	67.63	1.293	52.000	0.202	No significant difference
	2.2	27	65.48				
	Total	54	66.56				

The above table shows the significant difference between knowledge on genetic disorder among male and female students at post-test level but not in pre-test. In pre-test and post-test there is no any difference in attitude towards preventive measures for genetic disorder among male and female.

Discussion

The results are consistent with the study conducted at the largest university in Saudi Arabia. It is divided into three fields of study namely medicine, sciences and humanities students. The mean knowledge score was 5.3 ± 1.4 out of 7. Students with a better academic performance showed a greater knowledge compared with their companion.^[4]

A cross-sectional study that was conducted using a self-administered questionnaire which was distributed to 400 Omani adults aged 20–35 who attended primary healthcare institutions at the South Batinah Governorate in Oman. shows the results of the evaluation of associations between socio-demographic characteristics and unwillingness to perform pre-marital testing, as obtained from multivariate logistic regression modelling. The marital status was significantly associated with unwillingness to have pre-marital testing.^[5]

Conclusion

- Most of the student had average knowledge regarding genetic disorders and strong positive attitude towards preventive measures for genetic disorders and after implementing intervention programme the knowledge level is increased and the very strong positive attitude was developed.
- Most of the student knows the introductory part regarding genetics due to 12th science and some secondary school had included some genetic topics in their syllabus.
- It shows there is significant difference in knowledge score between males and females. It shows males had more positive attitude than females about preventive measures for genetic disorders and there was no any significant difference in attitude score between males and females.

- There is a significant association of attitude score with demographic variables such as previous history of genetic counseling.

Recommendations

1. A descriptive study can be conducted among students or community peoples.
2. A similar study can be replicated in other settings with different age groups .
3. A study can be conducted for assessing knowledge, attitude and practice regarding genetic disorders and genetic testing.
4. A comparative study may be conducted between males and females.

Limitation of the Study

1. Study was restricted to students with science background.
2. The sample was selected by simple random sampling method .
3. Data collection was done by knowledge questionnaire and attitude scale so the amount of information gathered was restricted.
4. The present study was limited to assess effectiveness of Structure Teaching Programme on knowledge regarding genetic disorder and attitude towards preventive measures for genetic disorders among undergraduates at higher educational institute. Study included only an evaluative approach.
5. The study is restricted in age group of between 18 to 24 years.

Ethical Clearance- Ethical Clearance was obtained from Institutional Ethics Committee of Dr. Vithalrao Vikhe Patil Foundation's Ahmednagar.

Source of Funding

The Author did not receive any type of funding for current study from external sources.

Conflict of Interest: There is no conflict of interest.

Competing Interest

Authors have declared that competing interest exist.

References

1. 1 A probable genetic origin for pitting enamel hypoplasia on the molars of *Paranthropus robustus*". ResearchGate. Retrieved 2019-03-09.
2. Genetic Disorders". learn.genetics.utah.edu. Retrieved 2019-07-01.
3. Brar Navdeep Kaur R. Textbook of Advanced Nursing Practice. 3rd ed. Jaypee Brothers Medical Publisher (P) Ltd; 2015.p.253.
4. A.S. Adewoyin N. Knowledge, attitude and control practices of sickle cell disease among youth corps members in benin city, nigeria [internet]. PubMed Central (PMC). 2015. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4853875/>
5. Olwi D, Merdad L, Ramadan E. Knowledge of Genetics and Attitudes toward Genetic Testing among College Students in Saudi Arabia. Public Health Genomics. 2016;19(5):260-8. doi: 10.1159/000446511. Epub 2016 Aug 20. PMID: 27544410

Control at the sewers to curb the COVID-19 pandemic in India- is the negligence perilous?

Anu V F¹, Nagarathna J², S K Srinath³

¹Post graduate student, Department of Pediatric and Preventive dentistry, Government dental college and Research Institute, Rajiv Gandhi / university of health sciences, Bangalore, Karnataka, India

² Associate Professor and Guide, Department of Pediatric and Preventive dentistry, Government dental college and Research Institute, Rajiv Gandhi / university of health sciences, Bangalore, Karnataka, India

³Professor and Head of Department, Department of Pediatric and Preventive dentistry, Government dental college and Research Institute, Rajiv Gandhi / university of health sciences, Bangalore, Karnataka, India

How to cite this article: Anu V F, Nagarathna J, S K Srinath et al. Control at the sewers to curb the COVID-19 pandemic in India- is the negligence perilous? Volume 13 Issue 3 July-September 2022

Manuscript

Abstract

COVID 19 PANDEMIC has stricken in multiple waves, crippling the nation with each strike. Attempts at curbing its spread has been focused on a few established modes of transmission. Current literature evidence suggests possibility of Feco-oral transmission, detection of viable virus in stools of covid infected individuals, viral shedding several weeks post recovery and potential persistence of viable virus in sewage. Guidelines and protocols laid down have not included this potentially dangerous mode of spread. Many countries including Australia, Finland etc have utilized waste water epidemiology as a tool in surveillance. This can be used as a warning signal for early detection and control. This review article proposes the addition of new guidelines in this spectre to aid in curbing the spread of pandemic as well as adopting sewage surveillance as a tool in primary prevention.

Keywords: Feco-oral transmission, Sewage Surveillance, Waste Water Based Epidemiology, SARS-CoV2, Sewage treatment plant

Abbreviations

SARS-CoV-Severe Acute Respiratory Syndrome Coronavirus2,
CDC- Centres for Disease Control and Prevention, WHO -World Health Organization,
STP-Sewage treatment Plant, WBE-Waste Water Based Epidemiology

Corresponding Author: Anu V F

Post graduate student, Department of Pediatric and Preventive dentistry
Government dental college and Research Institute,
Fort, Victoria Hospital, Bangalore, Karnataka, India
Postal code:560087
Tel: 8123584948
E-mail: dr.anuvf@gmail.com

Introduction

Ever since its entry into our country, all attempts at controlling the COVID 19 pandemic has offered only a brief respite. It is imperative that all modes of transmission be thoroughly reviewed at this juncture as the death tolls are peaking every day. The current guidelines on controlling the spread of SARS CoV2, viz social distancing, masks, isolation of infected individuals etc has been established on a few modes of transmissibility that focuses to prevent person to person transmission.

Recent literature emphasizes a strong possibility on feco-oral transmission of the virus. In a country like India, where the ground rules of sanitisation of waste water has not been given due relevance, persistence of the virus in the sewage and its transmission through such a route could give an insight as to why we are not able to bring down the numbers despite the measures followed for the past several months.

Although not considered highly pathogenic historically, Coronaviruses have changed their behaviour over the last decade, with the outbreak of SARS (severe acute respiratory syndrome) in 2002. The highly pathogenic coronaviruses include SARS-CoV, Middle East respiratory syndrome coronavirus (MERS-CoV) and SARS-CoV-2 (the Covid-19 virus), with its multiple variants that has emanated in the last few years. The respiratory tract is affected most, through attachment to the angiotensin converting enzyme 2 (ACE2) receptor.⁽¹⁾ Most of the research and preventive guidelines have been focused on the clinical symptoms affecting the respiratory tract. The gastro intestinal symptoms and the high expression of ACE2 receptors in the intestine⁽²⁾ are not being looked upon with enough significance.

Established Modes of Transmission and Current Guidelines

The established modes of transmission include inhalation of air carrying aerosols and fine droplets of infectious virus, splashes and sprays deposited on mucous membranes and transmission of the virus to the mucosa through hands soiled from contaminated inanimate surface⁽³⁾

The current guidelines on prevention of transmission include social distancing, wearing masks, Avoiding closed, crowded spaces and close contacts. Regular hand sanitisation and sanitisation of

inanimate surface that are frequently exposed. Home and self-isolation in case of symptoms.⁽⁴⁾

Feco-Oral Transmission

In 1972, White et al classified water related diseases functionally, of which two may be relevant in COVID 19 transmission; Water borne (water as a passive vehicle for transmission of infectious agent) and water washed (prevention of infection by provision for sufficient water for personal and domestic hygiene).⁽⁵⁾ In regard to excreta related diseases classification by Feachem et al, 1983, two categories pose relevance; SANITATION1, nonbacterial Feco-oral infections of low infectivity which spread when hygiene is compromised and SANITATION 6 which includes transmission through insect vectors which can be even more worrisome. In addition, another category that requires further attention is the “water cleaning category” wherein contaminated water used to clean inanimate surfaces can come in contact to oral mucosa through hands.⁽⁶⁾

Gastrointestinal symptoms such as Diarrhea, nausea, vomiting, abdominal pain, anorexia and often constipation, malena, acid reflux etc have been reported in many patients.⁽²⁾

A meta-analysis that included 10,089 patients concluded that the pooled prevalence of gastrointestinal symptoms were diarrhoea (7.7%), nausea or vomiting (7.8%), and abdominal pain (2.7%).⁽⁷⁾ Detection of viable SARS-CoV-2 in stools of COVID-19 patients has been reported^(8,9) and virus RNA has been found in sewage⁽¹⁰⁻¹²⁾ raising the possibility of faecal-oral transmission⁽⁶⁾ A literature review by Singer et al concludes that SARS CoV 2 virus is detectable in wastewater in presence of active or convalescent cases and that the use of this to estimate the prevalence is beneficial as it is not affected by age, gender or racial differences.⁽¹³⁾ It has been suggested that SARS-CoV-2 may persist longer in the digestive tract than in the respiratory tract⁽¹⁴⁾ Wu et al. (2020) found that the faecal samples of a patient in China were continuously positive for the viral RNA even after 33 days of seeing negative results for the respiratory samples⁽⁹⁾

Wastewater Based Epidemiology- its Application in Surveillance and its Potential Application in Modifying Preventive Strategies

Ahmed et al in 2020 reports to conduct the first

Wastewater-based epidemiology (WBE) study for SARS CoV2 in Australia. They concluded that wastewater monitoring can provide early warning signs especially when asymptomatic or mildly symptomatic cases are present in the community.⁽¹⁰⁾

In 2020, Nemudryi et al concluded that community qRT-PCR wastewater monitoring for SARS-CoV-2 RNA provides a measure of viral prevalence in real-time. However, the study failed to correlate clinical cases to these results.⁽¹⁵⁾

The World Health Organization recommends the used of common waste water treatment methods such as chlorination and UV light to inactivate the SARSCoV2 virus. However, its adequacy is questioned through several studies that suggested the use of multiple methods of disinfection such as anaerobic digestion and pond aeration, moving bed biofilm reactor (MBBR), and sequencing batch reactor (SBR) technologies, as well as secondary treatment combined with a tertiary disinfection step using peracetic acid, high-intensity UV lamps, or chlorine to reduce the virus concentration.⁽¹⁶⁾Zhang et al suggested that current disinfection guideline by WHO and China CDC might be inadequate to secure a complete removal of SARS-CoV-2 in medical wastewater after reporting an unexpected presence of SARS-CoV-2 viral RNA in septic tanks after disinfection with 800 g/m³ of sodium hypochlorite.⁽¹⁷⁾

Wastewater-based epidemiology (WBE) is beneficial as viral shedding subsequent to initial infection precedes the confirmed cases. This viral shedding can be accounted for nearly 100 million genome copies per liter of wastewater generated⁽¹⁸⁾

La Rosa et al. detected SARS-CoV-2 in wastewater of Milan and Turin two months before the first Italian case of COVID-19 was reported in February 2020⁽¹⁹⁾ Chavarria-Miro et al. detected the presence of SARS-CoV-2 RNA in a wastewater sample from Barcelona in January 2019, 41 days before Barcelona's first confirmed case in February 2020.⁽²⁰⁾

Vallejo et al 2021, reports a waste water-based epidemiological statistical model with 90% reliability and universal applicability which takes into account the entire population of the area , symptomatic as well as assymtomatic which help in tracking the disease for potential outbreaks.⁽²¹⁾

The factors to be taken into consideration in sewage treatment include the fact that sewage protected by organic matters are not susceptible to adequate disinfection, thus solid waste should be separated from hospital sewage and the fact that non centralized disinfection systems in isolation cabins can serve as a secondary source of infection⁽¹⁷⁾

Finland, Spain, Australia, and Netherlands have already launched national wastewater surveillance programs .⁽¹⁶⁾Since WBE can detect the virus earlier than the appearance of confirmed clinical cases, its importance in preventing an outbreak or wave is crucial.

Recommendations

The drainage and sewerage system standards in India are lagging far beyond the community needs. However, Urban areas and metropolitan cities are known to have STPs which utilize the waste water for further use as in irrigating agricultural lands or for other non drinking purposes. These can be put into effective use for surveillance as the pandemic is striking in multiple waves and with the vaccination process lagging behind the infectious surge.

Although many countries have adopted the WBE based surveillance system, Researches towards this end are lacking in our country. The potential for sewage as a source of infection also should not be neglected. Many gated communities and apartment complexes utilizes the retreated water efficiently in many cities . The prime STPs in major cities are alternate sources of irrigation.

In the current scenario where the measures to curb the Pandemic have been proven inadequate with increasing numbers of morbidity and mortality, Researches towards this end should be encouraged and adequate steps should be taken to prevent Feco-Oral Transmission.

1. At areas where STPs are non functional, People should be made aware of the importance of containing the sewage of infected persons and its proper disinfection with as much importance given to wearing Masks, social distancing and Hand sanitisation
2. The following pictorial representation can be adopted to the existing measures of Primary prevention at areas where WW/STPs are functional:

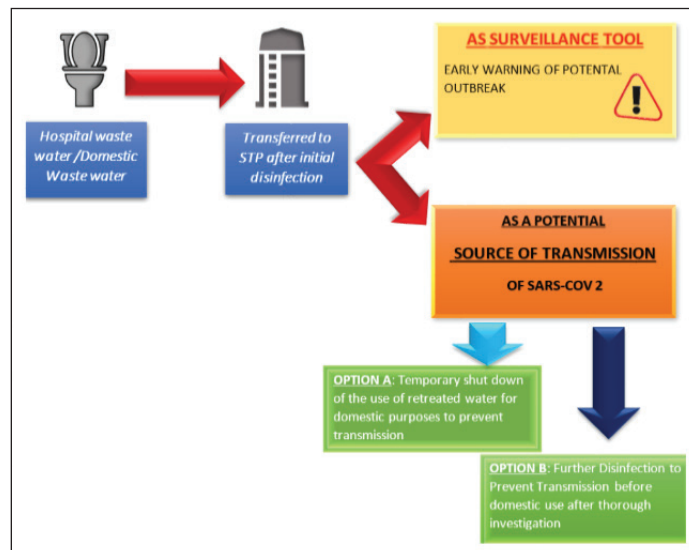


FIG 1: The waste water from COVID isolation hospitals and homes should be directed to a separate STP (sewage treatment plant), wherein it can be used as a surveillance tool to provide early warning of a potential outbreak. As it is a potential secondary source of transmission, additional disinfection must be carried out before implementation for domestic use.

Conclusion

Given the fact that substantial literature evidence supports the possibility of existence of viable virus in sewage, waste water treatment standards has to be escalated to meet the requirements of eliminating it as a potential source of transmitting the virus. In a developing nation like India, financial constrains can make additional disinfection of waste water difficult. In which case, we can choose to prevent usage of the retreated water for a substantial time. We can also adopt the sewage as a surveillance tool like many other countries for early warning of an outbreak to implement stringent controls at an earlier stage and thus diminish the morbidity and mortality rates.

Conflicts of Interest

No conflict of interest declared.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical Clearance

Ethical clearance not required

References

1. Fehr AR, Perlman S. Coronaviruses: an overview of their replication and pathogenesis. *Coronaviruses*. 2015:1-23.
2. Guo M, Tao W, Flavell RA, Zhu S. Potential intestinal infection and faecal–oral transmission of SARS-CoV-2. *Nature Reviews Gastroenterology & Hepatology*. 2021 Feb 15:1-5.
3. Centres for Disease control and Prevention. Scientific Brief: SARS-CoV-2 Transmission. [Internet]. US Department of Health and Human Services; [Updated on May 7, 2021] Available from: <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html>
4. World Health Organization. Advice for the public: Coronavirus disease (COVID-19). [Internet] [Updated on 1 October 2021]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>
5. White GF, Bradley DJ, White AU. Drawers of water: domestic water use in East Africa. Chicago: *University of Chicago Press*; 1972
6. Heller L, Mota CR, Greco DB. COVID-19 faecal-oral transmission: Are we asking the right questions?. *Science of the Total Environment*. 2020 Aug 10;729:138919.
7. Sultan S, Altayar O, Siddique SM, Davitkov P, Feuerstein JD, Lim JK, Falck-Ytter Y, El-Serag HB. AGA Institute rapid review of the GI and liver manifestations of COVID-19, meta-analysis of international data, and

- recommendations for the consultative management of patients with COVID-19. *Gastroenterology*. 2020 May 11.
8. Wang W, Xu Y, Gao R, Lu R, Han K, Wu G, Tan W. Detection of SARS-CoV-2 in different types of clinical specimens. *Jama*. 2020 May 12;323(18):1843-4.
 9. Wu Y, Guo C, Tang L, Hong Z, Zhou J, Dong X, Yin H, Xiao Q, Tang Y, Qu X, Kuang L. Prolonged presence of SARS-CoV-2 viral RNA in faecal samples. *The lancet Gastroenterology & hepatology*. 2020 May 1;5(5):434-5.
 10. Ahmed W, Angel N, Edson J, Bibby K, Bivins A, O'Brien JW, Choi PM, Kitajima M, Simpson SL, Li J, Tscharke B. First confirmed detection of SARS-CoV-2 in untreated wastewater in Australia: a proof of concept for the wastewater surveillance of COVID-19 in the community. *Science of the Total Environment*. 2020 Aug 1;728:138764.
 11. Medema G, Heijnen L, Elsinga G, Italiaander R, Brouwer A. Presence of SARS-Coronavirus-2 RNA in sewage and correlation with reported COVID-19 prevalence in the early stage of the epidemic in the Netherlands. *Environmental Science & Technology Letters*. 2020 May 20;7(7):511-6.
 12. Wurtzer S, Marechal V, Mouchel JM, Maday Y, Teyssou R, Richard E, Almayrac JL, Moulin L. Evaluation of lockdown impact on SARS-CoV-2 dynamics through viral genome quantification in Paris wastewaters. *MedRxiv*. 2020 Jan 1.
 13. Singer, A.; Wray, R. Detection and Survival of SARS-coronavirus in Human Stool, Urine, Wastewater and Sludge. Preprints 2020, 2020060216
 14. Arslan M, Xu B, El-Din MG. Transmission of SARS-CoV-2 via fecal-oral and aerosols-borne routes: Environmental dynamics and implications for wastewater management in underprivileged societies. *Science of the Total Environment*. 2020 Nov 15;743:140709.
 15. Nemudryi A, Nemudraia A, Wiegand T, Surya K, Buyukyoruk M, Cicha C, Vanderwood KK, Wilkinson R, Wiedenheft B. Temporal detection and phylogenetic assessment of SARS-CoV-2 in municipal wastewater. *Cell Reports Medicine*. 2020 Sep 22;1(6):100098.
 16. Fuschi C, Pu H, Negri M, Colwell R, Chen J. Wastewater-Based Epidemiology for Managing the COVID-19 Pandemic. *ACS ES&T Water*. 2021 May 9.
 17. Zhang D, Ling H, Huang X, Li J, Li W, Yi C, Zhang T, Jiang Y, He Y, Deng S, Zhang X. Potential spreading risks and disinfection challenges of medical wastewater by the presence of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) viral RNA in septic tanks of Fangcang Hospital. *Science of The Total Environment*. 2020 Nov 1;741:140445.
 18. Hart, O. E.; Halden, R. U. Computational analysis of SARSCoV-2/COVID-19 surveillance by wastewater-based epidemiology locally and globally: Feasibility, economy, opportunities and challenges. *Science of the total environment..* 2020, 730, 138875.
 19. La Rosa G, Mancini P, Ferraro GB, Veneri C, Iaconelli M, Bonadonna L, Lucentini L, Suffredini E. SARS-CoV-2 has been circulating in northern Italy since December 2019: Evidence from environmental monitoring. *Science of the total environment*. 2021 Jan 1;750:141711.
 20. Chavarria-Miró G, Anfruns-Estrada E, Guix S, Paraira M, Galofré B, Sánchez G, Pintó R, Bosch A. Sentinel surveillance of SARS-CoV-2 in wastewater anticipates the occurrence of COVID-19 cases. *MedRxiv*. 2020 Jan 1.
 21. Vallejo JA, Rumbo-Feal S, Conde-Perez K, Lopez-Oriona A, Tarrío-Saavedra J, Reif R, Ladra S, Rodino-Janeiro BK, Nasser M, Cid A, Veiga MC. Predicting the number of people infected with SARS-COV-2 in a population using statistical models based on wastewater viral load. *medRxiv*. 2020 Jan

Evaluation of Hemodynamic changes in Elective Cesarean section under Spinal Anesthesia

Arzoo Ralhan¹, Muskan Sodhi²

¹ & ²Resident, Department of Obstetrics and Gynaecology, Adesh Institute of Medical Sciences, Bathinda, Punjab

How to cite this article: Arzoo Ralhan, Muskan Sodhi et al. Evaluation of Hemodynamic changes in Elective Cesarean section under Spinal Anesthesia. Volume 13 Issue 3 July-September 2022.

Abstract

Background: Spinal block provides excellent anesthesia for cesarean section, but it is frequently accompanied by hypotension, which if untreated can pose serious risks to mother and baby. Over the years, many interventions have been tried to prevent hypotension, but no single technique has proven to be effective and reliable. This study was carried out with the aim to find if wrapping the legs with elastic crepe bandage in addition to traditional methods was effective in preventing post spinal hypotension.

Materials and Methods: A total of 60 full-term parturients with an uncomplicated pregnancy belonging to American Society of Anesthesiologists I or II were allocated randomly (30 in each group) to have their legs wrapped with elastic crepe bandage or no wrapping was done. All patients received intravenous (IV) crystalloid (20 ml/kg) 15 min prior to spinal injection and were placed in left lateral position. Electrocardiography and oxygen saturation was monitored continuously and heart rate, blood pressure was measured every 2 min until delivery of baby and every 5 min thereafter until end of cesarean section. Significant hypotension was treated with IV phenylephrine 50 µg bolus doses.

Results: The frequency of hypotension was significantly less ($P = 0.009$) in Group B (legs wrapped group) 3 (10%) patients when compared with Group A (nonleg wrapped) 13 (43.33%). In Group A 10 (33.33%) patients and in Group B 3 (10%) patients required rescue dose with phenylephrine which was statistically significant ($P = 0.0003$). Difference in the "mean change of arterial pressure" between Group A and B was highly significant ($P < 0.001$) recorded at 4, 6, and 8 min.

Conclusion: Incidence of hypotension can be reduced by wrapping the legs with elastic crepe bandage with a subsequent reduction in the use of potent vasopressor. Since leg wrapping with crepe bandage is cheap, easy, readily available, noninvasive, and nonpharmacological method, it can be recommended for preventing post spinal hypotension in a developing country like ours.

Keywords: Caesarean section, leg wrapping, spinal anaesthesia

Introduction

Cesarean birth has become the most common hospital-based operative procedure. The choice of anesthesia for cesarean section depends on the indication for the surgery, degree of urgency, maternal status and

desire of patient. Use of regional anesthesia has dramatically increased and use of general anesthesia for cesarean section has been steadily decreasing. ^[1] Risk of general anesthesia includes failed endotracheal intubation, failed ventilation, aspiration pneumonitis, postoperative nausea and vomiting, neonatal

Corresponding author:

Muskan Sodhi

resident, department of obstetrics and gynaecology,

adesh institute of medical sciences,

bathinda, punjab

dr.muskan13@gmail.com

9814541113

depression, and maternal awareness.^[2] Although spinal block provide excellent anesthesia for cesarean section it is frequently accompanied by hypotension generally proportional to the degree (level) of sympathectomy (height of block).^[3] Many methods to decrease the risk of hypotension have been studied, which include ensuring proper maternal position with uterus displaced off vena cava, infusion of fluids to increase effective blood volume, administration of ephedrine and phenylephrine, physical intervention such as leg wrapping.

Methodology

This prospective, double-blinded, and randomized controlled trial was undertaken after the approval by Institutional Ethics Committee. A written informed consent was obtained from each patient for participation in the study. As reported by previous studies a sample size of 27 in each group was necessary to detect a difference of this magnitude (39%) with 81% power in a two-tailed test at alpha error of 0.05. We recruited additional 10% patients keeping in view a possibility exclusion, failed block, etc. 60 full term pregnant patient with singleton uncomplicated pregnancy belonging to American Society of Anesthesiologists (ASA) Class I or II, scheduled for elective cesarean section under spinal anesthesia were randomly assigned by opening sealed envelope to either Group A (non-leg wrapping) (n = 30) or Group B (leg wrapped) (n = 30). An experienced anesthesiologist blinded to the leg wrapping, or the control group recorded the physiological variables. Patient characteristics, including age, height, weight, and gestational age was recorded. All the patients were kept fasting for 10-12 h before surgery. For all patients an intravenous (IV) line was secured using an 18G cannula in the left forearm and was premeditated with ranitidine 50 mg and metoclopramide 10 mg IV injections 30 min prior to the cesarean section.

Baseline blood pressure and heart rate were measured in the left supine wedged position. Baseline values were taken as the average of three successive readings. IV fluid preloading was then done with around 20 ml/kg of warmed ringer lactate solution over 15-20 min just prior to the spinal anesthesia. Group A patients had their lower limbs neither raised nor wrapped, but they were simply covered to hide them from anesthesiologist recording hemodynamics. Group B patients (n = 30) had their lower limbs wrapped immediately before the administration of

the subarachnoid block. Leg wrapping was achieved with crepe bandage (15 cm width, 4 m stretched length) applied from the ankle to the mid-thigh in both legs; during wrapping lower extremities were lifted at an angle of 45°. The crepe bandages were wrapped tightly enough that the women felt the tightness, yet it was comfortable and not painful. Care was taken to avoid compressing the legs to greater than arterial pressure by checking for capillary pulsation in the toes. All patients had their leg wrapped by the same person in around 3 min to eliminate bias introduced by method or altered force of wrapping. After wrapping the crepe bandages were hidden to ensure blinding.

Intrathecal all patients received 12.5 mg (volume 2.5 ml) 0.5% hyperbaric bupivacaine. Spinal anesthesia was performed in the sitting position using a 25G Quincke's needle in the L3-L4 or L4-L5 interspace through midline approach under all aseptic condition. Thereafter, the patients were placed supine with 15° left lateral tilt. Fluid replacement was maintained with ringer's lactate solution. Electrocardiography and oxygen saturation was monitored continuously and the heart rate and blood pressure was measured every 2 min until delivery of baby and every 5 min thereafter until the end of cesarean section. Duration of surgery and any intraoperative complications were recorded.

Hypotension was defined as fall in systolic blood pressure to ≤ 90 mmHg. Hypotension was treated immediately by increasing the rate of IV ringer lactate administration and by bolus 50 μ g phenylephrine intravenously. Parameters were recorded in a specially prepared proforma.

Results

Parturients in both groups were matched for age, weight, height, gestational age, and ASA grade no significant difference was found. There was no significant difference between the groups in respect to the duration of surgery from block delivery, delivery to end of surgery, total duration of surgery, time to achieve maximum sensory block height, and level of cephalad sensory block height.

Heart rate changes before delivery at 2 min interval were compared between the two groups, significant difference was found at 6th and 8th min ($P = 0.016$, 0.010), whereas no significant difference was observed after delivery.

The mean systolic blood pressure changes before delivery at 2 min interval when compared between two groups showed that Group B (leg wrapped group) had consistently higher systolic blood pressure throughout the measured interval. There was a significant difference in systolic blood pressure between the two groups at 4th, 6th, 8th, 10th, and 12th min and this difference was highly significant at 6th and 8th min ($P < 0.0001$). No significant difference was observed after delivery. Leg wrapped group had higher mean arterial blood pressure throughout the measured interval. There was highly significant difference at 4th, 6th, and 8th min ($P = 0.0002, 0.0001, 0.0003$), but no significant difference was observed after delivery.

In Group A, 13 (43.33%) patients developed hypotension and in Group B 3 (10%) patients developed hypotension thus significant difference in frequency of hypotension between the two groups was observed ($P = 0.009$). In Group A, 10 (33.33%) patients and in Group B 3 (10%) patients required rescue dose with phenylephrine, which was statistically significant ($P = 0.0003$).

Discussion

Hypotension following spinal anesthesia results from a decrease in arteriolar and venous tone secondary to sympathetic block, causing reduction in systemic vascular resistance and redistribution of central blood volume up to 500-600 ml to the peripheral compartment.^[4] A range of strategies are therefore being used to prevent or minimize hypotension, but there is no established ideal technique. The major interventions that have been used over the years are prophylactic fluid preloading (crystalloid or colloid), use of vasopressors like ephedrine or phenylephrine and use of varying mechanical interventions to increase central blood volume such as Esmarch bandages, compressive leg stocking, and crepe bandage.

The role of preloading with crystalloids in prevention of hypotension has been questioned whereas colloid is associated with the high cost and possibility of hypersensitivity and impaired coagulation. Use of vasopressors impairs utero-placental perfusion secondary to vasoconstriction with fetal or neonatal consequences. As a significant contribution to hypotension is made by venous pooling in the legs and abdomen, we therefore investigated the simple

leg wrapping as a method of reducing the incidence and severity of hypotension. In the present study, we found that there was a reduction in incidence of post spinal hypotension and reduction in need of rescue vasopressor administration achieved by using ordinary crepe bandage for wrapping the lower limbs. In Group A (nonleg wrapped) 43.33% and in Group B (leg wrapped) only 10% patient developed hypotension. Overall 33.33% parturient in nonleg wrapped group required rescue dose of phenylephrine, while only 10% parturients in leg wrapped group. Positive effect of wrapping the legs as a prophylactic method to prevent hypotension has also been investigated previously. van Bogaert et al. showed that the occurrence of hypotension in the control group and legs wrapped group with Esmarch elasticated bandage was 45.5% and 15.8%, respectively. Furthermore, the need of ephedrine administration was less in legs wrapped group than in the control group.^[5] Similar result was observed in a study by Rout et al., in which the number of episodes of hypotension was significantly reduced by leg wrapping with elasticated Esmarch bandages (18% of cases) as compared with controls (45.5% of cases). However, no significant differences were observed in the dose requirement for ephedrine between the groups.^[6] Bhagwanjee et al. observed that there was a high incidence of hypotension requiring vasopressor therapy in the control group (83%) compared with the leg wrapped group (16%) - a difference which was significant, both clinically and statistically.

In Group A, there was a decrease in systolic blood pressure following spinal anesthesia, which was significantly lower than the baseline value at 4th, 6th, 8th, and 10th min and was not significant thereafter. Leg wrapped patients had a nonsignificant decrease in systolic blood pressure when compared with baseline. In leg wrapped group, the mean systolic blood pressure remained consistently above the mean systolic blood pressure of control and the difference in between the groups was significant at 4th, 6th, 8th, 10th, and 12th min. Finding of the present study correlate with the study done by van Bogaert et al., who found that in all the groups, there was a decrease in systolic blood pressure, but the mean systolic blood pressure remained significantly above the systolic blood pressure of control. Similar findings were also observed by Rout et al., they showed that in wrapped groups, the mean systolic blood pressure did not significantly decreased to below baseline value. Systolic blood pressure was significantly lower

in the control group than in leg wrapped group at 3rd, 4th, 6th, 7th, and 10th min following spinal injection.

Comparison between the groups showed that there was highly significant difference in the mean arterial blood pressure at 4th, 6th, and 8th min. This is in agreement with the study done by Goudie et al. where the fall in diastolic blood pressure and mean arterial pressure was greater in the control group than in leg wrapped group. In their study, Adsumelli et al. they found 50% higher incidence of significant mean arterial pressure reduction in the control group compared with the sequential compression device group.

Conclusion

We conclude that incidence of hypotension can be reduced by wrapping leg with simple elastic crepe bandage with a subsequent reduction in the use of potent vasopressor agents and their unnecessary pharmacological action. As leg wrapping with elastic crepe bandage is cheap, easy, readily available, noninvasive, and nonpharmacological method, it can be recommended in addition with preload and left uterine displacement for preventing post spinal hypotension and its subsequent adverse effect on the mother as well as on a baby in developing countries like ours.

Ethical clearance- taken from institutional committee

Source of funding- Self

Conflict of Interest – Nil

References

1. Reisner LS, Lin D. Anesthesia for cesarean section. In: Chestnut DH, editor. *Obstetric Anesthesia*. 2nd ed. St. Louis: Mosby; 1999. p. 465-92.
2. Rocke DA, Rout CC. Volume preloading, spinal hypotension and caesarean section. *Br J Anaesth* 1995;75:257-9.
3. Anonymous. *MIMS Annual*. 19th ed. New Delhi: A.E. Morgan Publications (India) Private Limited; 1995. p. 836-7.
4. Ngan Kee WD, Khaw KS, Ng FF. Prevention of hypotension during spinal anesthesia for cesarean delivery: An effective technique using combination phenylephrine infusion and crystalloid cohydration. *Anesthesiology* 2005;103:744-50.
5. Kluger MT. Ephedrine may predispose to arrhythmias in obstetric anaesthesia. *Anaesth Intensive Care* 2000;28:336.
6. Ramin SM, Ramin KD, Cox K, Magness RR, Shearer VE, Gant NF. Comparison of prophylactic angiotensin II versus ephedrine infusion for prevention of maternal hypotension during spinal anesthesia. *Am J Obstet Gynecol* 1994;171:734-9.
7. Chan WS, Irwin MG, Tong WN, Lam YH. Prevention of hypotension during spinal anaesthesia for caesarean section: Ephedrine infusion versus fluid preload. *Anaesthesia* 1997;52:908-13.
8. Lee A, Ngan Kee WD, Gin T. Prophylactic ephedrine prevents hypotension during spinal anesthesia for Cesarean delivery but does not improve neonatal outcome: A quantitative systematic review. *Can J Anaesth* 2002;49:588-99.

KAP Study on Social Distancing and Utility Sharing among Students of Bhadrak Autonomous College, Odisha, India during the First COVID-19 Wave: Implications for Policy Decisions in Subsequent Waves

Asima Tripathy

Post Graduate Department of Zoology and Microbiology, Bhadrak Autonomous College, Bhadrak ,
Higher Education Department (Govt. of Odisha)

How to cite this article: Asima Tripathy et al. KAP Study on Social Distancing and Utility Sharing among Students of Bhadrak Autonomous College, Odisha, India during the First COVID-19 Wave: Implications for Policy Decisions in Subsequent Waves. Volume 13 Issue 3 July-September 2022

Abstract

Students are a high-risk group in a pandemic scenario like COVID-19, both as patients and as spreaders due to their attitudes and practices of very close association and utility-sharing among themselves. Schools and colleges in India have been closed since March 2020 till January 2021 and could just be reopened for higher classes for only three months in phases till April 2021. This has precipitated an unprecedented crisis in the lives of students and of educational organizations and institutions and the biggest headache for the ministries of higher education and the HRD ministry too. We conducted a KAP survey during the first COVID wave on March to May 2020 to analyze the risk factors involved in case of reopening of educational institutions. Accordingly we discuss the implications for policy decisions for such a highly sensitive group based on a study on **over 500 students** of the semi-urban locality of Bhadrak in Odisha, India. A questionnaire was prepared keeping in view the objectives of such a study by randomly picking students on campus, both boarders and day scholars, to collect the KAP-data from among the **nearly 6000** students of the College. We find that most of the students are vulnerable to catch an infection and have the highest potential to spread it to many in no time. The appropriate measures before the final opening of schools and colleges would be (a) to have enough space for ensuring social distancing (b) sensitization and awareness drives through all means among students to inhibit spread of the infection and (c) the required increase in manpower to ensure the successful implementation of the above two.

Keywords: COVID-19, Pandemic, KAP-study, utility sharing, sanitization, variants of concern

Introduction

COVID-19 has been continuing in waves across the globe since its first appearance in Wuhan, China and we are still reeling under its onslaught though several vaccines have already been administered to crores of people in different countries with varying degrees of success^[1-10]. Several theoretical models have been advanced to fit the data emerging from different countries and predictions have been made and are continuously being fine-tuned to explain the number of new incidences and fatalities depending on parameters such as sunlight duration and humidity etc. ^[11]. In the mean time the second Covid-19 wave

has passed and a third wave too, however mild, in most of the countries. But the attitude among students and in the general public has still a lot to be desired. We still see people crowding public places and public buses and trains without masks or below-the-nose masks, even when a variant of concern is raging.

The RNA virus has mutated continuously as if meta-evolving ^[12-14] in response to the vaccine and medication pressures ^[15-20] even as humans show signs of developing herd immunity against earlier variants ^[21]. In this rather unusual struggle for survival of the scientifically-empowered human-prey and the naturally-empowered virus-predator, Lotka-Volterra

type oscillations are being seen in the succession of waves of the pandemic, seemingly to restore order and equilibrium in the biosphere, considering its ever-increasing toll on humanity^[22-25]. How far are we really empowered to deal with a tiny, presumed-to-be-nonliving virus? Has humanity learnt from earlier pandemics sufficient lessons to have the right attitude and adopt the right practices when a pandemic hits or are we blinded by the pride of scientific achievement and the pursuit of supremacy by indulging in self-destructive gain-of-function research^[26-27]?

In the present study we focus on knowledge, attitude and practices among students of Bhadrak Autonomous College, Bhadrak, Odisha, India in regard to sharing of utilities and suggest some policy measures to be adopted to curb the spreading of any infectious disease due such sharing, in the event of reopening of educational institutions.

Materials and methods

Questionnaire consisting of 20 questions was distributed among the target students to gain information about their knowledge of specific infectious diseases and their attitude towards precautionary behavior to avoid getting infected. Questions were also included to gauge their practices of sharing of utilities with others at home and in hostel/mess environments. The aim was to come to a definite conclusion about prevalence of utility sharing among them and how such practices are to be curbed in a pandemic scenario to avoid explosive spread of infection in educational institutions. The participants in the study were informed beforehand about the nature and scope of the study and its how its outcome would enable formulation of specific policies for combating explosive spread of pandemic among student masses. Sufficient care was taken in formulating the questionnaire to avoid any kind of infringement upon personal privacy of the respondents.

Table 1: Questionnaire for survey on utility sharing

1. How many close friends do you have?
2. With how many friends you regularly share your bicycle or bike?
3. With how many friends you regularly share your study materials such as books, notes and pens?

4. With how many friends you regularly/ occasionally share your dresses?
5. With how many friends you share your washroom utilities such as bath towels/soap/oil/shampoo/ tooth paste?
6. With how many friends you do handshake/fist bump/high fives/hug to greet?
7. With how many friends you regularly/ occasionally share your dinning sets?
8. With how many friends you regularly/ occasionally share your towels?
9. With how many friends you regularly/ occasionally share your uniforms?
10. With how many friends you regularly/ occasionally share food from the same plate?
11. Do you wash your hands before taking food?
12. Which food items you usually take from roadside vendors/thela-wala?
13. How many days per week you take food from roadside vendors?
14. Do you have any knowledge of transmission of viral/bacterial infection through contact and through shared utilities?
15. How does Hepatitis infection spread?
16. What is hepatitis?
17. Hepatitis is caused by what?
18. When did you suffer from jaundice last?
19. Which other diseases you suffered from in last five years?
20. With how many persons do you share your toilet?

Findings of the study

The findings of the study are depicted in the fig. 1 to 5 below for ease of understanding. It was found that on an average a student has about 1 to 2 close friends with whom utility sharing happens which can and does contribute greatly to spread of infection due to compounding of the effect through contacts of contacts etc. We believe that this is the reason, in spite of imposing strict social distancing and masking norms in educational institutions, the spread could not be controlled effectively during the first wave

resulting in complete closure of schools, colleges and universities across the country. Sharing of bicycles and study materials was almost same in all the groups from with 1 to more than 5 friends. Sharing of dress materials with 2 or more friends is still found to be a common practice among the students surveyed.

In terms of personal hygiene we found that about 83% were in the habit of hand-washing regularly, which is quite satisfactory. Still considering the infectiousness of COVID, this has to be made 100% if successfully the spread is to be tackled. Similarly, *gupchup* or *panipuri* is the first choice roadside food with 38.1%

going for it, with 15.71% going for *dahibara-aludam* in the second spot. About 25% of the respondents take food from roadside *thelas* up to twice a week, while 22.78% take up to 5 times a week! This can be linked to the prevalence of incidence of dysentery and diarrhea among students due to such contaminated food taken so frequently. It compounds the problems in case of a raging pandemic because such gastro-intestinal infections make the persons immune-compromised and make them more vulnerable to infection, and once infected, it also makes them less likely to recover as they have higher probability of succumbing to associated comorbidities.

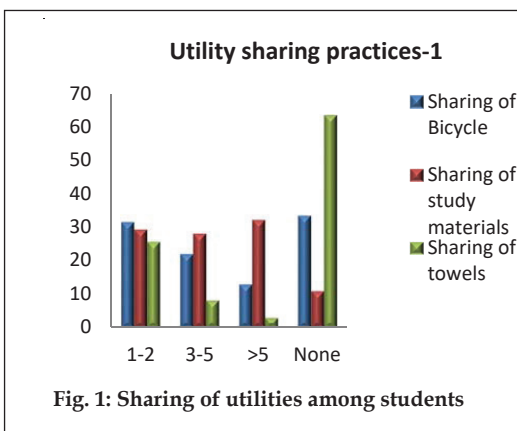


Fig. 1: Sharing of utilities among students

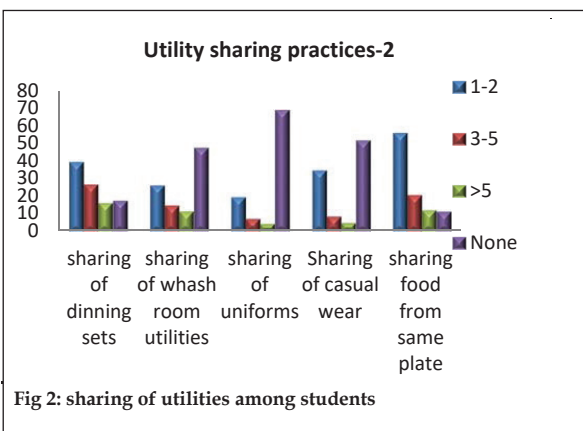


Fig 2: sharing of utilities among students



Fig 3: Hand-washing practice among students

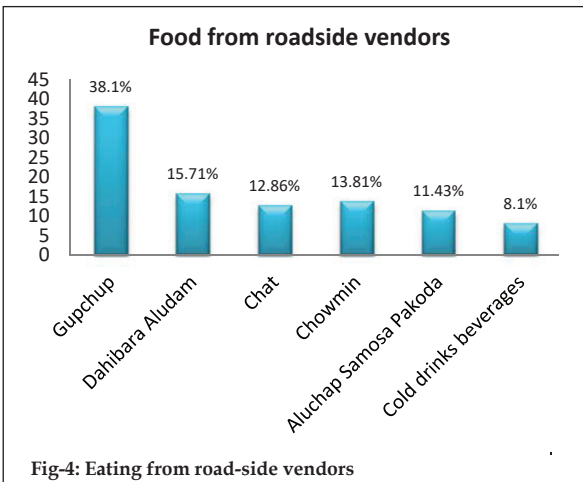


Fig-4: Eating from road-side vendors

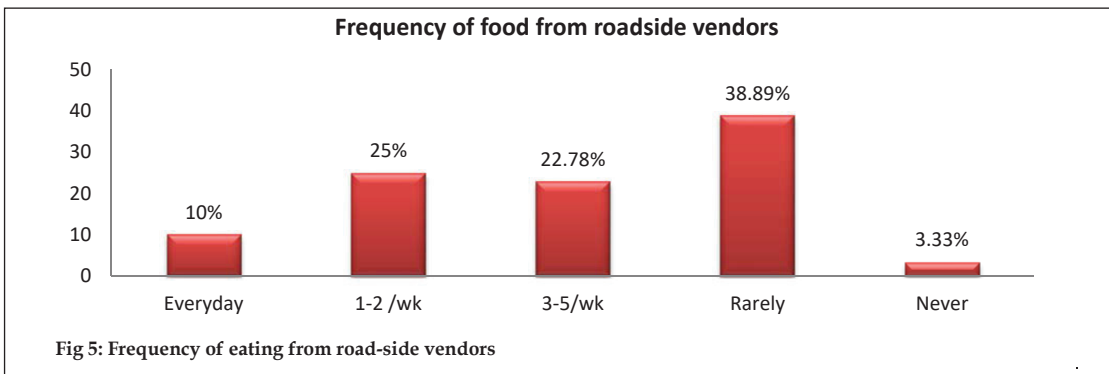


Fig 5: Frequency of eating from road-side vendors

Basing on these findings we suggest specific policy recommendations for reopening of educational institutions and hostels so that in subsequent waves of COVID and in any other pandemic, adequate measures can be taken by the authorities concerned for saving invaluable lives.

Specific policy recommendations

Institution

- a) Sanitization of every entrant and exitant at every gate of the college
- b) Classes and examinations be made in the online mode as far as practicable
- c) Each class be split into groups of 15 to 20 for both theory (offline classes) and laboratory sessions
- d) Sanitization of campus at least thrice a day, classrooms after every class and common rooms for students and teachers and canteens and cafes at hourly intervals.
- e) Sensitization of support staff
- f) Installation of sensor-based touch-free hand-washing points
- g) Prompt recruitment of extra teaching and support staff to ensure the implementation of the above
- h) Stretching of college hours with different batches of teachers and staff to ensure classes of every group of students
- i) Conversion of most of the existing classrooms to ICT enabled smart class rooms enabling engagement of online classes for all groups at the same time.

Hostels

- a) All hostels be remodeled by erecting individual living space cubicles in a room with the number of boarders per room restricted to ensure social distancing.
- b) Food supply to the rooms or restricted entry to dining halls.
- c) Toilets be attached to the respective rooms rather than being on sharing floor-wise

- d) Sanitization of rooms and campus and common spaces be made at least thrice a day
- e) Sanitization of every entrant and exitant at the gates
- f) Sensitization of support staff
- g) Prompt recruitment of adequate support staff for implementing these measures

This study was undertaken during the first COVID-19 wave before vaccines were developed and hence after wide-spread vaccination of the college-going youth, the data as well as the outcomes are certain to change drastically, which we propose to undertake in a future study. Reports of repeated infection (a.k.a. breakthrough infections), both symptomatic and asymptomatic, though mild, long and sometimes severe in nature, following full vaccination have been coming from all segments including the youth which again is a matter of grave concern for future course of action in regard to the strategy of vaccination as the only solution^[28-30].

Discussion and Conclusion

As long as infectiousness due to close contact or utility sharing remains responsible for the pandemic, these measures will help curb the spread. But, if the VOCs are indeed Vaccine Induced Variants Of Concern (VIVOC) *i.e.* produced from within due to interaction of injected viral fragments with the immune system of the individuals as happened in case of the delta and omicron variants of SARS-CoV-2, there is very little that can be done now. Similarly, if the majority of cases are false positives due to intrinsic lacunae of the use of RTPCR for detection, in which case, even ordinary flu cases can pass off as COVID positive cases, leading to alarming rise of infected cases. A further trouble is the complete disregard of comorbidities and multimorbidities as causes of deaths and ascribing almost all deaths to COVID-19 exclusively as if before the pandemic there were no other causes of deaths^[31-32]! Especially, COVID-19 made cancer even more invincible and more destructive than ever before^[33-37] through direct co-infection and through healthcare-deprivation.

Thus, the COVID statistics must be reviewed not only for ascertaining real COVID positive cases and deaths but also in regard to its real infectivity, especially with the later VOCs which seem to be VIVOCs. If VIVOCs are responsible for the latest

waves, then there is no hope of having any respite unless the effects of vaccines is completely wiped out and further vaccine doses are stopped from being administered, whether fresh or booster. The VIVOCs are not spreading as infectious agents but are coming up from within the vaccinated individuals, when the mRNA enters the genome and produces the COVID-like symptoms. There is need for an in-depth study of virus-vaccine interaction as it is an RNA virus and as such is prone to frequent mutations which further intensify due to pressures of vaccines and medications.

Funding Statement: Self.

Conflicts of Interest: The author declares no conflict of interest.

Ethical Clearance: No ethical issues in this study. Informed consent was taken from the participants.

References

- Cacciapaglia G, Cot C, Sannino F. Multiwave pandemic dynamics explained: how to tame the next wave of infectious diseases. *Scientific Reports* 2021;11:6638
- Tripathy A, Pradhan RK. COVID-19 as a Conscious Organism: A Novel Understanding of the SARS-CoV-2 as a Natural Evolution of the SARS Virus. *Indian Journal of Public Health Research and Development*.2020;11(7):142-147.
- Tripathy A, Pradhan RK. COVID-19 and Spanish Flu Pandemics: Insights into the Viral Vehicles of Life and the Concept of Dispersed Organisms. *Indian Journal of Public Health Research and Development*. 2020;11(10):6-9.
- Seong H *et al.* Comparison of the second and third waves of the COVID-19 pandemic in South Korea: Importance of early public health intervention. *International Journal of Infectious Diseases* 2021;104:742–745.
- Tripathy A, Pradhan RK. COVID-19 as a Dispersed Organism: Host Manipulation and Psychosocial Impacts. *Indian Journal of Public Health Research and Development*. 2020;11(10): 88-92.
- Chu J. A statistical analysis of the novel coronavirus (COVID-19) in Italy and Spain. *PLoS ONE* 2021;16(3):e0249037
- Tripathy A, Pradhan RK. Cycles in Time and Psyche: Implications for Cyclicity, Fatality and Symptomatics of COVID-like Pandemics. *Indian Journal of Public Health Research and Development*. 2021;12(2): 53-57.
- Tripathy A, Pradhan RK. COVID-19 management, treatment and vaccination strategies as the most efficient host manipulation by SARS-CoV-2: Reappraisal of a serious global public health crisis. *Indian Journal of Public Health Research and Development* 2022;13(1):77-82.
- Salyer SJ *et al.* The first and second waves of the COVID-19 pandemic in Africa: a cross-sectional study. *Lancet* 2021;397:1265–75
- Pei, S., Yamana, T.K., Kandula, S. *et al.* Burden and characteristics of COVID-19 in the United States during 2020. *Nature* 2021;598:338–341.
- O’Nuallain S, Bernal-Casas D. *Follow the Sun: How two rebel neuroscientists solved Covid-19*, Red Books, Wexford, Ireland, ISBN: 9781838215415, 2022.
- Tripathy A, Pradhan RK. A Prelude To Meta-Evolution, *Indian Journal of Science And Technology August 2018;11(31): DOI: 10.17485/Ijst/2018/V11i31/130098*.
- Wang R *et al.* Mechanisms of SARS-CoV-2 Evolution Revealing Vaccine-Resistant Mutations in Europe and America. *J Phys Chem Let* 2021;12(49):11850-11857
- Tripathy A, Pradhan RK., Methylation-Assisted Epigenetic Evolution and The Psycho-Biology of Human Experiences, *IJPHRD* 2018; 10(8):554-558.
- Tripathy A, Pradhan RK The Indomitable Force of Instinctive Urge in Competitive Success, Stress Response and Evolution. *International Journal of Scientific Research and Reviews* 2019;8(2):2286-2300.
- Moore JP, Offit PA. SARS-CoV-2 Vaccines and the Growing Threat of Viral Variants. *JAMA* 2021;325(9):821-822.
- Tripathy A, Pradhan RK., Role of Evolutionary Urge in Epigenetics And Gene-Culture Coevolution: A Meta-Evolution Perspective, *Indian Journal Of Science And Technology, August 2018;11(32):DOI: 10.17485/Ijst/2018/V11i32/131051*.
- Tripathy A, Pradhan RK. The Ubiquitousness of Prey-Predator Relationship(PPR), The Law of Purposive Association and Fundamental Questions In Evolution, *Indian Journal of Science And Technology August 2018;11(32): DOI: 10.17485/Ijst/2018/V11i32/131052*.
- Tripathy A, Pradhan RK., Symbiotic Interactions, Law of Purposive Association And The +/+ Nature Of All Co-Evolution, *Indian Journal of Science And Technology November 2018, 11(43); DOI: 10.17485/Ijst/2018/V11i43/132577*.
- Tripathy A. Pradhan RK. A Critical Analysis of Unusual Prey-Predator Relationships With Regard to Their Exclusive Evolutionary Advantages, *Indian*

- Journal Of Science And Technology* October 2018;11(39): DOI: 10.17485/Ijst/2018/V11i39/131270.
21. Randolph HE, Barreiro LB. Herd Immunity: Understanding COVID-19. *Immunity*. 2020; 52(5):737-741. doi:10.1016/j.immuni.2020.04.012.
 22. Tripathy A, Pradhan RK., Niche Classification, Niche Processes and Niche Dynamics: Role of Consciousness, *International Journal of Scientific Research and Reviews* 2019;8(1):1316-1328.
 23. Tripathy A, Pradhan RK., Niche, Competition and the Laws of Conscious Individual Dynamics: Similarities with Laws of Classical and Quantum Physics. *International Journal of Scientific Research and Reviews* 2019;8(1):1626-1635.
 24. Tripathy A, Pradhan RK, Parasite-Vector-Host Conscious mechanism as Determinant of Parasite Virulence, vector Infectivity and Host Susceptibility: Reproductive Success of malaria Parasites in plasmodia-Mosquito-Human Troika, *International Journal of Scientific Research and Reviews* 2019;8(1):2079-2086
 25. Tripathy A, Pradhan RK. Consciousness as the cosmic ordering principle and the interplay of order and disorder in the physical and biological systems, *International Journal of Scientific Research and Reviews* 2019;8(1):859-873.
 26. Dance A. The shifting sands of Gain-of-function research. *Nature* 28 Oct 2021;598:554-557.
 27. Menachery VD *et al.* A SARS-like cluster of circulating bat coronaviruses shows potential for human emergence. *Nature Medicine* 2015;21(12):1508-1513.
 28. Tyagi K *et al.* Breakthrough COVID19 infections after vaccinations in healthcare and other workers in a chronic care medical facility in New Delhi, India. *Diabetes & metabolic syndrome* 2021;15(3):1007-1008
 29. Shastri J *et al.* Severe SARS-CoV-2 Breakthrough Reinfection With Delta Variant After Recovery From Breakthrough Infection by Alpha Variant in a Fully Vaccinated Health Worker. *Front. Med.* 8:737007. doi: 10.3389/fmed.2021.737007
 30. Singh UB *et al.* Variants of Concern responsible for SARS-CoV-2 vaccine breakthrough infections from India. *J Med Virol.* 2021;1-5.
 31. Ge E *et al.* Association of pre-existing comorbidities with mortality and disease severity among 167,500 individuals with COVID-19 in Canada: A population-based cohort study. *PLoS ONE* 2021;16(10): e0258154
 32. Chudasama YV *et al.* Patterns of multimorbidity and risk of severe SARS-CoV-2 infection: an observational study in the U.K. *BMC Infect. Dis.* 2021;21:908.
 33. Bora BM, Patel VR. The deadly duo of COVID-19 and Cancer. *Front. Mol. Biosci.* 8:643004. doi: 10.3389/fmolb.2021.643004
 34. Tripathy A, Pradhan RK. The Cancer Principle-I: Introducing Cancer as a Fundamental Principle of Nature. *IJPHRD* 2020;11(6):1-5
 35. Tripathy A, Pradhan RK. The Cancer Principle-III: Evolution by Cancer. *Indian Journal of Public Health Research and Development.* 2020;11(6):11-16
 36. Tripathy A, Pradhan RK. The Cancer Principle-IV: The inevitability and invincibility of Cancer. *Indian Journal of Public Health Research and Development.* 2020;11(6):17-21
 37. Tripathy A, Pradhan RK. The Cancer Principle-V: Cancer Prevention and Therapeutics. *International Journal of Public Health Research and Development* 2020;11(6):30-34.

Acromegaly with Predisposition towards Cardiac Failure

Bhardwaj CM

Resident internal medicine SGT medical college, Hospital Gurgaon, Haryana India

How to cite this article: Bhardwaj CM et al. Resident Internal Medicine SGT Medical College, Hospital Gurgaon, Haryana India. Volume 13 Issue 3 July-September 2022

Abstract

Acromegaly is a rare disease caused by excess secretion of growth hormone. Most cases are due to pituitary macro or microadenoma. It usually occurs sporadically but some can be familial due to AIP gene mutation¹. We report a case of 45 year old gentleman with chief complaints of breathlessness since 15 days, increase shoe size, large hands and feet, protruded jaw, which eventually turned out to be acromegaly based on typical clinical appearance, hormonal features with chest xray showing features of cardiomegaly. Patient was managed conservatively, and discharged with stable vitals. Prompt and early intervention in such cases can prevent further progression of disease.

Keywords: Acromegaly, hypertension, type 2 diabetes, protruded jaw ,cardiomegaly, micro-macroadenoma

Introduction

Acromegaly is derived from a Greek word acro means extremities and megaly means enlargement. It is due to excess secretion of growth hormone. Growth hormone is secreted by anterior pituitary gland². Overall incidence is approximately 3-4 million per year and prevalence is 50 -80 per million worldwide³. It is due to pituitary micro or macroadenoma. It has equal predilection for both males and females. It is characterised by change in facial appearance with protruded jaw, interdental separation, large tongue, tight ring, large hands and feet. Eventually if unrecognised patient can land up with type 2 diabetes, hypertension , cardiac manifestations, arthritis.It is diagnosed by elevated growth hormone levels and treated medically as well by surgical approach⁴.

Case Report

A 45 year old male presented in OPD with complaints of breathlessness on exertion (NYHA-1), increase shoe

size , with loss of appetite since 15 days. On carefully examining patient , patient had protruded jaw, large hands and feet , excessive forehead sweating, deep voice and was detected with hypertension with a blood pressure of 142/84 mmhg On auscultation basal crepitation were present, Hba1c showed values of 7.4%GH levels and IGF-1 levels were elevated which further added to our diagnosis



Corresponding Author: Bhardwaj CM

Resident internal medicine SGT medical college hospital Gurgaon (122505), Haryana India



Fig1: A: Protruded Jaw and prominent supraorbital ridges ,

B: Forehead sweating C&D: Spade like hands and feet

Chest x ray was done which showed enlarged left and right ventricle Thus the clinical appearance, hormonal parameters together with biochemical parameters , chest x-ray aided the diagnosis Patient was started on amlodipine 5 mg , vildagliptin with metformin (Vysov-M 50/500mg), ocreotide 50 microgram thrice daily was started and after 5 days patient was discharged with stable vitals

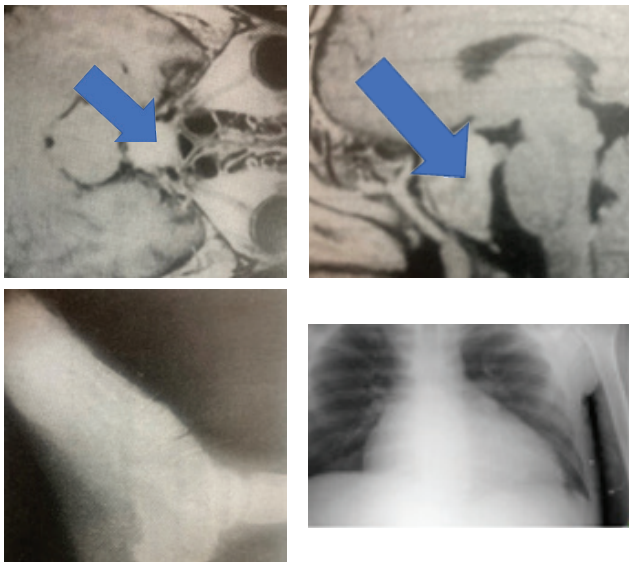


Fig 2A&2B: Arrow head in MRI brain showing pituitary macroadenoma, 2C: Xray heel - increase heel pad thickness 2D:Enlarged right and left ventricle

Lab Investigations	Values
Hb(g/dl)	11.4 g/dl
TLC(cumm)	4500 cells per cumm

Lab Investigations	Values
GH (ng/ml)	37ng/ml
IGF-1(ng/ml)	805ng/ml
TSH (microiu/ml)	3 micro IU/ml

Hb: hemoglobin, TLC- Total leucocyte count, GH- Growth hormone

IGF: Insulin like growth factor1, TSH-Thyroid stimulating hormone

Discussion-Acromegaly is caused by growth hormone hypersecretion. It is caused by pituitary micro /macroadenoma. Protean manifestation of GH, IGF-1 hypersecretion are indolent and are often not diagnosed after 10 years or more Acral overgrowth of bone results in frontal bossing, large hands, feet , prognathism, widened space between lower incisor teeth⁵. Soft tissue swelling results in increase heel pad thickness ,increase shoe or glove size, tight rings, large fleshy nose. Other features include forehead sweating,, deep voice, oily skin, arthropathy carpal tunnel syndrome, acanthosis nigricans ,visceromegaly, cardiomegaly, macroglossia , thyroid enlargement.⁶

The most significant effect of GH excess occurs with CVS system. Coronary artery disease, cardiomyopathy, left ventricular hypertrophy, hypertension ,decreased diastolic function occurs in most patients if left untreated. Obstructive sleep apnea occurs in more than 60% of patients, Diabetes mellitus occurs in 25% of patients⁷. Death occurs due to cardiovascular, cerebrovascular, respiratory disease. Screening is done by measuring IGF-1 levels together with elevated GH levels, aids in diagnosis. Treatment is done by using ocreotide 50microgram thrice daily injected subcutaneously . It suppress the growth hormone in 75% of patients. Transsphenoidal surgical resection of tumor can return GH levels to normal within an hour⁸.

Conclusion

Acromegaly should be identified early before the patient land up in its complications as discussed above.

Acknowledgement

I thank Dr Nityanand Sharma(Prof and HOD medicine), Dr VD Verma(Associate professor medicine) for their guidance.

Ethical clearance - Taken from committee

Source of funding - self

Conflict of interest - nil

Reference

1. Ezzat S, Foster MJ, Berchtold P, et al. Acromegaly, clinical and biochemical features in 500 patients. *Medicine*. 1994; 73: 233 - 45.
2. Arya KR, Pathare AV, Chadda M, et al. Diabetes in Acromegaly- a study of 34 cases. *J Indian Med Assoc* 1997;95: 546-7.
3. Melmed S. Acromegaly. In: DeGroot LJ ed., *Endocrinology*, 5th Ed, vol. 1, Elsevier Saunders Company 2006; pp. 417.
4. Reid TJ, Post KD, Bruce JN, Nabi KM, Reyes-Vidal CM & Freda PU 2010 Features at diagnosis of 324 patients with acromegaly did not change from 1981 to 2006: acromegaly remains under-recognized and underdiagnosed. *Clinical Endocrinology* 72 203- 208.
5. Mestron A, Webb SM, Astorga R, Benito P, Catala M, Gaztambide S, Gomez JM, Halperin I, Lucas-Morante T, Moreno B et al. 2004 Epidemiology, clinical characteristics, outcome, morbidity and mortality in acromegaly based on the Spanish Acromegaly Registry (Registro Espanol de Acromegalia, REA). *European Journal of Endocrinology* 151 439-446.
6. Ferdinand Roelfsema , Nienke R. Biermasz, Alberto M. Pereira. Clinical factors involved in the recurrence of pituitary adenomas after surgical remission: a structured review and meta-analysis. *Pituitary* (2012) 15:71-83
7. Ferdinand Roelfsema. Treatment of acromegaly: Are we satisfied with the outcome?. *EBioMedicine*. 2014 Dec 20;2(1):5-6. 9. Melmed S. Acromegaly. *N Engl J Med*. 1990; 322: 966-77
8. Bengtsson BA. Epidemiology and long-term survival in acromegaly: a study of 166 cases diagnosed between 1955 and 1984. *Acta Med Scand*. 1988;223: 327-35.

A study to assess the effectiveness of Self-Instructional Module on knowledge regarding Multi Drug Resistance Tuberculosis among staff nurses in selected hospital of Gurugram

Knowledge regarding Multi Drug Resistance Tuberculosis

Bharti Sachdeva¹, Nisha², Nidhi³

¹ Associate Professor, ^{2,3} Student, Faculty of Nursing, SGT University

How to cite this article: Bharti Sachdeva¹, Nisha², Nidhi³ et al. A study to assess the effectiveness of Self-Instructional Module on knowledge regarding Multi Drug Resistance Tuberculosis among staff nurses in selected hospital of Gurugram. Volume 13 Issue 3 July-September 2022

Abstract

Objective: To assess the effectiveness of self-instructional module on knowledge regarding multi drug resistance tuberculosis among staff nurses in SGT hospital’.

Material and Methods: An evaluative approach with one group pre-test, post-test design was used for the study. The purposive sampling technique was used to select 50 staff nurses as the sample. A structure knowledge questionnaire was used to assess the knowledge and SIM was administered to find its effectiveness. The collected data was analyzed by using descriptive and inferential statistics.

Result: The mean percentage of post-test knowledge score (16.48) was higher than the mean percentage of pre-test knowledge score (7.4). The calculated ‘t’ value is greater than the table value (0.05, 49df) i.e. 2.67. It showed a significant difference between mean pre and post-test knowledge scores. Calculated χ^2 values showed significant association between Education and area of residence of respondents with their post-test knowledge scores.

Conclusion: The findings of the study showed that staff nurses had inadequate knowledge regarding multi drug resistance tuberculosis before administration of SIM. The results indicated that the SIM is effective in increasing the knowledge of staff nurses on multi drug resistance tuberculosis.

Keywords: Effectiveness, Knowledge, Multidrug Resistance Tuberculosis, Self-Instructional Module

Introduction

Tuberculosis (TB) is a disease caused by bacteria mycobacterium tuberculosis that are spread from person to person through the air¹. TB usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys, or the spine. TB is treatable and curable. Tuberculosis is treated by antitubercular drugs.

Drug resistant TB, A person with active TB disease has drug resistant TB if the TB bacteria that the person is infected with, will not respond to, and are therefore resistant to, at least one of the main TB drugs². There are two ways that people get drug resistant TB. **Firstly**, people acquire drug resistant TB when their TB treatment is inadequate, **Secondly**, transmitted or primary drug resistant TB results from the direct

Corresponding Author:

Bharti Sachdeva

bharti.nursing@sgtuniversity.org

transmission of drug resistant TB from one person to another³. There are two main types of drug resistant TB, MDR-TB and XDR-TB (Extensively drug resistant TB)

Multi-drug-resistant tuberculosis (MDR-TB) is a form of tuberculosis (TB) infection caused by bacteria that are resistant to treatment with at least two of the most powerful first-line anti-TB medications (drugs), isoniazid (INH) and rifampin (RMP)⁴. Almost one in four people in the world are infected with TB bacteria. Extensively-drug-resistant tuberculosis (XDR-TB) is defined as resistance to INH,

rifampicin, flouroquinolon, and one of capreomycin/kanamycine/ amikacin.

The general symptoms of TB disease include: feelings of sickness or weakness, weight loss, fever, and Night sweats⁵.

Materials and Methods

The research design selected for the present study is Pre- Experimental design (i.e one group pre-test and post-test pre experimental design). In this design pre-test is conducted followed by Post-test for the same group after 7 days.

	Pre-test (O1)	Intervention (X)	Post-test (O2)
Group	Administration of Structured Knowledge Questionnaire on day-1	Administration of Self-instructional module on day-1	Administration of same Knowledge Questionnaire After 7 days.

O₁: Pre-test to assess the knowledge regarding multi drug resistance tuberculosis.

X: Self-instructional module on knowledge regarding multi drug resistance tuberculosis.

O₂: Post-test to assess the knowledge regarding multi drug resistance tuberculosis.

Variables Under Study

Three types of variables were identified in this study. They are:

- Independent variable
- Dependent variable
- Demographic variables

Independent variable: Independent variable in this study is self-instructional module (SIM) regarding multi drug resistant tuberculosis.

Dependent variable: Dependent variable in this study is knowledge of staff nurses regarding multi drug resistance tuberculosis.

Demographic variables: Demographic variables in this study were age, gender, Religion, qualification, area of residence, years of experience.

Sampling Technique

Sampling is a process of selecting a subset of the population in which entire population is represented.

In this study investigator used purposive sampling technique to draw the samples.

Sampling Criteria

Inclusion criteria

- The staff nurses who are working at selected hospital.
- The staff nurses who are willing to participate.

Exclusion criteria

- The staff nurses who are not willing to participate.
- The staff nurses who are not present at the time of data collection.

Sample Size

Sample Size: The sample size of this study is 50 staff nurses at selected hospital who are available at the time of data collection and fulfill the inclusion criteria.

Data Analysis and Interpretation

The data was analyzed using descriptive and inferential statistics.

- **Descriptive statistics:** frequency and percentage distribution to present the demographic variables.

- **Mean, range and standard deviation** were used to describe the knowledge regarding multi drug resistance tuberculosis
- **Inferential statistics:** appropriate statistical test chi square and t- test were used to analyze the data.

Result

Pretest score revealed that majority of the staff nurses 82.0% (41) had Inadequate level of knowledge regarding multidrug resistance tuberculosis and 18.0% (9) of them had moderate level of knowledge. Post-test score revealed that 74.0% (37) of staff nurses had adequate level of knowledge, 26.0% (13) of them had moderate level of knowledge and none of them were having inadequate level of knowledge regarding multi drug resistance tuberculosis.

Table 1: Comparison of pretest and posttest knowledge scores of staff nurses regarding multi drug resistance tuberculosis

N= 50

Level of Knowledge	Score	Pretest		Posttest	
		No	%	No	%
Inadequate	<50%	41	82.0	0	0.00
Moderate	50--75%	9	18.0	13	26.0
Adequate	>75%	0	0.00	37	74.0
Total		50	100	50	100

Table 2: Effectiveness of self-instructional module on knowledge regarding multi drug resistance tuberculosis among staff nurses

N=50

Area of knowledge	Pre-test		Posttest		Paired 't' test
	Mean	SD	Mean	SD	
Overall	7.4	0.87	16.48	1.29	16.64**

** Significant P< 0.01level, df 49, table value: 2.67

It is confirmed that the overall paired t' test value was 16.64; it is significant in table value 2.67 at 0.01 level. So, it is proved that the SIM was effective in improving knowledge of staff nurses regarding multi drug resistance tuberculosis.

Conclusion

Out of 50 respondents, in the pre-test, the majority 41 (82.0%) had inadequate knowledge and 9 (18.0%) had moderate knowledge. In post-test 13(26.0%) had moderate knowledge and 37 (74.0%) had adequate knowledge. The calculated t value was 16.64 which is greater than the table value. It concluded that there were significant differences between post-test and pre-test knowledge score on multi drug resistance tuberculosis, indicating that the self-instructional module (SIM) is very effective. Hence, with an increase in knowledge. There was no significant association between pre-test knowledge regarding multi drug resistance tuberculosis with selected demographic variables such as age, gender, religion, education, residential area, years of experience. The investigator concluded that the self-instructional module is an effective educating strategy in improving the knowledge of the staff nurses regarding multi drug resistance tuberculosis. Thus, the self-instructional module conducted by the investigator helped the staff nurses to improve their knowledge.

Ethical clearance: taken from departmental research committee, SGT University

Source of funding: Self

Conflict of Interest: Nil

References

1. Lalloo UG, Naidoo R, Ambaram A. Recent advances in the medical and surgical treatment of multi-drug resistant tuberculosis. Current opinion in pulmonary medicine. 2006 May 1;12(3):179-85.
2. Maurya AK, Kant S, Nag VL, Kushwaha RA, Kumar M, Jain S, Dhole TN. OL-036 Incidence of multi drug resistant tuberculosis (MDR-TB) in extrapulmonary tuberculosis cases in Northern India. International Journal of Infectious Diseases. 2011(15):S27.
3. Nair N, Wares F, Sahu S. Tuberculosis in the WHO south-east Asia region. Bulletin of the World Health Organization. 2010;88:164-.
4. Palomino JC. Newer diagnostics for tuberculosis and multi-drug resistant tuberculosis. Current opinion in pulmonary medicine. 2006 May 1;12(3):172-8.
5. Singh P, Katoch VM. Multi-drug resistant tuberculosis: current status and emerging tools for its management in India. The Journal of Communicable Diseases. 2006 Mar 1;38(3):216-29.

Disability Adjusted Life Year (DALY) loss in open tibia fracture treated with External vs Internal fixation

Bhukya Tejkumar

Assistant Professor, Mamata Medical College, Khammam

How to cite this article: Bhukya Tejkumar et al. Disability Adjusted Life Year (DALY) loss in open tibia fracture treated with External vs Internal fixation. Volume 13 Issue 3 July-September 2022

Abstract

Background: Tibial fractures are the most prevalent long bone fractures, with around a quarter of them being open. Due to the tibial shaft's lack of soft tissue covering and blood flow, managing these fractures can be difficult. The degree of initial bone displacement, comminution, and soft tissue injuries all influence the prognosis.

Objectives: To compare the loss of DALY in open tibia fracture patients treated with external versus internal fixation.

Methods: 50 patients with open tibia fractures – 25 patients treated with external fixation and 25 patients with internal fixation. On admission, demographic information was collected, and a comprehensive history was conducted to determine the mode of injury and any co-morbidities. To examine other connected injuries and open wounds, a general systemic and local examination was performed, followed by radiological evaluation in AP and Lateral views. After the diagnosis has been established, the patient was informed of the fracture and the necessity for surgery. The consent is obtained, and pre-operative planning is done. The mean DALY was calculated based on the union of fracture.

Results: External fixation resulted in an average DALY loss of 8.40 months, while internal fixation resulted in a DALY loss of 4.9 months. When compared to External Fixation, Internal Fixation clinical union occurs in a significantly shorter time.

Conclusion: The outcome of the study shows that Internal fixation outperformed External fixation in terms of DALY loss, with External fixation losing considerably more DALYs than Internal fixation.

Keywords: DALY, Tibia fracture, Gustilo anderson grading, External fixation, Internal fixation

Introduction

Open tibial fractures have a bimodal pattern, with low-energy and high-energy processes involved which are commonly caused by automobile accidents, sports accidents, and high-energy falls.¹ The fracture pattern is determined by the mode of injury. The majority of fractures have been comminuted. Pedestrians impacted in the upper and middle thirds of the tibia suffer bumper injuries. A fall from a great height often results in distal tibial and plafond fractures. A torsional force, indirect trauma leading in spiral fractures, and/or a fibular fracture at a different level with a minimum soft-tissue injury are

all examples of low-energy injuries. Direct trauma generally results in wedge or short oblique fractures with substantial comminution, and it can be linked with soft-tissue injury, compartment syndrome, bone loss, and ipsilateral-skeletal injury.²

In a developed western civilization, Behrens et al observed a rate of two open tibia fractures per 1000 injuries per year in a specified demographic group; this equates to 0.2 % of all injuries. In the developing world, the prevalence and severity of the disease may be significantly higher.³

Tibial fractures are the most prevalent long bone fractures, with around a quarter of them being open.

Due to the tibial shaft's lack of soft tissue covering and blood flow, managing these fractures can be difficult. The degree of initial bone displacement, comminution, and soft tissue injuries all influence the prognosis.⁴ To achieve bone and soft tissue healing, advanced bone repair and soft tissue covering are frequently necessary. As a result, open tibial fractures have a high prevalence of sequelae; infection, non-union, and limb loss are the most common causes of morbidity.⁵ In order to achieve rapid healing and early ambulation for the patient, the care of these fractures necessitates a multidisciplinary approach. The Gustilo-Anderson classification is the most generally used, and it divides open wounds into three severity categories depending on the size of the open wound, the degree of contamination, and the amount of soft-tissue injury.⁶

The disability-adjusted life year is used to assess disease burden (DALY). A DALY is the loss of one year's worth of full health. Years of life lost due to premature mortality (YLLs) and years of healthy life lost owing to disability (YLDs) due to prevalent cases of a disease or health condition in a population are calculated as DALYs.⁷

Materials and Methods

Sample size : 50 patients with open tibia fractures – 25 patients treated with external fixation and 25 patients with internal fixation.

Inclusion Criteria

- Patient with age > 15 years with open tibia fractures
- Patient presenting with grade II, IIIa and IIIb open tibia fracture

Exclusion Criteria

- Patients with closed fractures were excluded
- Patient having associated vascular injury, Fracture involving epiphysis,
- Patients not willing for surgery
- Patients not giving informed consent

On admission, demographic information was collected, and a comprehensive history was conducted to determine the mode of injury and any co-morbidities. To examine other connected

injuries and open wounds, a general systemic and local examination was performed, followed by radiological evaluation in AP and Lateral views. After the diagnosis has been established, the patient was informed of the fracture and the necessity for surgery. The consent is obtained, and pre-operative planning is done and standard surgical procedure is done. Patients were followed up periodically. The mean DALY was calculated based on the union of fracture.

Follow-up radiographs were taken one month after the initial procedure to assess the progression of the fracture union. After that, gradual weight-bearing was permitted. Patients were then evaluated every two months for clinical and radiological evaluations until the fracture healed. When a sufficient bridging callus was observed on radiographs, full weight bearing was allowed. The appearance of a bridge callus in at least three cortices on the radiograph was considered evidence of fracture union, as was the absence of pain or tenderness across the fracture zone. After the fracture had fully healed, the external fixation device was removed as an outpatient procedure. During follow-up, significant data such as the time to full weight bearing and the time to complete bone union were recorded. All subjects were effectively followed up.

Statistical Analysis: All the data was entered in the Ms-excel and the SPSS 20 software was used to compute statistical analysis. The outcomes were presented in the form of Tables and graphs with Mean, Standard deviation and percentages. The p-value of <0.05 was considered statistically significant.

Observation and Results

Table 1: Distribution based on Gender and age group

	External fixation	Internal Fixation
Mean Age (years)	45.31±3.45	42.17±5.67
Gender		
Male, n (%)	16 (64%)	15 (60%)
Female, n (%)	9 (36%)	10 (40%)

Male predominance was seen in both the groups with 64% and 60% respectively. The mean age in external fixation group was 45.31±3.45 yrs and the mean age in internal fixation group was 42.17±5.67 yrs.

Table 2: Distribution based on Fracture type (AO system)

Fracture type (AO classification)	External Fixation	Internal Fixation
A - extra-articular	10 (40%)	10 (40%)
B - partial articular	9 (36%)	10 (40%)
C - articular	6 (24%)	5 (20%)

According to AO system of fracture classification, in both the group Type A was seen in 40% of the cases each, Type B was seen in 36% in external fixation group and 40% in internal fixation group and Type C was seen in 24% of the cases with external fixation and in 20% of the cases in internal fixation group.

Table 3: Distribution based on Gustilo anderson grading

Gustilo-Anderson grading	External Fixation	Internal Fixation
I	7 (28%)	8 (32%)
II	13 (52%)	11 (44%)
IIIA	5 (20%)	6(24%)

According to Gustilo-Anderson grading, Type II - mild to moderate periosteal stripping, wound greater than 1 cm in length was seen in 52% of the cases with external fixation and 44% of the cases with internal fixation.

Type I - periosteal stripping, clean wound less than 1 cm was seen in 28% of the cases with external fixation and 32% of the cases with internal fixation.

Type IIIA - soft tissue injury, significant periosteal stripping with a wound that is usually greater than 1 cm in length with no flap required was seen in 20% of the cases with external fixation and 24% of the cases with internal fixation.

Table 4: Distribution based on DALY lost in Wound heal, Clinical and radiological union of fracture

Wound Healing DALY Lost (in months)	External Fixation	Internal Fixation
Wound healing	3.25 to 3.70	0.50 to 1.05
Clinical Union of fracture	7.40 to 7.90	2.4 to 4.6
Radiological Union of fracture	6.45 to 8.40	1.9 to 4.9

External fixation resulted in a DALY loss of

3.25 months, whereas internal fixation resulted in a DALY loss of 1.05 months. When compared to external fixation, internal fixation wound healing is significantly faster.

External fixation resulted in a mean DALY loss of 7.90 months, while internal fixation resulted in a mean DALY loss of 4.6 months. When compared to External Fixation, Internal Fixation clinical union occurs in a significantly shorter span.

External fixation resulted in an average DALY loss of 8.40 months, while internal fixation resulted in a DALY loss of 4.9 months. When compared to External Fixation, Internal Fixation clinical union occurs in a significantly shorter time.

Discussion

The World Bank and the World Health Organization have partnered to create Disability Adjusted Life Years (DALYs) as a measure of global disease burden. The DALY is a summary metric that combines time lost due to premature mortality and time spent in less-than-optimal health, sometimes known as "disability." The DALY is a broadening of the well-known Potential Years of Life Lost (PYLLs) metric to include lost health.⁸

The optimal treatment of unstable distal tibia without articular involvement remains controversial, despite the variety of treatment options which have been suggested for these injuries, including nonoperative treatment, external fixation, intramedullary nailing, and plate fixation. However, each of these treatment options has certain defects. Nonoperative treatment may be complicated by loss of reduction and subsequent malunion; external fixation of distal tibia fractures may result in insufficient reduction, malunion, and pin tract infection; there is some concern about the use of IMN in distal tibia fractures; ORIF results in extensive soft tissue dissection and may be associated with wound complications and infections.

Numerous studies have recently asserted that the MIPO approach is a safe and effective way to treat such fractures while avoiding some of the difficulties associated with traditional open plating. However, several research have shown flaws in the MIPO method. Although MIPO appears to be better for soft tissue and bone biology, Hasenboehler et al. found that simple fracture patterns had longer healing

times.⁹ According to Khoury et al., reduction for the MIPO technique should be done with caution due to the risk of sagittal plane malreduction.¹⁰ As a result, it's unclear if the MIPO technique's benefits outweigh ORIF. A tibial plafond fracture is a serious injury.

Tibial plafond fractures are serious injuries with a high rate of morbidity. These patients were previously treated with medial based open reduction and internal fixation (ORIF) of the tibia, with bone grafting as needed to achieve the aim of restoring the distal fibula length and articular surface.¹¹ This procedure had excellent outcomes and low complication rates, according to previous studies by Etter and Marsh et al.^{12,13}

When compared to External Fixation, Internal Fixation wound healing, clinical union and radiological union occurred in a significantly shorter time. So, DALY loss was less in internal fixation compared to the external fixation.

Conclusion

The outcome of the study shows that Internal fixation outperformed External fixation in terms of DALY loss, with External fixation losing considerably more DALYs than Internal fixation.

References

1. Song P, Pu LLQ. The Soleus Muscle Flap: An Overview of Its Clinical Applications for Lower Extremity Reconstruction. *Ann Plast Surg.* 2018 Dec;81(6S Suppl 1):S109-S116.
2. Bezstarosti H, Van Lieshout EMM, Voskamp LW, Kortram K, Obremskey W, McNally MA, Metsemakers WJ, Verhofstad MHJ. Insights into treatment and outcome of fracture-related infection: a systematic literature review. *Arch Orthop Trauma Surg.* 2019 Jan;139(1):61-72
3. Behrens F, Searls K. External fixation of the tibia. Basic concepts and prospective evaluation. *J Bone Joint Surg Br.* 1986 Mar;68(2):246-54. doi: 10.1302/0301-620X.68B2.3514629. PMID: 3514629.
4. Sivasundaram L, Trivedi NN, Gatta J, Ning AY, Kim CY, Mistovich RJ. Demographics and Risk Factors for Non-Accidental Orthopedic Trauma. *Clin Pediatr (Phila).* 2019 Jun;58(6):618-626.
5. Stella M, Santolini E, Sanguineti F, Felli L, Vicenti G, Bizzoca D, Santolini F. Aetiology of trauma-related acute compartment syndrome of the leg: A systematic review. *Injury.* 2019 Jul;50 Suppl 2:S57-S64.
6. Kazley J, Jahangir A. StatPearls [Internet]. StatPearls Publishing; Treasure Island (FL): Aug 14, 2021. Tibia Diaphyseal Fracture.
7. Arnesen T, Nord E (1999). The value of DALY life. *British Medical Journal.*319:1423-5
8. Arnesen T, Kapiriri L (2004). Can the value choices in DALYs influence global priority-setting? *Health Policy.*70:137- 149.
9. Hasenboehler E, Rikli D, Babst R. Locking compression plate with minimally invasive plate osteosynthesis in diaphyseal and distal tibial fracture: a retrospective study of 32 patients. *Injury.* 2007; 38(3):365-370.
10. Khoury A, Liebergall M, London E, Mosheiff R. Percutaneous plating of distal tibial fractures. *Foot Ankle Int.* 2002; 23(9):818-824.
11. Ruedi TP, Allgower M. The operative treatment of intraarticular fractures of the lowerend of the tibia. *Clin Orthop Relat Res.* 1979; 138:105-110.
12. Etter C, Ganz R. Long-term results of tibial plafond fractures treated with open reduction and internal fixation. *Arch Orthop Trauma Surg.* 1991; 110:277-283
13. Marsh JL, Bonar S, Nepola JV, Decoster TA, Hurwitz SR. Use of an articulated external fixator for fractures of the tibial plafond. *J Bone Joint Surg Am.* 1995; 77:1498- 1509

Management of Tibial Plateau Fractures in a Tertiary Care Hospital

Bhukya Tejkumar

Assistant Professor, Mamata Medical College, Khammam

How to cite this article: Bhukya Tejkumar et al. Management of Tibial Plateau Fractures in a Tertiary Care Hospital. Volume 13 Issue 3 July-September 2022

Abstract

Background: The multitude, diversity, and complexity of tibial plateau fractures make them difficult to treat. In the literature, the indications for non-operative vs operative management differ substantially. Varied surgeons have advocated for different treatment procedures, with some advocating for conservative management and others advocating for aggressive management.

Objectives: To compare the surgical management of tibial plateau fractures with percutaneous CC screw fixation, ORIF with plating and CC screw fixation and universal mini external fixator.

Methods: After the diagnosis of 30 patients has been established, the patient was informed of the fracture and the necessity for surgery. The consent is obtained, and pre-operative planning is done. The Schatzker classification was used to classify all Tibial plateau fractures prior to surgery. After a minimum of six months post-surgery, patients were followed up periodically. The functional outcome of the knee was assessed using the Rasmussen score and the knee society score for all patients who met the inclusion criteria.

Results: The average time for tibial plateau fracture union was 18 weeks (range from 18-22 weeks). In majority of the cases, around 50% had union of tibial plateau fracture by 16th weeks, 40% had fracture union by 18th week. 7% had fracture union by 20th week, 3% had fracture union by 22nd week.

Conclusion: PCCS or PF + CC screw fixation can attain near anatomical repair of the articular surface of the tibial plateau fracture. Since they are confined to the pattern of the fracture and its size, each of the three procedures employed to treat tibial plateau fractures has its own array of pros and cons.

Keywords: Tibial plateau fracture, PCSC, CC Screw and Plate Fixation, UMEX

Introduction

The knee joint is a complex synovial joint that controls the centre of body mass and posture, requiring a wide range of motion in three dimensions as well as the capacity to endure significant stresses. It is required for everyday tasks such as standing, walking, and stair climbing, as well as for sprinting, leaping, kicking, and changing directions.¹ The interaction of the articular surfaces, passive stabilisers, and muscles that traverse the joint is crucial for maintaining both range of motion and stability.²

The majority of tibial plateau fractures are caused by articular extension and can occur as a result of

high-speed collisions or falls from considerable heights, when fractures are caused by indirect shear pressures and direct axial compression, respectively.³ Due to the poor resistance of their subchondral bone to axially directed stresses, depression fractures are more likely in elderly people with osteopenic bones.⁴

Internal fixation had not yet supplanted conservative treatments as the major therapeutic option until recently. While it emphasises early mobilisation and lower morbidities, it excludes soft tissue problems.⁵

The primary goal of surgical treatment for tibial plateau fractures is to a) restore articular congruity and

b) restore mechanical axis. c) to restore ligamentous stability; all of these can result in an ideal functioning, pain-free knee with a decent range of motion.⁶

The process of repairing a bone is known as osteosynthesis. It is a surgical procedure in which bone pieces are fused together by screws, plates, nails, or wires to repair bone fractures.⁷ The aforementioned fixes the broken bone and allows it to knit solidly in the correct position.

Osteosynthesis or internal bone fixation are not used to treat all types of bone fractures. Osteosynthesis is best suited for open bone fractures with concomitant skin or soft tissue injury. It is also the preferred method of treatment for bone fractures with multiple fragments, leg fractures, and osteoporosis-related bone fractures.⁸

The articular congruency, complex ligamentous stability, and complex biomechanics of knee weight bearing position are important reasons why orthopaedic surgeons are concerned about tibial plateau fractures.⁹

The treatment of proximal tibial plateau fractures is still evolving. The rate of wound infection and wound dehiscence is significantly higher in open reduction and internal fixation techniques (ORIF) than in other techniques.¹⁰

Materials and Methods

Study design: Prospective study.

Place of study:

Duration:

Inclusion Criteria:

- Tibial plateau fractures with no prominent osteoarthritis.
- Closed fractures

Exclusion Criteria:

- Patients with Osteoarthritis
- Open fractures

Sample size: 30 patients.

On admission, demographic information was collected, and a comprehensive history was conducted to determine the mode of injury and any co-morbidities. To examine other connected injuries and open wounds, a general systemic and local

examination was performed, followed by radiological evaluation in AP and Lateral views.

After the diagnosis has been established, the patient was informed of the fracture and the necessity for surgery. The consent is obtained, and pre-operative planning is done. The Schatzker classification was used to classify all Tibial plateau fractures prior to surgery. After a minimum of six months post-surgery, patients were followed up periodically. The functional outcome of the knee was assessed using the Rasmussen score and the knee society score for all patients who met the inclusion criteria.

Statistical Analysis: All the data was entered in the Ms-excel and the SPSS 20 software was used to compute statistical analysis. The outcomes were presented in the form of Tables and graphs with Mean, Standard deviation and percentages. The Rasmussen score was used to grade the outcome. The p-value of <0.05 was considered statistically significant.

Observation and Results

A total of 30 patients with tibial plateau fracture were studied after meeting the inclusion criteria.

Table 1: Distribution based on demographics and laterality of fracture

Gender	Frequency	Percentage
Male	24	80%
Female	6	20%
Age group(years)		
<20	1	3.33%
21-30	10	33.33%
31-40	5	16.66%
41-50	9	30.00%
51-60	5	16.66%
Laterality		
Right	17	56.66%
Left	13	43.33%

Male predominance was seen with 80% and females were 20%. The male : female ratio was 4:1. Majority of the patients around 33% belonged to the 21 to 30 yrs age group followed by 30% in 41 to 50 yrs age group. A total of 16.66% each belonged to the age group of 31 to 40 and 51 to 60 yrs. and only 3% belonged to <20 yrs age group. The mean age was 38.33 ± 11.41 yrs. Around 57% had right tibial plateau fractures and the rest 43% had left plateau tibial fractures.

Table 2: Distribution based on Schatzker's classification

Type of fracture	Frequency	Percentage	PCCS	PF + CC	UMEX
Lateral split	1	3.33%	1	0	0
Split with depression	9	30.00%	9	0	0
Central depression	0	0	0	0	0
Medial condyle Fracture	3	10.00%	0	3	0
Bicondylar Fracture	9	30.00%	0	7	2
Metaphysiodiaphyseal disassociation	8	26.66%	0	0	8
Total	30	100	10	10	10

Fractures were classified based on Schatzker's Classification. Type II and type V tibial fracture were the most common fractures seen in 30% of the cases

each. Followed by Type VI fracture which was seen in 27% of the cases, Type IV Fracture was seen in 10% and Type I fracture was seen in 3% of the cases.

Table 3: Distribution based on Post-op complications

Complications	Frequency	Percentage	PCCS	PF + CC	UMEX
Knee joint stiffness	2	6.66%	1	1	
Implant failure	1	3.33%	0	0	1
Varus deformity	1	3.33%	0	0	1
Infection	2	6.66%	0	2	0
Nil	24	80%	0	0	0

Deep infection occurred in 7% of cases at the post-operative site. As a result, the plate was removed, the patient was given intravenous antibiotics, and an above-knee pop cast was applied. At 26 weeks, the fracture was eventually united. Varus deformity

developed in 3% of cases as a result of post-operative medial condyle collapse. Due to a lack of post-operative mobilisation, approximately 7% of the cases developed knee joint stiffness.

Table 4: Distribution based on Rasmussen function score outcomes

Result	Total	Percentage	PCCS	PF + CC	UMEX
Excellent	7	23%	6	0	1
Good	21	70%	4	10	7
Fair	2	7%	0	0	2
Poor	0	0%	0	0	0

According to the Rasmussen functional score, none of the 30 patients in the sample had a poor outcome. 60 % of patients treated with PCCS had excellent results, while 40% had good results. None of the patients had fair or poor outcomes. All of the patients treated with

PF + CC screw fixation had good outcomes, while 10% of the patients treated with UMEX had excellent outcome, 70% had good outcomes, and 2% of the patients had fair outcomes.

Table 5: Distribution based on fracture union

Fracture union (in weeks)	Frequency	Percentage	PCCS	PF + CC	UMEX
16	15	50.00%	7	4	4
18	12	40.00%	3	5	4
20	2	6.66%	0	1	1
22	1	3.33%	0	0	1

The average time for tibial plateau fracture union was 18 weeks (range from 18-22 weeks). In majority of the cases, around 50% had union of tibial plateau fracture by 16th weeks, 40% had fracture union by 18th week. 7% had fracture union by 20th week, 3% had fracture union by 22nd week.

Discussion

Tibial plateau fractures are among the most common fractures that occur as a consequence of a road accident, a fall from a great height, a sports injury, or an assault. About 1% of all fractures are tibial plateau fractures. Tibial plateau fractures occur 10.3 per 100,000 persons each year. Patients with tibial plateau fractures are on average 52.6 years old. Tibial plateau fractures have a bimodal distribution, with men under the age of 50 being more prone to sustain them by high-energy processes, which are usually connected with soft tissue injuries. Women over 70 are more prone to have tibial plateau insufficiency fractures as a result of falls. Tibial plateau fractures are more prevalent in males than in females.¹¹

Type of fracture	This study	Sangwan et al ¹²
I. Lateral split	3.33%	36%
II. Split with depression	30.00%	4%
III. Central depression	0	0
IV. Medial condyle Fracture	10.00%	20%
V. Bicondylar Fracture	30.00%	8%
VI. Metaphysiodiaphyseal disassociation	26.66%	32%

Sangwan ET al conducted research. The fractures were classified as type I in 9 patients, type II in 1 patient, type IV in 5 patients, type V in 2 patients, and type VI in 8 patients using the Schatzker et al criteria.¹²

The Overall Rasmussen score was Excellent in Type I and Type II fractures, the score was good in Type IV, V and VI fractures.

Lasinger et al. published a long-term outcome of 102 cases of tibial plateau fractures of all types, treated conservatively (45%) and surgically (55%). Using Rasmussen's criteria, they evaluated the functional outcome and found it to be excellent to good in 90 percent of the cases. They advocated open reduction and bone grafting for the treatment of depressed and split depressed fractures.¹³

In the study by Biggi F et al, 94 % of the patients showed radiographic union by 16-18 weeks.¹⁴

Previous studies	Fracture union duration
This study	18 weeks
Biggi et al ¹⁴	16 - 18 wks
Stannard et al ¹⁶	15.6 weeks

The average knee flexion was 0 degrees and 130 degrees. Knee motion is commonly reduced after Tibia plateau fractures. These are the results of articular involvement. These effects are exacerbated by immobilisation following a fracture or internal fixation. Early stable fracture fixation, meticulous soft-tissue handling, and immediate knee mobilisation all increase the chances of a positive outcome after most Tibial plateau fractures.

Conclusion

Percutaneous CC screw fixation (PCCS) or ORIF with plating and CC screw (PF + CC screw) fixation can help achieve near anatomical repair of the articular surface of the tibial plateau fracture. The articular surface can be restored by joystick manipulation of the fragment in the UMEX group, and the metaphyseal extension can also be reinforced by plate fixation in the UMEX group. Because they are confined to the pattern of the fracture and its size, each of the three procedures employed to treat tibial plateau fractures has its own array of pros and cons.

References

1. Bedi A, Le TT, Karunakar MA. Surgical treatment of nonarticular distal tibia fractures. *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*. 2006 Jul 1;14(7):406-16.
2. Himanshu.H,Prasad.MB,Verma.AK, Minimally Invasive Percutaneous Plate Osteosynthesis(Mippo) A Technique for Treatment of Distal Tibia Fractures,eISSN:2279-0853,p-ISSN:227-0861.Volume 15,Issue 12 Ver.1(December,2016), PP 31-38.
3. Collinge.C,Kuper.M, minimally invasive plating of high-energy metaphyseal distal tibia fractures,*JOrthop Trauma* 2007;21:355-361
4. David P Barei,Rockwood and Green's, Fracture in adults, 8th edition,vol-2,2473-2540
5. Kundu.A.K, outcome of minimally invasive plate osteosynthesis technique with locking compression

- plate in distal tibial fracture management, *Indian journal of orthopaedics surgery* 2015;1(3):138-145
6. Paluvadi.S.V, management of fracture of the distal third tibia by minimally invasive plate osteosynthesis- a prospective series of 50patients,*journal of clinical orthopaedics and trauma* 5 2014,129-136
 7. Dhakar.A, minimally invasive plate osteosynthesis with locking plates for distal tibia fractures,*JCDR*,2016Mar,vol-10(3):RC01-RC04
 8. Ali,SKI, evaluation of the functional outcome in distal tibia fractures managed by MIPPO technique using distal tibia locking plate,*IJOS*;2017;3(2):441-444
 9. Patel.YC, outcome of minimally invasive plate osteosynthesis(MIPO) technique in distal tibial fracture,*IJOS*;2017;3(3):10-14 10.
 10. Bahari.S, minimally invasive percutaneous plate fixation of distal tibia fractures, *Acta orthop. Belg.*,2007,73,635-640 11.
 11. Elsoe R, Larsen P, Nielsen NP, Swenne J, Rasmussen S, Ostgaard SE. Population-Based Epidemiology of Tibial Plateau Fractures. *Orthopedics*. 2015 Sep;38(9):e780-6.
 12. SangwanSS, SiwachRC, Singh R and Mittal R.Minimal invasive osteosynthesis: a biological approach in treatment of Tibial plateau fractures. *Indian Journal Of Orthopaedics* 2002; 36 : 4 : 246-50
 13. Lansinger O, Burgman B, Korner L. Tibial condylar fracture. 20 years followup. *J Bone & Joint Surg* 1986;68(AM):13-19
 14. Biggi F, Di Fabio S, D'Antimo C, Trevisani S. Tibial plateau fractures: Internal fixation with locking plates and the MIPO technique. *Injury*. 2010; 41(11):1178-1182.
 15. Stannard JP, Wilson TC, Volgas DA, and Alonso JE.The Less Invasive Stabilization System in the Treatment of Complex Fractures of the Tibial Plateau: Short-term Results. *J Orthop Trauma* 2004;18:552-58

Factors Influencing the use of Antenatal Care Service among Pregnant women in Nasarawa Local Government Area, Kano State, Nigeria

Bilkisu Yakubu Indabo¹, Deepak Vishwakarma², Rejoice P. Ravi³

¹Master of Public Health Student, P.P. Savani University, Surat, Gujarat, India

²Assistant Professor, Department of Public Health, P.P. Savani University, Surat, Gujarat, India

³Associate Professor, Parul Institute of Public Health, Parul University, Vadodara, Gujarat, India

How to cite this article: Bilkisu Yakubu Indabo, Deepak Vishwakarma, Rejoice P. Ravi et al. Factors Influencing the use of Antenatal Care Service among Pregnant women in Nasarawa Local Government Area, Kano State, Nigeria. Volume 13 Issue 3 July-September 2022

Abstract

Background: Utilization of antenatal care in Nigeria remains a big health challenge. Aim of the study was to find out the factors influencing the use of antenatal care service among pregnant women.

Methods: Cross-sectional study was carried out during the period of 10th February to 31st March 2021. Total of 143 pregnant women were attended antenatal clinic in Sir Muhammadu Sunusi Specialist Hospital Kano State Nigeria and sample of 104 pregnant women was chosen by using Krejcie and Morgan table.

Results: More than 58 (55.8%) of the respondents didn't attend antenatal care clinic regularly during their pregnancy period. Only 28 (26.9%) of the respondents completed 4 antenatal care visits because 33 (11.5%) of respondents said that distance was main reason to reach clinic on time. One third 34 (32.7%) of the respondents had complications during pregnancy because of lack of sufficient antenatal visit during pregnancy period.

Conclusion: Poor women may not have the financial assets required to either get registered at antenatal clinics or pay for the services rendered during the pregnancy period. Place of residence was another factor which influences the utilization of antenatal care. This may lead to women where they would partially attend the antenatal clinics.

Keywords: Antenatal care, Culture & customs, distance, pregnancy, Utilization

Introduction

Countries in Sub-Saharan Africa (SSA) and Southern Asia covers approximately 86% (254000) of the estimated global maternal deaths in 2017, with sub-Saharan Africa alone accounting for roughly 66% (196000), and Southern Asia accounted for nearly 20% (58000).^[1] Although by 2015, maternal mortality had

decreased by over 40% from the 1990 levels, maternal death rate continued to remain unacceptably high in SSA.^[2] Not accessing quality antenatal care (ANC) leads substantially to these preventable maternal deaths.^[3,4]

Women in Nigeria who do not have complete antenatal care has increased risk of experiencing a

Corresponding Author: Rejoice Puthuchira Ravi,

Associate Professor,

Parul Institute of Public Health,

Parul University, Vadodara, Gujarat, India

Mobile number: 09544432620

E-mail address: pr.rejoice@gmail.com

neonatal and maternal death, Lack of antenatal care is associated with a 40% increase in the risk. Women with irregular antenatal care attendance are much more prone to pregnancy complications such as, eclampsia and anemia besides higher adverse birth outcomes including preterm birth, low birth weight and still birth. Poor access to antenatal care services during pregnancy leads to poor pregnancy outcomes like preterm births.^[5]

Pre-term deliveries remain a significant perinatal challenge, with pre-term babies accounting for 5–25% of all deliveries and up to 75% of all perinatal mortality in some series.^[6,7,8] While only 0.87% of all live births occur at a gestational age less than 31 weeks, births below this gestational age are responsible for 84% of the neonatal mortalities among infants of all gestational ages in the developed world.^[9] In Nigeria, pre-term babies account for 40–60% of all perinatal deaths.^[10,11,12]

The factors that influence the initiation or attendance of antenatal care include lack of transport that will convey the pregnant woman to the health center, distance, religious, employment status, difficulties in preparation of children most especially those multi para, and inconvenient clinic hours. Psychosocial factors include whether the pregnancy was planned, the woman's reaction to the pregnancy, a delayed diagnosis of pregnancy, and in availability of social support.^[13] Many factors also serve as a barrier to access antenatal care during pregnancy which include Woman education, Culture, Parity, Maternal age, Inability to afford cost of antenatal care, Family refused, Lack of awareness about the important of antenatal care, Distance and transport problem, Time consuming during antenatal care, Lack of family support.^[14] Aim of the present study was to find out the factors influencing the use of antenatal care service among pregnant women in Sir Muhammadu Sunusi Specialist Hospital Kano State Nigeria

Methodology

A cross sectional study was conducted in Sir Muhammadu Sunusi Specialist Hospital Kano State Nigeria. The study was conducted during the period of 10th of February to the 31st March 2021. There were 143 pregnant women attended antenatal clinic at Sir Muhammadu Sunusi Specialist Hospital during

these periods. Total of 104 pregnant women were selected for the research study by using the Krejcie and Morgan table. Data analysis was carried out by using SPSS 22. Categorical variables were presented as frequencies and percentages.

Formula for determining sample size^[15]

$$S = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-p)}$$

S = required sample size

X² = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size

P = the population proportion (assumed to be .05 since this would provide the maximum sample size)

D = the degree of accuracy expressed as a proportion (.05).

Limitation of the study: The study was restricted to a small Hospital, so the result was valid only for the specific area and situation. Limited resources were the major constraint in research as it was self-financed study.

Results

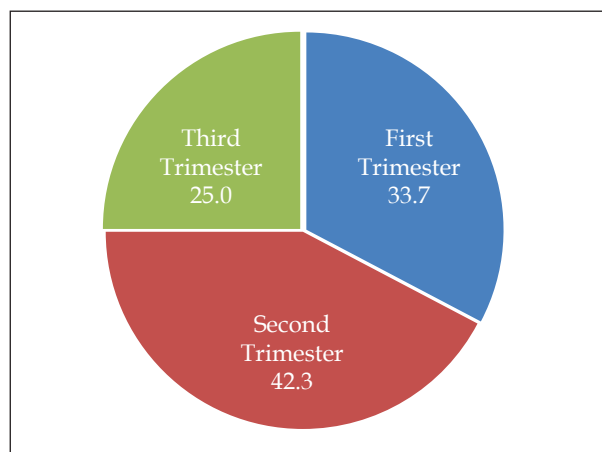


Figure 1: Percentage distribution of First Antenatal visit of Pregnant women

[Figure 1] shows the percentage distribution of first-time antenatal visit of pregnant women. Result indicates that one third of the women 34 (33.7%) visited antenatal care clinic in the first trimester itself and 44 (42.3%) of the women visited in second trimester and 26 (25.0%) of pregnant women visited only in the third trimester for the first-time antenatal care.

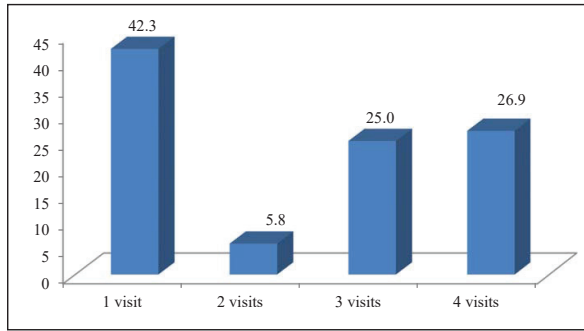


Figure 2: Number of antenatal care visits of pregnant women (N=104)

From the [Figure 2] it is seen that 44 (42.3%) of the women had visited only one time in antenatal clinic during their entire pregnancy period and 26 (25.0%) of the women completed 3 visits for antenatal care during their pregnancy. Only 28 (26.9%) of the women completed 4 visits for antenatal care visit during their pregnancy which was recommended by World Health Organization. It concludes that there was some lacuna in visiting antenatal care service among pregnant women that must be completed by providing accessibility and availability of healthcare institute especially for pregnant women.

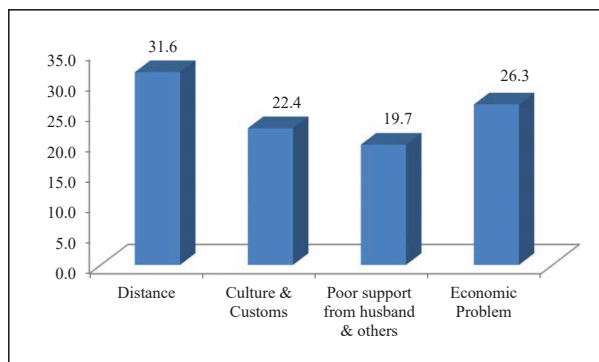


Figure 3. Reasons for not visiting minimum antenatal care service centre (N=76)

[Figure 3] shows the reasons for not visiting minimum antenatal care service during their pregnancy period. Result indicates that utilization of health care centre with respect to distance was one of the major problems in the study area. Results reveals that 24 (31.6%) of the women didn't attend antenatal clinic regularly because antenatal clinic was far from their place of living. Another reason was that economic status of family. In this study also shows that 20 (26.3%) of women didn't visit because lack of money and followed by culture & customs and poor support from husband & family members 17 (22.4%) and 15 (19.7%) respectively. It concludes that culture

& customs and family support has a major role in making pregnant women to visit the antenatal care clinic regularly.

Table 1: Distance between the place of living of pregnant women and antenatal clinic

Distance in Kilo Meter	Frequency	Percentage
0-10	10	(9.7)
11 -20	52	(50.0)
21 -30	30	(28.8)
31 and above	12	(11.5)
Total	104	(100.0)

[Table 1] indicates the distance between place of living of pregnant women and antenatal clinic. Result shows that 52 (50.0%) of the women were living 11-20 KM far from antenatal clinic and 12 (11.5%) of the women were living 30 KM far from antenatal clinic. It can conclude that adequate infrastructure facility of healthcare services was very less in the study area as a result women either postpone or reluctant to visit antenatal care.

Discussion

This study assessed factors affecting mothers in attending a recommended number of ANC services visits in the study area. Study showed that timing of first ANC visit did seem to be influenced by distance to the closest ANC facility. Present study shows that 33.7% of women attended in the first trimester of pregnancy. Attendance in the first trimester of pregnancy, also a long time period, is clearly not determined by geographic access, but likely by other factors, for instance cultural issues around making the pregnancy publicly known can play a role^[16]

The present study shown that 28 (26.9%) of the women had utilized antenatal care (completed 4 visits minimum) during their pregnancy which recommended by World Health Organization while the remaining 73.1% of the women occasionally attended the focused antenatal care. There were many factors for not visiting minimum antenatal care service during their pregnancy period. Result reveals that 15 (19.7%) of the women didn't attend antenatal clinic regularly because poor support from husband & family members. With respect to getting consent from family members and husband in order to use antenatal care service, women who claimed that they did not experience any problem getting permission are more likely to utilize antenatal care adequately

than women who experienced problems in that regard.^[17,18] This is an aspect where decision to utilize health service by women is hinged on the consent of their husbands or family members. If family members do not see any need for pregnant women to attend antenatal care, it becomes a problem for such women to access health service centre.

Culture and customs with respect to visit health facility alone is another factor determining adequate antenatal care utilization. In this study also shows that 20 (26.3%) didn't visit because of culture & customs 17 (22.4%). In some cases, women may not be willing to visit health facility without being accompanied by either their husbands or close relatives based on their beliefs or conviction.^[19] Women who reluctance because of their culture & customs to visit healthcare facility alone is not their problem are more likely to utilize antenatal care adequately than women who claimed that it is their problem. This implies that the more the number of women who consider not visiting health facility alone, the less the proportions of women that would adequately utilize antenatal care. Place of residence is another factor which influences antenatal care utilization.^[20-22] Accessibility to knowledge on health matters is a significant component of maternal and child health. When women are equipped with adequate knowledge on antenatal, natal, and post-natal services, it tends to increase their utilization of such services during their pregnancy period, delivery and post-natal period and also finding conducted in Magadi in Kenya^[23] which demonstrated that an increase in distance to the nearest healthcare facilities was associated with fewer antenatal visits.

Present study shows that 20 (26.3%) didn't visit antenatal clinic because lack of money. Poverty at household level may constitute a great barrier to accessing maternal health services. Women from poor households may not have the financial resources needed to either get registered at clinics or pay for the services rendered during the prenatal period. This may lead to a situation where such women would partially attend the clinics or not attend at all. The wealth index was strongly and negatively associated with the utilization of ANC services in rural Ethiopia. This study showed that women in middle and richer economic status were more likely to attend ANC service than those of poorer women. It is in line with several studies in different countries.^[24]

Similarly, a study from China found that women who had higher household incomes were more likely to have sufficiently utilized ANC services (AOR = 1.631, CI = 1.0-2.5).^[25]

Conclusion

Health-seeking behaviour of women has an important influence on health problems experienced during pregnancy. Therefore, attention should be given to improve the health seeking behaviour of women by health workers and other concerned members. But antenatal care coverage alone cannot reduce the incidence of health problems during pregnancy period. Further research must be needed to well understand the factors influencing antenatal care-seeking in the first trimester itself of pregnancy. As a result, this might be helping to identify the client behavior. Finding a Quality-Gap is always good rather than to find out Coverage-Gap with respect to antenatal care service. It can be helpful to execute application research while improving quality of care at health facilities to meet operational knowledge on how this is best done, and thus help to close the Quality-Gap. Afterall, it is essential to study the impact of accessibility and level of service requirement during antenatal period of women in the study area.

Acknowledgement

We thank Pregnant women for their valuable cooperation in providing the necessary and required information. We would like to thank all the staff in Sir Muhammadu Sunusi Specialist Hospital Kano State Nigeria for providing their supports during the study period.

Ethical Clearance

The study entitled "Factors influencing the use of antenatal care service among pregnant women in Nasarawa Local Government Area, Kano State, Nigeria" was approved by the Institutional Ethics Committee of P.P. Savani University, Surat.

Conflict of Interest: Nil

Source of Funding: Nil

References

1. World Health Organization. Maternal mortality: level and trends 2000 to 2017. Sexual and Reproductive Health. 2019. 12 p.
2. WHO, UNICEF, UNFPA WBG and UNPD. Trends in Maternal Mortality: 1990 to 2015: Estimates Developed by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Divisions. *Who / Rhr/1523*. 2015;32(5):1-55.
3. Tekelab T, Chojenta C, Smith R, Loxton D. Factors affecting utilization of antenatal care in Ethiopia: a systematic review and meta-analysis. *PLoS One*. 2019;14(4):1-24.
4. Kanyangarara M, Munos MK, Walker N. Quality of antenatal care service provision in health facilities across sub-Saharan Africa: Evidence from nationally representative health facility assessments. *J Global Health*. 2017;7(2).
5. Olugbenga A, Mokuola, Suleiman BM, Adesiyun OO, Adeniyi A. Prevalence and determinants of pre-term deliveries in the University of Ilorin Teaching Hospital, Ilorin, Nigeria. *PMC, US National Library of medicine, National Institutes of Health*. 2010 Jun 18;2(1):e3.
6. Demissie K, Rhoads GG, Ananth CV. Trends in preterm birth and neonatal mortality among blacks and white in the United States of America from 1989 to 1997. *Am J Epidemiol*. 2001;154:307-15.
7. Ezechukwu CC, Ugochukwu EF, Egbuonu I, Chukwuka JO. Risk factors for neonatal mortality in a regional tertiary hospital in Nigeria. *Nig J Clin Pract*. 2004;7:50-2.
8. Steer P. The epidemiology of preterm labour. *Br J Obstet Gynaecol*. 2005;112:1-3
9. Usher R. Extreme prematurity. In: Avery GB, editor. *Neonatology patho physiology and management of the Newborn*. Philadelphia: JB Lippincott (Publ):1987:pp.264-264.
10. Chike-Obi U. Preterm delivery in Ilorin; multiple and teenage pregnancies major aetiologic factors. *West Afr J Med*. 1993;12:228-30.
11. Njokanma OF, Olanrewaju DM. A study of neonatal deaths at the Ogun State University Teaching Hospital, Sagamu, Nigeria. *J Trop Paediatr*. 1995;98:155-60.
12. Njokanma OF, Sule Odu OA, Akesode FA. Perinatal mortality at the Ogun State University Teaching Hospital, Sagamu, Nigeria. *J Trop Paediatr*. 1994;40:78-81.
13. Pamela Low, Janis Paterson, Trecia Wouldes, Sarnia Carter, Maynard Williams, Teuila Percival. Factors affecting antenatal care attendance by mothers of Pacific infants living in New Zealand. *N Z Med J*. 2005 Jun 3;118(1216):U1489.
14. AhmedM Abbas, Mona Rabeea, Hamida A AbdelHafiz, Nadia H Ahmed. Effects of irregular antenatal care attendance in primiparas on the perinatal outcomes: a cross sectional study. *Proceedings in Obstetrics and Gynecology*. 2017;7(2):2.
15. Krejcie RV, Morgan DW. Determining Sample Size for Research Activities. *Educational and Psychological Measurement*. 1970. Mathole T, Lindmark G, Majoko F, Ahlberg BM. A qualitative study of women's perspectives of antenatal care in a rural area of Zimbabwe. *Midwifery*. 2004;20:122-132.
16. Thapa NR. Women's Autonomy and Antenatal Care Utilization in Nepal: A study From Nepal demographic and Health Survey. 2016. *MOJ Women's Health*. 2019;8(4).
17. Abimbola JM, Makanjuola AT, Ganiyu SA, Babatunde UMM, Adekunle DK, Olatayo AA. Pattern of Utilization of Ante-natal and Delivery Services in a Semi-urban Community of North-Central Nigeria. *Afr Health Sci*. 2016;16(14).
18. Rurangirwa AA, Mogren I, Nyirazinyoye L, Ntaganira J, Gunilla K. Determinants of Poor Utilization of Antenatal Care Services among Recently Delivered Women in Rwanda: A Population Based Study. *BMC Pregnancy Childbirth*. 2017;17(142).
19. Ali N, Sultana M, Sheikh N, Akram R, Mahumud RA, Asaduzzam M, Saker AR. Predictors of optimal antenatal care service utilization among adolescents and adult women in Bangladesh. *Health Serv Res Managerial Epidemiol*. 2018;5.
20. Yeneneh A, Alemu K, Dadi AF, Alamirrew A. Spatial Distribution of Antenatal Care Utilization and Associated Factors in Ethiopia: Evidence From Ethiopian Demographic Health Surveys. *BMC Pregnancy Childbirth*. 2018;18(242).
21. Abegaz KH, Habtewold RD. Trend and Barriers of Antenatal Care Utilization From 2000 to 2016 Ethiopian DHS: a data mining approach. *Scientific Afr*. 2019;3.
22. Yaya S, Bishwajit G, Ekholuenetale M, Shah V, Kadio B, Udenigwe O. Timing and Adequate Attendance of Antenatal Care Visits among Women in Ethiopia. *PLoS One*. 2017;12(9).
23. Monica Akingi Magadi. Maternal and Child Health among the Urban Poor in Nairobi, Kenya. 2003;19(2).
24. Birmeta K, Dibaba Y, D. Woldeyohannes. Determinants of maternal health care utilization in Holeta town, central Ethiopia, *BMC Health Services Research*. 2013;13 (1): 1-10.
25. Zhao Q, Huang ZJ, Yang S, Pan J, Smith B, and Xu B. The utilization of antenatal care among rural-to-urban migrant women in Shanghai: a hospital-based cross-sectional study. *BMC Public Health*. 2012; 12(1):1-10.

Situation of Consumer Protection for Health Establishments A Case Study of Phetchabun Province, Thailand

Boadsaporn Anusornpanichakul¹, Tiwaporn Junkhaw²

¹Pharmacist Ph.D., Department of Consumer Protection and Public Health Pharmacy, Phetchabun Provincial Public Health, Phetchabun;

²Assistant researcher Ph.D., Department of Laws, Phetchabun Provincial Public Health, Phetchabun, Thailand

How to cite this article: Boadsaporn Anusornpanichakul, and Tiwaporn Junkhaw et al. Volume 13 Issue 3
July-September 2022

Abstract

Thai government has announced a policy to develop Thailand to be Global Medical Hub to promote health business including spa for health, massage for health and massage for beauty. While Thai health establishments have been confronted a crucial problem – service quality, Health Establishments Act B.E.2559 was provided to particularly manage the business. The Act has been recently enforced, so any practices or operations have been not explicit yet which caused performance of engaged officials was ineffective. Hence, researcher studied situation of consumer protection for health establishments: a case study of Phetchabun Province, Thailand followed by the Health Establishment Act B.E. 2559. It was also to investigate problems, obstacles, limitations, and recommendations. In-depth interview with open-ended questions was used to collect data and participant observation was included. Purposive sampling was performed which informants were 6 entrepreneur representatives of health massage establishments which were specifically selected from three zones of Phetchabun - 2 for each, 11 district government officers from 11 districts - 1 for each, and 2 provincial government officers. The results were found that the Health Establishment Act B.E. 2559 was provided to control the health business especially people who required to start the health establishment in oversea and domestic. Health Establishment Division, Department of Health Service Support specified practices, missions, goals, and indicators for achievement followed by the Act, but guidelines, practices, and operations were not clarified. Besides, the practices were not focused on service quality which is a main factors affecting safety of service users. However, the officials applied their own experienced to perform. They required to improve IT system whereas assessment form was needed to develop. Training for staff in the health establishments could be always arranged. Merchants or managers conducting their establishments have insufficient cost for site improvement. They required to create a connection of co-workers for sharing and exchanging knowledge under support and assistant of the officials. In conclusion, stakeholders including government officers, merchants, service providers, and managers could be developed to raise their competency. While regulations and practices could be also adjusted to be explicit and covered phases of health establishment affairs, service quality which was a crucial part could be particularly heightened.

Keywords: health massage establishment, health massage establishment situation, risk assessment, health consumer protection, risk analysis, health massager

Introduction

Health tourism in Asia is a large market which Global wellness institute stated that in 2017 countries

in Asia have 15% of market share for the health tourism¹. There are some countries playing key roles for providing service in health tourism including Thailand, Singapore, India, Philippines, Malaysia,

Corresponding Author:

Boadsaporn Anusornpanichakul,

Department of Consumer Protection and Public Health Pharmacy, Phetchabun Provincial Public Health, 72 Nikorn Bumrung Road, Mueang, Phetchabun 67000, Thailand. Tel: +66 (0) 87 4465615 E-mail: boadsaporn@gmail.com

respectively². Due to potential of Thai health tourism, government has announced a policy to develop Thailand to be an international health center (Thailand as Global Medical Hub) to promote health business including spa for health, massage for health and massage for beauty which have been popular for Thais as well as foreigners³. As the government has focused on development of standards for health establishments, Health Establishments Act B.E.2559 was provided to promote, enhance, and regulate the business specifically. Department of Health Service Support, Ministry of Public Health was authorized to promote and develop the health service standards because of problems such as no readiness of establishment owners in tourism industry, unstandardized and poor service quality, and unqualified service providers⁴. Besides, owners of health spa and health massage were mainly small business with performance limitations⁵. Moreover, there was poor image of female service providers that male service users preferred to female providers, so it provided an opportunity to engage in hidden sex affairs⁶. Furthermore, staff of spa business including managers or service providers were insufficient and inefficient, and they could not communicate to service users with English⁷.

Previously there is no specific law to regulate the health business that these business were under Service Place Act B.E. 2509. Officials of each municipality or sub-district administrative organization were authorized to control and monitor them. After that, with a great number of health establishments, Thai government has required to handle and enhance them to be more standardized, so the Health Establishments Act B.E.2559 was provided. While the Act was enforced the health business, government officers in each region were authorized to achieve missions, goals, and indicators. As the officials performed and followed the Act, some problems and gaps between the two Acts were found; for example, Department of Health Service Support and each provincial health office had various procedures and differently followed the law that caused the officials were confused about performance. In addition, procedures of license approval were different, so health establishment merchants asking for a permission needed more explanation. Moreover, there are many complicated procedures of training and registration for health service providers. Also, clear and exact practices for related officials were not provided caused them difficult to perform. However, researcher realized

the problems of entire stakeholders including public and private sectors. Therefore, the researcher studied situation of consumer protection for health establishments: a case study of Phetchabun Province, Thailand followed by the Health Establishment Act B.E. 2559. It was also to explore problems, obstacles, limitations, and recommendations.

Materials and Methods

The study was qualitative research, so data collection was review of academic studies and engaged documents from reliable sources. In-depth interview with open-ended questions was used to collect data. Participant observation was included. Purposive sampling was conducted which key informants were 6 entrepreneur representatives of health massage establishments which were specifically selected from three zones of Phetchabun - 2 for each, 11 district government officers in charge from 11 districts - 1 for each, and 2 provincial government officers in charge.

Data Analysis

Due to in-depth interview, while the researcher interviewed the interviewees one by one, voice recorder was working. Then, transcription was performed. Moreover, participant observation of the performances in their establishments was carried out. The researcher recorded into a form whereas the observation was managed. Later, triangulation method was used for data reliability.

Ethical Considerations

This study was approved by the Ethic Committee for Human Research, Phetchabun Provincial Public Health Office 1/2020.

Results and Discussion

Pre-marketing function for the officials of provincial public health office was to approve a license for merchants and service providers following the Health Establishment Act B.E. 2559. People asking a permission were provided involving advices then required documents were submitted which establishment examination was carried out before approval in case of a license for merchant. Later, data input to www.spa.hss.moph.go.th was conducted. Data collection for approval was performed and

submitted to executives. However, standards of Department of Health Service Support for health establishments in Thailand and oversea were found some differences after review related academic documents.

Health Establishment Division, Department of Health Service Support specified practices, missions, goals, and indicators for achievement followed by the Health Establishment Act B.E.2559 and involving law. To accomplish the indicators, the health establishments were required to pass the standards as 90%. Phetchabun provincial public health office was authorized to approve license of health establishments. From 2017-2020 there are 671 licenses which divided into 120 licenses of health massage establishments, 551 certificate licenses of service provider for health establishments. But 13 service manager licenses for health establishment, spa business in Phetchabun province were approved by Department of Health Service Support, Ministry of Public Health as shown Table 1.

Table 1 Number of license approval following the Health Establishment Act B.E.2559

List	Number of license approval				
	2017	2018	2019	2020	Total
1. License for merchant in health massage establishment	0	30	49	41	120
2. Certificate of registered service provider in health establishment	333	57	113	48	551
3. License for service manager in health spa establishment	13	0	0	0	13
Total	346	87	162	89	684

Remarks: the number of licenses for merchant in health massage establishment was not included cancellation.

However, post-marketing function for the officials of provincial public health office was authorized to regulate and monitor the approved establishments followed required standards. If illegal performance

was found, all engaged information was collected and submitted to legal affair division for legal action. According to indicators specified by Department of Health Service Support, the officials of provincial public health office were required to perform for accomplishment that an indicator stated that 70% of health establishments was required to monitor using assessment form of health service standard for health massage establishment which was the same form for new approval. Provincial officials of Phetchabun monitored and inspected all of the establishments a time per fiscal year at least. Next, the directory of health establishment licenses and related documents were submitted to the officials of district Public Health office and community hospitals in order to examine the establishments in charge. However, at present illegal performance was not found.

According to specified practices by Health Establishment Division, Department of Health Service Support under the Health Establishment Act B.E.2559. While the officials of Phetchabun provincial public health office applied the determined practices to be their own guidelines for their operation in order to achieve the indicators, some limitations and problems were found which were classified by frameworks of the indicators and interview of the key informants.

Although the Health Establishment Act B.E.2559 was specifically provided to regulate health spa, health massage and beauty massage business, practices under the Act were not clarified. In addition, safety and protection of service users were not provided as well as service quality. Business owners were require to have damage security money (collateral damage) such as cash or government bond deposited resulting from performing business of service providers from careless service which shall be used to cure preliminary damage to the service users when they were hurt or injured during service that they were asked for it when asking a permission running health establishment which was consistent with studies of Marinwimon⁸, Kongket⁹.

Decentralization of Ministry of Public Health to provincial administration was considered to be appropriate that it empowered to provincial officials following and monitoring throughout the health establishments across area in charge. In addition, it was facilitated for people who required to start a health establishment. However, the indicators specified by provincial health public office to follow for achievement were mainly focused on quantitative

practice. For example, the indicators which would be assessed "Passed" were come from number of passed health establishments divided by total of health establishments without focusing detail assessment. Also, monthly performance report of pre and post marketing was submitted to correspondence procedure and to e-mail that caused excessed tasked for the officials while the officials who were in charge of pre marketing already input data of newly approved service providers and merchants via www.spa.hss.moph.go.th.

www.spa.hss.moph.go.th was assumed improperly practical which the system was not connected to other provincial public health office causing the officials could not check essential information before license approval. Moreover, the officials could not correct any information in the website by themselves when having any mistakes. Therefore, it was considered to improve the system to facilitate the official for effective practice.

Assessment form of health service standard for health massage establishment was found out that there was no exact scoring and assessment criteria caused the officials needed their own experiences for evaluation. It was assumed that the Health Establishment Act B.E.2559 was recently provided, thus the officials needed personal experiences and proficiency involved health consumer protection of another law to adapt for their operation. Furthermore, differences of standard approval for health establishments between domestic and oversea were obviously explored. It was considered to change the assessment form to be similar the assessment form for health establishment in oversea for the purpose of the government policy "Thailand as Global Medical Hub". It was supposed a defect that standards of service providers were different which accorded with Esichaikul's study¹⁰ stated that standard and quality of mostly health spa establishments in Thailand were considered low. It was appropriately emphasized on service quality along with site appearance whereas the service was a vital feature that was essential for license approval and surveillance which consistent with the studies of Chaisuvan¹¹, Kiawmeesuan¹² stated that service was crucial, so development of service skill and massage ethic was required to arrange continuously. Also, practice and massage procedures were needed to be proper with standard which it was not hurt or damaged any customers and it could meet their demand. Besides, good service

management could be presented through social media which influenced on customer decision. Perception of massage quality is the service could meet customers' demand and their expectation. Also, the satisfied massage could provide physical relaxation or relieve their damage or hurt which consist with Esichaikul¹⁰, Kiawmeesuan¹², Thakanun¹³.

According to collaboration of Ministry of Public Health and many official organizations with the purpose of standard development of oversea health establishments, it could contribute to appropriate acceptance of foreigners and trust in service towards Thai spa and Thai massage^{14,15}. However, domestic health establishments were required to urgently develop because they were not reached the standards. For example, although the officials examined the establishments by following the assessment form of health service standard for health massage establishment, obvious differences were found in each establishment including service providers, merchants, and service unit that it could consider their engaged factors and their context when examination such as knowledge, experiences, capability, and cost.

Furthermore, useful connection among merchants was required to create that is a channel to share, exchange, or update information which was consistent with Seede's study¹⁶ that mentioned providing opportunities to learn and exchange their experiences among merchants and specialists created business partners and alliances that That massage service was promoted. Moreover, Saiya¹⁷, Netpradit¹⁸ stated service providers should create a group or community in each district in order to exchange their knowledge and continuously enhance their skill and massage ethics whereas the merchants should set a learning system to enhance service providers to be master and professional for customers' safety and the standards and reliability were increased.

Many merchants, service providers, and managers were interested in development of their skill but they had insufficient cost and sometimes verbal communication among officials and them was mistaken that local dialect and picture media were needed for more understandable explanation. In addition, awareness towards all stakeholders especially staff of health establishment could be provided in order to brainstorm for finding solutions when facing any problems with some methods such as arranging a comment box or managing regular evaluation¹⁹. Besides, the health establishments

could be provided skillful and professional service providers of traditional massage as well as master and experienced receptionists. Also, massage equipment and products could be fully prepared for service²⁰.

However, many people labeled “masseuse” as a poor career and engaged in sex trafficking while the masseuse were satisfied in their career with honestly working. On the other hand, some masseuse involved in secret prostitution which was consistent with Kongangkab’s study²⁰ that stated the career of traditional massage was looked negatively which this problem directly affected reliability as well as their income. Furthermore, Monk-Turner & Turner²¹ mentioned that many researchers stated sex workers usually were found at massage establishments. At present traditional masseuse was a profession under the Health Establishments Act B.E.2559 but some Thais’ thought the masseuse negatively²². Due to the problem of image for convert sex trafficking in Thai massage business, Siriwaiprapan²³ mentioned the reason was business ethics which looming shortage of qualified human resources was appeared. Some skillful and experienced masseuse with English competency went aboard for working in oversea health establishments. As a result, merchants in Thailand needed to improve their health establishments to achieve the standards in order to obtain foreigners’ acceptance and to increase their income. It was consistent with Saiya’s study¹⁷ that stated traditional masseuse, merchants, and managers required to promote themselves reaching the standards and having certificates. They required the engaged official organizations to manage regular training especially massage training and support for establishment improvement.

Conclusion

Even though the Health Establishment Act B.E.2559 was provided to specifically regulate the health business, the health establishments in Thailand were required to enhance and improve for their achievement. Hence, stakeholders including government officers, merchants, service providers, and managers could be developed to raise their competency potential. Regulations and practices could be also adjusted to be more concise, explicit, and covered phases of health establishment affairs. At the same time, service quality for customer safety could be particularly heightened in order to support expansion of domestic and oversea

health establishments. However, there are some recommendations for further studies, for example, comparison of health establishments in domestic and oversea should be conducted. Studies to develop assessment form of health establishments should be carried out for suitability in any contexts. In addition, development of information technology for health establishment affairs should be studied for facility of officials.

Acknowledgements

The researcher would like to sincerely thank department of consumer protection and public health pharmacy under Phetchabun Provincial Public Health Office, and the entrepreneurs of health massage establishments for their participation.

Ethics Approval and Consent to Participate

This current study was approved by Ethical Review Committee for Human Research, Phetchabun Provincial Public Health Office. (reference no.1/20 - 06 -24/02/20)

Human and Animal Rights

Not applicable

Consent for Publication

All the participants were given an information letter explaining the purpose and the nature of the study, confidentiality, voluntary participation at any time with no consequences.

Source of Funding

None

Conflict of Interest

The authors declare no conflict interest, financial or otherwise.

References

1. Manager Online. Thailand’s Role as an ASEAN’s Leader and Medical and Health Tourism Improvement. [Internet] 2019 [cited 2019 Nov 6]. Available from: <https://mgronline.com/smes/detail>.

2. Teeranon K. Thailand's Wellness Tourism: Situation and Potential Towards Competition of ASEAN Region. *FEU Academic Review Journal* 2018; 12 (Supplement): 22-34.
3. Jungsomjatepaisal P. Developing Standards for Spa Establishments and Thai Massage for Health in the Federal Republic of Germany. *Department of Health Service Support Journal* 2019; 15(3): 4.
4. Choibamroong T. *Annual of International Thai Tourism Journal* 2007. Bangkok: Thailand Development Research Institute; 2008.
5. Sripol P, Phakdeeying R, Kowithayakorn V. Marketing Strategy of Health-Promotional Tourism Business in the Northeast of Thailand. *Dhammathas Academic Journal* 2019; 19(1): 123-132.
6. Upathambakul P, Agmapisarn CH. Sex Stereotypes of Female Traditional Thai Masseur: A Case Study of Traditional Thai Massage Parlors in Pattaya, Thailand. *Journal of Liberal Arts* 2018; 18(2): 75.
7. Junead J, Jamnongchob A, Wanichakorn A, Manirochana N. The Study on Potential of Thai Identity in Spa Business and Traditional Thai Massage Toward World Class Health Tourism Sector. *Panyapiwat Journal* 2018; 10(2): 1-16.
8. Marinwimon K. *Legal Measures Regarding Spa Business in Thailand. Master of Laws.* Bangkok: Ramkhamhaeng University; 2005.
9. Kongket Y. *Legal Measures for Control Health Establishments. Ph.D. in Social Sciences Journal* 2018; Special Issue. October: 1-13.
10. Esichaikul R, Chansawang R. A Study of Potential of Spa Business in Thailand. *Modern Management Journal* 2016; 14(1): 17-31.
11. Chaisuvan CH, Chantachon S. Service Provider Development Model in Health Service of the Union of Thai Traditional Medicine Society. *Journal of MCU Peace Studies* 2018; 6(1): -188-199.
12. Kiawmeesuan V, Khamsa-ard S, Siriwong Ph. Guidelines for Potential Development of Spa Business Focus on Expectation of Foreign Tourists in Huahin District, Prachuapkirikhan Province. *Dusit Thani College Journal* 2018; 12(2): 167-181.
13. Thakanun W, Huanprapai P. Thai Massage Service Behavior in Ratchaburi, Thailand. *Proceedings of the International Interdisciplinary Conference* [Internet]. 2018 [cited 2021 Jan 15]. Available from <https://www.iises.net/proceedings/international-interdisciplinary-conference/table-of-content/detail?article=thai-massage-service-behavior-in-ratchaburi-thailand>
14. Department of Health Service Support. *Health Service Standards for Oversea Establishment.* Bangkok: Genesis Media Com Company Limited; 2017.
15. Department of Health Service Support, Ministry of Public Health. *Handbook of Examination and License Approval for Health Establishments.* Bangkok: Genesis Media Com Company Limited; 2019.
16. Seedee R. *Guideline for Thai Spa and Massage to Build Business Alliances in the ASEAN Economic Community.* *Veridian E-Journal Silpakorn University* 2016; 9(3): 756-779.
17. Saiya S, Koonboonya P. A Thai Traditional Massage and a Health Therapy in the Community: A Case Study of the Communities in Kongchiam District of Ubonratchathani Province. *Bailan Journal, UbonRatchathani Rajabhat University* 2017; 2(10): 7-14.
18. Netpradit N. The Managerial Success of an Occupational Group of Thai Traditional Massage in the Region of Lampang Metropolitan Municipality, Lampang Province. *Journal of the Association of Researchers.* 2015; 20(1): 95-106.
19. Thongmark S, Prachapipat CH, Petchmanee S. The Quality Improvement of Health Spa by Staff Participation: A Case Study of KohSamui, Surat Thani Province. *Community Health Development Quarterly KhonKaen University* 2016; 4(1): 83-93.
20. Kongangkab S, Ngamvichaikit A, Vatjanasaregagul L. Marketing Mix Factors Affecting the Consumer Behavior of Thai Massage Service in Wat Phra Chattupon Wimon Mangkhalaram Ratchaworramahawihan. *VRU Research and Development Journal Science and Technology* 2016; 11(3): 295-304.
21. Monk-turner E, Turner CG. Thai Massage and Commercial Sex Work: A Phenomenological Study. *International Journal of Criminal Justice Sciences* 2017; 12(1): 57-68.
22. Wongkongkat S. Director of Department of Thai Traditional and Alternative Medicine. "Thai Traditional Masseur" Complaint Popular Soap Opera of a Channel. *Daily News.* [Internet]. 2016 [cited 2021 Jan 15]. Available from <https://www.dailynews.co.th/politics/387182>
23. Siriwaiprapan S, Soonthornsmai V. A Collaborative Human Capital Development Model for Small Spa and Thai Massage Business in Pattaya. *Modern Management Journal* 2016; 14(1): 77-90.

Effect of Maternal Body Composition and Hemoglobin Percentage at Term Gestation on Labour and Neonatal Outcome

Bushra Fatima¹, B Sandhya²

¹Assistant Professor, Department of Obstetrics and Gynecology, Niloufer Hospital for Women and Children, Osmania Medical College, Hyderabad

²Assistant Professor, Department of Obstetrics and Gynecology, Niloufer Hospital for Women and Children, Osmania Medical College, Hyderabad

How to cite this article: Bushra Fatima, B Sandhya et al. Effect of Maternal Body Composition and Hemoglobin Percentage at Term Gestation on Labour and Neonatal Outcome. Volume 13 Issue 3 July-September 2022

Abstract

Background: The Pre-pregnancy body weight and the haemoglobin percentage are two important parameters which determine and influence the maternal and fetal outcome. The fetal weight gain during pregnancy is about 9-12 kgs in Indian conditions. The maternal body composition is dependent on many factors like genetic, constitutional, racial, socioeconomic and nutritional factors

Objectives: To study the effects of maternal body composition and haemoglobin percentage at term gestation on labour and neonatal outcome

Methods: A total of 150 patients were taken into study. Gestational age was calculated from LMP and by early Ultra-sound Examination. Patient's haemoglobin was measured by spectrophotometric method. The following set of measurements were taken by single examiner. Maternal nutritional anthropometric measurements were taken, two to three days before EDD or after completion of 38 weeks by USG.

Results: Around 49% of the mothers belonged to the group 3 and a significant(35.32%) no. of mothers had HB% levels of <9. This indicates the nutritional status of the pregnant women in our population. All the parameters were significantly correlated with HB% when comparison is made between severely anaemic and non- anaemic group.

Conclusion: The young, illiterate women belonging to lower socioeconomic status have poor dietary intake as evidenced by lower fat free mass, fat mass, ANW, BMI and HB%. They showed adverse pregnancy out comes as evidenced by high prevalence of low birth weight babies, lower mean birth weight, lower Ponderal index and lower APGAR scores compared to non-anaemic women.

Keywords: APGAR, BMI, Nutrition, Ponderal

Introduction

The Pre-pregnancy body weight and the haemoglobin percentage are two important parameters which determine and influence the maternal and fetal outcome. The fetal weight gain during pregnancy is about 9-12 kgs in Indian conditions. The maternal body composition is dependent on many factors like genetic, constitutional, racial, socioeconomic and nutritional factors.

Although the overall effect of weight gain during pregnancy has been established, the components of weight gain that is fat versus fat free mass have, been shown to have an independent effect on birth weight.

During gestation alterations in maternal metabolism provides nutrients for fetal growth in addition to maternal and fetal energy requirements. The maternal fat stores are significantly increased in early gestation and provide for energy requirement

Corresponding Author: B Sandhya,

Assistant Professor, Department of Obstetrics and gynecology, Niloufer Hospital for Women and Children, Osmania Medical College, Hyderabad

Email: drbsandhya2@gmail.com

in midgestational to late gestation. All these factors influence the outcome of pregnancy and the infant's birth weight.

A recent study showed that one in five women booking for antenatal care were with increased BMI had more incidences of obstetric complications. They are also more prone to postoperative wound infections, endometritis and subfertility due to increased insulin resistance. In addition, maternal obesity substantially increases a child's risk of being overweight. Off springs of obese mothers are at increased risk of neural tube defects, macrosomia, neonatal death and morbidity associated with subsequent childhood obesity¹. And the incidence of obesity complicating pregnancy is now 18-38% of all pregnancies^{2,3,4,5}.

On the contrary, in developing countries like India we also have a problem of low BMI because of high prevalence of malnutrition. Pregnancies in women with low BMI also is known to be associated with increased risk of preterm deliveries, premature rupture of membranes and low birth weight and low APGAR score. However, it has also shown to have reduction in other pregnancy complications like preeclampsia, diabetes and obstetric interventions.^{6,7}

Anaemia in pregnancy is one of the most important public health problems not only in India but also in most of the South East Asian countries. About 16% to 40% of maternal deaths occur due to anaemia.

Standards laid down by WHO suggest haemoglobin below 11 gm% as anaemia. Incidence of anaemia during pregnancy in India ranges between 65% to 75%⁸. Birth weight plays an important role in infant mortality and morbidity, childhood development and adult health. Low birth weight is a significant risk factor for adverse health outcomes, including many childhood diseases. Reduced birth weight is related to the risk of type 2 diabetes and ischaemic heart diseases in later life. At the other end of the birth weight spectrum, macrosomia increases the risk of caesarean section delivery, delivery complications (i.e., shoulder dystocia) and subsequent childhood obesity⁹.

The present study enables the effect of various components of maternal weight gain, also the effect of haemoglobin which is taken as a marker of maternal nutritional status on birth weight and APGAR score. Therefore, this study was done to document the

effect of body composition on maternal and fetal outcome.

Materials and Methods

Department and Setting: This study was done at Dept of Obstetrics & Gynaecology,

Sample Size: A total of 150 patients were taken into study.

Gestational age was calculated from LMP and by early Ultra-sound Examination. Patient's haemoglobin was measured by spectrophotometric method. The following set of measurements were taken by single examiner. Maternal nutritional anthropometric measurements were taken, two to three days before EDD or after completion of 38 weeks by USG.

The various anthropometric measurements taken were:

Mid Arm Circumference – It was measured at a point halfway down the -left arm between the tip of acromion and olecranon to the nearest 0.1cm

Skin fold thickness – All measurements were taken with the subject seated on a stool, on the left side of the body with the Harpenden skin fold calipers. Four sites were selected

- Bicep's region over the midpoint of the muscle belly with the arm resting supinated on the subject's thigh.
- Triceps region over the mid part of muscle belly, midway between the olecranon and the tip of the acromion, with the upper arm hanging vertically.
- Subscapular region just below the tip of the inferior the angle of the scapula, at an angle of 45 degrees to the vertical
- Supra iliac region just above the iliac crest in the mid axillary line.

At these four sites, the skin fold was pinched up firmly between the thumb and fore finger and pulled away slightly from the underlying tissues before applying the calipers for the measurement.

- Maternal weight was measured using the same standard hospital equipment before and after delivery to the nearest 0.5 kg.
- Maternal height was taken by a standard height rod to the nearest 1cm.



Figure 1: Recording of Height

BMI as defined by Quetelet was computed as follows:

$BMI = \text{weight in kg} / [\text{height in mts}]^2$. Post-partum weight was taken for calculating BMI.

Maternal body fat was calculated by the Standard Anthropometric formula

$$\text{Body fat mass} = WB/100 \times [(522.5/DB) - 480.5]$$

DB – Body density, WB -- Body weight.

Body density was calculated by standard formula 'C-M x log of Sum of skin folds' where C = 1.1549, M = 0.0678

Maternal Fat free mass was calculated by subtracting Body Fat mass from the total body weight.

Maternal hemoglobin was measured by Spectrophotometric method.

Neonatal data included

Birth Weight: Birth weight which was recorded within 24 hours after birth on a pre-zeroed electronic weighing balance with the baby naked to the nearest 5 gms.



Figure 2: Birth Weight recording

- Length: Length of the baby was measured using an infant meter to the nearest of 0.1 cm.

The criteria taken into consideration for the study were as follows:-

Inclusion criteria

- Singleton uncomplicated pregnancy, booked for regular antenatal care.

Exclusion criteria

- Hypertension
- Endocrinal problems
- Multiple gestation
- Preterm delivery (before 37 completed weeks)
- Any medical illness complicating pregnancy.

Observation and Results

A total of 150 booked patients delivering at the study hospital, who met the criteria for eligibility were included in the study. All patients were divided in to four groups depending on the hemoglobin levels.

Table 1: Distribution based on Haemoglobin

GROUP	HB%	NO	%	MEAN HB%
GROUP 1	< 7 Gms	19	12.67	6.6163
GROUP 2	7.1-9 Gms	34	22.67	8.282
GROUP 3	9.1-11 Gms	74	49.34	10.220
GROUP 4	>11 Gms	23	15.34	11.93

Up to 49% of the mothers belonged to the group 3 and a significant (35.32%) no of mothers had HB% levels of <9. This indicates the nutritional status of the pregnant women in our population.

Table 2: Distribution based on Various maternal and neonatal parameters

Age Group	Frequency	Percentage
<19 Yrs.	22	14.67
>19 Yrs.	128	85.34
Parity		
PRIMI	60	40
Multi	90	60
BMI		
< 20	25	16.66

Age Group	Frequency	Percentage
>20	125	83.33
Literacy		
Illiterate	47	31.34
Literate	103	68.67
Ponderal Index		
<2.3	49	32.66
>2.3	101	67.33
Birth Weight		
<2.5Kgs	28	18.66
>2.5Kgs	122	81.33

Maternal age ranged from 17 yrs. to 32 yrs. About 1/4th of the mothers were young(<20 yrs.). Around 60% were Multipara and 40% were Primi parous. Maternal

BMI was >20 in 83% of the cases and <20 in 16.66%
all Hb Groups

Hb PARAMETER	Group-I	Group-II	Group-III	Group-IV
	<7% (19)	7.1-9%(34)	9.1%(74)	>11%(23)
ANW	51.55+5.35	55.14+6.22	59.06+2+7.7	64.9+8.31
BMI	19.99+2.11	22.066+2.44	23.31+72.59	25.099+2.92
MAC	22.876+1.924	24.476+2.13	25.07+52.10	26.43+2.02
Body Fat	9.7+2.32	14.2+6.88	14.3+3.71	16.3+3.69
Body Fat %	18.972+3.77	23.885+4.81	24.115+3.73	26.466+3.37
Body FFM	41.193+3.55	41.868+3.8	44.227+5.066	47.633+5.37
Birth weight	2.334+0.19	2.642+0.27	2.83+0.26	3.286+0.402
PI	2.070+0.15	2.338+0.179	2.415+0.161	2.515+0.185
APGAR	8.63+1.38	9.35+1.011	9.35+0.94	9.3+0.97
% of L B W	10%	5.34%	2.67%	0.67%

All the parameters improved as the HB% improved except for the Apgar Scores comparisons between Group-I and Group-II, Group II and Group-III, Group-III and Group-IV, and Group-I and Group-IV were made and the following results obtained.

Body fat free mass weight and Ponderal index had significant correlation with HB% when comparison is made between group I and group II.

Between group II and group III there was not much difference in the parameters except for the birth weight.

Only body fat free mass, birth weight and ponderal index had significant correlation with HB% between group III and group IV.

of the cases

Illiteracy was reported in 31.34% of the cases.

Ponderal Index was <2.3 in 32.66% of the cases and >2.3 in 67% of the cases.

Low Neonatal birthweight was seen in 18.66% of the cases.

Table 3: Distribution based on Mode of delivery across groups

HB%	<7	7-9	9.1-11	11
Vaginal Delivery	12(63.15%)	21(61.7%)	44(59.4%)	14(60.8%)
LSCS	7(36.8%)	13(38.2%)	30(40.5%)	9(39.1%)

LSCS was done in Group I, II, III and IV with incidence of 36.8%, 38%, 40.5% and 39%.

Vaginal Delivery was done in Group I, II, III and IV with incidence of 63%, 62%, 59%, 61%.

Table 4: Comparison of Various parameters across

All the parameters were significantly correlated with HB% when comparison is made between severely anaemic and non- anaemic group.

Discussion

Low birth weight continues to be a significant public health problem. In both developed and developing countries. An infant's birth weight is probably the single most important factor affecting neonatal mortality and is a significant determinant of postnatal, infant and later childhood morbidity. Thus, birth weight has been a target for public health intervention. Therefore, various maternal parameters which influence birth weight were studied.

It was observed that very significant number i.e., 84.67% of patients were anaemic whose HB % was below 11gms. This shows that in India a large number of pregnant women were anaemic in spite of various Government programmes to prevent it and which significantly contributes to maternal and perinatal mortality and morbidity. 12.6% of women belonged to severely anaemic group with HB% levels of less than 7gms depicting poor nutrition. It was observed in our study that patients with moderate and severe anaemia had less BMI, body fat, body fat free mass and delivered low birth weight babies with less Ponderal index compared with women who are mildly or not anaemic.

In present study the mean birth weight of babies born to severely anaemic mothers (Haemoglobin < 7 gms) was lowest and that of babies born to mothers with normal hemoglobin values was highest. Babies born to patients with severe anemia had lower Apgar scores. However, there was no correlation of Apgar scores with anemia in other groups.

The effects of components of maternal weight, that is fat and fat free mass on birth weight were considered, it was observed in the present study that body fat free mass has a significant influence on birth weight. Similar observations were made by the study done by Francisco mardones et al,¹⁰ and other studies done in western countries which concluded that maternal FFM was the most important variable, influencing birth weight followed by maternal fat mass.¹¹

The stronger influence of body fat free mass on birth weight compared with body fat suggests that the effect of maternal weight is mainly mediated through genetic or constitutional factors followed by nutritional intake.

The Indian women constitutionally and genetically are of smaller built and also have a poor nutritional intake. These three factors are responsible for the low birth weight babies. The first two factors being unmodifiable, the only means to increase the birth weight of babies born to these women is to improve their nutritional status by increasing the quality and quantity of their dietary intake.

In summary, there appear to be several maternal nutritional variables that seem to be operating in association with low birth weight and IUGR in developing country. While socio-economic status is one such, and may indeed have been issues that underpins many of the other etiological factors It

also seems that maternal weight gain is important, in addition to specific nutrients such as vitamin B12, folate and essential fatty acids, particularly n-3 LCPUFA.¹² The analysis of the clustering of these risk factors in specific socio-economic or home circumstances, or in specific cultural behaviour, or in food intake patterns is of interest, as such analyses may provide the way forward for effective and sustainable prevention strategies.

In present study a significant number of women (35%) who are pregnant for the first time were very young (below 20 years). This shows that in our population a large number of women are becoming mothers at a very young age which could have detrimental effects on the health of the mother and fetus. This is because dietary intake of teenage pregnant mothers will not be sufficient to meet the requirements of maternal growth and the additional pregnancy demands. Teenage pregnancy is still a common occurrence. It has adverse impact on the health of teenage mothers leading to various adverse maternal and fetal outcomes.

This has been aptly brought out in the present study, where in it was shown that most of the young Primi gravidas were anemic had lower BMI, had less fat and fat free mass and delivered LBW babies with low PI.

The teenage mothers developed more adverse perinatal complications such as preterm births, stillbirths, neonatal deaths, and delivered low birth weight babies, when compared with those of the adult Primi gravida mothers. 40% of the studied patients were Primi gravidas and 60% were multi gravidas. It is seen in the present study that the difference in hemoglobin levels: birth weight, BMI, body fat and fat free mass between the two groups is not significant. However, the percentage of LBW babies in Primi was 21.6% where as it was 16.6% in multis. This correlated well with the study done by Fedrick and Adelstein where in the rate of LBW babies was highest in Primi gravida (33.6%). Thus the rate of LBW babies was high in Primi gravida and this accounted for the seemingly high rate in young women.¹³

Post-natal weight measured within 48 hours after delivery was used for BMI. This was taken to represent the pre pregnancy BMI. It was seen that 52% of babies born to women of BMI of < 20 were of LBW compared to 12% of babies born to women with BMI of >20. This clearly indicates the strong

influence of maternal height and weight on birth weight. These IOM's recommendations were – for the first time – specified by mother's pre pregnancy BMI group because BMI is a significant modifier of infant's birth weight. Underweight women are more likely to have a low birth weight infant but the risk is reduced if they gain an appropriate amount of weight during pregnancy.¹⁴

Normal weight women have the lowest risk for delivering a low birth weight or a high birth weight infant. Overweight women have higher risk for developing gestational diabetes mellitus and delivering a high birth weight infant especially if they gain a lot of weight during pregnancy.

Excessive gestational weight gain is associated with an increase in maternal fat stores rather than being beneficial for fetal growth.

The only significant difference of Apgar scores was observed between severely anaemic and non-anaemic groups.

The mode of delivery based on BMI and HB% was studied and it was noted that the caesarean section rate was upto 42%. This analysis proves that as the BMI rises, there is a rise in C-Section rate. There was no significant difference in the C-Section rate with the severity of anaemia

Recommendations

1. Health education about nutrition during pregnancy may influence mothers favourably and remove the doubts related to diet during pregnancy.
2. Improving the level of education in our society especially female education.
3. Increasing the age at marriage so as to avoid teenage pregnancies.
4. Iron and folic acid supplementation to antenatal mothers.
5. Ensuring antenatal services to all the pregnant women.
6. So, with good antenatal care, certain factors can be modified and thus the incidence of LBW babies can be reduced.
7. Preconception counselling in obese women planning pregnancy should be counselled regarding ideal weight and importance of losing weight before entering pregnancy.

Nutritional education, behaviour modification, dieting and exercise should be stressed on.

Conclusion

Maternal nutritional status during pregnancy played a crucial role on the outcome of pregnancy and the birth weight of the infant as shown by the present study. The young, illiterate women belonging to lower socioeconomic status have poor dietary intake as evidenced by lower fat free mass, fat mass, ANW, BMI and HB%. They showed adverse pregnancy outcomes as evidenced by high prevalence of low birth weight babies, lower mean birth weight, lower Ponderal index and lower APGAR scores compared to those women with good diet intake, who had no anemia, had more antenatal weight, more body fat and fat free mass who gave birth to bigger babies with good APGAR scores. The rate of C-section is more as the body composition increases.

Ethical clearance- Ethical Clearance was taken from the Osmania Medical College Institutional ethics committee prior to the commencement of the study

Source of funding- Self

Conflict of Interest - Nil

References

1. Dagfinn Aune, Ola Didri kSaugstad, Tore Henriksen, Serena Tonstad. Mothers with higher BMI have increased risk of still birth, infant death, A Systematic Review and Meta-analysis. JAMA 2014;311(15):1536-1546
2. Masomeh Rezaie, Roonak Shahoei, Shoaleh Shahghebi. The effect of maternal body mass index on the delivery route in nulliparous women. J. Public Health Epidemiol. Vol. 5(12), pp. 493-497, December 2013
3. Alex Anderson. Influence of maternal body composition changes on new born outcome, the impact of gestational body compositions changes of pregnant women and their new borns. FASEB journal april 2014 volume 28 page no. 1031-1036.
4. Gazala Yasmin, Aruna Kumar, Bharti Parihar. Teenage Pregnancy - Its Impact On Maternal And Fetal Outcome. International Journal of Scientific Study. 2014;1(6):9-13.
5. F Gary Cunningham, Kenneth J Leveno, Steven L Bloom, John C Hauth, Dwight J Rouse, Catherine Y Spong, editors. Williams text book of obstetrics and

- Gynaecology, 23rd edition. New York. McGraw Hill. 2011 pg no. 112, 113, 115
6. Swati Vyas, Lubna Ghanieditors. Pregnancy and obesity, Progress in Obstetrics in Gynaecology, 18th edition. Churchill Livingstone Elsevier. P, 11-26. 2008
 7. Lukaski H. Methods for the assessment of human body composition. traditional and new. Am J Clin Nutr 1987;46:537-56.
 8. Agarwal Nutan and Kriplani Alka. Anaemia in pregnancy: A review. Asian Journal of Obs and Gynae Practice. 1999 March-May; 3 (2): 10-20.
 9. Cunningham, Gant, Levine, editors. Haematological disorders, Chapter 49 In: Williams Obstetrics, 21st edition, New York. McGraw Hill 2001: Page 1307-1338.
 10. Francisco Mardones Santander; Gabriela Salazar; Pedro Rosso R.; Luis Villarroel: "Maternal body composition near term and birth weight". Obstetrics & Gynecology. Vol 91. No 6: 873-877. June 1998.
 11. TA Daise, N Yasmin, H Begum. Effect of Maternal Body Mass Index on Perinatal Outcome. Medicine Today Vol.23(2) 2011 pp.100-102
 12. Letsky E. Hematologic disorders, Chapter 8 In: Barron MW and Lindheimer DMeditors. Medical disorders during pregnancy, 2nd edition. Mosby, 1995: Page 228-269.
 13. Adelstein P, Fedrick J. Antenatal identification of women at increased risk of being delivered of a low birth weight infant at term. Br J Obstet Gynaecol. 1978 Jan;85(1):8-11.
 14. Sharma JB. Nutritional anaemia during pregnancy in non-industrialized countries. Chapter 7 In: John Studd editors. Progress in Obstetrics and Gynaecology .15 edition, Churchill Livingstone 2003: page 103-120.

Effects of Traditional Way of Fish Consumption in Sri Lanka on Cardiovascular Risk Profiles

C.G. Devadason

Department of Zoology, Eastern University, Sri Lanka, Chenkalady, 30350, Sri Lanka

How to cite this article: C.G. Devadason et al. Effects of Traditional Way of Fish Consumption in Sri Lanka on Cardiovascular Risk Profiles. Volume 13 Issue 3 July-September 2022

Abstract

The influence of type of fish consumption on cardiovascular risk profiles was studied in Sri Lankan community. A challenge experiment was set up to do a research on the influence of omega-3 fatty acid content in fish on cardiovascular risk profiles of healthy people. Hundred healthy undergraduates (subjects) who were between the ages of 23 to 30 years and full time resident in the hostels in Sri Lanka, were randomly selected for this study. The students were fed with fish curry and fried fish for the amount of 80.41 ± 9.43 g of fish curry or 62.50 ± 11.04 g of fried fish for five days per week. Initial and after 24 weeks and after one year the lipid profiles of the subjects [total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL-C), high density lipoprotein (HDL-C), and very low density lipoprotein (VLDL-C)] were estimated in serum samples collected at commencement and end of the experiment, using automatic biochemical analyzer and the turbidometric method respectively. The fish consumption showed direct effect on the cardiovascular risk profiles by decreasing LDL-C and increasing HDL-C and decreasing LDL: HDL ratio and TC: HDL ratio and revealed the decrease of TG in serum.

Keywords: Fish consumption, Lipid profiles, Lipoproteins, omega3 fatty acid, cardiovascular disease.

Introduction

The beneficial health effects of fish and seafood consumption on cardiovascular risk factors have mainly been attributed to long chain omega-3 polyunsaturated fatty acids (LC omega-3 PUFAs)¹. The dietary omega-3 PUFAs of fish exert beneficial effects by reducing platelet aggregation and improving blood lipoprotein profiles and have been consistently associated with triglyceride-lowering effects². The most consistent effects of omega-3 PUFA are the reduction of serum cholesterol³, triglycerides, very-low density lipoprotein cholesterol (VLDL-C) and low density lipoprotein cholesterol (LDL-C)⁴. Further, intake of omega-3 PUFAs increases HDL-C⁵. Low HDL-cholesterol (HDL-C) as well as high LDL-C

is associated with the development of coronary heart disease (CHD)⁶. The fish consuming population had a lower atherogenic risk as opposed to the non-fish consuming population⁷. Nutritional studies have shown that the intake of omega-3 fatty acids from fish averages 1.3 gram per day in Japan as compared to 0.2 gram per day in the US⁸.

Two trials of 4 weeks and 8 weeks in duration showed that consumption of 125-150 g/ day (3.4-5.4g/day of omega-3 PUFA) of fish reduced of LDL-C by 14-15%⁹. Potential mechanisms for the cardioprotective effects of omega-3 fatty acids include: *anti-atherogenic effects such as* reduction in non-HDL-C levels, TG and VLDL-C levels, chylomicrons, VLDL-C and chylomicron remnants,

* Corresponding Author : Prof.C.G. Devadason

Department of Zoology,

Eastern University, Sri Lanka, Chenkalady, Sri Lanka, 30350, E.mail: stanley@esn.ac.lk

increase in HDL-C levels, improvement in LDL-C and HDL-C particle size and plaque stabilization and *antithrombotic effects, decreased systolic and diastolic blood pressure* ¹⁰.

In addition, the total cholesterol, TG, LDL-C are low in Eskimos whereas high HDL-C is raised. ¹¹ The reduction of total SFAs, is one of the main targets of dietary recommendations in order to lower morbidity and mortality due to CVD ¹².

The fish consumption showed direct effect on the cardio vascular risk profiles by decreasing LDL-C and increasing HDL-C and decreasing LDL: HDL ratio and TC: HDL ratio ⁹. Research revealed the decrease of TG in serum with fish consumption ¹³.

The main aims of the present study were to investigate whether high omega-3 fatty acid fish consumption influences Cardiovascular risk factors in a dose-dependent manner among healthy people between 23 to 60 years of age.

Materials and Methods

Selection of Subjects and Approach

A challenge experiment was set up to do a research on the influence of omega-3 fatty acid content on cardiovascular risk profiles of healthy people. Hundred healthy undergraduates (subjects) who were between the ages of 23 to 30 years were randomly selected for this study.

Consumption of Omega-3 fatty Acids Containing Fish

Fish cut and weighed (66.51 ± 12.29 g) into pieces of muscle. These pieces of fish muscle were made into a fish curry with coconut cream. The total weight of the fish curry including gravy was 80.41 ± 9.43 g which was fed to subjects ($n=39$). Another set of subjects ($n=35$) were fed with 62.50 ± 11.04 g fish fried in coconut oil (Vimal, Sri Lanka) daily. A six months trial commenced on December 2015 and ended on May 2016. . Subjects were fed 80.41 ± 9.43 g of fish curry or 62.50 ± 11.04 g of fried fish for five days per week. Initial, after 24 weeks and after one year the lipid profiles of the subjects [total cholesterol (TC), triglyceride(TG), low density lipoprotein (LDL-C), high density lipoprotein (HDL-C), very low density lipoprotein (VLDL-C)] and high sensitive C-reactive

proteins (hs-CRP) were estimated in serum samples collected at the commencement and end of the experiment, using automatic biochemical analyzer and the turbidometric method respectively.

Determination of Cardio vascular risk lipid indices

Serum cholesterol was estimated using the cholesterol oxidase-phenol-4-aminophenazone method with a lipid clearing agent by enzymatic colorimetric assay (Spinreact®-Spain). The cholesterol in the sample oxidized by the action of cholesterol oxidase enzyme into 4-Cholestenone and hydrogen peroxide which in turn reacts with phenol and 4-aminophenazone in the presence of peroxidase enzyme to produce red color. HDL-C was determined after precipitation of other lipoproteins by sodium phosphotungstate with magnesium chloride reagent (Spinreact®-Spain) and read using analyzer (Indika Chembell, Thermoscientific, UK). The serum TG level was estimated using an enzymatic method (Indika Chembell, Thermoscientific, UK)¹².

Results and Discussion

This study was conducted to assess the effect of fish consumption (omega-3 fatty acid) on serum lipid profile in healthy young subjects

Table 1: Polyunsaturated fatty acids (Omega-3 PUFA) in raw, fried and curried fish

Fish Name (Common Name)	Raw Fish(mg/100g)	Fried Fish(mg/100g)	CurryFish (mg/100g)
	Omega-3FA	Omega-3FA	Omega-3FA
<i>Leiognathus bindus</i> (Pony fish)	23.65(0.73)	2.44(0.36)	11.27(0.59)
<i>Mugil cephalus</i> (Mullet)	15.53(0.42)	5.38(0.77)	13.20(1.01)
<i>Rasterlliger kanagurata</i> (Mackerel)	23.90(0.08)	5.40(1.01)	24.29(1.49)
<i>Chirocentrus dorab</i> (Wolf)	25.04(0.70)	6.96(0.92)	15.50(0.74)
<i>Selar crumenophthalamus</i> (Scad)	23.68(3.12)	4.09 (1.26)	4.35 (0.34)
<i>Katsuwonus pelamis</i> (Tuna)	33.91(2.25)	7.61 (0.63)	15.65(1.16)
<i>Sphyræna jello</i> (Baracuda)	22.82(0.16)	5.21(1.13)	22.13(1.00)
<i>Dussumieria acuta</i> (Herring)	26.10(0.26)	3.97(0.65)	8.03 (2.60)

Data presented as mean (standard deviation)

Table 2: Cardiovascular risk profiles and lipid indices of the subjects of curry and fried fish consumers

Lipid Profiles	Curry Fish Eaters				Fried Fish Eaters			
	End Profiles	Initial Profiles	R -value	P-value	End Profiles	Initial Profiles	R value	P-value
TC (mg/dl)	193.86±37.63	188.06±27.26	0.17	0.32	185.78±32.39	183.11±28.63	0.32	0.52
TG(mg/dl)	132.97±54.14	143.91±67.56	0.39	0.03*	113.99±46.13	124.49±60.14	0.38	0.14
LDL-C(mg/dl)	122.14±31.44	113.37±23.55	-0.06	0.73	116.74±26.93	111.76±26.07	0.16	0.22
HDL-C(mg/dl)	45.17±4.85	46.00±9.23	0.12	0.48	45.97±11.81	45.16±8.69	-0.03	0.64
VLDL-C(mg/dl)	26.59±10.83	28.79±13.51	0.38	0.03*	22.79±9.23	24.89±12.03	0.38	0.14
TC:HDL	4.28±0.60	4.19±0.71	-0.17	0.61	4.13±0.46	4.16±0.79	-0.05	0.81
LDL:HDL	2.67±0.53	2.52±0.56	-0.16	0.27	2.61±0.40	2.57±0.61	-0.08	0.66
NON-HDL-C	148.69±34.32	142.06±24.57	0.081	0.64	139.81±29.50	137.95±27.26	0.25	0.65
AC	3.28±0.58	3.18±0.71	-0.182	0.58	3.09±0.55	3.15±0.79	-0.09	0.65
API	0.05±0.00	0.05±0.00	-0.063	0.62	0.05±0.01	0.05±0.01	0.01	0.24
TGHDL	2.22±0.78	3.66±2.07	0.149	0.37	2.53±1.06	2.89±1.68	0.23	0.08
Hscrp	1.89±3.47	1.83±3.58	-0.019	0.95	1.73±3.05	1.34±2.69	-0.02	0.41

*Significant, P < 0.05. AC: atherogenic coefficient, API: atherogenic index of plasma, HDL-C: high-density lipoprotein cholesterol, hs-CRP: high-sensitivity C-reactive protein, LDL: low-density lipoprotein, LDL-C: low-density lipoprotein cholesterol, TC: total cholesterol, TG: triglycerides, VLDL-C: very low-density

The omega-3 fattyacid in raw fish was significantly higher in almost all fishes than curry and fried fishes. By cooking fish with coconut cream and frying in coconut oil, the content of omega-3 fatty acid showed

decrease and which can be explained that the impact of omega-3 fattyacid in lipid profiles and atherogenesis did not reveal in the present result (Table 1).

Table 3: Status of Lipid parameters and lipid indices during pre and post intervention (6 months) and 1 year post intervention

Lipid Parameters	Pre	Post	Post	Significant (n=74) (2 tailed)
	Intervention	Intervention	Intervention (1 year)	
TC(mg/dl)	180.80(17.53)	175.20(27.42)	193.00(38.09)	0.01
TG(mg/dl)	96.40(28.47)	98.00(27.81)	86.93(21.68)	0.25
LDL-C(mg/dl)	110.53(29.89)	111.93(22.00)	131.44(33.19)	0.07
HDL-C(mg/dl)	44.27(6.79)	43.67(5.27)	44.13(3.93)	0.82
VLDL-C(mg/dl)	20.95(9.35)	19.60(5.56)	17.39(4.34)	0.38
NON-HDL-C (mg/dl)	136.53(15.42)	131.53(22.42)	148.87(34.85)	0.07
Lipid Indices				
TC:HDL	4.15(0.53)	4.00(0.21)	4.30(0.53)	0.01*
LDL:HDL	2.70(0.45)	2.54(0.27)	2.95(0.52)	0.08
AC	3.14(0.55)	3.00(0.22)	3.35(0.53)	0.04*
API	0.05(0.01)	0.05(0.01)	0.04(0.01)	0.55

* Significant P < 0.05 AC: atherogenic coefficient, API: atherogenic index of plasma, HDL-C: high-density lipoprotein cholesterol, LDL: low-density lipoprotein, LDL-C: low-density lipoprotein cholesterol, TC: total cholesterol, TG: triglycerides, VLDL-C: very low-density.

The cardio vascular risk parameters and lipid indices showed differences in pre and post intervention of experiment as shown in Table 3 where in curry fish consumers had significant variation between pre and post intervention in TG and VLDL content ($p < 0.05$). There was not significant difference in TC, LDL-C and HDL-C. However, the after another one year of post intervention showed that there was

no significant difference in the lipid profiles between the intervention while the lipid indices, TC: HDL and AC had significant different ($p < 0.05$) between intervention as shown in Table 2. There was no significant different in cardio risk profiles between pre and post intervention in overall both curried and fried fish consumers ($n=74$) (Table 3).

Table 4: Comparison of pre and post intervention of fish consumption of all subjects

	Pre-Intervention	Post -Intervention		
Lipid Parameters	Mean±SD	Mean ±SD	R value	P-value
TC(mg/dl)	183.10±28.63	185.78±32.39	0.324	0.520
TG(mg/dl)	124.49±60.14	113.99±46.13	0.379	0.139
LDL-C(mg/dl)	111.76±26.07	116.74±26.93	0.164	0.215
HDL-C(mg/dl)	45.16±8.68	45.97±11.81	-0.034	0.641
VLDL-C(mg/dl)	24.89±12.03	22.79±9.23	0.379	0.139
Non-HDL	137.95±27.26	139.81±29.50	-0.460	0.647
Lipid indices				
TC: HDL	4.16±0.79	4.13±0.46	-0.050	0.814
LDL: HDL	2.57±0.61	2.61±0.40	-0.084	0.661
AC	3.15±0.79	3.09±0.55	-0.091	0.649
API	0.05±0.01	0.04±0.01	0.006	0.244
Defence Protein				
HS-CRP(mg/L)	1.34±2.69	1.73±3.05	-0.018	0.412

* Significant $P < 0.05$ AC: atherogenic coefficient, API: atherogenic index of plasma, HDL-C: high-density lipoprotein cholesterol, hs-CRP: high-sensitivity C-reactiveprotein, LDL: low-density lipoprotein, LDL-C: low-density lipoprotein cholesterol, TC: total cholesterol, TG: triglycerides, VLDL-C: very low-density.

Table 5: hs-CRP content in serum before and after fish consumption

Parameter	Curry Fish Eaters			P	Fried Fish Eaters			P
	Initial	End	X ²		Initial	End	X ²	
Base line <1	65.70%	65.70%			74.40%	59%		
	n=23	n=23			n=29	n=23		
Inflammation	25.70%	17.10%			20.50%	25.60%		
	n=9	n=6			n=8)	n=10		
Acute	8.60%	17.10%			5.10%	15.40%		
Inflammation	n=3	n=6			n=2	n=6		
			1.6	0.45			2.92	0.23
hsCRP (mg/L)	0.92±0.82	0.98±0.95		0.44	0.72±0.72	0.88±0.74		0.40

As per the Table 5 the TC had not significantly changed due to curry or fried fish consumption ($\chi^2 = 1.495$, $p=0.474$). TG lower risk level increased in

curry fish consumers from 11.4% to 22.9% whereas it had decreased in fried fish eaters from 5.1% to 2.6%. Overall, high risk level of TG showed

decrease not significantly in both curry fish and fried fish consumers (20% to 14.3% and 5.1% to 0.0%) respectively. Curry fish consumers had an increase of lower risk of LDL-C from 8.6% to 20% whereas in fried fish consumers decreased from 17.9% to 12.8%, but higher risk level of LDL-C had no change in curry fish consumers whereas in fried fish eaters the high risk level of LDL-C had decreased from 5.1% to 2.6%. HDL-C lower risk level had increased from 48.6% to 80% in curry fish consumers and decrease from 12.8% to 5.1% in fried fish consumers and risk level was considered as per the lipid profile risk levels stated by American Heart Association (www.heart.org). However, TC: HDL ratio lower risk level had increase from 80% to 88.6% in curry fish consumers and increase from 66.7% to 88.6% in fried fish eaters. TC/ HDL-C and LDL/HDL-C ratio are risk indicators with greater predictive value than isolated parameters used independently. A study of ¹⁴revealed that coconut cream supplementation was responsible for the reduction in the LDL-C and increase of HDL-C. As observed by ¹⁴who observed rise of HDL-C with eating SFA rich coconut cream, this study agreed the rise in HDL-C while ingesting a saturated fat rich coconut cream cooked fish.

TG is found in high amount in both coconut cream and coconut oil as stated by¹⁴. Because of the reason, TG showed an increase in curry fish. It was observed that the hs - CRP has no significant difference before and after fish consumption and it reveals it could be a general inflammatory protein and it is subjected to vary with the inflammatory effects on body not only in blood vessels but also in other tissues (Table 5). The % of subjects in hs-CRP high risk group (>3) showed increase from 8.6% to 17.15% in curry eaters whereas it increased from 5.1% to 15.4% fried fish eaters. Since hs-CRP is subjected to change with general inflammation, it could not be used to predict the coronary artery inflammation. It was observed that hs-CRP had the significant difference between the males and females, and the males (0.98mg/L) had a significantly higher amount of hs-CRP than females (0.88mg/L).³stated that TC, TG and VLDL-C reduction due to the consumption of food with omega-3 PUFA and reached normal. But the present study did not agree with the above finding and omega-3 PUFA effects on cardio risk profiles is modulated by high intake of SFA with fish. ⁴ reported LDL-C reduction with omega-3PUFA in animal food while our study showed increase of LDL-C with consumption of fish. However, increase of HDL-C with omega -3 PUFA

containing fish intake observed by ⁶which is similar to the present study too. As stated by⁷ results of some studies have shown contradictory results regarding atherogenic effects of omega-3 PUFAs from fish.

However, the LDL-C showed no significant increase due to fish consumption. Among both fish curry and fried fish consumers, TC, LDL-C, TG and VLDL-C showed significantly higher upper quintiles than lower quintiles. Because of rise of stated cardio risk profiles showed higher than optimum reference level.

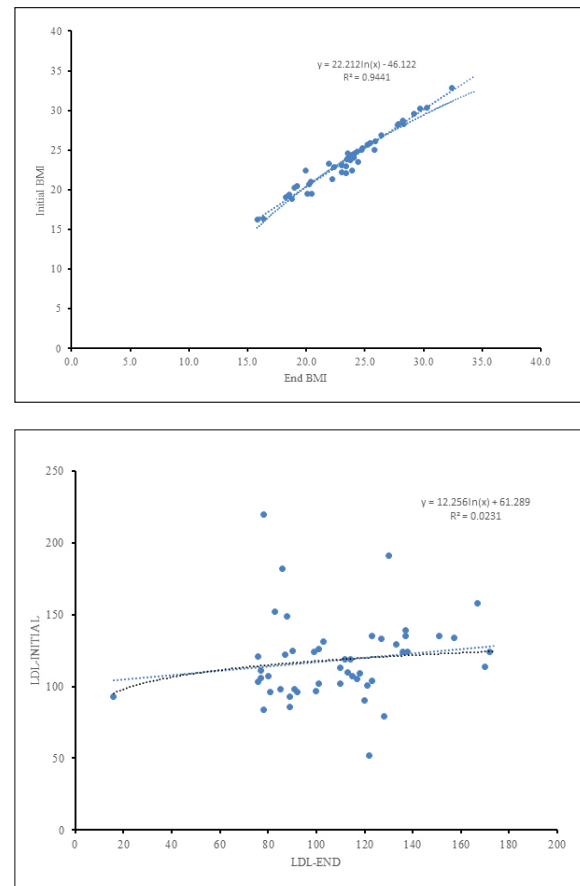


Figure 1: Correlation between pre and post intervention of BMI and LDL-C and VLDL-C

In the present study, there was no significant difference between curried and fried fish eating population except in TG and VLDL-C.

Conclusion

At the end of the trial experiment, due to feeding of omega-3 PUFA content fish, noticeable differences were observed on concentration of lipid cholesterol fractions and lipid indices among the subjects. Concentration of TC, TG, VLDL-C, Non-HDL and

LDL-C showed an increase among fish curry eaters than fried fish eaters whereas HDL-C and lipid indices such TC/HDL, LDL/HDL, AC and API were higher in fried fish eaters than fish curry eaters. However, the significant differences were observed in TG, VLDL-C and non-HDL-C in curry eaters. Significantly higher TG, VLDL-C and hs-CRP in male than female was observed in this study where males ate fish curry. Overall, non-HDL showed increase due to feeding of both type of fish consumption. Although, fish flesh consist of high amount of essential fatty acids, these role on cardiovascular profiles was prevented due to the style of consumption of fish.

Conflict of Interest

There is no conflict of interest in this paper

Source of Funding

I hereby acknowledge the UGC, Colombo , Sri Lanka for the funding

Ethical Clearance:

Approval was obtained from the Ethical Clearance Board of the Faculty of Health Care Sciences, Eastern University, Sri Lanka.

References

- Swanson. D., Block, R., Mousa, S.A. Omega -3-fatty acids EPA and DHA, Health benefits throughout life, *An International Review Journal*, (2012). 3, pp1-7.
- Mozaffarian, D., Wu, L., Jason.N. **Omega-3 Fatty Acids and Cardiovascular Disease Effects on Risk Factors, Molecular Pathways, and Clinical Events.** *Journal of the American College of Cardiology*, (2011),58, pp2047-2067.
- Leslie, M.A., Chen, D.J.A, Liddle, D.M, Robinson, L. E , Ma, D.W.L. A review of the effect of omega-3 polyunsaturated fatty acids on blood triacylglycerol levels in normal lipidemic individuals and borderline hyperlipidemic individuals, *Lipids in Health and Disease*, (2015), 14, 53 , DOI: 10.1186/s12944-015-0049-7.
- Bradbery, J.C, Hilleman, D.E. Overview of omega-3 fattyacid. *Pharmacy and Therapeutics*, (2013), 38(11),pp681-691.
- Okuda, N., Ueshima, H., Okayama, A., Saitoh, S., Nakagawa, H., Rodriquez, B.L, Sakata, K., Choudhury, S.R., Curb, J.D., Stamler, J. Relation of long chain n-3 polyunsaturated fatty acid intake to serum high density lipoprotein cholesterol among Japanese American men in Hawaii: the INTERLIPID study. *Arteriosclerosis* (2005),178(2),pp371-379.
- Yokokawa, H., Yasumura, S., Tanno, K., Ohsawa, M., Onoda, T., Itai, K., Sakata, K., *et al.* Serum low-density lipoprotein to high-density lipoprotein ratio as a predictor of future acute myocardial infarction among men in a 2.7-year cohort study of a Japanese northern rural population. *Journal of Atherosclerosis Thrombosis*, (2011), 18(2),pp89-98.
- Bulliyya, G. Influence of fish consumption on the distribution of serum cholesterol in lipoprotein fractions: comparative study among fish-consuming and non-fish-consuming populations. *Asia Pacific Journal of Clinical Nutrition*, (2002), 119(2), pp104-111.
- Sekikawa, A., Curb, J. D., Ueshima, H., El-Saed, A. *et al.* Marine derived n-3 Fatty acids and Atherosclerosis in Japanese, Japanese -American and white men: A cross-sectional study. *Journal of American College of Cardiology*, (2008),52, pp417-424, DOI: 10.1016/J. Jae, 2008 .03.047.
- Hallund, J., Madsen, B.O., Bugel, S.H., Jacobson, C., Jacobson, J., Krarup, H *et al.* The effect of cardiovascular risk markers in healthy men. *British Journal of Nutrition*, (2010), 104,pp 1528-1536.
- Vega-Lopez, S., Ausman, L.M., Jalbert, S.M., Erkkia, A.T., Lichtenstein A.H. Palm and partially hydrogenated soybean oils adversely alter lipoprotein profiles compared with soybean and canola oils in moderately hyperlipidemic subjects. *American Journal of Clinical Nutrition*, (2006),84, pp54-62.
- Mori, T.A., Burke, V., Puddey, I.B. *et al.* The effects of omega 3 fatty acids and coenzyme Q (10) on blood pressure and heart rate in chronic kidney disease: a randomized controlled trial. *Journal of Hypertension*, (2009), 27(9), pp1863-1872.
- Friedewald, W.T., Levy, R.T., Fredrickson, D.S. Estimation of the concentration of low-density lipoprotein cholesterol in plasma without use of preparative ultracentrifugation. *Clinical Chemistry*, (1972), 18, pp499-502.
- Schaefer, E.J., Levy, R.I, and Ernst, N.D. "The effects of low cholesterol, high polyunsaturated fat, and low at diets on plasma lipid and lipoprotein cholesterol levels in normal and hypercholesterolemic subjects. *American journal of Clinical Medicine*, (1981),34(9), pp1758-1763.
- Siri-Tarino, P.W., Qi Sun, Frank, B. H., and Ronald, M. K. (2010). Meta-analysis of prospective cohort studies evaluating the association of saturated fat with cardiovascular disease. *American Journal of Clinical Nutrition*, 91(3), 535-546, Doi-10.3945/ajcn.2009.27725.

A Cross Sectional Study to Assess Prevalence, Pattern, Trend and Impact of Substance Abuse among Medical Students

Dattatraya Dinna Bant¹, Sushma H R², A Akshay Subramanian³, Bushra Jabeen⁴

¹Professor And Hod, Dept. of Community Medicine, Kims Hubli, ²Assistant Professor, Dept. of Community Medicine, Kims Hubli

³Post Graduate, Dept. of Community Medicine, Kims Hubli, ⁴Assistant Professor, Dept. of Community Medicine, Esic Gulbarga

How to cite this article: Dattatraya Dinna Bant, Sushma H R, A Akshay Subramanian, Bushra Jabeen et al.

A Cross Sectional Study to Assess Prevalence, Pattern, Trend and Impact of Substance Abuse among Medical Students.

Volume 13 Issue 3 July-September 2022

Abstract

Background: Substance abuse remains a covert yet well known phenomenon among medicos and medical practitioners globally, and Substance abuse assumes special significance among the medical students as they are the future medical practitioners and have a potential role in treating and counselling^[4] the patients of substance abuse disorder. Medical education has always been regarded as highly stressful^[5]. Although, only the academic minded youth in the society tend to be selected for medical education, the stressful academic environment can exert a negative effect on the psychological and physical well being of medical students. The doctors are vulnerable to Substance abuse due to their ready accessibility to the substance .

Methods: A cross sectional study was conducted among 232 medical students of Karnataka Institute Of Medical Sciences and various other medical colleges of Karnataka with the help of a structural questionnaire .

Conclusion: It is observed that majority of the participants have adequate knowledge and practices regarding substance abuse. But some fraction of them indulged in substance abuse despite knowing their ill effects. They use various substances such as alcohol, marijuana, cigarettes in various forms such as powders, inhalants, injections, liquid forms etc. However trend towards increasing proportion of substance abuse was observed among students of medical field. The findings suggest that substance abuse in medical students frequently precipitates severe lapses in professionalism and too often endangers the life of not only the students who are using it but also the life of peers and others they may care for/treat in the future.

Keywords: Substance abuse, Medical students, Prevalence, Pattern, trends.

Introduction

Substance abuse and its associated problems are of global concerns. In recent years substance use has increased greatly throughout the world. Adolescence is the critical period when the first initiation of substance abuse takes place^[6]. Among the adolescents, students are particularly vulnerable due to various reasons like academic pressure, temptation by peer groups^[7] and easy availability of many such substances like **tobacco (cigarettes), alcohol, tranquilizers and other**

psychoactive drugs^[1]. A recent WHO estimate shows a burden of world-wide psychoactive substance use of around **2 billion alcohol users, 1.3 billion smokers and 185 million drug users**^[2].

According to World Health Organization (WHO), substance abuse is defined as, "**Persistent or sporadic use of a drug inconsistent with or unrelated to acceptable medical practice**"^[1]. Substance abuse leads to clinically significant impairment or distress. Impairment in social and occupational functioning is

Corresponding Author* : A Akshay Subramanian

Post Graduate,

Dept. of Community Medicine, Kims Hubli

often associated with substance use, which includes the inability to control use of or to discontinue use of the substance.^[2]

Substance abuse remains a covert yet well-known phenomenon among medical students globally^[3], and assumes a special significance among the medical students as they are the future medical practitioners and have a potential role in treating and counselling the patients of substance abuse disorder. Although, only the academically-minded youth in the society tend to be selected for medical education, the stressful academic environment can exert a negative effect on the psychological and physical well-being of medical students^[2]. Substance use pattern is of interest due to potential impact of drug related functional impairments on medical students i.e. accidents, decline in academic and professional performance etc.^[3]

This study was conducted to estimate **the prevalence of substance abuse, to assess the knowledge and attitudes towards the issue, and to explore possible risk factors associated with substance use among medical students in India.**

Aims and Objectives of Study

- To estimate the **prevalence** of substance abuse among medical students
- To study the **pattern** and **trend** of substance abuse among medical students
- To assess the **impact** of substance abuse on medical students

Review of Literature

A cross sectional study conducted by A Arora et al, revealed that the prevalence of substance abuse was 20.43 per cent (47/230) among medical students. An increase in substance abuse was observed in the latter years of medical education. A total of 43 of 47 (91.7%) students using these substances were aware of the ill effects. The most common reasons for substance use were relief from psychological stress (34/47, 72.4%) and occasional celebration (34/47, 72.4%). Of the 47 substance users, 28 (59.6%) made past attempts to quit the substance abuse.

Another cross sectional study conducted by Kumar P et al, It is found that Stress (situational, personal and professional), medical student abuse and family

history of alcoholism are the major risk factors. Despite paucity of studies in Indian population, substance use is reported between 32.5% to as high as 81.2% among medical students, interns and house physicians.

A Cross sectional study conducted by Kokiwar PR et al, Malla reddy institute of medical sciences, Hyderabad TELANGANA 2019, Stated that, Undergraduate (UG), as well as postgraduate (PG), medical students are exposed to daily stresses, which can lead to substance use and abuse.

Materials and Methodology

Study Design: Cross Sectional study

Source of Data: Medical Students of Karnataka Institute of Medical

Sciences, Hubli and various medical colleges of Karnataka.

Duration of The Study: 8th June 2020 to 7th July 2020 (1month)

Sample Size: The sample size was calculated from the study of Substance abuse among the medical graduates in a developing country done by Arora.A., Kannan.S., Gowri, S.Choudhary, Sudarshan, P.P. Khosla & " which was conducted between April and July 2014 at Subharthi Medical College, Meerut, India^[8] where prevalence was 20.43%.

Hence considering - $p = 20.43\% = 0.2043$

Applying the formula: $N = (z^2) \times p \times (1-p) / d^2$

where N=sampling size, z=confidence level at 95%, p=estimated

prevalence, d=range of C.I. (precision), We get the sample size; N=250

Inclusion Criteria: Medical students from various medical colleges of

Karnataka, consenting to participate.

Exclusion Criteria: Students not consenting to participate.

Method of Data Collection

The study was conducted among Medical students studying in various medical colleges of Karnataka. A structured questionnaire, and was provided to obtain information. The web-link was sent through whatsapp among MBBS students from first year to

post graduates. The questionnaire was accessed only after the participants were briefed about the purpose of the study and informed written consent was taken and data was collected. Confidentiality was maintained and the entered data was subsequently recorded and only those having access to the particular Google account can view it i.e. those involved in the survey. Data collection had been done for a duration of 1 week.

The Questionnaire consists of

Section A: Questions regarding knowledge about substance abuse.

Section B: Questions assessing attitude and practises regarding substance abuse.

Section C: Questions about physical and psychological impact of substance abuse.

Section D: Questions regarding abstinence from substance abuse.

Statistical Analysis: The data was collected and entered in Microsoft Excel Worksheet and analysed using appropriate tools, results were presented in the form of proportions and percentages were applied when necessary.

Result

Out of 232 students, 46.6% (n=108) were males and 53.4% (n=124) were females. Majority of the participants belong to the age group 20-25 years. A trend towards increased proportion of substance abuse was observed in the later years of medical education. Various substances available to the study participants included cigarette, alcohol, powder, tablet etc. [as in table 1]

Most of them used one substance at a time of which, 1.3% (n=3) used habitually (as in figure 1). Most of the participants initiated the use of substance use at age of 11-20 years (as in table 2). This test assessed the psychosocial attribute of those with substance abuse and those without and reported teenagers curiosity (51.3%, n=118) as the main reason (as in figure 2).

About 8.8% (n=20) people found it fairly difficult getting the substance during the lockdown period and 16.3% (n=37) participants family members were aware of the substance abuse and 5.5% (n=12) were guilty after using the substance. It was also interesting to note that students having history of substance

abuse in siblings were at a higher risk of using these substances⁽⁵⁾.

Among the participants 5.7% (n=13) (as in figure 3) made attempts to quit the use of concerned substance and out of these 2.2% (n=5) experienced withdrawal effects and thus had been unable to maintain abstinence. Also about 0.9% (n=2) of participants had experienced ill effects of substance abuse by being hospitalized (as in figure 4), but 1.3% (n=3) did not make any significant attempts. Among participants, when under the influence of substance experienced the following effects like physical fight, damage to property etc. (as in table 3)

About 1.8% (n=4) were involved in treatment program for drug abuse out of which 26.2% (n=60) found it helpful.

Table 1: indicates the various forms in which the substance abuse was consumed

Variables	Frequency (N=232)	Percent
Cigarette	42	18.1
Tablet	25	10.8
Patch	15	6.5
Powder	31	13.4
Drinking liquid	22	9.5
Transparent crystal	13	5.6
Injection	28	12.1
Inhalable vapour	16	6.9
Not applicable	30	12.9

Table 2: indicates the age in years when substance abuse was initiated by the study population

Variables	Frequency (N=232)	Percent
0-10 years	7	3
11-20 years	15	6.5
21-30 years	6	2.6
Never used	204	87.9

Table 3: indicates various circumstances experienced by the study population under intoxication

Variables	Frequency (N=232)	Percent
Physical fight	6	2.6
Injury	5	2.2
Damage to property	1	0.4
Hospitalized	2	0.9
Trouble with police	4	1.7

Variables	Frequency(N=232)	Percent
Disturbed social relationships	4	1.7
Harm to their academic performances	8	3.5
Never had been under the influence of drug.	216	93.9

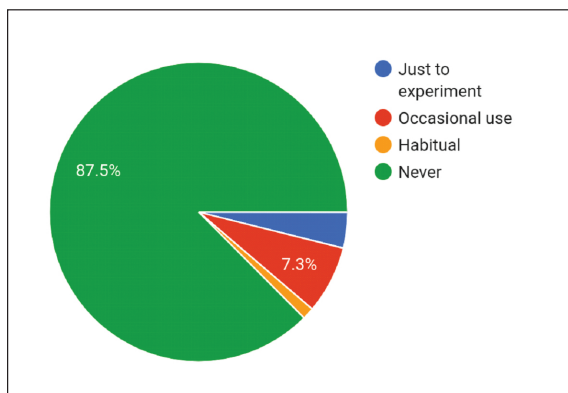


Figure 1: indicates the frequency of substance abuse

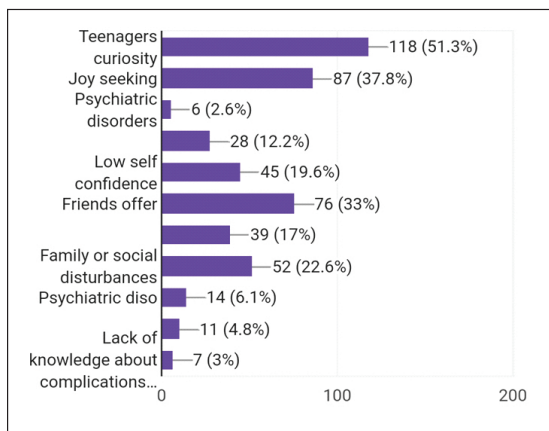


Figure 2: indicates the reason for initiating in substance abuse

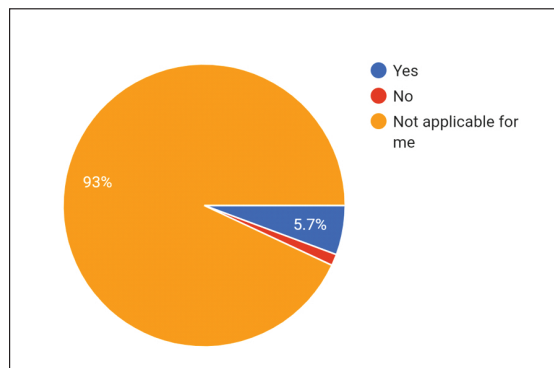


Figure 3: indicates the no. of study population who tried to quit their habits

Conclusion

It is observed that majority of the participants have adequate knowledge and practices regarding substance abuse. But some fraction of them indulged in substance abuse despite knowing their ill effects. They use various substances such as alcohol, marijuana, cigarettes in various forms such as powders, inhalants, injections, liquid forms etc. However trend towards increasing proportion of substance abuse was observed among students of medical field. The findings suggest that substance abuse in medical students frequently precipitates severe lapses in professionalism and too often endangers the life of not only the students who are using it but also the life of peers and others they may care for/treat in the future.

Conflict of Interest - Nil

Ethical Clearance - Not Taken

Source of Fund - Self

References

1. Kumar S, Niranjana A, Kumar M; substance abuse among undergraduate medical student in central india; international journal of health science and research; 2015
2. Rashid Mir A et al; Substance abuse pattern among medical students in Tumkur, Karnataka; International journal of community medicine and public health; 2016
3. Goel N, Khandelwal V; Pandya K; Kotwal A; Alcohol and tobacco use among undergraduate and postgraduate medical student in India; Central Asian journal of global health; 2015.
4. Substance abuse in doctors - statistics & treatment options [Internet]. American Addiction Centers. 2019 [cited 2022 Feb 7]. Available from: <https://americanaddictioncenters.org/medical-professionals/substance-abuse-among-doctors-key-statistics>
5. Sinha R. Chronic stress, drug use, and vulnerability to addiction. Ann NY Acad Sci [Internet]. 2008 [cited 2022 Feb 7];1141(1):105–30. Available from: <https://www.ncbi.nlm.nih.gov/labs/pmc/articles/PMC2732004/>

-
6. National Institute on Drug Abuse. Introduction [Internet]. National Institute on Drug Abuse. [cited 2022 Feb 7]. Available from: <https://nida.nih.gov/publications/principles-adolescent-substance-use-disorder-treatment-research-based-guide/introduction>
 7. Peer pressure and substance abuse [Internet]. Addiction Center. 2020 [cited 2022 Feb 7]. Available from: <https://www.addictioncenter.com/addiction/peer-pressure-substance-use/>
 8. Arora A, Kannan S, Gowri S, Choudhary S, Sudarasan S, Khosla PP. Substance abuse amongst the medical graduate students in a developing country. Indian J Med Res [Internet]. 2016 [cited 2022 Feb 7];143(1):101–3. Available from: <https://pubmed.ncbi.nlm.nih.gov/26997021/>

Comparative Assessment of Academic Performance among Kims Medical Students before and during Lockdown:a Cross Sectional Study

Dattatraya Dinna Bant¹, A Akshay Subramanian², Sushma H R³

¹Professor And Hod, Dept. of Community Medicine, Kims Hubli,

²Third Year Post Graduate, Dept. of Community Medicine, Kims Hubli

³Assistant Professor, Dept. Of Community Medicine, Kims Hubli

How to cite this article: Dattatraya Dinna Bant, A Akshay Subramanian, Sushma H R et al. Comparative Assessment of Academic Performance among Kims Medical Students before and during Lockdown:a Cross Sectional Study. Volume 13 Issue 3 July-September 2022

Abstract

Background: With the advent of Covid[5], it became very difficult to cater to the 1.7 billion[6] students whose education was on a technical hold. With the online classes around it became difficult for the students to imbibe certain basic concepts of knowledge and they had to instead mug-up a lot of portions. All these also led to a deviation from the normal teacher-student relationship. As a consequence it affected the grades a student obtained during the time of lockdown. Hence this study with the objectives to assess the psychological impact of lockdown on students, comparative assessment of students before and during lockdown and the pattern of reading from home and college is of significance.

Methodology: A cross sectional study was done for a period of one month on medical students for "Comparative Assessment of medical students before and during lockdown." The students were selected by convenience sampling. A pretested semi structured questionnaire was sent through whatsapp and the data collected. It was entered in Microsoft Excel sheet, analysed using SPSS version 25 and findings were represented in the form of figures and tables.

Conclusion: Even though the number of students gaining first class and second class marks have increased during the period of lockdown, the number of students securing distinction has considerably fallen. Many felt that their reading is far better when at hostel and in the presence of companions in the college campus and with the teacher-student relationship around with in room classes. As a matter of fact majority of them wanted to come back to campus as soon as possible and resume normal in-room classes.

Keywords: Comparative, Assessment, Medical, Before, Lockdown

Introduction

COVID 19 has taken us all by surprise and changed the way we live our daily life. In the process there are few things which we have come to be accustomed to like our parents working from home and most of the economic activities taking place through the e-commerce. Having said so, education is quite

different. But e-learning was found to be the only way forward when the epidemic struck without notice^[1].

It was important to cater to the 1.7 billion student population worldwide. Along with the many measures taken by the Government to limit the spread of transmission of Covid, it seemed very obvious that banning colleges from being opened and allowing

Corresponding Author: A Akshay Subramanian

Third Year Post Graduate, Dept of Community Medicine, Kims Hubli
aakshayqm@gmail.com

for regular in room classes seemed inappropriate^[2]. Many universities around the world either postponed or cancelled all campus activities to minimize gatherings and hence decrease the transmission of virus. However, these measures lead to higher economical, medical, and social implications on both undergraduate and postgraduate communities.

A sudden switch to the online mode of learning^[7] was received with lot of criticism. Eventhough it did cater to the needs of continuation of knowledge transfer, one has to really ponder why we were not able to replicate in -room classes in the online mode. As a reason, the concepts of primary importance were not fully understood by the students. Students had to mug up certain principles and theories without understanding them. The ever energetic adolescent and young adults of our nation had to sit stoic in front of e-gadgets for hours long leading to various physical morbidity^[3].

Furthermore anxiety set in and the apprehension of completing their college life without a campus feel and knowledge transfer between the 'guru and teacher' dooms large in front. All these have led to deteriorating performance of students^[8] in their college exams.

In this context this particular study with the following aims and objectives find relevance.

Aims and Objectives

to assess the psychological impact of lockdown on students

to compare academic performance of students before and during lockdown

to study the pattern of learning and reading from home and when in hostel.

Materials and Methodology

A cross sectional study was done for a duration of one month from 24 June 2021 to 24 July 2021. The study population were chosen to be the KIMS medical students. Convenient sampling technique was used.

Sample size calculation: In a study conducted by Nanigopal Kapasia et al under the title 'Impact of lockdown on learning status of undergraduate and postgraduate students during COVID 19 pandemic in West Bengal^[4], India it was found that 42% of the study subjects had anxiety as a result of impact of

lockdown on medical students. A sample size of 393 was calculated.

Data collection tool: A pre tested semi structured questionnaire was prepared using Google forms and circulated via Whatsapp to the study subjects for comparative assessment of grades of undergraduates before and during lockdown and to assess the pattern of reading when at home and in hostel , after doing the pilot test and making the necessary changes data collection was continued .The data thus collected was entered into Microsoft Excel sheet, tabulated, analysed using SPSS version 25 and associations between parameters were found and represented in the form of tables and figures.

Result and Discussion

Out of the 393 students who participated in the study, 60.8% study subjects were males and the others were females. 69.7% students resided in urban areas whereas 30.3% students resided in rural areas. There were study subjects from different years of undergraduation and a couple of postgraduates (as seen in Table 1)

It was interesting to note that day scholars and those staying in hostels were almost uniformly distributed in the study as 55.7% students resided in hostel and the remaining 44.3% students were day scholars. (as in figure 1) Majority of them (70.2%) of them felt that they could manage their studies better by residing in hostel rather than staying at home.

Surprisingly eventhough the number of students getting first class and second class grades have increased during the time of lockdown when compared to before, the distinction candidates have reduced during the period of lockdown (as in table 2) and it is quite evident when 84.2 % of the students opined that they felt they need to get back to in room classes and the atmosphere of college to acquire better grades.

Staying in either home or in hostel, both comes with its own pros and cons. While good food along with parental guidance and extra helping hand was considered as few of the advantages for staying in home (as in table 3), staying in hostel was considered advantageous to enjoy independence, for combined studies and to access accessory study materials from the library. (as in table 4) Students have come to cope with disadvantages of doing household chores, visits of relatives frequently and the urge to drift into

watching television and spending extra time for entertainment purposes when at home(as in figure 2) while hostelites feel lack of availability of balanced diet along with frequent distractions by friends are something to cope to(as in figure 3)

Furthermore 89.6% students agree to the fact that lockdown has changed their method/approach of studying more to do with the 65% students who felt that they were not able to imbibe the basic concepts of subject matter taught in online mode.69% students reasserted the fact that lack of teacher-student relationship in the campus was the prime reason for low grades during lockdown.

To add to it 74.6% students felt that its highly strenuous to sit for long hours in front of e-gadgets to obtain knowledge and in the process 81.2% students felt that they got addicted to internet.College life is never complete without due socialisation process taking place between exchange of friends and their camaraderie. 63.7% students are affected psychologically making them insecure without proper companionship in college due to lockdown.

Last but not the least the very own tedious process of e-learning has made 79.2% students lethargic and making 84% students feel the need to come back to college to resume normal in-room classes.

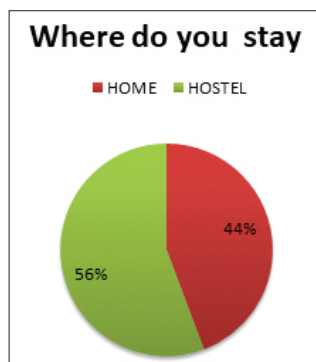


Figure 1: Indicates The Place of Stay of the Students Before Lockdown While Pursuing Medical Course

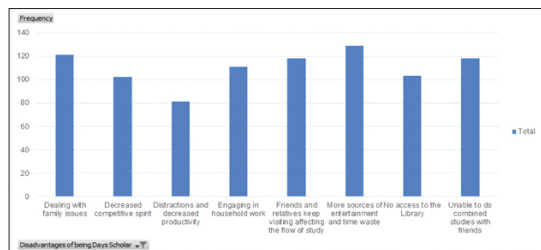


Figure 2: Indicates the Disadvantages of Staying in Home For Studying

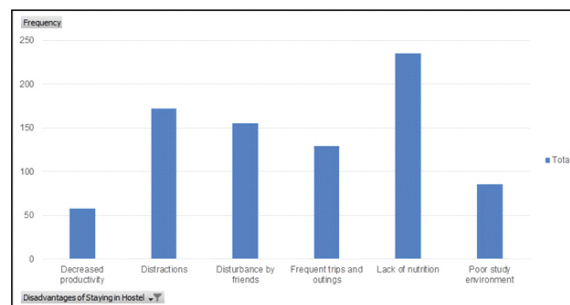


Figure 3: Indicates the Disadvantages of Staying in Hostel to Study

Table No 1: Distribution of the year of study of study participants

Year of study	Frequency	Percent
1st year MBBS	115	29.3
2nd year MBBS	79	20.1
3rd year MBBS	146	37.2
4th year MBBS	41	10.4
Internship	10	2.5
Postgraduate	2	0.5
Total	393	100.0

Table No 2: The average marks obtained before and during lockdown by the students

	Average percentage obtained in exam	
	Academic year 2018-19 -n(%)	Academic year 2019-20-n(%)
0-25%	5(1.3)	4(1.0)
25-50%	1(0.3)	6(1.5)
50-60%	39(9.9)	41(10.4)
60-70%	163(41.5)	169(43.0)
70-80%	69(17.6)	88(22.4)
80-90%	116(29.5)	85(21.6)
Total	393(100)	393(100)

Table No. 3: Advantages of staying at home to study as felt by the participants

Advantages of staying at home	Frequency(n)	Percentage(%)
Better study environment	83	10
Friends and siblings help	56	6
Good food	165	19
More comfort	121	10

Conti..Table No. 3: Advantages of staying at home to study as felt by the participants

Advantages of staying at home	Frequency(n)	Percentage(%)
More disciplined life	105	12
Needn't do all the basic things on your own-extra helping hands at home	121	14
Parental guidance	123	14
Reduced distraction and increased productivity	90	10

Table No. 4: The advantages of staying in hostel to study

Advantages of staying in hostel to study	Frequency(n)	Percentage(%)
Access to library	213	17
Combined studies	234	18
Increased productivity	180	14
Independence	245	19
More competitive spirit	221	17
More focus	188	15

Limitations

There might be recall bias in counting the grade or percentage of marks obtained before the lockdown. Students might also find it odd to openly disclose their percentage as part of a study. Also the time period of the study is of small duration for a study for public mental health importance concerning medical education in the crisis present today. A study of extended duration with retrospective prospective cohort can be a better modality.

Recommendations

It is highly recommended to carry forward with the study on a pan Indian scale with a cohort study design so as to evaluate the conditions and resources in medical education at the national level in the present crisis and to do the needful in the near future so as to

minimise the adverse effects of e-learning for medical education with impending third wave of Covid.

Source of fund : self

Ethical clearance: Taken from Institute Ethics Committee, KIMS HUBLI

Conflict of interest: nil

Conclusion: Even though the number of students gaining first class and second class marks have increased during the period of lockdown, the number of students securing distinction has considerably fallen. Many felt that their reading is far better when at hostel and in the presence of companions in the college campus and with the teacher-student relationship around with in room classes. As a matter of fact majority of them wanted to come back to campus as soon as possible and resume normal in-room classes.

References

1. The COVID-19 pandemic has changed education forever. This is how [Internet]. World Economic Forum. 2022 [cited 20 January 2022]. Available from: <https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/>
2. Crises and the COVID-19 pandemic: education responses and choices during times of disruptions. Issue 2021 [cited 28 December 2021]. Available from: https://issuu.com/educationinternational/docs/2021_ei_research_covid-subsahara_eng
3. 10 Bad Effects of Electronic Devices on Kids [Internet]. FirstCry Parenting. 2022 [cited 20 January 2022]. Available from: <https://parenting.firstcry.com/articles/parents-beware-this-is-how-gadgets-are-harming-your-little-child/>
4. Redirecting [Internet]. Doi.org. 2022 [cited 20 January 2022]. Available from: <https://doi.org/10.1016/j.childyouth.2020.105194>
5. Stopping the next one: What could the next pandemic be? [Internet]. Bbc.com. 2022 [cited 22 January 2022]. Available from: <https://www.bbc.com/future/article/20210111-what-could-the-next-pandemic-be>
6. 1.37 billion students now home as COVID-19 school closures expand, ministers scale up multimedia approaches to ensure learning continuity [Internet]. UNESCO. 2022 [cited 22 January 2022]. Available from: <https://en.unesco.org/news/137-billion-students-now-home-covid-19-school-closures-expand-ministers-scale-multimedia>

7. Sudden Shift: Reflections on Online Learning - AMLE [Internet]. AMLE. 2022 [cited 22 January 2022]. Available from: <https://www.amle.org/sudden-shift-reflections-on-online-learning/>
8. #CoronaVirus: Don't let our children down! | Global Campaign For Education [Internet]. Global Campaign For Education. 2022 [cited 22 January 2022]. Available from: https://campaignforeducation.org/en/2020/03/18/coronavirus-dont-let-our-children-down/?gclid=CjwKCAiA866PBhAYEiwANkIneCOVWNsHydyB5Rihdb40tBTJTZD-o6J8_fjTAF7MBYBnaHz7t_i0hoCDM0QAvD_BwE

Descriptive study on Awareness and utilization of Mission Indradhanush in urban slums of kalaburagi, Karnataka

Dayalaxmi. T. Shedole¹, Pavan Kalaskar², Jaya Suryavanshi³

^{1,2&3}Assistant Professor, Department of Community Medicine, GIMS, Kalaburagi, Karnataka, India.

How to cite this article: Dayalaxmi. T. Shedole, Pavan Kalaskar, Jaya Suryavanshi et al. Descriptive study on Awareness and utilization of Mission Indradhanush in urban slums of kalaburagi, Karnataka

Abstract:

Background: Mission Indradhanush was launched in December 2014 to achieve more than 90% full immunization coverage in the country by the year 2020. The Intensified Mission Indradhanush (IMI) was launched in October 2017 for reaching the drop-out and left-out children for immunization. Recently IMI 3.0 has been launched, "Focus of the IMI 3.0 were the children and pregnant women who have missed their vaccine doses during the COVID-19 pandemic. In urban areas, a large group of vulnerable population lives in slums, where mothers are illiterate and have numerous myths about vaccination; this results in children being unimmunized and increased susceptibility to diseases.

Methodology: A descriptive, community based, cross sectional study was conducted for a period of two months i.e in the month of Feb. and March 2021, among the residents of slums of urban field practice area (Manikeshwari) of Gulbarga Institute Of Medical Sciences, Kalaburagi, Kanataka. A preformed, pretested, semi-structured questionnaire was used to collect information regarding Socio-demographic data of respondents, Immunization status of children and Knowledge regarding Mission Indradhanush and Immunization.

Results: Out of 200 children included in the study 81.5% of the children were completely vaccinated according to their age. Statistically significant association was seen between father's occupation and socioeconomic status with the immunization status of children. 46% of the respondents told that they had heard the word Mission Indradhanush, and the source of information was from the health care workers (60.9%) followed by friends (35.9%). A total of 77.1% of the respondents had an adequate knowledge about Mission Indradhanush and immunization. Sex of the child, religion, literacy status of father and occupation of father had a significant association with knowledge about MI and immunization.

Conclusion: Our study concludes that immunization coverage is satisfactory. Of the 200 participants only 92 respondents told that they had heard of the word "Mission Indradhanush, hence there is need for strengthening of Information, Education, Communication (IEC) activities regarding the program – Mission Indradhanush.

Keywords: Awareness, Mission Indradhanush, Immunization Status, Children, Urban Slums.

Introduction

India's UIP has contributed significantly to ensure equity to children accessing the public health system through a variety of supply and demand side interventions, though there still remain challenges of inequity. This translates into a cohort of 89

lakhs missed children majorly in hard to reach and underserved populations. Evidence shows that unvaccinated and partially vaccinated children are most susceptible to childhood diseases and disability, and run a three to six times higher risk of death as compared with fully immunized children¹.

*Corresponding author:

Dr. Dayalaxmi T Shedole, Assistant professor,
Department of Community Medicine, Gulbarga Institute of Medical Sciences,
Kalaburagi-585105, Karnataka, India.
Mob: +919916246435
E-mail- dayalaxmi83@gmail.com

As a strategic endeavor, the Ministry of Health and Family Welfare, Government of India, launched Mission Indradhanush in December 2014 to achieve more than 90% full immunization coverage in the country by the year 2020 with a vision that it will eventually close immunity gaps and strengthen immunization coverage².

The Intensified Mission Indradhanush (IMI) was launched in October 2017 for reaching the drop-out and left-out children for immunization. In April 2018, MI was launched as one of the seven flagship schemes of the Government of India under the Gram Swaraj Abhiyan (GSA), an intensified multisectoral outreach program to deliver social welfare schemes in selected villages³.

Recently IMI 3.0 has been launched, "Focus of the IMI 3.0 will be the children and pregnant women who have missed their vaccine doses during the COVID-19 pandemic. They will be identified and vaccinated during the two rounds of IMI 3.0. Each round will be for 15 days each. Beneficiaries from migration areas and hard to reach areas will be targeted as they may have missed their vaccine doses during COVID19⁴.

In urban areas, a large group of vulnerable population lives in slums, where mothers are illiterate and have numerous myths about vaccination; this results in children being unimmunized and increased susceptibility to diseases. Parents are the primary health decision makers for their children, their knowledge regarding immunization in general have a great impact on the immunization status of their children⁵. With this background, we planned to undertake this study.

Objectives of the study

1. To assess knowledge of respondents about "Mission Indradhanush" and immunization.
2. To assess immunization status of children aged less than or equal to 24 months.
3. To study the association of Immunization status and Knowledge with various socio-demographic factors.

Materials and Methods:

Study population: Residents of slums in the Urban Field Practice area of GIMS, Kalburagi.

Sample size: 200 (convenient sampling) children in

the age group of 0-24 months attending MI session in urban slums of Manikeshwari UHTC.

Study design: Descriptive, Community based, Cross sectional study.

Study period: Two months (February 2021 to March 2021)

Inclusion criteria

Respondents whose children are aged less than or equal to 24 months attending Mission Indradhanush sessions and who are willing to participate.

Exclusion criteria:

Respondents who are not willing to participate.

Data collection method:

Total population of 13 slums coming under the field practice area of UHTC is nearly 15,649 with 3,465 families. An initial house to house survey was conducted in the slums of field practice area to find out the total number of children who are due for vaccination and a list of beneficiaries was prepared. After preparing the beneficiary list, sessions were planned in the month of Feb. And March 2021 when IMI 3(Intensified Mission Indradhanush) was launched. Mothers of eligible beneficiaries were informed about the date and place where the session will be held. On the day of session the mothers were briefed about the purpose of study and consent was taken for participation. A preformed pretested semi-structured questionnaire was used to collect information regarding the following,

- (A) Socio-demographic data of residents,
- (B) Immunization status of children and
- (C) Knowledge regarding Mission Indradhanush and immunization.

Immunization status of children was assessed by interviewing the respondents or from the immunization card. Only those respondents who told yes that they have heard about "Mission Indradhanush" were subjected to Knowledge assessment. The knowledge domain was assessed by 9 questions, the answer being yes, no and don't know. "Yes" (correct option) was given score 2 and "No" (wrong answer) was given score 1 and "Don't know" was given score 0 for each question. Answering 'yes'

to questions 1, 2, 3, 4, 5, 7 and 9 and 'No' to question 6 and 8 revealed good knowledge. The maximum score for knowledge was 18. 50th percentile was set as cut-off score, so the respondents who scored less than 9 were said to have inadequate knowledge and those who had score more than 9 were said to have adequate knowledge about vaccination. The questionnaire was initially developed in English and later translated into Kannada (local language) and translated back to English.

Statistical Analysis: Data entry was done in Microsoft excel spreadsheet and analysis was done by using SPSS software (version 16). Descriptive statistics was used and chi-square test as the test of significance; taking p-value of <0.05 as statistically significant.

Operational definitions:

1. **Complete immunization:** Defined as a child who has received one dose of BCG, one dose of Measles, 3 doses of DPT, OPV, Hepatitis B Vaccine within the age of one year (excluding OPV-0).

2. **Partial/ incomplete immunization:** Defined as a child who is not fully immunized but has received at least one dose of any vaccine within the age of one year
3. **Unimmunized children:** Defined as a child who has not received any vaccine as per National immunization schedule within one year of age⁶.

Results

Table 1. Distribution of children according to Immunization status.

Immunization status	Complete N (%)	Incomplete N (%)	Unimmunized N (%)
Total (N=200)	163(81.5%)	37(18.5%)	0

Out of 200 children included in the study 163 children were completely vaccinated according to their age where as 37 children vaccination was incomplete.

Table 2. Association between immunization status and selected variables

Socio-demographic factors	Immunization Status		X2, df, p-value
	Complete 163(81.5%)	Incomplete 37(18.5%)	
1. Sex			
Male	78(39%)	19(9.5%)	X2=0.148,df=1,p=0.71
Female	85(42.5%)	18(9%)	
2. Birth order			
1	51(28.5%)	10(5%)	X2=5.557,df=4,p=0.235
2	68(34%)	21(10.5%)	
3	29(14.5%)	5(2.5%)	
4	8(4%)	0	
>/=5	1(0.5%)	1(0.5%)	
3. Type of family			
Nuclear	93(46.5%)	20(10%)	X2=0.629,df=2,p=0.730
Joint	68(34%)	17(.5%)	
Three generation	2(1%)	0	
4. Family size			
<5	62(31%)	12(6%)	X2=0.406,df=1,p=0.524
>/=5	101(50.5%)	25(12.5%)	

Conti..Table 2. Association between immunization status and selected variables

Socio-demographic factors	Immunization Status		X2, df, p-value
	Complete 163(81.5%)	Incomplete 37(18.5%)	
5. Religion			
Hindu	120(60%)	27(13.5%)	X2=0.006,df=1,p=0.936
Muslim	43(21.5%)	10(5%)	
6. Mothers education			
Literate	139(69.5%)	32(16%)	X2=0.036,df=1,p=0.850
Illiterate	24(12%)	5(2.5%)	
7. Fathers education			
Literate	136(68%)	30(15%)	X2=0.118,df=1,p=0.731
Illiterate	27(13.5%)	7(3.5%)	
8. Mothers occupation			
Housewife	143(71.5%)	32(16%)	X2=3.040,df=3,p=0.386
Private	5(2.5%)	3(1.5%)	
Govt.	3(1.5%)	1(0.5%)	
Laborer	12(6%)	1(0.5%)	
9. Fathers occupation			
Private	84(42%)	19(9.5%)	X2=6.408,df=2,p=0.041 Significant
Govt.	8(4%)	6(3%)	
Laborer	71(35.5%)	12(6%)	
10. Socioeconomic status (Modified B G Prasad classification 2020)⁷			
Class I	71(35.5%)	6(3%)	X2=17.672,df=4,p=0.001 Highly significant
Class II	26(13%)	4(2%)	
Class III	29(14.5%)	8(4%)	
Class IV	29(14.5%)	12(6%)	
Class V	8(4%)	7(3.5%)	

In the above table significant association was found between father's occupation and immunization status of children i.e fathers of most of the children who had complete immunization were doing either private or were labourers, the association of socioeconomic status with immunization status was found statistically highly significant. i.e most of the children who were completely immunized were belonging to class I according to modified B G Prasad classification. No significant association was found between immunization status with other socio demographic variables.

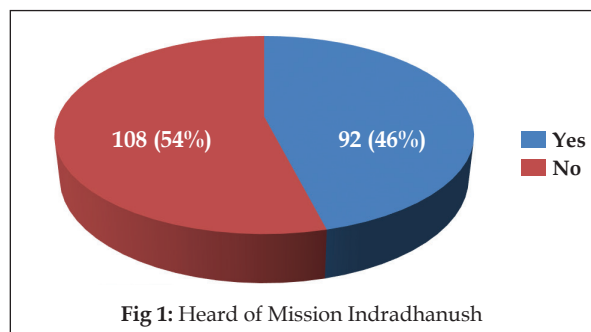


Figure 1: Distribution of study population according to whether they have heard of Mission Indradhanush.

Of the 200 residents involved in the study only 92 respondents told that they have heard the word Mission Indradhanush. Only those respondents who told that they are aware of word Mission Indradhanush were subjected to questions for testing their knowledge on Mission Indradhanush and Immunization.

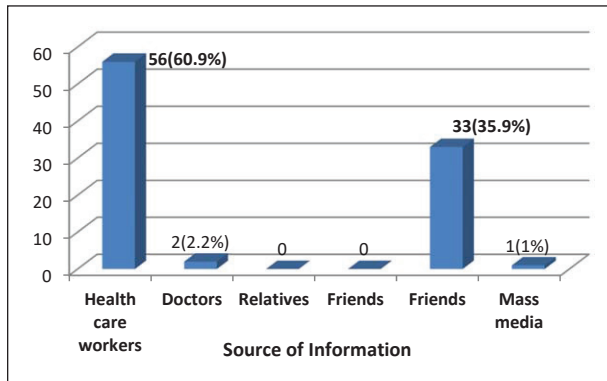


Fig 2: Source of information regarding Mission Indradhanush

The main source of information to the residents about mission indradhanush was from the health care workers (60.9%) followed by friends (35.9%).

Table 3: Assessment of knowledge regarding Mission Indradhanush.

Sl. no	Knowledge assessment	Yes N (%)	No N (%)	Don't know N (%)
1	Awareness about age related vaccination	89(96.7%)	1(1.1%)	2(2.2)

Conti..Table 3

Sl. no	Knowledge assessment	Yes N (%)	No N (%)	Don't know N (%)
2	Does the Vaccine prevent diseases	56(60.9%)	7(7.6%)	29(31.5%)
3	Vaccination schedule Should be followed	89(96.7%)	0	3(3.3%)
4	vaccination is compulsory	81(88%)	2(2.2%)	9(9.8%)
5	Vaccination should be given from birth	87(94.6%)	1(1.1%)	4(4.3%)
6	Are these Vaccines harmful	7(7.6%)	76(82.6%)	9(9.8%)
7	Can Child with common cold be vaccinated?	21(22.8%)	62(67.4%)	9(9.8%)
8	Can Child with fever be vaccinated?	24(26.1%)	59(64.1%)	9(9.8%)
9	Can Child with diarrhea be vaccinated?	9(9.8%)	75(81.5%)	8(8.7%)

Table 4: Association between knowledge about Mission Indradhanush and selected socio -demographic factors

Socio-demographic factors	knowledge about Mission Indradhanush		X ² , df, p-value
	Adequate N=71(77.2%)	Inadequate N=21(22.8%)	
1. Sex Male Female	26(28.3%) 45(48.9%)	16(17.4%) 5(5.4%)	X ² =10.228,df=1,p=0.001 Highly significant
2. Type of family Nuclear Joint Three generation	35(38%) 0 36(39.1%)	10(10.9%) 1(1.1%) 10(10.9%)	X ² =3.421,df=2,p=0.181
3. Family size <5 >/=5	25(27.2%) 46(50%)	7(7.6%) 14(15.2%)	X ² =0.025,df=1,p=0.874

Socio-demographic factors	knowledge about Mission Indradhanush		X ² , df, p-value
	Adequate N=71(77.2%)	Inadequate N=21(22.8%)	
4. Religion			
Hindu	40(43.5%)	19(20.7%)	X ² =8.211,df=1,p=0.004 Highly Significant
Muslim	31(33.7%)	2(2.2%)	
5. Mothers education			
Literate	62(67.4%)	18(19.6%)	X ² =0.037,df=1,p=0.847
Illiterate	9(9.8%)	3(3.3%)	
6. Fathers education			
Literate	56(60.9%)	21(22.8%)	X ² =5.301,df=1,p=0.021 Significant
Illiterate	15(16.3%)	0	
7. Mothers occupation			
Housewife	66(71.7%)	19(20.7%)	X ² =0.872,df=2,p=0.647
Private	1(1.1)	1(1.1%)	
Laborer	4(4.3%)	1(1.1)	
8. Fathers occupation			
Private	21(22.8%)	18(19.6%)	X ² =22.296,df=2,p=0.000 Highly significant
Govt.	2(2.2%)	1(1.1%)	
Laborer	48(52.2%)	2(2.2)	
9. Socioeconomic status (Modified B G Prasad classification 2020)			
Class I	44(47.8%)	11(12%)	X ² =3.368,df=4,p=0.498
Class II	9(9.8%)	2(2.2%)	
Class III	7(7.6%)	3(3.3%)	
Class IV	8(8.7%)	5(5.4%)	
Class V	3(3.3%)	0	

A total of 77.1% of the respondents had an adequate knowledge about Mission Indradhanush and immunization; 67.4% of the literate mothers and 9.8% of the illiterate mothers had adequate knowledge about MI and immunization, although this was not found to be statistically significant. Sex of the child, religion, literacy status of father and occupation of father had a significant association with knowledge about MI and immunization.

Discussion

We all know that immunization is one of the most effective ways to protect children against the vaccine preventable diseases. Our study highlighted that 46% of the respondents had heard about Mission Indradhanush and the main source of information about mission indradhanush was from the health care workers (60.9%) followed by friends (35.9%). where as in a study done by Mohapatra I et al. in urban slums of bhubaneswar, only 10% of the respondents had heard about MI and the most common source of

information regarding immunization were health care workers/doctors/volunteer, followed by friends/relatives and mass media, which accounted for 64%, 22% and 7%, respectively⁵. In a study by Kumar et al. in rural area of Telangana, the major source of information were health workers/doctors (46%), mass media (43%), and friends/relatives (7%). In another study by Kumar et al. in rural area of Telangana, the major source of information were health workers/doctors (46%), mass media (43%), and friends/relatives (7%)⁸.

Total coverage for completely immunized and incompletely immunized children in the present study was 81.5% and 18.5%, respectively, by both card plus recall, where as in a study done at bhubaneswar the total coverage for fully immunized and partially immunized children was 72% and 28%, respectively, by both card plus recall⁵, and in the study done in Nepal where total coverage for fully immunized and not fully immunized children was 92% and 8%, respectively⁹.

Present study shows that father's occupation and socioeconomic status was positively associated with immunization status of children such as complete and timely immunization where as in a study done by Mohapatra et al. it was fathers education/literacy status and mothers literacy status that was positively associated with vaccination status of children⁵.

In our study a total of 77.1% of the respondents had an adequate knowledge about Mission Indradhanush and immunization; 67.4% of the literate mothers and 9.8% of the illiterate mothers had adequate knowledge about MI and immunization, where as in a study done by Mohapatra et al. a total of 64% of the respondents had an adequate knowledge about vaccination⁵, and in a study by Birhanu et al. in Addis Ababa, Ethiopia, 55% of the mothers had good knowledge¹⁰.

Literacy status of mother was not associated with the level of knowledge in the present study which was consistent with the study done by Mohapatra et al⁵, where as in a study by Chris-Otubor et al. in Jos North, Nigeria, mother's education status was significantly associated with the level of knowledge¹¹.

Limitations

1. In the absence of MCH card, data regarding immunization was collected based on self reporting of the respondents, which could lead to issues of reporting bias.
2. The sampled population chosen is according to the convenience of the researchers; hence the results cannot be generalized.

Conclusion

In present study, about 81.5% of the children have taken their immunization appropriate to their age. Of the 200 participants only 92 respondents told that they are aware of the word "Mission Indradhanush". There was significant association seen between father's occupations, socioeconomic status of family with immunization status of children. Also significant association was seen between Sex of the child, religion, literacy status of father and occupation of father with knowledge about MI and immunization.

Recommendations

1. Periodic assessment and awareness generation activities should be done about the ongoing

and new programs launched by government; this will increase the utilization rates of the various vaccine preventable diseases.

2. Anganwadi workers, ASHA workers and through electronic media efforts should be put forth to raise the consciousness about importance of immunization and immunization rate irrespective of knowledge and area of residence of people.

Acknowledgment: I sincerely thank The Director, The Principal of Gulbarga Institute of Medical Sciences, the Professor and Head of the Department of Community Medicine, the Medical Officer of UHTC, the staff of the UHTC, the female health workers, the DHI students, the health inspector who facilitated for data collection and all the study participants for their cooperation and time.

Funding: No funding sources

Conflict of interest: None declared

Ethical clearance: Ethical clearance and approval was obtained from the Institutional Ethical Committee, Gulbarga Institute of Medical Sciences, Kalburagi.

References:

1. Intensified Mission Indradhanush: Identify, enlist, mobilize, vaccinate, monitor and report to achieve full immunization Pg. No. 1. Available from https://nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/Guidelines_for_immunization/Mission_Indradhanush_Guidelines.pdf
2. National Health Mission Tripura. Mission Indradhanush Operational Guidelines. 2015. [Last accessed on 2017 Feb 03]. pp. 5-10. Available from: <http://tripuranhm.gov.in/guidelines/0701201701.pdf>.
3. Strengthening immunization system to reach every child, operational guidelines 2019.2p. Available from: https://imi3.nhp.gov.in/assets/document/Operational_Guidelines.pdf
4. Harsh Vardhan launches Intensified Mission Indradhanush 3.0 [Internet]. Hindustan Times. 2022 [cited 25 March 2022]. Available from: https://www.hindustantimes.com/health/harsh-varadhan-launches-intensified-mission-indradhanush-30-101613779143920.html?utm_source=whatsapp&utm_medium=social&utm_campaign=ht_site
5. Mohapatra I, Kumar A, Mishra K. A study on awareness and utilization of Mission Indradhanush

- in an urban slum of Bhubaneswar. *J Family Med Prim Care* 2018;7:1294-9
6. Sreedhar M, Lavanya KM, Rao N. Primary Immunization Status of Children in 12-23 Months Age Group - A Cross Sectional Study in Urban Slums of Guntur Town, Andhra Pradesh, India. *Nat J Med Dent Res.* 2013; 1:9-13.
 7. Debnath DJ, Kakkar R. Modified BG Prasad Socio-economic Classification, Updated - 2020. *Indian J Comm Health.* 2020; 32(1):124-125.
 8. Kumar V, Anjaneyulu G, Sree VN, WM GS. Immunization status and knowledge regarding newer vaccines among mothers in a rural area of Rangareddy District, Telangana, India. *Int J Community Med Public Health* 2016; 3:3157-60.
 9. Shrestha T, Sermsri S, Sillabutra J. Factors affecting utilization of immunization services among mothers with children aged 12-23 months in the rural areas of Lalitpur district, Nepal. *J Health Res* 2013; 27:287-94.
 10. Birhanu S, Anteneh A, Kibie Y, Jejaw A. Knowledge, Attitude and Practice of Mothers Towards Immunization of Infants in Health Centres at Addis Ababa, Ethiopia. *Am J Health Res* 2016; 4:6-17.
 11. Chris-Otubor GO, Dangiwa DA, Ior LD, Anukam NC. Assessment of Knowledge, Attitudes and Practices of Mothers in Jos North Regarding Immunization. *IOSR J Pharm* 2015;5:34-45.

Comparisons of Transdermal Buprenorphine Patch versus Transdermal Fentanyl patch for postoperative analgesia in lower limb orthopedic surgery

Dilshad Kauser¹, Deepraj Singh²

¹Assistant Professor, Department of Anaesthesia Bhaskar medical college, Hyderabad Telangana.

²Professor, Department of Anaesthesia, Bhaskar medical college, Hyderabad Telangana.

How to cite this article: Dilshad Kauser¹, Deepraj Singh et al. Comparisons of Transdermal Buprenorphine Patch versus Transdermal Fentanyl patch for postoperative analgesia in lower limb orthopedic surgery. Volume 13 Issue 3 July-September 2022

Abstract

Background: Postoperative pain are acute, moderate to severe type. Lower limb orthopedic surgeries are subset of surgery which requires multimodal analgesia postoperatively as it requires excellent postoperative analgesia for early orthopedic rehabilitation as well. Transdermal opioid patches is a part of this multimodal analgesia regimen for postoperative pain relief.

Material and method: The study was conducted after Institutional Ethical committee approval, and informed written consent taken from all participants. 60 patients enrolled for this study of ASA 1 and ASA 2 grade, either gender posted for lower limb orthopedic procedure. The patients were assessed preoperatively and patches applied 6hrs prior surgery. All patients received paracetamol 1gm as rescue analgesic. Total duration of analgesia, requirement additional analgesic noted, pain evaluated with VAS and any side effects also noted for 3 days .

Results: The visual analogue scale shows significant values in the fourth [Group B] and eight hours [Group F] hours of the post-operative period. 0.0005 is the p-value. Pruritus was more common in group F which was statistically significant as compared to the group a. Pruritus was seen in six patients in group F but only two patients in Group B. Group F showed more incidence of nausea/vomiting as well as more requirement of antiemetic as compared to other groups, but it was not statistically significant.

Conclusion: In lower limb arthroscopic procedures, buprenorphine patch was shown to be more effective than fentanyl patch for postoperative pain, with no increased hemodynamic instability or side effects.

Keywords : Transdermal patch, Buprenorphine, Fentanyl, Post-operative complications

Introduction

Postoperative pain management is an ever-evolving topic that continues to be a challenge. According to studies, the majority of patients do not receive adequate pain control following surgery, which leads to delayed recovery, hemodynamic instability, insufficient respiratory effort, and other psychological

issues, all of which can lead to chronic postsurgical pain if not resolved promptly.^{1,2}

Recent findings of the advantages of medications used to treat chronic pain, as well as the re-emergence of older analgesics in the treatment of acute pain, have improved postoperative recovery.³ Transdermal drug delivery systems (TDS), which have been shown to

Corresponding author: Dilshad Kauser,

Assistant Professor, Department of Anesthesia, Bhaskar Medical College. Hyderabad.

Email: drdilshadkauser@gmail.com

be effective in the treatment of chronic pain, are now being utilized with success in the treatment of acute pain.⁴

TDS is a pain-relieving analgesic delivery system that is easy, dependable, and non-invasive. Transdermal administration of drugs such as fentanyl, buprenorphine, diclofenac, and others is possible.⁵ Transdermal opioid patches are well-known for their use in chronic pain. TDS has the potential to remove the pharmacokinetic adverse effects of parenteral and oral medication administration for immediate postoperative pain.⁶

Although they are more expensive than parenteral and oral medications, they eliminate the need of additive opioid dosages in the postoperative phase. The medicine is delivered in tiny amounts, with a consistent and sustained blood level of the drug. A number of studies have shown that buprenorphine and fentanyl patches can be used safely and efficiently to treat acute pain.

Materials and Methods

Type of Study: Random Cross-sectional study

Sample size: 60 patients with 30 patients each in Group B – Buprenorphine patch and Group F – Fentanyl patches

Inclusion Criteria:

- Patients aged between 21 to 60 yrs were included
- ASA I and II

Exclusion Criteria:

- Patients taking NSAID's, having allergies were excluded.
- Not willing to participate

The study was conducted after Institutional Ethical committee approval, and informed written consent taken from all participants. 60 patients enrolled for this study of ASA 1 and ASA 2 grade, either gender posted for lower limb orthopedic procedure. Patients were randomly divided into 2 groups. Group 1 received buprenorphine patch and Group 2 received fentanyl patch. The patients were assessed preoperatively and buprenorphine and fentanyl patches were applied. All patients received paracetamol 1gm as rescue

analgesic. Total duration of analgesia, requirement additional analgesic noted, panic evaluated with VAS and any side effects also noted for 3 days.

Statistical analysis: The SPSS 22 software was used to do the statistical analysis. The data was presented in the form of tables with means and percentages.

Observation and Results

Table 1: Distribution based on Gender and age group

Gender	Group B	Group F	Total
Male	19(63.33%)	21(70%)	40(66.66%)
Female	11(36.66%)	9(30%)	20(23.33%)
Age Group			
21 - 30	5(16.66%)	5(16.66%)	10(16.66%)
31 - 40	7(23.33%)	6(20%)	13(21.66%)
41 - 50	8(26.66%)	9(30%)	17(28.33%)
51 - 60	10(33.33%)	10(33.33%)	20(33.33%)
Total	43.12±9.21	46.18±8.57	

Male predominance was observed in both the groups with total males accounting for 67% and females were 23%.

The majority of the patients belonged to the age group of 51 to 60 yrs accounting for 33% of the cases, followed by 41 to 50 yrs age group with 28%, 22% belonged to the age group of 31 to 40 yrs and the least belonged to the age group of 21 to 30 yrs with 17%.

The mean + S.D for age group for Group B and Group F was 43.12±9.21 yrs and 46.18±8.57 yrs respectively.

Table 2: Distribution based on demographics and ASA

ASA	Group B	Group F	Total
Weight	69.5 + 7.22	68.37 + 5.01	
Height	167.83 + 8.11	166.7 + 7.75	
ASA			
ASA I	10(33.33%)	16(53.33%)	26(43.33%)
ASA II	20(66.66%)	14(46.66%)	34(56.66%)

The weight and height were similar across both the group.

In Group B, ASA I were 33% and ASA II were 67%.

In Group F, ASA I were 53% and ASA II were 47%.

Table 3: Distribution based on duration of surgery and analgesia

Mean Duration	Group B	Group F
Mean Surgery Duration	112.8 + 17.5	114.5 + 18.1
Mean duration of analgesia	18.26 ± 1.69	12.88 ± 0.86

In Group B, the mean duration of surgery was 112.8 ± 17.5 minutes, the mean duration of analgesia was 18.26 ± 1.69 hrs.

In Group F, the mean duration of surgery was 114.5 ± 18.1 minutes, the mean duration of analgesia was 12.88 ± 0.86hrs.

Table 4: Distribution based on VAS

VAS	Group B	Group F
0 hrs	0.28 + 0.980	0.30 + 0.109
4 hrs	2.16 ± .841	2.96 ± .600
8 hrs	1.68 ± 0.690	1.76 ± 0.523

The visual analogue scale shows significant values in the fourth [Group B] and eight hours [Group F] hours of the post-operative period. 0.0005 is the p-value.

Table 5: Distribution based on Post-op complications

Post- Op complications	Group B	Group F
Nausea and vomiting	3	5
Pruritis	2	6

Pruritus was more common in group F which was statistically significant as compared to the group B. Pruritus was seen in six patients in group F but only two patients in Group B. Group F showed more incidence of nausea/vomiting as well as more requirement of antiemetic as compared to other groups, but it was not statistically significant.

Discussion

Anesthesiologists employ a variety of strategies to provide analgesics in the treatment of postoperative pain. Each modality has its own set of advantages and disadvantages. The intravenous and oral methods, while successful in the immediate postoperative period, have drawbacks.⁷ Because of specific benefits and great efficacy, transdermal patches are becoming more common in hip operations, knee arthroplasties,

and abdominal procedures for acute or postoperative pain. Strong opioids, such as buprenorphine and fentanyl, are available as transdermal patches with benefits such as simplicity of administration, safety profile, and a less intrusive manner of administration with a sustained level of medication in the blood.⁸

Fentanyl is a synthetic opioid with a low molecular weight and high lipid solubility, making it an excellent choice for transdermal application in the treatment of acute pain. Buprenorphine, a partial agonist at mu receptors with limited oral bioavailability, high lipid solubility, and low molecular weight, is similar.⁹

Both opioid patches have been examined and proven to be effective in the treatment of chronic and acute pain, but there have been few comparative studies. Furthermore, research comparing them in acute pain indicate that further prospective randomised studies are needed to determine the optimal dose and side effects decisively.¹⁰

Because opioid patches take 12–24 hours to take effect, all patients were administered a transdermal patch 12 hours before surgery. We employed non-opioid analgesics (diclofenac) as rescue analgesics in our trial since combining intravenous or oral opioids with transdermal fentanyl or buprenorphine can exacerbate the negative effects of opioids such as nausea, vomiting, and respiratory depression. The buprenorphine patch was shown to be more effective in alleviating acute pain after surgery in this study. With little side effects, the overall dose of rescue analgesics was reduced. The conclusions of this study are in line with Machado FC et al systematics review.¹¹

Our study's limitations were that we only evaluated at the efficacy of transdermal patches in postoperative patients who had just lower limb arthroscopic procedures, so additional research is needed to understand how well they work in other major surgeries. Furthermore, no individual medication dosage response curve studies were conducted. The study's true power was not calculated using post hoc analysis.

Conclusion

In lower limb arthroscopic procedures, buprenorphine patch was shown to be more effective than fentanyl patch for postoperative pain, with no increased hemodynamic instability or side effects.

Ethical Clearance: Ethical Clearance was obtained

from the institutional ethics committee of Bhaskar Medical College prior to the commencement of study.

Source of funding: Self

Conflict of interest: Nil

References

- Holley FO, van Steennis C Postoperative analgesia with fentanyl: pharmacokinetics and pharmacodynamics of constant-rate i.v. and transdermal delivery. *Br J Anaesth.* 1988 May; 60(6):608-13.
- Nelson L, Schwaner R. Transdermal fentanyl: Pharmacology and toxicology. *Journal of Medical Toxicology* December 2009, 5:230.
- Duthied DJR, Rowbothamrwyldp J, Hendersonw D, Nimmo S. Plasma Fentanyl Concentrations During Transdermal Delivery Of Fentanyl To Surgical Patients. *British Journal Of Anaesthesia.* 1988; 60(6):614-618.
- David A Scott, David SN, Beilby, Calum McClymont, Postoperative Analgesia Using Epidural Infusions of Fentanyl with Bupivacaine: A Prospective Analysis of 1,014 Patients. *Clinical Science,* 1995.
- Scott LJ. Fentanyl Iontophoretic Transdermal System: A Review in Acute Postoperative Pain. *Clin Drug Investig.* 2016Apr; 36(4):321- 30.
- Peter JS, Koo, Pharm D. Postoperative pain management with a patient-controlled transdermal delivery system for fentanyl. *American Journal of Health-System Pharmacy,* 2005; 62(11):1171- 1176.
- Wendy Jeal, Paul Benfield. Transdermal Fentanyl A Review of its Pharmacological Properties and Therapeutic Efficacy in Pain Control. *Drugs* January 1997; 53(1): 109-138.
- Gourlay GK , Kowalski SR , Plummer JL , Cousins MJ , Armstrong PJ . Fentanyl blood concentration-analgesic response relationship in the treatment of postoperative pain. *Anesthesia and Analgesia* [01 Apr 1988; 67(4):329-337]
- Eugene R Viscusi, MD; Lowell Reynolds, MD; Frances Chung, MD et al Patient-Controlled Transdermal Fentanyl Hydrochloride vs Intravenous Morphine Pump for Postoperative PainA Randomized Controlled Trial *AMA.* 2004; 291(11):1333-1341.
- Karas-Trzeciak M, Grabowski T, Woloszczuk-Gebicka B, Borucka B. Fentanyl with ropivacaine infusion for postoperative pain relief in infants and children. Kinetics of epidural fentanyl. *Paediatr Anaesth.* 2015; 25(8):818-823
- Nakamura RK, Machado FC, Novais LSR. Erector spinae plane block for perioperative analgesia in cardiac surgery. *Case Rep Br JP.* 2018;1(4):369-371.

Comparison of 0.2% Ropivacaine with 0.25 % Levobupivacaine in Ultrasound Guided Transverse Abdominis plane block for Postoperative Analgesia in LSCS

Dilshad Kauser¹, Sherry Mathew²

¹Assistant Professor, Department of Anesthesia, Bhaskar Medical College, Hyderabad.

²Professor, Department of Anaesthesia, Bhaskar Medical College, Hyderabad Telangana.

How to cite this article: Dilshad Kauser, Sherry Mathew, Deepraj Singh et al. Comparison of 0.2% Ropivacaine with 0.25 % Levobupivacaine in Ultrasound Guided Transverse Abdominis plane block for Postoperative Analgesia in LSCS. Volume 13 Issue 3 July-September 2022

Abstract

Background: Transverse abdominis plane block is effective modality of post operative analgesia for anterior abdominal wall surgeries . Women undergoing LSCS need good pain relief for comfort and early recovery and mobilization. Ultrasound guided transverse abdominis plane block is safe and effective way for postoperative analgesia.

Objectives: The primary objective is total duration of postoperative analgesia. The secondary objective is to compare any side effects.

Methods: 80 primigravida ASA 1 status, undergoing LSCS were recruited in this prospective randomized study. They were divided into two groups ,group R ropivacaine ,who received 20 ml 0.2% ropivacaine, and group L patients who received 20ml 0.25% of levobupivacaine via TAP block under ultrasound guidance. Postoperative pain was assessed using the visual analog scale upon arriving at the recovery room ,just prior to being discharge to ward and at 6hrs,12 hours,18hrs,and 24hrs postoperatively to compare the effectiveness of analgesia.

Results: A total of 80 patients were analyzed . Duration of analgesia was significantly longer in L group 10.94 ± 0.62 hrs compared to group R 8.16 ± 0.36 hrs ($p < 0.001$), mean consumption of diclofenac was 150.77 ± 14.90 mg and 75.88 ± 28.77 mg in group R and L respectively ($p < 0.005$).

Conclusion : Postoperative analgesia is better with 0.25%levobupivacaine as compared to 0.2% ropivacaine.

Keywords: LSCS, analgesia, diclofenac, levobupivacaine, ropivacaine

Introduction

A Caesarean section is a major surgical surgery that can result in significant postoperative pain and discomfort. Early ambulation, new-born care (including breast feeding, mother-infant bonding), and the avoidance of postoperative morbidity all require adequate postoperative analgesia.¹ Systemic

or neuraxial opioids are frequently used to manage postoperative pain.² Despite the fact that single-shot neuraxial analgesic techniques utilising long-acting opioids or patient-controlled epidural opioid administration provide adequate analgesia, they are accompanied with side effects such as nausea, vomiting, and pruritus, which impair overall patient satisfaction.³

Corresponding author:

Dilshad Kauser

Assistant Professor, Department of Anesthesia, Bhaskar Medical College, Hyderabad.

Email: drdilshadkauser@gmail.com

Regional anaesthesia using local anaesthetics can decrease or eliminate the need of opioids and associated negative effects.⁴ In patients following caesarean section, direct blocking of the neural afferent supply of the abdominal wall, such as abdominal field blocks, ilioinguinal, and hypogastric nerve blocks, provides considerable postoperative analgesia. However, in patients having caesarean delivery, the lack of well-defined anatomical landmarks makes abdominal wall blockage challenging.⁵ All of this has resulted in the development of innovative techniques of post-operative pain treatment. There is a need for a new localised analgesic approach that is easy, dependable, and effective.

The abdominal wall incision is a significant source of discomfort for people following abdominal surgery. The nerves that feed the anterior abdominal wall run between the internal oblique and transversus abdominis muscles in the neurofascial plane.⁶ It is feasible to block the sensory nerves of the anterior abdominal wall before they leave this plane and pierce the muscle to innervate the whole anterior abdominal wall on that side by administering local anaesthetic into the transversus abdominis plane through petit triangle.

TAP Block as part of a multimodal analgesic regimen might reduce opioid intake while also improving analgesia. In this study, the efficacy of Transversus abdominis plane (TAP) block in delivering postoperative analgesia in caesarean section as well as its opioid sparing effect was assessed.

Materials and Methods

Type of Study: Random Cross-sectional study

Sample size: 80 patients with 40 patients each in Group

Inclusion Criteria

Patients with

- Primigravida
- ASA I

Exclusion Criteria

Patients with

- ASA II
- Other than primigravida

- Unwilling to participate in the study

80 primigravida ASA 1 status, undergoing LSCS were recruited in this prospective randomized study.

They were divided into two groups ,group R ropivacaine ,who received 20 ml 0.2% ropivacaine, and group L patients who received 20ml 0.25% of levobupivacaine via TAP block under ultrasound guidance.

Postoperative pain was assessed using the visual analog scale upon arriving at the recovery room ,just prior to being discharge to ward and at 6hrs,12 hours,18hrs,and 24hrs postoperatively to compare the effectiveness of analgesia.

Statistical analysis: The SPSS 22 software was used to do the statistical analysis. The data was presented in the form of tables with means and percentages.

Observation and Results

A total of 80 patients were divided into 2 groups of 40 patients each

Table 1: Distribution based on Age group

Age Group	Group - R		Group - L	
	Frequency	Percentage	Frequency	Percentage
18 to 25	28	70%	30	75%
26 to 35	12	30%	10	25%
Total	40	100%	40	100%

Group A: Majority of the patients belonged to the 18 to 25 yrs age group with 70% and 30% belonged to the 26 to 35 yrs age group. The mean age was 27.72 + 2.56 yrs.

Group B: Majority of the patients belonged to the 18 to 25 yrs age group with 75% and 25% belonged to the 26 to 35 yrs age group. The mean age was 28.58 + 3.41 yrs.

Table 2: Distribution based on various parameters

Parameters	Group - R	Group - L	T-value	p-value
Height	157.72 + 5.73	158.34 + 5.80	0.880	0.380
Weight	56.22 + 6.59	57.88 + 7.64	-0.240	0.810
Duration of Surgery	35.85 + 2.476	35.53 + 2.837	-0.546	0.785
Duration of analgesia	8.16 + 0.36	10.94 + 0.62	0.329	<0.001
Mean consumption of diclofenac	150.77+14.90	75.88+28.77	0.421	<0.005

Group A: The mean Height was 157.72 ± 5.73 cms, The mean weight was 56.22 ± 6.59 kgs, the mean duration of surgery was 35.85 ± 2.476 minutes and duration of analgesia was 8.16 ± 0.36 hrs. Mean consumption of diclofenac was 150.77 ± 14.90 mg

Group B: The mean Height was 158.34 ± 5.80 cms, The mean weight was 57.88 ± 7.64 kgs, the mean duration of surgery was 35.53 ± 2.837 minutes, and duration of analgesia was 10.94 ± 0.62 hrs. mean consumption of diclofenac was 75.88 ± 28.77 mg.

Table 3: Distribution based on mean vital parameters

Vital parameters	Group - R		Group - L	
	0 mins	30 mins	0 mins	30 mins
SBP	125.52 ± 8.21	117.44 ± 8.99	125.38 ± 7.95	114.6 ± 4.40
DBP	79.62 ± 6.50	76.2 ± 4.2	80.16 ± 6.42	75.52 ± 4.68
PR	80.6 ± 7.54	77.98 ± 5.87	80.74 ± 7.87	77.08 ± 5.55
MAP	95.01 ± 5.89	89.75 ± 4.89	95.21 ± 5.85	89.05 ± 3.89

The mean SBP, DBP, PR and MAP decreased significantly across both the groups from 0 to 30 minutes, with slightly better improvement in Group-L.

Table 4: Distribution based on VAS

Time	Groups	N	Mean	S.D	Z-value	P-value
6 hours.	R	40	2.28	1.021	1.802	0.072
	L	40	1.64	1.524		
12 hours.	R	40	2.96	.554	3.524	0.0005
	L	40	2.16	.841		
18 hours.	R	40	2.12	.600	0.729	0.466
	L	40	2.00	.577		
24 hours.	R	40	1.76	.690	0.660	0.509
	L	40	1.68	.523		

The visual analogue scale shows significant values in (Group A) and (Group B) in 12 hours of the post-operative period. with 0.0005 is the p-value.

Table 5: Distribution based on post-op complications

Post-op complications	Group - R	Group - L	Total
Bradycardia	0	0	0
Nausea & vomiting	2	0	2
Hypotension	0	0	0

Conti.. Table 5: Distribution based on post-op complications

Post-op complications	Group - R	Group - L	Total
Sedation(>3)	1	0	1
Respiratory depression	2	0	2

Post-op complications were seen more in Group - R compared to Group - L

Discussion

The pain experienced following a caesarean section is frequently significant. Effective analgesia has been demonstrated to minimise postoperative stress and speed recovery, early ambulation, newborn care (including breast feeding and maternal-infant bonding), and caesarean section postoperative morbidity prevention. Local anaesthetic treatments are widely known for improving the quality of postoperative recovery by lowering pain and analgesic requirement.⁷

TAP block can be used during a Caesarean section performed under regional anaesthesia. Injecting during the postoperative phase saves time in the operating room, and the neonate has already been born and is not at risk.⁸ As a result, at the conclusion of surgery, we did a TAP block. Although the Transversus Abdominis Plane Block plays an important function in abdominal procedures as an analgesic, it is not well understood. In our research, we show that it has potential efficacy in lowering pain ratings and opiate use in patients receiving lower segment caesarean section for the first 48 hours. Under ultrasound guidance, we performed a transversus abdominis plane block. McDonnell et al. assessed the efficiency of TAP block with ropivacaine for postoperative analgesia in caesarean deliveries conducted under spinal anaesthesia, and they discovered that TAP block significantly reduced pain score and 48-hour morphine consumption.⁹

Sirvasta et al. conducted a randomised double-blind study on 62 pregnant women scheduled for caesarean delivery to evaluate the role of TAP block as a component of multimodal postoperative analgesia. They discovered that the TAP block significantly decreased pain score at all study times during rest and movement, as well as decreased parturients tramadol consumption through patient controlled analgesia.¹⁰

There were several limitations to this study. The sample size was sample to establish the block's safety. Furthermore, the participants were not followed up on for the occurrence of chronic pain over a long period of time.

Conclusion

TAP block is a component of multimodal analgesia that offers extremely effective postoperative analgesia in the first 24 hours after caesarean sections. The TAP block with Levobupivacaine as a multimodal analgesic regimen with i.m. Diclofenac as the standard analgesic resulted in a superior analgesic effect with a lower postoperative VAS score, lower mean opioid consumption, and a longer time before the first request for rescue analgesia, all without complications.

Ethical Clearance: Ethical Clearance was obtained from the institutional ethics committee of Bhaskar Medical College prior to the commencement of study.

Source of funding: Self

Conflict of interest: Nil

References

1. G. Guler, G. Cakir, A. Ulgey, F. Ugur, C. Bicer, I. Gunes and A. Boyaci, "A Comparison of Spinal Anesthesia with Levobupivacaine and Hyperbaric Bupivacaine for Cesarean Sections: A Randomized Trial," *Open Journal of Anesthesiology*, Vol. 2 No. 3, 2012, pp. 84-89.
2. Bremerich DH, Fetsch N, Zwissler BC, Meininger D, Gogarten W, Byhahn C. Comparison of intrathecal bupivacaine and levobupivacaine combined with opioids for Caesarean section. *Curr Med Res Opin*. 2007 Dec;23(12):3047-54.
3. Camorcia M, Capogna G, Columb MO. Minimum local analgesic doses of ropivacaine, levobupivacaine, and bupivacaine for intrathecal labor analgesia. *Anesthesiology*. 2005 Mar;102(3):646-50.
4. Turkmen A, Moralar DG, Ali A, Altan A. Comparison of the anesthetic effects of intrathecal levobupivacaine + fentanyl and bupivacaine + fentanyl during caesarean section. *Middle East J Anaesthesiol*. 2012 Feb;21(4):577-82
5. Filiz Caraca , Erkiliç E, Akdikan A, Gümüş T, Kanbak O (2014) Assessment of the Effect of Intrathecal Low Dose Levobupivacaine or Bupivacaine Combined with Fentanyl in Patients Undergoing Cesarean Section. *J Anesth Clin Res* 5:465.
6. Dilek Subaşı , Ekinci O, Kuplay Y, Müftüoğlu T, Terzioğlu B. Comparison of intrathecal hyperbaric bupivacaine and levobupivacaine with fentanyl for caesarean section. *Göztepe Tıp Derg*. 2012;27:22-9.
7. Erkan Yavuz Akcaboy, Zeynep Nur Akcaboy, and Nermin Gogus, Low dose levobupivacaine 0.5% with fentanyl in spinal anaesthesia for transurethral resection of prostate surgery. *J Res Med Sci*. 2011 Jan; 16(1): 68-73.
8. Y. Y. Lee, K. Muchhal and C. K. Chan, "Levobupivacaine versus Racemic Bupivacaine in Spinal Anesthesia for Urological Surgery," *Anaesthesia and Intensive Care*, Vol. 31, No. 6, 2003, pp. 637-641
9. McDonnell JG, Curley G, Carney J, Benton A, Costello J, Maharaj CH, Laffey JG. The analgesic efficacy of transversus abdominis plane block after cesarean delivery: a randomized controlled trial. *Anesth Analg*. 2008 Jan;106(1):186-91,
10. Srivastava U, Verma S, Singh TK, Gupta A, Saxsena A, Jagar KD, Gupta M. Efficacy of trans abdominis plane block for post cesarean delivery analgesia: A double-blind, randomized trial. *Saudi J Anaesth*. 2015 Jul-Sep;9(3):298-302.

Role of usg in Ectopics: Recent Update

Arzoo Ralhan¹, Muskan Sodhi²

^{1&2}Resident, Department of Obstetrics and Gynaecology, Adesh Institute of Medical Sciences and Research, Bathinda, Punjab

How to cite this article: Arzoo Ralhan¹, Muskan Sodhi² et al. Role of usg in Ectopics: Recent Update.

Volume 13 Issue 3 July-September 2022

Abstract

This study is undertaken to emphasize the role of ultrasonography in the diagnosis of ectopic pregnancy and clinical analysis of the same in a tertiary care referral hospital.

Methodology

One hundred patients with provisional diagnosis of ectopic pregnancy were studied. Physical examination, urine pregnancy test, transabdominal scan using 5 MHz transducer or transvaginal ultrasonography of 7 MHz was done. The diagnosis of ectopic pregnancy was confirmed by direct observation by laparotomy or laparoscopy (which was taken as gold standard).

Results

The study showed ectopic pregnancy was most common in gravida 2 and in age group 26–30 years with most of them having married life <10 years. One or more risk factors were found in 66 % of cases. 54 % of cases presented with acute symptoms, 14 % of cases in shock. Among clinical presentation pain abdomen, history of amenorrhoea, bleeding per vaginum, abdominal tenderness, and cervical motion tenderness was most common. In ultrasonography, complex mass in adnexa was present in 60 % of cases and hemoperitoneum in 50 %. 96 % of cases were tubal pregnancy with most of them tubal rupture. In 98 % of cases, radical surgery was done. Salpingectomy was the most common surgery done (90 %). There was no negative laparotomy in this study. There was no maternal mortality in this series.

Conclusions

In all the 100 cases of ectopic pregnancy studied, the ultrasonography provided definitive diagnosis resulting in 100 % sensitivity and 100 % specificity, predictive value of positive test being 100 %. Ultrasonography done in earlier weeks of gestation had sensitivity of 96 % and false negative 4 %.

Keywords: Ectopic pregnancy, Laparotomy, Laparoscopy, Ultrasonography

Introduction

The implantation of the blastocyst outside the endometrial lining of uterus is called as “Ectopic Pregnancy.” The incidence varies from 1 in 300 to 1 in 150 deliveries. Although overall incidence of ectopic pregnancy has increased, the risk of death from ectopic pregnancy has declined by 90 %.

Ectopic pregnancy is often proclaimed as “the great masquerader,” as the diagnosis is complicated by a wide spectrum of clinical presentation varying from asymptomatic cases to hemoperitoneum and shock. The classical triad of amenorrhoea, abdominal pain, and vaginal bleeding is seen in only 50 % of patients with ectopic pregnancy. A more common

Corresponding Author : Arzoo Ralhan, Resident

Department of Obstetrics and Gynaecology

Adesh Institute of Medical Sciences and Research, Bathinda, Punjab

7009564596

Aosp1011@gmail.com

complication is the poor reproductive potential after an ectopic pregnancy. Physicians should maintain a high index of suspicion for ectopic pregnancy and should be cognizant of the importance of early diagnosis and early intervention. Hence, early diagnosis and treatment decrease both morbidity and mortality related to ectopic pregnancy.

Women who present with pain and bleeding in the first trimester, the differential diagnosis include normal early pregnancy, abortion, molar pregnancy, and ectopic pregnancy. The exact diagnosis can be made out with ultrasonography [1]. Women with damaged fallopian tubes, pelvic infection, smoking, assisted reproductive techniques are at higher risk for ectopic pregnancy. Even many women can develop an ectopic without any of the risk factors [2]. Increasingly, the ectopic pregnancy is diagnosed before the appearance of symptoms and signs due to wider availability of transvaginal sonography and serum β hcg estimation [3].

Pelvic ultrasound has revolutionized the diagnostic process of ectopic pregnancy and is now considered the gold standard for the diagnosis of ectopic pregnancy [4]. Transvaginal ultrasonography, in particular, may identify masses in the adnexa as small as 10 mm in diameter and can provide more detail about the character of the mass. At the same time, evaluate the contents of the endometrial cavity and assessment for the presence of free peritoneal fluid. In adnexa, a live embryo seen in up to a quarter of patients, gestational sac in 70 %, as complex mass in 90 % of patients with an ectopic pregnancy. Free intraperitoneal fluid is reported in 60 % of cases in transvaginal sonography. Echogenic or particulate fluid correlates with hemoperitoneum [5]. Multiple parameters have sensitivity and specificity of 100 % in the diagnosis [6].

Methods

The present study was carried out in patients with ectopic pregnancy attending hospital from October 2020 to September 2021.

Inclusion criteria: all patients suspected of having ectopic pregnancy by history and clinical examination and ultrasonography were included.

Exclusion criteria: intrauterine gestation and Ectopic pregnancy managed by expectant or medical line of treatment were excluded.

One hundred patients with provisional diagnosis of ectopic pregnancy were studied. Clinical examination, urine pregnancy test, transabdominal or transvaginal ultrasonography was done. The diagnosis of ectopic pregnancy was confirmed by direct observation by laparotomy/laparoscopy, which was taken as gold standard. The different surgical methods of treatment were noted and post-operative follow-up was done.

Results

During the study period from October 2020 to September 2021, 100 patients suspected of ectopic pregnancy were studied. Peak age of incidence was 26–30 years (44%), followed by patients in age group of 21–25 (28%). 16% patients were above 30 years and 12% below 22 years. 2nd gravida were the most sufferers (38%). Primi and 3rd gravida were 24 and 28%, respectively. Least incidence was found in 4th and above (10%) of the cases had married life <10 years.

90% of cases were referred with 58% belonging to lower socioeconomic status. One or more risk factors were identified in 58 patients (66%). The most common cause being post tubectomy. In post tubal sterilization procedures, most of them were following abdominal tubectomy (14 cases). In this study, all cases of ectopic pregnancy were following 3 years of sterilization. 4 cases were with consecutive ectopic pregnancy. Among 6 cases following IUCD, 4 had previous LSCS. In infertile patients, secondary infertility was common (14 cases) compared to primary infertility .

Most of the cases in our study presented with acute symptoms (54 %) and 30 of them had hemoperitoneum more than 1000 ml. 14 cases presented with shock. The most common presentation being pain abdomen followed by amenorrhea and bleeding per vaginum. On examination, 48 % cases presented with pallor and 14 % of cases with shock. Most common clinical finding being abdominal tenderness and cervical motion tenderness . 62 % of the cases had positive culdocentesis suggesting blood in the pelvic cavity. All the 100 cases had urine pregnancy test positive.

Most common ultrasonography finding was complex mass in the adnexa in 30 % of the cases; the complex adnexal mass was present with hemoperitoneum. In 4 cases, the adnexal mass was on the opposite side as confirmed by laparotomy.

In all the 100 cases studied, ultrasonography

provided the definitive diagnosis resulting in 100 % sensitivity and specificity. Predictive value of positive test being 100%.

In 4 cases, the previous scan done 15 days prior had shown complete abortion with no evidence of extrauterine pregnancy. As the symptoms persisted, the repeat scan showed hemoperitoneum with adnexal mass. Hence, the earlier scan had sensitivity of 96%, specificity 100%, and false negative being 4%. 96% were tubal pregnancy. Right being the most common site. Among tubal pregnancies, 48% were tubal rupture .

In 98% of cases, radical surgery was done. Salpingo ophorectomy was done in 6 cases. 2 cases were of ovarian pregnancy. In 14% of cases, salpingectomy was done in opposite tube.

Discussion

Incidence of ectopic pregnancy in this study was 1 in 143 which is comparable to other Indian studies of Arora et al. (1 in 160) [9] and Arup et al. (1 in 161) [3]. The peak age of incidence was 26–30 years and majority was gravid 2 or less; it is consistent with study by Arup et al. 66% of cases had one or more risk factors similar to study by Arup et al. In their study, most common was tubal pregnancy, and salpingectomy was the treatment in majority (81.9%) which is comparable with our study (90%). Study by Adhikari et al. [10] shows similar findings with our study. Most common ultrasonography finding being complex adnexal mass (61%), with our study showing 60%. But in our study, half of these cases had echogenic fluid in the cul de sac. Study done by Naseem et al. [6] showed sensitivity and specificity of 100% in the diagnosis of ectopic pregnancy by ultrasonography.

Conclusions

Ectopic pregnancy is one of the obstetric emergencies with long-term morbidity and mortality. Hence, high degree of suspicion, early diagnosis, and treatment improves the future reproductive potential. Ultrasonography helps in early diagnosis. Hence, all

early pregnancies should undergo Ultrasonography for viability and site of pregnancy. It can be considered as the gold standard in the diagnosis of ectopic pregnancy. It serves as single most, non-invasive, diagnostic test. It can be even used as single alone test.

Ethical clearance- Taken from ethical committee of institution

Source of funding- Self

Conflict of Interest – Nil

References

1. Levine D. Ectopic pregnancy. *Radiology*. 2007;245(2):385–397. doi: 10.1148/radiol.2452061031. [PubMed] [CrossRef] [Google Scholar]
2. Seeber BE, Barnhart KT. Suspected ectopic pregnancy. *Obstet Gynecol*. 2006;107(2 Pt 1):399–413. doi: 10.1097/01.AOG.0000198632.15229.be. [PubMed] [CrossRef] [Google Scholar]
3. Majhi AK, Roy N, Karmakar KS, et al. Ectopic pregnancy: an analysis of 180 cases. *J Indian Med Assoc*. 2007;105(6):308–314. [PubMed] [Google Scholar]
4. Bignardi T, Alhamdan D, Condous G. Is ultrasound the new gold standard for the diagnosis of ectopic pregnancy? *Semin Ultrasound CT MR*. 2008;29(2):114–120. doi: 10.1053/j.sult.2008.01.001. [PubMed] [CrossRef] [Google Scholar]
5. David AN, Lyndon MH. *Transvaginal ultrasound*. Mosby. 105–132.
6. Naseem I, Bari V, Nadeem N. Multiple parameters in the diagnosis of ectopic pregnancy. *J Pak Med Assoc*. 2005;55(2):74–76. [PubMed] [Google Scholar]
7. Ramanam RV, Gajaraj J. Ectopic pregnancy: the leash sign. A new sign on transvaginal Doppler ultrasound. *Acta Radiol*. 2006;47(5):529–535. doi: 10.1080/02841850600644782. [PubMed] [CrossRef] [Google Scholar]
8. Al-Sunaidi M, Tulandi T. Surgical treatment of ectopic pregnancy. *Semin Reprod Med*. 2007;25(2):117–122. doi: 10.1055/s-2007-970050. [PubMed] [CrossRef] [Google Scholar]

Hypertension and Diabetes Mellitus: Coprediction and Time Trajectories

Himanshu Garg¹, Nikhil Batra², Gaurav Singh³, Anshaj Mujral⁴

^{1,2,3,4} Resident, Department of Medicine, MMIMSR, Mullana, Ambala

How to cite this article: Himanshu Garg, Nikhil Batra, Gaurav Singh, Anshaj Mujral et al.
Hypertension and Diabetes Mellitus: Coprediction and Time Trajectories Volume 13 Issue 3 July-September 2022

Abstract

Type 2 diabetes mellitus and hypertension overlap in the population. In many subjects, development of diabetes mellitus is characterized by a relatively rapid increase in plasma glucose values. Whether a similar phenomenon occurs during the development of hypertension is not known. We analyzed the pattern of blood pressure (BP) changes during the development of hypertension in patients with or without diabetes mellitus using data from the MCDS and in the FOS during a 7-year follow-up. Diabetes mellitus at baseline was a significant predictor of incident hypertension (in FOS, odds ratio, 3.14; 95% confidence interval, 2.17–4.54) independently of sex, age, body mass index, and familial diabetes mellitus. Conversely, hypertension at baseline was an independent predictor of incident diabetes mellitus. In comparison with the nonconverters group, hypertension and diabetes mellitus converters shared a metabolic syndrome phenotype (hyperinsulinemia, higher body mass index, waist girth, BP, heart rate and pulse pressure, and dyslipidemia). Overall, results were similar in the 2 ethnic groups. We conclude that (1) development of hypertension and diabetes mellitus track each other over time, (2) transition from normotension to hypertension is characterized by a sharp increase in BP values, and (3) insulin resistance is one common feature of both prediabetes and prehypertension and an antecedent of progression to 2 respective disease states.

Keyword: Diabetes mellitus, pre hypertension, pre diabetes, glucose levels

Introduction

Diabetes mellitus and hypertension are among the most common diseases and cardiovascular risk factors, respectively, worldwide, and their frequency increases with increasing age.¹ Elevated blood pressure (BP) values are a common finding in patients with type 2 diabetes mellitus (T2D) and are thought to reflect, at least in part, the impact of the underlying insulin resistance on the vasculature and kidney.¹ On the contrary, accumulating evidence suggests that disturbances in carbohydrate metabolism are more common in hypertensive individuals,^{2,3} thereby

indicating that the pathogenic relationship between diabetes mellitus and hypertension is actually bidirectional.

The development of hypertension in diabetic individuals not only complicates treatment strategy and increases healthcare costs but also heightens the risk for macrovascular and microvascular complications considerably.^{2,4} Although BP lowering is followed by a significant reduction in cardiovascular and microvascular morbidity and mortality,^{5,6} a large proportion of diabetic subjects exhibit poorly controlled hypertension. This observation may

Corresponding Author : Nikhil Batra, Resident

Department of Medicine,
MMIMSR, Mullana, Ambala
nikhldr1403@gmail.com
7204546962

reflect not only delayed recognition of the presence of hypertension, clinical inertia, and poor adherence to the prescribed regimen but also uncertainty regarding the treatment targets and pathogenic correlation.

Methods

Study Populations

The MCDS is a population-based cohort participating in a longitudinal survey of incident diabetes mellitus and cardiovascular risk factors. Low-income neighborhoods in Amabala were identified, and a complete enumeration of these was performed from November 2016 to October 2019. Among the 15532 inhabitants of these neighborhoods, 2280 men and women (aged 35–64 years) were randomly selected from 6 low-income colonias examined between 1990 and 1992 and invited to return for 2 follow-up examinations, the first conducted between 1993 and 1995 and the second between 1997 and 1999. Of the 1770 subjects participating in the first follow-up (at 3.25 years), 1753 returned for the second follow-up (at 7 years). The clinical characteristics of the subjects not returning for the second follow-up were essentially superimposable on those of the subjects who did (data not shown).

Examinations were standardized and included interviews, anthropometry, BP measurements, a fasting blood draw, and a 75-g oral glucose tolerance test. Trained interviewers obtained information on medical history, medication use, and smoking status.

The FOS is a community-based cohort including 3754 men and women who attended the fifth clinic examination of the FHS. Participants were followed up from baseline to the sixth and seventh offspring exams, for an average period of 7 years. We used the exam visit date when a new case of diabetes mellitus or hypertension was identified as the date of diagnosis; otherwise, follow-up was censored at last follow-up (examination 6 or 7) for participants remaining nondiabetic or nonhypertensive.

In both cohorts, hypertension was defined as a systolic BP ≥ 140 mm Hg or a diastolic BP ≥ 90 mm Hg or current antihypertensive treatment. In both studies, subjects whose BP was $< 140/90$ mm Hg at baseline and both follow-up visits were classified as normotensives, those whose BP was $< 140/90$ mm Hg at the first visit who became hypertensive at the second or third visit

were classified as converters. T2D was classified as a fasting plasma glucose concentration ≥ 126 mg/dL or a 2-hour plasma glucose concentration ≥ 200 mg/dL on a standard 75-g oral glucose tolerance test. Subjects who gave a history of diabetes mellitus and who at the time of their clinical examination were taking oral antidiabetic agents were also considered to have T2D regardless of their plasma glucose values. Insulin-taking diabetic subjects whose age of onset was ≥ 40 years or whose body mass index (BMI) was > 30 kg/m² were also considered to have T2D. Subjects with type 1 diabetes mellitus were excluded. Subjects who developed diabetes mellitus at the first or second follow-up were denoted as converters. Subjects who tested normal on the oral glucose tolerance test on all 3 examinations were considered to be bona fide nonconverters during the observation period.

Anthropometric Measurements

Diabetes mellitus in at least one parent or sibling was coded as a positive family history of diabetes mellitus. Before examinations, all participants were asked to fast for at least 12 hours. Height, weight, waist and hip circumferences, and systolic and diastolic BP were measured; pulse pressure was calculated as the difference between systolic and diastolic BP and mean BP as the sum of diastolic BP and one third of pulse pressure.

Biochemical Measurements

Blood samples were obtained in the fasting state and 2 hours after a standard 75-g oral glucose load. Serum samples were centrifuged, divided into aliquots, and stored at -70°C until assayed. Fasting concentrations of serum insulin, proinsulin, plasma glucose, total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, triglycerides, and plasma glucose and insulin concentrations 2 hours after an oral glucose load were determined as described elsewhere² at baseline and at follow-up.

Results

Development of Hypertension

At the 3 examinations, 16% to 46% of the study subjects were hypertensive; among them, the prevalence of diabetes mellitus (20%–39%) was significantly

higher than that among normotensive subjects ($P < 0.0001$ for all 3 data sets). Among subjects who were normotensive at baseline ($n = 1876$), 108 became hypertensive at 3.25 years; another 107 subjects who were normotensive at both baseline and 3.25 years were found to be hypertensive at 7 years, and 28 other subjects who were normotensive at baseline and missed examination 2 were hypertensive at examination 3. Thus, a total of 243 subjects converted to hypertension during the 7-year follow-up, yielding a crude conversion rate of $\approx 2\%$ per year.

In comparison with subjects who were seen and found to be normotensive at all 3 examinations (nonconverters), converters to hypertension were older, heavier with a more central fat distribution, and had higher systolic and diastolic BP values and higher pulse rate at baseline regardless of their time of conversion. Diabetes mellitus was more prevalent among either group of converters than in nonconverters. Moreover, among normotensive individuals, diabetes mellitus at baseline was a significant predictor of incident hypertension independently of age, BMI, and family history of diabetes mellitus. Of note, when the baseline mean BP was included in the model, the predictive value of diabetes mellitus was attenuated and became nonsignificant.

All subject groups exhibited weight gain during the observation period independently of the conversion status or the time of conversion. In MCDS, the increase in BMI was a significant independent predictor of incident hypertension (the hazard ratio for 1 SD change in BMI was 1.31; 95% CI, 1.12–1.55 and in the same model, the corresponding hazard ratio for the presence of diabetes mellitus at baseline was 1.79; 95% CI, 1.14–2.77). On conversion, both systolic and diastolic BP values rose markedly and similarly in both groups of hypertension converters. Using only the data of MCDS subjects not receiving antihypertensive treatment, the rise in systolic BP was 19 (14) mmHg in subjects converting at examination 2 ($n = 65$) and 19 (17) mmHg in those ($n = 60$) converting at examination 3. Values higher than the 90th percentile of the changes in systolic BP observed in nonconverters were found in 70% of the subjects converting at examination 2 and in 58% of those converting at examination 3. Similar changes were observed in the converters of FOS. The presence of diabetes mellitus did not consistently affect the pattern of BP change in patients developing hypertension during the follow-up. Thus, in MCDS

patients not receiving antihypertensive medications, the increase in systolic BP in those converting to hypertension at examination 2 was 18 mmHg if nondiabetic and 20 mmHg if diabetic. On the contrary, the corresponding changes in systolic BP for patients converting at examination 3 were 27 mmHg in diabetic versus 17 mmHg in nondiabetic patients ($P < 0.05$).

Development of Diabetes Mellitus

Among subjects who were nondiabetic at baseline ($n = 1966$), 89 had developed diabetes mellitus by 3.25 years; another 71 subjects who were nondiabetic at both baseline and 3.25 years were found to be diabetic at 7 years, and 10 other subjects who were nondiabetic at baseline and missed examination 2 were diabetic at examination 3. Thus, a total of 170 subjects converted to diabetes mellitus during the 7-year follow-up, yielding a crude conversion rate of 1.2% per year. Among nondiabetic individuals, hypertension at baseline was more prevalent among diabetes mellitus converters than nonconverters (25% versus 15%; $P = 0.001$) and was a significant predictor of incident diabetes mellitus (in FOS, OR, 3.33; 95% CI, 2.50–4.44) independently of sex, age, BMI, and familial diabetes mellitus. Again, the increase in BMI during the observation period was a significant predictor of incident diabetes mellitus (in MCDS, the hazard ratio for 1 SD change in BMI was 1.36; 95% CI, 1.16–1.60 and the corresponding hazard ratio for presence of hypertension at baseline in the same model was 1.80; 95% CI, 1.03–3.04). Among the 1656 participants who were normotensive and nondiabetic at baseline, 104 had converted to diabetes mellitus at 7 years, 165 to hypertension, and 24 to both diabetes mellitus and hypertension. In comparison with the nonconverters group, hypertension and diabetes mellitus converters shared most phenotypic traits, namely, higher BMI, waist girth, BP, heart rate and pulse pressure values, serum triglycerides, and plasma insulin concentrations.

Discussion

The first main finding of the present study is that not only does the presence of hypertension predict future diabetes mellitus, in agreement with earlier epidemiological observations,^{2,3,8,9} but also the incidence of hypertension increases significantly in the presence of diabetes mellitus. During the 7 years

of follow-up, BP behaved as a tracking variable as individuals who converted to hypertension (at the first or second follow-up visit) had increased baseline BP values compared with nonconverters, although still within the normal range.¹⁰ Indeed, baseline BP was the strongest predictor of incident hypertension, and its inclusion in the statistical model significantly attenuated the predictive value of diabetes mellitus. More strikingly, hypertension and diabetes mellitus tracked each other consistently. Thus, the general population contains a pool of individuals with the phenotype of the metabolic (or insulin resistance) syndrome from which new hypertension or diabetes mellitus (or both) emerge over time. Importantly, weight gain may be one factor that contributes to the development of both hypertension and diabetes mellitus. Parenthetically, the increased incidence of hypertension in patients with diabetes mellitus may also reflect the closer surveillance of these individuals (ie, a small detection bias). The second, and possibly the most important, finding of this study is that the progression from normotension to hypertension in individuals destined to become hypertensive is marked by a steep increase in BP values averaging 20 mmHg for systolic BP within 3.5 years. In >60% of the converters, the increase in BP values during the period that preceded conversion was greater than the 90th percentile of the changes in systolic BP observed in nonconverters. This biphasic BP pattern is similar to that previously described for blood glucose values in MCDS individuals developing diabetes mellitus.² Finally, both the coprediction of hypertension and diabetes mellitus and this biphasic pattern of progression are not unique to Hispanic individuals because essentially the same findings were observed in the non-Hispanic white population of FOS.

One potential factor responsible for the covariance of diabetes mellitus and hypertension is insulin resistance. Of note, in a subcohort of FOS with a shorter follow-up, an inverse association between incident hypertension (or BP progression) and a proxy of insulin resistance was seen principally in younger people.¹⁰ Here, however, both fasting plasma insulin (a typical proxy for insulin resistance in epidemiological studies) and plasma insulin concentrations 2 hours after glucose ingestion were consistently higher at baseline in both hypertension and diabetes mellitus converters. Furthermore, baseline insulin levels copredicted both hypertension and diabetes mellitus after controlling for age and BMI and also for baseline BP and plasma glucose values. This pattern of results

lends support to the notion that insulin resistance is one common feature of both prediabetes and prehypertension, and one antecedent of progression to the 2 respective disease states.

Apart from the detrimental effects that disturbed insulin signaling exerts on carbohydrate metabolism, the hyperinsulinemia that characterizes insulin resistance states leads to vascular smooth muscle cell proliferation and increased vascular stiffness, which predispose to the development of hypertension. Additionally, insulin may directly or indirectly impair vasodilation and increase oxidative stress and the inflammatory process in the vascular wall. The sum of these effects is the impaired autoregulation of vascular tone, increased vascular resistance, and BP elevation. Finally, the antinatriuretic properties of insulin increase renal retention of sodium and water leading to volume overload, thereby predisposing to the development of hypertension.

Conclusion

In line with these suggestions, in our population, BMI values at baseline and weight gain during the observation period were significant predictors of both incident hypertension and diabetes mellitus, whereas heart rate and pulse pressure, both raw indices of sympathetic nervous system activity, were found to be elevated in patients who converted to hypertension. Finally, obese individuals with or without diabetes mellitus have been shown to have reduced concentrations of circulating natriuretic peptides. Because these molecules favorably affect intravascular volume status and vascular tone, this mechanism may be involved in the pathogenesis of hypertension in patients with diabetes mellitus.

Ethical clearance- taken from institutional committee

Source of funding- Self

Conflict of Interest - Nil

References

1. Ferrannini E, Cushman WC. Diabetes and hypertension: the bad companions. *Lancet*. 2012; 380:601-610. doi: 10.1016/S0140-6736(12)60987-8. [CrossrefMedlineGoogle Scholar](#)
2. Perreault L, Pan Q, Aroda VR, Barrett-Connor E, Dabelea D, Dagogo-Jack S, Hamman RF, Kahn

- SE, Mather KJ, Knowler WC; Diabetes Prevention Program Research Group. Exploring residual risk for diabetes and microvascular disease in the Diabetes Prevention Program Outcomes Study (DPPOS). **Diabet Med.** 2017; 34:1747–1755. doi: 10.1111/dme.13453. [CrossrefMedlineGoogle Scholar](#)
3. Wei GS, Coady SA, Goff DC, Brancati FL, Levy D, Selvin E, Vasan RS, Fox CS. Blood pressure and the risk of developing diabetes in African Americans and whites: ARIC, CARDIA, and the Framingham Heart Study. **Diabetes Care.** 2011; 34:873–879. doi: 10.2337/dc10-1786. [CrossrefMedlineGoogle Scholar](#)
 4. Aroda VR, Knowler WC, Crandall JP, Perreault L, Edelstein SL, Jeffries SL, Molitch ME, Pi-Sunyer X, Darwin C, Heckman-Stoddard BM, Temprosa M, Kahn SE, Nathan DM; Diabetes Prevention Program Research Group. Metformin for diabetes prevention: insights gained from the Diabetes Prevention Program/Diabetes Prevention Program Outcomes Study. **Diabetologia.** 2017; 60:1601–1611. doi: 10.1007/s00125-017-4361-9. [CrossrefMedlineGoogle Scholar](#)
 5. Hansson L, Zanchetti A, Carruthers SG, Dahlöf B, Elmfeldt D, Julius S, Ménard J, Rahn KH, Wedel H, Westerling S. Effects of intensive blood-pressure lowering and low-dose aspirin in patients with hypertension: principal results of the Hypertension Optimal Treatment (HOT) randomised trial. HOT Study Group. **Lancet.** 1998; 351:1755–1762. [CrossrefMedlineGoogle Scholar](#)
 6. Zoungas S, de Galan BE, Ninomiya T, et al.; ADVANCE Collaborative Group. Combined effects of routine blood pressure lowering and intensive glucose control on macrovascular and microvascular outcomes in patients with type 2 diabetes: new results from the ADVANCE trial. **Diabetes Care.** 2009; 32:2068–2074. doi: 10.2337/dc09-0959. [CrossrefMedlineGoogle Scholar](#)
 7. Ferrannini E, Nannipieri M, Williams K, Gonzales C, Haffner SM, Stern MP. Mode of onset of type 2 diabetes from normal or impaired glucose tolerance. **Diabetes.** 2004; 53:160–165. [CrossrefMedlineGoogle Scholar](#)
 8. Stamler J, Stamler R, Rhomberg P, Dyer A, Berkson DM, Reedus W, Wannamaker J. Multivariate analysis of the relationship of six variables to blood pressure: findings from Chicago community surveys, 1965–1971. **J Chronic Dis.** 1975; 28:499–525. [CrossrefMedlineGoogle Scholar](#)
 9. Emdin CA, Anderson SG, Woodward M, Rahimi K. Usual blood pressure and risk of new-onset diabetes: evidence from 4.1 million adults and a meta-analysis of prospective studies. **J Am Coll Cardiol.** 2015; 66:1552–1562. doi: 10.1016/j.jacc.2015.07.059. [CrossrefMedlineGoogle Scholar](#)
 10. Arnlöv J, Pencina MJ, Nam BH, Meigs JB, Fox CS, Levy D, D'Agostino RB, Vasan RS. Relations of insulin sensitivity to longitudinal blood pressure tracking: variations with baseline age, body mass index, and blood pressure. **Circulation.** 2005; 112:1719–1727. doi: 10.1161/CIRCULATIONAHA.105.535039. [LinkGoogle Scholar](#)
 11. McEniery CM, Wilkinson IB, Johansen NB, Witte DR, Singh-Manoux A, Kivimaki M, Tabak AG, Brunner EJ, Shiple MJ. Nondiabetic glucometabolic status and progression of aortic stiffness: the Whitehall II Study. **Diabetes Care.** 2017; 40:599–606. doi: 10.2337/dc16-1773. [CrossrefMedlineGoogle Scholar](#)
 12. Potenza MA, Addabbo F, Montagnani M. Vascular actions of insulin with implications for endothelial dysfunction. **Am J Physiol Endocrinol Metab.** 2009; 297:E568–E577. doi: 10.1152/ajpendo.00297.2009.

A Comparative Study of Personality Profile among Patients with Alcohol use Disorder and Opioid use Disorder

Sulagna Saha¹, S omsubhra Chattopadhyay², Subhendu Datta³,
Ningomban Heramani Singhd⁴

¹Senior Resident, Department of Psychiatry, College of Medicine and Sagore Dutta Hospital, Kolkata, India

²Associate Professor, Department of Psychiatry, College of Medicine and Sagore Dutta Hospital, Kolkata, India

³Assistant Professor, Department of Psychiatry, Medical College and Hospital, Kolkata, India

⁴Professor, Shija Hospitals and Research Institute Pvt. Ltd, Imphal, India

How to cite this article: Sulagna Saha, S omsubhra Chattopadhyay, Subhendu Datta, Prof. Ningomban Heramani Singhd et al. A Comparative Study of Personality Profile among Patients with Alcohol use Disorder and Opioid use Disorder. Volume 13 Issue 3 July-September 2022

Abstract:

Background: In India, two most common substances for which people seek treatment are alcohol and opioids. The conceptualization of personality in substance users shifted from the notion of an “addictive personality” to recognition that certain personality traits specifically impulsivity, sensation-seeking, novelty-seeking, low agreeableness and conscientiousness, high neuroticism are associated with substance use disorders and influence their development, maintenance and course.

Methods: 70 people with alcohol related disorders and 70 patients with opioid related disorders diagnosed by DSM 5 were interviewed with SADQ, LEEDS and NEO FFI3 to assess severity of substance related disorders and personality of those patients.

Results: The study showed that neuroticism (32.25 ± 4.22) was more in severe alcohol dependence patients and so was extraversion (31.50 ± 3.94). agreeableness (38.00 ± 5.57) and conscientiousness (40.33 ± 4.73) was more in the mild physical dependency group. Openness to experience had similar ranges in all the 3 dependency groups. Neuroticism (38.25 ± 3.55) was very high in high dependency OUD group and so was extraversion (34.92 ± 3.65). Openness to experience, agreeableness and conscientiousness had neutral findings in all the three dependence category.

Discussion: Previous studies showed agreeableness and conscientiousness were high in alcohol related disorders and in Opioid dependant patients neuroticism and extraversion were high. Our findings are also in the same way. Hence, there was significant association between the personality profile factors and the type of substance dependence and severity.

Keywords: Alcohol, Personality, Severity, Opioid

Introduction

In India, two most common substances for which people seek treatment are alcohol and opioids. Various biological, social and psychological factors have been implicated in initiation and maintenance of substance use disorders. The conceptualization of personality in substance users shifted from the notion of an “addictive personality” to recognition that certain

personality traits specifically impulsivity, sensation-seeking, novelty-seeking, low agreeableness and conscientiousness, high neuroticism are associated with substance use disorders and influence their development, maintenance and course. It has also been reported that personality traits have an effect on treatment-seeking, compliance and outcome of substance use disorders. Among various psychoactive substances, the association between personality and

alcohol use has been most widely studied. Studies have found that those with poly-substance use were higher on impulsivity, sensation-seeking and novelty-seeking and lower on socialization as compared to those dependent on a single substance.¹

The links between these personality dimensions and substance related behaviour appear to be mediated by different reinforcement processes. Neurotic personality traits (e.g., anxiety and depression proneness) have been shown to be linked to drinking behaviour through a negative reinforcement process, in that individuals prone to negative affect report negative reinforcement motives for alcohol and substance. There is also evidence supporting separate anxiety- and depression-related motives for drinking, with each motive being distinctly related to alcohol consumption and alcohol problems in a young adult.²

Northeast India is a region with serious drug use problems. Nagaland and Manipur are two sparsely populated states in that region, bordering Burma. These states have the highest prevalence of injecting drug users (IDUs) in India. Unsafe practices, especially needle sharing among IDUs, have been the main drivers of the HIV/AIDS epidemic in the region. Although antiretroviral therapy (ART) is now accessible in Northeast India, many drug users also suffer from hepatitis C infection, now their main cause of mortality, as affordable treatment is not available.³

The most unfortunate aspect of the phenomenon of drug addiction has been the alarming rise of addiction among the youths of this region and consequent increase in the drug related crimes. However, these studies have suggested that most of the young drug users started taking drugs between the age of 14 to 18 years and the largest member being found to be at the age of 16 and 17 years. These surveys further suggest that about 35 to 40 percent of the teenagers agreed that they tried gateway drugs like alcohol and tobacco.⁴

Therefore, there arose a need for studying the personality profiles of substance users to differentiate them from general population and formulate different treatment plans to curb the menace of drugs and explosion of drug related violence/ crimes.

Material and Methods

This is a cross-sectional and non-interventional study. Those seeking treatment for alcohol dependence

and opioid dependence in the Psychiatry out-patient department of Regional Institute of Medical Sciences (RIMS), Imphal, Manipur during September 2019 to August 2020 were included in this study. Patients were recruited through the convenience sampling and were assessed single time. The study protocol was approved by the Ethics Review Board of the Institute. Written consent was taken and those fulfilling the diagnosis of alcohol use disorder and opioid use disorder as per DSM-5 criteria were further assessed. The Inclusion criteria were patients who were diagnosed as alcohol use disorder and opioid use disorder according to DSM-5 criteria in age range of 18yrs to 65yrs. The Exclusion criteria were any patients having major psychiatric/physical disability such as psychosis or organic brain disorders and were dependent on other substances like cannabis, amphetamine type substances (ATS), etc. (except for tobacco). Considering the prevalence of alcohol dependent population in adults (> 18 yrs.) to be 17.1% the sample size was taken as 70 for alcohol dependent population and similarly 70 patients were taken for opioid dependent population. Socio-demographic details like age, sex, marital status, educational level, occupation, income, family type, religion, place of residence were recorded using a semi-structured proforma. Detailed history of substance use was collected from the patient/patient party attending the Department of Psychiatry to establish Alcohol Use Disorder and opioid use disorder as per DSM-5 criteria. SADQ (Severity of alcohol dependence questionnaire)⁶ a 20-item questionnaire designed to measure the degree to which help-seeking problem drinkers were experiencing the syndrome of alcohol dependence, was applied to assess the severity of dependence. Leeds dependence questionnaire (LDQ)⁷ was used for opioid users. The instrument is sensitive to mild and moderate levels of dependence and so can be helpful in determining treatment goals. In clinical settings, the LDQ can serve as a diagnostic measure of the severity of dependence, an important measure in determining treatment goals, and as a treatment outcome measure that works with abstinent patients. The NEO Five-Factor Inventory-3 (NEO-FFI-3)⁸ a 60-item version of the NEO-PI-3 comprising of 60 items, 12 belonging to each of the following five subscales: Neuroticism, Extroversion, Openness to experience, Agreeableness, and Conscientiousness answered on a five-point Likert scale ranging from strongly disagree (0) to strongly agree (4), was applied to the patients to assess their personality profile.

Statistical analysis

Data was analyzed using SPSS version 23 for Windows. Descriptive statistics like mean, standard deviation, percentage and proportion has been used. Chi-square test/Fisher's exact test, ANOVA test has also been used to test the level of significance. Results on categorical measurements like gender, residence, marital status, employment status, family type, duration of use, frequency of relapse, family history of substance abuse were presented in frequency and percentages. Chi-square test has been used to find the association between study parameters like substance abuse and residence, marital status, employment status, duration of substance abuse, family history of substance abuse, while Fisher's Exact test has been used to find the association between study parameters like substance abuse and age distribution, gender, socioeconomic status, family type, age of initiation, frequency of relapse etc. ANOVA test has been applied to study the association between study parameters like substance abuse with personality profile factors, personality profile factors with severity of substance abuse. P-value of <0.05 is taken as significant.

Results

In this study a total of 140 patients presenting to the Department of Psychiatry, RIMS, Imphal with history of substance abuse were divided into two groups, each containing 70 patients.

The maximum number of patients with alcohol use disorder belonged to the age range of 31-40 yrs. The majority of patients with opioid use disorder were in the age group of 31-40 yrs. Majority of the patients in both AUD and OUD group were males (98.6% each) with only 1 female in AUD and 1 female in OUD group. Out of 70 patients in AUD group 37 were from rural residence. In the OUD group majority of the patients (78.6%) were from urban residence. 88.6% of patients in AUD group were married with rest 8.6% unmarried and 2.9% divorced. 54.3% patients in OUD group were married, 42.9% were unmarried and 2.9% were divorced. 66 patients were employed in AUD group out of 70, whereas 59 patients were employed in OUD patients out of 70. 78.6% in AUD group belonged to middle class with 20% belonging to lower middle class and 1.4% belonging to upper middle class. In the OUD group 78.6% belonged to middle class, 17.1% belonged to upper middle class and 4.3% belonged to lower middle class. 90%

of patients in AUD belonged to nuclear family and 98.6% of patients in OUD belonged to nuclear family.

Substance Use Details

Variable		Alcohol use disorder n (%)	Opioid use disorder n (%)	P value
Age of Initiation in years	<20	14(20.0)	49(70.0)	0.000
	21-30	42(60.0)	18(25.7)	
	>31	14(20)	3(4.3)	
Duration of Use (years)	<10	28(40.0)	41(58.6)	0.061
	11-20	31(44.3)	24(34.3)	
	>21	11(15.7)	5(7.1)	
Frequency of Relapse	<4	66(94.3)	53(75.7)	0.004
	≥4	4(5.7)	17(24.3)	
Family history of substance abuse	Yes	56(80)	53(75.7)	0.541
	No	14(20)	17(24.3)	

60% patients had initiated drinking alcohol in 21-30 years of age. In OUD group 70% had initiated use of opioid before 20yrs of age. Majority of the AUD patients (44.3%) had duration of use in 11-20 years range. 58.6% patients in OUD had used the substance for duration less than 10 yrs. 94.3% of AUD patients and 75.7% of OUD patients had relapsed less than 4 times and 5.7% of AUD patients and 24.3% OF OUD patients had relapsed 4 or more times. 80% of AUD patients had family history of substance abuse and 75.7% of OUD patients had family history of substance abuse.

Comparison of NEO-FFI between 2 groups

variables	Alcohol use disorder (Mean ±SD)	Opioid use disorder (Mean ±SD)	P value
Neuroticism	24.40±5.17	34.21±3.85	0.001
Extraversion	26.74±4.18	30.99±3.98	0.001
Openness to experience	28.97±4.20	28.30±3.73	0.319
Agreeableness	30.23±4.22	25.23±3.6	0.001
Conscientiousness	32.51±4.94	21.61±3.09	0.001

Conscientiousness (32.51±4.94) and agreeableness (30.23±4.22) were high in AUD group. Neuroticism (34.21±3.85) and extraversion (30.99±3.98) were high in patients with OUD. Hence, there exists significant relationship between neuroticism, extraversion, agreeableness, conscientiousness with the type of substance abuse comparison of study variables in SADQ SEVERITY of AUD patients

variables	SADQ SEVERITY			P value
	Mild physical dependency (Mean ±SD)	Moderate dependency (Mean ±SD)	Severe alcohol dependence (Mean ±SD)	
Neuroticism	20.00±2.00	22.93±3.65	32.25±4.22	0.001
Extraversion	27.33±5.13	25.67±3.45	31.50±3.94	0.001
Openness to experience	35.00±3.46	28.73±3.91	28.58±4.80	0.037
Agreeableness	38.00±5.57	30.76±3.52	25.83±2.52	0.001
Conscientiousness	40.33±4.73	33.53±3.77	25.92±3.15	0.001

Patient with mild physical dependency had high conscientiousness (40.33±4.73) followed by agreeableness (38.00±5.57) and openness to experience (35.00±3.46). Patients with severe alcohol dependence had high neuroticism (32.25±4.22) and high extraversion (31.50±3.94).

Hence, there exists significant relationship between neuroticism, extraversion, agreeableness, conscientiousness with the degree of severity of alcohol consumption among the AUD group.

A comparison of study variables in LEEDS SEVERITY of OUD patients

variables	LEEDS SEVERITY			P value
	Low dependence (Mean ±SD)	Medium dependence (Mean ±SD)	High dependence (Mean ±SD)	
Neuroticism	32.67±1.15	33.42±3.45	38.25±3.55	0.001
Extraversion	31.00±2.65	30.13±3.62	34.92±3.65	0.001
Openness to experience	28.67±4.04	27.82±3.24	30.42±5.14	0.089
Agreeableness	26.33±2.52	24.98±3.54	26.08±4.17	0.551
Conscientiousness	23.33±2.08	21.98±3.11	19.5±2.32	0.023

Patients with low dependence had high neuroticism (32.67±1.15) and extraversion (31.00±2.65). Patients

with high dependence had very low conscientiousness (19.5±2.32) and very high neuroticism (38.25±3.55). Hence, there exists significant relationship between neuroticism, extraversion, agreeableness, conscientiousness with the degree of severity of opioid consumption among the patients of OUD group.

Discussion

The maximum number of patients abusing alcohol were in the age group of 31-40 years (47.1%) followed by 41-50 years (34.3%). The people who were dependent on alcohol under 30 years were 8.6% and 51 years or older were 10%. The maximum number of patients abusing opioids were in the age group of under 30 years (57.1%) followed by 30% in age group of 31-40 years. Number of the patients abusing opioids were very less (1.4%) in the group 51 years and older. In an Indian study conducted by Gupta SK et al1 it was found that majority of the AUD patients were in the age group of 25-45 years (45%) and majority of the patients in the OUD group were in the age group of 20-30 years (50%). This was also supported by other studies done by Bottlender M et al9 and Martin ED et al10.

Male preponderance was seen in this study in both the groups of AUD (98.6%) and OUD (98.6%). This was also consistent with the finding in the study Nevid JS et al11 and Zilberman N et al12 where majority were male patients. In the study done by McCormick RA et al13 males comprised over 97% of the admissions.

Out of 70 patients in the AUD group 37 (52.9%) belonged to rural background and in the OUD group out of 70 patients 15 (21.4%) were belonging to rural background. This was supported by a study done by Gupta SK1 which found that the AUD patients belonged mainly to rural background (50%) and OUD to urban background (76.3%).

In the AUD group 88.6% of the patients were married, 8.6% were unmarries and 2.9% divorced. Around 42.9% were unmarried in OUD group, 54.3% were married and 2.9% divorced. Similar results were shown in study done by Gupta SK6 with 82% patients married in AUD group and only 50 % married in OUD group. Western studies by Bottlender M et al9, Martin ED et al10 and Zilberman N et al12 showed similar findings. 32.8% were married or separated, 29.2% were single, and 38% were divorced or widowed in the study done by McCormick RA et al13.

Majority of the patients in AUD group and OUD group were employed. Similar supportive finding were found in studies done by Zilberman N et al¹², Nevid JS et al¹¹, Martin ED et al¹⁰.

The results showed that majority of AUD patients (78.6%) were from middle class, followed by lower middle class (20%) and upper middle class (1.4%). Majority of OUD patients (78.6%) were from middle class, followed by 17.1% from upper middle class, 4.3% from lower middle class. In the study done by Gupta SK et al¹ both the AUD (75%) and OUD (78%) groups were from middle class background.

Around 90% of AUD patients and 98.6% of OUD patients belonged to nuclear family. This was supported by Gupta SK et al¹, Martin ED et al¹⁰ and Zilberman N et al¹².

Majority of the AUD (60%) had age of initiation of alcohol use in 21-30 years age group. In the OUD group 70% had initiated abuse of opioids before 20 years of age. Study done by Bottlender M et al⁹ also supports alcohol initiation mean age of 29 years. In study of Gupta SK et al¹ age of initiation for alcohol use was 18-23 yrs and age of initiation of opioids was 15-20 yrs hence supporting the findings of this study.

The study shows 44.3% of AUD patients had duration of alcohol abuse between 11-20 years duration, whereas OUD patients had 58.6% patients with duration of use less than 10 years. Similarities were found in studies conducted by Terraceiano A et al¹⁴ The mean duration of alcohol use was 15 years as per Bottlender M et al⁹

Around 94.3% had relapsed less than 4 times in the AUD patient group and 5.7% had relapsed 4 or more times. In the OUD group 75.7% had relapsed less than 4 times. Number of relapses were more in the OUD group (24.3%). Similar finding of more relapses in the OUD group compared to the AUD groups were found in other studies done by Terraceiano A et al¹⁴ which shows that 43% had relapsed more than 6 times in a year.

The study shows that AUD patient had positive family history of substance abuse in 80% cases whereas the OUD group had positive family history of substance abuse in 75.7% cases. These finding were supported by Raketic D et al¹⁵ who found positive

family history in 82% of AUD patients and 74% of OUD patients. Similarly other studies supporting were done by McCormick RA et al¹³ and Martin ED et al¹⁰.

In the AUD group agreeableness (30.23±4.22) and conscientiousness (35.31±4.94) were much higher. Bozkurt M et al¹⁶ showed that Severity of impulsivity and dimensions of impulsivity were higher in alcohol-dependent inpatients than in healthy controls. There was negative correlation between impulsivity with reward dependence, persistence, self-directedness and cooperativeness, but impulsivity was positively correlated with novelty seeking, harm avoidance, depression and anxiety. Impulsivity was predicted by high depression and temperament dimensions (high novelty seeking, harm avoidance and low reward dependence). Combinations of personality dimensions that predict dimensions of impulsivity differed. The meta-analysis by Malouff JM et al¹⁷ showed alcohol involvement was associated with low conscientiousness, low agreeableness, and high neuroticism. Without adjustment for non-perfect reliability of measures, conscientiousness, agreeableness, and neuroticism explained 5%, 3%, and 2% of the variance in alcohol use, respectively.

The study showed than neuroticism (32.25±4.22) was more in severe alcohol dependence patients and so was extraversion (31.50±3.94). Agreeableness (38.00±5.57) and conscientiousness (40.33±4.73) was more in the mild physical dependency group. In a study conducted by Luchetti M et al¹⁸ Openness to experience had similar ranges in all the 3 dependency groups. higher conscientiousness and openness were associated with reduced risk of heavy drinking. Higher conscientiousness and agreeableness, and lower extraversion and openness were associated with lower probability of alcohol consumption. Impulsiveness was associated with increased risk of heavy alcohol consumption, whereas conscientiousness, the openness, and the assertiveness were associated with reduced the probability of heavy drinking. Self-discipline and deliberation were associated with increased incidence of abstinence, along with lower scores on impulsiveness, excitement seeking, positive emotions, and most facets of openness (except for ideas and values).

The study shows that neuroticism (34.21±3.85) and extraversion (30.99±3.98) were much high in patients with OUD. Openness to experience had neutral value. Neuroticism (38.25±3.55) was very high in high dependency OUD group and so was extraversion (34.92±3.65). Openness to experience, agreeableness and conscientiousness had neutral findings in all the three dependence category. In the study conducted by Gupta SK et al OUD group scored significantly higher on anger hostility, depression, self-consciousness, impulsivity (neuroticism) and excitement seeking (extraversion); and scored lower on fantasy, ideas (openness to experience), trust, straightforwardness, altruism (agreeableness) and on all facets of conscientiousness, namely, competence, order, dutifulness, achievement striving, self-disciplining and deliberation .

Limitations

The data in the study was collected through self-report questionnaires. Therefore, there is a high chance of distortion. Some participants might be reluctant to disclose their illicit drug use. Comorbid psychiatric disorders were excluded and might have influenced the psychometric findings.

Conflict of Interest: Nil

Source of funding- Self

References

- Gupta SK, Ambekar A, Dhawan A, Mehta M. Personality profile of alcohol and injecting opioid users: A comparative study from India. *Asian J Psychiatr* 2017 Feb 1;25(4):142-6.
- Woicik PA, Stewart SH, Pihl RO, Conrod PJ. The substance use risk profile scale: A scale measuring traits linked to reinforcement-specific substance use profiles. *Addict Behav* 2009 Dec 1;34(12):1042-55.
- Chakrapani V, Newman PA, Shunmugam M, Dubrow R. Social-structural contexts of needle and syringe sharing behaviours of HIV-positive injecting drug users in Manipur, India: a mixed methods investigation. *Harm Reduct J* 2011 Dec; 8(1):9.
- Ganapathi L, McFall AM, Srikrishnan AK, Kumar MS, Anand S, Lucas GM, et al. Young people who inject drugs in India have high HIV incidence and behavioural risk: a cross-sectional study. *J Int AIDS Soc* 2019 May ;22(5):e25287.
- Hasin DS, O'Brien CP, Auriacombe M, Borges G, Bucholz K, Budney A, et al. DSM-5 criteria for substance use disorders: recommendations and rationale. *Am J Psychiatry* 2013 Aug;170(8):834-51.
- Stockwell T, Murphy D, Hodgson R. The severity of alcohol dependence questionnaire: its use, reliability and validity. *Br J Addict* 1983 Jun;78(2):145-55.
- Raistrick D, Bradshaw J, Tober G, Weiner J, Allison J, Healey C. Development of the Leeds Dependence Questionnaire (LDQ): a questionnaire to measure alcohol and opiate dependence in the context of a treatment evaluation package. *Addiction* 1994 May;89(5):563-72.
- McCrae RR, Costa Jr PT. A contemplated revision of the NEO Five-Factor Inventory. *Pers Individ Dif* 2004 Feb 1;36(3):587-96.
- Bottlender M, Soyka M. Impact of different personality dimensions (NEO Five-Factor Inventory) on the outcome of alcohol-dependent patients 6 and 12 months after treatment. *Psychiatry research* 2005 Jul 15;136(1):61-7.
- Martin ED, Sher KJ. Family history of alcoholism, alcohol use disorders and the five-factor model of personality. *J Stud Alcohol* 1994 Jan ;55(1):81-90.
- Nevid JS, Gordon AJ, Barris A, Sperber JE, Haggerty G. Personality profiles of patients with alcohol use disorder and opioid use disorder in an inpatient treatment setting. *J Subst Abuse Treat* 2019 Feb 1;97:91-6.
- Zilberman N, Yadid G, Efrati Y, Neumark Y, Rassovsky Y. Personality profiles of substance and behavioral addictions. *Addict Behav* 2018 Jul 1;82:174-81.
- McCormick RA, Dowd ET, Quirk S, Zegarra JH. The relationship of NEO-PI performance to coping styles, patterns of use, and triggers for use among substance abusers. *Addict Behav* 1998 Jul 1;23(4):497-507.
- Terracciano A, Löckenhoff CE, Crum RM, Bienvu OJ, Costa PT. Five-Factor Model personality profiles of drug users. *BMC psychiatry* 2008 Dec 1;8(1):22-37.
- Raketic D, V Barisic J, M Svetozarevic S, Gazibara T, Kiscic Tepavcevic D, D Milovanovic S. Five-Factor Model Personality Profiles: The Differences between

-
- Alcohol and Opiate Addiction among Females. *Psychiatr Danub* 2017 Mar 20;29(1):74-80.
16. Bozkurt M, Evren C, Can Y, Evren B, Cetingok S, Yilmaz A. Relationships of personality dimensions with impulsivity in alcohol-dependent inpatient men. *Nord J Psychiatry* 2014 Jul 1;68(5):316-22.
17. Malouff JM, Thorsteinsson EB, Rooke SE, Schutte NS. Alcohol involvement and the five-factor model of personality: A meta-analysis. *J Drug Educ* 2007 Sep;37(3):277-94.
18. Luchetti M, Sutin AR, Delitala A, Stephan Y, Fiorillo E, Marongiu M, et al. Personality traits and facets linked with self-reported alcohol consumption and biomarkers of liver health. *Addict Behav* 2018 Jul 1;82:135-41.

Knowledge Towards the Impact of Indoor Environment and Lifestyle on Dry Eye

Eman Abdollah Aboulqasim Gaber¹, Mohd Zaki Awg Isa², Asma Ali Budalal³

¹Master Student, ²Doctor at International Medical School at Management and Science University, 40100 Shah Alam, Selangor, Malaysia,

³Research Associate at University of Benghazi, Libya Department of Scientific Affairs

How to cite this article: Eman Abdollah Aboulqasim Gaber, Mohd Zaki Awg Isa, Asma Ali Budalal et al. Knowledge Towards the Impact of Indoor Environment and Lifestyle on Dry Eye. Volume 13 Issue 3 July-September 2022

Abstract

This research aims to measure the level of Knowledge (symptoms, complications, prevention, potential indoor environmental risk factors, the 20-20-20 rule) of dry eye syndrome DES among adults in Malaysia. Data were gathered from a random sample of 315 Malaysian adults in Klang Valley. The study participants were 18 to 60 years [mean (\pm SD) age = 34 \pm 8]. Females represented a slightly higher percentage of the sample (55.66%). Of the 318 participants, most respondents (65.5%, n = 208) had a bad knowledge about dry eye syndrome. Only 86 adults had good Knowledge about the impact of the indoor environment and lifestyle on dry eye syndrome during the COVID-19 pandemic. Findings revealed that, MAs' knowledge significantly differ by participant's qualification ($\chi^2 = 27.6$, $p=0.002$), age ($\chi^2 = 15.4$, $p=0.018$). Education level and age were associated with Knowledge ($p < 0.05$). Results revealed significant determinants of good Knowledge about the DES in the age group 29-39 years with (OR: 1.647, 95%CI: 1.097-2.471, $P = 0.016$). Adults who are living in Kuala Lumpur, Gombak. And Klang & Petaling have similar odds of good Knowledge compared to other living areas. Finally, the health sector was a potential predictor of good Knowledge (OR: 4.246, 95%CI: 1.781-10.124, $P=0.001$). Nevertheless, none of the other demographical variables had a potential predictor of good Knowledge about dry eye syndrome. Therefore, healthcare professionals should raise public awareness regarding dry eye illness problems, especially on potential indoor environmental risk factors.

Keywords: Knowledge, Indoor Environment and Lifestyle, Dry Eye Syndrome, Malaysian Adults

Introduction

Dry eye disease DED is a developing public health concern that affects people's quality of life and their ability to see clearly and have a substantial socioeconomic impact¹. A variety of inflammatory causes of DE is an ocular surface disease and a common ocular surface disorder². It can be described by the tear film's breakdown of equilibrium. Which may lead by visual tear film instability, hyperosmolarity symptoms of the lacrimal gland, possible damage to the ocular surface inflammation, and disorders of

the neurosensory system³. Thus, individuals with DE may suffer visual impairment, pain, redness, dehydration, and other diseases related to every eye cause a feeling of burning and scratching on the eye's surface and the sense that there is something inside³.

The tear film is an essential part of our vision. It is made up of water, lipids, and proteins, protects our eyes from hazardous substances while also keeping them lubricated and pleasant. Unfortunately, DE is caused by an issue with our tear film, which means our eyes aren't getting enough lubricant. As a result,

Corresponding Author: Asma Ali Budalal,

Research Associate at University of Benghazi, Libya Department of Scientific Affairs

Email: asmaaiium76@gmail.com

(M): 0176846981

we are plagued by a variety of potentially unpleasant sensations. These include stiff, sore eyes, eye fatigue, sensitivity to light, and blurred vision.⁴ Many people may experience occasional DES throughout life, but chronic dryness can eventually lead to eye pain and blurred vision. Therefore, evaporative DE are concerning for many eye care professionals. Still, it impacts the evaporative form of the DE starting to show up in younger individuals. The environmental factors have been linked to the onset and severity of the evaporative DE⁵.

Vision problems and eye disease can come from tools, environment, chemicals, heavy light, radiation or physical setting of the workstations that may cause vision problems or eye injuries⁶. Environmental influence is one of the attributing factors for health status⁷. The eye is directly exposed to the outside. It, therefore, is endangered by a multitude of factors occurring in an individual's surroundings⁷. For instance, variations in temperature, airflow velocity and relative humidity, and passive cigarette smoking have demonstrated to alter the tear film homeostasis (by increasing tear film evaporation) and exacerbate DED symptoms.

In addition, chronic exposure to traffic derived air pollution can contribute to DED characterised by symptoms and signs of tear film instability⁸. Moreover, regular interaction with electronic display technology and lack of outdoor activities might worsen the development of DES.

Nowadays huge parts of the global population are spending a lot of time at their residence due to the current unidentified (COVID-19) pandemic⁷. Most adult population with DE assumes that they have been exposed to an indoor atmosphere more than before. Even though the consequences of these impacts of the interior environment on disease processes and symptoms have been widely investigated for some pulmonary illnesses, such as asthma and chronic obstructive pulmonary disease, less is known about the effects of the indoor environment on dry eyes^{8,9}. The term environment is broadly used to refer to any external and internal bodily states habitually experienced by an individual, such as demographic factors (i.e., age, region), lifestyle factors (i.e., contact lens wear), environmental factors (i.e. humidity) and physiological or genetic factors (i.e. health conditions).

The stability of the eye tear film are affected by environmental and occupational risk factors^{10,11}.

These environments are usually called "buildings' microclimate" and share low humidity and the daffiness of the air. Also, the amount of pollution and the effect of free radicals can add to the lipids of the eye's surface.

While examining the impact of the indoor environment on ocular symptomatology, it's important to examine not only the components that are common to both indoor and outdoor environments (humidity, temperature, ventilation, and pollutants) but also lighting and the use of visual display units (e.g., tablets, computers and smartphones, increasing exposure to digital devices¹². This can worsen the symptoms of DES, mostly caused by the interior environment and interactions between living and lifestyle habits. Therefore,¹² have investigated the online survey used to determine lifestyle habits, awareness, and symptoms. The study concluded that lifestyle and habits significantly impact DE Indoor Environment (Living and Lifestyle) symptoms near work. Furthermore, restricted outdoor activities have been linked to the development and progression of DES, which could be exacerbated during and after the COVID-19 pandemic outbreak because of dramatic changes in lifestyle and habits¹³. Working in an indoor environment, on the other hand, revealed slightly more indicators of eye dryness¹⁴.

Most of the previous research conducted at different locations addressed and considered the computer vision syndrome prevalence, Knowledge and associated factors¹⁵. However, it's noted that there was a lack of studies that consider the effects of indoor living environment and lifestyle on DES symptoms in adults. Furthermore, the majority of what is known about the DE is focused on the ambient (or outside) environment. Unfortunately, there is a scarcity of information on the impact of IE on DE symptoms¹⁶.

It's worthy of mentioning that there is an imperative need to implement strategies to increase further awareness of ocular diseases to reduce the risk of visual complications¹⁰. Thus, public awareness should be raised of risk factors related to DES. Therefore, this study attempts to assess the basic Knowledge toward the impact of IE on dry eye syndrome among adults' in Klang Valley Malaysia. Thus, this paper considered as a prototype to identify the Knowledge towards the impact of indoor environment in terms of living and lifestyle factors on DES among adults' in Klang Valley Malaysia which recognised as research priori.

Materials and Methods

Healthy Malaysian adults would answer an online questionnaire delivered by social media to measure the Knowledge among adults in Klang Valley areas aged from 18 to 60 years. Z Score method has been utilised to calculate the sample size was 385 participants. However, a total of 318 respondents have been considered in the statistical analysis after data cleaning and filtering the uncompleted duplicates, unusable responses. A self-designed questionnaire was developed in English and translated to Bahasa Melayu language used to assess the Knowledge among adults in Klang Valley. Socio-demographic data e.g., age, gender, ethnicity, education, employment status, residential area, living area, Occupation and nature of the job was reported. Public Knowledge about DES was assessed. Questions about familiarity with the diseases, familiarity with their risk factors, symptoms, the prevention, and the causes. participants were asked about potential indoor environmental risk factors (lifestyle factors and (living environment) were asked and also assessed. Chi-square test was used to compare the variables at a 5.0% level of significance. The binary logistic regression analysis has been utilized to evaluate the substantial determinants of good Knowledge about DES amid adults' in Klang Valley.

Results

In the population of interest, a total of 318 mas were interviewed during the survey, with females reaching 177 (55.66%), while males 141 (44.34%). The age group from 29 to 39 years was the most representative group and mean age (34 years \pm sd 8). 64.78% of the population is from urban areas, 34.26 % Malaysian, 7.23% Chinese, 5.66 % Indian; 52.83 from other nations. Living area in Kuala Lumpur has the highest percentage of 56.29%, the next both Hulu Langat and "Klang & Petaling" have the same percentage of around 13%, then living area in Gombak is with 21% and the lowest percentage is 1.89% is for others living areas. Master degrees" has the highest percentage of 39.62%, the next is the qualification "bachelor degrees" with a percentage of 25.79%, while only 1.26% had an elementary school. The employment of "private sector" has the highest percentage of 43.71%, the next employment of "government sector" is with a percentage of 31.76%. Unemployed, retiree and others are negligible. "Education sector" has the highest percentage of 26.10%, the next is "engineering"

with a percentage of 18.87%. The occupations with "health sector" and "economy and business" have the same the percentage around 9%. Finally, the rest of occupations are negligible. The majority of the sample 74.53% have indoors nature of job while 25.47% have outdoors nature jobs. Additionally, the majority spend inside the building >8 hours/day.

Knowledge

The knowledge-related portion had 9 questions about dry eye syndrome and were answered on a yes/no/I don't know basis portions adapted from previous research 4 One point was assigned to the correct option answer, and 0 points were assigned to the wrong answer where the knowledge score was calculated accordingly¹⁷. For more accurate classification, Bloom's cut-off was utilised to classify knowledge scores¹⁷ for the knowledge and practice scores. Scores of $\geq 80\%$ were considered good, and scores between 60–79% were considered fair. In comparison, scores of $< 60\%$ were assigned as poor¹⁷. The maximum total score varied from 0 to 9, with an average knowledge score of 7.2 (SD = 0.96, range 0–9) among the participants. This implies that the participants, on average, achieved 80% of the questions correctly ($(7.2/9) \times 100$). A cut-off level score of ≤ 7.2 indicated low Knowledge; meanwhile, a score of ≥ 7.3 (more than 80% of the total score) portrayed good Knowledge. About (34.5%, n=110) of participants obtained scores above 7.2, considered to have a good knowledge level towards the impact of indoor environment and lifestyle on dry eye.

Chi-Square Tests for Malaysian adults' Knowledge, and Demographics data

Chi-Square has been utilised to determine a significant relationship between the MAs' Knowledge, and demographics categorical variables. Findings revealed that, MAs' knowledge significantly differ by participant's qualification ($\chi^2 = 27.6$, $p=0.002$), age ($\chi^2 = 15.4$, $p=0.018$). Additionally, education level and age were associated with Knowledge ($p < 0.05$), but the participant's employments did not influence Knowledge score.

Factors associated with an acceptable level of Knowledge about DES.

The binary logistic regression analysis has been utilized to evaluate the substantial determinants of good Knowledge about Dry Eye Syndrome amid adults' populations in Klang Valley. After categorizing

Knowledge based on knowledge score, the total score ranges from 0-9, and ≤ 7 indicated poor Knowledge about DES. In contrast, a score of ≥ 7.2 . there were only (34.5%, n=110) respondents who demonstrated good Knowledge regarding DES symptoms. Binary logistic analysis was employed to identify the predictors of the extent of Knowledge among adults' populations in Klang Valley. Results revealed significant determinants of good Knowledge about the DES in the age group 29-39 years with (OR: 1.647, 95%CI: 1.097-2.471, P=0.016). Interestingly, participants with High School qualifications have better Knowledge about DES than other qualifications with (OR: 0.171, 95%CI: 0.031-0.928, P=0.041). Adults who are living in Kuala Lumpur, Gombak., and Klang & Petaling have similar odds of good Knowledge compared to other living areas. Finally, Good Knowledge was found to be a potential predictor of the health sector (OR: 4.246,95%CI: 1.781-10.124, P=0.001). Nevertheless, none of the other demographical variables had good Knowledge about DES.

Discussion

In general, the level of Knowledge concerning dry eye symptoms was low. Our result completely agreed with research presented in ¹⁹ which evaluated Knowledge of DE among Chinese Physicians in Singapore. More than a third of participants thought that think DES has widely spread in Malaysia as a common condition and should be treated, but is not severe enough to affect daily activities or not significant enough to be a socioeconomic burden., it's clear that most of the participants have various indoor environmental conditions but they don't know which optimal to prevent eye dryness and its side effects^{9,13}. Additionally, our results were consistent with ^{10,18}, they found that participants had observed a poor knowledge and attitude toward DES among the Saudi Arabian population, including that most of the participants did not have a routine ophthalmologist visit and tended to use electronic devices for a long time without a break knowing about their risk.

Conclusion

The level of Knowledge regarding dry eye syndrome symptoms among adults' populations in Klang Valley is very poor. DED is still not completely understood especially related to lifestyle habits. it's clear that most of the participants have various indoor

environmental conditions but they don't know which optimal to prevent eye dryness and its side effects. A patient's quality of life is significantly adversely affected by dry eye disease, which is widely prevalent and is increasing in incidence. Lots of attention has been paid to the risk factor of the indoor environment.

Ethical clearance- was obtained from the International medical school at Management and Science University.

Source of Funding

Self

Conflict of Interest

Nil

Reference

1. Aragona P, Giannaccare G, Mencucci R, Rubino P, Cantera E, Rolando M. Modern approach to the treatment of dry eye, a complex multifactorial disease: a PICASSO board review. *British Journal of Ophthalmology*. 2021 Apr 1;105(4):446-53.
2. Midhuna, K., Divya, N., Veeramani, V.P.A. And Bhaskaran, B., 2020. Assessment Of The Incidence And Prevalence Of Dry Eyes In Diabetic Individuals And It's Effect On Visual Acuity. *International Journal Of Current Pharmaceutical Research*, Pp.97-99.
3. Yuwanda V, Sitepu BR. Evaluating Dry Eye Symptoms After Phacoemulsification Using Ocular Surface Disease Index, Dry Eye Questionnaire-5, and Standardized Patient Evaluation of Eye Dryness. *Age (years old)*.;63:45-87.
4. Galor A, Kumar N, Feuer W, Lee DJ. Environmental factors affect the risk of dry eye syndrome in a United States veteran population. *Ophthalmology*. 2014 Apr 1;121(4):972-3.
5. Chlasta-Twardzik E, Górecka-Nitoń A, Nowińska A, Wylęgała E. The influence of work environment factors on the ocular surface in a one-year follow-up prospective clinical study. *Diagnostics*. 2021 Mar;11(3):392.
6. Isa MZ, Yaacob ZF, Sari MF. Vision problems among manufacturing workers in Selangor, Malaysia. *Journal of Optometry, Eye and Health Research*. 2019;1(1).
7. Chen A, Rosli SA, Hovis JK. A survey on daily activity inclination and health complaints among urban youth in Malaysia. *Journal of environmental and public health*. 2020 Dec 9;2020.
8. Stapleton F, Alves M, Bunya VY, Jalbert I, Lekhanont

- K, Malet F, Na KS, Schaumberg D, Uchino M, Vehof J, Viso E. The ocular surface. 2017 Jul 1;15(3):334-65.
9. Saldanha IJ. Learning about and addressing the indoor environment and dry eye: the time is ripe. *JAMA ophthalmology*. 2020 Aug 1;138(8):874-5.
 10. Alshammari, F., Shaikh, S., Hussain, A., Alafnan, A., Almuzaini, I. and Alshammari, B., 2021, June. Public Awareness of Common Eye Diseases and the Role of Pharmacists in Raising This Awareness in Saudi Arabia: In *Healthcare* (Vol. 9, No. 6, p. 692). Multidisciplinary Digital Publishing Institute.
 11. Wolkoff P. Dry eye symptoms in offices and deteriorated work performance—A perspective. *Building and Environment*. 2020 Apr 1;172:106704.
 12. Ganne P, Najeeb S, Chaitanya G, Sharma A, Krishnappa NC. Digital eye strain epidemic amid COVID-19 pandemic—a cross-sectional survey. *Ophthalmic epidemiology*. 2021 Jul 4;28(4):285-92.
 13. Huang A, Janecki J, Galor A, Rock S, Menendez D, Jeng BH, Kumar N. Association of the indoor environment with dry eye metrics. *JAMA ophthalmology*. 2020 Aug 1;138(8):867-74.
 14. Fagehi R, Ghazal H, Alrabiah S, Abusharha A, Alsaqr A, Masmali A. Ocular dryness assessment in Saudi employees working indoors and outdoors. *Clinical Optometry*. 2018;10:51.
 15. Mondal A, Shirin A. Assessment of Knowledge and Awareness About Computer Vision Syndrome Among IT Professionals and College Students. *RGUHS Journal of Allied Health Sciences*. 2021;1(2).
 16. Idarraga MA, Guerrero JS, Mosle Galor A, Kumar N. Relationships between short-term exposure to an indoor environment and dry eye (DE) symptoms. *Journal of clinical medicine*. 2020 May;9(5):1316.
 17. Bloom BS. Taxonomy of educational objectives: The classification of educational goals. Cognitive domain. 1956.
 18. Kawashima, M., Uchino, M., Sano, K. and Tsubota, K., 2013. A field test of Web-based screening for dry eye disease to enhance awareness of eye problems among general Internet users: a latent strategy to promote health. *Journal of medical Internet research*, 15(9), p.e2198.
 19. Lan W, Lee SY, Lee MX, Tong L. Knowledge, attitude, and practice of dry eye treatment by institutional Chinese physicians in Singapore. *The Scientific World Journal*. 2012 Jan 1;2012.

Treatise on the Distribution of the use of a Follow-Up Midwife by Academically Educated Mothers Compared to Non-Academically Educated Mothers

Friederike Harrich¹

¹Researcher Institut für Geschichte, Theorie und Ethik der Medizin, Neubau 17.11, Raum 01.32,
(Hauspostfach 1114), Moorenstr. 5, 40225 Düsseldorf, Germany

How to cite this article: Friederike Harrich et al. Treatise on the Distribution of the use of a Follow-Up Midwife by Academically Educated Mothers Compared to Non-Academically Educated Mothers. Volume 13 Issue 3 July-September 2022

Abstract

In the publication „Guiding principles for complementary feeding of the breastfed child“, the WHO clearly advocates that exclusive breastfeeding in the first six months after birth is essential for the development of the newborn. Of particular interest is the possible difference between academic and non-academic women, which has not yet been sufficiently investigated. First, however, there is the question of how children are cared for after birth, when the professional situation of mothers has changed considerably due to a changed image of women in society. Decisions about this are increasingly changing and subject to strong fluctuations over time. In the context of an emancipated and constantly changing image of women, a new understanding is developing which requires statistical processing.^{4, 6, 7, 14}

For this purpose, Dr. med. Friederike Harrich interviewed mothers about their situation and evaluated them in a large-scale study. This study was compared with two other studies in order to pool the data.^{1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14}

This study, which is part of a larger series of surveys, looks at the distribution of the use of a follow-up midwife by mothers with academic training compared to mothers without academic training and presents the differences and similarities depending on the mother's level of education.^{4, 6, 7}

Keywords: Breastfeeding, Breastfeeding behaviour, Breast milk, Mothers, Image of women, Gynaecology, Obstetrics, Paediatrics

Introduction

Because of many different influencing factors that depend on the mothers' pregnancy and breastfeeding behaviour, there are many differences in their behaviour and handling of their children and in the context of pregnancy that have not yet or not yet sufficiently been studied. Similarly, post-pregnancy behaviour has not been sufficiently researched, nor has the question of whether there is a difference in behaviour depending on the level of education.

This paper, as part of a large series of studies, explores the question of whether there is a correlation between the possible decision to hire a postnatal midwife and the educational status of the mother.

Material and Methods

The comparable studies are titled as follows in this meta-analysis:

Study A: "The breastfeeding behaviour of female

Present Address of Correspondence: Med. Friederike Harrich

Jülicher Straße 89
40477 Düsseldorf
Germany

academics in the period from 1950 to 1990” by Antonia Charlotte Freiin Teuffel von Birkensee.⁴

Study B: “On the change in breastfeeding behaviour in the FRG between 1950 and 1990 - An Orla History study” by Luisa Heininger.⁸

Study C: “On the Change in Breastfeeding Behaviour of Mothers in the Greater Düsseldorf Area between 1951 and 1990 - An Oral History Study” by Friederike Helene Margarethe Harrich.⁷

The three studies A, B and C were conducted as retrospective cohort studies. In studies A and B, a telephone interview was used to collect the data; in study C, a questionnaire was filled out in writing by the study participants alone, followed by a personal interview. Both methods have the advantage that the effect of social desirability in the form of impression management and self-deception is greatly reduced. The questionnaires, which are to be seen as a guide for the interviews, differ slightly, but also contain identical questions. All comparable surveys are compared in this meta-analysis. The study designs of the three studies to be compared are very similar, comparable but not identical. For example, it is noticeable that the time periods studied differ. While studies A and B examined breastfeeding behaviour in the years 1950 to 1990, study C investigated the same in the years 1951 to 1990. The dissertations by Ms Freiin Teuffel von Birkensee (Study A) and Ms Heninger (Study B) have the problem that the years 1960, 1970, 1980 and 1990 were duplicated in the cohort classification, which is not the case in Ms Harrich’s study (Study C). In order to prevent this duplication and still maintain equal time intervals, Study C began with a survey of women who gave birth in 1951.^{4, 6, 7, 8}

Furthermore, the studies differ in the number of study participants. Study A and B each involved 100 women, 25 per cohort, while Study C involved 44 women, 11 per cohort. It should be noted with regard to the size of the cohorts that in study C an incomplete completion of the questionnaire or a failure to remember led to exclusion from the study, which was not the case in studies A and B.^{4, 6, 7, 8}

In summary, study A deals with breastfeeding behaviour, birth and the time immediately after the birth of the child of academic women in the mentioned period, study B with non-academic women in the mentioned period and study C has a mixed study population. This and a closely coordinated study

design offer optimal opportunities for comparison.^{4, 6, 7, 8}

Results:

Table 1: Use of a follow-up midwife in study A.

	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Use of a follow-up midwife	92%	92%	88%	76%
No use of a follow-up midwife	8%	8%	12%	24%

Table 2: Use of a follow-up midwife in study B.

	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Use of a follow-up midwife	72%	80%	96%	83%
No use of a follow-up midwife	28%	20%	4%	17%

Table 3: Use of a follow-up midwife in study C.

	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Use of a follow-up midwife	90,9%	63,6%	100%	63,6%
No use of a follow-up midwife	9,1%	36,4%	0%	36,4%

The results of the analyses of the question whether the study participants had a follow-up midwife are shown in Table 1-3. It is striking that across the studies and cohorts, most study participants had no midwife, with values ranging from 63.6 % to 100 %.

Cohorts 3 and 4 are particularly noteworthy, not least because they contrast and directly follow each other, making them stand out from the other two cohorts. In the 1970s, the fewest women in the cohort and study comparison had a follow-up midwife. In

study B it was only 4%, in the other two studies 0%. This is a strikingly low value, which illustrates that the decision to have a follow-up midwife had nothing to do with the educational background of the women or the child fathers. The decision not to have a follow-up midwife was made irrespective of the educational level...

Furthermore, the development from cohort 3 to cohort 4, i.e. from the 1970s to the 1980s, is striking. The trend towards a follow-up midwife increased significantly to values between 17% and 44% in the study comparison, with study B showing the lowest value with 17% and study A the highest value with 44%. Study C is in the middle of the field in terms of percentage.

Conclusion

The trend against a follow-up midwife in the 1970s with the opposite trend can be seen in the individually considered studies and also in the comparison of these. It can be seen that the development is independent of the academic level of education, but the extent of the development is not. If the mothers had an academic educational background in the 1980s, they were more likely to choose a follow-up midwife than if the mothers did not have an academic background.

Conflict of interests:

No conflict of interests

Source of Funding:

self funded

Ethical Clearance

Ethical clearance was taken from the Ethics Committee of the Heinrich-Heine-University Düsseldorf, Germany

References

1. Bühling KJ. Friedmann W. Intensivkurs Gynäkologie und Geburtshilfe. Amsterdam. 2008
2. Eschrich E. Stillen und Säuglingsernährung im Wandel der Zeit. Norderstedt. 2013
3. Fehlemann S. Armutsrisiko Mutterschaft: Mütter- und Säuglingsfürsorge im Deutschen Reich. 1890 - 1924
4. Freiin Teuffel von Birkensee AC. Das Stillverhalten von Akademikerinnen in der Zeit von 1950 bis 1990. Düsseldorf. 2014
5. Gartner LM. Morton J. Lawrence RA. et al. Breastfeeding and the use of human milk. In: Pediatrics 115. 2005
6. Harrich FHM. ANNA - A newborn nutrition analysis. Düsseldorf. 2021
7. Harrich FHM. Zum Wandel des Stillverhaltens von Müttern im Großraum Düsseldorf zwischen 1951 und 1990 - Eine Oral History Studie. Düsseldorf. 2020
8. Heininger L. Zum Wandel des Stillverhaltens in der BRD zwischen 1950 und 1990. Düsseldorf. 2014
9. Hormann/Nehlsen. Die aktuelle Stillsituation in Deutschland und europaweit. In: Siebert W. Stögmann W. Wündisch GF. Stillen- einst und heute. Marseille. München. 1997
10. Murray et al. Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990–2013: quantifying the epidemiological transition. 2015
11. von Voss. Grützmacher. Pfahl. Stillen und Muttermilchernährung, vom Bundesministerium für Gesundheit. Bonn. 1980
12. Vögele J. Nahrungskultur, Essen und Trinken im Wandel. 4/2002 Im Kampf gegen die Säuglingssterblichkeit, Säuglingsernährung und Stillpropaganda. Ein Beitrag zur Geschichte der öffentlichen Gesundheitsfürsorge. Stuttgart. 2002
13. Winberg J. Das Stillen und der Austausch von Signalen zwischen Mutter und Kind - eine entwicklungsgeschichtliche und neuroendokrinologische Betrachtung. In: Bundeszentrale für gesundheitliche Aufklärung (BZgA). Stillen und Muttermilchernährung. Köln. 2001
14. World Health Organization (WHO). Guiding Principles for Complementary Feeding of the Breastfed Child. 2003. Available from: <https://www.fsnnetwork.org/resource/guiding-principles-complementary-feeding-breastfed-child>

Study of Efficacy and Outcome of Nasal CPAP in Preterm Neonates with Hyaline Membrane Disease

G Karthik Raj¹, Bolishetti Kalyan Kumar², M. C. Vennela³

¹Senior Resident, Gandhi Medical College And Hospital, Secunderabad

²Assistant Professor, Department of Pediatrics, Niloufer Hospital/Gandhi Medical College, Secunderabad

³Post Graduate, Gandhi Medical College And Hospital. Secunderabad.

How to cite this article: G Karthik Raj, Bolishetti Kalyan Kumar, M. C. Vennela et al. Study of Efficacy and Outcome of Nasal Cpap in Preterm Neonates with Hyaline Membrane Disease. Volume 13 Issue 3 July-September 2022

Abstract

Background: In the quest to bring down the neonatal mortality rate, the challenge is to develop low cost technology that can be used in remote settings. It is known that early use of continuous positive airway pressure (CPAP) reduces the incidence of respiratory distress and it may be used as an alternative to intubation and ventilation in some cases

Objectives: To study the efficacy and outcome of Nasal CPAP in preterm neonates with Hyaline membrane disease.

Methods: 50 preterm newborns with respiratory distress (Silverman's score 3-6) admitted in NICU were included in the study. All study population were connected to CPAP variables like gestational age, birth weight, antenatal steroids, Downes Score, Age of start of CPAP, initial FiO₂, initial PEEP, max FiO₂, max PEEP, duration of CPAP, duration of O₂ administration, acute complications like sepsis, pneumothorax, septal damage and duration of hospital stay are compared between CPAP success and CPAP failure groups.

Results: Preterm New-borns between 31-34 wks of gestational age had a success of 96.5% as compared to gestational age of 28-30 wks had success of 76.1% and p value 0.02. Preterm New-borns with birth weight > 1000 gms had success of 89% when compared to <1000gms had success rate of 50% which is statistically significant. Preterms New-borns born to mothers who received antenatal steroids had better outcome (CPAP success rate of (87.7%) as compared to babies born to mothers who had not received antenatal steroids

Conclusion: Early use of bubble CPAP is associated with lesser need for mechanical ventilation as well as reduced hospital stay. Bubble CPAP in pre-term neonates is efficient in decreasing respiratory distress, and associated with lesser complications as well as mortality rate.

Keywords: Bubble CPAP, CPAP, Nasal CPAP, Neonates, Respiratory distress

Introduction

In the quest to bring down the neonatal mortality rate, the challenge is to develop low cost technology that can be used in remote settings. It is known that early use of continuous positive airway pressure (CPAP) reduces the incidence of respiratory distress

and it may be used as an alternative to intubation and ventilation in some cases.¹ Recent literature suggests that bubbling CPAP is better than conventional CPAP.^{2,3} The bubbling CPAP is a form of oscillatory pressure delivery in which mechanical vibrations are transmitted to the chest secondary to non-uniform flow of gas bubbles across the downstream of a water

Corresponding Author Details: Bolishetti Kalyan Kumar,

Assistant Professor, Department Of Paediatrics, Niloufer Hospital/Gandhi Medical College, Secunderabad

Email id:- drkalyankumar15@gmail.com, kalyan4mail@gmail.com

Cell no: 9908501225, 8074076966

seal and this system results in waveforms similar to those produced by high-frequency ventilation when recorded by a transducer attached to the infant's airway. The chest vibrations produced contribute to gas exchange by facilitated diffusion.⁴ CPAP increases alveolar recruitment and size, enhancing the area available for gas exchange, and improves ventilation - perfusion relationship, thus improving hypoxemia.⁵

CPAP is an important treatment modality for respiratory distress syndrome (RDS) in preterm neonates. Bubble CPAP is one of the low cost nasal CPAP delivering systems. Following the introduction of CPAP, the mortality of RDS decreased from 55- 35% to 20-15%.⁶ These developments led to the more widespread and routine use of CPAP, as well as investigations into improving the application of CPAP in infants.

Bubble CPAP is less expensive, easier to operate, poses potentially fewer risks. It also requires less training than does intubation and subsequent conventional mechanical ventilation and is more suitable in neonatal units with limited resources in developing countries.⁷

Early CPAP commences within 5-10 min following birth or following resuscitation and stabilization of the infant in the delivery room. Early CPAP is intended to serve as an alternative to intubation and mechanical ventilation. It has been proposed that initial application of early CPAP in preterm may have the following advantages:

- Prompt stabilization avoids deterioration
- Avoids or decreases exposure to high FiO₂
- Shortens ICU stay
- Decreases need for intubation.

Thus, the goals of early CPAP are to minimize intubation and mechanical ventilation to reduce complications related to this approach.⁸

Materials and Methods

It was a prospective and observational study done in NICU, Department of Pediatrics, Gandhi Medical College, Secunderabad.

50 preterm newborns with respiratory distress (Silverman's score 3-6) admitted in NICU were included in the study. Gestational age was calculated either by LMP, new Ballard's score or fetal scan.

Inclusion Criteria

Preterm new-borns between gestational age of 28 -34wks admitted in NICU, with respiratory distress (Silverman's score 3-6) within 72hrs after birth, with evidence of HMD are included in the study.

Exclusion Criteria

- Preterm babies with gestational age < 28 wks and >34 wks of gestational age.
- Preterm babies with Birth asphyxia and persistent apnea.
- Congenital anomalies of airway like choanal atresia, cleft palate, Tracheo esophageal fistula and congenital diaphragmatic hernia.
- Babies with respiratory distress having Silverman's score <3 and >6.

Respiratory distress was assessed by Silverman's score that includes upper chest retractions, lower chest retractions, nasal flaring, xiphi-sternal retractions and expiratory grunt.

All those babies who failed CPAP were subsequently connected to mechanical ventilator.

The babies who are weaned off successfully from CPAP are considered as CPAP success group and the babies who required subsequent mechanical ventilation are considered as CPAP failure group.

All study population were connected to CPAP variables like gestational age, birth weight, antenatal steroids, Downes Score, Age of start of CPAP, initial FiO₂, initial PEEP, max FiO₂, max PEEP, duration of CPAP, duration of O₂ administration, acute complications like sepsis, pneumothorax, septal damage and duration of hospital stay are compared between CPAP success and CPAP failure groups.

Bubble CPAP is considered as efficient if the babies who were connected to bubble CPAP could be weaned off successfully.

Statistical Analysis: Data was analysed using SPSS 21 software. Chi-square test for comparison of proportions and Student "t" test to compare means between two groups. P value <0.05 was considered as statistically significant.

Observation and Results

Table 1: Distribution based on Gender, Gestational age, birth weight, Antenatal steroids

Sex	Total no. of babies n(%)
MALE	26(52%)
FEMALE	24(48%)
Gestational age	
28-30wks	11(22%)
31-34wks	39(78%)
Birth weight (gms)	
<1000gms	22(44%)
>1000gms	28(56%)
Antenatal steroids	
Antenatal steroids received	49(98%)
Antenatal steroids not received	1(2%)

Out of 50 preterm new-borns connected to bubble CPAP, males are (52%) and females are (48%). Among 50 preterm newborns connected to CPAP dominant group was 31-34 wks. (78%). Out of 50 babies 98% babies received antenatal steroids.

Table 2: Outcome of Babies on Nasal Cpap

Total no. of babies on nasal CPAP	CPAP Success	CPAP Failures
50(100%)	44(88%)	6(12%)

Out of 50 preterm new-borns who were put on nasal CPAP 88% babies were weaned off successfully and 12% babies required subsequent mechanical ventilation.

Table 3: Comparison of sex between CPAP success and failure groups

Sex	Success	Failure	Total	p-value
Male n(%)	22(88%)	3(12%)	25(50%)	0.669
Female n(%)	22(88%)	3(12%)	25(50%)	

Ratio of male and female babies are comparable in both success and failure groups

Table 4: Comparison of various parameters between CPAP success and failure groups

Gestational age (wks)	Success n(%)	Failure n(%)	Total N=50(%)	p-Value
28-30 weeks n=28	16(76.1%)	5(23.9%)	21(42%)	0.02
31-34weeks n=22	28(96.5%)	1(3.5%)	29(48%)	
Birth weight in gms				P VALUE
<1000gms n=02	01(50%)	01(50%)	2(4%)	<0.05
>1000gms n=48	43(89%)	5(11%)	48(96%)	P VALUE
Antenatal steroids				0.12
Received N=49	43(87.7%)	6(12.3%)	49(98%)	
Not received N=1	1(100%)	0(0%)	1(2%)	

Preterm Newborns between 31-34 wks of gestational age had a success of 96.5% as compared to gestational age of 28-30 wks had success of 76.1% and p value 0.02. Preterm Newborns with birth weight > 1000 gms had success of 89% when compared to <1000gms had success rate of 50% which is statistically significant. Preterms Newborns born to mothers who received antenatal steroids had better outcome (cpap success rate of (87.7%) as compared to babies born to mothers who had not received antenatal steroids.

Table 5: Comparison of CPAP variables between CPAP success and failure rates

CPAP Variables	CPAP Success (n=43)	CPAP Failures (n=7)
Age of start of CPAP in Hrs (Mean±SD)	4(±2.652)	6(±2.080)
Initial PEEP in cm of H2O (Mean±SD)	5.045(±0.2107)	5.00 (+0.0)
Initial FiO2 in % (Mean±SD)	50.45 (±2.107)	6.00 (±0.8944)
Max. PEEP in cm of H2O (Mean±SD)	5.091(±3.9066)	6.00(±0.8944)
Max. FiO2 in % (Mean±SD)	51.250(±3.9066)	64(±8.9443)

Age of start of CPAP is significantly less in success group emphasizing that if CPAP is started early better would be the outcome.

Discussion

This was a prospective study on the role of bubble CPAP in preterm neonates with mild respiratory distress (Silverman's score 3-6).⁹ A total of 50 preterm new-borns were included in this study. Out of 50 preterm new-borns that were started on bubble CPAP, 44(88%) preterm new-borns were weaned off successfully and the remaining 6(12%) preterm new-borns required subsequent mechanical ventilation.

All the variables (Neonatal and CPAP) are compared between CPAP success and CPAP failure groups. The age of start of CPAP, duration of CPAP, duration of O₂ requirement and duration of hospital stay are studied in both the groups. The incidence of mortality and other complications like sepsis, pneumothorax and chronic lung disease are also analysed in CPAP success group and failure group.

In prospective studies done by Koti et al¹⁰ and Urs et al¹¹ CPAP success rates were 75% and 80% comparable to our study. The study was conducted based on similar variables in preterm neonates to study the efficacy and outcome which has a success rate of 75% which is comparable to other studies .

In present study the success rate of babies with gestational age between 28-30 wks and 31-34 weeks is 76.1 % and 96.5 % respectively comparable with study Urs et al.¹¹ This indicates that as the gestational age increases the efficacy and outcome of CPAP increases .As shown in the study the success rate of babies with gestational age between 28-30 wks is 76.1% as compared to 96.5% with gestational age between 31-34 weeks which is comparable with other studies. Success rate of babies with gestational age >31 weeks is 96.5% where as in Urs et al study it was 81.57%. As the gestational age increases success rate increases as shown in our study the success rate is 96.5% when compared to Urs et al¹¹ study it was 81.57%. In the present study 87.7% of babies who received antenatal steroids were weaned off successfully from CPAP which is comparable with urs et al.¹¹ Antenatal steroids administration has improved survival , efficacy and outcome has improved in the present study 87.7% were weaned off successfully from CPAP.

Out of 50 preterm new-borns connected to bubble CPAP, males are (52%) and females are (48%)there is no comparable difference between sex distribution among the preterm neonates included in the study. Preterm New-borns with birth weight > 1000 gms had success of 89% when compared to <1000gms had

success rate of 50% which is statistically significant. Preterms New-borns born to mothers who received antenatal steroids had better outcome (cpap success rate of (87.7%) as compared to babies born to mothers who had not received antenatal steroids. Age of start of CPAP is significantly less in success group emphasizing that if CPAP is started early better would be the outcome

Conclusion

CPAP success rate is 96.5% in pre-term newborns having RDS with gestational age >31 weeks indicating it is most useful in these babies. Early use of bubble CPAP is associated with lesser need for mechanical ventilation as well as reduced hospital stay. Bubble CPAP in pre-term neonates is efficient in decreasing respiratory distress, and associated with lesser complications as well as mortality rate.

Ethical clearance- Ethical Approval was obtained from Institutional ethics committee of Gandhi Medical College prior to the commencement of the study.

Source of funding- Self

Conflict of Interest - Nil

References

1. Kaur C, Sema A, Beri RS, Puliye J. A simple circuit to deliver bubbling CPAP. *Indian pediatrics*. 2008 Apr 1;45(4):312.
2. DiBlasi RM. Nasal continuous positive airway pressure (CPAP) for the respiratory care of the newborn infant. *Respiratory care*. 2009 Sep 1;54(9):1209-35.
3. Verder H. Nasal CPAP has become an indispensable part of the primary treatment of newborns with respiratory distress syndrome. *Acta Paediatrica*, 2007; 96:482-484.
4. Wiswell TE, Srinivasan P. Continuous positive airway pressure. Goldsmith JP, Karotkin EH, editors. *Assisted ventilation of the neonate*, 5 th edition. Philadelphia: WB Saunders; 2004: 141-143.
5. Downes JJ, Vidyasagar D, Marrow GM, Boggs TR. Respiratory distress in newborn infants, new clinical scoring system with acid base and blood gas correlation. *Clin Pediatr* 1970; 9: 325-330.
6. Wiswell TE, Srinivasan P. Continuous positive airway pressure. Goldsmith JP, Karotkin EH, editors. *Assisted ventilation of the neonate*, 5 th edition. Philadelphia: WB Saunders; 2004: 12.

7. Robert M. Kliegman, Richard E. Behrman, Hal B. Jenson, Bonita F. Stanton. Nelson textbook of paediatrics. 18th ed. Philadelphia: kliegman Saunders; 2007: 731-736.
8. Ammari A, Suri M, Milisavljevic V, Sahni R, Bateman D, Sanocka U, et al. Variables associated with early failure of nasal CPAP in very low birth weight infants. *J Pediatr* 2005; 147: 341-347.
9. Kattwinkel J, Fleming D, Cha CC, Fanaroff AA, Klaus MH. A device for administration of continuous positive airway pressure by the nasal route. *Pediatrics* 1973;52(1):131-134.
10. Koti J, Murki S, Gaddam P, Reddy A, Reddy MDR. Bubble CPAP for respiratory distress syndrome in preterm infants. *Indian Pediatr* 2010; 47: 139-143.
11. Urs PS, Khan F, Maiya PP. Bubble CPAP-a primary respiratory support for respiratory distress syndrome in newborns. *Indian pediatrics*. 2009 May 1;46(5).

Impact of dental Fluorosis on quality of life of a group of Children in a Rural area in Nubia Region.

Ghada Tawfik¹, Nancy Khattab², Mohamed A. El-Yazeed³, Ehab M. Radwan⁴,
Marwa Saber Abd El Salam⁵.

¹Research assistant of pediatric Dentistry in Oral and Dental division in National Research Center.

²Prof. of Physical Anthropology in Faculty of African Postgraduate Studies- Cairo University.

³Prof. of Pediatric Dentistry and Head of Orthodontics and Pediatric Dentistry Department in National Research Center.

⁴Researcher of Pediatric Dentistry in Oral and Dental Division in National Research Center.

⁵Lecturer of Physical Anthropology in Faculty of African Postgraduate Studies – Cairo University.

How to cite this article: Ghada Tawfik, Nancy Khattab, Mohamed A. El-Yazeed, Ehab M. Radwan, Marwa Saber Abd El Salam. et al. Impact of dental Fluorosis on quality of life of a group of Children in a Rural area in Nubia Region. Volume 13 Issue 3 July-September 2022

Abstract

Background: Dental fluorosis is an oral condition caused by the ingestion of fluoride ions present mainly in drinking water. High fluoride level in drinking water may cause dental signs and symptoms that may affect the individual's quality of life. **Aim:** Assess dental fluorosis prevalence among Nubian children and estimate its effect on the quality of life through an oral health related quality of life questionnaire. **Methods:** The current study was performed on participants with age range 7-14 years in a rural region in Nubia with number of population 202. Subjects were examined clinically for Dental fluorosis using modified Dean's Index. Quality of life of children was evaluated using Oral Health related Quality of Life questionnaire (OHQoL). **Results:** it was found that mean fluoride level of water in Nubia was 8 mg/L, mean Fluorosis status in children was 2.31. There was no correlation between DF and OHQoL domains except for; 'self conscious' and 'difficult to relax' items which recorded moderate positive significant correlation. **Conclusion:** OHQoL revealed that DF had low impact on quality of life of Nubian children.

Keywords: Dental fluorosis – Egypt - Nubia – Quality of life – rural areas – Sudan.

Introduction

Quality of life is an important concept in many fields as; economics, sociology and political science which is concerned with individual's emotional, social and physical well-being. This concept aims to fight poverty, to fix important life standards, to satisfy individual's basic needs and to stimulate economic growth and political development.⁽¹⁾

The World Health Organization (WHO) expanded the definition of health and incorporated individuals' physical and psychological health, their degree of independence and their social interrelationships.⁽²⁾

Oral health is one of the domains of the quality of life. One of the attempts to improve oral health was suggested by the WHO in 1993 to incorporate fluoride in low levels in drinking water and toothpastes aiming to control or prevent dental caries.

Corresponding author: Ghada Tawfik.

Research Assistant of Pediatric Dentistry in Oral and Dental division in National Research Center.

E-mail: feeqgeopol@gmail.com

Fluoride has certain mechanism which leads to better oral health by enhancing the re-mineralization of incipient enamel lesions by establishing a healing process which inhibits further growth of cavities and also interferes with glycolysis, a process by which cariogenic bacteria metabolize sugars to produce acid, thus inhibiting caries action. Recent studies suggest that, when fluoride is ingested during the period of tooth development (the first 2 years of life), it makes enamel more resistant to future acid attacks.⁽³⁾

Fluoride is a double sword weapon, it will achieve its mechanism in teeth protection if only found in optimal levels, because exceeding this level of ingested fluoride causes an oral condition called *Dental Fluorosis (DF)*.⁽⁴⁾

Dental fluorosis is very common among the children and young people. It is a developmental defect characterized by hypo-mineralization of tooth enamel that occurs during the critical periods of tooth development. It can affect the appearance and structure of the tooth enamel. Mild fluorosis appears as fine lacy markings on the enamel of a tooth; usually the appearance is not markedly different from normal enamel. On the other hand, moderate and severe forms of dental fluorosis are characterized by greater hypo-mineralization and more pronounced porosity of enamel which appear to have white spots, yellow to brownish discoloration, and/or pitting or mottling of enamel.⁽⁵⁾

Dental Fluorosis is one of the oral health conditions that affects quality of life in a negative way especially its moderate and severe forms. Another factor that indirectly affects quality of life is social inequalities; which are measured by level of education, occupation, monthly income and type of housing or combination of various indicators. Studies and researches suggested that low standard of living can worsen the oral health status which in return affects the quality of life negatively.⁽⁶⁾

Singh s. et al, 2018 aimed to assess the impact of dental fluorosis on the OHRQoL of 12-15yearold children residing at an endemic region in India. Study resulted, dental fluorosis had a measurable impact on the QoL of affected participants⁽⁷⁾. Another study by Nilchian et al published in 2018 in another district in India showed that QOL decreased as the severity of dental fluorosis increased.⁽⁸⁾

However, this study chose a Nubian rural region as area of interest because Nubian children are under

privileged, lack medical services and very few studies were concerned with this area. Therefore, this study aimed to:

Assess impact of DF on QoL through :

- Measuring fluoride level in drinking water through water analysis.
- Evaluating socio-economic aspects of guardians of Nubian participants through a socio-economic status questionnaire.
- Measuring DF score and its effect on QoL through Oral Health related Quality of life questionnaire.

Methodology

Study Setting

This is a cross sectional study which was conducted in a rural area in Nubia called 'El-Allaki Valley.'

Sampling Technique

A convenient sample was collected from study region, over a period of three months, starting from December 2020 till March 2021. The number of participated children was 202.

Inclusion criteria

- Nubian children both males and females with age range from 7 - 14 years.
- They should be living in the same region since birth.
- Teeth to be examined should not be covered with fillings or braces.

Exclusion Criteria

- Parents or children who refused to join the study.
- Ethical Consideration

The current study was approved by the Medical Research Ethics Committee of the National Research Center in Cairo - Egypt with registration number (19/008).

The parents of all children who participated in the study received a consent with detailed written information about the aims and objectives of

the current study and were informed that their participation was not obligatory and anonymous and they have the right to withdraw themselves from the study at any time without being threatened.

Illiterate parents had the consent being explained to them verbally in details before signing with their finger print on the consent for an approval.

Clinical Examination

All participants were clinically examined for dental fluorosis. Examination was conducted in the backyards of their homes, under natural daylight, using disposable instruments consisting of a mirror and a probe to be more practical in use and more hygienic eliminating the need for sterilization.

Dental fluorosis examination was done using modified Dean’s index by inspecting their upper central permanent teeth under day light .

Modified Dean’s criteria:⁽⁹⁾

Classification	Criteria
Normal (0)	The enamel represents the usual translucent semivitriform-type of structure. The surface is smooth, glossy, and usually of pale, creamy white color.
Questionable (0.5)	The enamel discloses slight aberrations from the translucency of normal enamel, ranging from a few flecks to occasional white spots.
Very mild (1)	Small, opaque, paper white areas scattered irregularly over the tooth, but not involving as much as approximately 25% of tooth surface.
Mild (2)	The white opaque areas in the enamel of teeth are more extensive, but do not involve as much as 50% of tooth.
Moderate (3)	All enamel surfaces of the teeth are affected and surfaces subject to attrition show wear. Brown stain is frequently a disfiguring feature.
Severe (4)	All enamel surfaces of the tooth are affected and hypoplasia is so marked that the general form of the tooth may be affected. There is discrete pitting of the affected tooth. Brown stains are widespread and teeth often present a corroded-like appearance.

Collecting Water Samples

Samples of drinking water were collected- in clean plastic bottles for analysis of fluoride levels. Water analysis was conducted in the **National Research Centre - Advisory Unit for Virus Research and Biological Testing**.

The source of drinking water was ground water originating from tributaries of the Nile River to be put in large plastic containers to be directly used by people as they still don’t have sewage drains or water taps inside their homes.

The two following questionnaires were also filled

up by interviewing the mother or the father of each child:

1. Socioeconomic Status (SES) Questionnaire: ⁽¹⁰⁾

This questionnaire was a ready designed template with some modifications done on it, to suite customs and traditions of inspected areas. It is a face to face interview with the parent, used to collect data about some indicators:

- **Social status of the parent;** including age, gender, ethnic origin, marital status, primary language spoken at home, number of family members in the household, and whether their home is owned, rented or something else.
- **Educational level;** including elementary school, High school graduate, Technical school training, College graduate, Graduate school degree: Master’s or Doctorate degree, or illiterate.
- **Insurance;** how do parents pay for their medical expenses, whether self-pay, private insurance or funded by the government.
- **Employment;** in this indicator we ask the parent attending the interview if he/she were employed, and who earned income to support family, and asked them about the current work status if they had full or part time job, might be neither working nor looking for a job or not working and looking for a job.

Also, they were asked if they have other resources to support their family and asked about nature of these resources and their frequency.

2 Oral health related quality of life questionnaire

The present study aimed to determine the effect of dental fluorosis on oral health related quality of life of children and adolescents. It measures their awareness of the problems or limitations caused by dental fluorosis occurring in highly recorded scores.

In this questionnaire, the questions are divided into several domains asking about whether or not dental fluorosis caused functional limitations, physical pain, and psychological discomfort, physical and psychological disability. The answer of each question is a score ranging from 0 to 4.⁽¹¹⁾

0 stands for never,

- 1 hardly ever,
- 2 occasionally,
- 3 fairly often,
- 4 very often.

Results

- Fluorosis status & Modified Dean`s index:

In fluorosis status of Nubian children, minimum score was (1), maximum score was (4), mean ± standard deviation was (2.31 ± 0.94).

- **Modified Dean`s index scores among Nubian children:**

19.8% of Nubian children scored (1) or very mild fluorosis, 40% scored (2) or mild fluorosis, 30% scored (3) or moderate fluorosis and 9.9% scored (4) or severe

fluorosis. No one of Nubian participants showed normal or questionable fluorosis.

Water Analysis

Mean Fluoride level of drinking water in Nubia was 8 mg/L with minimum 7.5 and maximum 9.5.

Questionnaires:

a. Oral health related quality of life (OHRQoL) questionnaire.

Comparison between all answers in each question among Nubian children was performed by using Chi square test which revealed significant difference in all questions as P < 0.05, (Never) answer was significantly the highest in all question, while nobody selected (very often) as an answer. Presented in table (1)

Table (1): Comparison between different answers of Oral health related quality of life (OHRQoL) questionnaire among Nubian children:

		Never (0)		Hardly ever (1)		Occasionally (2)		Fairly often (3)		Very often (4)		P value
		%	N	%	N	%	N	%	N	%		
Functional limitation	Pronunciation	202	100.0	0	0.0	0	0.0	0	0.0	0	0	0.0001*
	Taste sensation	202	100.0	0	0.0	0	0.0	0	0.0	0	0	0.0001*
Physical pain	Painful aching	202	100.0	0	0.0	0	0.0	0	0.0	0	0	0.0001*
	Uncomfortable to eat	202	100.0	0	0.0	0	0.0	0	0.0	0	0	0.0001*
Psychological discomfort	Self-conscious	81	40.1	61	30.2	40	19.8	20	9.9	0	0	0.0001*
	Felt tense	182	90.1	20	9.9	0	0.0	0	0.0	0	0	0.0001*
Physical disability	Unsatisfactory diet	202	100.0	0	0.0	0	0.0	0	0.0	0	0	0.0001*
	Meal interruption	202	100.0	0	0.0	0	0.0	0	0.0	0	0	0.0001*
Psychological disability	Difficult relaxation	162	80.2	40	19.8	0	0.0	0	0.0	0	0	0.0001*
	A bit embarrassed	202	100.0	0	0.0	0	0.0	0	0.0	0	0	0.0001*
Social disability	A bit irritable with other people	202	100.0	0	0.0	0	0.0	0	0.0	0	0	0.0001*
	Difficult doing usual job	202	100.0	0	0.0	0	0.0	0	0.0	0	0	0.0001*
Handicap	Less satisfying life	141	69.8	41	20.3	20	9.9	0	0.0	0	0	0.0001*
	Unable to function	202	100.0	0	0.0	0	0.0	0	0.0	0	0	0.0001*

b. Socioeconomic Status Questionnaire:

1. Describe where they live

The answer 'NO' was significantly higher than the answer 'YES' in questions; 'it is owned or being bought by you', 'it is rented by money for you', 'I live with friends' and 'I have no permanent residence', while the answer 'YES' was significantly higher than the answer 'NO' in questions; 'it is occupied without rent or payment or money' & 'I live with family'. 100% of Nubian parents didn't own the homes they live in, neither rented by money for them. It is occupied without rent or money.

2. Education

100% of parents were illiterate.

3. Employment

Only 29.7% of Nubian parents were employed and they all were part timers. They have "other", "occasional" resources to support their families.

4. Occupation:

40% of parents worked as drivers, 19.8% as farmers, while 40% worked as shepherds.

I. Dental Fluorosis Correlation

Correlation between fluorosis status and fluoride level in drinking water was performed by using Pearson's correlation coefficient and revealed strong, positive, significant correlation.

Also, correlation between dental fluorosis status & domains of OHQoL questionnaire indicated moderate positive significant correlation among 2 items only "self-conscious" & "difficult to relax".

Discussion

El-Allaki Valley is a rural Nubian area located across the borders of Egypt- Sudan. All Nubian participants originated from El-Ababdah and El-Bashareyah tribes. This region was selected because they have ground water from where residents drink, under privileged and people lack their basic needs.

The age range selected was from 7 to 14 years old

because in this range upper and lower central incisors and 1st permanent molars will be fully erupted thus, it can be easily examined. Also, one of the inclusion criteria confirmed that it's a must that the first 2 years of the inspected child life to be spent in the same area of interest as it was found that children exposed to higher levels of fluoride in the first and second years of life were at higher risk for developing dental fluorosis of maxillary and mandibular central incisors, and first molars.⁽¹²⁾

In the current study, male percentage was significantly higher than female. It was believed that the number and percentage of females contributed was low; because their shyness prevented many of them to contribute and it was believed that they arise from a primitive, rural community that tends to hide girls and that they were born mainly to get married at young ages thus, cannot be considered among children.

Upon dental examination, dental fluorosis status among Nubian children was measured using modified dean's index at which no body scored (0) no fluorosis nor (0.5) questionable fluorosis. Fluorosis index ranged from very mild, mild, moderate till severe which resembles a study done in Jordan in 2020.⁽¹³⁾

Nubian children recorded moderate and severe fluorosis status score because on analysis of their drinking water, their result showed that mean fluoride level was 8 mg/L. Also, it was believed that, high temperature in Nubia region led to increase in consumption of drinking water to keep themselves hydrated and upon simple diet record, it was found that tea was the favorite and main beverage after water among Nubian children.

Concerning the OHQoL, usually moderate and severe scores of fluorosis index cause esthetic appearance problems and psychological discomfort and psychological disability and /or social disability. But, results in this study showed there was no correlation between fluorosis status among these children and quality of life except for the domains (less satisfaction of life) and (difficult to relax) showed moderate positive significance. This result disagreed with the results of a study done in Brazil, 2014 by Lima et al.⁽¹⁴⁾ and also disagreed with the results of another study done in India in 2018 which concluded that there was a high prevalence of dental fluorosis in this area and it had a measurable impact on the quality of oral health of the affected study participants.⁽⁷⁾

A concept that has been considered an important measure of quality of life is **Socio-economic status (S.E.S)**. It includes several aspects but, the most important were income, education, and working status.⁽¹⁵⁾

Parents of Nubian children were 100% uneducated. It was believed that this shocking result was due to their previous unsettled nomadic life. When they started settling in permanent residencies, they were still remote from urban areas where schools were located. Also, 70% of the population were unemployed. The reason behind this high percentage of unemployment among Nubian population was believed to be due to their primitive back ground, they don't have identity documents, no availability of proper education, limited chances of communication with others who live in areas having better chances of employment, and living in the heart of desert as they need to take a long bumpy road with multiple military ambush to reach the nearest urban biomes.

The 30% who are employed among Nubian participants has very primitive working chances as shepherds, drivers and few worked as farmers. All of the employees in this group worked as part timers. Results of Nubian participants agreed with a study done in Mexico in 2017, at which population of region of study in Mexico had high prevalence of dental fluorosis associated with low socioeconomic status (due to low educational level).⁽¹⁶⁾

Although income is often considered to be a straightforward indicator of material resources. But in this study we failed to obtain any information about their income range, as most of the parents were very annoyed from such question and refused to give any information concerning the money they earn.

Concerning homes where they live and if they own it or not, Nubian participants used to live in tents since 2 years but now they are living in homes given to them by the government to prepare them for a more stable life. Unfortunately these homes doesn't have drainage sewage as it costs alot and the government need a proper budget to fix this problem.

Conclusion

- Prevalence of dental fluorosis was high among uneducated children.
- S.E.S indicators indicates low socio-economic status of Nubian participants.

- Nubian participants had low perception towards their oral health problems and their low S.E.S level affected their quality of life in a negative way.

Conflict of interest: Nil.

Source of funding: self-funded

References

1. Akranavičiūtė, D., Ruževičius, J. Quality of life and its components' measurement. *Engineering Economics*, 2007. **2**:43-48.
2. Diener, E., Suh E.. Measuring quality of life: economic, social, and subjective indicators. *Soc. Indic. Res.*, 1997. **40**, (1): 189-216.
3. World Health Organization Expert Committee on Oral Health; WHO technical Report Series, 846. 1994.
4. Majumdar, K.K.; Health impact of supplying safe drinking water containing fluoride below permissible level on fluorosis patients in a fluoride-endemic rural area of West Bengal. *Indian J. Public Health*. 2011, **55** (4):303-308.
5. National Research Council. *Health Effects of Ingested Fluoride*. Washington, DC: The National Academies. 1993 Press .<https://doi.org/10.17226/2204:169>.
6. Locker D., Deprivation and oral health: a review. *Community Dentistry and Oral Epidemiology*. 2000, **28** :161-69.
7. Singh S., Saha S., Sanjay S., Shukla N., Reddy V.K.; Oral HealthRelated Quality of Life among 12-15Year Children Suffering from Dental Fluorosis Residing at Endemic Fluoride Belt of Uttar Pradesh, India. *J. Indian Assoc. Public Health Dent*.2018, (**16**): 54-7.
8. Nilchian F., Asgary I. and Mastan F.; The effect of dental fluorosis on the Quality of Life of female high school and precollege students of high fluoride concentrated area, *J Int Soc Prev Community Dent.*, 2018 **8**(4): 314-319.
9. R.G Rozier, 1994. Epidemiologic Indices for Measuring the Clinical Manifestations of Dental Fluorosis: Overview and Critique. *J. Dent. Res*. **8** (1): 39-55.
10. Socioeconomic status: https://cdn-links.lww.com/permalink/ppt/a/ppt_25_3_2013_05_01_pathare_200536_sdc1.pdf (accessed in 2019)
11. Silvieira H., Costa F. D., Torriani D. D., Demarco F. F. & Goettms M.L. Oral health-related quality of life of schoolchildren: impact of clinical and psychosocial variables. *Int. J. Paediatr. Dent*. 2014, **25**: 358-364.

12. Buzalafa M., Levy S. Fluoride Intake of Children: Considerations for Dental Caries and Dental Fluorosis. : Fluoride and the Oral Environment. *Monogr. Oral Sci.* 2011, **22**: 1-19.
13. Al Warawreh A. ,Al Tamimi Z.H. , Al Qatawna M.I. , Al Momani A., Al Mhaidat M. R. , El Naji W. S. , and AlSarairoh S.; Prevalence of Dental Fluorosis among Southern Jordanian Population. *Int. J. Paediatr. Dent.* **2020**; Article ID 8890004: 1-7
14. Lima L.M. , Neusa Barros Dantas-Neta N.B., Moura W.S., Moura M.S. , Mantessob A. , Moura L.F. , LIMA M.; Impact of dental fluorosis on the quality of life of children and adolescents. *Rev. Odontol. UNESP.* 2014 Sep.-Oct.;**43** (5): 326-332.
15. Winkleby M.A, Jatulis D.E, Frank E., Fortmann S.P. Socioeconomic Status and Health: How Education, Income, and Occupation Contribute to Risk Factors for Cardiovascular Disease. *Am. J. Public Health.*1992. **82**: 816-820.
16. Pérez N., Irigoyen-Camacho M.E. and Boges-Yañez A.S.; Factors affecting dental fluorosis in low socioeconomic status children in Mexico. *Community Dent. Health*, 2017 (**34**): 66-74.

A Case report of Hypersensitivity Pneumonitis presenting with Pneumomediastinum

Godbole Manas Shailesh¹, Manvi Sharma², Monika Sharma³

^{1,2,3}Resident, Department of Medicine, MMIMSR, Mullana, Ambala

How to cite this article: Godbole Manas, Shailesh, Manvi Sharma, Monika Sharma et al. A Case report of Hypersensitivity Pneumonitis presenting with Pneumomediastinum. Volume 13 Issue 3 July-September 2022

Abstract

A 24-year-old woman from the ambala presented to her general practitioner with exertional dyspnoea. There was a delay in diagnosis of the underlying respiratory condition, due to initial investigations being suggestive of cardiac disease. Subsequently, the patient developed clinical symptoms and signs of pneumomediastinum, which was discovered on radiological imaging. Detailed history-taking and further clinical testing confirmed the cause of this to be hypersensitivity pneumonitis due to sensitisation to pet birds. The patient was treated with high dose steroids and went on to make a good recovery. The birds were rehomed.

Keywords: pneumomediastinum, hypersensitivity, pneumonitis, sensitisation

Background

Although pneumomediastinum is a recognised complication of severe lung disease, it is only rarely reported in hypersensitivity pneumonitis.¹⁻³ In addition, this case highlights the vital importance of obtaining a full social history and making a full clinical examination in the dyspnoeic patient. Furthermore, the case illustrates how diagnoses can be delayed by misleading initial investigations.

Case Presentation

A 24-year-old woman was referred to the cardiology outpatient clinic by her general practitioner, due to exertional dyspnoea. An ECG had shown a right bundle branch block and left axis deviation. A chest radiograph had revealed broadening of the upper

mediastinum (thought to be secondary to unfolding of the thoracic aorta) and a prominent superior vena cava shadow.

In clinic, the patient reported having been short of breath for 4 months. The patient, a housewife, had never smoked, drank little alcohol, had no medical history of note and took no regular medications. She did not have any symptoms of heart failure and had no evidence of heart failure on clinical examination. However, transthoracic echocardiography demonstrated moderate left ventricular systolic dysfunction and trabeculation. There was no valvular pathology and the right heart was poorly visualised. Ramipril and furosemide were started, and MRI of the heart was arranged to investigate for any underlying cardiomyopathy and to further assess the broadened mediastinum. The MRI, at variance with

Corresponding Author: Godbole, Resident

Department of Medicine,
MMIMSR, Mullana, Ambala
godbolemanas95@gmail.com
7038399377

the echocardiogram findings, demonstrated normal left ventricular systolic function, an ejection fraction of 57% and no regional wall motion abnormality.

At follow-up, the patient reported feeling even more breathless and 'squeaks' could be heard on auscultation of her chest. She did not report any pain. Her respiratory rate was 30, heart rate 65, blood pressure 108/69, temperature 37.2°C and oxygen saturation was 95% on room air. A further chest radiograph showed increased lung markings with loss of definition of the heart borders and no overt pulmonary oedema, raising the clinical concern of interstitial lung disease. It also showed pneumomediastinum. An urgent high-resolution CT was arranged, following which the patient was immediately admitted to hospital and referred to the respiratory physicians.

Investigations

CT confirmed pneumomediastinum with pneumopericardium, a tiny left pneumothorax and mosaic attenuation of the lungs with areas of lucency, some areas of normal lung density and some areas of ground glass change. The overall picture suggested a combination of air trapping consistent with small airways pathology together with minor patchy ground glass change.

Differential Diagnosis

These non-specific CT appearances gave a differential diagnosis including hypersensitivity pneumonitis, bronchiolitis obliterans, drug-related pneumonitis and possibly chronic venous thromboembolism (VTE). A CT pulmonary angiogram was performed and showed no evidence of acute or chronic VTE.

Treatment

On further questioning by the respiratory team, it transpired that the patient had pets, including a cockatiel and a parrot. Full blood count (including eosinophils), urea and electrolytes, liver function tests and thyroid function tests were all within normal limits. Arterial blood gas results were pH 7.43 (7.36–7.44), pCO₂ 5.2 (4.4–6.0), pO₂ 8.8 (12.0–15.0), HCO₃ 25.5 (21.0–27.0), BE+1.7 (–4.0 to +4.0) and oxygen saturation was 93.5%. Serum autoimmune screen, avian specific IgG antibodies and total IgE were taken, and pulmonary function tests were requested.

A presumptive diagnosis of acute hypersensitivity pneumonitis was performed. Three days of methylprednisolone 1 g intravenously once daily was started, followed by oral prednisolone 40 mg once daily thereafter.

Outcome and Follow-Up

The patient made slow initial progress, however, her oxygen demands reduced over the following days and her breathlessness eased. The inspiratory squeaks on auscultation of her chest were less marked but were persistent. After 5 days she was deemed fit for discharge with early clinic review booked.

High-resolution CT repeated at her clinic review showed resolution of the pneumomediastinum and improvement in interstitial changes. The avian specific IgG antibodies confirmed the working diagnosis and the birds were rehomed with instructions to deep clean the house. Total IgE was 94.8 (0–250), budgerigar specific IgG antibodies 179 (0–16), pigeon avian specific IgG antibodies 131 (0–21) and parrot avian specific IgG antibodies 163 (0–26). Antinuclear antibody, anti-dsDNA, extractable nuclear antigens and anti-CCP were negative or within normal limits. Pulmonary function tests showed forced expiratory volume in 1 s (FEV₁) 1.06 (42% predicted), forced vital capacity (FVC) 1.14 (39% predicted), FEV₁/FVC 0.93, KCO 86% predicted, residual volume 1.95 (117% predicted), vital capacity 1.03 (34% predicted) and total lung capacity 2.98 (62% predicted).

At recent clinic review, clinical and radiological improvement had continued while steroid requirements were reduced.

Discussion

Pneumomediastinum is a rarely reported manifestation of hypersensitivity pneumonitis: the authors found only three such cases in the literature.^{1–3} More common causes of pneumomediastinum include the Valsalva manoeuvre, violent cough, emesis, acute bronchial asthma and mechanical ventilation.²

The mechanism behind pneumomediastinum is the rupture of marginally situated alveoli due to increased alveolar pressure.² In hypersensitivity pneumonitis, inflammation may lead to narrowing of the bronchioles, in turn increasing alveolar pressure due to obstruction of air flow.³ Following rupture of the alveoli, air dissects along the bronchovascular

sheaths to the lung hilum and mediastinal soft tissues, where it collects.²

In terms of explaining the clinical examination findings, in retrospect, the 'squeaks' heard on examination are likely to have been Hamman's sign. This is crepitus heard in time with the heartbeat (rather than respiration), due to movement of air in the mediastinum.²

Conclusion

This case highlights how initial investigations may mislead the clinician, and must be correlated with a thorough history and clinical examination in order to make a clear and timely diagnosis.

Ethical Clearance- taken from institutional committee

Source of funding- Self

Conflict of Interest - Nil

References

1. Fujiwara H, Arita K, Yoshimi T et al. . A case of summer-type hypersensitivity pneumonitis with mediastinal and subcutaneous emphysema. *Nihon Kyobu Shikkan Gakkai Zasshi* 1988;26:1102-6. [PubMed] [Google Scholar]
2. Ichikawa Y, Tokunaga N, Kinoshita M et al. . Subcutaneous and mediastinal emphysema associated with hypersensitivity pneumonitis. *Chest* 1991;99:759-61. doi:10.1378/chest.99.3.759 [PubMed] [Google Scholar]
3. Koschel D, Handzhiev S, Cardoso C et al. . Pneumomediastinum as a primary manifestation of chronic hypersensitivity pneumonitis. *Med Sci Monit* 2011;17:CS152-5. doi:10.12659/MSM.882115 [PMC free article] [PubMed] [Google Scholar]

Vascular and Pathological Complications in Diagnosed Type 2 Diabetes Mellitus in ENT Patients

Harsimrat Singh¹, Hitesh Marwaha²

¹Senior Resident, Department of ENT, Adesh Institute of Medical Sciences, Bathinda

²Resident, Department of Pathology, Adesh Institute of Medical Sciences, Bathinda

How to cite this article: Harsimrat Singh, Hitesh Marwaha et al. Vascular and Pathological Complications in Diagnosed Type 2 Diabetes Mellitus in Ent Patients. Volume 13 Issue 3 July-September 2022

Abstract

Background and Objectives

India is claimed to be the diabetes capital of the world. Many studies had proven that persistent hyperglycemia and associated metabolic syndrome features like hypertension, dyslipidemia and obesity contribute to the development of vascular complications.

The present study aims to study the prevalence and clinical profile of microvascular and macrovascular complications in newly diagnosed type 2 diabetes mellitus patients.

Methods: The study is a clinical, prospective and observational study of 100 newly detected type 2 diabetics attending medicine department outpatient/ inpatient, hospital, dehradun, form the subject for the study August 2018 to July 2020 (24 months) who matched the inclusion criteria.

Results: In this, 62 were males and 38 were females and the mean age was 54.05±13.24 years. 44% were detected when they presented with multiple complications due to diabetes. Common complications which they presented were coronary artery disease (15%), infection (12%), stroke (6%), ulcers (4%), neuropathy (4%) and diabetic ketoacidosis (1%). The prevalence of macrovascular complications CAD, CVD and PAD was 26.0%, 8.0% and 11.0% respectively and microvascular complications retinopathy, nephropathy and neuropathy was 20.0%, 34.0% and 16.0% respectively. High incidence of complications especially microvascular and CAD occur with HbA1c of range >6.5. The correlation coefficient of FBS and PPBS in relation to HbA1c was 0.56 and 0.57 respectively.

Conclusion: Smoking, increased BMI and waist circumference is associated with increased prevalence of diabetes. There is high prevalence of coronary artery disease, retinopathy and nephropathy at diagnosis. HbA1c levels predict the prevalence of complications.

Keywords: Type 2 Diabetes mellitus, microvascular, macrovascular, HbA1c, CAD

INTRODUCTION

Diabetes mellitus is a common and a serious disease with chronic complications and constitutes a

substantial burden for both patient and health care system. In 2011, the global prevalence of diabetes was estimated at 366 million this figure is predicted to

Corresponding Author: Hitesh, Resident

Department of pathology

AIMSR

Aosp1011@gmail.com

8057421180

reach 552 million by 2030 as a consequence of longer life expectancy, sedentary life style and changing dietary patterns. The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030.^{1,2}

The onset of type 2 diabetes is often silent and insidious. Pathogenic processes causing type 2 diabetes range from autoimmune destruction of cells of pancreas with consequent insulin deficiency to abnormalities that result in resistance to insulin action. The asymptomatic phase of hyperglycemia accounts for the relatively high prevalence of complications at initial presentation.³

This study aims in assessing the prevalence and to study the clinical profile of macrovascular and microvascular complications in newly diagnosed type 2 diabetes mellitus patients. This will highlight the need for screening for complications at initial presentation irrespective of the presence or absence of symptoms of the complications. Early detection and intervention will reduce the morbidity and mortality due to the complications.

Materials and Method

Source of Data

Newly detected patients with type 2 diabetes mellitus attending department of medicine (outpatient/inpatient), form the subjects.

Design of the Study

Cross-sectional descriptive study

Duration of Study

August 2018 to July 2020 (24 months).

Inclusion Criteria

Newly diagnosed type 2 diabetes mellitus adult patients greater than 20 years of age were included for the study.

(Laboratory diagnosis of diabetes mellitus was confirmed by latest criteria laid by the American Diabetic Association. Blood glucose levels were checked on two separate occasions before the diagnosis of diabetes mellitus was made.)

Exclusion Criteria

1. Type 1 diabetes mellitus
2. Any other severe illness
3. Patients already diagnosed of diabetes mellitus and on treatment
4. Refusal to be a part of the study
5. Pregnancy

Sample Size

Hundred cases of newly diagnosed type 2 diabetes mellitus were included in this study.

Method of Collection of Data

Patients newly detected of type 2 diabetes mellitus attending medicine department outpatient/inpatient, SGRRIMSHS hospital, dehradun were included for the study.

History

- Demographic characteristics such as age and sex were recorded.
- Family history of diabetes was recorded.
- Symptoms suggestive of diabetes or of related complications were noted.
- Past history of hypertension and complications of diabetes was documented. Any previous treatment for these complications taken was recorded.
- Smoking or alcohol history was noted.
- Nutritional history was taken.

Examination

- On general physical examination, the level of consciousness of the patient, vital parameters such as pulse, blood pressure (in sitting and standing position) temperature and respiratory rate was recorded.
- Anthropometric measurements:
 1. Weight (In Kilograms) And Height (In Centimetres) Was Recorded.
 2. The Body Mass Index Was Determined By Dividing The Weight (In Kilograms) By Height (In Metres²).

3. Measurement of waist circumference (cm)

- It is measured just above the uppermost lateral border of the right iliac crest, a horizontal mark is drawn, and then crossed with a vertical mark on the midaxillary line. The measuring tape was placed in a horizontal plane around the abdomen at the level of this marked point on the right side of the trunk.

- Presence of skin infections, gangrene and ulcers was noted.
- Systemic examination was carried out in all patients.
- Presence of sensory neuropathy was defined by symptoms of tingling and numbness over the extremities (bilaterally symmetrical) with or without impaired touch, vibration sense or joint position sense. Presence of motor neuropathy was noted. Autonomic dysfunction in the form of resting tachycardia, orthostatic hypotension, gastroparesis/diarrhoea or abnormal sweating was noted. 10gm monofilament was used to note any reduced sensation due to neuropathy.
- Dilated pupil fundoscopy was carried out in all patients in conjunction with ophthalmologist and retinopathy was defined and graded as non proliferative diabetic retinopathy and proliferative retinopathy. Proliferative retinopathy was described by the presence of any retinal or optic disc neovascularisation, or the presence of preretinal or vitreous haemorrhage, whereas the presence of microaneurysms, exudates (lipid exudates or 'cotton-wool spots') and/or retinal haemorrhages only was defined as non-proliferative retinopathy.

Laboratory Investigations

- Fasting and postprandial blood sugars (venous blood samples drawn) on two separate occasions using glucose oxidase-peroxidase method.
- Renal function tests included blood urea, serum creatinine and urine analysis.
- Urine was analysed for glucose, ketone bodies and protein.
- Microalbuminuria was estimated by

nephelometry. Microalbuminuria is defined as a mean urine albumin concentration more than or equal to 25mg/ml by nephelometry on three consecutive days.

- Presence of diabetic ketoacidosis was confirmed by high blood sugars, ketonuria, and metabolic acidosis on arterial blood gas analysis.
- Fasting lipid profile included serum cholesterol, serum triglycerides, serum high density lipoprotein, and serum low density lipoprotein. Patient was termed to have dyslipidemia if LDL was more than 100mg/dl, serum cholesterol >200 mg/dl, serum HDL <40 or serum triglycerides >150mg/dl.
- A 12- Lead electrocardiogram and 2D echocardiography to note the presence of ischemia or infarction.
- Carotid doppler was done to note for presence of stenosis.
- Ankle- brachial index was determined using arterial doppler.

Results

In this present study, 62 % and 38% comprised of males and females respectively and male: female ratio was 1.6:1.

Patients age class were classified based on the mean and SD , as per the result the mean age of the patient was 54.05 ± 13.24 .Age group between 30-40 years mean age was

16 (36.68 ± 3.53 years, $p=0.002$); 41-51 yrs 31 (45.61 ± 3.20 , CI 5% , $45.61-46.50$, $P=0.523$); 52-62 years 28 (57.28 ± 2.44 , CI 95% $56.47-58.08$, $p=0.880$); 63-71 15 (67.47 ± 3.24 , CI 95%

$67.73-69.06$, $p=0.788$) and >72 years the mean age was $10(78.90 \pm 6.52$, CI 95% $74.41-83.38$, $p=0.698$) .The age group between 30-40 years were statistically significant and less prone to express diabetics and its complications.

The mean age of diabetics in this study was 54.05 ± 13.24 years. The youngest was 30 years and oldest was 95 years. The maximum incidence of diabetics was seen in 52-62 years and more chances of developing diabetes in older age group (52-62 years) and incidence were statistically significant $p < 0.05$.

Duration of smoking was analysed by using univariate analysis, the result showed that individuals with longer duration of smoking were more susceptible for diabetes and its complications. It was expressed that, the mean duration of smoking was 20.20 ± 3.56 years, $p=0.02^*$. We correlated duration of smoking with respect to the different age group of the patients. Between 1-15 years 10 (10.9 ± 1.91 years, median 8.0 and $p=0.65$); 10-21 years 09 (19.6 ± 1.26 years, median=16, $p=0.03$); 22-26 years 03 (24.00 ± 3.38 , median=22, $p=0.08$), and more than 26 years was 14 (28.07 ± 2.76 years, median=21, $p=0.01$).

Total 100 diabetics were considered for the study out of which 36 patients were smokers. The prevalence of diabetes among smokers is statistically significant ($p<0.05$) and positively correlated with duration and its complications ($r=0.64$).

Patients presented with symptoms suggestive of different complications of diabetes viz., CAD, CVD, PVD, retinopathy, nephropathy and neuropathy. History from the patients was recorded systematically by using structured questionnaires. The patients presented with complaints correlated with diabetics complications of coronary artery disease, cerebrovascular disease, peripheral artery disease, retinopathy, nephropathy and neuropathy. The result being that 15% of cases expressed coronary artery disease, 7% was cerebrovascular disease, 7% peripheral artery disease, 2% was retinopathy and neuropathy 7% respectively.

Hypertension is considered as the one of the determinants for associated complications of diabetics. BP ranges $<120/80$ was statistically significant and more associated with diabetics $p=0.02$, followed by BP ranges between $120/80-140/90$, $p=0.01$, $140/90-160/110$, $p=0.03$ respectively. BP $>160/110$ was statistically not significantly associated with diabetics. 46 and 19 cases had prehypertension and hypertension respectively.

Body mass index is a profounded parameter for the onset of diabetes and its complications. In India, 65% of the patients suffered from diabetes with associated risk factors. The present study documented that, BMI was considered as one of predictor's for the diagnosis of diabetics. Elevated BMI is more associated with diabetic complications. Study results showed that cases with BMI <18 was 4, $p>0.05$, $18.1-24.9$ was 24, $p<0.05$, $25-29.90$ 50, $p<0.05$ and more than 30 BMI was 22, $p<0.05$.

Distribution of waist circumference presented, males and females expressed the variations of waist circumference; between <80 cms was 11% ($p=0.88$), $80-90$ cms was 34.0% ($p=0.01$), $91-100$ cms was 38.0% ($p=0.02$) and >100 cms was 17.0% ($p=0.56$). The waist circumference class interval between 80-90 and 91-100cms was statistically significant and more prevailing for diabetics complications ($p<0.05$). Mean in males was 90.14 ± 9.83 and in females was 87.92 ± 8.86 cms.

Total cholesterol was raised in 13 cases and rest were within normal range. Significant p value <0.05 was noted in cases with total cholesterol less than 200. Cholesterol is an important hallmark parameter for development of diabetes and its complications. Elevated serum cholesterol level can cause various manifestations in diabetics. Present study documented between 150-200 mg/dl as 45 cases were seen, $p=0.002$ and it was expressed in both gender followed by 100-150 (27), $p=0.023$, <100 mg/dl was (15), $p=0.01$. The elevated serum cholesterol level was not statistically significant ($p>0.05$) with association of diabetes.

Fundus examination was done for all eligible patients, the study revealed that no changes were seen in 80 cases, NPDR was 19 cases and PDR was seen in only one cases.

Laboratory parameters was analysed by standard laboratory procedure, the present study showed microalbuminuria in 34 cases and it was statistically significant ($p<0.050$).

ECG expressed different variants myocardial infarction in (3.0%); left bundle branch block (3.0%); left ventricular hypertrophy (3%); old infarction (7.0%); ischemic changes (8.0%) and arrhythmias in (2.0%).

ABI scale was recorded by using standard operating guidelines of diabetics patients, the ABI was expressed the range between <0.70 was 7.0% $0.7-0.90$ was 12% and >0.90 was 81.0% respectively. 19% of cases had limb ischemia, out of which 7% had critical ischemia.

Out of the total 100 diabetics, 28 cases were detected on routine investigations, 28 were incidentally detected when they attended the hospital for other illnesses and rest of the 44 cases presented with multiple complications due to diabetes.

Out of 100 cases, patients presenting with complications suggestive of CAD was (15.0%,

$p=0.014$), CVD was (6.0%, $p=0.521$) PAD was (6.0%, $p=0.448$). Symptoms of neuropathy seen in 4.0%, $p=0.69$; infection in 12.0%, $p=0.033$ and DKA was seen in only one cases $p=0.896$. The CAD and infection were positively associated with diabetics and statistically significant ($p<0.05$).

Of 100 cases, macrovascular complications CAD, CVD and PAD were expressed 26.0%, 8.0% and 11.0% respectively and microvascular complications retinopathy, nephropathy and neuropathy was expressed 20.0%, 34.0% and 16.0% respectively. Higher prevalence and statistical significance ($p<0.05$) of presence of CAD, retinopathy and neuropathy at diagnosis was noted in this study.

The study results determine that CAD is positively associated with smoking ($p=0.002$). The prolonged duration of smoking >20 years emerged to express CAD. Present study has been compared with non smoking and it was found to be statistically non significant with diabetics associated complications ($p<0.05$).

The study results revealed that CAD is positively associated with hypertensive patients ($p=0.004$). More hypertensives express CAD complication than other complications. Present study has been compared with normotensive and it was found to be statistically non significant with diabetics associated complications ($p<0.05$).

HbA1c is an important predictor for development of complications. High incidence of complications especially microvascular occur with HbA1c of range 6.5-7.5 and also $>9.5\%$. In our study, correlation coefficient of FBS and PPBS in relation to HbA1c was 0.56 and 0.57 respectively.

Discussion

This is a study done over a period of 24 months in cases of newly detected type 2 diabetes mellitus attending the inpatient and outpatient department of SGRRIMSHS hospital.

The mean age of the diabetics in our study was 54.05 ± 13.24 years. The maximum incidence of diabetics was seen between 52-62 years.

In our study, 62 were males and 38 females with a male: female ratio of 1.63:1. In western study, ratio is 1.07:1 and in Sri Lankan study it is 1.63:1. This difference noted is probably due to illiteracy and

decreased turnover of females to hospital for routine and treatment purposes.

In our study, 36 cases of the 100 were smokers. In the study conducted by Drivsholm et al, 86% of men and 50% women were smokers.

Family history of Diabetes in our study was 2% and in Nambuya AP et al study was 16%. This variation is probably due to high illiteracy and lack of awareness of diabetes among the people.

In our study, correlation coefficient of FBS and PPBS in relation to HbA1c was 0.56 and 0.57 respectively. In DCCT, it was 0.82 and in a study conducted by Nathan et al it was 0.89. The relative contribution of postprandial PG decreased progressively from the lowest to the highest quintile of HbA1c. By contrast, the relative contribution of fasting PG showed a gradual increase with increasing levels of HbA1c.

Conclusion

- Prevalence of diabetes increases with age and preponderance of males in our study.
- Increased BMI and waist circumference is associated with increased prevalence of diabetes.
- Large proportion of population presented because of complications occurring due to diabetes- a silent killer.
- Screening for CAD, retinopathy and nephropathy at diagnosis was statistically significant.
- There is high prevalence which is statistically significant ($p<0.05$) of coronary artery disease (26%), retinopathy (20%) and nephropathy (34%) at diagnosis.
- Prevalence of CVD, PVD and neuropathy is 8%, 11% and 16% which is statistically insignificant.
- HbA1c levels predict the prevalence of complications.
- There is moderate correlation between HbA1c and blood glucose levels.
- Screening with simple tests such as ECG, ECHO, fundoscopy and urine microalbuminuria at diagnosis for all cases of diabetes is essential to identify the complications at an early reversible stage.

Ethical clearance- taken from institutional committee

Source of funding - Self

Conflict of Interest - Nil

References

1. Wild S, Roglic G, Green A. Global prevalence of diabetes. Estimates for the year 2000 and projections for 2030. *Diabetes care* 2004; 27(5): 1047-53.
2. *Diabetes atlas 2011*, 5th edition.
3. American Diabetes Association. Diagnosis and classification of diabetes mellitus. *Diabetes care* 2006; 29: S43-S48
4. Awad AM. History of diabetes mellitus, *Saudi Medical Journal*, Riyadh, Vol.23 2002: 373-378
5. Levine R, Krall L, Barnett D. The history of diabetes. In Kahn CR, Weir GC, eds, *Joslin's diabetes mellitus*, 13th ed. Philadelphia, Lea and Febiger, 1994: 1-14
6. Jaeger E. *BertrageZupathologie des Auges*, siete 33. Eien: KK Hofund and Staatsdruckerei 1855.
7. The Early Treatment of Diabetic Retinopathy Study Research Group. Photocoagulation for diabetic macular edema. Report No. 4. *IntOphthalmolClin* 1987; 265-272.
8. Darwin E. *Zoonomia or the laws of organic life*. 3rd edition.1801; Vol 1, Johnson, London.
9. Kimmelstiel P, Wilson C. Intercapillary lesions in glomeruli of the kidney. *Amj Path* 1936; 12:83-97.
10. Marchal de Calvi CJ. *Rechurches sur les accidents diabetiques*. P. Asselin, Paris 1864.
11. Party FW. Introductory address to the discussion on the clinical aspect of glycosuria. *Lancet* 1885; 2:1003-1035.

Role of Delayed Primary Skin Closure in Preventing Superficial Abdominal Wound Infections in Peritonitis Patients

Jadhav Parthasarathi¹, D Ravisundar², M Praveen³,
Santhosh Babu Chintakindi⁴

^{1,2,3}Assistant professor, Department of Surgery Government medical college Nalgonda

⁴Associate professor, Department of Surgery Government medical college Nalgonda

How to cite this article: Jadhav Parthasarathi, D Ravisundar, M Praveen, Santhosh Babu Chintakindi et al. Role of Delayed Primary Skin Closure in Preventing Superficial Abdominal Wound Infections in Peritonitis Patients. Volume 13 Issue 3 July-September 2022

Abstract

Background: The commonest complication encountered postoperatively is wound infection despite the use of prophylactic antibiotics and following meticulous surgical techniques. The rate of surgical site infection is higher in case of contaminated surgeries as compared to elective surgeries.

Objectives: To determine whether delayed primary skin closure of contaminated and dirty abdominal incisions reduces the rate of surgical site infections (SSI)(superficial abdominal) compared with primary skin closure.

Methods: 50 patients who were above 18 years of age, admitted to our hospital through the emergency department and underwent exploratory laparotomy for perforated viscera, and the intraabdominal collection was included in this study.

Results: The cause of perforation was, 8(32%) cases of perforated appendicitis, traumatic perforation(8), ileal perforation(5) and duodenal perforation(4). In group A 17(68%) patients had wound infection and 10 (40%) had wound infection in group B. The distribution of wound infection in each respective subgroup with p-value. There was significant difference in stitch abscess formation and wound discharge between two groups (p-value< 0.05) i.e., 7(28%) patients of group A, developed stitch abscess while 6 patients developed wound discharge. However, no patient in group B developed stitch abscess and wound discharge. 1(4%) patient developed erythema in group A, while it was none in any patients of group B.

Conclusion: Delayed primary closure is better than primary closure in minimizing wound infection. But all patients who were grouped in delayed primary closure who underwent secondary closure had to stay more in hospital which is not cost-effective

Keywords: Superficial, Peritonitis, Abdominal wound infections, Skin closure

Introduction

The commonest complication encountered postoperatively is wound infection despite the use of prophylactic antibiotics and following meticulous surgical techniques.¹ The rate of surgical site infection is higher in case of contaminated surgeries

as compared to elective surgeries. Surgical site infection (SSI) and its associated complications like wound dehiscence, stitch sinuses, incision hernias, hypertrophic scar, and keloid formation are not only a source of discomfort for the patients but also discouraging for the surgeon.² These complications prolong the postoperative stay of patient and

Corresponding Author : Santhosh Babu Chintakindi, Associate professor,

Department of Surgery Government medical college Nalgonda

Email: drsantosh@inbox.lv

increase the cost of treatment.³ Primary closure technique of wound closure is simple as wound is closed primarily and no other procedure is widely practiced, there is disagreement among surgeons regarding the preferred technique for wound closure after contaminated surgeries. The rate of abdominal wound infection ranges from 15-70% in contaminated and dirty wounds.⁴

In order to control and reduce the rate of SSI various wound closure techniques and prophylactic measures have been tried by the surgeons but had vague results. The short term and long term complications, morbidity of patients following DPC and PC in peritonitis patients in our hospital have been studied and compared with previous studies. This present study would like to evaluate advantages and disadvantages of each of these techniques with regard to surgical site infections. Primary closure of the wound is the commonly practiced method in which skin is closed after wound irrigation at the end of the procedure.⁵

The role of ergonomics -advantages, disadvantages, duration of hospital stay, subsequent surgeries, expenditure, and morbidity in this study is minimal as this study is being conducted in government hospital.

MATERIALS AND METHODS

Department and Setting: This comparative study was conducted in the department of surgery in all units of Osmania general hospital.

Sample type and size: 50 patients who were above 18 years of age, admitted to our hospital through the emergency department and underwent exploratory laparotomy for perforated viscera, and the intraabdominal collection was included in this study.

Inclusion Criteria: patients of age 16-65 years of age and of both sexes were diagnosed with peritonitis.

Exclusion Criteria: Patients who have been diagnosed with spontaneous bacterial peritonitis and death of patients within 14 days, immunosuppressed like cancer therapy, steroids, diabetes, malnutrition were excluded from the study.

Method of Study: Equal number of patients with the diagnosis of a perforated appendix, ileal perforation, duodenal perforation, and traumatic visceral were randomized into two groups. In the study group (Group A), primary closure technique

was used and in group B, delayed primary closure was utilized. During surgery, pus and abdominal secretions were taken for culture and sensitivity. The abdominal cavity was irrigated with 6 to 8 litres of normal saline. In group A, primary closure of the musculo-peritoneal layer was done and closed with prolene. The fascia was closed with proline and the skin was closed with interrupted prolene sutures. The wound was examined 48 hours post-operatively, followed by dressing. The stitches were removed on the 8th day. However, In group B of delayed primary closure, after the closure of Musculo peritoneal layers, the fascia and skin were sutured with loose prolene stitches and packed with iodine soaked gauze piece.

The stitches were removed in the 12th postoperative period. Empirically patients of both groups were given third-generation cephalosporin and metronidazole, these were changed accordingly depending upon thereof culture and sensitivity and continued for at least 10 days. All patients were followed for early postoperative complications like wound infection and late complications like wound dehiscence, stitch abscess, stitch sinus, wound gaping, Data related to causes of perforation and complications of contaminated surgery were collected in preformed format.

Statistical analysis: Data was entered in SPSS (statistical packages for social sciences) version 18 and frequencies, ratios, percentages were drawn for descriptive variables, and chi-square with p-value <0.5 has been calculated to see the significant difference between the two groups.

Observation and Results

Table 1: Distribution based on Gender

Gender	Group A	Group B	Total
Male	24	16	40
Female	1	9	10
Total	25	25	50

Male predominance was seen in both the groups. The Male female ratio of 2:1.

Table 2: Distribution based on Age group

Age Group	Group A	Group B	Total
15 - 20 yrs	2	2	4

Conti..Table 2 : Distribution based on Age group

Age Group	Group A	Group B	Total
21 – 30 yrs	13	11	24
31 – 40 yrs	5	6	11
41 – 50 yrs	4	3	7
51 – 60 yrs	1	3	4
Total	25	25	50

Majority of the patients belonged to the age group of 21 to 30 yrs, followed by 31 to 40 yrs. The Mean age was 33 ± 30 years.

Table 3: Distribution based on causes of peritonitis

Causes of peritonitis	Group A	Group B	Total
Perforated appendicitis	8	8	16
Traumatic perforation	8	8	16
Ileal perforation	5	5	10
Duodenal perforation	4	4	8
Total	25	25	50

The causes of peritonitis was, Perforated appendicitis and traumatic perforation was seen in 32% of the cases each, Ileal perforation was seen in 20% of the cases and duodenal perforation was seen in 16% of the cases.

Table 4: Distribution based on Causes of perforation

Causes of perforation	Group A n(%)	Group B n(%)	Total n(%)	p-value
Perforated appendicitis	5(62.5%)	4(50%)	9(56%)	0.573
Traumatic perforation	5(62.5%)	3(37.5%)	8(50%)	0.974
Ileal perforation	4(80%)	2(40%)	6(60%)	0.831
Duodenal perforation	3(75%)	1(25%)	4(50%)	0.589
Total	17(68%)	10(40%)	27(54%)	

The cause of perforation was, 8(32%) cases of perforated appendicitis, traumatic perforation(8), ileal perforation(5) and duodenal perforation(4). In group A 17(68%) patients had wound infection and 10 (40%) had wound infection in group B. The distribution of wound infection in each respective subgroup with p-value.

Table 5: Distribution based on Complications

Complications	Group A	Group B	Total	P-value
Stitch abscess	07(28%)	none	07(14%)	0.018
Stitch sinus	none	none	none	-
erythema	01(4%)	none	01(2%)	0.434
Serous discharge	06(24%)	none	06(12%)	0.033
Separation of deep tissue	05(25%)	02(8%)	07(14%)	0.590
Total	19(76%)	02(8%)	21(42%)	

There was significant difference in stitch abscess formation and wound discharge between two groups ($p\text{-value} < 0.05$) i.e., 7(28%) patients of group A, developed stitch abscess while 6 patients developed wound discharge. However, no patient in group B developed stitch abscess and wound discharge. 1(4%) patient developed erythema in group A, while it was none in any patients of group B.

Discussion

SSI can complicate nearly every operative intervention knowledge of the risk of infection, the microbiology of likely infections, and the effective preventive measures are necessary to minimize the potential for this complication in any individual patient SSI continues to be the most common complication following surgical procedures. These infections are the biological summation of several factors: the inoculums of bacteria introduced into the wound during the procedure, the unique virulence of contaminants, the microenvironment of each wound, and the integrity of the patient's host defense mechanisms.⁶

In the entire series, 33 patients developed wound infections. In the primary closure, the group wound infection rate was 54.4% while it was 12% in the delayed primary group. There was a significant difference between the 2 Groups regarding wound infection ($p < 0.001$). This study showed that Delayed primary closure was more suitable for wound management for contaminated or dirty wounds. The most common diagnosis was perforated appendix (27%) followed by ileal perforation (24%), prepyloric (16%), duodenal (18%). And also showed that the mean postoperative stay was 16.5 ± 5 in delayed primary group and 19.4 ± 5 in primary group $p < 0.002$. There is a significant association between type of wound closure and length of hospital stay.

The study conducted by Dutta Roy d, Jitendra j. et al demonstrated SSI developed after incision closure in 23% of patient's infections were significantly more common in the primary group (42.25% vs 2.57% for DPC; $p=0.00375$) and also mean length of hospital stay were longer after pc (18.52 days than DPC 13.86 days) Stephen m. Cohn, Giovanni Giannottia et al demonstrated that in dpc group wound infection rate was 12%, in pc group was 48%. The wound infection rate was greater in the pc group than DPC. The duration of the hospital stay and hospital charges was similar between the two groups.

Previous studies	Rate of wound infection	Hospital stay in days
Chiang et al ⁷	PC-38.9% DPC-2.9%	PC-6.3 DPC- 8.4
Duttaroy et al ⁸	PC42.25 DPC2.57%	PC-18.5 DPC- 13.8
Stephen M.cohn et al ⁹	PC-48% DPC-12%	Same hospital stay
Mukthar Ahmad et al ¹⁰	PC-39.2% DPC-6.3%	PC-18.4 DPC-12.5
This study	PC-76% DPC-2% Nil or 0% For SSI (2% in DPC is separation of deep tissue not included in SSI)	PC- 20 +/-5 DPC- 25 +/-5

Prevention of SSI can be achieved by several methods. The viable inoculums of bacteria in the wound can be reduced via better preoperative preparation of the surgical site, sound infection-control practice while performing operations and adherence to the principles of preventive antibiotic therapy. Modified surgical the technique can reduce the risk of hematoma, tissue injury, and Foreign bodies within the surgical site amplify the risk of infection for a given level of inoculums. Enhanced oxygen delivery, better core body temperature control, and rigorous blood glucose control in surgical patients are new areas that have the potential to even further reduce the rate of SSI. Although an SSI rate of zero may not be achievable, continued progress in understanding the biology of infection at the surgical site and consistent applications of proven methods of prevention will allow us to further

reduce the frequency, cost, and morbidity associated with SSI. Along with broad-spectrum antibiotics and keeping the skin open for a few days to settle down the intra- abdominal infections and then going for secondary closure of skin have brought down the SSI dramatically.

Limitations

- Randomization was not possible due to intension to observe equal number of patients with identical aetiology.
- Sample size was very small with respect to individual group.
- However, the disadvantages of allowing exogenous bacteria such as staphylococci to contaminate the wound in ward before closure have been recognized.

Conclusion

Delayed primary closure is better than primary closure in minimizing wound infection. But all patients who were grouped in delayed primary closure who underwent secondary closure had to stay more in hospital which is not cost-effective, but being government hospitals and patients do have all services free of cost here, there will be less burden on patients. So present study recommends DPC as a preferential mode of skin closure in laparotomy wounds than pc in government setup like because of minimal complications. But in the private sector where ergonomics play a major role in the socio-economic condition of patient DPC proves to be costly, this study would recommend conventional pc for skin closure in laparotomy wounds than DPC in private sector hospitals.

Ethical Clearance: Ethical clearance was obtained from Government Medical College, Nalgonda, prior to the commencement of the study

Source of funding: Self.

Conflict of interest: Nil

References

1. Hedrick TL, Sawyer RG, Hennessy SA, Turrentine FE, Friel CM. Can We Define Surgical Site Infection Accurately in Colorectal Surgery? *Surgical Infect* 2014;15(4):372-6.

2. Haridas M, Malangoni MA. Predictive factors for surgical site infection in general surgery. *Surgery* 2008;144(4):496-503.
3. Greisman HC. Wound management and medical organization in the Civil War. *The Surgical clinics of North America*. 1984;64(4):625-38.
4. Fukuda H, Morikane K, Kuroki M, Kawai S, Hayashi K, Ieiri Y, et al. Impact of surgical site infections after open and laparoscopic colon and rectal surgeries on postoperative resource consumption. *Infection* 2012;40(6):649-59.
5. Kusachi S, Kashimura N, Konishi T, Shimizu J, Kusunoki M, Oka M, et al. Length of stay and cost for surgical site infection after abdominal and cardiac surgery in Japanese hospitals: multi-center surveillance. *Surg Infect (Larchmt)* 2012;13(4):257-65.
6. Andersson AE, Bergh I, Karlsson J, Nilsson K. Patients' experiences of acquiring a deep surgical site infection: an interview study. *Am J Infect Control* 2010;38(9):711-7.
7. Chiang RA, Chen SL, Tsai YC. Delayed primary closure versus primary closure for wound management in perforated appendicitis: a prospective randomized controlled trial. *J Chin Med Assoc*. 2012 Apr;75(4):156-9.
8. Duttaroy DD, Jitendra J, Duttaroy B, Bansal U, Dhameja P, Patel G, et al. Management strategy for dirty abdominal incisions: primary or delayed primary closure? A randomized trial. *Surg Infect (Larchmt)* 2009;10(2):129-36.
9. Stephen M Cohn, Giovanni Gianotti, et al. Prospective Randomized Trial of Two Wound Management Strategies for Dirty Abdominal Wounds. *ANNALS of Surgery*, Vol. 233, No. 3, 409 -413
10. Mukhtar Ahmed, Kishwar Ali et al. Comparison of Primary Wound Closure with Delayed Primary Closure in Perforated Appendicitis. *J Ayub Medical College Abbottabad* 2014;26(2):153-157

Role of Radiology in Mucormycosis: Recent Update

Kushpreet Kaur¹, Sandeep Singh², Harsimrat Singh³, Mandeep Kour⁴

¹Post graduate, Department of Radiology, Index medical College, Indore, M.P

²Demonstrator, Department of Pathology, GMC khandwa, M.P.

^{3,4}Senior Resident, Department of Otolaryngology, AIMSR

How to cite this article: Kushpreet Kaur, Sandeep Singh, Harsimrat Singh³, Mandeep Kour et al. Role of Radiology in Mucormycosis: Recent Update. Volume 13 Issue 3 July-September 2022

Abstract

The purpose of this study was to describe common radiographic patterns that may be useful in predicting the diagnosis of rhinocerebral mucormycosis. **Methods:** We retrospectively evaluated the imaging and clinical data of four males and one female, 3 to 72 years old, with rhinocerebral mucormycosis. **Results:** All the patients presented with sinusitis and ophthalmological symptoms. Most of the patients (80%) had isointense lesions relative to brain in T1-weighted images. The signal intensity in T2-weighted images was more variable, with only one (20%) patient showing hyperintensity. A pattern of anatomic involvement affecting the nasal cavity, maxillary sinus, orbit, and ethmoid cells was consistently observed in all five patients (100%). Our series demonstrated a mortality rate of 60%. **Conclusion:** Progressive and rapid involvement of the cavernous sinus, vascular structures and intracranial contents is the usual evolution of rhinocerebral mucormycosis. In the context of immunosuppression, a pattern of nasal cavity, maxillary sinus, ethmoid cells, and orbit inflammatory lesions should prompt the diagnosis of mucormycosis. Multiplanar magnetic resonance imaging shows anatomic involvement, helping in surgery planning. However, the prognosis is grave despite radical surgery and antifungals.

Keywords: Rhinocerebral Mucormycosis, Imaging Findings, MRI, Neuroradiology

Introduction

Rhinocerebral mucormycosis is an acute, fulminant, and often lethal opportunistic infection typically affecting diabetic or immunocompromised patients.¹ It is caused by one of the members of the mucoraceal family, including *Absidia*, *Mucor*, and *Rhizopus*.² Clinically, presenting symptoms are nonspecific including headache, low-grade fever, facial swelling, and orbital or paranasal sinus syndrome. After infection of the nasal cavity and paranasal sinuses, the fungi cause a necrotizing vasculitis that extends

rapidly into deep face, orbits, cranial cavity, and brain through skull base partitions and foramina.² When limited involvement of the paranasal sinuses is present, survival rates are between 50% and 80%.³ However, when brain invasion has occurred, mortality is greater than 80%. Because of its lethal nature, it must be recognized early and treated aggressively. We retrospectively reviewed the neuroimaging findings in a series of five patients with rhinocerebral mucormycosis to establish common radiographic patterns that may be useful in predicting the diagnosis of this infection.

Corresponding Author : Khuspreet Kaur

Post Graduate

Department of radiology

Index medical college, indore

Dr.sandeepsingh88@gmail.com

8770195036

Methods

We evaluated the imaging and clinical data of four males and one female, 3 to 72 years old, with mucormycosis of the craniofacial areas. Patients were selected for study if the diagnosis of mucormycosis was established by means of biopsy, culture, or autopsy, and computed tomography (CT) scans or magnetic resonance (MR) images were available for review. All the patients were immunosuppressed. Two had diabetes mellitus, and four had hematologic conditions and concomitant immunocompromised states. All patients had MR imaging with a 1.5-T system. Both T1- and T2-weighted images were obtained as well as T1-weighted images after intravenous injection of gadopentetate dimeglumine (0.1 mmol/kg). Four patients had CT scans available for review.

Images were evaluated for density, signal intensity, and contrast enhancement characteristics. The CT density was evaluated in non-enhanced images and compared with muscle/brain. The MR signal intensity was compared with gray matter on the T1- and T2-weighted images. Gadolinium enhancement was graded on a scale from none to marked. All studies were reviewed by two neuroradiologists (DAH, ABD), and the anatomic structures involved by the infection were defined by consensus. Clinical information about the presentation, management, and evolution of disease was obtained from medical history in all cases.

Results

Clinical Presentation

All the patients presented with sinusitis and ophthalmological symptoms. Three patients (60%) had clinical symptoms of cavernous sinus involvement including diplopia/ophthalmoplegia and facial pain/numbness.

Computed Tomography Findings

Of the four patients who had CT scans available for review, 3 (75%) had isodense to muscle/brain lesions. Only one patient (25%) had hyperdense lesions relative to muscle/brain in the noninvasive portion suggesting secondary obstructive changes (inspissated secretions).

Magnetic Resonance Imaging Signal Intensity

Most of the patients (80%) had isointense lesions relative to brain in T1-weighted images. The signal intensity in T2-weighted images was more variable, with only one (20%) patient showing hyperintensity. The rest of the lesions were either hypointense or isointense in long retention time images.

Enhancement Pattern

One patient (20%) didn't have enhancement of his inflammatory process after the administration of gadolinium. Two patients (40%) had variable enhancement, with mixed non-enhancing and marked enhancing portions of their inflammatory lesions. One patient (20%) had mild enhancement and the remaining patient (20%) had no enhancement at all. Dural enhancement was observed in two patients (60%) and mixed leptomenigeal and pachymeningeal enhancement was present in another patient (20%).

Clinical Evolution

Orbital exenteration, ethmoidectomy, medial maxillectomy, and debridement of the nasal vault were performed in all patients. More extensive debridement of necrotic tissue was performed as required in each particular case according to surgical findings. All patients received amphotericin-B locally and parenterally. Two patients (40%) recovered, while three patients (60%) expired.

Discussion

Mucormycosis, also known as zygomycosis and phycomycosis, was first described by Paulltauf in 1885.⁴ Phycomycetes are ubiquitous fungi occurring in soil, air, skin, body orifices, manure, spoiled food, and dust.^{5,6} Inoculation occurs by inhalation, when spores reach the nasal cavity and/or nasopharynx. The fungus may then spread to the paranasal sinuses and subsequently to the orbit, meninges, and brain by direct extension.⁷ Orbital involvement results from spread through the nasolacrimal duct and medial orbital wall. Such invasion is facilitated by the thinness of the lamina papyracea, congenital dehiscence often present along the medial wall, and the perforations of the medial wall by arteries and veins.^{8,9} Mucormycosis invades the walls of the blood vessels resulting in vascular occlusion, thrombosis,

and infarction, as well as dissemination to the central nervous system from the primary focus.^{5,10,11} Spread to the brain may occur via the orbital apex, orbital vessels, or via the cribriform plate.¹² Generally, the presenting symptoms are low-grade fever, cephalgia, sinusitis, facial swelling, orbital apex syndrome with blurred vision, and cranial palsies from cavernous sinus involvement in an immunocompromised patient.^{13,14,15} Early visual loss would favor the diagnosis of rhino-orbital-cerebral mucormycosis over bacterial cavernous sinus thrombosis in which blindness is a much later finding.

We found that MRI signal intensity of mucormycosis lesions tends to be isointense or hypointense in all sequences. After the administration of gadolinium the lesions had variable enhancement patterns ranging from homogeneous to heterogeneous or non-enhancing at all. We think that contrast-enhanced T1-weighted images are helpful in delineating the intracranial spread when meningeal enhancement is present as well as in identifying invasion of the cavernous portion of the internal carotid artery by the disease. This had been previously described by Mohindra and associates who showed that MRI can detect cavernous sinus invasion and vascular complications such as ischemia.

Conclusions

Progressive and rapid involvement of the cavernous sinus, vascular structures, and intracranial contents is the usual evolution of rhinocerebral mucormycosis. Multimodality imaging is helpful in prompting an early diagnosis when a pattern of nasal cavity, maxillary sinus, ethmoid cells, and orbit inflammatory process is present, especially when iso- or hypointense lesions are observed. Multiplanar MRI shows anatomic involvement, which helps in surgery planning. However, the prognosis is grave despite radical surgery and antifungals.

Ethical clearance- Taken from ethical committee of institution

Source of funding- Self

Conflict of Interest – Nil

References

1. Rumboldt Z, Castillo M. Indolent intracranial mucormycosis: case report. *AJNR Am J Neuroradiol.* 2002;23:932-934. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]

2. Chan L L, Singh S, Jones D, et al. Imaging of mucormycosis skull base osteomyelitis. *AJNR Am J Neuroradiol.* 2000;21:828-831. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
3. Anselmo-Lima W T, Lopes R P, Valera F C, et al. Invasive fungal rhinosinusitis in immunocompromised patients. *Rhinology.* 2004;42:141-144. [[PubMed](#)] [[Google Scholar](#)]
4. Paulltauf A. Mycosis mucorina. *Virchows Arch.* 1885;102:543. [[Google Scholar](#)]
5. Naussbaum E S, Holl W A. Rhinocerebral mucormycosis: changing patterns of disease. *Surg Neurol.* 1994;41:152-156. [[PubMed](#)] [[Google Scholar](#)]
6. Hopkins M A, Treloar D M. Mucormycosis in diabetes. *Am J Crit Care.* 1997;6:363-367. [[PubMed](#)] [[Google Scholar](#)]
7. Kohn R, Helper R. Management of limited rhino-orbital mucormycosis without exenteration. *Ophthalmology.* 1985;92:1440-1443. [[PubMed](#)] [[Google Scholar](#)]
8. Abramson E, Wilson D, Arky R A. Rhinocerebral phycomycosis in association with diabetic ketoacidosis. *Ann Intern Med.* 1967;66:735-742. [[PubMed](#)] [[Google Scholar](#)]
9. Rangel-Guerra R A, Martinez H R, Saenz C, et al. Rhinocerebral and systemic mucormycosis: clinical experience with 36 cases. *J Neurol Sci.* 1996;143:19-30. [[PubMed](#)] [[Google Scholar](#)]
10. Thajeb P, Thajeb T, Dai D. Fatal strokes in patients with rhino-orbital-cerebral mucormycosis and associated vasculopathy. *Scand J Infect Dis.* 2004;36:643-648. [[PubMed](#)] [[Google Scholar](#)]
11. Ochi J W, Harris J P, Feldman J I, et al. Rhinocerebral mucormycosis: results of aggressive surgical debridement and amphotericin B. *Laryngoscope.* 1988;98:1339-1342. [[PubMed](#)] [[Google Scholar](#)]
12. Sheman D D. *Orbital Anatomy and Its Clinical Applications.* Philadelphia, PA: Lippincott-Raven; 1992. pp. 1-26.
13. Gamba J L, Woodruff W W, Djang W T, et al. Craniofacial mucormycosis: assessment with CT. *Radiology.* 1986;160:207-212. [[PubMed](#)] [[Google Scholar](#)]
14. Terk M R, Underwood D J, Zee C, et al. MR imaging in rhinocerebral and intracranial mucormycosis with CT and pathologic correlation. *Magn Reson Imaging.* 1992;10:81-87. [[PubMed](#)] [[Google Scholar](#)]
15. Harril W C, Stewart M G, Lee A G, et al. Chronic rhinocerebral mucormycosis. *Laryngoscope.* 1996;106:1292-1297. [[PubMed](#)] [[Google Scholar](#)]

Water, Sanitation and Hygiene Status in the Schools of a District in Karnataka

Malingu¹, Pallavi Sarji Uthkarsh^{2*}, Gangaboraiah³

¹MPH Scholar, Department of public health, Rajiv Gandhi Institute of Public Health and Center for Disease Control, Rajiv Gandhi University of Health Sciences, 4th T Block East, Jayanagar, Bengaluru, Karnataka.

²Faculty, Department of Preventive and Social Medicine, Bengaluru, Karnataka.

³Statistician, Rajiv Gandhi Institute of Public Health and Center for Disease Control, Rajiv Gandhi University of Health Sciences, 4th T Block East, Jayanagar, Bengaluru, Karnataka.

How to cite this article: Malingu, Pallavi Sarji Uthkarsh, Gangaboraiah et al. Water, Sanitation and Hygiene Status in the Schools of a District in Karnataka. Volume 13 Issue 3 July-September 2022

Abstract

Background: Safe water, Sanitation and hygiene practices is one of the cost effective way to prevent diseases but open defecation is one of the major public health challenge in India in order to create healthy environment and awareness regarding safe sanitation and hygiene practices at primary school level Government of India implemented WASH(water, sanitation and hygiene) programme throughout the country. **Methods:** A cross sectional study was conducted at 80 schools of Tumakuru district where schools were selected based on multistage sampling technique to assess the WASH activities. Data was analyzed using SPSS version 20. **Conclusion:**Majority of the schools had gender based toilet facility and hand washing facility but lacked soaps for hand wash. Less than one third of school displayed sanitation and hygiene charts and provided filtered water for drinking purposes. Majority of the schools had satisfactory WASH facilities but in terms of monitoring and supervision of hygiene activities but behavioural change activities were found to be average.

Keywords: School-health, Government schools, Health promotion, Hygiene promotion, Sanitation, WASH. Menstrual hygiene management.

Introduction

Unsafe water, poor sanitation, and hand hygiene are responsible for 8, 29, 000 annual deaths globally¹ Whereas in India, 15.5% of total deaths in the year 2016 were due to diarrhea, lower respiratory and other common infectious diseases in India. Karnataka state reported 23.7% of deaths reported in the age group of 0-14 were due to diarrheal diseases, lower respiratory diseases and others.² In India, 40% of population practices open defecation.³ As per ICMR report open defecation, is responsible for 4.6% of the

disease burden through diarrheal diseases and other infections in India.² Safe sanitation hygiene practices acts as a primary barrier for such infections.⁴

Where sanitation and hygiene promotion are one of the components of health promotion and it is cost effective strategy⁵ to eradicate open defecation by creating awareness through education about safe sanitation and hygiene practices and to make every child as an agent to promote sanitation and hygiene in their family and community.

As its commitment to achieve Sustainable

*Corresponding Author : Pallavi Sarji Uthkarsh

233, West of Chord road, 2nd A main, Rajajinagar, Bangalore -86

Email ID: pallavisarji@yahoo.com

development goal 6, Government of India (GOI) started WASH (Water, sanitation and hygiene) programme⁶ on 14th August 2015, the GOI declared 100% sanitation coverage in all schools of India.⁷ Current study aimed to assess the status of WASH infrastructure, hygiene and sanitation promotion activities in selected government schools of a district in Karnataka state.

Materials and Methods

A cross sectional study was done in four Taluks of Tumakuru district of Karnataka state from July 2018 to December 2018 after obtaining an institutional ethical committee approval. Multi stage sampling techniques was used to select schools. In the first stage, four taluks out of ten were selected based on convenient sampling technique. In the second stage, from each taluk one hobli was selected conveniently. In the third stage all the government upper primary schools which had co-education coming under the

selected hobli was prepared and 20 schools from each hobli i.e, total 80 schools (20 urban and 60 rural) were selected using a simple random sample technique. Data was collected using a standard observational check list of "Swachh Vidyalaya Puraskar 2017-18. Data was entered in a SPSS software and analyzed using a version 20.

Results

Among 20 urban schools studied only 6(30%) schools were providing filtered and packed water. Out of which 3 schools (50%) were providing < 1.5 liters water/day/student and 33.3 % of schools used container without the tap to store the water. Whereas in 60 rural schools, 25(41.7%) of them were providing filtered and packed water for students, out of which only 20(51.2%) schools providing > 1.5 liters water/day/student and 34(87.2%) schools used container with tap to store the water (table 1)

Table 1: Availability of drinking water facility in school

Indicator	Variable	Urban	Rural	Total
Source of drinking water N=20(for urban) N=60(for rural)	Students bring drinking water from home	14(70.0)	21(35.0)	35(43.8)
	Water storage cement tank within the school premises.	0(0.0)	14(23.3)	15(18.8)
	Filtered/ packaged water provided by the school	6(30.0)	25(41.7)	30(37.5)
N= 6 for urban and N=39 for rural, total=45(applicable only for schools Which had drinking water source)				
Quantity of drinking water available/day/student	Less than 1.5 litres per student per day	3(50.0)	19(48.8)	22(48.9)
	>1.5 litres/person per day throughout the year	3(50.0)	20(51.2)	23(51.1)
	Not applicable	14(70.0)	21(35.0)	35(43.8)
Method of storage	Container without tap	2(33.3)	5(12.8)	7(15.5)
	Container with tap	4(66.7)	34(87.2)	38(84.5)
	Not applicable	14(70.0)	21(35.0)	35(43.8)
Quality of water	No testing	3(50.0)	19(48.8)	22(48.9)
	Tested once in a year	3(50.0)	20(51.2)	23(51.1)
	Not applicable	14(70.0)	21(35.0)	35(43.8)

(column percentages are mentioned in the parenthesis)

Availability Accessibility and safety of toilet facilities

Nearly 89% Co-education schools had at least one toilet unit each for boys and girls. Only 32% of schools in urban and rural area had separate toilet for teachers. Majority (83%) of both rural and urban schools didn't

have toilets that are accessible by CWSN. Height and size of toilet and urinal facilities in all the rural and urban schools were suitable for all age groups. Where as 76% of rural schools toilets had door with latch/bolt and in 13.3% of rural schools didn't have proper door with latch and bolt and 5% of them lacked roof

and proper ventilation and natural light .None of the schools in urban and rural area had separate dustbins

with lid facility for disposal of sanitary waste and facilities for the treatment of sanitary waste(table 2).

Table 2. Accessibility and safety of toilet facilities

Indicator	Variable	Urban	Rural	Total
Height and size of toilet and urinal facilities suitable for all age groups	Yes	20(100.0)	60(100.0)	80(100.0)
	No	0(0)	0(0)	0(0)
All Toilets with secure door with latch and cloth hanging hooks	1. No	0(0)	8(13.3)	8(10.0)
	2. Door with latch/ bolt only	20(100.0)	46(76.7)	66(82.5)
	3. Door with latch/ bolt and cloth hanging hooks	0(0)	6(10.0)	6(7.5)
All Toilets with roof and proper ventilation for natural light and air	Yes	20(100.0)	57(95.0)	77(96.3)
	No	0(0)	3(5.0)	3(3.7)
separate dustbins with lid for disposal of sanitary waste	Yes	0(0)	0(0)	0(0)
	No	20(100.0)	60(100.0)	80(100.0)
Facility for disposal of sanitary waste(treatment/ disposable option)	Yes	0(0)	0(0)	
	No	20(100.0)	60(100.0)	80(100.0)

Hygiene Facilities in Schools

All rural and urban schools had hand washing facilities at accessible height to all children of all age group. There was a shortage in teachers trained

in sanitation and hygiene education but the Child cabinet member were taking active role in promotion of sanitation and hygiene in urban and rural areas by involving in cleaning of school premises, class rooms , teaching areas and toilets. (table 3)

Table 3. Supervision of Hygiene Practices

Indicator	Variable	Urban	Rural	Total
Two teachers trained in sanitation and hygiene education	Yes	0(0)	0(0)	0(0)
	No	20(100.0)	60(100.0)	80(100.0)
Do Child cabinet members taking active role in promotion of sanitation and hygiene	Yes	15(75.0)	42(70.0)	57(71.2)
	No	5(25.0)	18(30.0)	23(28.8)
Supervises the cleaning and maintenance of toilet	1. No one in particular	5(25.0)	18(30.0)	23(28.8)
	2. Team of teachers, staff and child cabinet members	15(75.0)	42(70.0)	57(71.2)
Supervises the hand washing of students before MDM(mid day meal)	1. No one in particular	0(0)	12(20.0)	12(15.0)
	2. Teacher/ staff member	20(100.0)	48(80.0)	68(85.0)

Operation, maintenance of WASH services and capacity building activities

Nearly 90% of the urban and 86.7% of the rural schools were disposing liquid waste to drain. Total 10% urban and 13.3% rural schools didn't have any specific measures to dispose the liquid waste, whereas separated solid organic waste in some of urban schools and in majority of rural schools were handed over to the farmers even though it is required to kitchen garden. The staff incharge mentioned that sustainability and maintenance of kitchen garden was difficult to lack of improper compound wall/barrier facility around the schools.

In all rural and urban school classrooms and teaching areas been cleaned daily. Only 10% of the urban and 16.0% rural school premises were not cleaned daily and had water logging issues. Nearly 30% of schools did not clean their toilets on a regular basis. Majority of the schools were providing awareness on hand washing with soap in the daily morning and assembly clubs. Nearly half of the schools were imparting menstrual hygiene education at least once in 3 months and majority lacked display materials on sanitation and hygiene.

Discussion

In the current study it was found that 37% of the schools were providing filtered water for drinking. Only 18 % schools were depended on common source for drinking and washing purpose. Majority (81%) of rural and urban schools didn't have toilets that are accessible by CWSN where as a study conducted by water aid of India in 9 states and 453 schools and 34 districts of India found that 32% schools had separate facility for children with special needs(CWSN) (32%(12.5%) schools had Wash basin/taps for hand washing either inside or attached to every toilet unit for hand wash after the toilet.

Current study also found that all the schools had child cabinet members and in nearly 75% of the schools child cabinet members were taking active role in promotion of sanitation and hygiene in schools. Which is really a good progress towards creation of sanitation agents to achieve SDG 6, a study in a similar setting in Tanzania schools 80% of schools had active School Health Club (SHC),⁶ and a study conducted in south western Nigeria in public schools found that hygiene education and promotion was found to be poor because none of the schools had sanitation club.⁸

In current study nearly 75% of the schools were providing awareness on sanitation and hygiene in daily morning assembly clubs where as, in 45% of the schools are providing MHM(menstrual hygiene management) education at least once in 3 months and 77.5 % of the schools Conducted Cultural compilation programmes on sanitation and hygiene. Only 21.3% of the schools displayed sanitation and hygiene chart in the school similar to a study conducted in the schools of Tanzania, where 70% of schools promoted hygiene and sanitation by conducting cultural programme and competitions on sanitation and hygiene (either in community or in the schools involving parents⁹ but a study conducted in south western Nigeria in public schools found that frequency of hygiene education was found to be very less (hygiene talk was given once in a term) and frequency of conducting education programme on menstrual hygiene management was very less.⁸

In majority of schools drinking water facility was found be average where sanitation and hygiene facilities was satisfactory. In terms of operation and maintenance of sanitation and hygiene facilities was found to be not up to the mark.

Ethical Clearance

Ethical clearance obtained from RGIPH & CDC ethical committee.

Source of funding

Nil

Conflict of interest

No conflict of interest

References

1. Mortality and burden of disease from water and sanitation [Internet]. World Health Organization. 2016 [cited 5 January 2019]. Available from: https://www.who.int/gho/phe/water_sanitation/burden/en/
2. India: Health of the Nation's States, The India State-Level Disease Burden Initiative. Delhi, India: Indian council of medical research, public health foundation of India, institute for health metrics and evaluation; 2018 p. 65,127,130.
3. Poirier,P.UNICEF's game plan to end open defecation. www.unicef.org. Accessed 5Jan. 2019. https://www.who.int/gho/phe/water_sanitation/burden/en/

- unicef.org/media/91316/file/Game-plan-to-end-open-defecation-2018.pdf
4. The Director, Total Sanitation Campaign Ministry of Drinking Water and Sanitation Government of India. Ecological Sanitation Practitioner's Handbook. New Delhi-110003: The Director, Total Sanitation Campaign Ministry of Drinking Water and Sanitation Government of India; 2011 p. 5,6,7.
 5. Mills, J. E., Cumming, O. The Impact of WASH on Key Health & Social Outcomes - Review of Evidence. 2016. SHARE/UNICEF. Accessed on 5th Jan 2019. <https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/2780>
 6. Ministry of Human Resource Development, Government of India. Swachh Bharat Swachh Vidyalaya Government of India Ministry of Human Resource Development A National Mission Clean India: Clean Schools A Handbook. Delhi, India. Ministry of Human Resource Development; 2014 p. 2,4,5.
 7. An assessment of school WASH Infrastructure and hygiene behavior in nine states Status of School WASH two years after the Swachh Vidyalaya Abhiyan [Internet]. Wateraidindia.in. 2015 [cited 30 December 2018]. Available from: <http://wateraidindia.in/wp-content/uploads/2016/10/School-Wash-Report-WEB.pdf>
 8. Olukanni DO. Assessment of wash program in public secondary schools in South-Western Nigeria. ARPN Journal of Engineering and Applied Science. 2013;8(3):222.
 9. Antwi-Agyei P, Mwakitalima A, Seleman A, Tenu F, Kuiwite T, Kiberiti S, Roma E. Water, sanitation and hygiene (WASH) in schools: results from a process evaluation of the National Sanitation Campaign in Tanzania. Journal of Water Sanitation and Hygiene for Development. 2017 Feb 14:washdev2017159.

Relationship between Hypothyroidism and Non-Alcoholic Fatty Liver Disease: A Systematic Review and Meta-analysis

Manvi Sharma¹, Mayank Nangru², Godbole Manas Shailesh³

¹Resident, Department of Medicine, MMIMSR, Mullana, Ambala

²Post Graduate Student, Department of Pathology, BPS GMC(W), Khanpur Kalan, Sonapat Haryana

³Resident, Department of Medicine, MMIMSR, Mullana, Ambala

How to cite this article: Manvi Sharma, Mayank Nangru, Godbole Manas Shailesh et al. Relationship between Hypothyroidism and Non-Alcoholic Fatty Liver Disease: A Systematic Review and Meta-analysis. Volume 13 Issue 3 July-September 2022

Abstract

Background: Previous studies propose that hypothyroidism might play a crucial role in the pathogenesis of non-alcoholic fatty liver disease (NAFLD), but findings from published studies on the relationship between hypothyroidism and NAFLD are still controversial. Our study aimed to make a comprehensive evaluation of the relationship between hypothyroidism and NAFLD through a meta-analysis.

Methods: The pooled odds ratios (ORs) with 95% confidence intervals (95% CIs) were calculated to evaluate the strength of the relationship between hypothyroidism and NAFLD through meta-analysis.

Results: Thirteen articles were ultimately included in our meta-analysis. Meta-analysis of the 13 studies found a high correlation between hypothyroidism and NAFLD (OR = 1.52, 95% CI 1.24-1.87, $P < 0.001$). Meta-analysis of 9 studies providing adjusted ORs found that hypothyroidism was independently correlated with NAFLD (OR = 1.72, 95% CI 1.32-2.23, $P < 0.001$). Subgroup analysis found that both overt hypothyroidism and subclinical hypothyroidism were significantly correlated with NAFLD, and the pooled ORs were 1.70 (95% CI 1.23-2.36, $P = 0.002$) and 1.40 (95% CI 1.10-1.77, $P = 0.006$), respectively. Besides, meta-analysis of studies providing adjusted ORs also found that both overt hypothyroidism and subclinical hypothyroidism were independently correlated with NAFLD, and the pooled ORs were 1.81 (95% CI 1.30-2.52, $P < 0.001$) and 1.63 (95% CI 1.19-2.24, $P = 0.002$), respectively.

Conclusion: The meta-analysis provides strong epidemiological evidence for the relationship between hypothyroidism and NAFLD. Both individuals with subclinical and overt hypothyroidism are at higher risk for NAFLD than euthyroid subjects.

Keywords: hypothyroidism, euthyroid, non alcoholic fatty liver

Introduction

The prevalence of non-alcoholic fatty liver disease (NAFLD) has increased substantially during the past decades, and it has become the leading cause

of liver disease worldwide, which may be partly attributed to the rising prevalence of obesity ⁽¹⁾. NAFLD is a chronic liver disease defined as hepatic accumulation of fat in the absence of excess alcohol consumption and not only insulin resistance (IR)

Corresponding Author : Manvi Sharma

Resident

department of medicine,

MMIMSR Mullana , Ambala

maanvi3094sharma@gmail.com

9671414636

but also genetic predisposition play a key role in its pathogenesis. NAFLD can be divided into two main histological categories, namely nonalcoholic fatty liver and nonalcoholic steatohepatitis, which is the progressive subtype of NAFLD and can further induce liver cirrhosis and hepatocellular carcinoma⁽²⁾. An increasing number of diseases have been reported to be linked to NAFLD, such as cardiovascular disease, type 2 diabetes, chronic kidney disease, and cancer⁽³⁻⁵⁾. The prevention and treatment of NAFLD have become the focus of medical research in recent years, and identifying the risk factors for NAFLD is critical to develop effective preventive interventions against NAFLD.

Hypothyroidism is a common disease of the endocrine system that affects lifelong health. The physiological role of the thyroid gland has been taken seriously by many scholars, not just because of the critical role of thyroid hormones in cell metabolism and energy homeostasis⁽⁶⁾ but also for the more important fact that thyroid dysfunction is associated with numerous diseases⁽⁷⁾. Hypothyroidism comprises subclinical hypothyroidism and overt hypothyroidism. Subclinical hypothyroidism is considered as a disease with an elevated thyroid-stimulating hormone (TSH) level than normal range, normal serum free thyroxine (fT4) level and absence of obvious clinical manifestation. Overt hypothyroidism is defined as a disease with an elevated TSH level and a lower fT4 level, and it may be accompanied by obvious clinical symptoms. Some studies have found that both overt hypothyroidism and subclinical hypothyroidism are associated with cardiovascular diseases and mortality. Other studies also have found that either overt hypothyroidism or subclinical hypothyroidism may be associated with other diseases, such as chronic kidney disease, dementia, and fractures⁽⁸⁻¹⁰⁾.

Materials and Methods

Inclusion and Exclusion Criteria

Our inclusion criteria were as follows: (1) cohort, cross-sectional, or case-control studies which investigated the association between hypothyroidism and NAFLD; (2) all studies must report odds ratios (ORs) with 95% confidence intervals (95% CIs) values or other values which could be converted into ORs; (3) included NAFLD patients must be diagnosed with

an ultrasound examination or pathologic examination to make a clear definite diagnosis, and other diseases that could cause hepatic steatosis were excluded; and (4) the diagnosis of hypothyroidism must be based on biochemical tests including TSH levels and T4/FT4 levels.

Results

Study Selection

We searched the databases from mentioned above and found 670 articles, while 634 articles were excluded according to the title and abstract for the following reasons: animal studies, the main purpose of these studies unrelated to the content of the present study. Thirty-six studies were evaluated by reviewing full-texts. Twenty-three articles were excluded after reading full-texts, for there were no data on the outcomes of interest. There were 13 articles included in our meta-analysis ultimately. Following the aforementioned search, a total of 13 studies with 42,143 participants were incorporated into our final analysis studies.

Study Characteristics

Nine studies reported outcomes on the association between subclinical hypothyroidism and NAFLD, and six studies reported outcomes on the association between overt hypothyroidism and NAFLD. Those 13 studies were published from 2003 to 2017, and the number of recruited participants was from 332 to 18,544. Nine studies provided adjusted ORs and four studies only provided native ORs.

Meta-Analysis

Meta-analysis of the 13 studies found a high correlation between hypothyroidism (including both overt hypothyroidism and subclinical hypothyroidism) and NAFLD (OR = 1.52, 95% CI 1.24–1.87, $P < 0.001$). After excluding 4 studies without adjusted ORs, meta-analysis of 9 left studies found that hypothyroidism was significantly and independently correlated with NAFLD (OR = 1.72, 95% CI 1.32–2.23, $P < 0.001$).

Meta-analysis of nine studies found that subclinical hypothyroidism was significantly correlated with NAFLD (OR = 1.40, 95% CI 1.10–1.77, $P < 0.006$). After excluding three studies without providing adjusted

ORs, meta-analysis of six left studies found that overt hypothyroidism was significantly correlated with NAFLD (OR = 1.63, 95% CI 1.19–2.24, $P < 0.002$).

Funnel plots did not show obvious indications of publication bias. The P values of Egger's test in the meta-analyses relating overt hypothyroidism and subclinical hypothyroidism were 0.35 and 0.17, respectively.

Discussion

Although previous studies propose that hypothyroidism might play a crucial role in the pathogenesis of NAFLD, some observational studies fail to find an obvious association between hypothyroidism and NAFLD. However, based on the results of the present meta-analysis, hypothyroidism plays an important role in the pathogenesis of NAFLD. The meta-analysis suggests epidemiological evidence for the obvious relationship between hypothyroidism and NAFLD, and the impact of hypothyroidism is independent from other known risk factors for NAFLD. Besides, both subclinical hypothyroidism and overt hypothyroidism are independently related to NAFLD. It is more remarkable that our study, which comprised 13 available studies from 11 countries, is the first meta-analysis integrating the evidence for the relationship between hypothyroidism and NAFLD.

According to our study, hypothyroidism independently increases the risk of NAFLD, which has some implications in the screening of hypothyroidism and NAFLD. It may be helpful for the screening of NAFLD among hypothyroidism patients since those patients are at higher risk of developing NAFLD. Meanwhile, it may also be helpful to identify hypothyroidism in patients with NAFLD and to give an appropriate treatment for hypothyroidism. Therefore, the results of this study is of great significance in the preventive medicine of hypothyroidism and NAFLD.

Our results demonstrate that either overt hypothyroidism or subclinical hypothyroidism independently increases the risk of NAFLD. Some studies have laid the foundation for the findings of the meta-analysis by providing some possible explanations for the molecular mechanism underlying the relationship between hypothyroidism and NAFLD. There are several possible mechanisms which can explain the relationship between hypothyroidism and NAFLD. First, obvious relations between

hypothyroidism and metabolic changes have been reported, which include IR, dyslipidemia and obesity and they have important roles in the development of NAFLD. Both IR and obesity are vital factors in the development of NAFLD, which are also common in hypothyroidism patients compared to those general population. IR can accelerate liver injury in NAFLD. Besides, Demir et al. found that hypothyroidism can cause NAFLD in rat models, and pointed out that obesity is one of the key factors in the relationship between hypothyroidism and NAFLD. The metabolic changes aforesaid among hypothyroidism patients can thus further result in the development of NAFLD. Second, thyroid hormones can regulate lipid metabolism in the liver *via* thyroid hormone receptor β , and they can decrease cholesterol and triglyceride levels. It is worth mentioning that lower levels of thyroid hormones in hypothyroidism can increase the levels of cholesterol, low-density lipoproteins and triglyceride due to the delivery of hepatic fatty acids, but decrease the level of high-density lipoprotein (HDL), and thus can affect lipid metabolism. Therefore, patients with overt hypothyroidism often have fatty infiltration of the liver and thus have a higher risk for NAFLD. Hypercholesterolemia caused by hypothyroidism also plays an important role in the pathogenesis of NAFLD. According to the results of the present research, we found an obvious phenomenon that the correlation between overt hypothyroidism and NAFLD was more significant than that between subclinical hypothyroidism and NAFLD. As mentioned above, overt hypothyroidism is defined as having a much higher TSH level and lower T4 and T3 levels compared to subclinical hypothyroidism. The more significant correlation between overt hypothyroidism and NAFLD may be explained by the synergistic effects of higher TSH level and lower thyroid hormones in the pathogenesis of NAFLD, because TSH itself may induce hepatocyte steatosis *via* TSH receptor signal.

Conclusion

Our meta-analysis provides strong epidemiological evidence for the significant relationship between hypothyroidism and NAFLD. Both individuals with subclinical hypothyroidism and overt hypothyroidism are at a higher risk for the development of NAFLD than those with normal thyroid function. More prospective cohort studies are needed to further strengthen the relationship between NAFLD and hypothyroidism.

Ethical clearance- taken from institutional committee

Source of funding- Self

Conflict of Interest - Nil

References

- Rinella ME. Nonalcoholic fatty liver disease: a systematic review. *JAMA* (2015) 313(22):2263–73. doi:10.1001/jama.2015.5370
- Charlton MR, Burns JM, Pedersen RA, Watt KD, Heimbach JK, Dierkhising RA. Frequency and outcomes of liver transplantation for nonalcoholic steatohepatitis in the United States. *Gastroenterology* (2011) 141(4):1249–53. doi:10.1053/j.gastro.2011.06.061
- Adams LA, Anstee QM, Tilg H, Targher G. Non-alcoholic fatty liver disease and its relationship with cardiovascular disease and other extrahepatic diseases. *Gut* (2017) 66(6):1138–53. doi:10.1136/gutjnl-2017-313884
- Motamed N, Rabiee B, Poustchi H, Dehestani B, Hemasi GR, Khonsari MR, et al. Non-alcoholic fatty liver disease (NAFLD) and 10-year risk of cardiovascular diseases. *Clin Res Hepatol Gastroenterol* (2017) 41(1):31–8. doi:10.1016/j.clinre.2016.07.005
- Chang Y, Jung HS, Yun KE, Cho J, Cho YK, Ryu S. Cohort study of non-alcoholic fatty liver disease, NAFLD fibrosis score, and the risk of incident diabetes in a Korean population. *Am J Gastroenterol* (2013) 108(12):1861–8. doi:10.1038/ajg.2013.349
- Mehran L, Amouzegar A, Rahimabad PK, Tohidi M, Tahmasebinejad Z, Azizi F. Thyroid function and metabolic syndrome: a population-based thyroid study. *Horm Metab Res* (2017) 49(3):192–200. doi:10.1055/s-0042-117279
- Allelein S, Schott M. [Thyroid dysfunction]. *MMW Fortschr Med* (2016) 158(Spec No 1):45–52. doi:10.1007/s15006-016-7652-z
- Iglesias P, Bajo MA, Selgas R, Diez JJ. Thyroid dysfunction and kidney disease: an update. *Rev Endocr Metab Disord* (2017) 18(1):131–44. doi:10.1007/s11154-016-9395-7 [PubMed Abstract](#) | [CrossRef Full Text](#) | [Google Scholar](#)
- Rieben C, Segna D, da Costa BR, Collet TH, Chaker L, Aubert CE, et al. Subclinical thyroid dysfunction and the risk of cognitive decline: a meta-analysis of prospective cohort studies. *J Clin Endocrinol Metab* (2016) 101(12):4945–54. doi:10.1210/jc.2016-2129
- Yang R, Yao L, Fang Y, Sun J, Guo T, Yang K, et al. The relationship between subclinical thyroid dysfunction and the risk of fracture or low bone mineral density: a systematic review and meta-analysis of cohort studies. *J Bone Miner Metab* (2017). doi:10.1007/s00774-017-0828-5
- Eshraghian A, Hamidian Jahromi A. Non-alcoholic fatty liver disease and thyroid dysfunction: a systematic review. *World J Gastroenterol* (2014) 20(25):8102–9. doi:10.3748/wjg.v20.i25.8102

The Influence of Age, Gender, Type of Pregnancy, and Climatic Variations on the Serum T3 and T4 Hormones Profile in Growing Awassi Sheep

Mashair Z Ismail¹, Najlaa K. Al-Hamdi²

¹Senior Scientist, Central Veterinary Laboratory, Veterinary Directorate, Baghdad, Iraq

²Scientist, Central Veterinary Laboratory, Veterinary Directorate, Baghdad, Iraq

How to cite this article: Mashair Z Ismail, Najlaa K. Al-Hamdi et al. The Influence of Age, Gender, Type of Pregnancy, and Climatic Variations on the Serum T3 and T4 Hormones Profile in Growing Awassi Sheep. Volume 13 Issue 3 July-September 2022

Abstract

Background: The growth of lambs is influenced by several nutritional, genetic, and metabolic endocrine factors. Lambs that are fed on a high-level nutrient-dense diet exhibit quicker growth than those on a less aliment-fed diet. In addition, 3-5-3'-triiodothyronine (T3) and thyroxine (T4) are the key hormones that regulate nutrient utilization and partitioning.

Objective: This study investigates the thyroid activity in Awassi lambs in relation to the sex of the animal, season, and the type of pregnancy (single & twin) by the direct measurement of the serum concentration of T3 and T4 at various growth stages.

Method: This study was conducted by utilizing a total of 19 animals of two-weeks old Awassi lambs (single and twins). The lambs were weaned gradually at the end of the second week of age and fed concentrate and hay. Blood samples were then collected, which was subsequently followed by the measurement of serum T3 and T4 concentrations by utilizing radioimmunoassay (RIA).

Results: Our data reveal a significant ($p < 0.01$) drop in T3 at 14 weeks of age, while serum T4 in females was significantly higher ($p < 0.05$) as compared to males. We conclude that the sex of the animal and the type of pregnancy had no impact on the thyroid hormonal values.

Discussion and Conclusion: Our results revealed variations in the levels of TH due to the impact of several determinants, including sex of the animal, type of pregnancy, and age of the lambs. Our data revealed TH mostly declines during warmer temperatures, and remains high at colder temperatures. Our study suggests that an increase in the ambient temperature between April-May in Iraq may play a significant role in the hormonal fluctuation process in lambs. The decline in the T3 and T4 values reflect the depression in thyroid activity.

Keywords: Awassi Lambs, T3, T4.

Introduction

The Awassi is the most widespread type of sheep in Southwest Asia and it's the dominant breed in Iraq, and Syria, and it's the only indigenous breed of sheep in Lebanon, and Jordan. One of the drawbacks of the Awassi is their rate of reproduction – ewes typically

lamb just once/year and usually give birth to just one lamb. Furthermore, thyroid hormones (TH) are important modulators for developmental processes, general metabolism, and thermogenic adaptation to the environmental temperature in both humans and animals.^{1,2} These hormones play a crucial role

in productive performance such as milk secretion, growth, and hair fiber production in domestic farm animals, including small ruminants. Hence, TH blood concentration may potentially be considered as an indicator of the metabolic and nutritional status of these animals.¹⁵ The effect of the sex of the animal on thyroid activity in newborn and growing animals is somewhat contradictory.⁹

While several studies have previously indicated that higher levels of T3 and T4 were found in male lambs and kids as compared to females⁵, other findings have reported that both hormones were significantly higher in female lambs as compared to their male counterparts.^{6,23} Furthermore, other studies have presented doubtless indication concerning the contribution of TH in the adaptation to NEB status in the course of certain endotoxin-mediated diseases, and in the process of resumption of cyclic ovarian function involving the postpartum dairy cows.²² It has been reported that T3 level in both genders is almost identical to those in humans, however, whereas the T4 levels were higher in females than males, although other groups have reported inverse results.^{7,8,9} Furthermore, due to its high sensitivity to climatic variations, the thyroid gland function has shown to be influenced by the presence of specific variations that occur at regular intervals for less than a year. Most of the abovementioned studies have concluded that the maximum values of hormonal levels were observed during the low temperatures of winter months as compared with the temperature of summer months in sheep^{14,19}, ram lamb^{15,17}, and goats.^{3,18} The latter can be explained as high temperature depresses the thyroid gland activity.^{10,12,11} However, in camels, the inverse result was recorded, and the levels of T3 and T4 hormones showed a higher value in summer months than those in winter.

Our investigation reveals a significant correlation between thyroid gland activity and the growth rate in rapidly growing lambs by maintaining metabolism in tissues at optimal values.^{12,16} In addition, adverse effects on the growth rate have been indicated if the hormonal values fall out of range. It has been reported that when T3 hormone levels were higher during the first month in lambs and kids compared to those of the other three months.⁵

There is currently no comprehensive analysis pertinent to TH association with respect to, sex, season and climatic changes, or the pregnancy type

in lambs. Our study investigates the levels of serum T3 and T4 in the growing male and female Awassi lambs (singleton and twin pregnancies) in Baghdad province at 2, 4, 6, 10, 14, 18, 22, and 26 weeks of age.

Materials & Methods

A. Animals

This study was conducted by utilizing a total of 19 Awassi lambs, comprising 8 males and 11 females. The lambs were two weeks old and raised as flocks at Al-Shualla station, Agricultural Research, Iraq. All lambs were weaned gradually starting from the end of the second week of age by reducing milk intake. The weaning was complete at the 12th week of age and then it was replaced by concentrate and hay feeding. The lambs were housed in free stalls under normal ambient temperature.

B. Blood Sampling

Blood samples were collected from the jugular vein at 2-weeks of age and continued on a 2-week interval for a 6-month period (November-May). Blood samples were stored in the absence of anticoagulant factors, and the serum was collected from each sample after centrifugation and stored at -20° C until analysis.

C. Radioimmunoassay

Serum T3 and T4 concentrations were measured by RIA kits (Amersham, UK).

D. Statistical Analysis

Data were analyzed by the analysis of variance (ANOVA), and means were further tested by Duncan's multiple range tests (as a post hoc test). A p-value <0.05 was considered statistically significant. Each result is the mean \pm the standard deviation of the values obtained from six replicates.²⁰

Results

Our study exhibits high T3 hormone values at 2 and 4 weeks of age. In addition, our investigation revealed a significant decrease ($p < 0.01$) in the level of T3 hormone at 14 weeks of age in both sexes as compared to its levels at 2 and 6 weeks of age (Figs.1,2). Furthermore, our data indicate that thyroid hormone

levels at 18 weeks have returned to the same levels observed between 6 and 10 weeks of age. Moreover, T3 relapsed again and started to decline gradually from week 22 up to week 26 of age. Furthermore, our results indicate there were significant differences between the drop of T3 hormone levels at 14 and 26 weeks in both sexes (Fig.1, 2), while there were no variations seen in the level of the T3 hormone level between males and females (Fig.3). Our results revealed the absence of the sex of the animal impact on the thyroid T3 levels. It is worth mentioning that a high level of T4 was reported in female lambs which were significantly higher ($p<0.05$) than males (Fig.4). Our results have demonstrated that clear differences were observed between T4 levels at 2, 4, 10, and 18 weeks of age in both sexes (Fig.4), although there are no explanations for the sharp drop in the T4 level at 6 weeks. However, the gradual decline at 22 and 26 weeks referred to the increase in the ambient temperature. A significant difference ($p<0.01$) was reported between these values at 6 and 22 weeks in comparison with those of all other weeks of the study except for that of 26 weeks of age. Furthermore, no variations were seen in the levels of TH with respect to the type of pregnancy. Our statistical analysis has indicated there were no differences between the levels of TH in single and twin male or female lambs. Our results indicate that type of pregnancy had no impact on T3 and T4 hormones values (Figs.1, 2, 5, 6).

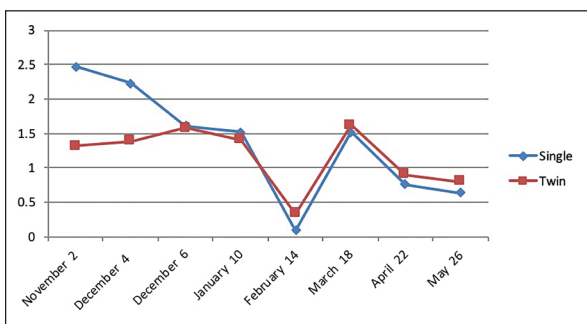


Fig. 1: T3 concentration (ng/ml) in male lambs

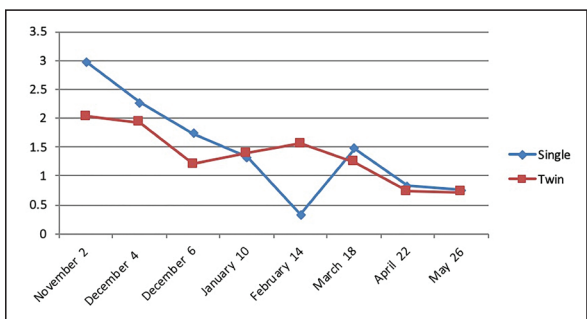


Fig. 2: T3 concentration (ng/ml) in female lambs

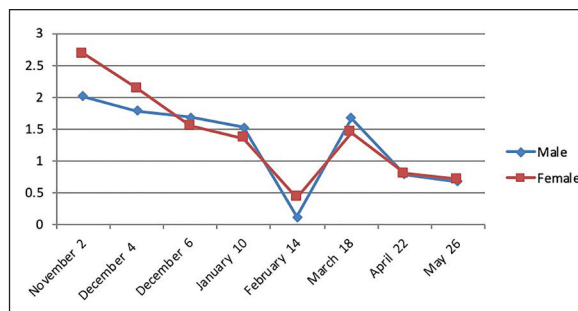


Fig. 3: T3 hormone levels (ng/ml) in male and female Awassi lambs

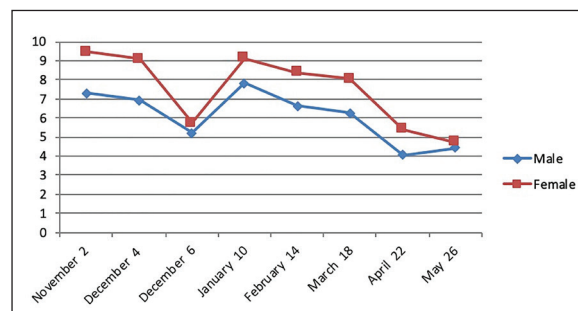


Fig. 4: T4 hormone levels (ng/ml) in male and female Awassi lambs

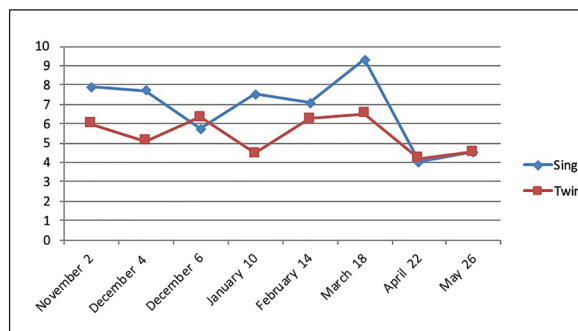


Fig. 5: T4 concentration (ng/ml) in male lambs

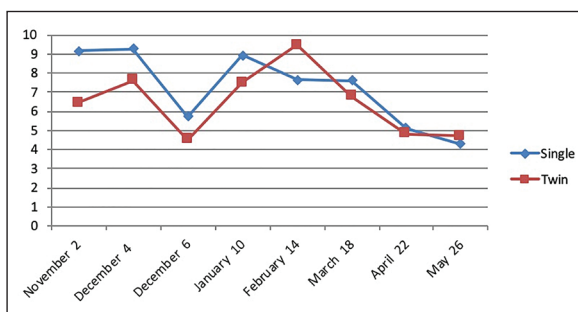


Fig. 6: T4 concentration (ng/ml) in female lambs

Discussion

Thyroid function in rapidly growing animals is highly influenced by the stage of maturity, growth hormone secretion, and the differences in appetite.¹²

This investigation revealed the presence of high T3 hormone values at 2 and 4 weeks of age. These findings are in agreement with previous studies, which also revealed high T3 hormonal levels in lambs and kids during the first month of age.⁵ Furthermore, this study revealed a significant decrease in the T3 levels at 14 weeks of age in both sexes as compared to its levels at 2 and 6 weeks of age (Figs.1, 2). These variations in the hormonal levels have been indicated at weaning in previous studies.²¹ The decline in the T3 and T4 values reflects the depression in thyroid activity^{10,12}. Furthermore, no variations were seen in the level of the T3 hormonal level between males and females (Fig.3). These results revealed the absence of the impact of the sex of animals on the thyroid T3 levels which indicates that our results are in consonance with the findings of another study that was previously conducted in humans.^{9,18} Moreover, our data which pertain to the T4 high levels in female lambs as compared to the male counterparts concur with results from previous studies.⁶ However, other studies have reported that T3 and T4 were significantly higher ($p<0.01$) in males than females.¹⁹ These results were also demonstrated that clear differences were observed between T4 levels at 2, 4, 10, and 18 weeks of age in both sexes (Fig.4). There is currently no explanation for the sharp drop in the T4 level at 6 weeks, however, the gradual decline at 22 and 26 weeks referred to the increase in the ambient temperature. A significant difference ($p<0.01$) was reported between these values at 6 and 22 weeks in comparison with those of all other weeks, except for that of 26 weeks of age.

Furthermore, no variations were seen in the levels of TH in regard to the type of pregnancy. Statistical analysis indicated no differences between single and twin male or female lambs. It is worth mentioning that little information is known concerning the relationship between thyroid hormone levels and type of pregnancy. Therefore, and according to the results of this study, it can be concluded that the type of pregnancy has no effect on T3 and T4 hormone values (Figs.1,2,5,6).

Conclusion

Our study revealed variations in the levels of TH due to the impact of several determinants, including sex of the animal, type of pregnancy, and age of the lambs. Our preliminary data reveal that TH mostly declines during warmer temperatures, and remains high at

colder temperatures, which make this element worthy of further investigation. Awassi sheep represent an important economic component of the agricultural economy. Our data also suggests that an increase in the ambient temperature between April-May in Iraq may play a significant role in the hormonal fluctuation process in lambs. The decline in the T3 and T4 values reflects the depression in thyroid activity.^{10,12} Hence, we recommend conducting further studies on a larger sheep population in various provinces to determine the elements that may impact the thyroid hormonal levels and their influence on the growth.

Ethical Clearance

This study was conducted according to the protocols of the Veterinary Directorate, which were *adopted by the American Physiological Society*.

Funding

Veterinary Directorate.

Conflict of Interest

None declared.

References

- Galal S, Gürsoy O, Shaat I. Awassi sheep as a genetic resource and efforts for their genetic improvement. *Small Rumin Res.* 2008;79(2-3):99–108.
- Medrano RF, He JH. Advances in thyroid hormones function relate to animal nutrition. *Annals of Thyroid Research.* 2016;2:45-52.
- Todini L, Delgadillo JA, Debenedetti A, Chemineau P. Plasma total T3 and T4 concentrations in bucks as affected by photoperiod. *Small Rumin Res.* 2006;65(1-2):8–13.
- Moenter SM, Woodfill CJ, Karsch FJ. Role of the thyroid gland in seasonal reproduction: thyroidectomy blocks seasonal suppression of reproductive neuroendocrine activity in ewes. *Endocrinology.* 1991 Mar;128(3):1337–44.
- Dahl GE, Evans NP, Thrun LA, Karsch FJ. Thyroxine is permissive to seasonal transitions in reproductive neuroendocrine activity in the ewe. *Biol Reprod.* 1995 Mar;52(3):690–6.
- Ashour G, Neama A. Ashmawy, Dessouki S. M, Shihab OH. Blood hematology, metabolites and hormones in newborn sheep and goat from birth to weaning. *Int J Adv Res (Indore).* 2015;3:1377–86.

7. Eshratkha B, Sabri N, Jafari R, Pour R, Seyyed T. Determination of plasma thyroid hormones by Chemiluminescence and Radioimmunoassay methods in calves. *Glob Vet*. 2010;4:554-7.
8. Razzak MA. Effect of Age and Sex on Thyroid Function Tests Established of norms for the Egyptian Population in Development in Radioimmunoassay and Related Procedures. International Atomic Energy Agency; 1992. pp. 353-8.
9. Franklyn JA, Ramsden DB, Sheppard MC. The influence of age and sex on tests of thyroid function. *Ann Clin Biochem*. 1985 Sep;22(Pt 5):502-5.
10. Ahmed Z, Khan M. ul Haq A, Attaullah S, ur Rehman J. Effect of race, gender, and age on thyroid and thyroid-stimulating hormone levels in northwest frontier province, Pakistan. *J Ayub Med Coll Abbottabad*. 2009;21:21-4.
11. Prakash P. Rathore. Seasonal variations in blood serum profiles of triiodothyronine and thyroxine in goat. *Ind. J. Anim*. 1991;61:1311-2.
12. Nazifi S, Gheisari HR, Poorabbas H. The influence of thermal stress on serum biochemical parameters of dromedary camels and their correlation with thyroid activity. *Comp Haematol Int*. 1999;9(1):49-53.
13. Mycek MJ, Harrey R, Champe PC. Lippincott Williams and Wilkins. New York. 2001;247-254.
14. Starling JM, da Silva RG, Negrao JA, Maia AS, Bueno AR. Seasonal variation of thyroid hormones and cortisol of sheep in tropical environment. *Rev Bras Zootec*. 2005;34:2064-73.
15. Webster JR, Moenter SM, Woodfill CJ, Karsch FJ. Role of the thyroid gland in seasonal reproduction. II. Thyroxine allows a season-specific suppression of gonadotropin secretion in sheep. *Endocrinology*. 1991 Jul;129(1):176-83.
16. Todini L. Thyroid hormones in small ruminants: effects of endogenous, environmental and nutritional factors. *Animal*. 2007 Aug;1(7):997-1008.
17. Doubek J, Slosarkova S, Fleischer P, Mala' G, Skrivanek M. Metabolic and hormonal profiles of potentiated cold stress in lambs during early postnatal period. *Czech J Anim Sci*. 2003;48:403-11.
18. Ekpe ED, Christopherson RJ. Metabolic and endocrine responses to cold and feed restriction in ruminants. *Can J Anim Sci*. 2000;80(1):87-95.
19. Todini L, Lucaroni A, Malfatti A, Debenedetti A, Costarelli S. Male-female differences in the annual profiles of the thyroid hormones blood level by the goat. *Atti della Societa Italiana della Scienze Veterinarie*. 1992;46:169-73.
20. Domenech-Coca C, Mariné-Casadó R, Caimari A, Arola L, Del Bas JM, Bladé C, et al. Dual liquid-liquid extraction followed by LC-MS/MS method for the simultaneous quantification of melatonin, cortisol, triiodothyronine, thyroxine and testosterone levels in serum: applications to a photoperiod study in rats. *J Chromatogr B Analyt Technol Biomed Life Sci*. 2019 Feb;1108:11-6.
21. Doi J, Ohtsubo A, Ohtsuka A, Hayashi K. Triiodothyronine but not thyroxine accelerates myofibrillar proteolysis via ATP production in cultured muscle cells. *Biosci Biotechnol Biochem*. 2003 Nov;67(11):2451-4.
22. Fazio E, Ferlazzo A, Cravana C, Medica P. Effects of weaning on total and free iodothyronines in lambs. *Vet Q*. 2015 Mar;35(1):16-20.
23. Huszenicza G, Fodor M, Gacs M, Kulcsar M, Dohmen MJ, Vamos M, et al. Uterine bacteriology, resumption of cyclic ovarian activity and fertility in postpartum cows kept in large-scale dairy herds. *Reprod Domest Anim*. 1999;34(3-4):237-45.

A Scoping Review on Design Modifications of Lingual Holding Arch appliance

Mathias Merlyn R¹, Pawar Madhura², Lath Tripti³

¹Post Graduate Student, Dr.D.Y. Patil Dental College and Hospital Pimpri, Dentistry, D.Y. Patil Vidyapeeth Pune*

²Associate Professor, Dr.D.Y. Patil Dental College and Hospital Pimpri, D.Y. Patil Vidyapeeth Pune

³Post graduate student, Dr.D.Y. Patil Dental College and Hospital Pimpri, D.Y. Patil Vidyapeeth Pune

How to cite this article: Mathias Merlyn R, Pawar Madhura, Lath Tripti et al. A Scoping Review on Design Modifications of Lingual Holding Arch appliance. Volume 13 Issue 3 July-September 2022

Abstract

Background: Lingual holding arch appliance has been the most trusted space maintainer in the field of pediatric dentistry. This study put forward mapping of application of various designs of lingual holding arch appliance and to verify the main gap in the research on this field.

Methods: This is a scoping review that took place in 2021 following PRISMA-ScR Guideline. Data was searched through the database PubMed, SCOPUS, Google scholar The search strategy included keywords 'bilateral fixed space maintainer' 'space maintainer' 'lower lingual holding arch' 'fixed lingual arch appliance' 'functional lingual arch holding appliance' A total of eleven studies from nine hundred and thirty original articles were identified and were included and reviewed. The study selection and tabulation of data were performed by two independent reviewers. Any disagreement in study selection was resolved by a third reviewer.

Conclusion: In the transitional phase, preventive and interceptive orthodontic plays a significant role in minimizing the inevitable developing malocclusion The mapping determined all proposed designs for the prevention of space loss. Each design needs to be carefully selected based on the phase of mixed dentition. This paper provides information on various designs of a lingual arch space maintainer, and it can be concluded that there is a necessity for long-term follow-up studies for further research in the field.

Keywords: space maintainer, space regainer, lingual holding arch in mixed dentition, bilateral fixed space maintainer

Introduction

The primary dentition not only helps in chewing, esthetic, phonetics, jaw, and muscle growth but also maintains the dental arch until the permanent teeth come to play their role. The ideal occlusion in primary teeth consists of spacing, primate space, and flush terminal plane. Primary dentition in certain clinical situations requires early intervention to enhance dental, alveolar, and musculoskeletal development.

The early intervention can be either preventive or interceptive.

The interceptive orthodontic provides a prompt treatment that intervenes in the developing malocclusion. Approximately 14-49% of primary dentition gain benefit from the interceptive orthodontic treatment modalities.¹(Ngan P, Alkire RG, Fields H Jr. 1999) In mixed dentition, over-retained teeth are related to delay or ectopic eruption

Details of the Corresponding Author: Merlyn Roshal Mathias

MDS(III) D.Y. Patil Dental College and Hospital Pimpri, Dr.D.Y. Patil Vidyapeeth Pune,

Postal Address: D. Y. Patil Dental College, Pimpri, Pune, India 411018

Phone No: +918050907520

Email: roshal.merlyn@dpu.edu.in

of the successor, hence the extraction at the earliest is a must. (Bishara SE, Staley RV1987) In the early mixed dentition phase, premature loss of primary first molar, before 7.5 years of age causes a minor transient space loss. ³(Padma Kumari B, Retnakumari N 2006) It is usually compensated by the eruption of the successor's teeth. However, during the eruption of permanent incisors, the primary cuspid drifts distally due to eruption force and contributes to space loss. ⁴(O A Cuoghi et al 1998) Similarly, premature loss of the second primary molar at the same age causes the permanent first molar to drift in a mesial direction that contributes to permanent space loss. ⁵⁻⁶ (Northway WM, Wainright RW1980, Northway WM, Wainright RL, Demirjin A. 1984)

Space management is a technique through which the available space is either maintained or insufficient space is converted into sufficient space for successors using a fixed or removable appliance. ⁷ (Foley T, Wright GZ, Weinbergr SJ. 1996) This is brought about by fabrication of space maintaining or regaining appliances depending upon the requirement of space using mixed dentition analysis. ⁸⁻¹⁰ (Bishara SE, Staley RN. 1984, Tanaka MM, Johnston LE. 1974, Wright GZ, Kennedy DB 1978) The space maintainer, as the name suggests, maintains adequate space for the successor within the arch. ¹¹⁻¹² (Gianelly AA 1995, Brothwell DJ 1997)

The passive lingual arch appliance is made case-specific appliance about the clinical situation. Every case is unique and based on the clinical situation various modifications are put forth by many authors. The present review aims to compile the data of the various medication of lingual arch appliance in one article so that it's useful for the practitioner and students to gain knowledge and apply it in their practice.

Methodology

Study Protocol

The study protocol was prepared before conducting the study and the protocol was made using PRISMA-ScR guidelines. The study was conducted under the following headings—the aim of the study, search strategy, eligibility criteria, and data summary.

Inclusion Criteria

Any in-vivo study, clinical trial, a systematic review with or without meta-analysis, umbrella review,

narrative review, addressing the modifications of space maintainer in mixed and early permanent dentition were included in the scoping review.

Exclusion Criteria

Studies with no keywords, remarks, and articles in languages other than English were excluded from the review.

Database Search Strategy

A search strategy was performed using keywords related to the lingual arch appliance. Data was searched through the database PubMed, SCOPUS, Google scholar until 17 September 2021. The search strategy included keywords 'bilateral fixed space maintainer' 'space maintainer' 'lower lingual holding arch' 'fixed lingual arch appliance' 'functional lingual arch holding appliance'. Further articles were hand searched for inclusion criteria. The English language article that fulfilled the inclusion criteria addressing the modifications done in the lingual holding arch appliance was eligible for inclusion. This search yields 11 studies to be included in the review.

Study Selection and Data Tabulating

The peer-reviewed articles that fulfilled the inclusion or exclusion criteria, addressing lingual arch space maintainer were eligible for inclusion. The basis for final inclusion was—Population-(any)-concept-(lingual arch space maintainer)-context- (interceptive treatment). There were no specific primary or secondary outcome measures described for the review. The study selection and tabulation of data were performed by two independent reviewers (MM and TL). Any disagreement in study selection was resolved by a third reviewer (MP). While tabulating the data, the variables drawn out were author (year), study design, location, objectives, results, conclusion, and limitations.

Result

Evidence Selection

In the evidence-based selection of the present review, 930 articles were identified from the database and 6 were through the manual search were identified. Out of 936, 53 articles were not related to fixed

lingual holding appliances and were excluded from the study. Following duplication, 74 articles were screened for the title and abstract content. Full text 22 articles were reviewed for eligibility assessment and finally, 11 articles were included in the review based on inclusion criteria.

Evidence Insights on Lingual Arch Space Maintainer

The included articles are further divided into the following sub-categories based on their usage in the mixed dentition period.

1. Lingual holding arch space maintainer in Early mixed dentition
2. Lingual holding arch space maintainer in the Transition period
3. Lingual holding arch space maintainer/space regainer in the late mixed dentition:



Figure 1: Shows lingual holding arch modified with canine spur



Figure 5: Shows lingual holding arch modifies to preserve space of congenitally missing premolar



Figure 2: Shows fixed functional lingual holding arch



Figure 3: Shows semifixed functional space maintainer



Figure 4: Shows Lingual arch holding appliance with open coil space regainer.

Discussion

In the transitional phase preventive and interceptive orthodontic plays a significant role in minimizing the inevitable developing malocclusion. The principle behind this is maintaining the leeway space of 3.4mm in the upper arch and 1.8mm in the lower arch. In the mandible, a fixed passive lingual holding arch appliance is used for the same. The appliance posteriorly rests passively on the lingual surface of banded the first permanent molar and anteriorly 1mm away from the cingulum of permanent incisors. Thus, provide very little soft tissue irritation. The main drawback of the appliance is no chair-side manipulation is possible once it is soldered.

1. Lingual holding arch space maintainer in Early mixed dentition

Modified Anterior Segment of LLA

In the early mixed dentition stage, permanent incisors and first permanent molars are in the passive eruptive phase until the occlusion is established. The ideal protocol for the extension of the anterior segment of the lingual holding arch appliance is from distal of 72 to distal of 82. The appliance does not interfere with the eruption of the lateral incisor and prevents midline shift by maintaining its position. The drawback is the difficulty faced at chair-side manipulation and the appliance has to be replaced by a conventional fixed passive lower lingual holding arch appliance after the complete eruption of both lateral incisors.¹³ (Dugoni SA 1995)

Modified Posterior segment of LLA

The fixed passive lower lingual holding arch appliance with an omega loop in the posterior segment brings upon the correction to a certain extent. The omega loop is positioned close to the mesial aspect of the first permanent molar at the level of the second primary molar. The omega loop helps in chair-side manipulation. However, the activation of the appliance by opening omega loop facilitates lingual tipping of anterior and distal tipping of molar to a certain level thereby correcting minor discrepancy in the occlusion.¹⁴ (Kiran D.P 2015)

Modified Anterior and Posterior Segment of LLA

In the early mixed dentition phase, premature loss of bilateral primary molar contributes to minor space loss whereas the passive eruptive force of lateral incisor exerts unwanted distal drifting of primary cuspid subsequently changing midline. Anteriorly, the canine spur is incorporated in the disto-cervical aspect of the primary cuspid thereby engaging the tooth in the bucco-cervical undercut. It provides stability for the primary cuspid and maintains the midline. In the posterior segment, the addition of the omega loop facilitates chair-side manipulation. In the absence of anterior crowding and the presence of sufficient anterior space, this appliance is useful. (Figure 1).¹³ (Dugoni SA 1995)

2. Lingual holding arch space maintainer in a transition period

Early loss of bilateral multiple primary molars before 7 years contributes to the delayed eruption of permanent successors due to overlying bone and thick fibrous mucosa. The long span of the edentulous area can allow supra eruption of opposite teeth, stimulate habitual lateral tongue thrust habit, and improper distribution of masticatory load. The functional¹⁴ (Kiran D.P 2015) (Figure 2) and semi-functional¹⁵ (Jonathan PT et al 2017) (Figure 3) fixed lower lingual arch holding appliance contributes to overcoming the above-said problems. The appliance is consisting of artificial teeth with an acrylic base either soldered or acrylic/incorporated in the main unit. The functional unit either rests directly on the alveolar ridge using acrylic base and clasp or indirectly above the soldered wire placed in the edentulous area of the tooth. As the said appliance rest on the alveolar ridge, it stimulates bone loss and eruption of successor due to vertically directed masticatory force. In the presence of a clear acrylic base, the clinical evaluation is made handy and overcome the above-noted problems. The main drawback is the bulky acrylic base and the higher chance of debonding and breakage of the appliance. In multiple replaced teeth, the appliance has to be trimmed multiple times and has to be replaced by a conventional appliance once the entire successor erupts into the oral cavity.¹⁴⁻¹⁵ (Kiran D.P 2015,

The hinge lock system is incorporated in between functional and non-functional units. It uses a buccal

and lingual molar tube in the acrylic base on the buccal and lingual flange and a 0.64mm locking wire made to pass through the acrylic molar tube and rest on the molar tube band of the first permanent molar. This helps in easy removal of the appliance without debanding and allows better visualization on follow-up.¹⁴ (Chalakkal Pet al 2017; Jonathan PT et al 2017)

3. Lingual Holding arch Space Maintainer/ Space Regainer in the late Mixed Dentition

In the presence of a long-standing edentulous arch, the leeway space deficiency related to caries and chronic infection the subsequent loss of proximal tooth structure and eventually early tooth loss. It is either brought upon by mesially drifted first permanent molar, lingually erupted incisor, and decreased anterior arch width or moderate crowding with retroclined lower incisors. The space regaining tool such, open coil spring used by segmental bonding of two adjacent teeth or along with Niti wire to distalize and vertical inclination of first permanent molar and create space by pushing an anterior and posterior segment of the banded tooth away from each other. It also corrects the midline shift in the mixed dentition phase. Another tool is a crossbow with a fixed lower lingual holding arch appliance, the segment is soldered on either side of the banded first permanent molar, and using the open coil spring in the distal segment of the band brings about sufficient space is regained for the successor's teeth.¹⁷ (Chalakka P et al 2012) (Figure 4)

4. Combination of space maintainer with habit breaking appliance:

In the presence of para-functional habit related to lower arch, lip bumper along with fixed lower lingual arch holding appliance will additionally intercept lip sucking habit.¹⁸ (De Souza N et al 2018)

As Interim Appliance in Case of Congenitally Absent Premolar:

In cases of congenitally missing mandibular premolars, wherein the loss of primary molars is inevitable; LHA with a horizontal loop in the edentulous region can be given. Until all second permanent molars come into occlusion, this will maintain the mesiodistal width for fixed prosthesis options in the future.¹⁹ (Chauhan. A et al 2 019) (Figure 5)

Conclusion

Based on the findings of the present review, it is concluded that

1. The various designs about different clinical situations have been proposed for the prevention of space loss due to premature loss of deciduous teeth; however, the utilization of the appliance needs to be carefully addressed based on the phase of the mixed dentition period.
2. To our best knowledge, the literature lacks in the long-term follow-ups of clinical studies on modifications of lingual arch holding space maintainers, hence the evidence on their longevity is considered to be weak.

Clinical Significance

Why this paper is important for pediatric dentists?

1. This paper summarizes the design modifications of the lingual arch space maintainer.
2. It discusses the case appropriate design selection of space maintainers. Patient evaluation for oral hygiene, caries risk assessment, and space analysis, and finally patient compliance are the important parameter to be considered for the success of the space maintaining the appliance.
3. Although it provides information on various designs of a lingual arch space maintainer, there appears a necessity for long-term follow-up studies for further research in the field.

Ethical clearance - The article is a Scoping review, thus Ethical clearance was not taken for the research.

Source of funding - Self

Conflict of Interest - NIL

Reference

1. Nagan P, Alkire RG, Fields H Jr. Management of space problems in the primary and mixed dentitions. *Journal of the American Dental Association* (1939). 1999. Sep;130(9):1330-1339. DOI: 10.14219/jada.archive.1999.0403.
2. Bishara SE, Staley RV. Maxillary expansion: clinical implications. *Am J Orthod Dentofacial Orthop* 1987;91:13-4.

3. Padma Kumari B, Retnakumari N. Loss of Space and Changes in the Dental Arch after Premature Loss of the Lower Primary Molar: A Longitudinal Study. *J Indian Soc Pedo Prev Dent* 2006; 19(3): 90-96.
4. Cuoghi OA, Bertoz FA, Mendonça MR, Santos EC. Loss of space and dental arch length after the loss of the lower first primary molar: a longitudinal study. *J Clin Pediatr Dent* 1998;22:117-120.
5. Northway WM, Wainright RW. 1980. D E space—a realistic measure of changes in arch morphology: space loss due to unattended caries. *Journal of Dental Research* 10(10):1577-1580 DOI 10.1177/00220345800590100401.
6. Northway WM, Wainright RL, Demirjin A. 1984. Effects of premature loss of deciduous molars. *Angle Orthodontist* 54:295-329.
7. Foley T, Wright GZ, Weinberg SJ. Management of lower incisor crowding in the early mixed dentition. *ASDC J Dent Chd.* 1996 May-Jun;63(3):169-74. PMID: 8853819.
8. Bishara SE, Staley RN. Mixed-dentition mandibular arch length analysis: a step-by-step approach using the revised Hixon-Oldfather prediction method. *Am J Orthod.* 1984 Aug;86(2):130-5. doi: 10.1016/0002-9416(84)90304-x. PMID: 6589958.
9. Tanaka MM, Johnston LE. The prediction of the size of unerupted canines and premolars in a contemporary orthodontic population. *J Am Dent Assoc.* 1974 Apr 1;88(4):798-801. PMID: 4525402
10. Wright GZ, Kennedy DB. Space control in the primary and mixed dentitions. *Dent Clin North Am.* 1978 Oct;22(4):579-601. PMID: 279479.
11. Gianelly AA. Leeway space and the resolution of crowding in the mixed dentition. *Seminars in Orthodontics* 1995; 1:188-194.
12. Brothwell DJ. Guidelines on the use of space maintainers following premature loss of primary teeth. *J Can Dent Assoc* 1997; 63:753-766.
13. Dugoni SA, Lee JS, Varela J, Dugoni AA. Early mixed dentition treatment: post retention evaluation of stability and relapse. *Angle Orthod.* 1995;65(5):311-20.
14. Kiran D.P, Bhatt. K, Barad. A, Patejdr. V, A novel fixed functional lingual arch space maintainer. *EJDTR* 2015, 4(2), 271-27.
15. Jonathan PT, Sethi HS, Neha, Kirtaniya BC. Semi-Fixed Functional Lingual Arch Space Maintainer: A Case Report. *Int J Oral Health Med Res* 2017;4(5):46-50.
16. Chalakkal P, Ferreira AN, Da Costa GC, Aras MA. Functional Lingual Arch with Hinge-type Lockable Dentulous Component. *Int J Clin Pediatr Dent* 2017;10(3):302-308.
17. Chalakka P, Thomas AM, Akkara F, Pavaskar R. New design space regainers: 'Lingual arch crossbow' and 'Double banded space regainer'. *J Indian Soc Pedod Prev Dent* 2012; 30:161-165.
18. De Souza N, Martires S, Chalakkal P, Da Costa GC. An innovative appliance for the simultaneous treatment of premolar space loss and lip sucking habit. *Contemp Clin Dent* 2018;9: S358-60
19. Chauhan. A, Chandra. P, Tandon. R, Singh. S, Azam. A. Modified Lingual Arch for space maintenance in Missing Mandibular Teeth. *J Contem Orthod* 2019;3(4):43-44

Breast Symptoms Among Women Attendant's to Early Detection Breast Clinic

May Abdul Salam¹, Jawad K. Al-Diwan²

¹MBCHB.FIBMS.FM, Cancer Screening Fellowship, Al-Elwiyaa Maternity Teaching Hospital, Women Health Center, Iraq.

²Prof.(MSc, DCN, FIBMS, FFPH).Department of Family and Community Medicine, College of Medicine, Baghdad University. Iraq.

How to cite this article: May Abdul Salam, Jawad K. Al-Diwan et al. Breast Symptoms Among Women Attendant's to Early Detection Breast Clinic. Volume 13 Issue 3 July-September 2022

Abstract

Background: Breast cancer is the most commonly diagnosed cancer in women. Breast cancer early detection is a program that combines early diagnosis for symptomatic patients with opportunistic breast clinical examination screening. This study was conducted to demonstrate the drawback of opportunistic screening.

Methodology: A group of 200 symptomatic patients were consulted at the women's health center at AL-Elweiyaa maternity teaching hospital in Baghdad between January 2021 and June 2021. Breast physical exam, imaging tests (ultrasound and mammographic examination), and fine-needle aspiration cytology analysis (FNAC) were done. All cases are categorized according to ACR/BI-RADS atlas lexicon.

Results: Only 18 percent of those who went to the breast clinics with the purpose of getting screened showed up. Of those who had clinical breast examinations, 94(35.7%) and 169(64.3%) were subjected either to mammograms, ultrasound, or mammograms. Thirty-five (94.8%) patients were under BI-RADS 1 and 2 (no malignant), while BI-RADS 4 (suspicious of malignancy) was noticed in 21 (18.7%) patients using mammograms and 91 (81.3%) using U/S. BI-RADS 5 was noticed in 1 (100%) using a mammogram.

Conclusion: This study showed that opportunistic screening is essential in breast cancer screening.

Keywords: Breast cancer, breast symptom, early detection, screening, BI-RADS.

Introduction

Breast cancer is the most significant and frequent cancer in women across the world, and the leading cause of cancer-related fatalities in developing countries⁽¹⁾. It is the most often diagnosed cancer in Iraqi women, accounting for nearly a third of all female cancer cases and the country's primary cause of mortality from malignant neoplasms⁽²⁾. Iraqi research shows that breast cancer in younger women is more advanced stages and has a higher incidence of aggressive tumors^(3,4).

Early detection measures are the best strategy to find breast cancer early and improve survival chances. Symptomatic patients presenting with symptoms such as breast discomfort, mass, and nipple discharge, as well as unsystematic opportunistic breast clinical examination screening, are included in Iraq's breast cancer, early detection model. Mammograms "for women over 40 years old of age" or ultrasounds ""for women younger than 40 years old of age". These services are offered at the women's request or the suggestion of her physician. Tissue samples are taken from patients with positive radiological evaluation

Corresponding Author: May Abdul Salam

Al-Alwiyaa Maternity Teaching Hospital, Women Health Center, Baghdad, Iraq.

Email:20107004@mecriq.edu.iq

“mammography and/or ultrasound” according to the breast early detection clinics’ triple assessment protocol⁽⁴⁾.

Since 2000, the Iraqi Ministry of Health has worked with the World Health Organization to establish a nationwide program for the early identification of breast cancer. Because of a lack of infrastructure, the organized systemic screening program for the international community has yet to be implemented⁽⁵⁾.

Therefore, to overcome those obstacles a fellowship for cancer screening was established. This work was carried out to show the drawback of opportunistic screening⁽⁶⁾.

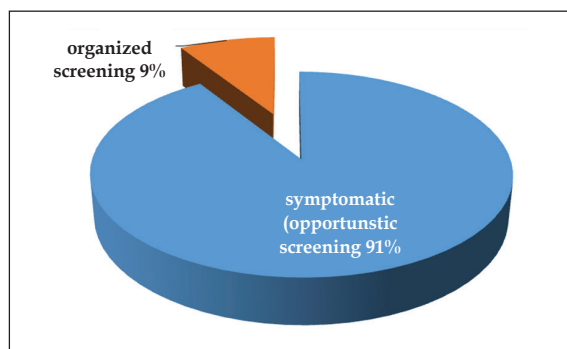
Patients and Method

A group of 200 symptomatic patients were consulted at the women’s health center at AL-Elweiya maternity teaching hospital in Baghdad between January 2021 and June 2021. Breast physical exam, imaging tests, “ultrasound and mammographic examination,” followed by fine-needle aspiration cytology analysis (FNAC) were done. According to the “ACR/BI-RADS atlas lexicon, all cases are categorized into incomplete (category 0) and complete assessment (categories 1, 2, 3, 4, 5, 6)”^{5,7}.

FNAC was done for those with BI-RADS >=3. The impact of the independent variable (symptomatic) on the malignancy of the lesions was measured. Statistical analysis was performed, and different variables were analyzed.

Results

“Figure (1) shows patients referred to the clinic and the reasons for attending opportunistic screening among the studied sample”.



Figure(1): Distribution of the sample according to the breast clinic’s reasons for attendance.

A total of the 182 (91%) women were subjected to opportunistic screening, while only 18(9%) women underwent organized screening. Of those who had clinical breast examinations, 94(35.7%) and 169(64.3%) were subjected either to mammograms and ultrasound and mammograms respectively.

Table (1): BI-RADS, categories into mammography and ultrasonography

BI-RADS	Mammography		Ultrasound	
	NO.	%	NO.	%
0	17	100	0	0.0
1	30	76.9	9	23.1
2	5	17.9	23	82.1
3	20	30.3	46	69.7
4	21	18.7	91	81.3
5	1	100	0	0.0
Total	94	35.7	169	64.3

$\chi^2=79.98, P \text{ value} = 0$

Thirty-five (94.8%) patients were under BI-RADS 1 and 2 (no malignant), while BI-RADS 4 (suspicious of malignancy) was noticed in 21 (18.7%) patients using mammograms and 91 (81.3%) using U/S. BI-RADS 5 was noticed in 1 (100%) using a mammogram.

Table (2): Breast symptoms in benign and malignant lesions

Breast Symptoms	Breast changes			
	Benign		Malignant	
	No.	%	No.	%
Lump	50	66.7	25	33.3
Pain	28	87.5	4	12.5
Nipple discharge	8	88.9	1	11.11
Total	86	74.1	30	25.9

$\chi^2=6.1847, df=2, p < 0.05$

The most prominent symptom was lumps, and the least was nipple discharge. There was a significant difference in the type of lesion (benign and malignant) with symptoms ($\chi^2=6.1847, df =2, p < 0.05$)

Discussion

Breast cancer mortality has been reduced due to early diagnosis of the illness through coordinated screening of women. The gathering of data on symptoms at the screening visit is critical to the success of breast cancer screening programs⁷. The lower rate (9%) of women attending screening is in the line reported in

Iraq (8.4%)⁴. The low observed rate (9%) is similar to that reported in Jordan (8.6%)⁸. The observed figure in this study (9%) is lower than that reported in Saudi Arabia (37.8%)⁹. This disparity might be explained by the fact that the health system in Iraq is focusing on the treatment and not the preventive focus. Conflict in Iraq (wars, civil wars, and widespread violence) might explain the lack of focus on treatment. Panic developed at the beginning of the covid-19 pandemic interfered with preventive service, so the authorities closed the screening clinic of breast cancer, which led to disturbance of the screening program.

The sensitivity of mammography is reduced in dense breasts¹¹. As a result, the advantage of undergoing breast ultrasonography outweighs the risk of BI-RADS overestimation or underestimation¹². Mammography identified 58.5 percent of BI-RADS 1, 2, and 3 scores, whereas 23.4 percent of BI-RADS 4 and 5 scores. This contradicts the findings of research that compared the two modalities¹³. Ultrasonography had a better cancer detection rate and was more helpful than mammography. In women with dense breast tissue, mammography may have specific difficulties identifying lesions. When mammography showed BI-RADS=0, ultrasonography identified abnormalities. According to specific research, with BI-RADS below 4 may benefit more from extra ultrasound study. However, those with BI-RADS 4 and above who already had a high risk of cancer, ultrasound might not gain any additional information¹⁴. In this study of 75 cases, 25(33.3%) were malignant, and 50 (66.7%) were benign. Other studies showed 50 breast masses on FNAC and found that 7 cases (14%) were malignant and 43 (86%) were benign¹⁵. Similarity studied 757 cases on FNAC and found that most cases were benign (50.2%), followed by malignant cases (31.4%)¹⁶. The percentage of benign cases in our study was closer to that in Bangladesh¹⁵. A difference might relate to sample size and decreased awareness of women about the risk of the breast lump and for seeking medical consultation from breast cancer screening clinics. Nipple discharge develops in about (11.1%) of malignant women. It is consistent with that reported in China¹⁷. Benign causes of nipple discharge were the most detected (88.9%). Another study¹⁸ showed cytological examination of nipple discharge (54.79%) were benign cases and (1.37%) were malignant, so that the nipple discharge is a poor indicator of an underlying malignancy.

Conclusions

The introduction of an individual opportunistic breast cancer screening program played a significant role in increasing public and healthcare provider awareness, practice, and attitudes toward screening among asymptomatic women, which is considered the first step in establishing population-based screening.

Financial Disclosure: There is no financial disclosure.

Conflict of interest: The authors declare no conflict of interest.

Ethical clearance: taken from the Arabic Board of Health Specializations.

References

1. Alwan NA. Iraqi breast cancer: A review on patients' demographic characteristics and clinic-pathological presentation. *Journal of the Factuality Medicine of Baghdad*. 2010;52(1):106-111.
2. Alwan NA. Family History among Iraqi Patients Diagnosed with Breast Cancer. *International Journal of Science and Research(IJSR)*. 2017; 6(2):868-872.
3. Alwan NA, Al-Rufuee .R. Farah. Comparative demographic and clinicopathological study on the behavior of mammary carcinoma in three Iraqi governorates (Baghdad, Hilla, and Karbala). *Journal of the Factuality Medicine of Baghdad*. 2010; 52(4):419-423.
4. Alwan NA, Shawkat M. Mena. Treatment options and follow-up among Iraqi patients with breast carcinoma. *European Journal of Medical and Health Sciences (EJMED)*. 2020;2(2):171
5. Al Ameen I. MARWAH, Rajab K. Khalid, Ali M. Besmah, Al DiwanJawad . Screening Motives among Attendants of Breast Cancer-Early Detection Clinics, in Iraq. *Indian Journal of Medicine and Toxicology*. 2020;14(1):636-641.
6. Asghar AL, Alwan NA, and Inaam I: Initiating opportunistic breast cancer screening program for asymptomatic self -referring women in Iraq. *Journal of the Faculty of Medicine Baghdad*. 2016;58(4):342-347.
7. DhariHiba. Reporting of the fellowship of cancer screening. Personal communication.
8. Eberal.Margaret M, Carter CathleenA: BI-RADS classification for management of abnormal mammograms. *J Am Board FM Med* 2006; 19:161-4.
9. Abu-Helalah, M.A., Alshradideh, H.A., Al-Serhan,

- A.A, Kawaleet, M., and Ne- sheiwat, A.I. (2015) Knowledge, Barriers and Attitudes towards Breast Cancer Mammography Screening in Jordan. *Asian Pacific Journal of Cancer Prevention*.2015;16, 3981-3990.
10. AljohaniSomaya, SaibIsraa, NoorelahiMuatasim: Women's performance of breast cancer screening (breast self -examination, clinical breast exam and mammography. *Advance in breast cancer research*. 2017,6 ,16-27.
 11. Aribal E, Mora P, Chaturvedi A, Hertl K, Davidovic J, Salama D, et al . Improvement of early detection of breast cancer through collaborative multi-country efforts: Observational clinical study. *European Journal of Radiology*.2019; 11(5):P31-38.
 12. Kerlikowske K. et al. Identifying women with dense breasts at high risk for interval cancer: a cohort study. *Ann. Int. Med*. 2015, 162:673-681.
 13. Regina Hooley, Geisel J, Raghu. Screening breast ultrasound outcomes and diagnostic performance, *Semin Ultrasound CT MR*.2018 Feb;39(1):25-34.
 14. MohsinKhaleel, F.Kareem Tara, Awn Anas.Ultrasound finding of Mammographically dense breasts in a sample of Iraqi female patients. *Journal of the Faculty of Medicine Baghdad*. 2019: 61(1):39-43.
 15. ChairatRungnapa, PuttisriAdisorn, PamarapaAsani, SamintharapanyaSahatham, TawichasriChamaiporn and PatumanondJayanton. Are both ultrasonography and mammography necessary for cancer investigation of breast lumps in resource-limited countries?.*ISRN Oncology*. 2013(172):1-6.
 16. KhanamKazi, AkterNasima, TabashumTarana, RaazaMaruf Muhammad Abu Khalid, UIHosnaAsma, RahmanFarzana and Begum Afroza . Aclinicopathologic study of various breast lesions by fine-needle aspiration cytology FNAC. *Curr Surg*. 2018;8(3-4):27-31.
 17. Ganiat O, Omoniyi-Esan, Osasan S, Titiloye N, Olasode B. Cytopathological review of breast lesions in Ile-IfeNigeria. *The Internet J. of Third World Med*. 2008; 8:10-25.
 18. Hong Zhao, LiweiZou, Xiaoping Geng, and SuishengZheng. Limitation of mammography in diagnosing breast diseases compared with ultrasonography: a single-center retrospective analysis of 274 cases. *European Journal of Medical Research*. 2015;20(1):49
 19. Dolan, R. T., Butler, J. S., Kell, M. R., Gorey, T. F., and Stokes, M. A. (2010). Nipple discharge and the efficacy of duct cytology in evaluating breast cancer risk. *Surgeon*.2010, 8(5):252-258.

To Evaluate the Effectiveness of DPP4 Inhibitors in Relation to Blood Sugar and Lipid Profile

Megha Sharma¹, Amit Varma², Kiran Bhat³, Rohit Rakholia⁴

¹Senior Resident, Department of Medicine, Shri Guru Ram Rai Institute of Medical Health and Sciences, Dehradun

²Head of Department, Department of Medicine, Shri Guru Ram Rai Institute of Medical Health and Sciences, Dehradun

³Associate Professor, Department of Biochemistry, Shri Guru Ram Rai Institute of Medical Health and Sciences, Dehradun

⁴Senior Resident, Department of Radiodiagnosis, Shri Guru Ram Rai Institute of Medical Health and Sciences, Dehradun

How to cite this article: Megha Sharma, Amit Varma, Kiran Bhat, Rohit Rakholia et al. To Evaluate the Effectiveness of DPP4 Inhibitors in Relation to Blood Sugar and Lipid Profile. Volume 13 Issue 3 July-September 2022

Abstract

The purpose of study was to compare the glycemic parameters- Fasting Blood Sugar (FBS), Postprandial blood sugar (PPBS), and HbA1C in subjects with Type 2 Diabetes Mellitus taking DPP4 Inhibitors versus other OHA either used alone or in combination with other oral hypoglycemic agents (OHA). Methods: The subjects attending outdoor and indoor clinics of the Department of Medicine suffering from type 2 diabetes mellitus and satisfying the inclusion and exclusion criteria of study were included in the study. Results: Treatment with DPP-4 Inhibitors was associated with a better glycemic control as compared to non DPP-4 inhibitors. Conclusion: DPP-4 inhibitors also had a positive effect on beta cell function and insulin resistance as depicted by higher C-peptide levels and HOMA-IR respectively.

Keywords: diabetes mellitus, hypoglycemic agents, C-peptide levels, insulin resistance.

Introduction

Diabetes mellitus as a disease has emerged as a major epidemic all over the world over more than last two decades with increasing prevalence and additional risk factors being added. Around 425 million people have diabetes in the world where over 7.79 crore cases of diabetes in India in 2019. Prevalence of diabetes in Indian adults is 11.8%. The identification of newer risk factors helped in delineating more the underlying etiopathology of the disease process. During this period our armamentarium has been enriched by newer class of drugs^[1-3].

An important and interesting addition is the incretin class of drugs, especially DPP-4 inhibitors, which lower postprandial blood sugar by releasing insulin from the pancreas in response to the food in the second part of the duodenum and by preventing the rapid degeneration of incretin in early stage of diabetic patients who have enough pancreatic reserves. Although type 2 diabetes mellitus is characterized by marked insulin resistance but there is also progressive beta cell dysfunction and insulinopenia. It is interesting to observe the insulin effect and the incretin effect in subjects with reduced pancreatic reserves : It has also been observed that

Corresponding Author: Rohit Rakholia

Senior Resident, Department of Radiodiagnosis,

Shri Guru Ram Rai Institute of Medical Health and Sciences, Dehradun

rohitrakholia@gmail.com

6397448262

on adding DPP-4 inhibitors to metformin therapy was efficacious independent of insulin resistance stage, body mass index (BMI), and disease duration and duration of prior metformin use [4-10].

It has been observed that the hypoglycemic response of various class of drugs in Type II Diabetes mellitus is different. Some may respond expectedly while others may not show glycemic control with higher doses and combination of drugs while the others may have hypoglycemia even with the small doses. Our recent understanding of the heterogeneity of Type II Diabetes mellitus into various subtypes- Severe Insulin Deficient Diabetes, (SIDD), Insulin Resistant Obese Diabetes, (IROD), Combined Insulin Resistant and Deficient Diabetes, (CIRDD), Mild Age-Related Diabetes, (MARD) are likely to be responsible for these differences in the treatment outcomes. Hence it is rationale to differentiate between the insulinopenic and the non-insulinopenic groups amongst Type II Diabetics. Besides, the effect of DPPIV inhibitors on lipid profile and beta cell function are the pleotropic effect which are the additional effects which needs validation. This study assumes greater significance as it attempts to evaluate these aspect of DPPIV inhibitors.

Methods

Study Design

Study was conducted as a Cross sectional observational analysis and included 2 groups.

Group A included type 2 diabetes patients on DPP 4 inhibitors either alone or in combination.

Group B included type 2 diabetes patients on OHA other than DPP 4 inhibitors either alone or in combination.

Study Area

The study was conducted in Department of Internal Medicine, Shri Mahant Indiresh Hospital, Dehradun. It is situated in foothills of Himalayas, catering the population both from the hill areas and the plains of Uttarakhand and nearby states.

Study Population

The subjects attending outdoor and indoor clinics of the Department of Medicine suffering from type

2 diabetes mellitus and satisfying the inclusion and exclusion criteria of study were included in the study. The study included two groups : group A & B.

Group A included subjects taking DPP-4 inhibitors in addition to other oral hypoglycemic agents, it included 100 patients.

Group B were taken as control and included subjects with type 2 diabetes taking oral hypoglycemic agents but not DPP-4 inhibitors. In both the groups subjects taking insulin were not be included, which included 100 patients.

Study Duration

The study was conducted from December 2018 - May 2020.

Methods

Inclusion Criteria

1. Age more than 18 years.
2. Subjects with type 2 diabetes mellitus.
3. Subjects on DPP-4 inhibitors in group A.

Exclusion Criteria

1. Age less than 18 years.
2. Type 1 diabetes.
3. Secondary diabetes.
4. Gestational diabetes mellitus.
5. Congenital forms of diabetes.
6. Subjects on insulin.
7. Chronic kidney disease.

Methodology

The subjects so included were subjected to a detailed clinical history with special emphasis on duration of illness and treatment history and a thorough clinical examination was done in each case. The diagnosis of Diabetes was based on ADA guidelines (2019). A informed consent was taken in all cases included in the study. The subjects on DPP-4 inhibitors for atleast 3 months(180 days) prior to the study were included. The subjects included in the study continued to be treated by the respected medical consultants and were investigated as per the protocol, however

FBPS, PPBS, HbA1c, F.Insulin, C-peptide levels & lipid profile done in each case. C-peptide levels and insulin resistance were correlated with FBS, PPBS, HbA1c and lipid profile. The results so obtained were analyzed using suitable statistical methods.

These subjects were categorized in 2 groups:

Group A included subjects taking DPP-4 inhibitors in addition to other oral hypoglycemic agents, it included 100 patients.

Group B were taken as control and included subjects with type 2 diabetes taking oral hypoglycemic agents but not DPP-4 inhibitors. In both the groups subjects taking insulin were not be included.

Results

Baseline characteristics of group A (DPP-4 Inhibitor)

Variable	mean±sd
Age	59.47±12.02
Duration of diabetes	9.06±4.74
T.Cholesterol	211.61±66.69
BMI(kg/m ²)	23.97±1.59
WHR	0.86±0.04
FBS (mg/dl)	146.53±31.74
PPBS (mg/dl)	193.08±45.87
HbA1C	8.43±1.05
Fasting Insulin (uU/L)	6.11±3.15
HOMA-IR	2.20±1.30
Fasting C-Peptide (mg/dl)	4.79±1.65

Baseline characteristics of group B (non DPP-4 Inhibitor)

Variable	mean±sd
Age	61.44±10.39
Duration of diabetes	8.82±4.56
T.Cholesterol	278.60±59.58
BMI(kg/m ²)	24.66±1.49
WHR	0.86±0.02
FBS (mg/dl)	120.61±25.65
PPBS (mg/dl)	220.32±49.44
HbA1C	8.16±1.20
Fasting Insulin (uU/L)	5.85±2.69
HOMA-IR	1.74±1.41

Fasting C-Peptide (mg/dl)	3.56±1.94
---------------------------	-----------

Number of study participant in age group 35-45 are 15% in group A and 5% in group B, in 46-55yr 24% in group A and 30% in group B, In 56-65yr 26% in group A and 32% in group B, in 66-75yr 27% in group A and 22% in group B, In >75yr 8% in group A and 11% in group B.

Males in study participants in 44% in group A & 52% in group B & Female 56% in group A and 48% in group B.

Mean c-peptide levels for group A is 7.05 and 6.28 in group B in first 4 years

Mean c-peptide levels during 4-8 years of DM were 4.82 & 3.53 in group A&B respectively

Mean c-peptide levels during 8-12 years of DM were 3.74 & 2.84 in group A&B respectively

Mean c-peptide levels during 12-16 years of DM were 3.59 & 2.64 in group A&B respectively

Mean c-peptide levels during 16-20 years of DM were 2.92&1.91 in group A and B

Mean c-peptide levels >20years duration were 1.89&0.94 in group A and B.

The results were found to be significant in patients with diabetes duration of more than 4 years.

FBS was found to be higher in Group A as compared to group B,

PPBS was found to be higher in group B as compared to group A

HbA1C was found to be higher in group A as compared to group B.

All 3 findings were found to be statistically significant.

Fasting insulin and HOMA-IR were found to be higher in group A as compared to group B and the difference was found to be statistically significant.

Fasting C-peptide levels are higher in group A as compared to group B and this difference was found to be statistically significant.

BMI was found to be significantly lower in group A as compared to group B and this difference was found to be statistically significant. For WHR no significant difference was found in neither of the two groups.

Total cholesterol was found to be lower in group A

as compared to group B and the result was found to be statistically significant

No significant difference in glycemic and non-glycemic parameters were seen in all 3 members of DPP-4 inhibitors

Discussion

The study was conducted in the Department of Medicine at Shri Gruru Ram Rai Institute Of Medical And Health Sciences, Dehradun and was planned as a cross sectional observational study with the aim to evaluate the effectiveness of DPP-4 Inhibitors with relation to C-peptide and Insulin resistance.

It included consecutive type 2 diabetic subjects attending the inpatient and outpatient department of the institute and were included only if they satisfied the inclusion and exclusion criteria of study. These subjects were categorized into 2 groups- Group A & Group B. Group A included subjects who were on either DPP-4 inhibitor alone or in a combination whereas group B included the subjects not on DPP-4 inhibitor. Both groups were carefully matched for age, sex and duration of illness (table 1-4).

The effectiveness of DPP4 inhibitors was evaluated in terms of various glycemic and non-glycemic parameters. The glycemic parameters in the study included FBS, PPBS and HbA1c whereas the non-glycemic parameters included lipid profile and anthropometry. For this study the patients were stabilized with the drugs for a minimum period of 3 months.

Type 2 diabetes mellitus is a heterogeneous group comprising of predominantly insulinopenia, predominant insulin resistance, combination of both or age related deterioration of beta cell function (4,5,6). It is further observed that at the time of diagnosis of Type 2 Diabetes Mellitus as a heterogeneous group majority of beta cell mass (and functions) are already lost (118), however the preservation of the function and mass is significant in a sub group with insulin resistance, or a combination of insulinopenia or insulin resistance, hence this would have a significant bearing on the management of the disease.

The glycemic parameters were compared in the two groups and there was significant difference observed in FBS, PPBS and HbA1c in these groups where DPP-4 inhibitors were found to be more potent in reducing PPBS as compared to non-DPP-4 group. As far as the

glycemic control is concerned, the other contemporary group of drugs have a similar glucose lowering effect. Rather the non-sulfur containing sulphonylureas are more potent in terms of reducing glycemic status. However in the present study the number of drugs in either group is not compared. It has been observed that DPP4 inhibitors reduce HbA1C by 0.8- 1.4% (depend on type of DPP 4 inhibitor used). A study by Dror Dicker *et al* observed that the treatment with saxagliptin showed an average decrease in HbA1C levels of 0.43-1.17% whereas treatment with vildagliptin showed an average decrease in HbA1C levels of 1.4% after 24 weeks as monotherapy in a subgroup of patients with no prior oral treatment and after a short period of time from the diagnosis of diabetes. But secretagogues are more potent glucose lowering agents whereas SGLT- 2 inhibitors have also almost similar HbA1C lowering effect. In a meta-analysis that included information regarding treatment of type 2 diabetes with sitagliptin and vildagliptin for ≥ 12 weeks compared with placebo and other oral antidiabetic drugs, Amori *et al.* showed a reduction of 0.74% in HbA_{1c} levels. The result proved DPP-4 inhibitors were only slightly less effective than sulphonylureas and as effective as metformin and thiazolidinediones in regard to reducing blood glucose. In studies with combination therapy of DPP-4 inhibitors and metformin in one pill, the results were even better because of two possible causes. First, metformin has an upregulating effect on the level of glucagon like peptide 1 (GLP-1), and therefore it enhances the incretin effect of the DPP-4 inhibitors. A second possible explanation for the improved results in the combined drug is the improved compliance of patients when taking one oral drug instead of two[136].

These observations also implies that DPP-4 inhibitors are non inferior to other classes with regards to lowering blood sugar levels (glycemic parameters). Further the degree of glucose lowering by these agents also depends upon the nature of type 2 diabetes mellitus - insulinopenic predominant, insulin resistance predominant, combination of both or mild adult onset type. Our recent understanding of the heterogeneity of Type II Diabetes mellitus into various subtypes- Severe Insulin Deficient Diabetes, SIDD, Insulin Resistant Obese Diabetes, IROD, Combined Insulin Resistant and Deficient Diabetes, CIRDD, Mild Age-Related Diabetes, MARD are likely to be responsible for these differences in the treatment outcomes. Hence it is rationale to

differentiate between the insulinopenic and the non-insulinopenic groups amongst Type II Diabetics. It would also depend upon the mean duration of illness. Despite these intra-group variations, the adjustment of various OHAs have been made in both the groups to maintain HbA1c in a reasonably achievable range.

Conclusion

In conclusion, the results of this study suggest

1. Treatment with DPP-4 Inhibitors was associated with a better glycemic control as compared to non DPP-4 inhibitors.
2. DPP-4 inhibitors also had a positive effect on beta cell function and insulin resistance as depicted by higher C-peptide levels and HOMA-IR respectively.
3. DPP-4 inhibitors are also associated with a significant reduction in Total Cholesterol levels but were found to be weight neutral.

Ethical clearance- Taken from ethical committee of institution

Source of funding - Self

Conflict of Interest - Nil

References

1. Chen L, Magliano DJ, Zimmet PZ. The worldwide epidemiology of type 2 diabetes mellitus – present and future perspectives. *Nature reviews endocrinology*. 2012 Apr;8(4):228-36.
2. Ginter E, Simko V. Diabetes type 2 pandemic in 21st century. *Bratislavské lekárske listy*. 2010 Jan 1;111(3):134-7.
3. Fox CS, Coady S, Sorlie PD, D'Agostino Sr RB, Pencina MJ, Vasan RS, Meigs JB, Levy D, Savage PJ. Increasing cardiovascular disease burden due to diabetes mellitus: the Framingham Heart Study. *Circulation*. 2007 Mar 27;115(12):1544-50.
4. Drucker DJ. The biology of incretin hormones. *Cell metabolism*. 2006 Mar 1;3(3):153-65.
5. Holst JJ. The physiology and pharmacology of incretins in type 2 diabetes mellitus. *Diabetes, obesity and Metabolism*. 2008 Aug;10:14-21.
6. Pitman MR, Menz RI, Abbott CA. Hydrophilic residues surrounding the S1 and S2 pockets contribute to dimerisation and catalysis in human dipeptidyl peptidase 8 (DP8).
7. Martin JH, Deacon CF, Gorrell MD, Prins JB. Incretin-based therapies—review of the physiology, pharmacology and emerging clinical experience. *Internal medicine journal*. 2011 Apr;41(4):299-307.
8. Kahn SE. The importance of β -cell failure in the development and progression of type 2 diabetes. *The Journal of Clinical Endocrinology & Metabolism*. 2001 Sep 1;86(9):4047-58.
9. Fonseca VA. Defining and characterizing the progression of type 2 diabetes. *Diabetes care*. 2009 Nov 1;32(suppl 2):S151-6.
10. Halban PA, Polonsky KS, Bowden DW, Hawkins MA, Ling C, Mather KJ, Powers AC, Rhodes CJ, Sussel L, Weir GC. β -cell failure in type 2 diabetes: postulated mechanisms and prospects for prevention and treatment. *The Journal of Clinical Endocrinology & Metabolism*. 2014 Jun 1;99(6):1983-92.

Adrenal Insufficiency due to Total Primary Empty Sella Syndrome

Monika Sharma¹, Yatharth Bansal², Tejinder Talwar³

^{1,2}Resident, Department of Medicine, MMIMSR, Mullana, Ambala

³Professor, Department of Medicine, MMIMSR, Mullana, Ambala

How to cite this article: Monika Sharma, Yatharth Bansal, Tejinder Talwar et al. Adrenal Insufficiency due to Total Primary Empty Sella Syndrome. Volume 13 Issue 3 July-September 2022

Abstract

A 64-year-old woman was transported suffering from persistent lower abdominal pain, vomiting, and low-grade fever. Magnetic resonance imaging revealed an empty sella (ES) and hormone tests revealed a disappearance of diurnal variation of cortisol, low cortisol and adrenocorticotropic hormone (ACTH) secretion especially in the morning, and poor ACTH-cortisol axis reaction, as well as normal hypothalamus-pituitary gland-thyroid or adrenal gland axis hormone reaction. The cause of ES remained unclear; however, based on a diagnosis as adrenal insufficiency due to inappropriate ACTH secretion caused by total primary ES syndrome, we started hydrocortisone (15 mg/day). Afterwards, she immediately became symptom-free and was discharged.

Keywords: Adrenal insufficiency; Cortisol; Adrenocorticotropic hormone; Empty sella syndrome

Introduction

“Empty sella” (ES) refers to the neuroradiological or pathological finding of an apparently empty sella turcica that contains no pituitary tissue [1]. An ES develops when cerebrospinal fluid (CSF) fills the sella turcica, compressing pituitary tissue until it lines the floor and walls of the sella, and when there is remodeling of the sella turcica and a flattening of the pituitary gland that results from subarachnoid space extension into an intra-sellar position and a stretching of the pituitary stalk [2-6]. ES syndrome (ESS) refers to an anatomical and radiological condition, first described by Busch in 1951 [6]. ESS is complete or partial, depending on whether the sella turcica is completely or partially filled with CSF; this results in displacement of the pituitary gland, and therefore ESS is the pathological

variant [6, 7]. In partial ESS, there is a pituitary gland thickness of 3 - 7 mm, with the sella filled less than 50% with CSF [6]. On the other hand, total ESS refers to when the pituitary gland thickness is less than 2 mm, and spinal fluid fills over half of the sella [6]. ESS patients have one or more pituitary hormone deficiencies [6].

Regarding pathophysiology and etiology, ESS is subdivided into two categories: primary ESS (PES) and secondary ESS (SES). PES occurs when there is increased CSF pressure alongside a defect in the diaphragma sellae. While there is no clear genetic association known to cause a predisposition to PES, it is likely that the incompetent diaphragma sellae was present at the patient's birth. The pathogenetic mechanisms of PES are not well established, but an

Corresponding Author : Dr. Tejinder Talwar

Professor

Department of Medicine,

MMIMSR, Mullana, Ambala

drtejindertalwar@gmail.com

9466258705

ischemic atrophy of the adenohypophysis may be involved in the development of a PES with idiopathic chronic raised intracranial pressure, preventing the recovery of the gland volume after the intracranial pressure is restored to normal values. Restitution of ES may also be an indicator of ordinary intracranial pressure. This is rarely known to cause pituitary dysfunction. On the other hand, there is a reported case in which a diagnosis of PES with anterior pituitary dysfunction was made in the absence of any history of pituitary irradiation, pituitary adenoma, or surgery. SES can occur as a result of damage to the pituitary itself (e.g., pituitary apoplexy) or as a consequence of surgery, radiation treatment, immunotherapy or other novel forms of treatment, hemorrhage, autoimmune hypophysitis, neurosarcoidosis, or an infarction of the pituitary gland, and it may occur at any time during the patient's life. In addition, a relationship has been reported between infection with Hantaan virus and SES.

Case Report

A 64-year-old woman was transported suffering from persistent lower abdominal pain, vomiting, and low-grade fever. She had also been transported to our hospital 2 years ago due to the same complaint. Her medical history included total blindness when she was in her 30s, undergoing fibroid surgery when she was in her 40s, schizophrenia, type 2 diabetes mellitus without any complications, hypertension, and dyslipidemia. She was treated with risperidone, metformin, voglibose, candesartan, and pravastatin. The patient was unemployed and did not have any food or drug allergies. She had never experienced abnormal menstruation, including amenorrhea, and had a son. She had no family history of any immunodeficiency disorders or other congenital anomalies. She was independent for everyday activities, lived alone, and received food delivery services. On the other hand, she had sometimes complained about fatigue or abdominal pain, especially in the morning, according to her detailed history. This case report was approved by the Kanazawa Medical University Himi Municipal Hospital ethics committee and carried out in conformance with the principles of the Declaration of Helsinki.

She was 150 cm tall and weighed 57 kg, and she was obese, but without moon face, skin rashes, or striae. Her vital signs were abnormal, with a blood pressure of 104/58 mm Hg, a heart rate of 76 regular

beats/min, a body temperature of 37.6 °C, oxygen saturation of 97% in ambient air, and a respiratory rate of 16/min; her Glasgow Coma Scale score was 15 (Eye (E) 4 Verbal (V) 5 Motor (M) 6) points. She complained of tenderness throughout the entire abdomen, and nothing else abnormal, including skin findings, was detected upon physical examination. A routine laboratory examination revealed increased values of white blood cells, lactate dehydrogenase, creatine kinase, and decreased values of blood urea nitrogen, sodium, and chloride. On the other hand, other values were normal, including complete blood count, biochemistry, casual blood glucose, ammonia, and urine tests. In addition, no dramatic hormone secretion abnormality was confirmed in spotting pituitary, thyroid, and adrenal gland hormone examinations. In an imaging examination, a cranial computed tomography (CT) scan revealed ES in the pituitary gland with a height of 1 mm. A magnetic resonance imaging (MRI) scan found CSF filling the sella turcica, and its intensity was the same as the cerebral ventricle (iso-intensity in T1-weighted image, and high intensity in T2-weighted image), in addition to the similar findings of the CT scan. On the other hand, chest and abdominal CT scans revealed normal findings. At this point, we suspected her diagnosis was ESS, which led to insufficient ACTH secretion and adrenal insufficiency. After she was hospitalized, we measured daily ACTH and cortisol secretion and performed two hormone load tests, namely an insulin tolerance test (ITT) and intravenous (IV) administration of Novolin R[®] 6 U (0.1 U/kg), and an anterior pituitary function test through combined IV administration of four hypothalamic releasing hormones: corticotropin-releasing hormone (CRH), thyrotropin-releasing hormone (TRH), luteinizing hormone-releasing hormone (LH-RH), and growth-hormone releasing factor (GRF). As a result, we confirmed a disappearance of diurnal variation of cortisol, low ACTH secretion in the morning, and poor ACTH-cortisol axis reaction as well as normal hypothalamus-pituitary-gland-thyroid or adrenal gland axis hormone reaction. More specifically, on the ITT, a hypoglycemic state occurred 30 min after insulin administration and continued until 90 min after; on the other hand, we could not regard this as single ACTH deficiency, because its secretion was confirmed. Other pituitary hormones had been secreted adequately by the hypothalamus upon release of hormone stimulation. On the other hand, her daily cortisol secretion to urine was 58.8 mg/dL/day and was within normal range.

Based on these results, we suspected the following pathology: CSF filled her sella turcica and caused insufficient pituitary hormone secretion. Then, she suffered from adrenal gland cortex function failure, and diurnal variation of cortisol vanished based on low ACTH secretion. On the other hand, cortisol secretion had been sustained at the very limit, and a time lag occurred between cortisol and ACTH secretion. The phenomenon was due to PES. Along the way, some kinds of stress had caused further ACTH hyposecretion, which led to her symptoms. Therefore, she only ever experienced hyponatremia due to temporary adrenal insufficiency when she experienced stress. Her gonadal hormone function had been maintained because she hadn't experienced amenorrhea, and she had given birth. The cause of her complete blindness was suspected to be due to compression of the optic nerve by ES. On the other hand, the cause of ES in this case remained unclear.

Although we could not get a definite diagnosis, we diagnosed it as adrenal insufficiency due to inappropriate ACTH secretion caused by PES. We concluded that it would be safer to treat her through corticosteroid replacement therapy, especially in the morning, because she would repeatedly suffer from adrenal insufficiency with high percentages under stress conditions. We started hydrocortisone (15 mg/day) from the 10th hospital day, and she immediately became symptom-free, and she was discharged on the 19th hospital day. On the other hand, we also expected to administer hydrocortisone (10 mg) to be taken in the event of stress, including similar symptoms, burn, or trauma.

Discussion

We present the first known case of adrenal insufficiency due to insufficient ACTH secretion caused by total PES.

ESS is considered to a relatively rare entity, but research reports that it is present in 5.5-20% of autopsies, and that it is also present in an estimated 12% of neuroimaging patients. Additionally, some reports note an even higher incidence in clinical practice, with estimates of up to 35%. ESS incidence peaks in the forties through sixties. However, the incidence of pediatric ES varies significantly by population surveyed, ranging from as little as 1.2% in children without endocrine symptoms to as much as 68% in children with known endocrinopathy^[2].

Because endocrine function is ordinarily intact, patients with ESS typically have normal histories and physical exams. Clinical manifestations of ESS include headache (the most typical manifestation), hypopituitarism, CSF rhinorrhea, visual abnormalities and deterioration including impairment of the visual field, overweight/obesity, hypertension, irregular menses, primary amenorrhea, and multiple pregnancies, some of which may often be associated with intracranial hypertension. In our case, recurrent manic-like episodes had been confirmed, and hyponatremia was seen upon her admission; therefore, we suspected adrenal cortical insufficiency as the cause.

In most cases, pituitary function is normal despite the pituitary gland's abnormal appearance of the pituitary gland, but in approximately 20% of cases, any or all pituitary hormone levels may be affected. Hyperprolactinemia and GH deficiency appear to be the two most common findings in ES: hyperprolactinemia is present in 10-17% of cases and may be due to a microprolactinoma or functional hyperprolactinemia, while GH deficiency is present in 4-60% of cases, but its clinical significance in adults is unclear. Gonadotropin deficiency is found in 2-32% of cases, while ACTH, thyroid-stimulating hormone (TSH), and antidiuretic hormone (ADH) deficiencies are less frequent, with incidences of approximately 1% each. Specifically, in some reports, authors advised following basic neuroendocrinological testing: fasting cortisol, free thyroxine (FT₄), estradiol or testosterone, insulin-like growth factor 1 (IGF-1), and prolactin. In addition, the following labs are necessary for pituitary function evaluation in any patient found to have ES: for the adrenal axis, early-morning fasting cortisol levels are a screening option for ACTH deficiency, and overtly low levels of cortisol (less than 3.0 µg/dL) are considered consistent with adrenal insufficiency.

Most patients with ES remain asymptomatic throughout their life and require no treatment; however, in cases where isolated ACTH deficiency develops, corticosteroid treatment should be enforced in order to avoid fatal consequences. Patients allergic to succinate ester can tolerate alternative ester-free corticosteroids^[31]. Patients with hypopituitarism should be given hormone replacement therapy in time, and followed up afterwards, but chronic hyponatremia should always be corrected gradually, in order to avoid osmotic myelinolysis syndromes.

Conclusion

This case study has several limitations. First, this paper reviews a single case report and case series of ESS. Therefore, the actual situation of ESS may differ from the results of the literature review, due to reporting bias. Second, we did not measure hormone values during the patient's convalescent stage; therefore, we should have measured them and compared them with the values at time of admission for a detailed diagnosis. Third, metyrapone testing should be performed to assist in this diagnosis.

In conclusion, we have reported the first known case of adrenal insufficiency due to insufficient ACTH secretion caused by total PES. This case highlights the complex pathology, procedure of diagnosis, and treatment for ESS. On the other hand, further investigations are needed to clarify the precise pathogenesis of ESS.

Ethical clearance - taken from institutional committee

Source of funding - Self

Conflict of Interest - Nil

References

1. Auer MK, Stieg MR, Crispin A, Sievers C, Stalla GK, Kopczak A. Primary empty sella syndrome and the prevalence of hormonal dysregulation. *Dtsch Arztebl Int.* 2018;115(7):99-105. doi pubmed
2. Lenz AM, Root AW. Empty sella syndrome. *Pediatr Endocrinol Rev.* 2012;9(4):710-715.
3. Ucciferro P, Anastasopoulou C. Empty Sella. In: *StatPearls.* Treasure Island (FL), 2020.
4. Izizag BB, Ngandu A, Mbiso DL. [Empty sella syndrome: a case report]. *Pan Afr Med J.* 2019;33:317. doi pubmed
5. Braitheh N, Breiteh N, Kashou HE. Sinus bradycardia as a rare and unusual presentation of partial empty sella syndrome: a case report. *Am J Case Rep.* 2019;20:1071-1074. doi pubmed
6. Aijazi I, Abdullah Al Shama FM, Adam Mukhtar SH. Primary empty sella syndrome presenting with severe hyponatremia and minimal salt wasting. *J Ayub Med Coll Abbottabad.* 2016;28(3):605-608.
7. Jurca MC, Bembea M, Kozma K, Sandor MI, Negrean RA, Dobjanschi L, Cuc EA, et al. Empty sella associated with growth hormone deficiency and polydactyly. *Rom J Morphol Embryol.* 2018;59(1):381-384.
8. Chiloiro S, Giampietro A, Bianchi A, Tartaglione T, Capobianco A, Anile C, De Marinis L. DIAGNOSIS OF ENDOCRINE DISEASE: Primary empty sella: a comprehensive review. *Eur J Endocrinol.* 2017;177(6):R275-R285. doi pubmed
9. Guitelman M, Garcia Basavilbaso N, Vitale M, Chervin A, Katz D, Miragaya K, Herrera J, et al. Primary empty sella (PES): a review of 175 cases. *Pituitary.* 2013;16(2):270-274. doi pubmed
10. Delgado-Hernandez A, Verduzco-Mendoza A, Luna-Reyes FA, Marquez-Palacios S, Arch-Tirado E. [Analysis of the joint and a posteriori probability between primary empty sella, its comorbidities and audiovestibular pathology]. *Cir Cir.* 2015;83(6):459-466.

Correlation between Academic achievement, Clinical Performance and Clinical Competency in Midwifery

Blaze Asheetha Maria Rosario¹, .Sr. Mariam O.J (Sr. Celcy Mary)²

¹Associate Professor, St Philomena's College of Nursing, No.1, Mother Theresa's, Viveknagar P.O, Bangalore

²Professor and Former Principal, St Johns College of Nursing, Bengaluru

How to cite this article: Blaze Asheetha Maria Rosario, Sr.Mariam O.J (Sr.Celcy Mary) et al. Correlation between Academic achievement, Clinical Performance and Clinical Competency in Midwifery. Volume 13 Issue 3 July-September 2022

Abstract

Background: Academic achievement represents an individual's theoretical or cognitive understanding. The practical examination is a systematic method of evaluating clinical performance in the clinical area. However, it has been the last two decades that there has been a shift towards Competency-based education practices. Competencies are now defined as the ability of an individual to execute a task, which can be both cognitive and practical, among the other traits.

Methodology: A correlational study was undertaken among nursing students in a selected Institute. There were 45 nursing students chosen using the purposive sampling method for the study. Researchers used a clinical competency-based evaluation tool for midwives, combined with previously obtained theory and practical University marks, to collect data. Karl Pearson's product-moment correlation was used to compute the relationship between three variables. Tables and figures were then used to arrange and display the resulting data.

Results: The findings revealed a moderate positive correlation between academic achievement and clinical performance, a weak positive Correlation between academic achievement and Competency scores, and a weak positive correlation between Clinical Performance and Competency scores. With the routine assessment of theory and practical assessment, opportunities are to be created for competency assessment, for the world needs competent midwives rather than just qualified midwives.

Keywords: Correlation, academic achievement, clinical performance, Competency, Midwives

Introduction

The nursing and Midwifery workforce occupy the most considerable portion of the health sector. Appropriate education is the key to bringing in the quality workforce into practice. It is not just the number that matters, but what matters most is the practicing member. Is the member trained enough? Does the member know? Can the member do the skills expected? Is the member competent? If the answer to these questions is "yes," we know education serves the demand.

There is a shortage of Nursing and Midwifery workforce throughout the globe. The world will have

six million nursing, and midwifery vacancies by 2030.¹ The pandemic has further made the situation even more challenging far beyond expectations¹So there is a serious problem soon. The emerging challenges in the health sector require well-prepared Nurses and Midwives. While collaboration is warranted from the highest councils to the local associations to work towards the mission of clinical education, efforts can be taken at individual institution levels too.²

Moreover, new graduates find it very challenging to practice in the new environment.³Here, we need to think about what makes the recent graduates fail when posted at work post-registration and course completion?

Education for a time long centered around the “Cognitive domain.” Nurse-Midwifery is a skill-based entity where skills are as essential as the knowledge gained. Knowledge and skill are not independent; the underlying ability allows an individual to perform a skill. They go hand in hand. Now it is not just enough to “know something” or “do something.” It is significant for nurse-midwives to complete a task ensuring safe practice, which is competence—being competent houses both being knowledgeable and being skillful.

Our assessment patterns about the “Cognitive domain” are usually paper and pen-based University-based question paper examinations. For the “psychomotor domain,” the assessments on a more extensive run are through two evaluator-based practical exams. A candidate clearing these assessments completes a series of years of study and the course. A “pass” in the final years theory and practical test declares the candidate “Qualified Nurse Midwife,” which gives wings to practice. However, the question is, are these Nurse-Midwives ready for safe practice? Is there something beyond theory and practicals which should be looked upon? This study strives to determine the relationship between academic achievement, clinical performance, and clinical competence.

Statement of the Problem

“A study to assess the correlation between academic achievement, clinical performance and clinical competency scores in Midwifery among final year undergraduate Nurse-Midwifery students in a selected institution, Bengaluru.”

Objectives

- To assess academic achievement, clinical performance, and clinical competency scores in Midwifery among final year undergraduate Nurse-Midwifery students.
- To assess the correlation between academic achievement, clinical performance, and clinical competency scores in Midwifery among final-year undergraduate nurse-midwifery students.

Hypotheses

At 0.05 level of significance:

- **H₁:** there is a statistically significant correlation between academic achievement and clinical performance among final-year undergraduate nurse-midwifery students.
- **H₂:** there is a statistically significant correlation between academic achievement and clinical competency scores among final-year undergraduate nurse-midwifery students.
- **H₃:** there is a statistically significant correlation between clinical performance and clinical competency scores among final-year undergraduate nurse-midwifery students.

Operational Definitions

- **Academic achievement:** In this study, it refers to the knowledge gained by final-year undergraduate nurse-midwifery students as assessed using existing Theory University marks in Midwifery
- **Clinical Performance:** In this study, it refers to the practical skills gained by final-year undergraduate nurse-midwifery students as assessed using existing Practical University marks in Midwifery
- **Clinical Competency:** In this study, it refers to attributes in terms of cognitive or physical capability to perform tasks expected from an undergraduate nurse-midwife student at the point of course completion as listed and tested using a researcher prepared Midwifery Clinical Competency Based Assessment Tool.
- **Nurse-Midwifery Students:** In this study, it refers to pupils studying final year Basic BSc Nursing in a selected institution.

Methodology

A correlational study was conducted in a Nursing Institution. A sample of 45 Nurse-Midwifery students was selected using the purposive sampling technique. Data were collected using retrieved University mark sheets, and the researcher prepared Midwifery Clinical Competency-Based Assessment Tool. The retrieved university marks were the basis of academic achievement and clinical performance. The Midwifery Clinical Competency-based assessment tool was administered to the students to self-rate their competency at the point of final examination. The

collected data was analyzed using descriptive and inferential statistics. After that, the analyzed data was organized and presented in the form of tables and figures.

Ethical Considerations

- Ethical approval was obtained from the Institutional Ethical Committee of the institution
- Permissions were sought from the concerned authority of the Institution
- The participants were kept informed before consent was taken after assuring confidentiality and anonymity.

Result and Interpretation

• **Section 1: Sample characteristics of Nursing students.**

The mean age of the participants was 21.67, and all of them were females. The majority (80%) were Christians and interested in Midwifery(88.89%). A vast majority (93.33%) were satisfied with the supervision they received.

• **Section 2: Description of academic achievement, clinical performance, and clinical competency scores in Midwifery**

Table 1: Mean, Mean Percentage, Median, Mode, Range, and Interquartile range of academic achievement, clinical performance, and clinical competency scores in Midwifery. n=45

Variables	Max Score	Mean	Mean %	Median	Mode	Range	Interquartile range
Academic achievement	100	67.29	67.29%	67	69,63	54-85(31)	11.5
Clinical Performance	100	86.87	86.87%	86	85	94-82(12)	4
Competency Scores	405	298.44	73.68%	291	291	201-405(204)	63.5

Table 1 shows that the mean percentage was least for academic achievement (67.29%). The practical scores gained by students were highest (86.87%), constituting their clinical performance. The competency scores were in between the theory and functional scores.

- **Section 3: Correlation between academic achievement, clinical performance, and clinical competency scores in Midwifery.**

Table 2: Correlation between academic achievement, clinical performance, and clinical competency scores in Midwifery n=45

Correlation	Variables	Pearson Correlation Coefficient (r)	P-Value	Inference
Correlation between academic achievement and clinical performance	Academic Achievement	0.716.	p<0.001	Moderate Positive Correlation (S*)
	Clinical Performance			
Correlation between academic achievement and Competency scores	Academic Achievement	0.0556	0.7169	Weak positive Correlation (NS)
	Competency scores			
Correlation between Clinical Performance and Competency scores	Clinical Performance	0.1748.	0.251	Weak Positive Correlation (NS)
	Competency scores			

The Karl Pearson correlation formula computed a moderate positive correlation between academic achievement and clinical performance (0.716). This translates that when academic achievement scores increase, the clinical performance scores also increase

and vice versa. The same is demonstrated in the scatter plot in **Fig 1**. Hence the research hypothesis H1 is accepted, stating a statistically significant correlation between **academic achievement and clinical performance** among Nurse-Midwifery students.

A small positive correlation (0.0556) was found between **academic achievement and Competency scores** using the Karl Pearson correlation formula. The scatter plot in fig 2 mimics the same. The research hypothesis H2 was accepted, stating a statistically significant correlation between **academic achievement and Competency scores** among Nurse-Midwifery students.

The Karl Pearson correlation formula computed a weak positive correlation (0.1748) between **Clinical Performance and Competency scores**. Fig 3 represents the scatter plot demonstrating a correlation between **Clinical Performance and Competency scores**. Hence the research hypothesis H3 is accepted, stating a statistically significant correlation between **Clinical Performance and Competency scores** among Nurse-Midwifery students.

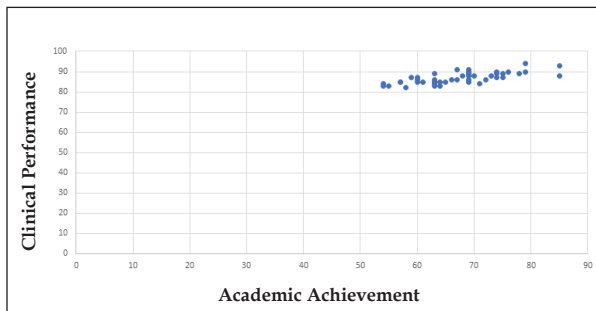


Fig 1: Scatter plot between Academic Achievement and Clinical Performance

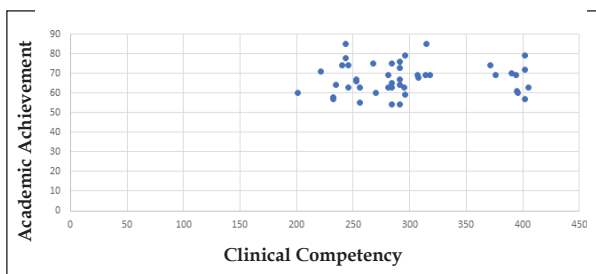


Fig 2: Scatter plot between Academic Achievement and Clinical Competency

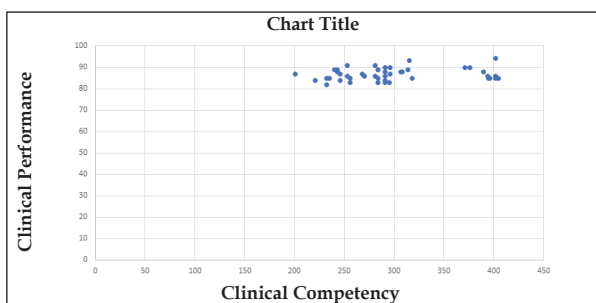


Fig 3: Scatter plot between Clinical Performance and Clinical Competency

Discussion

The study results depicted a statistically significant correlation between academic achievement and clinical performance. The same has been shown by a study conducted earlier⁴. Generally, it is assumed that students who perform well in class perform well in the clinical area. The underlying theory is what they bring out during practice. To do something, they should know something. The 'knowing' is enabled in classrooms and the 'doing' happens in the ward, aided with lab practice or simulated situations.

When analyzing the means of academic achievement and clinical performance, the academic achievement was lesser than the clinical performance. This shows that the participants were more clinically sound than their academic caliber. This finding contrasts with another study where academic performance dominates the clinical performance of candidates.⁵

From Time extended Nursing education stresses Clinical performance than classroom learning.⁶The fact can be thoroughly agreed that the cognitive domain cannot be neglected. After all, what the student learns in the classroom becomes the foundation for clinical practice.

A statistically non-significant weak positive correlation was computed between clinical competency, academic achievement, and clinical performance. The clinical performance of the participants was good, and the academic achievement was acceptable. The participants had comparatively less clinical competency than their clinical performance scores but higher than their academic achievement. The finding can be compared to the results of a Korean study which indicated that "students with high academic achievement have better clinical performance, but confidence in clinical performance is not related to academic achievement."⁷

The study was conducted during the pandemic, which greatly impacted the results. The low academic scores may be probably due to the students' online theory classes. The high clinical exposure in the Covid wards would have resulted in appreciable clinical behavior, which also may be the reason for mediocre clinical competency in Midwifery.

Being good in the psychomotor domain did not ensure clinical competency, and being mediocre in academics does not provide clinical competency. Although it includes knowledge and skill, it is much

more complex than it seems. The scores in the study and the differences it possesses may also be due to factors like rater bias and differences, data collected using university retrieved scores, etc. Having a high clinical performance score does not ensure guaranteed clinical competency. When attempts made to answer why that happens? Studies have shown that clinical instructors report that only superficial surface learning occurs mainly in natural settings. Students study only for exams, and actual learning does not happen.³

A pass in theory and practical exams with/without decent scores does not ensure clinical competency. Clinical competency may be woven with the theory and practice but still a distinct entity. The profession does not just anticipate qualified Midwives but strives for competent midwives. This revolution should start with framing objectives ,the first component of education. An appropriate evaluation tool is just another cherry on the top.

Implications

Nurse-Midwifery is between a piece of knowledge and a skill-woven entity, every opportunity should be utilised to integrate theory into practice. The educators play a pivotal role in delivering the hospital in the classroom and vice versa. There is a tremendous responsibility on the educators' heads, hearts, and hands to mold the budding students into competent Nurse-midwives at least ready enough to practice safely. The education should be abreast with the current trends. Currently, it seems to be an era of competency education. The stakeholders governing Nurse-Midwifery education should work and support competency-based education at various levels. The Indian Nursing Council already sets the foundation in India; the rest lies in the hands of everyone who is a Nurse Midwife in practice, Research, Administration or education, or a combination.

Limitations

The study was limited to:

- Student nurse-midwives studying in a selected institution only.
- The small purposive sample
- The data collected from University records
- Clinical performance scores marked by

the researcher as one of the practical exam evaluators.

- Midwifery Clinical competency scores as self rated by the participants themselves.

Recommendations

- A similar study with a larger sample can be conducted for generalization.
- Appropriate interventions can be devised, and their effects on academic achievement, clinical performance, and clinical competency can be evaluated.
- Comparative studies involving Nurse-Midwives across various levels like pre-registration, post-registration, post-one-year work practice, and so forth can be studied.
- Methodological studies involving tool development and psychometric testing can be devised to assess data regarding academic achievement, clinical performance, and clinical competency.

Conclusion

The study was conducted to assess the correlation between Midwifery related academic achievement, clinical performance, and clinical competency among Nurse-Midwifery students in a selected institution, Bengaluru. Though the study demonstrates a correlation between all the three variables, the intensity with which they are related differs. This warrants further intensive research and reckons the stakeholders to revisit components of Nurse-Midwifery education.

Ethical clearance - Taken

Source of funding - Self

Conflict of Interest - nil

References

1. World Health Organization (2020)State of the world's nursing 2020:investing in education ,jobs and leadership. Available at: <https://www.who.int/publications-detail/nursing-report-2020>.(Accessed 14 May 2020)
2. Lazenby M, Chambers S, Chyun D, Davidson P, Dithole K, Norman I, Tlou S. Clinical nursing and midwifery

-
- education in the pandemic age. *International Nursing Review*. 2020 Sep;67(3):323-5.
3. Liou, S., Chang, C., Tsai, H., & Cheng, C. The effects of a deliberate practice program on nursing students' perception of clinical competence: *Nurse Education Today*. 2013; 33: 358-363. PMID:22858306 <http://dx.doi.org/10.1016/j.nedt.2012.07.007>
 4. Rheault W, Shafernich-Coulson E. Relationship between academic achievement and clinical performance in a physical therapy education program. *Physical therapy*. 1988 Mar 1;68(3):378-80.
 5. Buhat-Mendoza DG, Mendoza JN, Tiana CT, Fabella EL. Correlation of the academic and clinical performance of Libyan nursing students. *Journal of Nursing Education and Practice*. 2014 Nov 1;4(11):82.
 6. Gough HG, Hall WB. The prediction of academic and clinical performance in medical school. *Research in Higher Education*. 1975 Dec;3(4):301-14.
 7. Kim HW, Kim MG. The relationship among academic achievement, clinical competence, and confidence in nursing students' clinical performance. *The Journal of Korean Academic Society of Nursing Education*. 2021;27(1):49-58.

Awareness and Attitude about Nurse Led Clinic (NLC) among Health Care Professionals

Kavita Bhoknal¹, T Sivabalan²

¹Assistant Professor, Pravara Institute of Medical Sciences (DU), Smt.Sindhutai Eknathrao Vikhe Patil College of Nursing

²Principal Loni (Bk), Tal.Rahata, Dist. Ahmednagar, Maharashtra

How to cite this article: Kavita Bhoknal, T Sivabalan et al. Awareness and Attitude about Nurse Led Clinic (NLC) among Health Care Professionals. Volume 13 Issue 3 July-September 2022

Abstract

Background: Nursing binds human society with a bond of care and affection. Nursing is a calling to care, which offers an oasis of poignant stories and pool of challenges. The scope of nursing practice has expanded and extended to different settings other than hospital only. Nurses deal with the most precious thing in this wide world the human life. The present study was undertaken with an aim to determine the awareness and attitude towards Nurse Led Clinic (NLC) among health care professionals.

Material and Methods: A descriptive study, was carried out among 105 health care professional (30 Nurses, 30 Physicians, 30 Dentist and 15 Physiotherapist of Pravara Rural Hospital Loni Bk to assess awareness and attitude about Nurse led clinic. The participants was selected by simple random sampling technique, and self prepared and content validated structured questionnaire (for awareness) and rating scale (for attitude) was used for data collection. The descriptive statistics (mean, SD) and inferential statistics (chi square test) was applied wherever required.

Results: The overall knowledge score for nurse was (7.56±2.06), for physician (8.76±2.96), for dentist (9.0±2.92) and for physiotherapist the score was (7.52±2.97) which is >50% indicating average level of knowledge on NLC. In line with, overall attitude score for nurse was (85.8±5.0) for physician (76.3±11.6), for dentist (79.1±10.7) and for physiotherapist the score was (72.8±7.56) which is >73% indicating average to good attitude on NLC. It was noted that the demographic variables like age, gender, previous knowledge, work experience had significant association with knowledge and attitude on NLC at 0.05 level.

Conclusion: The study findings showed that health care professionals had average knowledge and good attitude regarding the nurse led clinic. The health care professional's demographic variables had significantly associated with the study variables. There was a weak correlation was observed between the study variables.

Keywords: Awareness, attitude, nurse led clinic, health care professionals

Introduction

Health care system is an integrated and collaborative profession where health personnel of different line of system are working together to get the aim of betterment of patients health and improved system of patient care. Physicians, surgeons, nurse's, physiotherapist, housekeeping persons and lot of

various cadres are involved in health care. With the advancement of medical sciences, role of nurses also expanded as clinician, researcher and advanced nurse practitioner. This expansion has played a vital role in bridging the gap between medicine and nursing. Furthermore, this bridging has revealed the emergence of Nurse Led clinics.¹

Corresponding Author:

Email: kavitabhoknal13@gmail.com

Mobile: 8551079002

Today's nurses are empowered with competency and knowledge, and acts as backbone of the hospital. To overcome the shortage of doctors in developing countries, there is need to focus on utilization of nursing services and knowledge in the area where they are enriched with core competencies needed for patient care. Nurse led clinics appears to be an innovative ideas where the health need of patients care can be fulfilled in timely and cost effective manner. There is a need to broaden the scope of nursing curriculum by adding more concepts like competency based modules and critical thinking among nurses.²

Health care delivery evolves across the world and struggles to cope with changes in medical care, and with the rising number of people living longer with long term conditions, it is frequently suggested that more care should be delivered and coordinated by nurses who have the most daytoday contact with affected individuals and their families.³The Indian Nursing Council has developed curriculum for the most important way to reduce maternal death in India would be to ensure that a skilled health professional is present at every birth. Skilled care during childbirth is vital because millions of women and newborns develop serious complications during or immediately after delivery. Health professionals like doctors, nurses who have midwifery skills can recognize these complications and treat them or refer to higher health centers immediately if more skilled care is needed.⁴

In recent years there has been an evolution in the nurse led clinics within hospital outpatient departments, and health centers. The government endorsed the use of such clinics as a way for the public to access specialist health care and treatment quickly and also as an effective way to manage chronic illness. However, currently there is a lack of uniform structure in educational preparation and practical guidance for nurses interested in taking up nurse led practice.⁵

As there is a shortage of health care specialists, ministry of health is planning to introduce Nurse Practitioners (NPs) in selected disciplines such as oncology, neurology, critical care, cardiovascular care, and anesthesia. The nurse led clinics are not a common practice in India. However, it has been functioning in the US since 1960s, UK since 1980s and Netherlands since 2012. Nurse led clinics are mainly run by nurses independently or supported by a multidisciplinary team with advanced skills and knowledge and can work autonomously. In these clinics, nurses make detailed physiological assessment, planning, delivery

of treatment, monitoring of patient condition, management of medication, patient education and referral to higher centers when indicated.^{6,7,8}

Through the nurse midwives is legally permitted to conduct delivery there is hardly few nurse led births clinics were established. There may be numerous factors involve most important the perception of public on outcome on nurse led care, in India the concept of nurse led clinic is at early stage wherein the nurse midwives is competent and skillful in nature.⁹ The awareness on nurse practitioner and nurse led clinics are mere among the people including the health care professionals. Thus the present study was undertaken to assess the awareness and attitude on nurse led clinics among the health care professionals.

Material and Methods

Anon experimental research, descriptive study design with cross sectional approach was carried out among the 105 health care professional (Nurses 30, Physician 30, Dentist 30, and Physiotherapist 15) employed at Pravara Rural Hospital, Loni Bk, Maharashtra. The health care professionals those who are available during data collection period and willing to participate were included in the study. The structured performa was used for data collection, and it consists of socio demographic data (08 items), structured questionnaire (assessment of knowledge on NLC (20 items), and rating scale (assessment of attitude on NLC (20 items). Based on obtained scores the knowledge and attitude was categorized as poor, average and good respectively. The content validity of tool was established with number of experts, and the split half method was used to assess the reliability of tool, and the calculated r value (0.82) highlights that the tool was found to be reliable.

The study was approved by Institutional Ethics Committee and Institutional Research Committee (IEC/IRC) of Pravara Institute of Medical Sciences (DU) and the Administrative Permission was sought from the concerned authorities. The written informed consent was taken from all health care professionals before the enrollment in the study. The data collection was done by employing questionnaire method, wherein the collected data was organized, tabulated and analyzed by using appropriate descriptive and inferential statistics techniques wherever required, $p < 0.05$ level was considered as the level of significance; and the analyzed data was presented in the form of tables, figures and diagrams.

Results

Socio demographic profile of health care professionals: Majority (67%) of nurses were 20 – 30 years of age, and nearly two third (60%) of them were female. Significantly (43%) had less than 05 years of work experience, wherein majority (77%) acquired information through peers and friends. In line with physicians, nearly one third (30%) were 25 – 30 years of age, majority (77%) of them was male, significant percent (40%) had work experience less than 05 years and majority (77%) had information through journals.

Majority (57%) of dentist were 25 – 30 years of age, (60%) of them were male, (77%) had work experience less than 05 years, and (17%) had more than 15 years. Most (90%) of them had information about NLC through journals; whereas more than half (53%) of physiotherapist were 31 – 40 years of age, majority (67%) of them were female, and (60%) had work experience less than 05 years and interestingly all (100%) the physiotherapist did not had any information related to NLC.

Awareness and attitude of health care professionals about Nurse Led Clinic: Distribution of mean, SD and mean percentage of health care professionals on awareness regarding nurse led clinic shows that overall mean awareness score for nurses was (7.56±2.06), for physician (8.76±2.96), for dentist (9.0±2.92) and for physiotherapist the score was (7.52±2.97) which is >50% of total score indicates average level of knowledge on NLC. The section wise mean score was depicted in the below mentioned Table No.1. The health care professionals had mean score more than 73 indicating that average to good attitude towards nurse led clinics.

Association between awareness's, attitude and demographic variables: It was noted that the nurse's age, gender, previous work experience; physician's age, gender, years of experience; dentist age, gender; physiotherapist age, years of experience had significant association with knowledge and attitude on nurse led clinics at $p < 0.05$ level (Table No.2). Alongside, there was a weak positive correlation ($r = 0.37$) was observed between the study variables i.e. knowledge and attitude.

Table No 1: Awareness and attitude of health care professionals about Nurse Led Clinic

Knowledge	Max. score	Nurse		Physician		Dentist		Physiotherapist	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Introduction	05	2.06	0.43	2.93	1.31	2.73	1.04	2.39	0.98
Legal aspects	05	2.89	1.15	2.83	0.91	3.13	0.97	2.06	1.03
Practical aspects	05	2.59	0.48	3.00	0.74	3.16	0.91	3.06	0.96
Overall	15	7.56	2.06	8.76	2.96	9.02	2.92	7.52	2.97
Attitude	100	85.8	4.59	76.3	11.6	79.1	10.7	72.8	7.56

Table No. 2: Association between awareness's, attitude and demographic variables

S. N.	Category	Variables	Knowledge (x2 value)	Attitude (x2 value)
1	Nurse	Age	4.33*	4.22*
		Gender	5.19*	3.88*
		Year of experience	3.20	3.90*
		Previous knowledge	4.25*	2.60
2	Physician	Age	4.10*	5.10*
		Gender	3.47	4.21*
		Year of experience	3.90*	3.60
		Previous knowledge	3.88*	3.00
3	Dentist	Age	1.70	4.20*
		Gender	3.64	4.68*
		Year of experience	5.26*	3.64
		Previous knowledge	3.25	3.92*

Conti.. Table No. 2: Association between awareness's, attitude and demographic variables

S. N.	Category	Variables	Knowledge (x2 value)	Attitude (x2 value)
4	Physiotherapist	Age	4.19*	4.23*
		Gender	3.64	3.40
		Year of experience	5.26*	3.85*
		Previous knowledge	3.25	3.90*

(df: 3 Table value 3.84, $P < 0.05$ level, * Significant)

Discussion

The study results highlights that the health care professionals had awareness on nurse led clinic through the peers and scientific journals whereas physiotherapist did not had any information on nurse led clinics. It was in congruence with Banahan B, Sharpe T¹⁰ that the previous knowledge was found to be an important determinant of health care professionals especially the physician's approval of nurse practitioners and significantly associated with higher acceptance. It is emphasized that the awareness and publicity leads to better acceptance and recognition of nurse practitioners by the people in the field of nursing and health.

The health care professionals under study had average level of awareness on various aspects regarding nurse led clinics. Similarly Nasaif HA¹¹ too found that majority of primary care physicians had a poor understanding on nurse practitioners and their role, and how they functions in clinical practice, and educational requirements and academic preparation to become an nurse practitioners. It is imperative that the health care professionals and the public needs have clear understanding and awareness on nurse practitioners and their role in the society for better acceptance and effective health care delivery system. The results envisages that all the health care professionals under study did had positive attitude towards nurse led clinics, the facts was in acceptance of Sofer M, Dalia A¹² that since 1990's the physician attitudes toward nurse practitioners utilization and employment have become more positive.

It is a need of the hour and essential that all health care team shall have a similar attitude and positivity towards nurse practitioners and nurse led clinics, thus the statutory bodies like Indian Nursing Council, State Nurses and Registration Councils and

Government and Professional Nursing Associations like Trained Nurses Association of India (TNAI), Nursing Research Society of India (NRSI), and Society of Midwives India (SOMI) etc shall initiate several steps and strategy to make sure that the initiation of independent nurse practitioners shall be legal and acceptable to all. Meeting the societal needs and health care demands the need of the hour is to have independent nurse practitioners and starting of nurse led clinics in various discipline and specialty.

Conclusion

Study findings showed that the health care professionals had average knowledge and good attitude towards nurse led clinic. Alongside the demographic characteristics like age, gender, experience had significant association with the study variables. The role of advanced nursing practice shall be introduced gradually to the overcome resistance and ensuring successful implementation of the role with the support of government, statutory bodies and other professional organizations.¹³

Education and discussion with healthcare professions and health policymakers are needed to ensure they are fully informed about the nurse led clinics and its potential positioning and advantages etc. Alongside there is need for multidisciplinary approach and collaboration for the planning and implementation of nurse led clinics in India. The current scenario demands necessitates requirement of independent nurse practitioner to overcome the disparity in health care and its utilization.

Conflict of Interest : Nil

Source of Funding : Self

Institutional Ethical committee letter :

Reference

1. Medical chivalry and team work. *American Journal of Nursing* 1927;27(5):367
2. Rani R, Kaur S. Nurse led clinics in India: An innovative approach in patient management. *International Journal of Advanced Research*, 2019; 7 (9): 1190 – 92
3. Khair K. What is a nurse led service: A discussion paper. *J Haem Pract* 2017; 4(1): 27 – 32
4. Richard H. *Nurse led clinics: Practical issues*, 1st ed. Routledge Publishers: 2003: 85 – 93
5. Hatchett R. Key issues in setting up and running a nurse-led cardiology clinic. *Nurse Stand* 2005;20:49 – 53
6. Harbman P. The development and testing of a nurse practitioner secondary prevention intervention for patients after acute myocardial infarction: A prospective cohort study. *Int J Nurs Stud* 2014;51:1542 – 56
7. Mallah MH, Farah I, Madani W, Bdeir B, Habib S, Bigelow ML et al. The impact of nurse led clinics on the mortality and morbidity of patients with cardiovascular diseases. *J Cardiovasc Nurs* 2016;31:89 – 95
8. Guha S, Sethi R, Ray S, Bahl V, Shanmugasundaram M, Kerkar P et al. Cardiological Society of India: Position statement for the management of ST elevation myocardial infarction. *Indian Heart J* 2017;69:63 – 97
9. Ann TY, Shiu H, Diana. Exploring the scope of expanding advanced nursing practice in nurse led clinics: A multiple case study. *Journal of Advanced Nursing* 2016; 68(8): 1780–92
10. Banahan B, Sharpe T. Evaluation of the use of rural health clinics: Attitudes and behaviors of primary care physicians in service areas of nurse practitioner clinics. *Public Health Report*, 1982; 97(6): 566 – 571
11. Nasaif HA. Knowledge and attitudes of primary care physicians toward the nurse practitioner role in the Kingdom of Bahrain. *Journal of the American Academy of Nurse Practitioners*, 2014; 24: 124 – 131
12. Sofer M, Dalia A. Nurse-Led Health Clinics Show Positive Outcomes. *American Journal of Nursing*, 2018; 118 (2): 97 – 114
13. Farces KY, Wong M, Loretta CY. Establishing a definition for a nurse led clinic: Structure, process and outcome. *Journal of Adv Nursing* 2006; 53 (3): 358 – 69

A study of Clinical Profile of Patients with Traumatic Cataract

Nalini Jayanthi. B¹, Sujatha Asadi²

¹Assistant Professor of Ophthalmology, Govt. Medical college Nalgonda

²Assistant Professor, Osmania Medical College and Osmania General Hospital, Hyderabad

How to cite this article: Nalini Jayanthi. B, Sujatha Asadi et al. A study of Clinical Profile of Patients with Traumatic Cataract. Volume 13 Issue 3 July-September 2022

Abstract

Background: Traumatic cataracts cause a significant amount of vision loss and blindness in the general population, particularly in underdeveloped nations. It's associated with a variety of ocular injuries.

Objectives: To study the clinical profile of traumatic cataract patients.

Methods: A total of 50 patients who satisfied the inclusion criteria were recruited for the study, and a comprehensive history was obtained. A thorough slit lamp examination was performed using a torch light under diffuse lighting.

Results: In majority of the patient's total cataract was done in 86% of the cases. Among the associated ocular damage, corneal injury was seen in 62% of the patients, And associated ocular complication was Lens matter in anterior chamber reported in 22% of the cases, Uveitis in 8% of the cases and Glaucoma was reported in 6% of the cases.

Conclusion: Traumatic cataracts result in considerable vision impairment, psychological distress, and a major financial burden. To avoid vision loss in traumatic cataract patients, a better knowledge of these injuries is required. Appropriate health awareness education, as well as early prevention, is required among the population.

Keywords: Trauma, Cataract, Slit lamp, Glaucoma

Introduction

Ocular trauma is considered one of the most serious public health issues in the globe. It is the world's single most common cause of acquired monocular blindness. Ocular damage causes around 1.6 million individuals to go blind across the world.¹ Ocular trauma is thought to be responsible for around 40% of monocular blindness.² Cataract advancement occurs as a result of trauma. After a variety of ocular insults, including blunt and penetrating trauma, a traumatic cataract can occur. Infrared energy, ionising radiation, and UV radiation are all rare causes of traumatic cataract.³

Domestic injury is the most prevalent type of injury in children, which occurs most frequently while they are playing at home or at school. Young people are the most prevalent victims of sports and work-related eye injuries, followed by accidents caused by youngsters participating in high-risk sports lacking supervision or protective measures.⁴

Cataracts can be caused by both penetrating and traumatic injuries. The visual prognosis of traumatic cataract is determined by the type of ocular trauma, the level of lenticular involvement, and any ocular structural damage. The time of intervention has been stressed that for a better prognosis, cataract surgery

Corresponding Author: Nalini Jayanthi. B,

Assistant Professor of Ophthalmology, Govt. Medical College Nalgonda

Email id: nalinijayanthi@inbox.lv

should be performed within a year of the initial procedure in adults and within six months of the initial surgery in children.⁵

Traumatic cataract has a physiological, social, and monetary impact on the quality of life of younger people, thus it's crucial to understand the clinical profile for proper treatment. The purpose of this study was to look at the clinical characteristics of individuals who had traumatic cataracts.

Materials and Methods

Type of Study: Retro prospective Cross-sectional study.

Study Setting: Department of Ophthalmology. Sarojini Devi eye hospital

Study Duration: 2 years, 2019 to 2021

Inclusion Criteria

- Traumatic cataract patients

Exclusion Criteria

- Those unwilling to participate in the study.

A total of 50 patients who satisfied the inclusion criteria were recruited for the study, and a comprehensive history was obtained. A thorough slit lamp examination was performed using a torch light under diffuse lighting. Where applicable, intraocular pressure was measured using Goldmann applanation tonometry.

Statistical analysis: The data was analysed using SPSS 22 software and the outcome was presented in the form tables with percentages.

Observation and Results

Table 1: Distribution based on demographics

Gender	No of patients	Percentage
Male	34	68%
Female	16	32%
Age group (years)		
11-20	6	12%
21-30	14	28%
31-40	13	26%
41-50	12	24%
51-60	5	10%

Male predominance was seen with 68% and females were 32%. The male: female ratio was 2.1: 1.

Majority of the patients belonged to the age group of 21 to 30 yrs with 28% followed by 31 to 40 yrs with 26%, 24% belonged to the age group of 41 to 50 yrs age, 12% belonged to the age group of 11 to 20 yrs and the least belonged to the age group of 51 to 60 yrs. The mean age was 34.17 ± 4.37 yrs.

Table 2: Distribution based on type, cause and duration of trauma

Type of trauma	Number of cases	Percentage
Blunt	13	26%
Penetrating	37	74%
Cause of trauma		
Rod/ stick	27	54%
Stone	7	14%
Glass	2	4%
Wired fence	10	20%
Ball	4	8%
Total	50	30
Duration of trauma		
≤ 1 week	2	4%
≤ 1 month	16	32%
≤ 1 year	25	50%
>1 year	7	14%
Total	50	100%

In majority of the cases, it was penetrating trauma reported in 74% of the cases and blunt trauma was seen in 26% of the cases. Most common cause of trauma was due to rod/stick in 54% of the cases, followed by wired fence in 20% of the cases, stones in 14% of the cases, ball in 8% of the cases and glass in 4% of the cases. Majority of the patients around 50% presented within a year after trauma, 32% of the cases presented within a month of trauma, 14% took more than a year after trauma for cataract and only 4% of the cases presented within a week of trauma.

Table 3: Distribution based on type of cataract

Type of cataract	No of patients	Percentage
Total cataract	43	86%
Soft cataract	3	6%
Subcapsular cataract	2	4%
Rosette cataract	2	4%
Total	50	100%

In majority of the patients total cataract was done in 86% of the cases, soft cataract was done in 6% of the cases, subcapsular and rosette cataract was done in 4% of the cases each.

Table 4: Distribution based on associated ocular damage

Associated Ocular Damage	No of patients	Percentage
Corneal injury	31	62%
Iris injury	16	32%
Vitreous haemorrhage	2	4%
Associated Ocular Complication		
Lens matter in anterior chamber	11	22%
Uveitis	4	8%
Glaucoma	3	6%
Total	30	100%

Among the associated ocular damage, corneal injury was seen in 62% of the patients, Iris injury was seen in 32% of the cases, Vitreous haemorrhage was seen in 4% of the cases.

The associated ocular complication was Lens matter in anterior chamber reported in 22% of the cases, Uveitis in 8% of the cases and Glaucoma was reported in 6% of the cases.

Discussion

The most prevalent cause of unilateral cataract is trauma. A primary repair of a corneal, iris, or scleral wound, as well as a comprehensive evaluation of injury to the intraocular structures, may be required at the time of presentation following an eye injury. Prior to surgery, a comprehensive assessment of the nature and degree of the ocular injury, meticulous planning, and counselling are critical to the successful management of these cases.⁶

The incidence of trauma in this study age group was more in the teenage years compared to other studies who reported in children since they were paediatric studies who focussed on the study population while this study had included patients with all age groups. In previous studies, the incidence of traumatic cataract was shown to be higher in the younger age group. Daljit Singh has a similar age demographics.⁷

In this study 54% of the cases had trauma due to stick/ rod. Injury occurred as a result of their regular

activities, such as playing with or handling such things at home or in their neighbourhood, which is similar to previous studies by Krishnamachari M et al⁸ and Memon MN et al reported that 54.7 % and 44 % of patients, respectively, sustained stick injury.⁹

The kind of damage and the form of the cataract were also found to have statistical relevance. In this study, Majority had total cataract surgery, while Shah et al observed soft cataract in the majority of cases.¹⁰

The most common related ocular morbidity was corneal involvement. These findings backed with previous research that found corneal impairment to be the most prevalent related injury. According to Memon et al., 2012, the interval between damage and cataract surgery had no effect on the ultimate visual result of traumatic cataract patients, and that these patients, if treated appropriately, had a satisfactory visual prognosis.

Trauma can be reduced with awareness and caution. Because corneal involvement is one of the most prevalent morbidities associated with traumatic cataract, the need of early reporting and proper follow-up, particularly those suffering from traumatic cataract, must be emphasised.

Conclusion

In India, traumatic cataracts result in considerable vision impairment, psychological distress, and a major financial burden. To avoid vision loss in traumatic cataract patients, a better knowledge of these injuries is required. Appropriate health awareness education, as well as early prevention, is required among the population.

Ethical Clearance: The ethical clearance was obtained from Government Medical College prior to the commencement of the study.

Source of funding: Self

Conflict of Interest: Nil

References

1. Negrel AD, Massembo-Yako B, Botaka E: prevalence et causes de la ceciteou Congo. Bull WHO. 1990;68:237.
2. Johns KJ, Feder RS, Bowes Hamill M. Lens and cataract, AAO basic and clinical science course series. San Francisco: the foundation for the American Academy of ophthalmology, 2001;50-54:213-216.

3. Zaman M, Sofia I, Muhammad DK. Frequency and visual outcome of traumatic cataract. *J Postgrad Med Inst.* 2006;20:330-4.
4. Irvine JA, Smith RE. *Lens Injuries in trauma.* CV Mosby.1991;126-135
5. Maida JM, Mathers K, Alley CL. Pediatric ophthalmology in the developing world. *Curr Opin Ophthalmol.* 2008;19:403-8.
6. Gilbert C, Muhit M. Eye conditions and blindness in children: priorities for research, programs, and policy with a focus on childhood cataract. *Indian J Ophthalmol.* 2012;60:451-5.
7. Singh D, Singh K, Singh J, Sood R. The role of intraocular lens in traumatic cataract. *Indian J Ophthalmol.* 1983 May;31(3):294-7
8. Krishnamachary M, Rathi V. Management of traumatic cataract in children. *J Cat Refract Surg* 1997;23:681-7
9. Menon M N, Narsani AK, Nizamani NB. Visual outcome of unilateral traumatic cataract. *Journal of College of physicians and surgeons Pakistan* 2012; 22:497-500.
10. Shah MA, Shah SM, Shah SB, Patel CG, Patel UA. Morphology of traumatic cataract: does it play a role in final visual outcome? *BMJ Open.* 2011 Jul 29;1(1):e000060.

Macrovascular and Microvascular Complications in Newly Diagnosed Type 2 Diabetes Mellitus

Nikhil Batra¹, Himanshu Garg², Gaurav Singh³, Anshaj Mujral⁴

^{1,2,3,4} Resident, Department of Medicine, MMIMSR, Mullana, Ambala

How to cite this article: Nikhil Batra, Himanshu Garg, Gaurav Singh, Anshaj Mujral et al. Macrovascular and Microvascular Complications in Newly Diagnosed Type 2 Diabetes Mellitus. Volume 13 Issue 3 July-September 2022

Abstract

Background and Objectives: India is claimed to be the diabetes capital of the world. Many studies had proven that persistent hyperglycemia and associated metabolic syndrome features like hypertension, dyslipidemia and obesity contribute to the development of vascular complications.

The present study aims to study the prevalence and clinical profile of microvascular and macrovascular complications in newly diagnosed type 2 diabetes mellitus patients.

Methods: The study is a clinical, prospective and observational study of 100 newly detected type 2 diabetics attending medicine department outpatient/ inpatient, MMU hospital, ambala, form the subject for the study August 2018 to July 2020 (24 months) who matched the inclusion criteria.

Results: In this, 62 were males and 38 were females and the mean age was 54.05±13.24 years. 44% were detected when they presented with multiple complications due to diabetes. Common complications which they presented were coronary artery disease (15%), infection (12%), stroke (6%), ulcers (4%), neuropathy (4%) and diabetic ketoacidosis (1%). The prevalence of macrovascular complications CAD, CVD and PAD was 26.0%, 8.0% and 11.0% respectively and microvascular complications retinopathy, nephropathy and neuropathy was 20.0%, 34.0% and 16.0% respectively. High incidence of complications especially microvascular and CAD occur with HbA1c of range >6.5. The correlation coefficient of FBS and PPBS in relation to HbA1c was 0.56 and 0.57 respectively.

Conclusion: Smoking, increased BMI and waist circumference is associated with increased prevalence of diabetes. There is high prevalence of coronary artery disease, retinopathy and nephropathy at diagnosis. HbA1c levels predict the prevalence of complications.

Keywords: Type 2 Diabetes mellitus, microvascular, macrovascular, HbA1c, CAD

Introduction

Diabetes mellitus is a common and a serious disease with chronic complications and constitutes a substantial burden for both patient and health care system. In 2011, the global prevalence of diabetes was estimated at 366 million this figure is predicted to

reach 552 million by 2030 as a consequence of longer life expectancy, sedentary life style and changing dietary patterns. The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030.^{1,2}

The onset of type 2 diabetes is often silent and

Corresponding Author : Himanshu Garg

Resident

Department of Medicine,

MMIMSR, Mullana, Ambala

2491himanshugarg2491@gmail.com

7082989373

insidious. Pathogenic processes causing type 2 diabetes range from autoimmune destruction of cells of pancreas with consequent insulin deficiency to abnormalities that result in resistance to insulin action. The asymptomatic phase of hyperglycemia accounts for the relatively high prevalence of complications at initial presentation.³

This study aims in assessing the prevalence and to study the clinical profile of macrovascular and microvascular complications in newly diagnosed type 2 diabetes mellitus patients. This will highlight the need for screening for complications at initial presentation irrespective of the presence or absence of symptoms of the complications. Early detection and intervention will reduce the morbidity and mortality due to the complications.

Materials and Method

Source of Data

Newly detected patients with type 2 diabetes mellitus attending department of medicine(outpatient/ inpatient), MMU hospital, ambala, form the subjects.

Design of the Study

Cross-sectional descriptive study

Duration of Study

August 2018 to July 2020 (24 months).

Inclusion Criteria

Newly diagnosed type 2 diabetes mellitus adult patients greater than 20 years of age were included for the study.

(Laboratory diagnosis of diabetes mellitus was confirmed by latest criteria laid by the American Diabetic Association. Blood glucose levels were checked on two separate occasions before the diagnosis of diabetes mellitus was made.)

Exclusion Criteria

- Type 1 diabetes mellitus
- Any other severe illness
- Patients already diagnosed of diabetes

mellitus and on treatment

- Refusal to be a part of the study
- Pregnancy

Sample Size

Hundred cases of newly diagnosed type 2 diabetes mellitus were included in this study.

Method of Collection of Data

Patients newly detected of type 2 diabetes mellitus attending medicine department outpatient/ inpatient, SGRRIMSHS hospital, dehradun were included for the study.

History

- Demographic characteristics such as age and sex were recorded.
- Family history of diabetes was recorded.
- Symptoms suggestive of diabetes or of related complications were noted.
- Past history of hypertension and complications of diabetes was documented. Any previous treatment for these complications taken was recorded.
- Smoking or alcohol history was noted.
- Nutritional history was taken.

Examination

- On general physical examination, the level of consciousness of the patient, vital parameters such as pulse, blood pressure (in sitting and standing position) temperature and respiratory rate was recorded.
- Anthropometric measurements:
 - a. Weight (in kilograms) and height (in centimetres) was recorded.
 - b. The body mass index was determined by dividing the weight (in kilograms) by height (in metres²).
 - c. Measurement of waist circumference (cm) - It is measured just above the uppermost lateral border of the right iliac crest, a horizontal mark is drawn, and then crossed with a vertical mark on the

midaxillary line. The measuring tape was placed in a horizontal plane around the abdomen at the level of this marked point on the right side of the trunk.

- Presence of skin infections, gangrene and ulcers was noted.
- Systemic examination was carried out in all patients.
- Presence of sensory neuropathy was defined by symptoms of tingling and numbness over the extremities (bilaterally symmetrical) with or without impaired touch, vibration sense or joint position sense. Presence of motor neuropathy was noted. Autonomic dysfunction in the form of resting tachycardia, orthostatic hypotension, gastroparesis/diarrhoea or abnormal sweating was noted. 10gm monofilament was used to note any reduced sensation due to neuropathy.
- Dilated pupil funduscopy was carried out in all patients in conjunction with ophthalmologist and retinopathy was defined and graded as non proliferative diabetic retinopathy and proliferative retinopathy. Proliferative retinopathy was described by the presence of any retinal or optic disc neovascularisation, or the presence of preretinal or vitreous haemorrhage, whereas the presence of microaneurysms, exudates (lipid exudates or 'cotton-wool spots') and/or retinal haemorrhages only was defined as non-proliferative retinopathy.

Laboratory Investigations

- Fasting and postprandial blood sugars (venous blood samples drawn) on two separate occasions using glucose oxidase-peroxidase method.
- Renal function tests included blood urea, serum creatinine and urine analysis.
- Urine was analysed for glucose, ketone bodies and protein.
- Microalbuminuria was estimated by nephelometry. Microalbuminuria is defined as a mean urine albumin concentration more than or equal to 25mg/ml by nephelometry on three consecutive days.
- Presence of diabetic ketoacidosis was

confirmed by high blood sugars, ketonuria, and metabolic acidosis on arterial blood gas analysis.

- Fasting lipid profile included serum cholesterol, serum triglycerides, serum high density lipoprotein, and serum low density lipoprotein. Patient was termed to have dyslipidemia if LDL was more than 100mg/dl, serum cholesterol >200 mg/dl, serum HDL <40 or serum triglycerides >150mg/dl.
- A 12- Lead electrocardiogram and 2D echocardiography to note the presence of ischemia or infarction.
- Carotid doppler was done to note for presence of stenosis.
- Ankle- brachial index was determined using arterial doppler.

Results

In this present study, 62 % and 38% comprised of males and females respectively and male: female ratio was 1.6:1.

Patients age class were classified based on the mean and SD , as per the result the mean age of the patient was 54.05±13.24 .Age group between 30-40 years mean age was

16(36.68±3.53years,p=0.002);41-51yrs 31(45.61±3.20 ,CI 5%,45.61-46.50,P=0.523); 52-62 years 28(57.28±2.44, CI 95% 56.47-58.08,p=0.880); 63-71 15(67.47±3.24, CI 95%

67.73-69.06,p=0.788) and >72 years the mean age was 10(78.90±6.52, CI 95% 74.4183.38,p=0.698) .The age group between 30-40 years were statistically significant and less prone to express diabetics and its complications.

The mean age of diabetics in this study was 54.05±13.24 years. The youngest was 30 years and oldest was 95 years. The maximum incidence of diabetics was seen in 52-62 years and more chances of developing diabetes in older age group (52-62 years) and incidence were statistically significant p<0.05.

Duration of smoking was analysed by using univariate analysis, the result showed that individuals with longer duration of smoking were more susceptible for diabetes and its complications . It was expressed that, the mean duration of smoking was 20.20±3.56 years, p=0.02*. We correlated duration

of smoking with respect to the different age group of the patients. Between 1-15 years 10(10.9±1.91years, median 8.0 and $p=0.65$); 10-21 years 09(19.6±1.26 years, median= 16, $p=0.03$); 22-26 years 03(24.00±3.38, median =22, $p=0.08$), and more than 26 years was 14 (28.07±2.76years, median=21, $p=0.01$).

Total 100 diabetics were considered for the study out of which 36 patients were smokers. The prevalence of diabetes among smokers is statistically significant ($p<0.05$) and positively correlated with duration and its complications ($r=0.64$).

Patients presented with symptoms suggestive of different complications of diabetes viz., CAD, CVD, PVD, retinopathy, nephropathy and neuropathy. History from the patients was recorded systematically by using structured questionnaires. The patients presented with complaints correlated with diabetics complications of coronary artery disease, cerebrovascular disease, peripheral artery disease, retinopathy, nephropathy and neuropathy. The result being that 15% of cases expressed coronary artery disease, 7% was cerebrovascular disease, 7% peripheral artery disease, 2% was retinopathy and neuropathy 7% respectively .

Hypertension is considered as the one of the determinants for associated complications of diabetics. BP ranges $<120/80$ was statistically significant and more associated with diabetics $p=0.02$, followed by BP ranges between $120/80-140/90$, $p=0.01$, $140/90- 160/110$, $p=0.03$ respectively. BP $>160/110$ was statistically not significantly associated with diabetics. 46 and 19 cases had prehypertension and hypertension respectively.

Body mass index is a profounded parameter for the onset of diabetes and its complications. In India, 65% of the patients suffered from diabetes with associated risk factors .The present study documented that, BMI was considered as one of predictor's for the diagnosis of diabetics. Elevated BMI is more associated with diabetic complications. Study results showed that cases with BMI <18 was 4, $p>0.05$, 18.1-24.9 was 24, $p<0.05$, 25-29.90 50, $p<0.05$ and more than 30 BMI was 22, $p<0.05$.

Distribution of waist circumference presented , males and females expressed the variations of waist circumference; between <80 cms was 11% ($p=0.88$), 80-90cms was 34.0% ($p=0.01$), 91-100cms was 38.0% ($p=0.02$) and >100 cms was 17.0% ($p=0.56$). The waist circumference class interval between 80-

90 and 91-100cms was statistically significant and more prevailing for diabetics complications ($p<0.05$) . Mean in males was 90.14±9.83 and in females was 87.92±8.86cms.

Total cholesterol was raised in 13 cases and rest were within normal range. Significant p value <0.05 was noted in cases with total cholesterol less than 200. Cholesterol is an important hallmark parameter for development of diabetes and its complications. Elevated serum cholesterol level can cause various manifestations in diabetics. Present study documented between 150-200 mg/dl as 45 cases were seen, $p=0.002$ and it was expressed in both gender followed by 100-150 (27), $p=0.023$, <100 mg /dl was (15), $p=0.01$. The elevated serum cholesterol level was not statistically significant ($p>0.05$) with association of diabetes.

Fundus examination was done for all eligible patients, the study revealed that no changes were seen in 80 cases, NPDR was 19 cases and PDR was seen in only one cases .

Laboratory parameters was analysed by standard laboratory procedure, the present study showed microalbuminuria in 34 cases and it was statistically significant ($p<0.050$) .

ECG expressed different variants myocardial infarction in (3.0 %) ; left bundle branch block (3.0%); left ventricular hypertrophy (3%); old infarction (7.0%) ; ischemic changes (8.0%) and arrhythmias in (2.0%).

ABI scale was recorded by using standard operating guidelines of diabetics patients, the ABI was expressed the range between <0.70 was 7.0% 0.7-0.90 was 12% and > 0.90 was 81.0% respectively. 19% of cases had limb ischemia, out of which 7% had critical ischemia.

Out of the total 100 diabetics, 28 cases were detected on routine investigations, 28 were incidentally detected when they attended the hospital for other illnesses and rest of the 44 cases presented with multiple complications due to diabetes.

Out of 100 cases, patients presenting with complications suggestive of CAD was (15.0%, $p=0.014$), CVD was (6.0%, $p=0.521$) PAD was (6.0%, $p=0.448$). Symptoms of neuropathy seen in 4.0%, $p=0.69$; infection in 12.0%, $p=0.033$ and DKA was seen in only one cases $p=0.896$. The CAD and infection were positively associated with diabetics and statistically significant ($p<0.05$).

Of 100 cases, macrovascular complications CAD, CVD and PAD were expressed 26.0%, 8.0% and 11.0% respectively and microvascular complications retinopathy, nephropathy and neuropathy was expressed 20.0%, 34.0% and 16.0% respectively. Higher prevalence and statistical significance ($p < 0.05$) of presence of CAD, retinopathy and neuropathy at diagnosis was noted in this study.

The study results determine that CAD is positively associated with smoking ($p = 0.002$). The prolonged duration of smoking > 20 years emerged to express CAD. Present study has been compared with non smoking and it was found to be statistically non significant with diabetics associated complications ($p < 0.05$).

The study results revealed that CAD is positively associated with hypertensive patients ($p = 0.004$). More hypertensives express CAD complication than other complications. Present study has been compared with normotensive and it was found to be statistically non significant with diabetics associated complications ($p < 0.05$).

HbA1c is an important predictor for development of complications. High incidence of complications especially microvascular occur with HbA1c of range 6.5-7.5 and also $> 9.5\%$. In our study, correlation coefficient of FBS and PPBS in relation to HbA1c was 0.56 and 0.57 respectively.

Discussion

This is a study done over a period of 24 months in cases of newly detected type 2 diabetes mellitus attending the inpatient and outpatient department of SGRRIMSHS hospital.

The mean age of the diabetics in our study was 54.05 ± 13.24 years. The maximum incidence of diabetics was seen between 52-62 years.

In our study, 62 were males and 38 females with a male: female ratio of 1.63:1. In western study, ratio is 1.07:1 and in Sri Lankan study it is 1.63:1. This difference noted is probably due to illiteracy and decreased turnover of females to hospital for routine and treatment purposes.

In our study, 36 cases of the 100 were smokers. In the study conducted by Drivsholm et al, 86% of men and 50% women were smokers.

Family history of Diabetes in our study was 2% and in Nambuya AP et al study was 16%. This variation is probably due to high illiteracy and lack of awareness of diabetes among the people.

In our study, correlation coefficient of FBS and PPBS in relation to HbA1c was 0.56 and 0.57 respectively. In DCCT, it was 0.82 and in a study conducted by Nathan et al it was 0.89. The relative contribution of postprandial PG decreased progressively from the lowest to the highest quintile of HbA1c. By contrast, the relative contribution of fasting PG showed a gradual increase with increasing levels of HbA1c.

Conclusion

- Prevalence of diabetes increases with age and preponderance of males in our study.
- Increased BMI and waist circumference is associated with increased prevalence of diabetes.
- Large proportion of population presented because of complications occurring due to diabetes- a silent killer.
- Screening for CAD, retinopathy and nephropathy at diagnosis was statistically significant.
- There is high prevalence which is statistically significant ($p < 0.05$) of coronary artery disease (26%), retinopathy (20%) and nephropathy (34%) at diagnosis.
- Prevalence of CVD, PVD and neuropathy is 8%, 11% and 16% which is statistically insignificant.
- HbA1c levels predict the prevalence of complications.
- There is moderate correlation between HbA1c and blood glucose levels.
- Screening with simple tests such as ECG, ECHO, fundoscopy and urine microalbuminuria at diagnosis for all cases of diabetes is essential to identify the complications at an early reversible stage.
- Ethical clearance- taken from institutional committee

Source of funding - Self

Conflict of Interest - Nil

References

1. Wild S, Roglic G, Green A. Global prevalence of diabetes. Estimates for the year 2000 and projections for 2030. *Diabetes care* 2004; 27(5): 1047-53.
2. *Diabetes atlas 2011*, 5th edition.
3. American Diabetes Association. Diagnosis and classification of diabetes mellitus. *Diabetes care* 2006; 29: S43-S48
4. Awad AM. History of diabetes mellitus, *Saudi Medical Journal*, Riyadh, Vol.23 2002: 373-378
5. Levine R, Krall L, Barnett D. The history of diabetes. In Kahn CR, Weir GC, eds, *Joslin's diabetes mellitus*, 13th ed. Philadelphia, Lea and Febiger, 1994: 1-14
6. Jaeger E. *Beritrag zur Pathologie des Auges*, siet 33. Eien: KK Hofund and Staatsdruckerei 1855.
7. The Early Treatment of Diabetic Retinopathy Study Research Group. Photocoagulation for diabetic macular edema. Report No. 4. *IntOphthalmolClin* 1987; 265-272.
8. Darwin E. *Zoonomia or the laws of organic life*. 3rd edition. 1801; Vol 1, Johnson, London.
9. Kimmelstiel P, Wilson C. Intercapillary lesions in glomeruli of the kidney. *Amj Path* 1936; 12:83-97.
10. Marchal de Calvi CJ. *Rechurches sur les accidents diabetiques*. P. Asselin, Paris 1864.
11. Party FW. Introductory address to the discussion on the clinical aspect of glycosuria. *Lancet* 1885; 2:1003-1035.

Prevalence and Associated Factors in Practice of Self-Medication in Urban Slums of Southern Rajasthan

Nitesh Mangal¹, Matariswa Samanta², Mehul Patel³, Dilip Kumar L⁴,
K. A. Varghese⁵, Mansi Sharma⁶

^{1,4}Associate Professor, ³Assistant Professor, ⁵Statistician, ⁶Senior Resident, Department of Community Medicine, ²Associate Professor, Department of Pathology, Pacific Institute of Medical Sciences, Umarda, Udaipur, Rajasthan, India.

How to cite this article: Nitesh Mangal, Matariswa Samanta, Mehul Patel, Dilip Kumar L, K. A. Varghese, Mansi Sharma et al. Prevalence and Associated Factors in Practice of Self-Medication in Urban Slums of Southern Rajasthan. Volume 13 Issue 3 July-September 2022

Abstract

Background: The assessment of prevalence rate, determinants, reasons and major ailments due to self medication is a matter of vital importance for vulnerable social groups like slum dwellers in view of the high risk involved.

Materials and Method: A cross-sectional study among 305 randomly selected urban slums adults were conducted at Udaipur, Rajasthan by collecting data using semi-structured questionnaire to analyze the factors, determinants reasons and major ailments for self medication. The descriptive statistical measures, frequencies and chi-square test of significance for association were used.

Results: The estimated overall prevalence of self medication was 59.0% with 69.0% for male and 50.0% for female of urban slum adults. The sex, age, education level, type of family and family income were found significantly associated with self medication ($p < 0.05$). The main sources of information for self-medication were the chemist in medical shops (42.95%) and different forms of advertisements (22.62%). More than 90% practicing respondents felt saving of time, easiness and economical benefit as major reasons for self medication. The common ailments for self medication practices included fever (25.0%), headache (23.33%), cough and cold (17.22%), diarrhea (15.55%), pain (11.11%) and sleeplessness (16.7%).

Conclusion: Community specific strategies with stringent legal measures would be required to encounter the problem of self medication by vulnerable groups like slum dwellers.

Keywords: Self-medication, Prevalence rate, Urban slums

Introduction

Self-medication is defined as the use of medicine by a patient on self initiative or on the advice of a pharmacist or a lay person instead of consulting a medical practitioner.¹ The patient empowerment is considered as important in the development of patient doctor relationship.² Self-medication

commonly practiced in developing countries is attributable to weak economic infrastructure including poor accessibility to primary health care, increasing trend in cost of medicine and emergence of alternative systems of treatment available in rural areas. Secondly, there are other reasons like poverty, ignorance, cultural and traditional beliefs among people regarding use of medicine for cure of a

disease which has led to high prevalence rate in self-medication mostly in developing countries.³

It is also reported that self-medication in countries like India may be due to easy availability of wide range of drugs without valid prescription. Inadequate health services are also reported as a cause for increasing prevalence rate of self-medication. Though sale of antibiotics and certain drugs without valid prescription is banned in India, there is high prevalence of self-medication which include antibiotics also.⁴ The self-medication without prescription by using 'over the counter' facility available in supermarkets and other outlets is a matter of serious concern. Even though 'over the counter' concept has no legal entity in India, all those drugs which are not included in the list of drugs are being sold without proper prescription.⁵

The associated risk identified in self-medication include adverse drug reaction, inaccurate diagnosis of disease, increased morbidity, drug interaction, wastage of health care resources, antibiotics resistance and many others.³ Both in developed and developing countries self-medication has become a serious phenomenon posing many challenges including drug abuse, drug resistance, polypharmacy, dependence and drug interactions. The educated youth are prone to self-medication with the influence of media and internet. The frequent non-formal advice by the pharmacist is also a threat for self-medication. Studies have shown that self-medication is a common practice even among health care workers and also for the medical practitioner. Therefore, it is argued that the realistic assessment of self medication need a segmented approach.⁶

There are some health care providers who advocate self-medication for short term relief of symptoms even in the case of chronic or recurrent diseases.⁷ Few health care providers favor by saying that self-medication for minor ailments and symptoms may not be a major problem. They advocate that for some chronic or recurrent illness, after initial diagnosis and prescription self-medication may be possible with a advisory role of the doctors.⁸

As the ambit of the self-medication is beyond consumption of medicines to treat disorder without consulting medical practitioner, the issues like reuse of retained drugs, direct purchase of drugs which are not the 'over the counter' drugs etc adds to the severity of problems arising due to self-medication. Hence the segmented community-based studies to

assess the prevalence rate and factors affecting self-medication is a topic of very high contemporary relevance.⁹ Therefore, the present study is aimed to assess the prevalence rate and factors contributing self-medication by a vulnerable group of the society covering urban slum dwellers.

Objectives

1. To ascertain the prevalence of self-medication in urban slums dwellers of southern Rajasthan and
2. To study the determinants of sources of information, common ailments and benefits of self-medication practice.

Methodology

The community based cross sectional study was conducted during October 2021 to January 2022 in the vicinity of Urban Health Training Centre (UHTC) of Pacific Institute of Medical Sciences (PIMS). The sample size of 305 respondents was calculated using the formula $4pq/l^2$ where p is taken as 73.6%.¹⁰ The present study was based on simple random sampling technique with households as unit of sampling. The households were randomly selected till 305 adult respondents were available for the study. The list of urban slum households available with UHTC was used for sample selection. The study population included persons above 18 years of age, both male and female, residing in the selected urban slum areas.

Inclusion criteria: All adults above 18 years of age group residing and available in the selected households who have given the consent at the time of visit for data collection by a team consisting of faculty members, interns and medical social workers were included in the study.

Exclusion criteria: Those adults who have any chronic diseases and pregnant women at the time of data collection were excluded from the study. The subjects who did not give informed consent were also excluded.

The study was conducted after obtaining the ethical clearance from the Institutional Ethical Committee of PIMS, Udaipur. The confidentiality of the data was maintained. The data was collected from each of the selected adult family members using semi-structured questionnaire. The data collected included socio-demographic factors like age, sex, marital status,

type of family, education level, type of occupation, family income, socio-economic status, practice and pattern of self-medication and listed reasons/factors for opting for self-medication. Any person who used medicine without specific prescription from a medical doctor during the last 3 months was considered as one practicing self medication. However, the slightly modified definition of self medication used in the present study is "Self-medication is the selection and use of medicines by individuals to treat self-recognized illness or symptoms without any prescription by a medical practitioner."

Statistical Methods

The collected data was entered on MS Excel sheet with the unique identity for each person included in the study. The estimation of frequencies and other descriptive statistics were calculated using options for statistical functions available under MS Excel. The factors like age, sex, marital status, occupation, education, household income and type of family were assessed for having association with self-medication using chi-square test. $P < 0.05$ was considered to be statistically significant.

Results

Out of 305 study participants, 143 (46.9%) were male and 162 (53.1%) were female. Most of the study participants belonged to the age group of 31 to 40 years (28.4%). About one-fourth 22.3% of study participants were illiterate and 77.7% were found literate ranging from primary education up to graduate. The prevalence of self medication was estimated to be 59% in the study area. Among 143 males, 99 (69.0%) and among 162 female, 81 (50.0%) were found practicing self-medication respectively. The gender effect was found statistically significant with self-medication practices. ($p = 0.0001$) (Table 1)

The factors like gender ($p = 0.001$), age ($p = 0.0007$), education level ($p = 0.023$), type of family ($p = 0.008$) and family income ($p = 0.024$) were found to have statistically significant association with self medication in the study area. (Table 2)

The sources of information prompting for self medication as reported by the respondents were the chemist in medical shops (42.95%), different forms of advertisements (22.62%), quacks (10.49%), colleagues (9.18%) and neighbors (8.85%) respectively. (Figure 1)

Out of 180 practicing respondents of self-medication, 91.1% felt saving of time, 90.0% felt easiness, 94.5% felt economic and quick relief, 78.9% felt minimum medical procedures and 77.8% felt continuity of routine work. (Table 3)

The common ailments for which the self medication followed were fever (25.0%), headache (23.33%), cough and cold (17.22%), diarrhea (15.55%), body pain (11.11%) and others such as sleeplessness and heartburn which comprises about 7.79% respectively. (Figure 2)

Table 1: Prevalence of self-medication according to gender among participants (n=305)

Particulars	Male	Female	Overall
Sample size (no.)	143	162	305
Self medication practioners (n)	99	81	180
Prevalence rate (%)	0.69	0.50	0.59
Calculated 't' value for gender difference	10.55		
p-value	0.001		

Table 2: Factors associated with self-medication by urban slum dwellers (n=305)

Particulars	Characteristics (n)	Self medication		Chi-square value	p-value
		Yes (n=180) n (%)	No (n=125) n (%)		
Age	< 20 (n=31)	24 (77.4)	07 (22.6)	21.41	0.0007*
	21-30 (n=68)	48 (70.6)	20 (29.4)		
	31 - 40 (n=71)	46 (64.8)	25 (35.2)		
	41 - 50 (n=65)	34 (52.3)	31 (47.7)		
	51- 60 (n=54)	23 (42.6)	31 (57.4)		
	> 60 years (n=16)	05 (31.3)	11 (68.7)		
Marital status	Married (n=267)	227 (85.0)	40 (15.0)	0.04	0.757
	Unmarried (n=38)	31 (81.6)	07 (18.4)		
Education	Illiterate (n=68)	44 (64.7)	24(35.3)	11.28	0.023*
	Primary school (n=148)	93(62.8)	55(37.2)		
	Middle school (n=46)	27(58.7)	19(41.3)		
	High school (n=31)	13(41.9)	18(58.1)		
	Graduate & Above (n=12)	03(25.0)	09(75.0)		

Conti..Table 2: Factors associated with self medication by urban slum dwellers (n=305)

Particulars	Characteristics (n)	Self medication		Chi-square value	P-value
		Yes (n=180) n (%)	No (n=125) n (%)		
Occupation	Job & Business (n=11)	05(45.0)	06 (54.5)	1.61	0.80
	Skilled worker (n=63)	37(58.7)	26 (41.3)		
	Unskilled worker (n=146)	90(61.6)	56 (38.4)		
	Student (n=27)	16 (59.3)	11 (40.7)		
	Housewife (n=58)	32 (55.2)	26 (44.8)		
Socio-economic status	Upper (n=21)	10 (47.6)	11(52.4)	1.36	0.50
	Upper- middle (n=59)	34 (57.6)	25 (42.4)		
	Lower middle (n=225)	136 (60.4)	89 (39.6)		
Type of family	Nuclear (n=221)	141 (63.8)	80 (36.2)	6.89	0.008*
	Joint/ Three Generation (n=84)	39 (46.4)	45 (53.6)		
Family Income	>5000 (n=221)	134 (60.6)	87 (39.4)	4.17	0.024*
	5000-10000 (n=41)	25 (61.0)	16 (39.0)		
	10000-15000 (n=24)	14 (58.3)	10 (41.7)		
	>15000 (n=19)	07 (36.8)	12 (63.2)		

*Statistically significant with p<0.05

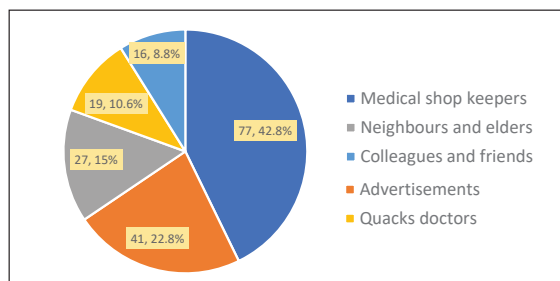


Figure 1: Frequency distribution of respondents according to sources of information for self-medication (n=180)

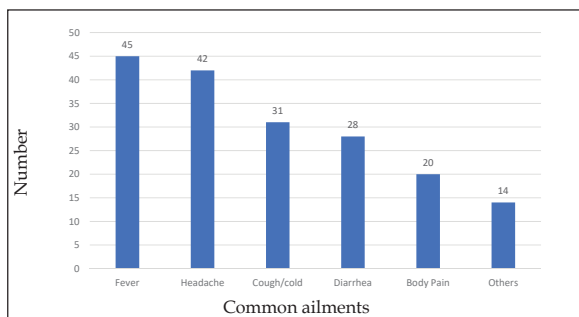


Figure 2: Common ailments for self-medication practiced among respondents (n=180)

Table 3: Perception of respondents on immediate benefits of self medication (n=180)

Factors/benefits	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly disagree n (%)
Time saving	121 (67.2)	43 (23.9)	13 (7.2)	2 (1.1)	01 (0.6)
Easiness in availability	98 (54.4)	64 (35.6)	12 (6.7)	04 (2.2)	02 (1.1)
Economical	151 (83.8)	19 (10.6)	05 (2.8)	03 (1.7)	02 (1.1)
Quick relief	116 (64.4)	54 (30.0)	03 (1.7)	03 (1.7)	04 (2.2)
Minimal medical procedures	86 (47.8)	56 (31.1)	18 (10.0)	12 (6.7)	08 (4.4)
Continuation of routine work	79 (43.9)	61 (33.9)	10 (5.6)	12 (6.7)	18 (10.0)

Discussion

The prevalence of self-medication in the current study was 59.02 %. The various studies done by Pranav V et al, Gupta P et al, Vargese SS et al, Borgohain A et al in urban slums of Karnataka, Mumbai, Maharashtra, Assam and showed the prevalences of self-medication as 47.0%, 55.9%, 68.0%, 79.1%, respectively.^{8,11-13} The statewise variation in the prevalence of self-medication was due to variation in low level of education, poor socio-economic status, lack of medical facilities and non-availability of drugs. However, the high rate of prevalence of self medication is a common feature among slum dwellers.

The present study found the prevalence of self-medication practice in 99 (69.2%) males and among 81(50.0%) females which is higher among males. Similar results were obtained in the study by Pranav V et al which showed that prevalence of self-medication was significantly more among males (65.2 %) when compared to females (34.8%).¹¹ On the other hand, the study done by Gupta P et al showed that prevalence of self medication was significantly more in the females (59.8%) compared to males (48.9%).¹² The study done by Dey V et al in West Bengal also showed that females were more dependent on self-medication.¹⁴ Hence the self medication in the slum area appears to be neutral to gender across various regions.

The self medication was more common in slum areas of present study irrespective of age groups. The study conducted by Dey V et al showed that self-medication practice was more common in 30-60 years of age group.¹⁴ The study done by Jain M et al

in Rajasthan showed that self-medication practice was common in younger age group.¹¹ It is observed that self-medication is higher in less than 30 years age group irrespective of locations.

The self medication in the present study was more prevalent amongst illiterate and people with primary education than the people having education of middle school and above. Similar finding was observed in the study conducted by Borgohain A et al and Vargese SS et al.^{8,13} While in contrast the study done by Dey V et al and Kumar V et al showed participant having education of graduation and above had used self-medication more compared to those having education less than secondary and illiterate person.^{14,15} Hence the level of education does not show any systematic pattern for self medication in different slum areas.

The present study showed that self medication was more prevalent in nuclear families compared to joint family. Similar results were found in the study done by Borah H et al.¹⁶ The current study found that 159 (88.3%) respondents took self medication whose monthly income was less than INR 10000/-. The study done by Loharkar N et al found that 33% self medication was observed in the individuals whose monthly income was less than INR 10000/-.¹⁷ Therefore, the income level also does not reveal any uniform pattern for self medication in slum areas.

The common sources of information regarding self medication for the study respondents were the pharmacist or medical shops (42.8%). Similar finding were observed in the study done by Pranav V et al and Patrick S et al.^{11,18} The study conducted by Gupta P et al showed that the respondents got information about drugs through local pharmacists (42.1%) and previous consultation (25.4%) with doctor for similar complaints, and other sources were friends (13.2%), television (7.1%) and internet (3.5%).¹² In contrast to the present study, the study done by Kumar V et al revealed the other sources of taking self medication were found to be one's own personal experience and doctors' old prescription.¹⁵ In other words, the sources of information for self medication are more or less same with varying degree of influences in different slum areas.

The present study revealed that the immediate benefit/reasons for self medication were time saving (91.1%), easy availability (90.0%), economy (94.5%), past positive results (12.8%), lack of knowledge about complications (6.6%), fear of facing the doctor

(8.3%). In studies done by Pranav V et al, Gupta P et al, and Puwar B et al reported self medication cited monetary benefits were (24.1%), (40.5%) and (60.0%) respectively.^{11-12,5} The various studies done by Gupta P et al (19.3%), Vargese SS et al. (41.2 %) and Puwar B et al (52.0%) stated that self medication was a time saving approach.^{12,13,5} Therefore, it is not possible to generalize one or two specific reasons for practice of self medication. The diverse reason with varying relative importance indicates the need to have location specific strategies to overcome the problem of self medication in different slum areas.

The common ailments for which the self medication taken by the study respondents were fever (25.0%), headache (23.33%), cough and cold (17.22%), diarrhea (15.55%), body pain (11.11%) and others such as sleeplessness and heartburn which comprises about 7.79% respectively. The study done by Puwar B et al revealed that self medication was consumed for problems like fever (42.5%), headache (30.30%) and common cold (24.24%) which is close to our findings.⁵ In another study conducted by Pranav V et al observed that the major health conditions for which self-medication practiced were head/body ache (40.3%), common cold (33.3%), fever (20.3%) and cough (14.7%).¹¹

The various reasons for self medication were saving time, instant relief from the problem, economy, continuity of work etc. instantly and taking drug on their own were the important findings from the study. It is evident that self medication is practiced in almost all slums for common and minor illness. However, the high prevalence of self medication in slums will have to be discouraged.

Limitations

- The present study was conducted on a small sample and hence the results cannot be generalized.
- Assessment of seasonal patterns of self-medication practice was not taken into consideration.

Conclusion

The prevalence rate of self medication has been found substantially high among slum dwellers of southern Rajasthan, with relatively higher rate for male adults. The factors having significant association with self

medication included gender, age, education level, family type and family income. The sources to receive information about the medicine has been medical shopkeepers, advertisements, quacks, colleagues, etc. The immediate reasons for self medication included time saving, easy availability, economy, sudden relief, past experiences, poor knowledge of risk and fear of meeting doctors. The self medication was largely adapted for minor ailments like fever, headache, cough & cold, diarrhoea, body pain, etc.

Recommendations

Legislative measures and community specific awareness strategies would be required to bring down the problem of self medication among slum dwellers.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Study was conducted after getting ethical clearance from Institutional Human Ethics Committee (IHEC).

References

1. WHO guidelines for the regulatory assessment of the medicinal products for use in self medication, 2000. (n.d.). Last accessed on January 25, 2021. (n.d.). Retrieved from apps.who.int/medicinedocs/en/d/Js2218e/.
2. World Health Organization: The role of the pharmacist in self-care and self-medication. Report of the 4th WHO Consultative Group on the role of the pharmacist in health care system 1998. Available from: (n.d.). Last accessed on January 25, 2021. (n.d.). Retrieved from <http://www.who.int/medicines/library/dap/who-dap-98-13/who-dap-98-13>. Pdf.
3. Parulekar M, Mekoth N, Ramesh CM, Parulekar A. Self-medication in Developing Countries a Systematic Review. *Journal of Pharmaceutical Technology, Research and Management*.2016;4(2)103-127.
4. Rajendran A, Kulirankal KG, Rakesh PS, George S. Prevalence and pattern of antibiotic self-medication practice in an urban population of Kerala, India: A cross-sectional study. *Indian J Community Med* 2019;44:S42-5.
5. Puwar B. Self medication practice among adults of Ahmedabad city. *Healthline*.2012;3(2):24-26.
6. Mathias EG, Anjalin D, Prabhu S. Self-Medication Practices among the Adolescent Population of South Karnataka, India. *Hindawi Journal of Environmental and Public Health* Volume 2020, Article ID 9021819, 6 pages <https://doi.org/10.1155/2020/9021819>.
7. Bennett PJ, Brown MJ; Topics in drug therapy. In: Bennett PJ, Brown MJ, editors. *Clinical Pharmacology*. 10th ed. New York: Churchill Livingstone, 2008; 5-32. (n.d.). Retrieved from <https://www.ncbi.nlm.nih.gov/NCBI/Literature/PubMedCentral>.
8. Borgohain A, Dev A, Tamuli P. Prevalence and pattern of self medication amongst urban slum dwellers of Jorhat town of Assam. *Indian Journal of Applied Research*.2017 ;7(6):6-8.
9. Nimitha P, Rakesh PS, Francis PT, Leelamoni K. Prevalence & Practice of Self-Medication in Ernakulum District, southern India. *Indian J Comm Health*. 2017; 29, 3: 282-286.
10. Jain M, Prakash R, Bapna D, Jain R. Prevalence and Pattern of Self medication Practices in Urban area of Southern Rajasthan. *Ntl J of Community Med* 2015; 6(4):474-477.
11. Pranav V, Narayanan P, Guddattu V. Self medication practice among urban slum dwellers in Udupi taluk, Karnataka, India. *Int J Pharm Pharm Sci* 2017;9(6):19-23.
12. Gupta P, Bobhate PS, Shrivastava SR. Determinants of self medication practices in an urban slum community. *Asian Journal of Pharmaceutical and Clinical Research*.2011;4(3):54-57.
13. Vargese SS, Durgawale PM, Mathew P. Prevalence of Self Medication in an Urban Slum Area in Maharashtra, *Journal of Krishna Institute of Medical Sciences University*. 2013; 2(2): 108-110.
14. Dey V, Biswas R. Practice of self medication among adult population in the municipal corporation area of Siliguri, West Bengal, India. *Journal of Comprehensive health*.2019;7(1):19-23.
15. Kumar V, Mangal A, Yadav G, Raut D, Singh S. Prevalence and pattern of self-medication practices in an urban area of Delhi, India. *Med J DY Patil Univ*.2015;8:16-20.
16. Borah H, Kakati R, Borah M, Deka C. Self-Medication Practices and its determinants among urban dwellers of Dibrugarh town, Assam. *Scholars Journal of Applied Medical Sciences*. 2016; 4(8E):3100-3106.
17. Loharkar N, Keche Y, Yegnanarayan R, Dharma M, Bhosale A, Makan A. Self Medication Use in Urban Population of Pune, Maharashtra, India. *Scholars Journal of Applied Medical Sciences*. 2013; 1(6):732-738.
18. Patrick S, Badyal D. Self-medication practices in patients attending a Tertiary Care Teaching Hospital in Urban North-West India. *Acta Med Int* 2018;5:44-7.

A Successful Prototype of a Multipronged Helmet Campaign in a District of South India

Pallavi Sarji Uthkarsh¹, Namratha B Reddy², Utkarsha Lokesh³

¹Associate Professor of Community Medicine, Shri Atal Bihari Vajpayee Medical College, Karnataka. India.

²Resident, Department of Anaesthesia, Rarajeshwari Medical College, Karnataka.

³Professor, Department of Maxillofacial Surgery, Shyamala Reddy Dental College. India.

How to cite this article: Pallavi Sarji Uthkarsh¹, Namratha B Reddy², Utkarsha Lokesh³ et al. A Successful Prototype of a Multipronged Helmet Campaign in a District of South India. Volume 13 Issue 3 July-September 2022

Abstract

Background/problem: Road traffic injuries are the leading cause of injury and death in the productive age group. Two-wheeler riders accounted for nearly half of fatal and nonfatal injuries. Head injury is the most common cause of death among them, which can be reduced by the appropriate use of the helmet. Though there was a law about the compulsory wearing of a helmet in the state, it was never enforced in the district and helmet usage rate in a district before the campaign varied from 1% to 5%.

Methods: 'Helmethon', a unique multi-faceted Campaign in the district of India was carried out for a period of three months in the year 2015 to promote helmet for prevention of head injuries. The campaign targeted the general public with a special focus on youth and stakeholders, who are responsible for enforcement of helmet legislation.

Results: Campaign was successful in sensitizing the community and drawing the stakeholder's attention towards the importance of preventing head injuries through enforcement of helmet law. The law was enforced in Tumkur district in less than a fortnight following the campaign and helmet usage rate among riders soon after enforcement had increased to 80% from a mere 1%.

Conclusion: A well planned and committed helmet campaign shall sensitize the community regarding helmet safety and encourages them to use it. It also influences stakeholders to enforce the helmet law with the least resistance.

Keywords: Injuries, Head injury, Helmet enforcement, Community Participation, Health Promotion, Injury prevention, Youth, Health campaign

Introduction

Globally, Road traffic injuries (RTIs) kill 1.35 million people every year and rank as 8th leading cause of death¹. Low and middle income countries like India attribute to 93% of these fatalities². In India, deaths due to road traffic injuries have increased by 58.7% from 1990-2017³. In the year 2015, according to

MORTH data, Indian roads witnessed 1374 accidents and 400 deaths which amounts to losing 17 lives every hour!⁴ and most disheartening fact is that part more than half of them were in the productive age group of 15-34 years¹, who are the bread winners of the family. Two wheeler users form the vulnerable road users⁵ as they are not protected by any protective shield .

Corresponding Author: Pallavi Sarji Uthkarsh

M.D, D.N.B, MNAMS, DPD, FAM, 233, West of Chord Road, 2nd Stage, 1st A main, Rajajainagar-86 Karnataka. India.

email: pallavisarji@yahoo.com,

9945232944

Nearly 30% of road traffic accidents were reported among motorized two wheeler users⁴ and head injuries are the common cause of death among them¹. **By proper use of helmet**, 42% risk of fatal and 69% risk of non fatal head injuries can be reduced¹. In spite of this proven evidence to prevent deaths and existence of Indian motor vehicle act 1988, which states that "Every person driving or riding (otherwise than in a side car, on a motor cycle of any class or description) shall, while in a public place, wear 2 [protective headgear conforming to the standards of Bureau of Indian Standards]"⁶ still there was no strict enforcement of the law in many districts of India. It might be due to lack of support from the community or lack of priority of stakeholders such as the police⁵

Evidence from many countries showed that effective changes can be brought if "legislative measures are supported by sustained enforcement and by creating awareness among public regarding the effects of being non compliant"⁷. Hence a Helmethon, a Multifaceted Campaign was planned to sensitize the community, especially the youth and to bring stakeholders attention towards this safety initiative.

Materials and methods

Campaign Area

Karnataka the southern state in India which is one of the top 13 states contributing to 80% of road traffic accidents⁴ of the country. The state has 25 districts, Campaign was done in a district of Tumkur, which is an educational hub spread over 10,598 km with important National and state highways passing through it⁸. It has a population of 2.68 million⁹ and reported more than 6000 injury cases with an injury mortality of 58/100,000/year¹⁰. Nearly 45% of fatal head injuries and 35.5 % of nonfatal injuries were reported in two wheeler users.¹⁰ There was no any enforcement of Helmet law and usage of Helmet was only among 1% in the entire district.

Target population: Campaign was targeted towards different stakeholders such as Superintendent of police, District Commissioner, political leaders, media and community especially the youth.

Campaign duration and strategies: Helmethon – campaign for helmet was done for a period of three months from March to May in the year 2015, with multipronged strategies such as Helmet Education, Formation of a group of young crusaders to promote

helmet, HELfie –Challenge, Stake holders Meet, Bike rally and flash mob, Pledge for helmet, inter college cultural events for helmets, Marathon for helmet after obtaining an ethical approval from the institution ethical committee and necessary permissions from the stakeholders.

Campaign Strategies

Classroom based Helmet Education

NSS officers and principals from different degree and professional colleges were met and briefed regarding the importance of helmet education to their students and they were requested to arrange a session on helmet education for their students preferably in the morning hours to have a good attention. This program covered 100 students each from six institutions i.e. 600 students. Students were administered a pre -tested, semi structured questionnaire to know the change in knowledge and attitude among them before and after the education program. Content comprised of, burden of injuries among two -wheeler users especially among youth, cause of death in crashes involving two -wheeler users, death rates among helmet and non-helmet users, how helmet acts a vaccine in preventing head injuries, type and quality of helmet to be worn, right way of wearing helmet, importance of pillars wearing helmet and importance of wearing a helmet irrespective of the law

Mode of Educational program was a didactic lecture with a power point presentation and a short movie clip promoting the helmet. The slides of the PowerPoint were made pictorial to grab the attention of the students.

Formation of "Shell of Safety"- a gang of helmet crusaders: After the helmet education youth were asked to come forward and volunteer to spread awareness about helmet among peers and public, which led to the formation of "shell of safety." With more than 200 youth coming forward as helmet crusaders who formed the backbone of all campaign activities.

HELfie Challenge: This challenge was inspired by the successful ice bucket challenge initiative, where youth were asked to post a selfie taken with a Helmet and post it in social media page of the campaign and invite others to take up the challenge. The HELfie with maximum likes would get Coffee shop VOUCHERS. This idea initially brought lot of youth to the page and

it became a platform to share ideas, messages and videos about helmet. Facebook page was active for more than six months and around 800 people actively participated in the Facebook campaign.

Stake Holders Meet

Creating awareness about helmet safety to the students (youth) and to the general public involved the cooperation and support from various stake holders who played major role at the district level, such as district commissioner (DC), superintendent of Police(SP), University chiefs and the media. Stakeholders were met individually and a press meet was held to brief about the importance of such campaign in creating awareness. Stakeholders were given the statistics regarding number of lives that could be saved if helmet was made mandate. Press meet gave a wide publicity to the campaign and helped in spreading the word in the community. Stakeholders were also made a part of the campaign by inviting them as chief guests to various events.

Bike Rally and Flash Mob

Preparation Pre-requisites involved permissions from District Commissioner, SP and heads of all institutions, police security and ambulance service. Rally sequence was planned after discussing with principals, students and NSS(National service scheme) officers of different colleges to utilize the tea and lunch break timings for flash mob, so that maximum crowd could participate or witness it. Youth were invited to prepare slogans, to design T-shirts, to prepare placards and posters for the rally and the best was rewarded. Youth were also invited to prepare for a flash mob, which was an integral part of the rally. Nearly 200 volunteers in 100 Bikes with placards and T-Shirts with slogans of helmet safety moved from one collage campus to other covering main streets and important traffic junctions of the city. 'Harley Davidson Riders Group' supported the campaign by joining the rally. This added a glamour quotient. Volunteers of Bike rally performed a flash mob at more than 30 junctions.

Inter Collegiate Events

Intercollege competitions like helmet themed debate, essay writing, short movie making, Cartoons, photography, helmet painting, mime shows, fashion

show, singing and dancing were held. Nearly 25 institutions with more than 400 participants took part in these events. Stake holders like district commissioner, media, Superintendent of police, Vice chancellors were invited as chief guests of the program. The inter -college events were spread over a period of more than two months, which gave every participant more time to think and speak about helmet. All the participants and winners were rewarded in a concluding ceremony which was witnessed by more than 3000 youth. The highlight of the ceremony was the narration of real -life incidence by few people who lost their kins to head injures by not wearing helmet. Short movies prepared by the students were screened during the event and streamed in the social media platforms.

Marathon for Helmet

2K -Marathon, the first marathon of the district was conducted in the month of April 2015 in Tumkur city to spread awareness about helmet to the public, nearly 2000 students of all educational institutions and more than 1000 general public and various stake holders such as superintendent of police, District commissioner, vice chancellors of the university, principals of the institutions, celebrities, NSS officers, media personnel took part in the marathon. Prior to the Marathon, necessary permissions were sought and wide publicity was given through celebrity ambassadors, local FM Radio, TV channels and newspapers. Road map for the Marathon was planned and volunteers for first aid services and refreshments were stalled at the planed junctions. T-shirts with slogans on helmet safety were given to the participants. The marathon of 2k started at 7 am at the Siddhartha engineering collage and concluded at the stadium. Post marathon, crowd was addressed by the celebrity regarding helmet safety.

Public involvement in the Campaign:

Youth and general public voluntarily involved in the campaign as participants and spectators of the campaign.

Results/Outcome of the campaign

Campaign was successful in getting the attention and participation of more than 10,000 youth from different educational backgrounds towards helmet

and its importance. Class room based education, Bike rally and flash mob, Inter collage events were successful in reaching more than 4000 youth directly and more than 6000 people through social media. Bike rally prompted many to buy helmet . The flash mob attracted the crowd towards the importance of helmet safety and encouraged them to come forward to take a pledge to wear helmet at all cost while on two wheeler. Nearly 5000 people did come forward and took a pledge to wear helmet.

The event made youngsters interact, think and discuss about helmet safety during preparation / rehearsals for the various events of the campaign. Campaign was successful in creating youth ambassadors for helmet . and sensitizing the community towards importance of helmet wearing. Campaign did draw the attention of various stake holders like superintendent of police, district commissioner and media towards the importance of helmet for both riders and pillions. Eventually the superintendent of police brought strict enforcement of helmet and seatbelt law in the district which increased immediate helmet usage in Tumkur district from a mere 1% to 80% within a week of enforcement.

Discussion

To work towards achieving the sustainable developmental goal of reducing the morbidity and mortality due to road traffic injuries,⁷ prevention activities need to focus on multiple approaches like education ,availability of safety/protective devices, suitable environment and legislation. Strict enforcement without priming or proper sensitization leads to resentment or rebellious attitude in the society and may turn out to be futile.^{5,11} Helmethon, was such a unique campaign/initiative in India targeted towards prevention of head injuries by educating youth, through youth, and mobilised large amount of youth to pledge for helmet and take up the role of helmet crusaders. Most importantly, the campaign sensitized the stakeholders to enforce the strict helmet legislation. This approach can be a model for many districts to increase awareness, to reduce the resistance in the community for safety initiatives /injury prevention activities by sensitizing the community and stake holders.

The campaign faced several challenges from beginning till end. The first major challenge for the

campaign was funding. An attempt was made to collaborate with Rotary club, which some how did not materialize due to logistic issues. Road safety funds were explored too, with no success. Finally crowd funding proved to be successful.

The second challenge was getting the common free time of all the students to ensure full participation as it involved students from different courses with different time tables. We could overcome this by a detailed planning following discussion with the staff especially National service scheme coordinators of the Institutions and student representatives. None of the classes or examinations were disturbed due to the campaign.

Third challenge was to convince the stake holders and the head of institutions about the role of helmet in road safety. The head of institution had to be convinced about the role of helmet in road safety and also they had to be convinced that the youth had to be educated and made crusaders of helmet wearing. The campaign aimed at convincing them to wear helmet even if there was no strict helmet rule. Frequent meetings were held with the superintendent of Police, District Commissioner and media. Lot of evidence-based statistics had to be provided to them regarding the importance of helmet in saving lives in road traffic injuries. Eventually the compulsory helmet rule came into effect.

Fourth challenge was getting support and participation from the community/public. Advertising through Press meets, local FM and TV channels, Roping in a celebrity for various activities helped in grabbing the attention of the public towards importance of Helmet.

Fifth challenge was ensuring the safety of many youth who enthusiastically took part in the bike rally , flash mob and marathon. All these events happened all around the district for the first time. It demanded a detailed planning, support and supervision from police, doctors and public.

Conclusions: A committed, planned and well executed campaign with multiple strategies at a district level can attract and sensitize the youth, general community and stakeholders attention towards the importance of helmet in prevention of head injuries and can also bring successful enforcement of helmet legislature with least resistance from the community.

What is Already Known:

- Road traffic Injuries are a major public health problem taking lives of many youth
- Helmets reduce the risk of head injuries and hence death due to them.
- Enforcement of Helmet law is required to reduce head injuries
- Education combined with enforcement is required to increase the compliance of injury prevention activities

What it adds

- Youth could be a great strength/crusaders for injury prevention activities
- A committed campaign can attract the stake holders focus towards importance of enforcement of helmet law in prevention of head injuries
- Such campaign at the district level sensitizes the community and helps in enforcing the legislature for helmet with least resistance

Competing interest: none

Funding: Crowd funding

References

1. Global staus report on road safety 2018 [Internet]. [cited 2020 Apr 2]. Available from: <https://apps.who.int/iris/bitstream/handle/10665/277370/WHO-NMH-NVI-18.20-eng.pdf?ua=1>
2. Road traffic injuries [Internet]. [cited 2020 Apr 2]. Available from: <https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries>
3. Mortality due to road injuries in the states of India: the Global Burden of Disease Study 1990–2017 - The Lancet Public Health [Internet]. [cited 2020 Apr 2]. Available from: [https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667\(19\)30246-4/fulltext](https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(19)30246-4/fulltext)
4. Road_Accidents_in_India_2015.pdf [Internet]. [cited 2020 Apr 3]. Available from: https://morth.nic.in/sites/default/files/Road_Accidents_in_India_2015.pdf
5. Helmets-a road safety manual [Internet]. [cited 2020 Apr 3]. Available from: https://www.who.int/roadsafety/projects/manuals/helmet_manual/1-Why.pdf
6. THE MOTOR VEHICLES ACT, 1988 [Internet]. [cited 2020 Apr 3]. Available from: <http://legislative.gov.in/sites/default/files/A1988-59.pdf>
7. WHO | Global status report on road safety 2015 [Internet]. WHO. World Health Organization; [cited 2020 Apr 3]. Available from: http://www.who.int/violence_injury_prevention/road_safety_status/2015/en/
8. Tumakuru district. In: Wikipedia [Internet]. 2020 [cited 2020 Apr 9]. Available from: https://en.wikipedia.org/w/index.php?title=Tumakuru_district&oldid=949928561
9. Tumkur District Population Census 2011-2020, Karnataka literacy sex ratio and density [Internet]. [cited 2020 Apr 9]. Available from: <https://www.census2011.co.in/census/district/267-tumkur.html>
10. Gururaj G, Uthkarsh PS, Rao GN, Jayaram AN, Panduranganath V. Burden, pattern and outcomes of road traffic injuries in a rural district of India. *Int J Inj Contr Saf Promot.* 2016 Jan 2;23(1):64–71.
11. Application of Behavior-Change Theories and Methods to Injury Prevention | Epidemiologic Reviews | Oxford Academic [Internet]. [cited 2020 Apr 9]. Available from: <https://academic.oup.com/epirev/article/25/1/65/718686>

A Cross Sectional Study on Functional and Psychological Status of Geriatric Population in Urban Areas of Perambalur

Parthasarathi Ramanathan¹, Rock britto², Ram Prabhakar³, Maniprabhu^{4*}, Kishorekumar⁵, Lakshmi Naryanan⁶, Lakshmipriya⁷

¹Assistant Professor, Department of community medicine, KAPV Govt. Medical college, Trichy

²Associate professor, Department of community Medicine, Dhanalakshmi Srinivasan Medical college, Perambalur

³Assistant Professor, Department of community medicine, Govt. Theni Medical College, Theni

⁴Assistant Professor, Department of Community Medicine, Govt. Pudukkottai Medical College, Pudukkottai

^{5,6,7}Interns (CRRI) in Dhanalakshmi Srinivasan Medical College, Perambalur

How to cite this article: Parthasarathi Ramanathan, Rock britto, Ram Prabhakar, Maniprabhu*, Kishorekumar, Lakshmi Naryanan, Lakshmipriya et al. A Cross Sectional Study on Functional and Psychological Status of Geriatric Population in Urban Areas of Perambalur. Volume 13 Issue 3 July-September 2022

Abstract

Background: Aging is the physiological deterioration in one's functional & mental capacity. It has been documented that geriatric population are more prone to cognitive impairment & depression that leads to functional disability which in turn makes them dependent on someone for their activities of daily living (ADL). Objective of this study is to find the prevalence of functional disability, cognitive impairment, depression and its association with sociodemographic factors among the geriatric population.

Methods: This cross-sectional study was conducted from February to March 2020 among 150 elderly people (>60yr) in urban field practicing area of Dhanalakshmi Srinivasan medical college and hospital, Perambalur in Tamil Nadu.

Results: The prevalence of functional disability was 17% (ADL scale) while cognitive impairment was seen in 22% (MMSE) and depression was observed in 35% (PHQ-9) of the study population. Sociodemographic factors such as gender, marital status and type of diet were found to be statistically associated with functional disability among the elderly.

Conclusion: More than one-third of the geriatric population had signs of depression while one-fifth of the study population had cognitive impairment. Sociodemographic factors such as female gender and taking mixed diet were found to be statistically associated with functional disability whereas no association was found for cognition impairment and depression. The study also provides baseline data on co-morbid conditions in geriatric population which can be used by the local health authorities for providing comprehensive geriatric care with special focus on depression and cognitive impairment.

Keywords: Functional disability, Activities of Daily living, ADL, Geriatrics, Depression, Cognitive impairment

Introduction

Aging is a process of deterioration in the individual's functional and mental capacity that results from structural changes as age advances. It is not

merely a matter of accumulating years but also a process of "adding life to years, not years to life" ¹. Improvements in healthcare facilities have brought about longevity which is considered to be one of the greatest achievements that led to the ratio of older

*Correspondence: Maniprabhu,

Department of Community Medicine

Email: drsmaniprabhu88@gmail.com

persons globally being changed dramatically from one in fourteen in the 1950s to about one in four at present ². By 2025, the number of elderly people will increase to more than 1.2 billion with about 840 million of these in low-income countries. In India, according to the Sample Registration System of 2005, 7.2% of the people were above the age of 60 years ³. These demographic changes are progressing fastest in the developing countries, especially in India which will soon become home to the world's second-largest geriatric population. Much success has been achieved in the control of public health problems leading to increased life expectancy. But this has been led down by the inadequacy of health and administrative systems around the world in ensuring equal distribution of felt needs of the "greying" population⁴.

As the proportion of older and disabled persons keeps growing coupled with the rise in prevalence of chronic diseases, the importance of functioning health and illness comes under scanner. Chronic illness and functional ability influence the quality of life in older populations. There is also evidence that older people have the risk of multiple co-morbidities, which may lead to increased disability³. A person's mental health and many common mental disorders are shaped by social, economic and physical environments.

According to Commission on Social Determinants of Health (CSDH), the social determinants such as the conditions in which people are born, live, school, play, work, learn, age and worship strongly determines the health of an individual. Risk factors for many common mental disorders are heavily associated with social inequalities, wherein the greater the inequality the higher the risk of mental disorders⁵the Social Determinants of Health (SDOH). Although Primary Health Centres along with their sub-centres are distributed all over the country, the elderly are not able to avail the facilities at the PHC or its sub-centers owing to lack of transport, geographical distance or physical disabilities or for the need of funds for transport facility ⁶. The findings of a survey conducted among elderly persons over 60 years of age attending geriatric clinics in rural areas revealed that almost 50 percent of the Indian elderly have chronic diseases and 5 percent suffer from immobility ^{7,8}.

The percentage of elderly reporting various ailments were visual impairment in 88.0%, Locomotive disorders involving joints and muscles in 40.0%, Neurological complaints in 18.7%, Cardiovascular diseases in 17.4%, Respiratory diseases in 16.1%, Skin

conditions in 13.3%, Gastro-intestinal/abdominal disorders in 9.0%, Psychiatric disorders in 8.5%, Hearing loss in 8.2% and Genitourinary disorders in 3.5% ⁹. There is ample scope for research into the physical and mental diseases of elderly and their management in hospital, family and community levels and into preventive geriatrics besides the epidemiology of such disorders affecting the elderly ⁶. Many clinicians in India have misidentified depression and cognitive disability as an aging process rather than a disease and this thought ought to be altered soon with the ever-increasing geriatric population. Functional disability among the geriatric age group is mainly not recognized in early stages because of the lack of cost-free geriatric friendly health care systems and the ignorance of our people. Therefore, it is important that health care workers especially those in the community level to identify and address functional disability, depression, and cognitive impairment among the elderly by implementing necessary steps for effective management and prevention which is the focus of our study.

Objectives

To assess the functional disability by using Activities of Daily Living scale (ADL scale), cognitive dysfunction by using the Mini-Mental State Examination (MMSE), Depression by using the Patient Health Questionnaire (PHQ-9) among the geriatric population (>60 years) in urban field practicing area of Dhanalakshmi Srinivasan medical college and hospital, Perambalur;

To estimate the magnitude of various co-morbidities in the geriatric population;

To determine the socio-demographic factors associated with functional disability and cognitive impairment in the geriatric population.

Materials and Methods

Through a convenient sampling technique using a semi-structured questionnaire, the socio-demographic data was recorded and scales such as ADL scale, PHQ-9 scale, and MMSE scale were used in people more than 60 years residing in the urban field practice areas of Dhanalakshmi Srinivasan medical college. The data collection for this study was done for 2 months from February 2020 to March 2020 with a sample size of 150 elderly people collected by face-to-face method. According to Priya RP et al⁴, a study

conducted among the urban population in Tamil Nadu showed a prevalence of functional disability as 27.6% .With this prevalence and allowable error of 10%, the estimated minimum sample size was 92 (with 20% of non-response rate). It was decided to include 150 samples as our study population which was more than the minimum required sample size. Data about the socio-demographic profile was collected by face-to-face interview during house visit. Risk factors such as age, waist circumference, family history and physical activity were taken into account.

Only participants above 60 years of age were included in the study and terminally ill patients were excluded. ADL score was calculated using a 10-point rating scale questionnaire. The MMSE scale was calculated using the criteria of orientation, registration, attention and calculation, recall, language, and copying.

Results

In our study population, 91% were young old, 8% were middle old, 1% were old old. Considering gender, 55% were male and 45% were female, 84% of the study population were married and 16% were widowed. 23% of the study population lived in a nuclear family, 77% lived in a joint family. 5% consumed veg diet and 95% consumed both veg and non-veg diet.;4% of the population consume 2 times a day, 95% consume 3 times a day,1% consume more than 3 times a day.

Diabetes, Osteoarthritis, Hypertension, Cataract were 4 common co-morbidities prevailing in our study population and also causing significant morbidities in the elderly population. Other lesser common causes in decreasing order of frequencies include anemia, deafness, coronary artery disease, chronic kidney disease, thyroid disorder, and COPD.

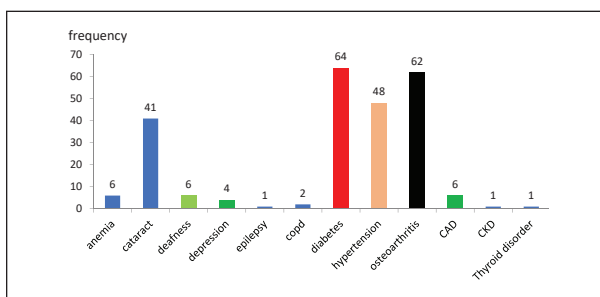


Fig 1: Graph depicting various co-morbidities prevailing in our study population (more than single response accounted)

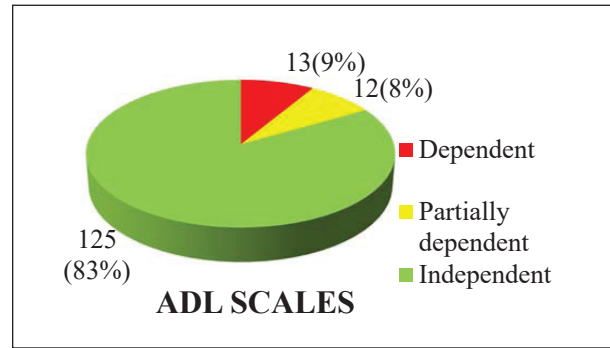


Fig 2: Prevalence of Dependency for ADL among the study population (n= 150)

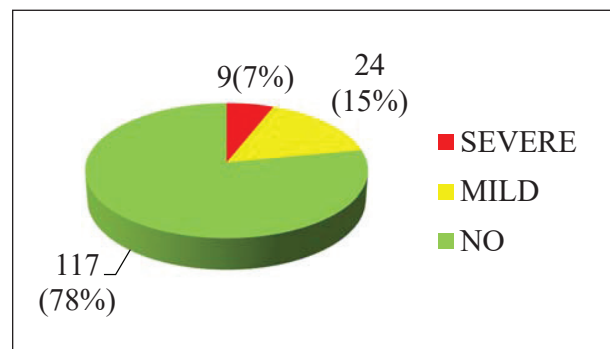


Fig 3: Prevalence of Cognitive Impairment among study population (n= 150)

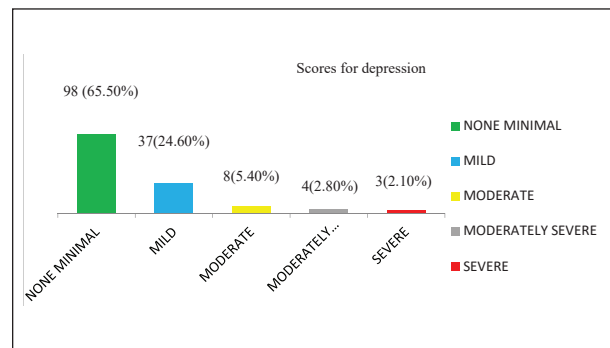


Fig 4: prevalence of depression in our study population (n=150)

Dependency in our study calculated based on the ADL scale revealed that 17% of our study participants were dependent (partial and complete dependency) on others for their daily routine as shown in Fig.2. Cognitive impairment measured using MMSE scale revealed that 22% of our participants having cognitive impairment (mild and severe) as shown in Fig.3. Depression measured based on the PHQ-9 questionnaire revealed that 35% of our population showed symptoms of depression (mild, moderate, moderately severe, severe) as shown by Fig.4.

Table 1: Association between socio-demographic factors & functional dependency (n=150)

Sociodemographic factors		Dependent	Partially dependent	Independent	Total	p value
Age	Young old	18(13%)	44(32%)	74(55%)	136	0.734
	Middle old	3(24%)	4(31%)	6(45%)	13	
	Very old	0	0	1	1	
Gender	Male	6(7%)	33(40%)	43(53%)	82	0.009
	Female	15(22%)	15(22%)	38(56%)	68	
Marital status	Married	19(15%)	33(26%)	74(59%)	126	0.008
	Widowed	2(8%)	15(62%)	7(30%)	24	
Type of family	Nuclear	4(11%)	11(33%)	19(56%)	34	0.101
	Joint	17(15%)	37(32%)	62(53%)	116	
Type of diet	Veg	0	6(75%)	2(25%)	8	0.045
	Mixed	21(15%)	42(30%)	79(55%)	142	
Frequency of food intake (per day)	2 times	0	5(71%)	2(29%)	7	0.279
	3 times	21(15%)	42(30%)	79(55%)	142	
	>3 times	0	0	1	1	

In our study, 13% were dependent among young old while 24% were dependent among middle old and this difference in proportion was not statistically significant. Moreover, a higher proportion of females (22%) were dependent compared to 7% dependency in males and this difference in gender-based dependency was statistically significant. 15% of those married and 8% of those widowed were dependent and difference in proportion was also significant. Interestingly, none of the subjects taking vegetarian diet were dependent while 15% of those who consumed mixed diet were functionally dependent and the difference in proportion was statistically significant (Table 1).

Table 2: Association between sociodemographic factors and cognition impairment (n=150)

Socio-demographic factors		Severe cognitive impairment	Mild cognitive impairment	No cognitive impairment	Total	p-value
Age	Young old	10(7%)	21(15%)	105(78%)	136	0.719
	Middle old	0	1(7%)	12(93%)	13	
	Very old	0	0	1(100%)	1	
Gender	Male	5(7%)	9(13%)	54(80%)	68	0.911
	Female	5(6%)	13(16%)	64(78%)	82	
Marital status	Married	7(6%)	19(15%)	100(79%)	126	0.418
	Widowed	3(13%)	3(13%)	18(76%)	24	
Type of family	Nuclear	4(12%)	3(9%)	27(79%)	34	0.459
	Joint	6(5%)	19(16%)	91(79%)	116	
Type of diet	Veg diet	0	2(25%)	6(75%)	8	0.865
	Mixed diet	10(7%)	20(14%)	112(79%)	142	
Frequency of diet	2 times	1(14%)	2(28%)	4(58%)	7	0.368
	3 times	9(6%)	20(14%)	113(80%)	142	
	>3 times	0	0	1	1	

About 7% and 15% of young old had severe cognitive impairment and mild cognitive impairment, respectively which was higher than 7% mild cognitive impairment in middle old but this difference was not statistically significant. There was no statistically significant association between the occurrence of cognitive impairment and variables such as gender, marital status, type of family, type and frequency of diet (Table 2). Similarly, there was no statistically significant association between the occurrence of depression and variables such as age, gender, marital status, type of family, type and frequency of diet (data not shown).

Discussion

The study results showed that the prevalence of functional disability was 16.66% (83% independent, 8% partially dependent, 9% dependent) among the geriatric urban population in Perambalur district of Tamil Nadu. A similar study conducted in the rural area of Kanyakumari district by Priya RP et al⁴ showed a prevalence of 20.6% functional disability in the elderly. Similarly, VenkataRao et al¹⁰ also conducted a study in the rural area of Villupuram district and reported the prevalence of functional disability in handicaps as 88%. This urban-rural difference can be attributed to differences in lifestyle, poor social-economic support and inadequate or inaccessibility in delivery of health care services in the rural population¹¹.

Also, in our study, 61.4% have normal cognitive status, 36% had mild cognitive impairment, and 3.5% had severe cognitive impairment. These findings can be compared with study conducted by Malini et al¹² in urban slums of Chennai in which 78.5% had normal cognitive status, 15% had mild cognitive impairment and 6.5% had severe impairment. Another study done by Kumar et al¹³ among the rural elderly population in Tamil Nadu showed 43.25% prevalence of severe cognitive impairment. This urban-rural difference may be due to the high literacy rate among urban people and also variations in sample size.

In our study, the prevalence of depression among urban geriatric population was 35% in comparison to 21% severe depression reported by Radhakrishnan et al¹⁴ in a study conducted in the rural areas of Salem district. Also, in a study by Sinha et al¹⁵ in the rural area of Sembakkam severe depression was reported in 6.8% with 13.6% moderate and 22.3% having

mild depression. These difference in prevalence of depression can be due to various factors such as good family support in urban population, socioeconomic status differences and variations in sample size.

In our study, there was a significant association between socio-demographic factors such as gender, marital status and mixed diet) and functional disability. However, there was no significant association between socio-demographic factors and cognitive impairment as well as depression.

Furthermore, our study also provides data regarding prevalence of various co-morbidities in geriatric population such as 42% having diabetes mellitus, 41% with osteoarthritis, 32% with hypertension and 27% with cataract. Similar study done by Jennifer H et al¹⁶ showed a much higher prevalence of 75% osteoarthritis, 63.9% hypertension, 55.6% cataract and 33.3% diabetes mellitus among the elderly while Viswam k et al¹⁷ also reported 43% diabetes and 29% having hypertension. These differences may be due to lifestyle differences of study population, inequality in distribution of health care facilities, socio-economic status and awareness regarding various health conditions.

Strength and limitations: The current study involved a comprehensive examination of urban geriatric population as it reveals the prevalence of functional disability, depression, cognitive impairment along with the association between socio-demographic factors and functional disability as well as prevalence of various co-morbidities prevailing in the geriatric population. Had we included the rural population of the same district in our study, better comparative results and factors determining the urban-rural gap could have been recognized.

Conclusion: More than one-third of the geriatric population had signs of depression while one-fifth of the study population had cognitive impairment. Sociodemographic factors such as female gender and taking mixed diet were found to be statistically associated with functional disability whereas no association was found for cognition impairment and depression. There was high prevalence of co-morbidities especially Diabetes mellitus, Hypertension, Osteoarthritis among the elderly.

Recommendations: Based on the data from our study, a simple comprehensive community-based approach to elderly population suffering from depression, cognitive impairment, and functional

disability can be designed at the PHC level so that appropriate measures can be taken to limit the morbidity. Both economical and psychological family support should be strengthened to the elderly and the Government can consider providing age- appropriate skill-based jobs especially for empowering older widowed women. Effective implementation of health programmes especially for non-communicable diseases (NCD) is the need of the hour as there was a high prevalence of diabetes, hypertension and osteoarthritis among the geriatric population.

Ethical clearance- obtained from Institutional Ethics Committee, Dhanalakshmi Srinivasan Medical college and Hospital (DSMCH)

Source of funding- Self

Conflict of Interest - None

References:

1. H GJ, Lakshmi PAA, C VD, Das B. A study on morbidity status of geriatric population in the field practice area of Karpaga Vinayaga Institute of Medical Sciences, Tamil Nadu, India. *International Journal Of Community Medicine And Public Health*. 2016 Dec 24;3(9):2575-8.
2. Swami HM, Bhatia V, Dutt R, Bhatia S. A Community Based Study of the Morbidity Profile among the Elderly in Chandigarh, India. *Bahrain Med Bull*. 2001 Nov 30;24.
3. Chakrabarty D, Mandal PK, Manna N, Mallik S, Ghosh P, Chatterjee C, et al. Functional disability and associated chronic conditions among geriatric populations in a rural community of India. *Ghana Medical Journal* [Internet]. 2010 [cited 2020 Mar 20];44(4). Available from: <https://www.ajol.info/index.php/gmj/article/view/68913>
4. Priya RP. A Study on the health and social problems of a geriatric population in a rural area of Kanyakumari District, Tamil Nadu [Internet] [masters]. Sree Mookambika Institute of Medical Sciences, Kulasekharam; 2017 [cited 2020 Mar 20]. Available from: <http://repository-tnmgrmu.ac.in/10110/>
5. Sriram P. Prevalence and Factors Associated with Psychiatric Morbidity among Internally Displaced Elderly Population: A Cross Sectional study [Internet] [masters]. Madras Medical College, Chennai; 2015 [cited 2020 Mar 20]. Available from: <http://repository-tnmgrmu.ac.in/7507/>
6. Jadhav V.S JVS. A study of morbidity profile of geriatric population in the field practice area of rural health training centre, Paithan Govt. Medical college, Aurangabad. *IOSRPHR*. 2012 Jan;2(2):184-8.
7. Asadullah M, Kuvalekar K, Katarki B, Malamardi S, Khadka S, Wagle S. A study on morbidity profile and quality of life of inmates in old age homes in Udupi district, Karnataka, India. *International Journal of Basic and applied medical sciences*. 2012;2(3):91-7.
8. Purty AJ, Bazroy J, Kar M, Vasudevan K, Veliath A, Panda P. Morbidity Pattern among the Elderly Population in a rural area of Tamil Nadu, India. 2005.
9. Srinivas PJ, Manjubhashini S. A study on morbidity profile among elderly population in Visakhapatnam District, Andhra Pradesh. *Journal of Dental and Medical Sciences*. 2014;13(9):21-25.
10. Venkatarao T, Ezhil R, Jabbar S, Ramkrishnam R. Prevalence of disability and handicaps in geriatric population in rural South India. *Indian journal of public health*. 2005;49(1):11.
11. Ganesh R, John J, Saravanan S. Socio demographic profile of oral cancer patients residing in Tamil Nadu - A hospital-based study. *Indian Journal of Cancer*. 2013 Jan 1;50(1):9.
12. Malini P. A Study comparing Mini Mental State Examination and Mini Cognitive assessment as screening tool in assessing cognitive functioning in Elderly. *University Journal of Medicine and Medical Specialities* [Internet]. 2019 Mar 22 [cited 2020 Mar 20];5(2). Available from: <http://14.139.191.179/index.php/medicine/article/view/10583>
13. Kumar S, Rajasekhar P, Reddy NB, Sai TSR, Prabhu GR, Swarnalatha N. Socio-Demographic Determinants of Mental Health Problems among Rural Elderly Population. *Ind Jour of Publ Health Rese & Develop*. 2013;4(3):33.
14. Radhakrishnan S, Nayeem A. Prevalence of depression among geriatric population in a rural area in Tamilnadu. *International Journal of Nutrition, Pharmacology, Neurological Diseases*. 2013 Jul 1;3(3):309.
15. Sinha SP, Shrivastava SR, Ramasamy J. Depression in an older adult rural population in India. *MEDICC rev*. 2013 Oct;15:41-4.
16. H GJ, Lakshmi PAA, C VD, Das B. A study on morbidity status of geriatric population in the field practice area of Karpaga Vinayaga Institute of Medical Sciences, Tamil Nadu, India. *International Journal Of Community Medicine And Public Health*. 2016 Dec 24;3(9):2575-8.
17. Viswam S, Nair G, Thomas B, Shivashankar V. A Prospective Observational Study on Polypharmacy in Geriatrics at A Private Corporate Hospital. *Journal of Applied Pharmaceutical Science*. 2017 Oct 1;7:162-7.

A Study to Compare the Effectiveness of Active Release Technique Versus Deep Friction Massage on Pain, Grip Strength and Functional Performance in Patients with Chronic Lateral Epicondylitis

Priyanka Dabkara¹, Jeban Daniel², Mayuri Sharma³, Arindam Bose⁴

¹Physiotherapy consultant and coach in fitterfly health tech pvt ltd

²Principal, IMS, Indore, ³Faculty, MAHSI, Indore,

⁴Professor & PG Guide, Choithram College of Paramedical Sciences, Indore

How to cite this article: Priyanka Dabkara, Jeban Daniel, Mayuri Sharma, Arindam Bose et al. A Study to Compare the Effectiveness of Active Release Technique Versus Deep Friction Massage on Pain, Grip Strength and Functional Performance in Patients with Chronic Lateral Epicondylitis. Volume 13 Issue 3 July-September 2022

Abstract

Background and Objectives: Lateral epicondylitis is a very common overuse syndrome in the elbow. It is an injury which involves the extensor muscles of the forearm. The most frequent location of the involvement is in the musculotendinous junction of the extensor carpi radialis brevis muscle. It leads to pain, reduced grip strength and functional impairments affecting individual's lifestyle. Active release technique and deep friction massage both are effective techniques in the treatment of lateral epicondylitis. This study focuses on the comparative perspective of these soft tissue techniques along with the conventional treatment in terms of relief to the patients suffering from lateral epicondylitis.

Study Design: Experimental design comparative in nature.

Method: This study was done on 30 subjects who were divided equally into two groups. Group A received active release technique along with the conventional treatment for lateral epicondylitis and group B received deep friction massage along with the conventional treatment. Each patient was assessed on 1st, 11th and 21st day using Numeric Pain Rating Scale (NPRS), hand dynamometer and Patient Rated Tennis Elbow Evaluation (PRTEE) questionnaire.

Result: Statistical analysis of the data revealed that both the therapies produced improvement in pain, grip strength and functional activity status among patients with chronic lateral epicondylitis but according to independent t-test there was highly significant difference between active release technique and deep friction massage groups. The study confirmed that the effect of therapy in group B is more effective rather than group A by NPRS scores but on PRTEE and grip strength effect of therapy in group A (ART) was more effective rather than group B (DFM). And by paired sample test there was statistically significant difference between before and after program in group A and group B among chronic lateral epicondylitis patients.

Conclusion: The study concluded that active release technique and deep friction massage both are effective treatments if done along with the conventional treatment. Active release technique demonstrated better improvement than the deep friction massage in the management of lateral epicondylitis.

Keywords: Chronic lateral epicondylitis, Active release technique, Deep friction massage, NPRS, PRTEE and grip strength.

Corresponding Author - Mayuri Sharma

Demonstrator

(Previously worked as Assistant Professor in Choithram College of Paramedical Sciences)

MGM Allied Health Sciences Institute(MAHSI),Indore

Email id - mayuri_489@rediffmail.com

Introduction

Lateral epicondylitis is the most common lesion in the elbow¹. German physician F. Runge is usually credited for the first description of the condition, calling it "writer's cramp" in 1873. Later it was called "washer women's elbow". British surgeon Henry Morris published an article in *The Lancet* describing "lawn tennis arm" in 1882. The popular term "tennis elbow" first appeared in the same year in a paper by H.P. Major, describing as "lawn-tennis elbow"^{2,3}. It is an injury involving the extensor muscles of the forearm⁴.

The most frequent location of the involvement is in the musculotendinous junction of the Extensor Carpi Radialis Brevis (ECRB) muscle⁶. Due to severe pain, patient becomes unable to participate in the provoking activities like racket sports, throwing etc. Patient feels difficulty with repetitive forearm/ wrist tasks, such as sorting or assembling small parts, typing on a keyboard or using a computer mouse, gripping activities, using hammer, turning a screwdriver, shuffling papers, or playing a percussion instrument⁶. Positive tests of provocation include palpation tenderness on or near the lateral epicondyle, pain with resisted wrist extension performed with the elbow extended (Cozen's test), pain with resisted middle finger extension performed with the elbow extended (Maudsley's test) and pain with passive wrist flexion with the elbow extended and forearm pronated (Mill's test)^{4,6}.

During the acute phase it is important to prevent further damage and thereby development of chronic lateral epicondylitis by adequate care and support and avoiding the hasty movements of supination, wrist extension, radial deviation and tight grips causing repeated breakdown in the formation of scar tissue which subsequently prolongs the inflammatory reaction and leads to the formation of adhesions¹¹.

Long established treatment protocol for LE consists of counterforce bracing, non-steroid anti-inflammatory drugs, ultrasound, iontophoresis or phonophoresis for pain relief followed by stretching and strengthening exercises for flexibility and endurance training^{6,11}. In recalcitrant cases surgery may be an option¹¹.

Nowadays, soft tissue technique to gain importance is active release technique (ART). ART was developed by P. Michael Leahy which is a deep tissue technique used for breaking down scar tissue/adhesions and restoring function and movement. ART is application

of deep digital tension over tenderness and asking the patient to actively move the tissue from the shortened to lengthened position and thereby breaking the adhesions formed¹².

Deep friction massage/Cross friction massage is another specific soft tissue massage technique that was developed by Cyriax. The purpose of deep friction massage (DFM) is to maintain the mobility within the soft tissue structures of ligaments, tendons and muscles and prevent adherent scars from forming. In situations where adhesions are already formed a more intense friction can help to break them as well. To perform this stroke the fingertips or thumbs are applied, either alone or reinforced by the adjacent finger¹

Methodology

Study Design: Experimental design comparative in nature

Source of Data Collection: Various physiotherapy clinics and hospitals of Indore and back-end departments of various companies.

Method of Data Collection: Random purposive sampling

Sample Size: 30 subjects

Sample Design: The subjects who fulfilled the inclusion and exclusion criteria were selected for the study and a written consent was taken from the selected subjects before undergoing the treatment.

Study Duration

November 2017 – December 2017

Inclusion Criteria

- Both males and females
- Pain- >3 months
- Unilateral involvement
- Positive Cozen's test and Mill's test
- Numeric Pain Rating Scale (NPRS) score- 3-6

Exclusion Criteria

- History of trauma to upper limb and cervical region

- Any surgery of upper limb and cervical region
- Local infections
- Local malignancy
- Acute lateral epicondylitis
- Cervical radiculopathy
- Osteoporosis
- Recent steroid infiltration

Materials Used in the Study

Tools used for Intervention

- Therapeutic ultrasound machine.
- Hand dynamometer.
- Couch
- Table
- Chair

Tools used for Outcome Measures

- Numeric Pain Rating Scale (NPRS)
- Patient - Rated Tennis Elbow Evaluation questionnaire (PRTEE)
- Hand dynamometer.

Procedure

Tests used for lateral epicondylitis

1. Cozen's test
2. Mill's test

Patients fulfilling the inclusion and exclusion criteria were randomly divided considering their age and working hours into two groups: group A and group B.

Patients in group A received Active Release Technique (ART) along with conventional treatment and patients in group B received Deep Friction Massage (DFM) along with conventional treatment.

In conventional treatment bracing, ultrasound and exercises were given. Exercise regimen included stretching and strengthening exercises.

1) Group A-

Active Release Technique (ART) -

Patient position - sitting on chair, elbow flexed resting on table, forearm in mid prone position and wrist in neutral position.

Therapist applied pressure to the extensor carpi radialis brevis muscle distal to their attachment at the elbow. Therapist placed the thumb over ECRB muscle and patient had to extend his/her elbow and pronate the forearm and flex the wrist meanwhile the therapist moved the pressure proximally.

Doses -10 minutes in one session and 3 sessions/week on alternate day.

2) Group B-

Deep Friction Massage (DFM)-

Patient position - sitting on the chair, elbow flexed to 90 degree resting on the table, forearm supinated and wrist in neutral position.

Therapist applied pressure by the thumb to the extensor carpi radialis brevis (ECRB) muscle distal to their attachment at the elbow and gave friction massage transversely to the fiber orientation.

Dose: 10 minutes in one session and 3 sessions/week on alternate day.



3) Ultrasound in both the groups at the tenoperiosteal junction of the ECRB muscle.

Parameters-

Mode- Continuous Frequency- 3 Megahertz

Intensity - 1 Watt/square centimeter Duration - 5 minutes

Doses: 3 sessions/week on alternate day.

4) Exercise regimen in both the groups -

Stretching exercise:

Patient position - sitting on chair, forearm pronated, elbow extended and wrist in neutral position.

With the help of another hand or taking help of wall patient had to stretch the muscle for 30 seconds by palmarly flexing the wrist.

Doses - 10 stretches/ session once daily.
Strengthening exercise:

Patient position - sitting on chair with elbow in 90 degree flexion, forearm pronated resting on thigh and wrist in neutral position.

Patient had to extend the wrist against the manual resistance applied by another hand on the dorsum of the affected hand and held the position for 10 seconds.

Doses - 10 contractions/ session once daily.

The patients were treated for three weeks and outcome measures were taken for analysis of the efficacy of the treatment on 1st, 11th and 21st day of the treatment.

Statistical Analysis

Sampling

Both probability and non-probability sampling techniques were used for this study. Non probability sampling technique was used to select the required samples from the population of individuals who had chronic lateral epicondylitis while the allocation of a group to a sample done was using probability sampling technique.

Study Tools

- Numeric Pain Rating Scale (NPRS).
- Patient Rated Tennis Elbow Evaluation Questionnaire (PRTEE).

- Hand dynamometer.
- Therapeutic ultrasound.

Statistical Methodology

Overall, data of 1st day, 11th day and 21st day were available for the study which were statistically analyzed in order to evaluate the improvement in pain, grip strength and functional activity status.

Statistical Technique

The statistical analysis was performed using SPSS version 20. This was assumed that the recorded observations had followed a normal distribution.

Results

In the present study, out of thirty subjects 21 were female and 9 were male. The age of all subjects who had lateral epicondylitis in the study was between 25 to 59 years.

Result of the study shows clearly that there is positive correlation of .783 present between the NPRS scores of 1st and 11th day and there is statistical significance difference between the two scores ($p < 0.05$). Similarly, there is positive correlation exists between the 1st and 11th day scores of PRTEE and grip strength also.

It can be clearly seen that there is a positive correlation present between the 11th and 21st day scores of NPRS, PRTEE and grip strength which is showing that there is statistically significant difference present between the 11th and 21st day outcome measures and the change was consistent after training across subjects.

According to the result there is still a positive correlation exists between the pre- intervention and post-intervention outcome measures. Between 1st and 21st day NPRS scores there is a correlation of .550 present and the p value is less than 0.05 (0.05) which shows that there is statistically significant difference between pre and post intervention.

There is a correlation of .453 present between the 1st and 21st day PRTEE scores. Similarly, correlation of .669 present between pre-intervention and post-intervention scores of grip strength in group A.

The mean column in the paired sample t- test displays the average difference between before and

after 11 days program of NPRS scores (2.333), PRTEE scores (20.433) and grip strength scores (2.312) among patients in ART group. The standard deviation column displays the standard deviation of the average difference score. The std. error mean column provides an index of the variability one can expect in repeated random samples of 15 patients similar to the ones in the study. The 95% confidence interval of the difference provide an estimate of the boundaries between which the true mean difference lies in 95 % of all possible random samples of 15 patients similar to the ones participating in the study.

Since the significance value for change in all measurements are less than 0.05 or $P=0.000$, we can conclude that the average difference of 4.66 per patients of NPRS scores, 36.93 of PRTEE and 3.82 of Grip strength scores are not due to chance variation, and can be attributed to after 21 days program i.e. statistically significant difference between before and after program in group A among chronic lateral epicondylitis patients.

Discussion

The present study was intended to evaluate and compare the effectiveness of active release technique and deep friction massage on pain, grip strength and functional performance in patients with chronic lateral epicondylitis.

The 11- point NPRS is a scale to measure the pain in which patients rate their pain ranging from 0 (no pain) – 10 (worst imaginable pain) over past 24 hours and it has been shown to have concurrent and predictive validity as a measure of pain intensity. The PRTEE estimates the patient's pain and function over the past week.

Our study shows that deep friction massage decreases the pain intensity which was also shown in a study of **Rosemary Yi et al (2017)**. They did a comparative study on "Deep friction massage versus steroid injection in the treatment of lateral epicondylitis". DFM group demonstrated a significant improvement in all outcome measures including VAS pain score, DASH score and grip strength.

Both the techniques, ART and DFM are supposed to breakdown the scar tissue/adhesions and restore the functions and movements. In this study, the NPRS scores of the group which received deep friction massage were improved more than the group which

received active release technique. This may be because the deep friction massage produces an analgesic effect which can last up to 24 hours. Whereas, the PRTEE and grip strength scores of the ART group improved more than the DFM group.

This may be because the ART effectively treats the underlying cause of the disorder resulting in increased range of motion, increased strength and improved circulation. ART helps to relax the deeper tissues in the forearm throughout the length whereas DFM targets only a smaller area. ART provides effective and long lasting relief from pain and increases the strength of the muscle thus grip strength increases. The cumulative effect of reduced pain and increased muscle strength results in improved functional activity status of the patient.

In our study the grip strength among the subjects of ART group improved which was proved in another study of **Dr Soumik Basu et al (2017)** also. They did a comparative study on "Effectiveness of active release technique in the treatment of chronic lateral elbow pain". Each patient was assessed pre and post treatment program using hand held dynamometer for grip strength, PRTEE for functional activity status evaluation and goniometer for checking the range of motion. They came to the conclusion that ART group demonstrated better improvements in grip strength, functional performance and range of motion than the control group. In another study by **Jordan A. Gliedt et al (2014)** on a 48 year old man with complaint of lateral elbow pain found that by the application of ART during the three weeks treatment program, patient's pain was significantly reduced and functional activity status of the patient also got improved. Study conducted by **KM Harnet et al (2012)** also supports our findings in which they evaluated the efficacy of ART on functional performance by PRTEE and pain free grip strength (PFGS) in patients with tennis elbow. They included 30 patients with lateral epicondylitis divided into two groups. One group received ART in combination with conventional treatment and in another group only the conventional treatment was given. They concluded that ART showed better results by improved grip strength and functional activity status than another group.

Thus we can conclude from results of our study with support of previously done studies that deep friction massage and active release technique both are effective in the management of chronic lateral

epicondylitis whereas deep friction massage being more effective for short term pain relief and active release technique being more effective for long lasting relief in pain and improvement in grip strength and thus the functional activity status of the patients of chronic lateral epicondylitis.

Limitations Of Study:

1. Sample size taken for the study was small.
2. Long term effect of the intervention was not assessed in our study.

Scope for Further Study

1. Study with large sample size is recommended.
2. Long term effect can be considered.
3. A comparative study can be done between ART and other soft tissue techniques.

Conclusion

The study confirmed that the effect of therapy in the DFM group is more effective rather than in ART group by Numeric Pain Rating Scale (NPRS) scores but on Patient Rated Tennis Elbow Evaluation (PRTEE) questionnaire and grip strength effect of therapy in ART group was more effective rather than DFM group. And by paired sample test there was statistically significant difference between before and after program in group A and group B among chronic lateral epicondylitis patients.

Ethical clearance: Taken from Institutional ethics committee of Choithram college of paramedical sciences(EC/NOV/17/19)

Source of Funding : Self

Conflict of Interest: Nil

Bibliography

1. Goguin JP, Rush. Lateral epicondylitis- what is it really? *Current orthopaedics*. 2003; 17: 386-9
2. Flatt AE. Tennis elbow. *Proceedings (Baylor University Medical Center)*. 2008; 21(4): 400-2
3. Major HP. Lawn- tennis elbow. *BMJ*.1883; 2(1185): 557
4. Magee D. *Orthopaedic physical assessment*. 6th edition Saunders Elsevier; 2014: 407- 8
5. Ebnezar J, John R. *Essentials of orthopaedics for physiotherapists*. 3rd edition. Jaypee Brothers Medical Publishers (P) ltd; 2017; 292-4
6. Kisner C, Colby LA. *Therapeutic exercises- foundations and techniques*. 6th edition. Jaypee Brothers Medical Publishers (P) ltd: 636-40
7. Cyriax JH, Cyriax PJ. *Cyriax illustrated manual of orthopaedic medicine*. OM publications; 1993: 66-7
8. Basu S, |Bhatia D et al. Effectiveness of active release technique in the treatment of chronic lateral elbow pain. *International Research Journal of Human Resources and Social Sciences*. 2017, 4(5); 24-32
9. Gliedt JA et al. chiropractic treatment of lateral epicondylitis: a case report utilizing active release technique. *Journal of Chiropractic Medicine*. 2014; 13(2): 104-9
10. Van Rijn RM, Huistede BM et al. Associations between work related factors and specific disorders at the elbow: a systematic literature review. *Rheumatology (oxford)*. 2009; 48(5): 528-36
11. Joshi J, Kotwal P. *essentials of orthopaedics and applied physiotherapy*. 2nd edition. Saunders Elsevier; 2011.497-8

Neutrophil - Lymphocyte ratio as a predictive marker for Early Stage Diabetic Nephropathy

Raghavendar Reddy Gundepalli¹, Veeda Mohan Kumar²,
A. Raghuram Bhargavi³

^{1,2,3}Assistant Professor, Department of General Medicine, Mahavir Institute of Medical Sciences,
Shivareddy Pet, Vikarabad, Telangana.

How to cite this article: Raghavendar Reddy Gundepalli, Veeda Mohan Kumar, A. Raghuram Bhargavi et al. Neutrophil - Lymphocyte ratio as a predictive marker for Early Stage Diabetic Nephropathy. Volume 13 Issue 3 July-September 2022

Abstract

Background: Diabetic nephropathy is a diabetic microvascular complication. An increase in urine albumin excretion is the clinical manifestation. Total white blood cell count is a basic but sensitive measure of inflammation that has been evaluated as an inflammatory marker in a variety of cardiac and noncardiac ailments such as stroke, acute myocardial infarction, and heart failure.

Objective: To analyze Neutrophil-lymphocyte ratio as a predictive marker for early stage diabetic nephropathy.

Methods: The research enrolled 230 individuals, with 115 of them having type 2 diabetes and 69 having Early Stage DN. The control group consisted of 115 healthy volunteers of similar age and gender. All of the patients' samples were collected and tested for HBA1c, CBC, FBS, PPBS, RFT, Urine microalbumin, and Urine albumin creatinine ratio. The Mogensen DN diagnostic criteria and the American Diabetes Association was used

Results: This research had a total of 230 participants. Diabetic nephropathy patients and non-diabetic nephropathy patients were divided into two groups. NLR was shown to have a substantial relationship with neutrophil and lymphocyte counts. In the DN group, mean neutrophil counts increased while mean lymphocyte levels decreased, resulting in a substantially higher NLR value in the patient group than in the control group. The patient group's mean NLR values were considerably higher than the control group's (P 0001), and the NLR values of patients with early stage DN were significantly higher than those of patients without early stage DN (P 0001). The results reveal that DN was associated with NLR, Creatinine, and Insulin Resistance.

Conclusion: NLR might be used as a predictor and predictive risk factor for early-stage diabetic nephropathy. This test is affordable, routinely performed, and easy to compute. NLR can be a cost-effective alternative marker as a predictor of Diabetic Nephropathy in a setting with constrained laboratory resources.

Keywords: Diabetic nephropathy, Inflammation, Microvascular, Urine albumin

Introduction

India is the world's diabetes capital, with diabetes and prediabetes prevalence rates of 9% and 114%, respectively.¹ Indians have an aggressive clinical profile for type 2 diabetic mellitus (T2DM).² When

compared to Caucasians, Indians had approximately two decades earlier onset of T2DM, as well as the highest rates of prediabetes progression to T2DM (18% in Indians as compared to 2% in the USA, 6% in Finland, and 11 % in China).^{3,4}

Corresponding Author: Maddela Gopinath,

Associate Professor,

Department of General Medicine, Mahavir Institute of Medical Sciences, Shivareddy Pet, Vikarabad, Telangana.

Diabetes mellitus is a systemic disease with severe microvascular and macrovascular complications. Diabetic retinopathy, diabetic neuropathy, and diabetic nephropathy are examples of microvascular complications, whereas cardiovascular diseases, stroke, and peripheral vascular disorders are examples of macrovascular complications.⁵ Diabetic nephropathy (DN) causes serious complications in 25–40% of diabetic people and is the primary cause of end-stage renal failure.⁶ UMAER (urine microalbumin excretion rate) is a test that can be used to detect and track the course of DN.⁷

Inflammation plays a key role in the development and progression of DN, and a number of inflammatory cytokines (interleukin-1 (IL-1), interleukin-6 (IL-6), interleukin-8 (IL-18), tumour necrosis factor (TNF-), and others) are linked to the disease's aetiology.⁸ In the case of DM, the CD4/CD8 ratio decreases. During an inflammatory reaction, the rate of circulating leukocytes changes. Neutrophilia is often accompanied by lymphopenia.^{9,10} Neutrophil elevation, which indicates an acute state of inflammation, and lymphopenia, which occurs as a result of physiological stress, have lately been combined into one index.

The high prevalence of diabetes among Indians portends an exponential rise in diabetes-related end organ damage and morbidity over the next few decades. There is a pressing need for low-cost, easy-to-measure predictors of diabetes-related end-organ damage in Indians. This would aid in the implementation of preventative treatment aimed at these patients in order to enhance long-term clinical results.¹¹ NLR has recently been found as a novel inflammatory marker for evaluating cardiovascular disease severity and poor prognosis in the general population and in patients with ESRD.^{12,13}

However, we are aware of just a few research examining the predictive usefulness of NLR in DN. Based on this context, This study intends to evaluate the relationship between diabetic nephropathy and NLR, as well as whether NLR may be used as a predictive and precise indicator.

Material and Methods

This study was a Case Control Study conducted between January 2018 and June 2018 for a duration of 6 months in the Department of General Medicine of R.L.Jalappa Hospital and Research Centre, a tertiary

care hospital attached to Sri Devaraj Urs Medical College which caters to rural population of Kolar and neighborhood districts.

The study recruited 115 patients diagnosed with type 2 DM, 69 of whom have Early Stage DN. The control group was composed of 115 healthy age and sex matched subjects. A semi structured questionnaire which contains age, sex, smoking, family history, chronic diseases, risk factors, dietary compliance and used drugs of each participant was obtained by interviewing after obtaining written informed consent from the eligible subjects.

Inclusion Criteria

- Patients diagnosed with type 2 DM
- Adults > 18 years of age

Exclusion Criteria

- Myocardial infarction
- Coronary artery disease
- Heart failure
- Active infection
- Acute poisoning
- Cancer, AIDS, blood diseases that affect neutrophils and lymphocytes
- Diseases that affect urinary protein excretion
- Diseases that affect the renal blood flow

Controls: The control group was composed of healthy age and sex matched subjects.

Blood samples were drawn from all the patients and were subjected to CBC, HBA1c, FBS, PPBS, RFT, Urine micro albumin and Urine albumin creatinine ratio. The American Diabetes Association and the Mogensen DN diagnostic criteria state that DM patients with urinary albumin excretion ratios (UAE) reaching 20 µg/min to 200 µg/min or 30 mg/24 h to 300 mg/24 h more than twice in 6 months have early stage DN.

Statistical Analysis: SPSS statistical software version 24.0 was used for statistical calculations. The $P < 0.05$ was considered statistically significant.

Ethical considerations: Prior to the onset of the study, ethical approval was obtained from ethical committee of Mahavir Institute Of Medical Sciences. All the collected information was kept confidential, and it is being used for research purpose only.

Observation and Results

This research had a total of 230 patients. Diabetic nephropathy patients and non-diabetic nephropathy patients were divided into two groups.

Table 1. Distribution based on Demographic and laboratory data of the patient and control groups

Variable	DN group (n =115)	Control group (n =115)	p-value
Age (years)	52.21 ± 8.47	51.19 ± 10.73	0.34
Male	67 (58.2)	59 (51.3)	0.12
Female	48(42.8)	56 (48.7)	
BMI (kg/m ²)	25.13 ± 3.93	24.24 ± 3.41	0.069
UA (μmol/l)	304.61 ± 108.81	331.59 ± 81.93	0.083
Creatinine (μmol/l)	82.41 ± 19.67	73.91 ± 18.39	0.026*
TG (mmol/l)	2.30 ± 2.46	1.26 ± 0.69	0.004*
Total cholesterol (mmol/l)	5.80 ± 7.17	4.89 ± 0.92	0.232
HDL (mmol/l)	1.54 ± 0.73	1.41 ± 0.27	0.37
LDL (mmol/l)	3.01 ± 0.93	2.91 ± 0.78	0.41

In both the groups the mean age, gender, BMI, was nearly similar. Early Stage DN was found in 69 of the 115 patients with DM (60%). The patient group showed significantly higher creatinine and triglyceride (TG) values than the control group. No statistically significant differences in UA, TC, HDL, and LDL levels were detected between the patient and control groups.

Table 2: Comparison of Laboratory Parameters between and within the groups

Variables	Patients with diabetes			p- value
	With early stageDN (n = 69)	Without earlystage DN (n =46)	Control group(n = 115)	
WBCs (109/l)	6.74 ± 1.99	5.39 ± 1.56	6.61 ± 1.67	<0.001*
Neutrophils (109/l)	4.39 ± 1.51	3.81 ± 1.33	3.72 ± 1.27	<0.001*
Lymphocytes (109/l)	1.91 ± 0.85	1.81 ± 0.89	2.03 ± 0.47	0.023
Monocytes (109/l)	0.43 ± 0.12	0.46 ± 0.17	0.51 ± 0.19	0.028
Platelets (109/l)	195.31 ± 46.53	204.82 ± 52.87	211.32 ± 51.27	0.19
CRP (mg/l)	2.29 ± 1.03	1.74 ± 0.89	0.99 ± 0.81	<0.001*
NLR	2.51 ± 0.63	2.12 ± 0.68	1.73 ± 0.69	<0.001*

NLR was shown to have a substantial relationship with neutrophil and lymphocyte counts. In the DN group, mean neutrophil levels have increased while mean lymphocyte levels decreased, resulting in a substantially higher NLR value in the patient group than in the control. The patient group's mean NLR values were considerably higher than the control group's, and the NLR values of patients with early stage DN were significantly higher than those of patients without early stage DN (P<0001).

Table 3: Logistic regression analysis of factors independently associated with DN

Variables	P	EXP(B)	95% CI
NLR	0.002	2.081	1.267-3.441
Creatinine	<0.001	1.028	1.031-1.063
Total cholesterol	0.011	1.532	1.134-1.899
TG	0.387	0.953	0.809-1.079
SBP	0.017	1.087	1.039-1.142
DBP	0.157	1.021	0.959-1.123
Smoking	0.071	1.945	0.981-3.790
BMI	0.078	0.812	0.823-1.029
HbA1c	0.058	1.173	1.009-1.391
Insulin Resistance	<0.001	1.156	1.051-1.271

The risk variables were subjected to a logistic regression analysis. NLR, Creatinine, and Insulin Resistance were all associated with DN.

Discussion

The purpose of this study was to look at the independent link between NLR and DN. The NLR levels in diabetic patients with DN were substantially higher than in diabetic patients without DN and healthy controls. DN is a typical DM complication that comprises vascular and neuropathic complications. Many epidemiological studies have found that diabetes is associated to chronic inflammation, which can contribute to the development of angiopathy and nephropathy. The cause of DN, a common serious consequence in diabetic individuals, is unknown. DN has been associated with chronic inflammation in several studies.^{14,15,16} Insulin resistance, diabetes, and related microvascular and macrovascular complications are known to be influenced by inflammatory chemicals and endothelial dysfunction.¹⁷ In earlier Caucasian research, neutrophilia and relative lymphocytopenia were

found to be independent indicators of nephropathy, neuropathy, and retinopathy.^{18,19,20,21} However, there are no comparable data on the effectiveness of NLR in Indians with diabetes. NLR can be an economical and accurate predictor of the incidence of early stage diabetic nephropathy in Indians with T2DM.

The findings of this study corroborate with Huang et al., who observed that NLR was considerably higher in diabetics patients with signs of nephropathy.²²

NLR was considerably increased in individuals with higher albuminuria, showing a correlation between inflammation and endothelial dysfunction in diabetics with nephropathy, according to Akbas et al.²³ NLR has been associated to diabetic nephropathy and is also a predictor of end-stage renal disease, according to Afsar et al.²⁴ NLR was emphasised to be a predictive factor for a decrease in renal function in a three-year follow-up study of diabetic individuals.²⁵ NLR levels were also shown to be considerably greater in diabetic patients with nephropathy compared to diabetic patients without microvascular problems and healthy control participants, according to Moursy et al.²⁶ NLR was also shown to be associated with albuminuria in a study of Turkish patients.²⁷ Tsai et al. observed significant differences in total leucocyte, neutrophil, and monocyte counts between diabetics and healthy individuals. They also reported that in the presence of ischemic problems, NLR is much higher.²⁸ The NLR levels in diabetic patients were greater than those in healthy controls. Early stage DN was shown to be much more common in diabetes individuals with high NLR values than in diabetic patients with low NLR values.

Conclusion

According to the findings of this study, NLR may be used as a predictor and prognostic risk marker of early stage diabetic nephropathy. Further research is needed to develop substantial proof to be used more routinely in clinical settings. NLR is a simple and clear metric. This test is affordable and performed on a regular basis. In a setting with limited laboratory resources, NLR can be a low-cost, effective alternative marker for predicting diabetic nephropathy.

Acknowledgement

The authors are very thankful to all Staff and Postgraduates of the Department of General Medicine

who helped me during the course of this research study.

Ethical Clearance: The ethical clearance was taken from the Mahavir Institute Of Medical Sciences institutional ethics committee prior to the commencement of the study.

Funding: Self

Conflict of interest: Nil

References

1. Dutta D, Mukhopadhyay S. Intervening at prediabetes stage is critical to controlling the diabetes epidemic among Asian Indians. *Indian J Med Res* 2016;143:401-4.
2. Dutta D, Maisnam I, Shrivastava A, Sinha A, Ghosh S, Mukhopadhyay P, *et al.* Serum Vitamin-D predicts insulin resistance in individuals with prediabetes. *Indian J Med Res* 2013;138:853-60.
3. Dutta D, Mondal SA, Kumar M, Hasanoor Reza AH, Biswas D, Singh P, *et al.* Serum fetuin-A concentration predicts glycaemic outcomes in people with prediabetes: A prospective study from Eastern India. *Diabet Med* 2014;31:1594-9.
4. Dutta D, Choudhuri S, Mondal SA, Maisnam I, Reza AH, Ghosh S, *et al.* Tumor necrosis factor alpha - 238G/A (rs 361525) gene polymorphism predicts progression to type-2 diabetes in an Eastern Indian population with prediabetes. *Diabetes Res Clin Pract* 2013;99:e37-41.
5. Robert J Smith. Endocrine Disease and Metabolic Disease Sector X, Diabetes Mellitus, and Hypoglycemia sited in Cecil Essentials of Medicine 9th Edition :2016; 657- 675.
6. Ritz E, Rychlik I, Locatelli F, Halimi S. End-stage renal failure in type 2 diabetes: a medical catastrophe of worldwide dimensions. *Am J Kidney Dis* 1999; 34: 795-808.
7. Wang T, Wang Q, Wang Z, *et al.* Diagnostic value of the combined measurement of serum Hcy, serum Cys C, and urinary micro albumin in type 2 diabetes mellitus with early complicating diabetic nephropathy. *ISRN Endocrinol* 2013; 2013: 407452.
8. Lim AK, Tesch GH. Inflammation in diabetic nephropathy. *Mediators Inflamm* 2012;2012: 146- 54.
9. Jirkovska A, Fejfarova V, Hosova J, *et al.* Analysis of the inflammation reaction and selected indicators of immunity in patients with an infected diabetic ulcer. *Cas Lek Cesk* 2002; 141: 483-6.

10. Eibl N, Spatz M, Fischer GF, et al. Impaired primary immune response in type 1 diabetes: results from a controlled vaccination study. *Clin Immunol* 2002; 103: 249-5.
11. Argan O, Ural D, Kozdag G, Sahin T, Bozyel S, Aktas M, Karauzum K, Yilmaz I, Dervis E, Agir A: Associations Between Neutrophil Gelatinase Associated Lipocalin, Neutrophil-to Lymphocyte Ratio, Atrial Fibrillation and Renal Dysfunction in Chronic Heart Failure. *Med Sci Monit* 2016;22:4765-72.
12. Turkmen K, Ozcicek F, Ozcicek A, Akbas EM, Erdur FM, Tonbul HZ: The relationship between neutrophil-to-lymphocyte ratio and vascular calcification in end-stage renal disease patients. *Hemodial Int* 2014;18:47-53.
13. Ahbap E, Sakaci T, Kara E, Sahutoglu T, Koc Y, Basturk T, Sevinc M, Akgol C, Kayalar AO, Ucar ZA, Bayraktar F, Unsal A: Neutrophil-to-lymphocyte ratio and platelet-to-lymphocyte ratio in evaluation of inflammation in end-stage renal disease. *Clin Nephrol* 2016;85:199-208.
14. Diagnostic performance of electrocardiography in the assessment of significant coronary artery disease and its anatomical size in comparison with coronary angiography. *J Res Med Sci* 2011;16:750-5.
15. Rivero A, Mora C, Muros M, García J, Herrera H, Navarro-González JF. Pathogenic perspectives for the role of inflammation in diabetic nephropathy. *Clin Sci (Lond)* 2009;116:479-92.
16. Astrup AS, Tarnow L, Pietraszek L, Schalkwijk CG, Stehouwer CD, Parving HH, et al. Markers of endothelial dysfunction and inflammation in type 1 diabetic patients with or without diabetic nephropathy followed for 10 years: Association with mortality and decline of glomerular filtration rate. *Diabetes Care* 2008;31:1170-6.
17. Pitsavos C, Tampourlou M, Panagiotakos DB, Skoumas Y, Chrysohoou C, Nomikos T, et al. Association between low-grade systemic inflammation and type 2 diabetes mellitus among men and women from the ATTICA study. *Rev Diabet Stud* 2007;4:98-104.
18. Lim AK, Tesch GH. Inflammation in diabetic nephropathy. *Mediators Inflamm* 2012;2012:146154.
19. Núñez J, Núñez E, Bodí V, Sanchis J, Miñana G, Mainar L, et al. Usefulness of the neutrophil to lymphocyte ratio in predicting long-term mortality in ST segment elevation myocardial infarction. *Am J Cardiol* 2008;101:747-52.
20. Gibson PH, Croal BL, Cuthbertson BH, Small GR, Ifezulike AL, Gibson G, et al. Preoperative neutrophil-lymphocyte ratio and outcome from coronary artery bypass grafting. *Am Heart J* 2007;154:995-1002.
21. Ulu S, Bucak A, Ulu MS, Ahsen A, Duran A, Yucedag F, et al. Neutrophil-lymphocyte ratio as a new predictive and prognostic factor at the hearing loss of diabetic patients. *Eur Arch Otorhinolaryngol* 2014;271:2681-6.
22. Huang W, Huang J, Liu Q, Lin F, He Z, Zeng Z, et al. Neutrophil-lymphocyte ratio is a reliable predictive marker for early-stage diabetic nephropathy. *Clin Endocrinol (Oxf)* 2015;82:229-33.
23. Akbas EM, Demirtas L, Ozcicek A, Timuroglu A, Bakirci EM, Hamur H, et al. Association of epicardial adipose tissue, neutrophil-to-lymphocyte ratio and platelet-to-lymphocyte ratio with diabetic nephropathy. *Int J Clin Exp Med* 2014;7:1794-801.
24. Afsar B. The relationship between neutrophil lymphocyte ratio with urinary protein and albumin excretion in newly diagnosed patients with type 2 diabetes. *Am J Med Sci* 2014;347:217-20.
25. Azab B, Daoud J, Naeem FB, Nasr R, Ross J, Ghimire P, et al. Neutrophil-to-lymphocyte ratio as a predictor of worsening renal function in diabetic patients (3-year follow-up study). *Ren Fail* 2012;34:571-6.
26. Moursy EY, Megallaa MH, Mouftah RF, Ahmed SM. Relationship Between neutrophil-lymphocyte ratio and microvascular complications in Egyptian patients with type 2 diabetes. *Am J Intern Med* 2015;3:250-5.
27. Kahraman C, Kahraman NK, Aras B, Cosgun S, Gülcan E. The relationship between neutrophil-to-lymphocyte ratio and albuminuria in type 2 diabetic patients: A pilot study. *Arch Med Sci* 2016;12:571-5.
28. Tsai, J.C., Sheu, S.H., Chiu, H.C. et al. (2007) Association of peripheral total and differential leukocyte counts with metabolic syndrome and risk of ischemic cardiovascular diseases in patients with type 2 diabetes mellitus. *Diabetes/Metabolism Research and Reviews*, 23, 111-118.

Effects of Prolonged Use of Face Masks among Healthcare Workers Working in a Tertiary level Hospital in Kathmandu, Nepal

Rajesh Karki^{1,*}, Asmita Lamichhane², Aarati Timsina³

¹Assistant Professor, Department of Public Health, Yeti Health Science Academy, Kathmandu, Nepal

²Student, Post Basic Bachelor in Nursing, Yeti Health Science Academy, Kathmandu, Nepal

³Student, Bachelor in Public Health, Yeti Health Science Academy, Kathmandu, Nepal

How to cite this article: Rajesh Karki, Asmita Lamichhane, Aarati Timsina et al. Effects of Prolonged Use of Face Masks among Healthcare Workers Working in a Tertiary level Hospital in Kathmandu, Nepal. Volume 13 Issue 3 July-September 2022

Abstract

COVID-19 is a pandemic threat that affects every aspect of life on the planet. Hundreds of thousands of cases were diagnosed around the world in a short period of time. Health workers are critical to the health-care system and play a critical role during global pandemics. They are also a high-risk group that must wear a face mask for extended periods of time. The purpose of this study was to determine the effects of prolonged facemask use on healthcare workers. A descriptive cross-sectional study was conducted at Shahid Gangalal National Heart Centre, Kathmandu, Nepal. The information from 335 healthcare personnel was collected using a self-administered questionnaire technique. This study included all of the hospital's healthcare workers from various departments. The descriptive analysis was carried out using SPSS statistical software, version 26. Out of 355 respondents, the majority of responders (69.9%) were under 30 years old, with a mean age of 29.03 (\pm 4.7) years. Regarding the effects of wearing a face mask for a longer length of time, 99.70 % of the health workers experienced some sort of effect. The most prevalent effects were pain behind the ear (84.2%), difficult during exertion (71.0%), headache (57.6%), and the least common was alteration in sense of smell (15.2 %). According to the findings, almost all of the participants experienced some form of effect from wearing a face mask, hence necessary action by concerned authorities and participants is required to minimize these effects.

Keywords: Covid-19, Effects, Face mask, Healthcare worker

Introduction

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by the newly discovered severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)^[1]. It was first discovered in December 2019 in Wuhan, China, among patients with viral pneumonia symptoms. On March 11, 2020, the World Health Organization (WHO) declared the novel coronavirus outbreak a global pandemic. COVID-19 has resulted in a huge loss of human life around the world, and it poses an unprecedented threat to public health. Hundreds of thousands of cases were diagnosed

around the world in a short period of time. The pandemic has created severe economic and social disruption: tens of millions of people are at risk of falling into extreme poverty, which might rise to 132 million by the end of the year ^[2-4]. COVID-19's worsening status will be difficult for nations like Nepal, which have a fragile and under-equipped health infrastructure^[5]. Nepal, a South Asian country with a low health security index (111 out of 195 countries), is not safe from the COVID-19 threat ^[6], and on January 23, 2020, the country officially reported its first case^[7]. In the fight against the pandemic, healthcare workers (HCW) are on the

*Corresponding Author:

E-mail: karkirajesh2022@gmail.com

front lines. For the patients and families affected by this contagious disease, they are the only source of hope and cure. They've been posted in COVID-19 wards and laboratories to provide direct medical care to patients, putting their lives at risk. During the pandemic, several HCWs have been infected with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and have died^[8, 9]. Face masks are a type of personal protective equipment intended to keep respiratory diseases from spreading^[10]. Face masks have proven to be effective in safeguarding both HCWs and the general public by decreasing the spread of infection via airborne transmission^[11]. However, wearing masks for lengthy periods of time has a number of physiologic and psychological consequences, as well as the potential to reduce work efficiency. Physical side effects of long-term usage of N95 and surgical masks include headaches, trouble breathing, acne, skin breakdown, rashes, and reduced memory. It also obstructs eyesight, communication, and thermal balance^[12]. As a result, the main objective of this study is to determine the effects of prolonged face mask use among healthcare professionals in tertiary level hospital.

Materials and Methods

Study area and design

The study was conducted at the Shahid Gangalal National Heart Center in Bansbari, Kathmandu, which has been in operation since 1995. It is currently a tertiary-level hospital with 293 beds. The hospital is fully equipped and offers all of the necessary treatment options for cardiac patients. For this study, the researchers used a descriptive cross-sectional design.

Sample Size

This study includes a total of 335 healthcare workers from different departments, including medical officers, nurses, lab technicians, and radiographers.

Sampling Technique and Procedure

The HR department provided records of health care workers working at the concerned hospital. All health care professionals who gave consent and were present during the data collection period were included in this study.

Data collection: Tools and techniques

The data was collected from respondents using a self-administered questionnaire. The researcher created the questionnaire based on the existing literature^[12, 13]. Each respondent was provided with clear instructions prior to receiving the questionnaire. During the distribution and collection of the questionnaire, the researcher was personally involved. The data was collected between August 1st and September 30th, 2021.

Data Collection Procedure

Permission to collect data was acquired from the hospital prior to the start of the study. Ethical approval was provided by the Yeti Health Science Institutional Review Committee (YHSA-IRC) and the Shahid Gangalal National Heart Center Institutional Review Committee (IRC). The study's purpose was fully explained, and each respondent signed a consent form. On a daily basis, the obtained data was checked, reviewed, and organized to verify its accuracy and completeness. The data was coded and modified to eliminate omissions and duplicates.

Data Analysis

For descriptive analysis, frequency, percentage, mean, and standard deviation were determined. Cross-tabulation was used to quantify the relationship between socio-demographic factors, professional-relevant information, and the effects of wearing a mask for a long period of time. All of the analyses were carried out using SPSS statistical software, version 26.

Results

Professional Characteristics of the Respondents

A total of 335 health-care workers were enrolled in the study, with an average age of 29.03 (\pm 4.7) years. Respondents with more than 6 years of job experience were found to have the most (37.0%). The majority of healthcare employees who participated in this survey were nurses (78.8%), with more than half (57.0%) working in medical departments and the majority (76.4%) working 6–8 hours per day. In terms of mask types, number of masks used, and duration of mask use, more than half of the respondents (54.6%)

used both types of mask, i.e., surgical and N-95. The majority (79.7%) of respondents preferred to use two masks at a time, and wearing mask for 6-8 hours was the most common (62.1 %).

Physical Effects

Table 1 outlines the physical effects that health workers have experienced. The majority (84.2%) of the 372 respondents reported pain behind the ears, 71.0 percent reported difficulty breathing at work, and more than half (63.6%) reported general nose discomfort, followed by headache (57.6 percent). Only 15.2 percent of respondents reported a change in their sense of smell.

Table 1: Physical effects experienced by respondents.

Characteristics	Frequency	Percentage
Suffered from pain behind the ear	282	84.2
Feelings of difficulty in breathing during work	238	71.0
Feeling of generalized nasal discomfort	213	63.6
Having difficulty with communication	196	58.5
Headache	193	57.6
Excessive sweating around the mouth	160	47.8
Fogging of spectacles	157	46.9
Feelings of excessive fatigue	156	46.6
Altered sense of smell	51	15.2

*Multiple Response Answer

Dermatological Effects

Out of 335 respondents, over half (53.4%) of them had detected acne on their faces, 23.9 percent had noticed skin rashes on their faces, and 12.5 percent had noticed no dermatological changes (Table 2).

Table 2: Dermatological effects experienced by the respondents.

Characteristics	Frequency	Percentage
Feelings of itchiness on the face	159	47.5
Acne on the face	179	53.4
I noticed skin rashes	80	23.9
Facial redness	118	35.2
Experienced increased skin temperature around the mouth	92	27.5
None of above	42	12.5

*Multiple Response Answer

Physical effects based on selected socio-demographic and professional factors

From table 3, we can infer that the physical effects of prolonged use of a mask are highly prevalent according to socio-demographic and professional characteristics.

Table 3: Distribution of Physical Effects based on Selected Socio-demographic and Professional Characteristics.

Characteristics	Physical Effects	
	Yes	No
Gender		
Male	46 (100%)	0
Female	288 (99.7%)	1 (0.3%)
Working hours per day		
6-8 hours	255 (99.6%)	1 (0.4%)
More than 8 hours	79 (100%)	0
Used mask type		
Surgical	143 (99.3%)	1 (0.7%)
N-95	8 (100%)	0
Both	183 (100%)	0
Number of masked uses at a time		
1	51 (98.1%)	1 (1.9%)
2	267 (100%)	0
More than 2	16 (100%)	0
Total number of hours spent wearing the mask		
less than 8 hours	207 (99.5%)	1
More than 8 hours	127(100%)	0

Dermatological effects according to selected socio-demographic and professional-related information

Dermatological effects are more prevalent (89.6%) in females than in males (67.4%), whereas effects are almost similarly distributed according to working hours, mask types, number of masks used at a time and number of hours spent wearing a mask (Table 4).

Table 4: Distribution of Dermatological Effects based on Selected Socio-demographic and Professional Characteristics.

Characteristics	Dermatological Effects	
	Yes	No
Gender		
Male	31 (67.4%)	15 (32.6%)
Female	259 (89.6%)	30 (10.4%)
Working hours per day		

Conti..Table 4: Distribution of Dermatological Effects based on Selected Socio-demographic and Professional Characteristics.

Characteristics	Dermatological Effects	
	Yes	No
6-8 hours	224 (87.5%)	32 (12.5%)
More than 8 hours	66 (83.5%)	13 (16.5%)
Used mask type		
Surgical	125 (86.8%)	19 (13.2%)
N-95	7 (87.5%)	1 (12.5%)
Both	158 (86.3%)	25 (13.7%)
Number of masked uses at a time		
1	48 (92.3%)	4 (7.7%)
2	227 (85%)	40 (15%)
More than 2	15 (93.7)	1 (6.3%)
Total number of hours spent wearing the mask		
Less than 8 hours	178 (85.6%)	30 (14.4%)
More than 8 hours	112 (88.2%)	15 (11.8%)

Discussion

In the current study, 335 health workers participated, and 99.7% of them said they had experienced side effects from wearing facemasks for long periods of time. This results is similar to a research conducted in New York City, which found that 91.54 percent of health workers experienced side effects as a result of wearing a face mask for a longer length of time^[12]. A cross-sectional study of 250 healthcare workers conducted at SRM Medical College Hospital and Research Institute in Chennai found that 67.6% developed excessive sweating around the mouth, 58.2% had difficulty breathing on exertion when wearing a mask, 48.8% had general discomfort in the nose, 45.2 percent had pain behind the ears, 35.3 percent had dry mouth, 30.3 percent had dry mouth, and 26.1 percent had dry mouth, and only a small percentage of healthcare workers had symptoms of impaired sense of smell (7.2%)^[13]. Similarly, a research in Italy found that 55% of people have nasal dryness, 50% have nasal blockage, and 39% have headaches^[14]. Another study conducted in Portugal found communication discomfort (40.9%), headache (19.4%), and dyspnea (14.4%) as a result of prolonged use of a facemask^[15]. This percentage is lower than what we found in our research.

In our study, 87.46% (293/335) of the respondents said they had dermatological problems. This percentage was higher than the (46.1%) recorded in a Chinese prospective cross-sectional survey of 567 HCWs. Similarly, the most prevalent adverse skin reactions were acne (69.0%), rash (60.5%), and itching (55.2%), according to the same study^[16]. Another study found that 35.5 percent of people in Singapore experienced significant skin reactions as a result of wearing masks during the severe acute respiratory syndrome pandemic, with acne (59.6%), itching (51.4%), and rash being the most prevalent (35.8 %)^[17]. In our study, acne (53.4%) and itchiness (47.5%) were the most common symptoms of dermatological effects, followed by redness on the face (35.2%) and an increase in skin temperature (27.5%).

Conclusion

According to this study, almost all health professionals had various negative effects from prolonged mask wear during the COVID-19 epidemic. A health professional is a vital resource in the fight against the pandemic. Working with a mask for longer periods of time is not always a choice, but rather a necessity, and this necessity must be carefully monitored and managed by the concerned authorities to minimize negative effects. A study like this could also be valuable in raising awareness among health providers so that they can take the necessary steps to avoid negative consequences.

Ethical Approval

Ethical approval was obtained from the Institutional Review Committee of Yhealth Health Science Academy and Shaid Gangalal National Heart Center.

Conflict of Interest

The authors declare that they have no conflicts of interest

Source of funding

None

References

1. Panthee B, Dhungana S, Panthee N, et al. COVID-19: the current situation in Nepal. *New microbes and new infections*. 2020;37:100737.
2. Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta Bio Medica: Atenei Parmensis*. 2020;91(1):157.
3. World Health Organization. Impact of COVID-19 on people's livelihoods, their health and our food systems. 2020, October 13 [Available from: <https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems>].
4. Feldman M, Lacey Krylova V, Farrow P, et al. Community health worker knowledge, attitudes and practices towards COVID-19: Learnings from an online cross-sectional survey using a digital health platform, UpSCALE, in Mozambique. *PloS one*. 2021;16(2):e0244924.
5. Dhakal S, Karki S. Early epidemiological features of COVID-19 in Nepal and public health response. *Frontiers in medicine*. 2020:524.
6. Khanal P, Paudel K, Devkota N, et al. Corona virus fear among health workers during the early phase of pandemic response in Nepal: A web-based cross-sectional study. *PLOS Global Public Health*. 2021;1(12):e0000083.
7. Pun SB, Mandal S, Bhandari L, et al. Understanding COVID-19 in Nepal. *Journal of Nepal Health Research Council*. 2020;18(1):126-7.
8. Erdem H, Lucey DR. Healthcare worker infections and deaths due to COVID-19: a survey from 37 nations and a call for WHO to post national data on their website. *International Journal of Infectious Diseases*. 2021;102:239-41.
9. Shrestha RM, Kunwar AR. COVID-19 impact on doctors and health workers. *Orthodontic Journal of Nepal*. 2020;10(2):2-5.
10. Liu X, Zhang S. COVID-19: Face masks and human-to-human transmission. *Influenza and other respiratory viruses*. 2020;14(4):472.
11. Liao M, Liu H, Wang X, et al. A technical review of face mask wearing in preventing respiratory COVID-19 transmission. *Current Opinion in Colloid & Interface Science*. 2021;52:101417.
12. Rosner E. Adverse effects of prolonged mask use among healthcare professionals during COVID-19. *J Infect Dis Epidemiol*. 2020;6(3):130.
13. Purushothaman P, Priyanga E, Vaidhyswaran R. Effects of prolonged use of facemask on healthcare workers in tertiary care hospital during COVID-19 pandemic. *Indian Journal of Otolaryngology and Head & Neck Surgery*. 2021;73(1):59-65.
14. Monini S, Meliante PG, Salerno G, et al. The impact of surgical masks on the nasal function in the COVID-19 era. *Acta Oto-Laryngologica*. 2021;141(10):941-7.
15. Peres D, Monteiro J, Boléo-Tomé J. Medical masks' and respirators' pattern of use, adverse effects and errors among Portuguese health care professionals during the COVID-19 pandemic: A cross-sectional study. *American Journal of Infection Control*. 2021.
16. Wan X, Lu Q, Sun D, et al. Skin barrier damage due to prolonged mask use among healthcare workers and the general population during the COVID-19 pandemic: a prospective cross-sectional survey in China. *Dermatology*. 2022;238(2):1-8.
17. Foo CCI, Goon ATJ, Leow YH, et al. Adverse skin reactions to personal protective equipment against severe acute respiratory syndrome—a descriptive study in Singapore. *Contact dermatitis*. 2006;55(5):291-4.

Recurrence Rate after Marginal Excision of Lipomas

Ramesh Chhaganbhai Badhiya¹, R. M Jitia², Dr.Haresh B. Vala³

¹⁻³Assistant Professor, Department of Surgery, Shantabaa Medical College & General Hospital Amreli, Gujarat

How to cite this article: Ramesh Chhaganbhai Badhiya, R. M Jitia, Haresh B. Vala et al. Recurrence Rate after Marginal Excision of Lipomas. Volume 13 Issue 3 July-September 2022

Abstract

Background and Aim: Lipoma is a benign tumor composed of mature adipocytes. This study was performed on patients with histologically diagnosed and confirmed lipomas to evaluate clinical outcome after marginal excision of the tumors and to determine whether local recurrence had any correlation with patient age and sex, or tumor size and location.

Materials & Methods: The present is the retrospective analysis that examined the 100 patients diagnosed with lipomas. The tumor in all the patients was found to be deeply seated and ultrasounded guided biopsy was performed preoperatively. The margins of soft tissue resections of the tumor specimens were defined as (1) intralesional, (2) marginal and (3) wide. The margins were marginal in all cases; none of the patients had any treatment other than surgery.

Results: It was found that Lipomas had an equal predilection for upper and lower extremities. The results of the study showed that none of the patients had any local recurrence. No patient had experienced metastasis at the time of this study. Local recurrence did not correlate with patient age or sex for patients with lipomas, neither with size or location of the tumors.

Conclusion: The present study shows that histological analysis provides for accurate diagnosis of lipomas. The recurrences rate in the patients with tumor was not found in any of the above patients where marginal excision was planned. There was no relationship seen in patient age, sex, size and location of the tumor. However to overcome the limitation of the study, the long term follow up is recommended for the further studies.

Keywords: Lipoma, Excision, Recurrence, Metastasis

Introduction

Lipoma is a benign tumor composed of mature adipocytes. The tumor often presents as a painless soft tissue mass occurring with a peak incidence at age 40–60 years. Although most lipomas originate from subcutaneous fat, some are located under the fascia and are called deepseated lipomas. Lipomas are the most common soft-tissue tumor.¹ These slow-growing, benign fatty tumors form soft, lobulated masses enclosed by a thin, fibrous capsule. Although

it has been hypothesized that lipomas may rarely undergo sarcomatous change, this event has never been convincingly documented. It is more probable that lipomas are at the benign end of the spectrum of tumors, which, at the malignant end, include liposarcomas.^{2,3}

Well into the 1970s, the term “well-differentiated liposarcomas” was used to describe a class of adipocytic soft tissue tumours with local aggressive behavior but typically without metastatic spread.

Corresponding Author : Ramesh Chhaganbhai Badhiya

Shantabaa Medical College & General Hospital Amreli, Gujarat

Email address: researchguide86@gmail.com

Mobile number: 9427350988

Based on this particular behavior, they have been renamed as “atypical lipomatous tumours (ALT)” or “atypical lipomas”.^{4,5} ALTs are with a frequency of 40–45% the most common adipocytic tumours, often seen after the fifth decade of life with a slight male predominance. Growing slowly this may result in comparatively large tumours. Lipomas usually present as solitary, slowgrowing, and painless tumors in the trunk or extremities in adults. Lipomas usually are well-circumscribed, lobulated lesions composed of adipose tissue often separated from surrounding adipose tissue by a thin fibrous capsule.⁶

Lipomatous tumors represent the most common soft tissue tumors. The biological spectrum ranges from benign lipomas to high-grade liposarcomas of variable histology. The fact that well-differentiated liposarcomas (WDL) show no potential for metastasis unless they undergo dedifferentiation led to the introduction of terms such as atypical lipoma, particularly for lesions arising at surgically amenable locations in the limbs and on the trunk because at these sites, wide excision usually is curative and hence the designation “sarcoma” is not warranted.⁷ ⁸ Therefore, to address these conflicting reports, this study was performed on patients with Histologically diagnosed and confirmed lipomas to evaluate clinical outcome after marginal excision of the tumors and to determine whether local recurrence had any correlation with patient age and sex, or tumor size and location.

Materials & Methods

The present is the retrospective analysis that examined the 100 patients diagnosed with lipomas and treated at the medical institute and associated hospital. The included patients were informed about the study and the informed consent was obtained prior to the inclusion in the study. There were 60 males and 40 females. The age ranges of the patients included in the study were from 30 – 75 years, with mean age to be around 54 years. The study procedure was informed to the ethical committee and the ethical clearance certificate was obtained prior to the start of the study. None of the patients were lost on follow up.

The tumor in all the patients was found to be deeply seated and ultrasounded guided biopsy was performed preoperatively. The margins of soft tissue resections of the tumor specimens were defined as (1) intralesional, (2) marginal and (3) wide. The margins

were marginal in all cases; none of the patients had any treatment other than surgery.

In respect to the local recurrence and the metastasis the outcome of the patient was evaluated. The study was aim further to check any relation with age, sex, size and location of tumor. Statistical analysis was performed using chi-square test. The t test was used to evaluate the relationship of tumor lipoma with patient age and tumor size, and the relationship of local recurrence with patient age and tumor size. The chi-square test was used to evaluate the relationship of the type of tumor Lipoma with patient sex, tumor location, and local recurrence, and the relationship of local recurrence with patient sex and tumor location. Analyses were performed using SPSS software for Windows version 22.0

Result

The present study was performed on patients with histologically diagnosed lipomas to evaluate clinical outcome after marginal excision of the tumors and to determine whether local recurrence had any correlation with patient age and sex, or tumor size and location. The present study consist of 100 patients who were diagnosed with lipomas were included in the study. Of the total included patients in the study there were 60 men and 40 women. The sex related difference was not found to be statistically significant. Mean age of patients with lipomas was found to be 53 years. The age range was found to be from 30 to 75 years.

In general the mean maximum diameter of lipomas was analysed to be 11.5 cm. It was found that Lipomas had an equal predilection for upper and lower extremities. The results of the study showed that none of the patients had any local recurrence. No patient had experienced metastasis at the time of this study. Local recurrence did not correlate with patient age or sex for patients with lipomas, neither with size or location of the tumors.

Discussion

The present study design is retrospective with its inherent limitations. However, well controlled retrospective studies are useful to evaluate a treatment approach. In this study, all of the patients had preoperative biopsy followed by marginal surgical resection and postoperative histologic

analysis of their tumors. For the purpose of the study, the histology of the tissue specimens was reviewed again and a consensus with postoperative histologic analysis was confirmed. Therefore, in this setting, the current authors believe the analysis and results are valid.

Second, the length of follow-up of the study is relatively short. To obtain useful results, all patients with deep-seated lipomas of the extremities with a minimum follow-up of 12 months and complete imaging and histological data were included in the study. However, given the relatively short follow-up, the results should be regarded with caution as it is possible that the results of this series underestimates the true rate of local recurrence of Lipomas, which likely will increase over time.

Patients may choose to ignore symptoms of recurrence after the follow-up period. Although this may be the case for a proportion of patients in the lipoma group these latter patients were informed of having had removed a mild form of cancer, so any signs of recurrence would most likely guide them to contact the hospital.^{9,10}

The differential diagnosis of lipomas can be problematic because of overlapping demographic, imaging, and histologic features. Increased patient age, tumor size, and deep location have been suggested as indicators of lipomas. Lipomas often show thin areas of linear enhancement.⁷ Only 2 previous studies evaluated the outcome of patients with cytogenetically confirmed Lipomas. Using immunohistochemistry, reverse transcriptase polymerase chain reaction, or FISH, lipomas are characterized by rearrangements of the chromatin remodeling gene HMGA2 on chromosome 12q15. The current authors concur with these reports and recommend molecular cytogenetic analysis for the differential diagnosis of lipomas to obtain a tissue diagnosis before surgical intervention.¹¹

However, it is possible that the true recurrence rate of lipoma may be lower and that these studies likely misclassified many patients as having lipomas. The optimal treatment and follow-up protocol for lipomas has been unclear. Although marginal excision has been a standard practice for lipomas, is controversial, some surgeons suggest a marginal excision whereas others recommend a wide resection. Kooby et al reported a higher risk of local recurrence after marginal excision of Lipoma.¹²⁻¹⁴

In contrast, Sommerville et al¹⁵ reported a local recurrence rate of 8% after marginal excision of lipoma, and Bassett et al¹⁶ also recommended a marginal excision for lipoma because of a low risk for local recurrence. However, these studies are limited by the lack of molecular analysis for accurate diagnosis of lipomatous tumors. In the current study, the authors acknowledge that obtaining a tissue diagnosis before surgical intervention is ideal. Although histology remains the cornerstone for the diagnosis of lipomatous tumors, complementary molecular cytogenetic analysis enhances the results obtained with histologic analysis, aiming to diagnose a lipoma correctly before surgery to predict the outcome and risk of local recurrence of deep-seated lipomatous tumors. In addition, conservative surgery is preferable for lipomas. Although a marginal surgical dissection extends into or through the reactive zone of the tumor that possibly is microscopically positive, the current authors perform marginal excision because of the benign and low-grade malignant behaviour of the respective tumors, and the awareness that a wide resection is associated with increased morbidity compared with re-excision of an eventual local recurrence.

Conclusions

The present study shows that histological analysis provides for accurate diagnosis of lipomas. The recurrences rate in the patients with tumor was not found in any of the above patients where marginal excision was planned. There was no relationship seen in patient age, sex, size and location of the tumor. However to overcome the limitation of the study, the long term follow up is recommended for the further studies.

References

1. Charifa A, Azmat CE, Badri T: Lipoma pathology. 2018.
2. Patel S, Metgud R: Estimation of salivary lactate dehydrogenase in oral leukoplakia and oral squamous cell carcinoma: a biochemical study. *Journal of cancer research and therapeutics* 2015, 11:119.
3. Metgud R, Khajuria N, Patel S, Lerra S: Nuclear anomalies in exfoliated buccal epithelial cells of petrol station attendants in Udaipur, Rajasthan. *Journal of cancer research and therapeutics* 2015, 11:868.
4. Rauh J, Klein A, Baur-Melnyk A, Knösel T, Lindner L, Roeder F, Jansson V, Dürr HR: The role of surgical margins

- in atypical Lipomatous Tumours of the extremities. *BMC Musculoskeletal Disorders* 2018, 19:1-7.
5. Skubitz KM, D'Adamo DR: *Sarcoma*. Mayo Clinic Proceedings: Elsevier, 2007. pp. 1409-32.
 6. Gupta P, Potti TA, Wuertzer SD, Lenchik L, Pacholke DA: Spectrum of fat-containing soft-tissue masses at MR imaging: the common, the uncommon, the characteristic, and the sometimes confusing. *Radiographics* 2016, 36:753-66.
 7. Errani C, Cocchi S, Ali N, Chehrassan M, Righi A, Gambarotti M, Mavrogenis AF, Vanel D, Donati D: Recurrence after marginal excision for atypical lipomatous tumors versus lipomas of the extremities. *Orthopedics* 2016, 39:e610-e4.
 8. Metgud R, Naik S, Patel S: Spindle cell lesions: A review on immunohistochemical markers. *Journal of Cancer Research and Therapeutics* 2017, 13:412.
 9. Presman B, Jauffred SF, Kornø MR, Petersen MM: Low recurrence rate and risk of distant metastases following marginal surgery of intramuscular lipoma and atypical lipomatous tumors of the extremities and trunk wall. *Medical Principles and Practice* 2020, 29:203-10.
 10. Campanacci M: *Bone and soft tissue tumors: clinical features, imaging, pathology and treatment*: Springer Science & Business Media, 2013.
 11. Peterson JJ, Kransdorf MJ, Bancroft LW, O'connor MI: Malignant fatty tumors: classification, clinical course, imaging appearance and treatment. *Skeletal radiology* 2003, 32:493-503.
 12. McTighe S, Chernev I: Intramuscular lipoma: a review of the literature. *Orthopedic reviews* 2014, 6.
 13. Stojanov IJ, Mariño-Enriquez A, Bahri N, Jo VY, Woo S-B: Lipomas of the oral cavity: utility of MDM2 and CDK4 in avoiding overdiagnosis as atypical lipomatous tumor. *Head and Neck Pathology* 2019, 13:169-76.
 14. Kooby DA, Antonescu CR, Brennan MF, Singer S: Atypical lipomatous tumor/well-differentiated liposarcoma of the extremity and trunk wall: importance of histological subtype with treatment recommendations. *Annals of surgical oncology* 2004, 11:78-84.
 15. Sommerville SM, Patton JT, Luscombe JC, Mangham DC, Grimer RJ: Clinical outcomes of deep atypical lipomas (well-differentiated lipoma-like liposarcomas) of the extremities. *ANZ journal of surgery* 2005, 75:803-6.
 16. Bassett MD, Schuetze SM, Distèche C, Norwood TH, Swisshelm K, Chen X, Bruckner J, Conrad III EU, Rubin BP: Deep-seated, well differentiated lipomatous tumors of the chest wall and extremities: The role of cytogenetics in classification and prognostication. *Cancer* 2005, 103:409-16.

Beyond the Pandemic: Masking-Behaviour, Practices, Skin problems and Attitude among Healthcare workers and Medical students of South India

Reshmi Subramaniam¹, Kavitha K¹, Neetha L², C. Raghuveer², Jisharaj V R³

¹Assistant Professor, Department of Dermatology, Venereology and Leprosy, Sree Uthradom Thirunal Academy of Medical Sciences, Trivandrum, India

¹Associate Professor, Department of Dermatology, Venereology and Leprosy, Sree Uthradom Thirunal Academy of Medical Sciences, Trivandrum, India

²Senior Resident, Department of Dermatology, Venereology and Leprosy, Sree Uthradom Thirunal Academy of Medical Sciences, Trivandrum, India

²Associate Professor, Department of Dermatology, Venereology and Leprosy, Vijayanagara Institute of Medical Sciences, Ballari, India

³Biostatistician, Department of Preventive Medicine, Sree Uthradom, Thirunal Academy of Medical Sciences, Trivandrum, India

How to cite this article: Reshmi Subramaniam, Kavitha K, Neetha L, C. Raghuveer, Jisharaj V R et al. Beyond the Pandemic: Masking-Behaviour, Practices, Skin problems and Attitude among Healthcare workers and Medical students of South India. Volume 13 Issue 3 July-September 2022

Abstract

Background

Mask-related dermatoses among health-care workers can impact their quality of life, work and the safety afforded by the mask. Hence their prompt recognition and remedial measures assume importance during the pandemic.

To collect data about-types of masks used, facial skin problems encountered and factors involved, skin care practices followed and attitude to mask-wearing among medical students and healthcare workers of South India, a cross-sectional survey was conducted using an online structured questionnaire filled by the respondents after informed consent. Data was analysed using appropriate statistical tests.

Results and Conclusion

Of the 576 respondents, majority used unscientific combinations of masks. Most common mask-related dermatosis was new-onset acne. Female gender, younger age, oily skin and longer hours of mask-wearing were predisposing factors. Improper care of skin and mask and reluctance to seek medical advice was observed. Majority had a positive attitude to wearing mask during the pandemic and found several other benefits to mask-wearing.

Information about scientific mask-wearing practices and common mask-related skin problems must be disseminated among the medical fraternity and remedial measures offered. A general positive attitude to mask-wearing gives assurance of adherence to mask wearing even during the trough phase of pandemic.

Keywords: maskne, mask-related dermatosis, mask-related skin problems, masking behaviour, Covid-19

Introduction

The Covid-19 pandemic, first reported from Hubei Province of China in December 2019 has been raging

since, all over the world, in the form of incessant waves and variants. We have fought and won many a battle against this contagion. At the time of writing this article, 65% of world population has received at

least one dose of anti-covid vaccination.¹Nevertheless, masking is and always has been our first and most reliable line of defence against infection and emerging variants, especially among health-care workers and frontline covid warriors, apart from social distancing and hand hygiene.

Masks prevent COVID-19 transmission by effectively filtering droplets containing virus particles and also deter smearing of infected hands over mouth and nose. The flow resistance of mask limits the spread of viruses in the room.² The type of mask preferred and duration of mask use vary among individuals and so do the skin problems associated with their routine use. Health care workers (covid warriors or those serving patients in the out-patient department) and medical students formed the basis of our study. In this study we attempted to assess the masking behaviour pattern among health care workers and students, the skin problems faced by them, skin care practices adopted and their attitude to the prospect of mask-wearing during the pandemic and beyond. Skin problems, apart from affecting the quality of life and work, may cause one to frequently touch face or nose thereby predisposing to covid transmission, especially among those working in hospital setting. Hence prompt recognition of skin problems and remedy along with prevention strategies help in reinforcing the protective effect of masks.

Aims and Objectives

1. To find out about the types of masks preferred by health care workers and students
2. To assess the frequency and type of mask-related skin problems and attempt to observe the factors associated with the same
3. To find out about the skin care practices followed in relation to mask usage
4. To assess the attitude of medical students and health care workers to the prospect of using mask for the rest of the pandemic and beyond.

Study Design

After informed consent, a cross-sectional survey among medical students and health care workers was conducted online using an online structured questionnaire prepared in Google forms after reviewing previously done studies. A structured questionnaire of 17 questions was asked with varying

number of answer options and a few questions with more than one response possible. An explanatory description about the purpose of study and assurance of anonymity of response was given and consent sought before proceeding to survey page. Background demographic details obtained included age, sex and role in health care setting (whether student or health care worker) and type of skin-oily/dry or sensitive type. Specific questions related to mask usage included type of mask used, skin problems faced with mask usage, basic skin care regimen followed and attitude to mask-wearing in the future. The data was recorded in Microsoft Excel and analysed using statistical product and service solutions (SPSS) Version 23.0 for Windows.

Results

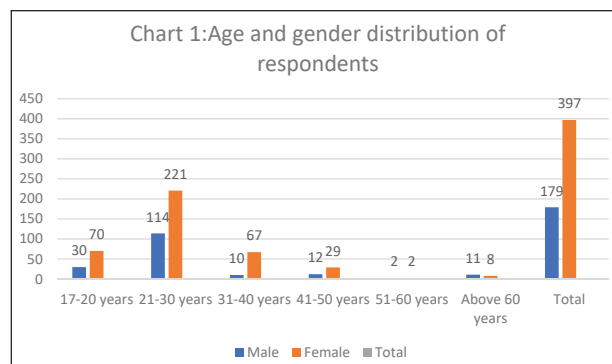
Demographic profile (Chart 1)

Of the total 576 respondents, 397 (69%) were female with female to male preponderance of 2.2. About 58 percent (335) of all respondents were students and rest (241, 42%) were healthcare workers.

Females comprised 67 percent and 71 percent of respondents among medical students and healthcare workers respectively.

Majority (335, 58%) of respondents belonged to age-group of 21- 30 years followed by 100 (17%) among 17-20 years age-group. Seventy-seven (13%) respondents belonged to the age-group of 31-40 years.

Of the 335 medical students, 70% (235) belonged to age group of 21-30 years and the rest were between 17-20 years of age.

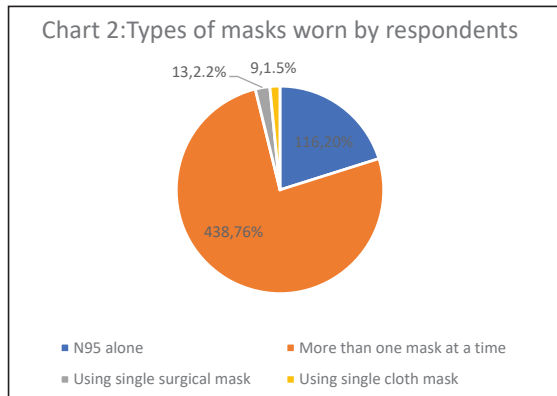


Facial skin type of respondents

Majority (48%) reported having facial skin that was oily in forehead and nose only. Thirty two percent

reported oiliness of face in all areas .Others (18.5%,1%) had dry skin and sensitive skin respectively.

Type of mask used by respondents (Chart 2)



Of the total 576 respondents,376(65%) respondents used N95 mask,of which 116 (32%,n=376) used single N95 mask and the rest (260,68%) used it in combination with other masks like surgical mask or cotton mask.A combination of cloth and surgical mask was used by 22%(126) while Double surgical mask was used by 52(9%).Thus,taken together 76 percent (438) used more than one type of mask(N95,cloth or surgical) or 2 pieces of the same type of mask at a time. Eighty-three(14.4%,n=576) respondents used cloth mask outside with surgical mask inside while 43(7.4%,n=576) respondents wore cloth mask inside with surgical mask outside.

While N95 mask was used by 81% of HCW,it was used by only 54% of students.A significantly large percentage (43%) of students used ‘Double mask’ of cloth and surgical mask compared to only 14% of HCW. It was thus found that medical students were more likely to use non-N95 mask as compared to health care workers(p value<0.05).

Number of hours/day of mask use by respondents

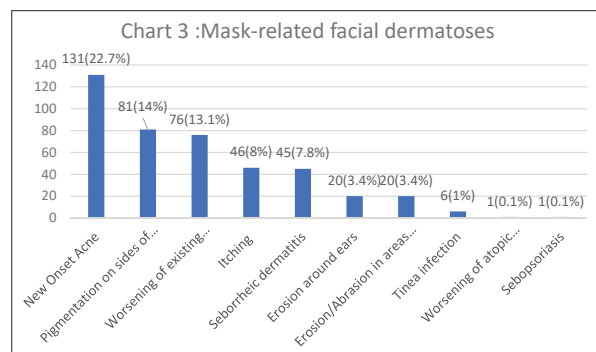
About 49% of respondents used mask for about 3-6 hours a day, while (42%) used mask for 6-12 hours a day.4.8% and 4% respectively worked more than 12 hours/day and less than 3 hours/day respectively.

Mask-related dermatoses among respondents (Chart 3)

Total prevalence of mask-related dermatoses was 44%(254,n=576) ,of which,81%(207,n=254) constituted acne. Thus, the total prevalence of acne was found to

be 35.4%. Majority of acne(63%,n=207) was new-onset acne and seen in 131 respondents.It was found that the female gender,age less than 30 years,having facial skin which was oily in all areas and mask use more than 6 hours a day were factors associated with new-onset acne or worsening of existing acne following mask use(p<0.05).It was not found to be related to the type of mask used.

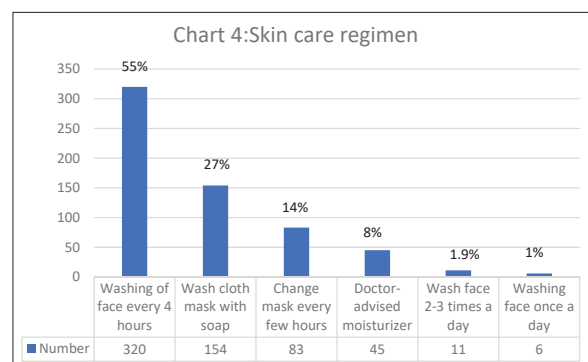
Erythema/Pigmentation on sides of nose seen in 81(14%) was not found to be related to any one mask type. Discomfort of face like increased facial seborrhea and and increased sweating of face were seen in 26%(152) and 206 (35.8%) respectively.



Two hundred and eight respondents (36.1%) did not experience any mask-related facial dermatoses.

Of all the respondents having mask-related dermatosis, 143(56.2%, n=254) respondents had more than one concern. Twenty six (10.2%,n=254) had to change the type of mask for relief from skin problems.

Skin care regimen (Chart 4)



About 55%(320,n=576) respondents reported washing the face every 4 hours while 14% (83) changed mask every few hours. About 27% (154) reported washing their mask with soap and water. Of this,about 14% of N95 mask users used to wash their mask with soap and water.Nine respondents washed

their surgical masks. Of the total 207 respondents who used cloth mask in some way, only 92 (44.4%) respondents were washing them regularly. Twenty three respondents (4%) did not follow any special skin care regimen.

About 25 acne sufferers (12%, n=207) took oral/topical medication while 12 (6%) resorted to homemade remedies like turmeric and lemon.

Hundred and six (18%) respondents followed more than one of the above measures.

Positive aspects of mask wearing

About 77% (442) found at least one positive aspect. About 45% (261) observed reduced frequency of bronchial and nasal allergies. About 21% (122) felt more confident wearing mask than without it. About 16% (93) of respondents reported positive aspects like concealment of acne, unwanted hair growth on face (12%, 69), lessened worry about stained teeth or bad breath (14%, 81). Others reported matching fashion (3%), reduced need for sunscreen (9%), make-up (9%) and sun protection. About 28% respondents (164, n=576) did not find any positive aspect in mask-wearing other than protection from Covid-19.

Attitude to Mask Wearing

About 65% of our respondents did not mind or were happy to wear mask during the rest of the pandemic while 35% were totally averse to the prospect.

About comparable percentages among medical students and health care workers were "totally averse to" (36% vs 32%) and "were happy to/Did not mind" (64% vs 67%) wearing mask during the pandemic, respectively.

Similar percentages (63-69%) of all types of mask users (N95, Double mask and cloth mask users) did not mind/were happy to wear mask during the pandemic.

Attitude to mask-wearing beyond the pandemic

Fifty-eight respondents (10%) were happy to wear mask regularly even after the pandemic.

A comparable percentage of medical students and HCW (8.3%, 12.4% respectively) were happy to wear mask even after the pandemic.

Discussion

The highly transmissible nature of the Covid-19 infection via the respiratory route had resulted in a legal requirement for all to wear masks in all public spaces in India. This practice assumes a lot of importance in protecting healthcare workers in the hospital setting so as to prevent paralysis of healthcare delivery and to ensure uninterrupted care to Covid and non-Covid patients alike. With the return of students to medical schools, they were included in our study along with health care workers, as very few studies of the impact of mask-wearing on medical students was possible as Covid-19 had caused online shift of classes.

A female preponderance among respondents in our study is similar to that in other online survey studies.^{3,4,5} Seventy five percent of our respondents were aged less than 30 years.

Being a health-care setting, N95 mask was the most common mask used, although more among health care workers as compared to students. However, in more than two-thirds of users, it was being incorrectly coupled with other masks like cloth or surgical mask. This practice was often to improve comfort (when used with cloth mask underneath). Since N95 masks are generally used more than once, the general perception is that combining with one-time use surgical mask or added layer of cloth mask improved protection and fit. Very often the malodour from the inside of a N95 mask being reused, is countered by adding another layer of mask underneath. However, Centers for Disease Control (CDC) clearly advises against this practice of combining N95 mask with any other.⁶

Another one-third of our respondents followed CDC recommended 'Double-masking' or 'layering'.⁷ This involves wearing a cloth mask outside a surgical mask/medical procedure mask to improve fit and filtration. It was found that only 160 respondents (27%) were using mask (N95 mask or layered mask) in a CDC recommended manner.

Multiple layers of masks being used, in our hot humid tropical climate setting, caused mask related facial dermatoses like acne, seborrheic dermatitis etc. Mask is known to exacerbate acne by increasing the temperature, raising the pH, sebum dysregulation, Cutibacterium acnes multiplication, innate immune response and increasing sweating; swelling of epidermal keratinocytes and pilosebaceous follicle

obstruction ensues.^{8,9,10,11} Prevalence of acne in our study was lesser compared to other similar online surveys.^{4,12,13,14}

Predisposing factors for maskne were found to be- female gender, age less than 30 years, oily skin and long hours of mask usage as in other studies.^{5,15} Added to this the tendency to reuse masks without washing can cause a similar outcome⁵. The association between N95 mask/surgical mask and maskne seen in other studies was not seen in our study.^{5,12,16} Frequent cleaning of face, as practised by many of our respondents is not recommended as it causes excessive peeling and rebound acne due to hypersecretion of sebum¹⁴. Thus, in spite of increased oiliness/seborrhoea it is recommended to use an antibacterial cleanser with pH between ⁵⁻⁷ and not more than twice a day.¹³

Our setting being a tropical hot and humid climatic region, mask-associated increased facial seborrhoea was a menacing problem. About 2/3rd of these respondents had/developed some form of acne. Other facial skin dermatoses/issues were seborrheic dermatitis, itching, erosion around ears/nose clips, Tinea infection as seen in other studies.^{17,18,19,20,21} In our study, facial skin problems did not constitute a pressing reason to change the type of mask.

Only 12% of acne-sufferers sought medical help. Low grade of acne, lack of painful/pustular lesions, ability to mask the acne and blemishes by use of face mask itself, lock-downs, the stress of pandemic and falling sick/caring for sick family members and dearth of social events during the pandemic maybe causes for lackadaisical attitude to facial skin care. Resorting to homemade herbal remedies could also contribute.

Proper care of the mask is an important aspect of caring for the facial skin. Though it is advised to wash cloth masks with soap and water after every use, N95 masks and surgical masks should never be subject to treatment with water, in order not to disrupt their filtration efficacy.²² Fourteen percent of N95 mask users reported washing their mask with soap and water before reuse.

Our respondents admitted to have found other medical benefits to mask-wearing like reduced incidence of respiratory allergy and protection from other upper respiratory illnesses, air pollution and the sun rays on the skin. Improved confidence maybe seen in some and others wishing to camouflage self-

perceived unappealingness of facial dermatoses, which in turn may cause them to defer seeking dermatological consult for their skin issues during the pandemic.

Majority of our respondents did not mind/were happy to wear mask during the pandemic. Attitude to mask-wearing during and after the pandemic, was not much different between students and health workers and nor did it change with the current type of mask being used.

In many East-Asian countries such as Japan, South Korea, China, Hong Kong etc, even before the Covid-19 pandemic, wearing mask in public was not an uncommon sight, be it to counter air pollution, the sun or respiratory pathogens. It even became part of their culture for some.^{23,24} In a country like India fraught with respiratory illnesses like TB and peaking air pollution levels, masking beyond the pandemic may not be frowned upon as long as it does not hamper public safety. With depleting ozone layer and undesirable part of solar spectrum causing photoaging and melasma, masking may certainly be recommended by dermatologists in future.

Conclusions and Recommendations

There is a positive attitude to mask-wearing among the medical fraternity while battling the pandemic. However, the safety afforded by masks is hampered if they are not used in an evidence-backed manner. Improper care of skin and mask may predispose to mask-related facial dermatoses among other factors and need to be duly addressed, in order to prevent long-term sequelae like scarring. In addition to protection from Covid-19, mask has afforded many a benefit. Only time can tell about the course of the pandemic but masking seems all-set to become part of lifestyle or therapy for some, even beyond the pandemic.

Ethical Clearance: Taken from Institutional Ethics Committee

Source of Funding: Self

Conflict Of Interest: Nil

References

1. Holder J. Tracking coronavirus vaccinations around the world [Internet]. The New York Times. The New York Times; 2021 [cited 2022Mar30]. Available from:

- <https://www.nytimes.com/interactive/2021/world/covid-vaccinations-tracker.html>
2. Kähler CJ, Hain R. Fundamental protective mechanisms of face masks against droplet infections. *J Aerosol Sci.* 2020; 148:105617.
 3. Yuan X, Xi H, Le Y, Xu H, Wang J, Meng X, et al. Online survey on healthcare skin reactions for wearing medical-grade protective equipment against COVID-19 in Hubei Province, China. *PLoS One.* 2021;16(4):1-9.
 4. Purushothaman PK, Priyanga E, Vaidhyswaran R. Effects of prolonged use of facemask on healthcare workers in tertiary care hospital during COVID-19 pandemic. *Indian J. Otolaryngol. Head Neck Surg.* 2021; 73:59-65.
 5. Techasatian L, Lebsing S, Uppala R, Thaowandee W, Chaiyarit J, Supakunpinyo C, et al. The effects of the face mask on the skin underneath: a prospective survey during the COVID-19 pandemic. *J Prim Care Community Health.* 2020;11
 6. CDC. How to use your N95 respirator [Internet]. Centers for Disease Control and Prevention. 2022 [cited 2022 Mar 30]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/use-n95-respirator.html>
 7. CDC. Improve the fit and filtration of your mask to reduce the spread of COVID-19 [Internet]. Centers for Disease Control and Prevention. 2021 [cited 2022 Mar 30]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/mask-fit-and-filtration.html>
 8. Hua W, Zuo Y, Wan R, et al. Short-term skin reactions following use of N95 respirators and medical masks. *Contact Dermatitis.* 2020;83(2): 115-121.
 9. Jusuf NK, Putra IB, Sari L. Differences of microbiomes found in noninflammatory and inflammatory lesions of acne vulgaris. *Clin Cosmet Investig Dermatol.* 2020; 13:773-780.
 10. Gomolin, Tamar & Cline, Abigail & Russo, Marian. Maskne: Exacerbation or Eruption of Acne During the COVID-19 Pandemic. *SKIN The Journal of Cutaneous Medicine.* 2020; 4:438-439.
 11. Damiani G, Gironi LC, Grada A, et al. COVID-19 related masks increase severity of both acne (maskne) and rosacea (mask rosacea): Multi-center, real-life, telemedical, and observational prospective study. *Dermatologic Therapy.* 2021; e14848
 12. Yaqoob S, Saleem A, Ahmad Jarullah F, Asif A, Essar MY, Emad S. Association of Acne with Face Mask in Healthcare Workers Amidst the COVID-19 Outbreak in Karachi, Pakistan. *Clin Cosmet Investig Dermatol.* 2021; 14:1427-1433
 13. Spigariolo CB, Giacalone S, Nazzaro G. Maskne: The Epidemic within the Pandemic: From Diagnosis to Therapy. *J Clin Med.* 2022;11(3):618.
 14. Rosner E (2020) Adverse Effects of Prolonged Mask Use among Healthcare Professionals during COVID-19. *J Infect Dis Epidemiol.* 2020; 6:130.
 15. Chaiyabutr C, Sukakul T, Pruksaeakanan C, Thumrongtharadol J, Boonchai W. Adverse skin reactions following different types of mask usage during the COVID-19 pandemic. *J Eur Acad Dermatol Venereol.* 2021 Mar;35(3): e176-e178
 16. Althobaiti HM, Althobaiti H, Khan M, Alsatti H, Samarkandy SJ. The Association Between Facial Dermatitis and Face-Mask Wearing During COVID-19 in Saudi Arabia. *Cureus.* 2022 Feb 15;14(2): e22265
 17. Veraldi S, Angileri L, Barbareschi M. Seborrheic dermatitis and anti-COVID-19 masks. *J Cosmet Dermatol.* 2020 Oct;19(10):2464-2465.
 18. Szepietowski JC, Matusiak Ł, Szepietowska M, Krajewski PK, Bialynicki-Birula R. Face Mask-induced Itch: A Self-questionnaire Study of 2,315 Responders During the COVID-19 Pandemic. *Acta Derm Venereol.* 2020 May 28;100(10): adv00152
 19. Krajewski PK, Matusiak L, Szepietowska M, Bialynicki-Birula R, Szepietowski JC. Increased Prevalence of Face Mask-Induced Itch in Health Care Workers. *Biology (Basel).* 2020;9(12):451.
 20. Bortoluzzi, P., Boneschi, V. & Veraldi, S. "Mask" Tinea: An Increasing Infection during COVID-19 Pandemic. *Mycopathologia.* 2020; 187:141-142.
 21. Metin N, Turan Ç, Utlu Z. Changes in dermatological complaints among healthcare professionals during the COVID-19 outbreak in Turkey. *Acta Dermatovenerol Alp Pannonica Adriat.* 2020 Sep;29(3):115-122.
 22. Goh Y, Tan BYQ, Bhartendu C, Ong JJY, Sharma VK. The face mask: How a real protection becomes a psychological symbol during Covid-19? *Brain Behav Immun.* 2020; 88:1-5.
 23. Flaskerud, J. H. Masks, Politics, Culture and Health. *Issues in Mental Health Nursing.* 2020; 41: 846-849
 24. Chung J-B, Kim B-J, Kim E-S. Mask Wearing Behavior and COVID-19: Synthetic Effects of Individualism and Collectivism in Korea. *Research Square Platform LLC;* 2021 Aug 6; Available from: <http://dx.doi.org/10.21203/rs.3.rs-777573/v1>

Does Rhino-genic Headache Improve after Endoscopic Concha Bullosa Surgery in the Adult Patients?

Ahmed Muhei Rasheed¹, Ahmed Salah Ahmed², Mustafa Salman Hamed³

¹Assistant professor, FIBMS, Department of surgery-otolaryngology/ College of Medicine / Baghdad University, Bab Al-Muadham/ Baghdad/ Iraq

²FIBMS, Otolaryngology Specialist/ AL-Yarmouk Teaching Hospital, Main Street/ Mahela 602/Al-qadsia/Baghdad/Iraq

³FIBMS, Otolaryngology Specialist/ AL-Numan Teaching Hospital, Mahela 310/ Al-adamiyah/Baghdad/Iraq

How to cite this article: Ahmed Muhei Rasheed, Ahmed Salah Ahmed, Mustafa Salman Hamed et al. Does Rhino-genic Headache Improve after Endoscopic Concha Bullosa Surgery in the Adult Patients? Volume 13 Issue 3 July-September 2022

Abstract

Background: Pneumatization of Middle Turbinate (MT) is one of the common anatomical variations of the Nasal cavity named Concha Bullosa. It may be presented with facial pain or headache. There are several surgical techniques to treat Concha Bullosa.

Aim of the study: This is to evaluate the improvement of Rhino-genic headache after endoscopic Concha Bullosa surgery in adult patients.

Patients and methods: A prospective comparative study was designed in the Department of Otolaryngology at Al-Jerahat Teaching Hospital in Medical City and private hospital, Baghdad, Iraq, from March 2019 to August 2020. Forty patients suffering from headaches of Rhino-genic origin of more than six months duration were enrolled in the current study. Nasal examination by zero-degree endoscope revealed unilateral or bilateral MT enlargement with mucosal contact points to the Osteo-Meatal Complex or the Nasal Septum. All the patients had Nasal and Para-Nasal sinuses CT scan and xylocaine-xylometazoline test. The Forty patients were allocated into two groups, group A patients treated by Partial Lateral Middle Turbinectomy (PLMT). The 20 patients in group B had been subjected to Middle Turbinate Transverse Excision (MTTE). Patients followed-up every week in the first month and then every two weeks for the next two months. The headache assessment was achieved preoperatively using the Visual Analogue Scale (VAS) and at the third postoperative month. Statistical analysis was done using the Chi-square test to compare the VAS scores in group A patients at the third postoperative month to group B patients, and P-value was calculated.

Results: Fifty percent of the patients treated by PLMT became free of headache, 35% had a mild headache, and 15% moderate. In contrast, 85% of the patients subjected to MTTE became headache-free, and 15% still with mild headache (P value= 0.031).

Conclusions: MTTE is a better option than PLMT in relieving headaches due to contact between Concha Bullosa and Osteo-Meatal Complex or Nasal Septum.

Keywords: Concha Bullosa, Middle Turbinate Transverse Excision, Partial Lateral Middle Turbinectomy, Visual Analogue Scale.

Introduction

Rhino-genic headache is due to contact between mucosal surfaces inside the Nasal cavity in the absence of inflammatory Nasal diseases, Nasal polyp, or Nasal mass. Middle Turbinate (MT) pneumatization is the Concha Bullosa (CB) definition with an incidence of 5-25% in the average population. CB may cause a Nasal obstruction which can adversely affect the ventilation and mucociliary clearance of the Para-Nasal sinuses. ⁽¹⁾

CB is divided into three types depending on the extension of pneumatization itself: extensive, bulbous, and lamellar. ⁽²⁾

CB can be evaluated during endoscopic examination about their size and their relationship with neighboring structures. ⁽³⁾ Table (1) shows the endoscopic classification of CB.

Table 1: Endoscopic classification of CB. ⁽⁴⁾

Grade	Description
1	The sphenothmoid recess and uncinat process are both visible.
2	The sphenothmoid recess is invisible; the uncinat process is visible.
3	The sphenothmoid recess and uncinat process are both invisible.
4	Giant concha bullosa occupies the entire middle meatal area, extending to the inferior meatus.

One of the indications for endoscopic CB surgery is to remove any contact points between the MT and the Nasal Septum and/or the lateral Nasal wall; such contact enhances infection and may result in neuralgic pain or pressure sensation. ⁽⁵⁾

CB had several surgical techniques for its management, including lateral marsupialization, medial marsupialization, crushing, transverse excision, and finally, Conchoplasty. ^(6,7,8)

This study aims to evaluate the improvement of Rhino-genic headache following endoscopic CB surgery in adult patients.

Patients and Methods

This prospective comparative study was designed in the Department of Otolaryngology at Al-Jerहत Teaching Hospital in Medical City and private hospital, Baghdad, Iraq, from March 2019 to August 2020.

All the patients enrolled in the current study suffered from the headache of Rhino-genic origin for more than six months. Routine Otolaryngological history and examination were achieved, including Nasal endoscopic examination by zero degrees, 4mm rigid endoscope under local anesthesia, which reveal unilateral or bilateral enlargement of the MT with mucosal contact points to the Osteo-Meatal Complex, and/ or, to the Nasal Septum. All the patients were sent to Nose and Para-Nasal sinuses CT scan (axial & coronal views) to ensure the unilateral or bilateral CB. Figure (1) shows the pre-operative Nasal endoscopic examination.

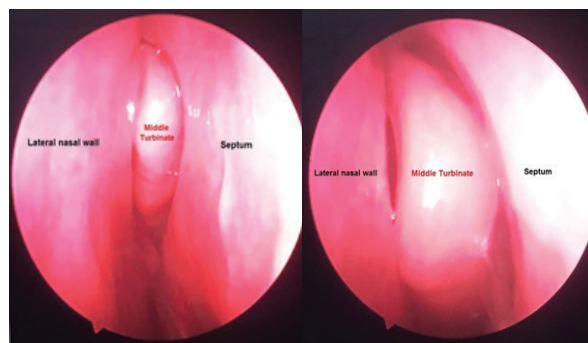


Figure 1: Nasal endoscopic examination showing enlarged MT with contact to the Nasal septum and lateral Nasal wall.

Xylocaine with xylometazoline test was performed for all patients. Under endoscopic guidance, gauzes soaked with a mixture of 10% xylocaine and 0.1 xylometazoline were placed inside the Nose at the contact areas. If the headache had been relieved within 10 minutes, the test was considered positive, and the patient was selected for endoscopic Concha Bullosa surgery.

Visual Analogue Scale (VAS) was used for subjective assessment of headache pre-operatively and at the end of the third postoperative month. VAS (10 cm line) scores were as follow: 0 = no headache, 1-3 = mild headache. 4-6 = moderate headache, 7-9= severe headache, and 10= worst pain.

Forty patients were included in this study that was suitable to the inclusion criteria, which were the presence of headache over the route of the Nose, Forehead, and/ or Peri-Orbital area of more than six months duration due to CB with clear contact areas to the Nasal Septum and/or the Osteo-Meatal Complex.

Exclusion criteria were revision Nasal and Para-Nasal sinuses surgery, a Nasal mass, Nasal

inflammatory diseases (Polyps or even mucosal hypertrophy with muco-purulent discharges), Inferior Turbinate hypertrophy, severe Nasal Septal deviation, Medical illnesses associated with headache presentation like Hypertension, Renal diseases, Vascular disorders, Migraine, Neuroglia, Cervical Spine disorders and Temporo-Mandibular disorder (that ensuring through Medical, Neurological, Ophthalmological, Maxillofacial and Psychological consultations). Bleeding tendency disorders, pregnancy, and high-risk patients from general anesthesia were also excluded.

Each patient was given a code number; patients with odd numbers (20 patients) were allocated in group A and had been subjected to Partial Lateral Middle Turbinectomy (PLMT), while the other 20 patients with double numbers in group B were treated by Middle Turbinate Transverse Excision (MTTE).

Surgical Procedures

Under general anesthesia with Oro-Tracheal intubation and Pharyngeal pack in Anti-Trendelenburg position and with Nasal endoscopic guidance (0-degree, 4 mm diameter, 180 mm length) and camera display system, 10% xylocaine with 0.1% xylometazoline soaked pledgets were inserted around the MT and over the area of the Middle Meatus.

In PLMT, a vertical incision in the CB was done by using a sickle knife with incision continuation to the lower margin of the MT reaching to the lateral insertion in the lateral Nasal wall. The superior incision continued by using a micro-scissor to the posterior end of the MT. Once the lateral part of the MT had been separated, it was resected with mucosa, as shown in figure (2).

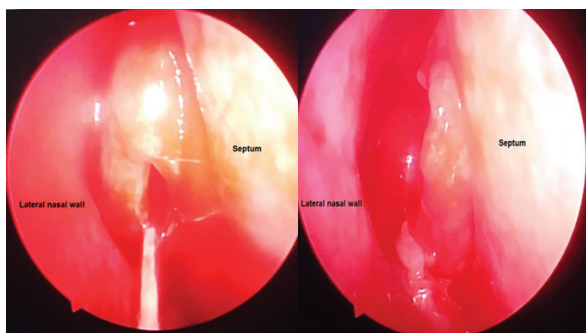


Figure 2: Partial Lateral Middle Turbinectomy.

In MTTE, cutting the inferior half of the MT with its mucosa was done by using a micro-scissor, as shown in figure (3).

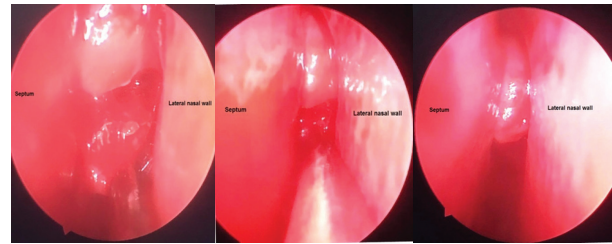


Figure 3: Middle Turbinate Transverse Excision.

At the end of the operation, Merocel packs were inserted for two days. Then, the patients were discharged to home with ten days course of Oral antibiotics and sodium bicarbonate Nasal wash.

The patient's follow-up was achieved every week for the first month & then every two weeks for the next two months. At the third postoperative month, the patients were assessed for headache improvement subjectively by VAS scores. All the patients were asked to phone or return at any time if there was any problem related to their conditions for further assessment and follow-up.

Statistics

The data had been managed and analyzed with computer software SPSS version 24.

- Frequency tables and graphs (pie charts).
- The Chi-square test was used to define the association between the categorical variable.
- A confidence level of 95% with a P-value equal to or less than 0.05 was considered significant.

Results

The patient's ages were ranged (from 18 to 45) years, mean age was (24.6) years, and standard deviation was (± 8.4) years.

The total number of patients was (40) patients which included 22 (55%) females (12 in group A and 10 in group B) and 18 (45%) males (8 in group A & 10 in group B).

The 40 patients included in the current study presented with headache as a chief complaint; other associated symptoms are shown in table (2).

Table 2: Associated Symptoms

Symptoms	Number of patients and %		Total
	Group A	Group B	
Nasal obstruction	11 (27.5%)	14 (35%)	25 (62.5%)
Snoring	10 (25%)	11 (27.5%)	21 (52.5%)
Rhinorrhoea	7 (17.5%)	5 (12.5%)	12 (17.5%)
Anosmia	2 (5%)	1 (2.5%)	3 (7.5%)

The sites of Rhino-genic headache were Frontal in 29 patients (72.5%), Nasal in 15 patients (37.5%), and Peri-Orbital in 13 patients (32.5%).

The CB of the patients who presented with Rhino-genic headache mainly was in grades 3 and 4. Fifty-five percent of the CB were in grade 3, 40% were in

grade 4, and only 5% were in grade 2.

The Distribution of CB according to the side is shown in table (3).

Table 3: Distribution of Concha Bullosa according to side

Group	Bilateral	Right	Left	Total
A	10 (25%)	6 (15%)	4 (10%)	20 (50%)
B	12 (30%)	3 (7.5%)	5 (12.5%)	20 (50%)
Total	22 (55%)	9 (22.5%)	9 (22.5%)	40 (100%)

Intergroup comparison had shown that the relief of headache after three months of the operation was statistically more significant in group B patients who MITTE treated than the patients in group A who were subjected to PLMT (P-value = 0.031), as shown in table (4).

Table 4: Headache VAS scores preoperatively and at the third postoperative month in both groups

			Visual analogue scale scores					Total
			0	1-3	4-6	7-9	10	
group	A	Pre-operative	0	0	11 (55%)	6 (30%)	3 (15%)	20 (100%)
		Post-operative	10 (50%)	7 (35%)	3 (15%)	0	0	20 (100%)
	B	Pre-operative	0	0	8 (40%)	8 (40%)	4 (20%)	20 (100%)
		Post-operative	17 (85%)	3 (15%)	0	0	0	20 (100%)
Statistics			Chi square = 7.222 Degree of freedom = 2 P value = 0.031*					

Discussion

Headache is one of the most commonly presenting symptoms in clinical practice. It could be due to various diseases, so an accurate diagnosis of Rhino-genic headache is essential before starting treatment to get good results. The current study depended on Nasal endoscopy, CT scan of Nose and Para-Nasal sinuses, and xylocaine-xylometazoline test to reach a correct diagnosis of Rhino-genic headache. Morgenstein and Krieger⁽⁹⁾ stated that the confirmation of the diagnosis of Rhino-genic headache is achieved by Nasal endoscopy and CT scan. An anesthetic test that can be performed with various anesthetic solutions, including xylocaine, cocaine, and tetracaine, is also a useful confirming test.^(10,11,12)

The sites of Rhino-genic headache in the current study were Frontal in 72.5%, Nasal in 37.5% and Peri-Orbital in 32.5%. Perhaps, these multiple pain

sites may be explained because the Rhino-genic headache is a referred pain through the Ophthalmic and Maxillary divisions of the fifth Cranial nerve; the different contact sites between mucosal surfaces inside the Nasal cavity may also be referred to play a role. Behin et al.⁽¹³⁾ reported Frontal and Peri-Orbital pain. Clerico et al.⁽¹⁴⁾ described pain in the Supra-Orbital region (74%), Peri-Orbital region (37%), and Maxillary region (26%). Rai et al.⁽¹²⁾ reported sites of pain in the Frontal area in (82%), Peri-Orbital (34%), Nasal (32%), Malar (4%), all over the head (4%), and Occipital in (2%).

This study had evaluated the outcomes of 2 types of endoscopic CB surgeries in adult patients who presented with Rhino-genic headache.

In the current study, it was observed that the CB of the patients who presented with Rhino-genic headache mainly was in grades 3 and 4. Fifty-five percent of the CB were in grade 3, 40% were in grade

4, and only 5% were in grade 2. This observation can be explained because the more significant the CB's size, the greater the chance to contact other mucosal surfaces inside the Nasal cavity, leading to a Rhinogenic headache.

The present study showed that 85% of the patients managed by MTTE became free of headache, and 15% still complained of a mild headache at the third postoperative month. The complete relief of headache was found in 50% of the patients treated by PLMT, 35% still complaining of a mild headache, and 15% with moderate headache (P value= 0.031).

Perhaps, this result of headache improvement may be due to the elimination of the mucosal contact points on both sides of the MT in MTTE (medial side to the Nasal Septum and lateral side to the Osteo-Meatal Complex). In contrast, in PLMT, the elimination of mucosal contact area was achieved over the lateral side of the MT only.

Many studies have been carried out and shown different success rates of endoscopic surgical management of CB. Parsons and Batra ⁽¹⁵⁾ found improvement in 91%, while Morganstein and Kreiger ⁽⁹⁾ reported an 89% success rate, and Cho et al. ⁽¹⁶⁾ showed a success rate in 82% of patients. Likewise, Ramadan ⁽¹⁷⁾ showed improvement of pain in 60% of patients, Clerico et al. ⁽¹⁴⁾ study had shown that there was a 50% improvement of pain in 76% of the patients.

In their study, Mokbel et al. ⁽¹⁸⁾ mentioned that endoscopic CB surgery gives a more precise complete excision with exceedingly significant improvement in headache and facial pain (98%). Cantone et al. ⁽¹⁹⁾ found that endoscopic CB surgical intervention may rapidly resolve CB-related headaches (decreasing health care costs with improving the headache).

Yarmohammadi et al. ⁽²⁰⁾ stated that the effect of surgical management of the CB was highly significant on severity, frequency, and duration of headache (P-value less than 0.001). Ankit et al. ⁽²¹⁾ found that the severity of the complaints was achieved in 76.3% at the third postoperative month of PLMT. In comparison, postoperative improvement was found in 86.6% of the patients in a study done by Hammad and Gomaa. ⁽²²⁾ Bektas et al. ⁽²³⁾ found that (52.7%) of the patients had total relief of pain after endoscopic surgery while (47.3%) reported occasionally having minimal pain, which they considered insignificant; this result due to surgical removal of the mucosal contact point, which may relieve the headache.

Conclusion

The outcome of the endoscopic CB surgery in adult patients suffering from Rhinogenic headache is better in patients who had Transverse Excision of the lower half of the MT than patients treated by PLMT after three months follow-up.

Ethical clearance - The consent was taken from the patients and their family, the details & type of the operation and complications of surgery and the risk general anesthesia explained to them & they signed the form which was authorized in hospital by Ethics committee.

Source of funding - Self funding.

Conflict of Interest - It as nil.

References

1. Sigston EA, Iseli CB, Iseli TA. Concha bullosa: reducing middle meatal adhesions by preserving the lateral mucosa as a posterior pedicle flap. *The Journal of laryngology and otology*. 2004 Oct 1;118 (10):799.
2. Doğru H, Tüz M, Uygur K, Çetin M. A new turbinoplasty technique for managing concha bullosa: Our short-term outcomes. *The Laryngoscope*. 2001 Jan 1;111(1):172-4.
3. Eren SB, Kocak I, Dogan R, Ozturan O, Yildirim YS, Tugrul S . A comparison of the long-term results of crushing and crushing with intrinsic stripping techniques in concha bullosa surgery. *International forum of allergy & rhinology* 2014 Sep 1; Vol. 4, No. 9:753-758.
4. Tanyeri H, Aksoy EA, Serin GM, Polat S, Türk A, Unal OF. Will a crushed concha bullosa from again? *The Laryngoscope*. 2012 May 1;122 (5):956-60.
5. Har-El G, Slavitt DH. Turbinoplasty for concha bullosa: a non-synechia-forming alternative to middle turbinectomy. *Rhinology*. 1996 Mar;34 (1):54-6.
6. Richtsmeier WJ, Cannon CR. Endoscopic management of concha bullosa. *Otolaryngology-Head and Neck Surgery*. 1994 Apr;110 (4):449-54.
7. Apuhan T, Yıldırım YS, Şimşek T, Yılmaz F, Yılmaz F. Concha bullosa surgery and the distribution of human olfactory neuroepithelium. *European Archives of Oto-Rhino-Laryngology*. 2013 Mar 1;270 (3):953-7.
8. Willner A, Lazar RH, Zalzal GH. Endoscopic treatment of concha bullosa in children. *Operative Techniques in Otolaryngology-Head and Neck Surgery*. 1996 Sep 1;7 (3):289-92.

9. Morgenstein KM, Krieger MK. Experiences in middle turbinectomy. *Laryngoscope* 1980;90 (10 Pt 1):1596-603.
10. Roe JO. The frequency dependence of persistent and so-called congestive headaches upon abnormal conditions of the nasal passages. *Med Record* 1888;34:200-4.
11. Mohebbi A, Memari F, Mohebbi S. Endonasal endoscopic management of contact point headache and diagnostic criteria. *Headache*. 2010;50:242-8.
12. Rai UL, Devi PS, Singh NJ, Lyngdoh NC, Sudhiranjan Th, Nongthombam N. Contact point headache: Diagnosis and management in a tertiary care center in Northeast India. *Journal of the medical society*. 2018, Vol. 32, Issue:1:51-56.
13. Behin F, Behin B, Bigal ME, Lipton RB. Surgical treatment of patients with refractory migraine headaches and intranasal contact points. *Cephalalgia*. 2005; 25:439-43.
14. Clerico DM, Evan K, Montgomery L, Lanza DC, Grabo D. Endoscopic sinonasal surgery in the management of primary headaches. *Rhinology*. 1997; 35:98-102.
15. Parsons DS, Batra PS. Functional endoscopic sinus surgical outcomes for contact point headaches. *Laryngoscope*. 1998; 108:696-702.
16. Cho W, Eom TW, Kim JH. A case of mucosal contact point headache caused by the septal spur. *Korean J Otorhinolaryngol Head Neck Surg*. 2014;57:407-10.
17. Ramadan HH. Nonsurgical versus endoscopic sinonasal surgery for rhinogenic headache. *Am J Rhinol*. 1999;13:455-7.
18. Mokbel KM, Abd Elfattah AM, Kamal E . Nasal mucosal contact points with facial pain or headache: lidocaine can predict the result of localized endoscopic resection. *Eur Arch Otorhinolaryngol*. 2010; 267:1569-1572.
19. Cantone E, Castagna G, Ferranti I, Cimmino M, Sicignano S, Rega F, et al. Concha bullosa related headache disability. *Eur Rev Med Pharmacol Sci*. 2015 Jul;19 (13):2327-30.
20. Yarmohammadi ME, Ghasemi H, Pourfarzam S, Nadoushan MRJ, Majd SA, et al. Effect of turbinoplasty in concha bullosa induced rhinogenic headache, a randomized clinical trial. *J Res Med Sci*. 2012 Mar; 17 (3):229-34.
21. Ankit S, Nirali C, George AA. Comparison between lateral partial turbinectomy and canthoplasty for concha bullosa. *National Journal of Otorhinolaryngology and Head & Neck Surgery*. August 2013; Vol. 1 (10) No. 2:23-24.
22. Hammad MS, Gomaa MA, et al. Role of some anatomical nasal abnormalities in rhinogenic headache. *Egyptian Journal of Ear, Nose, Throat and Allied Sciences*. March 2012; Vol. 13, Issue 1: 31-35.
23. Bektas D, Alioglu Z, Akyol N, Ural A, Bahadir O, Caylan R. Surgical Outcomes for Rhinogenic Contact Point Headaches. *Med Princ Pract*. 2011; 20:29-33.

A study of Association of Blood Groups with Anemia in healthy Young Adults

Retash Shan¹, Shomalla Jan², Bharti Devi Thaker³, Kailash Singh⁴, Mrityunjay⁵, Sunil Sachdev⁶

¹Senior Resident, Department of Physiology, GMC Jammu, Bakshinager

²Senior Resident, Department of Anatomy, GMC Kathua, Chak Sajjan

³Assistant professor, PG department of Pathology, GMC Jammu, Bakshinager

⁴Assistant Professor, Department of Surgery, GMC Jammu, Bakshinager

⁵Professor, Department of Physiology, GMC Jammu, Bakshinager

⁶Professor and Head, Department of Physiology, GMC Jammu, Bakshinager

How to cite this article: Retash Shan, Shomalla Jan, Bharti Devi Thaker, Kailash Singh, Mrityunjay, Sunil Sachdev et al. A study of Association of Blood Groups with Anemia in healthy Young Adults. Volume 13 Issue 3 July-September 2022

Abstract

Background: Blood is a specialised connective tissue that gives each individual their identity by determining their blood group and type. In transfusion medicine, the blood group has clinical significance. Malnutrition is one of the world's significant health issues, with anaemia accounting for a significant proportion of the problem, particularly in underdeveloped nations. Reduced haemoglobin levels have an unfavourable effect on the functioning of other human bodily systems. The association between blood groups and disorders including stomach cancer and pernicious anaemia has been established. Previously, several research examining the relationship between anaemia and different blood types yielded mixed results. As a result, the current study was conducted in order to shed light on blood groups and haemoglobin (Hb) levels.

Objectives: To determine if there is a relationship between blood group distribution and the prevalence of anaemia among young medical students based on the variations of haemoglobin concentration of individuals.

Materials & Methods: First-year MBBS and BDS students enrolled to GMC Jammu in the academic year 2020-21 were used as subjects, and blood grouping was performed using the conventional antisera slide agglutination method. With the use of Sahli's hemoglobinometer, the participants' haemoglobin content was calculated. Hb less than 13 g/dl for males and less than 12 g/dl for females was deemed anaemia.

Results: The blood group distribution was B (39.6%), O (34%), A (21.2%), & AB (5.2%). The overall distribution of anemia in subjects was blood group B with 13.2%, O with 10%, A with 5.6%, and AB with 2.4%. 172 (68.8%) subjects were having normal hemoglobin concentrations and 78 (31.2%) were found to be anemic. 5 (4%) males were anemic and 73 (58.4%) females had low Hb content. The prevalence of anemia in relation to blood groups was highest in AB (46.15%) followed by B (33.33%), O (29.41%), and A (24.41%). The Chi-square value was 2.466 with a p-value of 0.4814 which is insignificant (> 0.05) in all blood groups, showing a non-significant association between anemia and blood groups.

Conclusion: In terms of frequency, anaemia was found to be more common in those with the B blood group and less common in those with the AB blood group. The blood types followed the North Indian pattern (B > O > A > AB), and anaemia followed the same pattern. However, when it came to the distribution of participants with anaemia by blood

group, the AB blood group was found to be more vulnerable. Females were found to be more anaemic, which might be attributed to a decrease in red cell mass caused by increased oestrogen levels. Although not statistically significant, this study suggests an association between blood types and anaemia.

Keywords:Anemia, Blood groups, Hemoglobin, Estrogen

Introduction

Blood is a specialised connective tissue that gives each individual their identity by determining their blood group and type. In transfusion medicine, the blood group has clinical significance. Malnutrition is one of the world's significant health issues, with anaemia accounting for a substantial chunk of the problem, particularly in underdeveloped nations. Anemia is a condition in which the oxygen-carrying capacity of the blood is diminished, either owing to a reduction in red blood cells or a decrease in the amount of haemoglobin in the blood.¹Anemia can be caused by a variety of factors, including blood loss, reduced red cell synthesis, or accelerated red cell destruction.² Anemia is defined by the World Health Organization (WHO) as Hb less than 13 g/dl in men over the age of 15, and less than 12 g/dl in non-pregnant women over the age of 15.³

Anemia is a major worldwide health issue that affects both underdeveloped and developed countries, having significant implications for human health as well as socio - economic development.⁴According to WHO Anemia affects 1.62 billion individuals worldwide, approximately 24.8 % of the total population, It is also thought to be responsible for approximately 20% of maternal and perinatal deaths in underdeveloped countries.⁵ Anemia has a well-known negative influence on mother and child health. A higher risk of maternal and infant mortality has been associated to severe anaemia.⁶

Anemia has also been attributed to population-wide impairments in physical and psychological development, behaviour, and occupational performance.⁷ Due to diminished oxygen delivery and cellular oxidative capacity, anaemia can even impair physical performance. As a result, it would be ideal to combat anaemia by providing treatment to those who are prone to it.⁸ It would be easier to provide precise dietary recommendations to prevent the incidence of anaemia in such a group if the specific population prone or resistant to anaemia could be identified. The fact that the A blood type is linked to a higher risk of stomach cancer is well-known.⁹Similarly, females with non-O blood types have a 40-60% increased risk of ovarian cancer.¹⁰ It is also essential to obtain

information on the distribution of these blood types in a population group and to determine whether there is any association between blood group and anaemia, which can help to prescribe suitable preventative interventions in avoiding anaemia in a certain population.

Materials and Methods

Type of Study: Cross-sectional study

Study setting: Department of Physiology, GMC Jammu, Bakshinager,

Duration of study: September 2021 and November 2021.

Sample size: 250 Medical students(males and females) pursuing first phase MBBS and BDS in the academic year 2020-2021 were selected as subjects.

The individuals were given a brief overview of the study and protocol, and signed informed consent was obtained from them. This study was approved by the institution's Ethical Committee (IEC).

Inclusion Criteria

- Males and females between the age group of 17 and 20 who are healthy.

Exclusion Criteria

- Subjects with known hemolytic disorders, hereditary anemia, abnormal hemoglobin, anemic subjects under treatment, bleeding disorders, malignancies, acute and chronic infection.

The technique of blood grouping & typing: The antisera slide agglutination method was used to group and type the blood. Antisera A, B, and D were used. Students were given a sterile finger prick on one of their middle three fingers on their left hand, and a few drops of blood were placed in a test tube with 0.9 percent normal saline. The antisera were mixed individually with the saline suspension of blood on a slide and evaluated for agglutination; the presence or absence of clumping determined the blood type.

Agglutination was collected on a glass slide and focussed using a compound microscope's low-power objective for confirmation.¹¹

The technique of Hemoglobin Estimation: Hemoglobin was estimated using Sahli's hemoglobinometer test, which is based on the principle of acid hematin production and colorimetric matching with the apparatus's standard comparators. The first of three measurements corresponded to the hue of the fluid when it was somewhat darker than the comparator. When the fluid colour matched the comparator perfectly, the second reading was taken. The fluid colour was somewhat lighter than the usual colour in the third reading. All three measurements were recorded in g/dl, with the scale set to the lower meniscus values. The final haemoglobin measurement in g/dl was calculated as the average of the three values.¹¹ Furthermore, the frequency of anaemia was

determined for the ABO blood group and Rh factor. The WHO standards for identifying anaemia were used to get the diagnosis. Hb <13 g/dl for males and Hb <12 g/dl for females was deemed anaemia. The study used WHO cut-offs for mild, moderate, and severe anaemia, which were defined as Hb less than 13 g/dl, <11 g/dl, and <8 g/dl for males and less than <12 g/dl, <11g/dl, and <8g/dl for females.

Statistical Analysis: The result was represented as a percentage, which is the frequency distribution of each ABO blood group and Rh factor, as per the normal technique. The unpaired t-test was used to analyse the demographic data. The frequency distribution (observed frequency) of the blood group among the overall anaemic population (N= 78) was compared to those of the general nonanemic population (N= 172) using the Chi-Square test to establish the association between the blood group and anaemia.

Observation and Results

Table 1: Comparison of Demographic and Hb Parameters between male and female subjects studied.

Parameter	Gender	Number	Mean	SD	Significance	
					t-value	p-value
Age (years)	Males	125	17.8320	0.63164	-4.137	0.097
	Females	125	18.1040	0.71147		
Weight (Kg)	Males	125	60.8320	4.50580	22.341	< 0.0001
	Females	125	50.7040	2.32110		
Height (cm)	Males	125	167.0000	4.24644	38.110	< 0.0001
	Females	125	155.1680	3.97723		
BMI (kg/m ²)	Males	125	19.8568	1.77529	-5.927	< 0.0001
	Females	125	21.0417	1.35779		
Hb	Males	125	13.82	0.76	22.18	< 0.001
	Females	125	10.94	1.57		

Table 2: Blood group-wise and gender-wise distribution of subjects studied.

Blood group	Males		Females		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
A	26	20.8	27	21.6	53	21.2
AB	06	4.8	07	5.6	13	5.2
B	50	40.0	49	39.2	99	39.6
O	43	34.4	42	33.6	85	34.0
Rh-positive	118	94.4	120	96	238	95.2
Rh-negative	7	5.6	5	4	12	4.8

Table 3: Distribution of subjects studied concerning anemia in males and females.

Blood groups	Males Anemia < 13 g/dl				
	N (125)	Normal	Mild	Moderate	Severe
A	26	25	1	0	0
AB	6	5	1	0	0
B	50	48	2	0	0
O	43	42	1	0	0
Rh-positive	118	114	4	0	0
Rh-negative	7	6	1	0	0
Blood groups	Females Anemia				
	N (125)	Normal	Mild < 8g/dl	Moderate < 11g/dl	Severe < 12 g/dl
A	27	14	2	11	0
AB	7	2	2	3	0
B	49	18	9	22	0
O	42	18	7	17	0
Rh-positive	120	49	19	52	0
Rh-negative	5	3	1	1	0

Table 4: Association of blood groups with anemia among the subjects studied.

Blood groups	Non-Anemic (a) N (%)	Mild N (%)	Moderate N (%)	(b) Anemic (%)	Grand Total(c)=a + b (%)	Prevalence of Anemia according to blood groups=b/c (95% confidence interval)	Chi sq. value	p-value
A	39 (15.6)	3(1.2)	11(4.4)	14 (5.6)	53 (21.2)	24.41(14.93-37.57)	2.466	0.4814
AB	7(2.8)	3(1.2)	3(1.2)	6 (2.4)	13 (5.2)	46.15(23.21-70.86)		
B	66 (26.4)	11(4.4)	22 (8.8)	33 (13.2)	99 (39.6)	33.33(23.02-41.0)		
O	60 (24)	8(3.2)	17(6.8)	25 (10)	85 (34)	29.41(20.79-39.82)		
Total	172 (68.8)	25(10)	53(21.2)	78(31.2)	250(100)	-		
Rh-positive	163 (65.2)	23 (9.2)	52 (20.8)	75 (30)	238 (95.2)	31.51(25.16-36.8)	0.504	0.4788
Rh-negative	9 (3.6)	2 (0.8)	1 (0.4)	3 (1.2)	12 (4.8)	25(4.69-49.12)		
Total	172 (68.8)	25 (10)	53 (21.2)	78 (31.2)	250 (100)	-		

(Note: For Calculation of association we have considered anemia in two categories i.e. males and females).

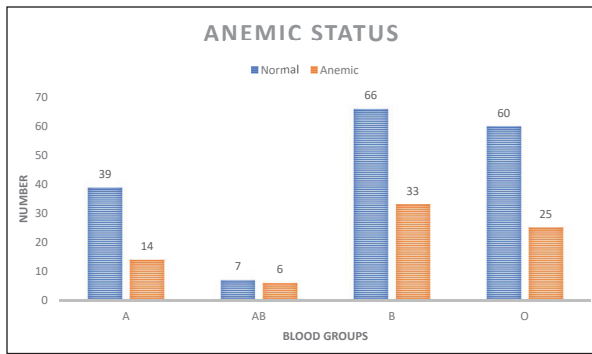


Fig 1: Association of Blood groups with Anemia.

There were 250 participants in the research, with 125 males and 125 females. The comparison of socio-demographic factors and Hb of participants is shown in Table 1. The prevalence of different blood types in boys and females is shown in Table 2 in decreasing order (B > O > A > AB). The B blood group was the most frequent among the participants (39.6%). Table 3 demonstrates that 172 (68.8%) of the individuals had normal haemoglobin values, whereas 78 (31.2%) were anaemic. 5 (4%) of males were anaemic, whereas 73 (58.4%) of females had low Hb levels. Table 4 shows the typical distribution of anaemia in blood groups: B group has 13.2 %, O group has 10%, A group has 5.6 %, and AB group has 2.4 %. Anemia was shown to be prevalent in blood types AB (46.15 percent), B (33.33 %), O (29.41 %), and A (29.41 %) (24.41 %). In all blood groups, the Chi-square value was 2.466 with a p-value of 0.4814, which is negligible (> 0.05), indicating that there is no link between anaemia and blood types. Overall, 75 Rh-positive participants (30%) and 3 Rh-negative subjects (1.2%) were confirmed to be anaemic. Anemia was found to be prevalent in 31.51 % of Rh-positive people and 25 % of Rh-negative people. The Chi-square value was 0.504, with a p-value of 0.478, which is not statistically significant.

Discussion

Blood grouping and type is a commonly performed inquiry prior to blood donation, identification card documentation, and is beneficial in the event of an emergency blood transfusion. Hemoglobin estimation is a standard test performed in outpatient departments in almost all medical disciplines. Both examinations are frequently performed as part of the MBBS, BDS, and BSc paramedical curriculum.¹² The current study comprised 250 first-year medical students, including males (125) and girls (125). The B blood group was the most common, accounting for 39.6% of all cases, followed by the O blood group (34%), A blood

group (21.2%), and AB blood group (5.2%). The predominance of the ABO blood group was the same in our study as in the North Indian trend. According to several studies, the ABO blood categories B > O > A > AB were the most common. Anemia was shown to be most common in blood group B (13.2%), followed by O (10%), A (5.6%), and AB (5.6%) in our study (2.4%). In studies by Kaur M, Basak Asim Kumar, and Maji Kaushik et al, the similar pattern of anaemia distribution within the B blood type was observed.^{13,14} The prevalence of anaemia was found to be higher in blood group AB (46.15 %), followed by blood group B (33.33 %), O (29.41 %), and least in blood group A (24.41 %), however this was not statistically significant ($p=0.4814$).

Tebit EK and Tayong DBK observed that the AB group was more likely to be anaemic, which is consistent with the findings of this study.¹⁵ There have been very few studies comparing haemoglobin levels in different ABO blood types in a small population. ABO blood type frequencies differ from one population to the next. Similarly, blood haemoglobin levels range from person to person. Age, sex, ethnicity, region, occupation, socioeconomic level, and numerous medical conditions all contribute to these disparities. When compared to age-matched men, women had 12% lower Hb levels.¹⁶ Hemoglobin concentrations can also be influenced by genes that encode for RBC enzymes and membranes.¹⁷ Anemia is a worldwide public health issue that is exacerbated in underdeveloped countries. From childhood to old age, anaemia has affected many organ systems in the human body. Low haemoglobin levels have been associated with poor academic performance in students.¹⁸ Mild anaemia can diminish immunological competence and have a negative impact on productivity. According to numerous studies across the Indian subcontinent, the average prevalence of anaemia was 25-80 %. In a study conducted by the Indian Council of Medical Research (ICMR) in sixteen districts across eleven states, the prevalence rate of anaemia was 90.1 % among adolescent girls aged 11 to 18. Anemia was observed in 35% of the 300 students evaluated in their research.¹⁹ The average prevalence of anaemia in different blood types was found to be 31.2 % in this study. Further analysis revealed that anaemia was more prevalent in female medical students (58.4%) than male medical students (4%) at GMC Jammu. In Telangana, girls (84.66%) had a similar greater prevalence of anaemia than boys (12.72 %).²⁰ This study revealed a correlation between blood

group type and anaemia, albeit it was not statistically significant, possibly due to the small sample size. If a correlation between anaemia and blood group is identified, it will be much easier to forecast which populations are more susceptible or resistant to anaemia, and thus to prescribe preventative actions to these populations so that the negative effects of low Hb levels may be prevented. According to Karl Landsteiner the relevant agglutinins should be absent in the plasma if the specific agglutino-gen is present on the RBC surface. According to this rule, a blood type possesses agglutino-gen-alpha on the RBC surface and agglutino-gen-beta in its plasma; blood group O's plasma contains both alpha and beta agglutinins. Individuals with blood type antigens alpha and beta are more likely to be anaemic due to a higher risk of hemolysis, whereas those without these antigens are less susceptible to anaemia. Individuals with blood types B, AB, and A can avert anaemia by eating a vitamin- and iron-rich diet on a regular basis. Due to the limited sample size, the study's limitations include the inability to compare males and females independently and the inability to determine which form of anaemia each blood group is prone to.

Conclusion

B > O > A > AB were the blood groups observed in decreasing order in the study. The B blood group is the most prevalent subgroup with low Hb levels (13.2 %). When it came to the distribution of individuals by blood types and their association to anaemia, blood group AB (46.15 %) was the most common. In the study, the anaemia found with decreasing prevalence was AB > B > O > A, and there was no significant association between anaemia and any blood group. Females were more prone to anaemia than males, which might be attributable to a reduction in red blood cell mass caused by high oestrogen levels. We can counsel those who are more vulnerable to anaemia to consume a diet rich in iron and vitamins, as well as their supplements, based on their blood types. Future research should be done on a larger population to corroborate the findings and to determine what sort of anaemia each blood group is prone to.

Conflict of Interest: Authors declare that there is no financial or intellectual conflict of interest.

Source of Funding: Self-financed.

Ethical Clearance: Mandatory ethical clearance was obtained before the study from IEC, GMC Jammu.

References

1. Pal GK, Pal P, Nanda N. Comprehensive Textbook of Medical Physiology. Volume I, edition 1. New Delhi: Jaypee Broth. Med. Pub. (P) Ltd.; 2017.
2. Kumar V, Abbas AK, Fausto N, et al. Robbins' basic pathology. 8th ed. Philadelphia: Saunders; 2007.
3. WHO. Hemoglobin concentration for the diagnosis of anemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva, World Health Organization, 2011 (WHO/NMH/NHD/MNM/11.1) (<http://www.who.int/vmnis/indicators/hemoglobin.pdf>). Last accessed 5th March 2022
4. Janz TG, Johnson RL, Rubenstein SD. Anemia in the emergency department: evaluation and treatment. Emerg Med Pract. 2013; 15 suppl 11:1-15.
5. Harvey P. A strategic approach to anemia control, MOST, The USAID micronutrients program, Arlington, Virginia, 2004. <http://health.nytimes.com/health/guides/disease/anemia/treatment>. Last accessed 5th March 2022
6. Aimakhu CO, Olayemi O. Maternal hematocrit and pregnancy outcome in Nigerian women. West Afr J Med. 2003; 22(1): 18-21.
7. Sanstead HH. Causes of Iron and Zinc deficiencies and their effects on the brain. J Nutr. 2000; 130(2S Suppl): 347S-349S.
8. Zhang AS, Enns CA. Molecular mechanism of normal iron homeostasis. Hematology Am Soc Hematol Educ Program. 2009; 1: 207-214.
9. Yeoh GS. Carcinoma of the stomach. Singapore Med. J. 1960; 1: 140.
10. Yuzhalin AE, Kutikhin AG. ABO and Rh blood group in relation to ovarian, endometrial, and cervical cancer risk among the population of South-East Siberia. Asian Pac J Cancer Prev. 2012; 13(10): 5091-6.
11. Ghai CL. A Textbook of Practical Physiology. 8th ed. New Delhi: Jaypee Broth. Med. Pub. (P) Ltd.; 2013.
12. PY.2.11 Estimate Hb, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT. <https://old.mciindia.org/UG-Curriculum/UG-Curriculum-Vol-I.pdf>. Last accessed 5th March 2022
13. Kaur M. Relationship and Distribution of ABO, Rh Blood Groups and hemoglobin concentration among the Adolescents. J Phys Pharm Adv 2015, 5(9): 703-712.
14. Basak Asim Kumar and Maji Kaushak: Blood group and anemia: Exploring a new relationship, Journal of Public Health and Epidemiology. 2013; 5(1): 43-45.

15. Tebit EK and Tayong DBK. Anemia and its association with the month and blood phenotype in blood donors in FakoDivision, Cameroon. *BMC Hematology*. 2016;16: 29.
16. Murphy WG. The sex difference in hemoglobin levels in adults-mechanisms, causes, and consequences. *Blood Rev* 2014; 28: 41-7.
17. Barrera-Reyes PK, Tejero ME. Genetic variation influencing hemoglobin levels and risk for anemia across populations. *Ann N Y Acad Sci*. 2019; 1450:32-46.
18. Jain AK. *Textbook of Physiology*. Vol I, 7thed. New Delhi: Avichal Publishing Company; 2017.
19. Reshmarani, Shilpa N, Subhash Chimkode. A study of the correlation between blood groups and anemia in young adults. *Int. J Phys* 2019; 7(4): 199-202.
20. Kancharla Sirisha, Mangala Gowri SR. Association of anemia with blood groups. *International Physiology*. 2019; 7(2): 71-75.

Evaluation of Virtual Classes Teaching among first-year MBBS students during COVID-19 era in GMC Jammu

Retash Shan¹, Shomalla Jan², Sunita Kumari³, Mrityunjay⁴,
Sunil Sachdev⁵, Dev Raj⁶

¹Senior Resident, Department of Physiology, GMC Jammu, Bakshinager

²Senior Resident, Department of Anatomy, GMC Kathua, Chak Sajjan

³Senior resident, Physiology Department, GMC Jammu

⁴Professor, Department of Physiology, GMC Jammu, Bakshinager

⁵Professor and Head, Department of Physiology, GMC Jammu, Bakshinager

⁶Lecturer, Department of Community Medicine, GMC Jammu

How to cite this article: Retash Shan, Shomalla Jan, Sunita Kumari, Mrityunjay, Sunil Sachdev, Dev Raj et al. Evaluation of Virtual Classes Teaching among first-year MBBS students during COVID-19 era in GMC Jammu. Volume 13 Issue 3 July-September 2022

Abstract

Background: The Covid-19 era has caused the shifting of medical teaching into an Online podium. This has provided us with an excellent opportunity to recognize MBBS- students' preferences of these Online classes which otherwise did not form a significant part of the traditional medical teaching. We have undertaken online classes for theory & practical for the first time in our medical college at GMC Jammu. So the current study was conducted to assess & analyze the preference of first-year MBBS students between online classes & traditional classroom teaching.

Objectives: To evaluate the predilection/inclination of first-year MBBS students between online classes and traditional classroom teaching.

Materials & Methods: An institution-based descriptive cross-sectional study was performed on 180 MBBS students of 2020-21 batch at the Department of Physiology in GMC Jammu, after receiving Institutional ethics committee (IEC) clearance who have attended online classes for a minimum of 1 hour per day or 6 hours per week for 1-month duration using zoom or other video-based learning platforms. A pre-structured questionnaire-based feedback study was conducted after obtaining written consent from the first-year MBBS students. We designed a total of 24 questions related to their theory & practical classes, for assessing their preference for Online classes in comparison to traditional classroom teaching with multiple-choice options.

Results: In our study, we found that overall, 61.11% of MBBS students prefer traditional classroom teaching over Online classes and 60% of students prefer traditional teaching methods over online learning for practical classes. However, 50% of students reported that accessibility to stable internet was causing difficulty in following Online classes. Moreover, 53.89% of students reported that they get distracted at home during Online classes. Further, 66.11% of students mentioned a lack of personal interaction & lonely experience on the Online platform.

Conclusion: In our study, we found that medical students prefer the traditional teaching method to the Online platform for learning as well as examination. For better understanding and learning, the first phase of MBBS students prefers that traditional classroom teaching should be followed by Online classes that can be easily accessed by students at their convenient time. In this study, the majority of medical students reported limited access to stable internet, distractions & disturbances in the domestic environment, & lack of personal interaction as the barriers to Online learning.

Keywords: Covid-19, Medical students, Online classes, Traditional teaching method.

Corresponding Author: Sunita Kumari,

Senior Resident, Physiology Department, GMC Jammu

Email id: gmcjammuinvestigator@gmail.com

Introduction

The Covid-19 era has caused a dynamic shift in the world education system, thus transforming medical teaching into an Online podium. The imposition of lockdown led to the shutdown of physical classrooms and hence Online education became the new norm. This has provided us with an excellent opportunity to recognize MBBS- students' preferences of these Online classes which otherwise did not form a significant part of the traditional medical teaching. In unprecedented times like this, with the traditional classroom setup, it is not possible to allow social distancing, so Online classes are probably the best option available for teaching. To name positive attributes of Online classes, few are flexibility in the timing, to study in a comfortable domestic environment, and a platform to openly share ideas.¹

The virtual platform has its limitations. Both the students and the teachers are required to have technical skills for better efficacy. In this scenario, the associated factors such as the functioning of the devices and platform, social environment all play an important role in the success of the Online classes.²

However, students are not satisfied by continuous lectures in their normal classroom setting nor are they able to withstand the same in virtual mode. They always expect something innovative & new which can involve a mixture of both Online and classroom learning. Thus, the learning modality offered to the students has to be learner-centric.³

As both teachers and students adapt to this new teaching-learning environment amidst a stressful Covid pandemic, it is essential to evaluate the system currently being used given the limited literature available regarding the same in India.

Moreover, we have undertaken Online classes for theory & practical for the first time in our medical college at GMC Jammu from May to July 2021. So, the current study was conceived to assess & analyze the preference of first-year MBBS students between Online classes & traditional classroom teaching, after the reopening of colleges in August 2021 & conducted in Nov 2021.

Materials and Methods

An institution-based descriptive cross-sectional study was performed on 180 MBBS students of 2020-21 batch in November 2021 at physiology department, in GMC

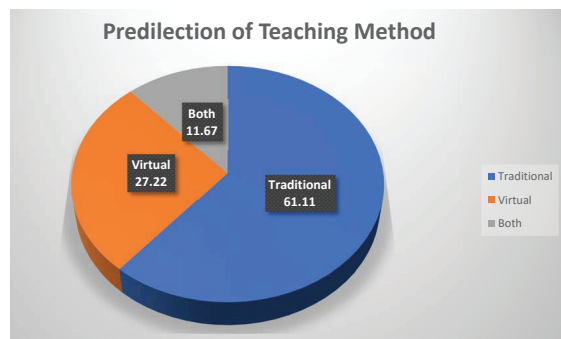
Jammu, after receiving Institutional ethics committee (IEC) clearance issued vide no. IEC/GMC/2021/664 dated 02.11.2021. Those medical students, who have attended Online classes for a minimum of 1 hour per day or 6 hours per week for a minimum of 1-month duration using zoom or any other video-based learning platform were recruited for the study. Each class of Physiology whether attended by traditional classroom teaching or Online mode were scheduled for a duration of 1 hr. A pre-structured questionnaire-based feedback study was conducted after obtaining written consent from the first-year MBBS students. An in-depth literature review was performed and a questionnaire was developed & adapted from previous few studies to satisfy our study objectives [4,15]. Questions were framed to evaluate medical students' perception of online classes vis a vis traditional classroom teaching. These questions were then reviewed by the subject expert and validated. As per the recommendations of the expert, the questions were either removed or rephrased. Finally, we designed 24 questions related to their practical & theory classes, for assessing their preference for online classes or traditional classroom teaching with multiple-choice options. A questionnaire was shared with first-year MBBS students in a classroom. The study was advertised by word-of-mouth and through in-class announcements. Responses were anonymous & no personal information was collected. Data were analyzed using SPSS 26 statistical software. To analyze the closed questions, simple descriptive statistics were used.

Observation and Results

Participant characteristics are depicted. In our study, we spotted that 61.11% of MBBS students prefer traditional classroom teaching over online classes. 52.22% of students desire traditional classroom teaching in comparison to online learning for theory classes. 60% of students opt for traditional classroom teaching than online learning for practical classes. 60% of students recommended that traditional classroom teaching should be followed by online classes. 50% of students reported that accessibility to stable internet was causing difficulty in following online classes. 53.89% of students mentioned distractions in a domestic environment and 66.11% of students reported a lack of personal interaction & lonely experiences as barriers to Online learning.

Table 1: Participant Characteristics

Online classes attended by students for total duration	(Duration/ User Percentage)
less than 1 month	0%
1 month	62%
more than 1 month	38%
2) Online classes attended by students per day	
less than 1 hr	0%
1 hr	34%
More than 1 hr	66%
Online classes attended by students per week	
less than 6 hr	8%
hr	60%
more than 6 hr	32%
Devices used for accessing Online classes	
Laptop/Desktop	9%
Smartphone/Tablet	81%
Both	10%

**Fig1: Predilection of teaching method by students.**

Discussion

As due to the Covid-19 Pandemic situation, medical colleges and universities were closed by the government for traditional classes. Hence, Online classes were the only available option for teaching purposes in medical colleges. We planned this study to understand the student's perspective between Online & Traditional classes, through a questionnaire-based study in the Covid era, so that we can apply this knowledge to enhance effective learning in the future [4]. In traditional teaching methods, teachers are on the stage in front of students interacting with them in the classroom and the practicals. The traditional teaching method has been universally accepted and adopted in almost all medical colleges in India.⁵ The

term virtual learning occurs at the computers, and other media devices with the help of the Internet, with the information delivered through a browser or media applications (Zoom, Google Meet, Microsoft Teams, etc.) [6]. The present study attempts to analyze and assess students' perception of Online classes conducted during the COVID-19 era. A mixture of both encouraging & unenthusiastic responses was received from participants toward the Online classes. Respondents were males and females of Z generation (born between 1997-2012) in the age group of 17-21 years, in a ratio of 1:1. Most spent more than 1 hr/day in Online classes. In our study, the majority of the respondents used smartphones (81%) to access Online classes. Research has shown limited interaction between teacher & student to be a common problem in an Online learning environment.⁷ Social interaction is one of the most important components of teaching and learning experiences.⁸ Interaction between the students and teacher and also inter-student interaction helps to make learning more productive, meaningful and also enhances students' knowledge.⁹

Students reported that interaction in Traditional classroom teaching encouraged learning, which was not achieved through Online classes.¹⁰ In, our study we found that medical students prefer traditional classroom teaching (61.11%) over Online classes. Similar findings were shown by Dondorf T et al., & Abbasi S et.al., who observed that the traditional classroom teaching was more successful than the Online classes in their study.^{11,12} In contrast, Lall S & Singh N with Hannay M & Newvine T observed in their study that students prefer Online classes more than traditional classroom teaching.^{13,14}

Many participants have reported limited access to a stable internet, distractions at home environment & lack of personal interaction as the limitations to Online learning. Despite these limitations, 11.67% of the students wanted a combination of both Online & classroom teaching for the future. 61.11% of participants wanted only classroom classes and 27.22% wanted only virtual classes.

The Covid-19 pandemic resulted in a rapid shift from classroom teaching to Online teaching to maintain uninterrupted & continuous learning for the students. Insufficient time was present to modulate the curriculum to fit into the framework of virtual teaching. Both teachers and students had to rapidly learn to adapt to this new environment of Online teaching and learning.¹⁵

Limitations of the study: Although care has been taken to report the responses accurately, an element of bias is always said to be associated with questionnaire-based studies. We have conducted this study during the Covid-19 pandemic with first phase MBBS students only and want to collect data after the Covid pandemic for all phases of medical students of our college so that a better evaluation of change in teaching method preferences by medical students can be done. We also want to continue our research with a large number of students in other medical colleges of the Jammu region to understand more about student preferences in medical education.

Conclusion

In the present study, our findings suggest that first phase MBBS students prefer traditional teaching to Online classes. The majority of students suggest that traditional classroom teaching should be followed by Online classes for better understanding and learning as that can be easily accessed by students at their convenient time. About half of the class felt internet instability was the culprit for hampering Online learning. 53.89% of students mentioned distractions in the domestic environment and 66.11% of students reported a lack of personal interaction & lonely experiences as the barriers to online learning. The majority of students used Smartphone devices for accessing Online classes. Thus, the present study gives weight to the student's voice by specifically evaluating medical students' perceptions about teaching methodology.

Acknowledgment: We would also like to acknowledge the students for participating in the study.

Declaration of participant consent: The authors certify that they have obtained all appropriate participant consent.

Ethical clearance: The study was approved by the IEC of GMC Jammu.

Funding: No funding sources.

Conflict of interest: No conflict of interest is there.

References

1. Elfaki N, Abdulraheem I, Abdulrahim R. Impact of e-learning vs traditional learning on students performance and attitude. *Int J Med Res Health Sci* 2019; 8:76-82.
2. Venkatesh S, Rao YK, Nagaraja H, Woolley T, Alele FO, Malau Aduli BS. Factors influencing medical students' experiences and satisfaction with blended integrated e-learning. *Med Princ Prac* 2020; 29:396-402.
3. Warnecke E, Pearson S. Medical students perceptions of using e-learning to enhance the acquisition of consulting skills. *Australas Med J* 2011; 4:300-7.
4. Vala NH, Vachhani MV, Sorani AM. Study of evaluation of e-learning classes among medical students during Covid-19 pandemic phase in Jamnagar city. *Natl J Physiol Pharm Pharmacol* 2020; 10(12): 1040-1042.
5. Rosenberg MJ. *Beyond E-learning: Approaches and Technologies to Enhance Organizational Knowledge, Learning and Performance*. San Francisco: Pfeiffer; 2006.
6. Yu D, Zhang W, Chen X. New generation of e-learning technologies. In: *First International Multi-symposiums on Computer and Computational Sciences*. Hangzhou: Zhejiang University; 2006.p.455-9.
7. Gregory VL. Student perceptions of the effectiveness of web-based distance education. *New Lib World* 2003; 104(10): 426-431.
8. Moore MG. Three types of interaction. In: Harry K, John M, Keegan D, editors. *Distance Education: New Perspectives*. 1st ed. New York: Routledge; 1993.p.19-24.
9. Hurst B, Wallace R, Nixon SB. The impact of social interaction on student learning. *Read Horiz* 2013; 52(4): 375-98.
10. Kemp N, Grieve R. Face-to-face or face-to-screen? Undergraduates' opinions and test performance in classroom vs. online learning. *Front Psychol* 2014;5: 1278.
11. Dondorf T, Breuer R, Nacken H. Classroom vs E-learning: A Case Study on the performance of students in Different Learning Scenarios. Spain: *International Conference on Education and New Learning Technologies*; 2016.p.6507-16.
12. Abbasi S, Ayoob T, Malik A, Memon SI. Perceptions of students regarding e-learning during covid-19 at a private medical college. *Pak J Med Sci* 2020; 36: S57-61.
13. Lall S, Singh N. Covid-19: Unmasking the new face of education. *Int J Res Pharm Sci* 2020; 11:48-53.
14. Hannay M, Newvine T. Perceptions of distance learning: A comparison of online and traditional learning. *MERLOT J Online Learn Tech* 2006;2;1-11.
15. Karnath M, Basti AR, Jayamala AK. Virtual classes conducted during Covid-19 pandemic- Medical students' perspective. *Indian J Physiol Pharmacol* 2021;65(2): 132-7.

A Cross-Sectional Study to Estimate the Proportion of Early Initiation and Exclusive Breastfeeding Practices in Rural Field Practice Area, Mysore

Roopadevi V¹, Dayanand M², Aravind K³, Sampat Kumar⁴

¹Assistant Professor, Dept of Community Medicine, Gadag Institute of Medical Sciences, Gadag, Karnataka

²Professor, Dept of Community Medicine, Mysore Medical College and Research Centre, Mysore, Karnataka

³Associate professor, Dept of Community Medicine, Gadag Institute of Medical Sciences, Gadag, Karnataka

⁴Assistant Professor, Dept of Pathology, Kodagu Institute of Medical Sciences, Kodagu

How to cite this article: Roopadevi V, Dayanand M, Aravind K, Sampat Kumar et al. A Cross-Sectional Study to Estimate the Proportion of Early Initiation and Exclusive Breastfeeding Practices in Rural Field Practice Area, Mysore. Volume 13 Issue 3 July-September 2022

Abstract

Introduction: Breastfeeding is the healthiest and easily accessible nutrient to the infants. Malnutrition is more prevalent in India and inappropriate feeding practices are one of the reasons. So the current study is conducted to estimate the prevalence of early initiation and exclusive breastfeeding practices and factors influencing on these practices.

Methods: A cross-sectional study was conducted among 198 mothers of children less than 24 months in the field practice area of Mysore Medical College and Research Institute, Mysore by using simple random sampling method during March 2015 to August 2015 by using pretested and semi-structured questionnaire. In our study we found that 70.2% mothers initiated breastfeeding within 1 hour of delivery, the most common reason for delay was LSCS, 14.6% mothers practice the prelacteal feed, 92.9% mothers fed colostrum, exclusive breastfeeding (EBF) was practiced in 105 (53%) mothers. The most common reason for non-EBF was lack of knowledge 78 (47.6%). Gender, fathers education, socio-economic status and number of antenatal visits had an influence on breastfeeding practices.

Conclusion: Majority of the women did not practice EBF. The knowledge regarding proper breastfeeding practices should be emphasized on each antenatal and postnatal visits. Improved socio-economic status can improve breastfeeding practices.

Keywords: Exclusive breastfeeding, prelacteal feed, Infant and Young Child.

Introduction

Breast feed is the first fundamental right of the child. Breastfeeding is the healthiest and easily accessible nutrient to the infants^{1,2}. and it has many health benefits for both the mother and infant. Breast milk contains all the nutrients an infant needs in the first six months of life. Breastfeeding protects against diarrhoea and common childhood illnesses such as

pneumonia, and may also have longer-term health benefits, such as reducing the risk of overweight and obesity in childhood and adolescence. Provision of mother's breast milk to infants within one hour of birth is referred to as "early initiation of breastfeeding" and ensures that the infant receives the colostrum, or "first milk", which is rich in protective factors³. The breastfeeding should be continued for at least two years along with complementary

feeding¹. Malnutrition is more prevalent in India and inappropriate feeding practices are the one of the reason⁴. So the current study is conducted to estimate the prevalence of early initiation and EBF practices among infants and young children in rural area and to also assess the factors influencing on infant and young child feeding practices.

Objectives

1. To estimate the proportion of early initiation and Exclusive Breastfeeding (EBF) among infants and young children in rural area.
2. To assess the socio-demographic and other factors influencing on Infant and young child feeding practices.

Materials and Methods

WHO has defined 'Breast-Feeding' as Infant who has received any breast milk, expressed or from breast.⁵ Early initiation is starting breastfeeding as soon as possible ideally within an hour. Colostrum is a thick, sticky and light yellowish in colour excreted first 4-5 days after delivery. Prolactal feed is a feed of formula, cow's milk or glucose water given before the first breastfeed (any food or fluid).⁶ Exclusive breast feeding: Infant has received only breast milk and no other liquids or solids except vitamins/ mineral supplements and medicines.⁵

A cross sectional study was conducted among 198 mothers of children less than 24 months in the field practice area of Mysore Medical College and Research Institute, Mysore by using simple random sampling method. The study was conducted after getting ethical clearance from college. The data was collected from March 2015 to August 2015 by using pretested and semi-structured questionnaire introduced to the mother. The questionnaire included socio demographic data, and breastfeeding practices. The questionnaire was explained to them in the local language after taking written consent. Data was analyzed by using Epi- Info software. Frequencies and proportions were calculated. Chi-square test was done to find the factors influencing on EBF.

Results

In our study we found that most of the children belonged to 0-5months (34.3%) age group followed by 18-23months (31.8%), 6-11(17.2%)months and

least were found in 12-17 months (16.6%). Majority of the children were females 104(50.2%). Most of the mothers were of 21-25years(52%) followed by 18-20years(26.3%), 26-30years(16.2%), 31-35(4.04%) and >35years(0.5%). Majority of the mothers were Hindus (97%). Most of the mothers were educated and illiterates were only 12.6%. Majority were studied up to Highschool (61.6%) followed by middle school(11.6%), Post high school/Intermediate/Diploma(11.1%), professional degree/honors degree/ postgraduate degree(1.5%), Graduates(1%) and least was primary school (0.5%). Illiterate fathers were more compared to mothers. The pattern of distribution of educational status was similar to mothers educational status and the distribution was as follows High school(23.7%), middle school(16.7%), Post high school/Intermediate/ Diploma(12.1%), Graduate(10.6%), Primary school(7.1%), professional degree(1%). Majority of the mothers were Homemakers(94.4%) and 5.6% were working mothers. Considering fathers occupation, most people belonged to unskilled worker(41.4%) followed by clerical/shop owner/ farmer (29.8%), Skilled(20.2%), Semi-skilled (6.1%) and least were belonged professional(2.5%) category of occupation. Majority of the mothers belonged to Joint family (39.4%) followed by Extended(30.8%) and Nuclear family(29.8%). And majority of the mothers were from Class IV (40.9%) followed by Class V (32.8%) of B G Prasad Socio-economic status classification.

Table1: Distribution of Breastfeeding initiation and Reasons for its delay.

Variables	Frequency (198)	Percent
Breastfeeding Initiation		
Delayed	59	29.8
Normal	139	70.2
Total	198	100
Reasons for delayed Breastfeeding Initiation		
LSCS	26	44.1
Milk was not excreted	17	28.8
Lack of knowledge	06	10.2
Baby in ICU	05	08.4
Difficulty to suck	04	06.8
Premature	01	01.7
Mother unable to feed	01	01.7
Wrong positioning	02	03.4
Breast problems	02	03.4

In our study we found that 70.2% mothers initiated breastfeeding within 1 hour of delivery and 29.8% were delayed. The most common reason for delayed initiation of breastfeeding was LSCS(44.1%) followed by mothers perception of not excreting the milk(28.8%) then lack of knowledge(10.2%) followed by other reasons.

Table 2: Distribution of prelacteal feed and its reasons

Prelacteal feed	Frequency (198)	Percent
Yes	29	14.6
No	169	85.4
Reasons for prelacteal feed	Frequency (29)	Percent
Belief	13	44.8
Unable to feed	14	48.3
Beneficial	01	03.4
Mother not available	01	03.4

In our study we found that 29 (14.6%) mothers practice the prelacteal feed and the most common reasons for introducing prelacteal feed was mother was unable to feed the baby for some reason followed by belief /custom.

Table 3: Distribution of colostrum and Reasons for not giving colostrum

Colostrum	Frequency (198)	Percent
Yes	184	92.9
No	14	7.1
If Colostrum not given reasons	Frequency (14)	Percent
Unable to feed	06	42.8
Custom followed	04	28.6
Unaware of benefits	02	14.3
Influenced by others	02	14.3

In our study we found that 184 (92.9%) mothers fed colostrum and the most common reason for not feeding colostrum was unable to feed which includes mothers perception of milk not secreted or breast problems or medical complications.

Table 4: Distribution of Exclusive Breastfeeding practice and reasons for non-exclusive breastfeeding.

Exclusive Breastfeeding	Frequency (198)	Percent
No	105	53.0
Yes	93	47.0
Reasons for non-exclusive breastfeeding	Frequency (105)	Percent

Conti..Table 4: Distribution of Exclusive Breastfeeding practice and reasons for non-exclusive breastfeeding.

Exclusive Breastfeeding	Frequency (198)	Percent
Milk insufficiency	26	24.8
Lack of Knowledge	50	47.6
Mother's desire	14	13.3
Introduction of water	12	11.4
Medical; complications	02	1.90
Resumption of work	01	0.95

EBF was practiced in 105 (53%) mothers and the most common reason for non-EBF was lack of knowledge 78 (47.6%) and the least reasons were medical complications and resumption of work of mother.

In our study we found that children aged 0-5months and 18-23 months old child, female gender, family belonging to Hindu religion, mother aged between 21-25years, educated up to post high school and homemaker had better EBF practices compared to others. It was statistically significant for gender, father's education and Socio-economic status.

Birth order of 2 and 3 and Birth interval of 3 years had better EBF practice. Preterm child, Early registration of ANC, 7-10 ANC visits during pregnancy, mothers with pregnancy desirability, institutional delivery, low birth weight child had better EBF practices compared to their counter groups. However only early registration of ANCs and ANC visits were found to be statistically significant.

Discussion

Breastfeeding saves lives. An exclusively breastfed infant is 14 times less likely to die from diarrhoea, 4 times less likely to die from respiratory diseases and 3 times less likely to die from other infections as compared to a bottle-fed infant.³

In our study we found that 70.2% mothers initiated breastfeeding within 1 hour of delivery 29.8% were delayed. The most common reason for delayed initiation of breastfeeding was LSCS (44.1%) followed by mothers were not excreted the milk (28.8%). According to DLHS-4 Karnataka breastfed children within one hour of birth in rural area was 65.9% which is slightly less compared to our study⁷. In other studies conducted by H Gladius Jennifer et.al⁸ and Madhu K et.al⁹, results were high compared to our

study with respect to early initiation of breastfeeding at rural area.

The major reason for delay in our study was mothers undergoing LSCS and in a study conducted by Nayak Sunil et.al¹⁰, was uneasiness to mothers and second reason was same as our study. Prolactal feeds were given to 14.6% children which is less compared to other studies conducted by H Gladius Jennifer et.al, Madhu K et.al, and Sugun V et.al.¹¹ In a study conducted by Suguna V et.al, 89.5% mothers fed colostrum which is less compared to our study and the most common reason for not giving colostrum, in our study was mothers unable to feed the child.

EBF was practiced among 47% in our study which is less compared to studies conducted by Mallikarjun H B et.al, 12 and H Gladius Jennifer et.al, but high compared to study conducted by Senthivel V et.al¹³ and Nayak Sunil et.al. The most common reason given by mother for not giving EBF were no knowledge of EBF and not having adequate breastmilk and the reasons were similar in our study.

In our study we found statistical significant factors gender, fathers education, socio-economic status. In a study conducted by Patil Sapna et al¹⁴ and Agho et. al¹⁵ found male child was better breastfed compared to female child which is contrary in our study. Similar results with fathers education was found in Srivastava et al¹⁶ but in other studies by Patil Sapna et al and Ashwini et al mothers education influenced EBF practice. The socio-economic status association was found similar to our study by Ashwini et al¹⁷ and Srivastava et al¹⁶. We also found statistically significant results with antenatal case registration and number of antenatal visits. May be early registration and regular antenatal checkups helped in giving health education related to breastfeeding practices. The similar results with antenatal visits were found in Srivastava et al¹⁶ and Agho et. al¹⁵. The only limitation of the study is recall bias as we had collected the data for infant and young child. The strength of our study is that we have tried to find out the reasons for not practicing proper breastfeeding practices which can be improved by health education.

Conclusion

Majority of the women not practiced EBF practice. The knowledge regarding proper breastfeeding practices has to be emphasized on each antenatal and postnatal visits. The health workers should be

educated regarding adequate IYCF practices in rural areas. Improved socio-economic status can improve breastfeeding practices.

Ethical clearance - Taken from institutional ethical committee

Source of funding - Self

Conflict of Interest - Nil

References

1. WHO 2003. Global Strategy for Infant and Young Child Feeding. Geneva: WHO.
2. Britton C, McCormick FM, Renfrew MJ, et al. Support for breastfeeding mothers. Cochrane Database of Systematic Reviews. 2007; (1)
3. Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services. Geneva: World Health Organization; 2017 (<http://www.who.int/nutrition/publications/guidelines/breastfeeding-facilities-maternity-newborn/en/>).
4. Ministry of Health and Family Welfare. Nutrition in India, National Family Health Survey (NFHS) 2005-06.
5. World Health Organization: Infant and young child feeding; model chapter for textbooks for medical students and allied health professionals. Geneva: World Health Organization; 2009.
6. Gupta A, Kushwaha K. Breastfeeding and complementary feeding. Dehli: Breastfeeding Promotion Network in India; 2015
7. District Level Health And Facility survey (DLHS-4) 2012-13: India, Kanataka: Mumbai: International Institute for Population Sciences 2010; p 85-87. Available from: URL: <http://www.rchiips.org/pdf/rch3/report/ka.pdf>. accessed on 2013 October 28.
8. Jennifer GH. A Cross-sectional Descriptive Study was to Estimate the Prevalence of the Early Initiation of and Exclusive Breast Feeding in the Rural Health Training Centre of a Medical College in Tamilnadu, South India. JCDR. 2012;.
9. Madhu K, Chowdary S, Masthi R. Breast feeding practices and newborn care in rural areas: A descriptive cross-sectional study. Indian J Community Med. 2009;34(3):243.
10. Sunil N, Padodara J, Sushil P, Vaibhav G, Swati P, Vivek C et al. Breast feeding practices in urban community of Surat city. National Journal of Community Medicine 2010;. 2010;1(2):111-113.

11. Suguna V, Geetha L. Evaluation of breast feeding practices in urban area of Khammam, Telangana state. *Int J App Basic Med Res* [Internet]. 2015 [cited 17 October 2015]; 5(2):83-6. Available from: http://www.cibtech.org/J-MEDICAL-SCIENCES/PUBLICATIONS/2015/Vol_5_No_2/17-JMS-051-SUGUNA-EVALUATION.pdf
12. Mallikarjuna H, Banapurmath C, Banapurmath S, Kesaree N. Breastfeeding Problems in First Six Months of Life in Rural Karnataka. *Indian Pediatr.* 2002;39(9):861-4.
13. Senthilvel V, Sumathi S, Singh Z, Jayanthi V. A study on breastfeeding practices among nonworking women in the rural area of puducherry. *Indian J Matern Child Health.* 2011;13(3):1-12.
14. Patil S, Hasamnis A, Pathare R, Parmar A, Rashid A, Narayan K. Prevalence Of Exclusive Breast Feeding And Its Correlates In An Urban Slum In Western India. *IeJSME* [Internet]. 2009 [cited 7 October 2015];3(2):14-8. Available from: http://web.imu.edu.my/ejournal/approved/ejournal_3.2_14-18.pdf
15. Agho K, Dibley M, Ogbonmwan J. Determinants of EBF in Nigeria. *BMC Pregnancy and Childbirth* 2011. 2015;11(2):1-8.
16. Srivastava N, Awasthi S. Breastfeeding practices for newborns among urban poor in Lucknow, northern India: A prospective follow-up study. *clinical epidemiology and global health.* 2013:1-6.
17. Ashwini S, Katti S, Mallapur M. Comparison of breast feeding practices among urban and rural mothers: A cross-sectional study. *International Journal of Medicine and Public Health.* 2014;4(1):120.

Assessment of the prevalence of Hypertension and its association with various risk factors in the rural population of the district Muzaffarnagar

Sangeeta Jain Sharma¹, Lubna Zarin², Umer Farooq³, Dheeraj Sharma⁴,
Santosh Raghav⁵

^{1,2,3,4}Assistant Professor, ⁵Statistician cum Lecturer, Dept. of Community Medicine,
Muzaffarnagar Medical College, Muzaffarnagar U.P.

How to cite this article: Sangeeta Jain Sharma, Lubna Zarin, Umer Farooq, Dheeraj sharma, Santosh Raghav et al. Assessment of the prevalence of Hypertension and its association with various risk factors in the rural population of the district Muzaffarnagar. Volume 13 Issue 3 July-September 2022

Abstract

Background: We are living in a rapidly changing environment. One of the most striking examples of this shift is the fact that NCDs such as Hypertension, Cardiovascular diseases, Cancer, Diabetes and Chronic Lung diseases have overtaken infectious diseases as the world's leading cause of morbidity and mortality. Hence, it is important to know the blood pressure status before target organ damage occurs.

Aim and objectives: This study was designed to Assess the prevalence of Hypertension and its association with various risk factors in the rural population of the district Muzaffarnagar.

Material and Methods: Community based, Cross-sectional study. Simple random Sampling was done to have the sample size of 660. Semistructured, pretested questionnaire and different measurement tools were used to collect the data.

Result: Shows that the prevalence of Hypertension was observed to be 18.9 % (stage i+ stage ii), out of which 13.3 % were in stage i Hypertension and 5.6% were in stage ii Hypertension. Pre-hypertensive constituted 40.2% while 40.9% of study subjects were Normotensive.

Conclusion: There was a significant impact of the risk factors on the prevalence of hypertension and different preventive measures should be advised to prevent and control the epidemic of hypertension.

Keywords: Hypertension, BMI, Central obesity, salt intake

Introduction

Hypertension is an iceberg disease and can be described as the sleeping epidemic which will create havoc when it wakes up. HTN is the third leading killer in the world and responsible for one in every eighth death.¹ The prevalence of Hypertension increases with advancing age to the point where more than half of people aged 60 to 69 years old and approximately three-fourths of those aged 70 years

and older are affected.² The Blood Pressure, which is related to age is primarily responsible for an increase in both incidence and prevalence of Hypertension with increasing age.³

The Global Burden of Disease reported that in 1990 there were 5.2 million deaths from cardiovascular diseases in developed countries and 9.1 million developing countries. Treating raised blood pressure and maintaining it below 140/90 mmHg is associated with a reduction in cardiovascular complications.⁴

The situation in India is much more alarming due to high prevalence and related morbidity and mortality from Hypertension. According to W.H.O. statistics 2014 the prevalence of Hypertension in India was 23% and it is estimated that by the year 2025, the prevalence of Hypertension in urban India to be 29-45% in men and 25-38% in women. The annual loss of approximately US\$ 500 billion due to major non-communicable diseases amounts to approximately 4% of gross domestic product for low and middle-income countries.⁵

The global status on Non- Communicable Diseases Report (2011) has reported that there were more than 2.5 million deaths from CVD in India in 2008, two-thirds due to coronary artery disease and one-third to stroke⁶

Considering the rapid epidemiological transition in India and to see the impact of this among rural population, the current study has been undertaken to know the updated estimate of prevalence of HTN and its associated risk factors among rural population of district Muzaffarnagar.

Aims and Objectives: To Assess the prevalence of Hypertension and its association with various risk factors in the rural population of the district Muzaffarnagar.

Material And Methods: Study design: Community based, cross sectional study. **Study area:** Study was conducted in the catchment area of rural health training centre, village Bilaspur, a field practice area of the Department of Community Medicine, Muzaffarnagar Medical College, District Muzaffarnagar. **Study units:** Individuals 18 years and above. **Inclusion criteria:** Individuals aged 18 years and above, residing in the study area for last one year and who gave informed consent. **Exclusion criteria:** All pregnant ladies. Individuals who were very sick and not willing to be the part of the study. **Sample size:** Considering over all prevalence of Hypertension in rural India to be 17.9%.⁷

$$\text{Sample size (N)} = 4PQ/L^2$$

P=Considered rural prevalence

$$Q = 100 - P$$

L =Permissible error of P (17% of prevalence)

$$N = 634 + 5\% \text{ of } N \text{ (Non-respondent error)} = 634 + 32 = 666$$

However only 4.1% were actual non-respondents, that's why final sample size was 660.

$$634 + 4.1\% \text{ of } N = 634 + 26 = 660$$

Sampling method: There were 1500 registered families at Rural health training Centre. We divided the study area in four zones and listed the houses of the registered families according to the zones. We collected the sample of 165 subjects from each zone and selected the houses of registered families of the concerned zone by random number table and from each house all the subjects who were fulfilling the inclusion criteria were included in the study. We visited the number of houses till we get the desired sample of 165 in one zone and repeated the same in other zones. **Data collection:** Semi structured and pre-tested questionnaire was used to elicit the required information from the study subjects. The questionnaire was pre-tested on (10% of the total sample size). Necessary modifications were made to overcome the difficulties encountered in pre-testing. Manual Mercury Sphygmomanometer was used for Blood Pressure recording and Portable Dial Weighing Machine, Stadiometer, Measuring Tape was used for anthropometry.

Blood Pressure Measurement Technique:

B.P. was measured manually with standardised Mercury Sphygmomanometer. For standardization, we took three B.P. instrument and three readings were taken with each of the three B.P. instrument in one subject, in almost same conditions. The instrument which gave most consistent reading was selected. Blood pressure was measured with the following precautions:

- Sitting posture with back supported, legs uncrossed and extra clothing's removed.
- Arms were relaxed and kept at the level of the heart with arm resting on the table.
- B.P. was measured in left arm.
- Size of the cuff was appropriate.
- Room temperature was comfortable and study subjects were advised to be relaxed and to take 5-minutes rest in sitting position.
- B.P. was measured 1 hour later, if subject gave history of smoking, exercise and caffeine intake.
- Cuff was inflated 30 mmHg above the level

at which radial pulse disappeared and then slowly cuff was deflated at 2mmHg/second and korotkoff sounds were observed with stethoscope placed over the brachial artery.

- The 1st(appearance) and the 5th(disappearance) sounds were recorded as indicative of systolic and diastolic blood pressure.
- Two readings of B.P. were taken in all the patients and three times in those patients who were showing variation of B.P. >10mm of Hg in two readings.
- Mean of all the readings was calculated.

Interpretation of B.P. readings:

Study subjects were labelled as Normotensive, Pre-hypertensive, Hypertensive stage I and Hypertensive stage 2 according to JNC-8 classification (2013)⁸

B.P. Classification	Systolic B.P. (m.m.of Hg)	Diastolic B.P. (m.m.of Hg)
Normal	<120 AND	<80
Pre-Hypertension	120-139 OR	80-89
Stage-1 Hypertension	140-159 OR	90-99
Stage-2 Hypertension	>160 OR	>100

Individuals who were taking anti-hypertensive for the last three months, were considered as known hypertensive, irrespective of their blood pressure level at the time of study.

Anthropometry

1- Height:

- Measured height with stadiometer.
- Back rested straight against the posterior surface of stadiometer with arms by the side of the body. Both the heels were touching the base of the stadiometer with no foot wear.
- Distance between the heel and top most portion of head was measured in centimeters, nearest to 0.5 centimeters.

2-Weight:

- Weight was measured with standardized portable dial weighing machine.

- Scale was set to zero and was rectified, if any error.
- Subjects were asked to stand still with feet 15 centimeter apart, with minimum clothing and no foot wear.
- Weight was measured to the nearest of 0.5 kilogram.

3-Waist circumference:

All upper clothing was kept above the waist, arms were crossed and hands were placed on the opposite shoulders and marked the highest point of lateral iliac border on both the sides and waist circumference was measured at this level by non-elastic measuring tape in centimeters.

4- Hip circumference:

Hip circumference was measured at the level of maximum protuberance of hips by non-elastic measuring tape, in standing position.

Variables studied: a. Dependent variables: Systolic and Diastolic blood pressures. b. independent variables: Age, dietary habits, amount of salt intake, level of physical activity, family history of Hypertension and Diabetes, smoking, alcohol consumption and obesity. Statistical analysis: Data entry and statistical analysis was performed by using MS excel and SPSS window version of 22.0 software. Interpretation and analysis of the study was done by using Chi-square test. P value was calculated to see the statistical association. If the P value was less than 0.05, association was considered as significant

Approval: Prior written approval was taken from institutional ethical committee and verbal consent was taken from the study subjects.

Study duration: About one and half year (01/03/2016 to 28/08/2017).

Results: This study was undertaken with the objectives to estimate the prevalence of HTN and association of risk factors with Hypertension. Results that have been drawn from the observations are as follows:

- Prevalence of Hypertension was observed to be 18.9 %, out of which 13.3 % were in stage I Hypertension and 5.6% were in stag II Hypertension. 40.2 % were pre hypertensive and 40.9% were normotensive. (Table-1, Fig.-1)

- Prevalence of Hypertension was more in alcoholics, i.e., 37.3% as against 13.1% in non-alcoholic. This association was statistically significant. (Table-2)
- Prevalence of Hypertension was more in smokers, i.e., 58.6% as against 3.5% in non-smokers and the association was statistically significant. (Table-2)
- In the total study population, prevalence of Hypertension was more among sedentary workers as compared to heavy workers. This association that the Hypertension is higher in sedentary population was significant. (Table-2)
- Prevalence of Hypertension was more in non-vegetarians, i.e., 23.7% as against 14.9% in vegetarians (Table-2).
- It was revealed that Hypertension is more in study subjects in whom salt consumption was 5 gm or >5gm i.e., 20.1% as against 12.0% in study subjects in whom salt consumption was <5gm. This association was statistically non-significant as value of $p > 0.05$ (Table-2).
- There were 8% of study subjects, who gave positive family history of Diabetes and out of these 49.1% were hypertensive. 14% study subjects show positive family history of Hypertension and out of these 34.8% were Hypertensive. There were 13.5% study subjects who gave positive family history of Diabetes and Hypertension both and among those 58.4% were Hypertensive. The association between positive family history of Hypertension and Diabetes and prevalence of Hypertension among study subjects was significant as the value of p was < 0.05 . (Table-3)
- In the total study population, prevalence of Hypertension in obese subjects found to be 61.9%, as against 36.8%, 17.1% and 13% in pre-obese, normal and underweight respectively. These differences were statistically highly significant. (Table-3)
- In the total study population, prevalence of Hypertension in study subjects with WHR > cut off value was found to be 53.8% and in study subjects with WHR \leq cut off value was found to be 14.2%. This observation was statistically highly significant. (Table-3)
- Study shows that the prevalence of Hypertension in age group of 60 years and above was 46.5% and there was increasing trend of prevalence of Hypertension with age, which was statistically highly significant as value of p was < 0.05 . (Table-3)

Discussion

This study was undertaken to estimate the prevalence of Hypertension, and association of risk factors in the Rural area of District Muzaffarnagar. Studies are not available in the District Muzaffarnagar in regard to this topic but many studies have been conducted regarding the same, in other Districts of Uttar Pradesh and other states. There are some similarities as well as some variations observed between the result of this study and the studies conducted by others on the same topic, which is discussed here as follows.

In our study, the overall prevalence of HTN is 18.9%. Our study reported a prevalence towards lower side when compared to other studies by Bharadwaj et al, who reported the prevalence of 30% among rural inhabitants.⁹ Yadav et al, who reported the prevalence of Hypertension as 32.2%.¹⁰

The prevalence rates of HTN are variable from place to place depending on the cut-off point for Hypertension used and the method employed in measurement of blood pressure. Mohan et al from Chennai have shown prevalence of HTN to be 20%.¹¹ Gupta et al have shown a prevalence of 21.1% in rural India, which is almost at par with our study.¹² The prevalence of 14.5% in rural Lucknow is comparatively lower than our study.

Our study shows that around half of the population was in pre HTN group (40.2%). These participants in pre HTN stage are of great interest, since chances of progression to HTN is high. Studies have already established that relationship between BP and risk of cardiovascular disease is continuous, consistent and independent of other risk factors and pre-hypertensive have a greater chance to go in to HTN.

Our study reveals higher prevalence of Hypertension in alcoholics, smokers, obese, non-vegetarians, elderly and sedentary life style subjects. The prevalence of Hypertension among vegetarians was lesser as compared to non-vegetarians in our study. This finding is in line with finding of Bhadoria et al who also reported prevalence of HTN more in non-vegetarians than vegetarians.¹³ In our study,

only 3.3% study subjects were obese. The prevalence of HTN in obese subjects was 61.9% which is much higher from the studies by Vimal et al and Rodger et al.^{14,15}

Prevalence of Hypertension is directly related to the increased salt intake and in our study 20.1% were hypertensive with an intake of >5gm/day. Findings of our study were in line with study of Radhika et al who reported an association of HTN with excess salt intake in south Indian population. Most studies have also reported that there are several communities whose intake of sodium chloride is 3 g or less per day have low average blood pressure. When these people migrate to communities where the daily salt intake is 7 to 8 g, their blood pressure increases proportionately due to exposure to new social environments with changes of dietary habits. Radhika found that mean dietary salt intake (8.5 g/d) in the population was higher than the recommended by the World Health Organization (< 5 g/d). This study also revealed that there was higher salt intake among elderly persons and higher income group population. Studies also showed that compared to zero added salt (38.5% vs 23.3%, $p < 0001$), addition of salt > 1 teaspoon/day at the dining table was associated with a higher prevalence for Hypertension. The INTER SALT study of 10079 men and women at 52 centers from 32 countries projected that a 100 umol/day lower sodium intake over a lifetime would result in a 9 mmHg smaller rise in systolic pressure from 25 to 55 years age. The INTER SALT study also demonstrated a clear relationship between salt intake and *level* of blood pressure among communities. The study of railway employees in India, with 15.2% Hypertension in south Indians and 6.2% in north Indians with twice/as much salt intake in the north than in the south, the results are totally at variance with the accepted views.^{16,17,18,19}

Table 1: Prevalence of hypertension in study subjects as per JNC-8 criteria

Classification of Hypertension	Total (N=660)	
	No.	%
Normal	270	40.9
Pre-HTN	265	40.2
Stage I HTN	88	13.3
Stage II HTN	37	5.6
Total HTN=13.3 +5.6 =18.9%		
Total	660	100

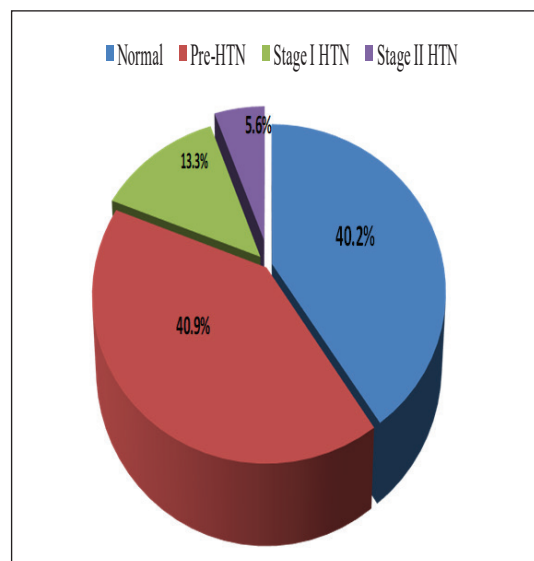


Fig 1: Prevalence of hypertension in study subjects as per JNC-8 criteria

Table 2: prevalence of hypertension in study subjects having risk factors of addiction, physical inactivity and diet (N=660)

Risk factors	HTN Absent(n=535)		HTN Present (n=125)	
	No.	%	No.	%
1-Alcohol				
Present(n=158)	99	62.6	59	37.4
Absent(n=502)	436	86.9	66	13.1
$\chi^2=45.821$, $df=1$, $p=0.00001$, Highly significant				

Conti.. Table 2: prevalence of hypertension in study subjects having risk factors of addiction, physical inactivity and diet (N=660)

2-Smoking				
Smokers(n=184)	76	41.4	108	58.6
Non-smokers(n=476)	459	96.5	17	3.5
$\chi^2=262.657, df=1, p=0.00001, \text{Highly significant}$				
3-Physical Activity				
Heavy Worker(n=96)	84	87.5	12	12.5
Moderate(n=320)	269	84.1	51	15.9
sedentary(n=244)	182	74.5	62	25.5
$\chi^2= 11.12, df=2, p=0.0038, \text{Significant}$				
4-Dietary Habits				
Non-Vegetarian(n=303)	231	76.3	72	23.7
Vegetarian(n=357)	304	85.1	53	14.9
$\chi^2= 8.48, df=1, p=0.003, \text{Significant}$				
5-Amount of salt intake				
< 5 gms (n=98)	86	88	12	12
5 gms or >(n=562)	449	79.9	113	20.1
$\chi^2 = 3.359, df=1, p=0.0668, \text{non-Significant}$				

Table 3: Prevalence of hypertension in the subjects having the risk factors of positive family history of HTN and diabetes, obesity, and advanced age (N=660)

Risk factors	HTN Absent(n=535)		HTN Present(n=125)	
	No.	%	No.	%
1-Family history of diseases				
Diabetes(n=53)	27	50.9	26	49.1
HTN(n=92)	60	65.2	32	34.8
Diabetes& HTN (n=89)	37	41.6	52	58.4
Absent(n=426)	411	97.0	15	3.0
$\chi^2=123.97, df=3, p=0.0001, \text{Significant}$				
2--BMI				
≥ 30 (n=21)	8	38.1	13	61.9
25 - 29.9(n=57)	36	63.2	21	36.8
18.5 - 24.9(n=327)	271	82.9	56	17.1
<18.5(n=255)	220	87	35	13
$\chi^2=42.367, df=3, p=0.0001, \text{Significant}$				
3-WHR				
$\geq \text{Normal}$ (n=78)	36	46.2	42	53.8
<Normal (n=582)	499	85.8	83	14.2

Conti..Table 3: Prevalence of hypertension in the subjects having the risk factors of positive family history of HTN and diabetes, obesity, and advanced age (N=660)

Risk factors	HTN Absent(n=535)		HTN Present(n=125)	
	No.	%	No.	%
$\chi^2=70.20$, $df=1$, $p=.00001$, Highly significant				
4-Age in years				
<20 (n=61)	60	98.4	1	1.6
20-30 (n=203)	183	90.2	20	9.8
30-40 (n=191)	168	88	23	12
40-50 (n=109)	71	65.1	38	34.9
50-60(n=53)	30	56.6	23	43.4
60& above(n=43)	23	53.5	20	46.5
$\chi^2=86.61$, $df=5$, $p =0.00001$, Highly Significant				

Abbreviations

B.P.	Blood pressure
BMI	Body mass index
CVD	Cardio vascular disease
CHD	Congestive heart disease
HTN	Hypertension
JNC	Joint national committee
NCD	Non-communicable diseases
WHO	World health organization
WC	Waist circumference
WHR	Waist to hip ratio

Conclusions

This study was undertaken with the objectives to estimate the prevalence of Hypertension and assessment of specific risk factors. Prevalence of Hypertension was observed to be 18.9 %, out of which 13.3 % were in stage I Hypertension and 5.6% were in stag II Hypertension. Prevalence of Hypertension was more in elderly, alcoholics, smokers, non-vegetarians, sedentary population, obese and persons with high WHR and subjects with higher intake of the salt, and these association was mostly statistically significant.

Recommendations

Indian health system is challenged with increasing prevalence of non-communicable diseases and HTN

being one of the major. This urges a strong need to improve health care at policy, community and family level by incorporating prevention, surveillance, treatment and appropriate management. One factor which can help is by regular re-training, enhancement and upgrading skills of health care professionals providing Hypertension related care. Thus, control of HTN can provide an access point in reduction of other cardio vascular disease mortality. Population based interventional approaches like reduction of salt intake, tobacco avoidance and regular physical activity can be incorporated in the control programs.

Declarations: Acknowledgement: The authors thanks village Pradhan and study subjects of the area for granting permission to carry out the study and for their co-operation. **Funding:** We did not

receive external funding for this research. **Competing interests:** All authors declare that they have no competing interests towards this study.

Bibliography

- Shah et al Hypertension and its determinants among adults in high ... - Nature www.nature.com/jhh/journal/v15/n2/pdf/1001131a.pdf?origin...detail Journal of Human Hypertension. 2001; 15:107-112.
- Burt VL et al. Trends in the prevalence, awareness, treatment and control of Hypertension in the adult US population. 1960 to 1991. Hypertension 1995; 26:60-69.
- Franklin SS, Gustin W, Wong ND, Larson MG, Weber MA, Kannel WB, et al. Hemodynamic patterns of age-related changes in blood pressure. The Framingham Heart Study. 1997; 96:308-315.
- World Health Organization. Global Health Repository. Available from: URL: <http://www.who.int/gho/ncd/>.
- WHO World Health Statistics 2014-World Health Organization www.who.int/gho/publications/world_health_statistics/2014/en/
- Reddy, S.S., & Prabhu, G.R. (2005). Prevalence and risk factors of Hypertension in adults in an urban slum, Tirupati, Andhra Pradesh. Indian Journal of Community Medicine, 2005; 30: 84-86.
- Midha T, Idris MZ, Saran RK, Srivastav AK, Singh SK. Prevalence and determinants of Hypertension in the urban and rural population of a north Indian district. East Afr J Public Health. 2009; 6:268-73.
- Journal of the American Medical Association December, 18, 2013 <http://jama.jamanetwork.com/article.aspx?articleid=1791497> Endorsed by the AAFP, July 2014: <https://www.aafp.org/patient-care/clinical-recommendations/all/highbloodpressure.html>
- Bhardwaj sumit Hypertension 1995; 26: 886-890. 6: 60-69. pISSN: 0976 3325 eISSN: 2229 6816 National Journal of Community Medicine Vol 3 Issue 2 April-June 2012 Page 213 original article prevalence, awareness, treatment and control of Hypertension among the people above 15 years in rural area Nagpur Maharashtra.
- Yadav S, Boddula R, Genitta G, Bhatia V, Bansal B, Kongara S, et al. Prevalence and risk factors of preHypertension and Hypertension in an affluent north Indian population. Indian J Med Res. 2008; 128:712- 20. Bhardwaj sumit Hypertension 1995; 26: 886-890. 6: 60-69. pISSN: 0976 3325 eISSN: 2229 6816 National Journal of Community Medicine Vol 3 Issue 2 April-June 2012 Page 213 original article prevalence, awareness, treatment and control of Hypertension among the people above 15 years in rural area Nagpur Maharashtra.
- Mohan V, Deepa M, Farooq S, Datta M, Deepa R. Prevalence, awareness and control of Hypertension in Chennai – The Chennai Urban Rural Epidemiology Study (CURES-52).
- Gupta, R., Deedwania, P.C, Achari, V., Bhansali, A., Gupta, B.K., Gupta, A., et al. (2013). Normotension, preHypertension and Hypertension in urban middle-class subjects in India: prevalence, awareness, treatment and control. American Journal of Hypertension, 26(1): 83-94.
- Bhadoria et AL, Prevalence of Hypertension and associated risk factors in central India, J. Fam com med 2014; 21:29-38.
- Vimala A, Ranji SA, Jyosana MT, Chandran V, Mathews SR, Pappachan JM. The prevalence, risk factors and awareness of Hypertension in an urban population of Kerala [South India]. Saudi J Kidney Dis Transpl. 2009; 20:685-9.
- Rodger RA, Lawes CM, Gaziano T, Vos T. The growing burden of risk from high BP, Cholesterol and body weight. In Disease Control Priorities in Developing World. Jamison DT, Breman JG, Measham AR, Alleyne G, Claeson M, Evans DB, Jha P, Mills A, Musgrove P. editors. Oxford: Oxford University Press; 2006: 851-68.
- Radhika G, Sathya RM, Sudha V, Ganesan A, Mohan V. Dietary Salt Intake and Hypertension in An Urban South Indian Population - [CURES - 53] J Assoc Physicians India. 2007; 55:405-11
- Stamler R. Implications of INTERSALT study. Hypertension 1991; 17(Suppl 1): 1017-1020. Elliot P, Stamler J, Nichols R, et al. INTERSALT Cooperative Research Group. INTERSALT prevalence of Hypertension amongst women.
- Chintha K, Srikrishna MP. Prevalence of Hypertension among Adult Rural Population. N J Res in Community Medicine. 2014; 3:205-7.s
- Chockalingam S, Jayalakshmi R, Chockalingam A. WHL News Letter 69/2000-Scientific News Prevalence of Hypertension in a rural town in Tamilnadu.

A Case Series of Uterine Prolapse in Pregnancy

Shreedevi S Kori¹, Dayanand S Biradar², Rajasri G Yaliwal³,
Subhashchandra R Mudanur⁴, Vaishnavi Malji⁵

¹Associate Professor in OBG, BLDE(DU) Shri BM Patil Medical College, Hospital and Research Center, Vijayapura, Karnataka, India

²Associate Professor in GENERAL SURGERY, BLDE(DU) Shri BM Patil Medical College, Hospital and Research Center,
Vijayapura, Karnataka, India

³Professor in OBG, BLDE(DU) Shri BM Patil Medical College, Hospital and Research Center, Vijayapura, Karnataka, India

⁴Professor OBG, BLDE(DU) Shri BM Patil Medical College, Hospital and Research Center, Vijayapura, Karnataka, India

⁵Post Graduate in OBG, BLDE(DU) Shri BM Patil Medical College, Hospital and Research Center, Vijayapura, Karnataka, India

How to cite this article: Shreedevi S Kori, Dayanand S Biradar, Rajasri G Yaliwal, Subhashchandra R Mudanur, Vaishnavi Malji et al. Title of the article: A Case Series of Uterine Prolapse in Pregnancy. Volume 13 Issue 3 July-September 2022

Abstract

Pelvic organ prolapse is a common gynecological problem in developing countries, but pelvic organ prolapse occurrence in pregnancy is a rare phenomenon. We present a case series of pelvic organ prolapse during pregnancy. All four cases were treated conservatively. Half of the patients had cesarean sections and the other half delivered vaginally. One of the cases of cesarean section was done in view of cervical dystocia. Of the four cases, half presented with early rupture of membranes. There was one patient who delivered prematurely at 36 weeks of gestation. The postnatal period was uneventful and the prolapse regressed in all patients spontaneously.

Keywords: Pregnancy, Prolapse, pessary

Introduction

Pelvic organ prolapse is a common gynecological problem in developing countries, but pelvic organ prolapse in pregnancy is a rare phenomenon. Uterine prolapse is the descent of one or more of the pelvic organs (including the bladder, uterus, small bowel and rectum) from their normal fixed anatomical position into the vaginal canal¹. The mean prevalence is 19.7% [range 3.4-56.4%]².

Pelvic organ prolapse during pregnancy is very rare with an estimated incidence of 1 per 10,000-

15,000 deliveries³. Its association with pregnancy is rare and can lead to obstetric complications. These can arise in the antepartum, intrapartum or postpartum periods of pregnancy. Antenatal complications can range from minor cervical infection to spontaneous abortion, and even preterm labor⁴. Intrapartum complications include problems with cervical dilatation, presence of ulcerations or lacerations over the cervix and prolonged labor, obstructed labor, uterine rupture and even death³. In most cases spontaneous vaginal delivery occurs but some situations may require emergency intervention

Corresponding Author: Rajasri G Yaliwal

Professor in OBG

BLDE(DU) Shri BM Patil Medical College, Hospital and Research Center, Vijayapura, Karnataka, India

Email: ryaliwal@bldedu.ac.in

Mobile No: +91 98451 52240

with cesarean delivery. Preexisting POP usually resolves spontaneously during the second trimester of pregnancy, whereas prolapse occurring during pregnancy usually presents during second trimester and can worsen progressively if left unattended⁵. We hereby report four cases of pelvic organ prolapse (POP) during pregnancy.

Case 1

A 28-year-old gravida 3 para 2 living 1 death 1 with a body mass index (BMI) of 18.10kg/m² visited the hospital during 10 weeks of pregnancy with a prolapsed uterus on 4th of February 2018. Pelvic examination revealed a stage 3 (by POP Q classification) pelvic organ prolapse. Standing or walking increased the prolapse while bed rest resolved it. Hospitalization was advised for the patient but she refused and wanted to manage conservatively at home. Her previous pregnancy history consisted of a stillbirth female baby that was born at 34 weeks in 2016, puerperium period was uneventful and two days later she was discharged in good health. She had her second vaginal delivery after nine hours of labor at 38 weeks of gestation in 2017. A 2800gms live baby boy was delivered with Apgar score of 10/10. No history of pelvic trauma or prolapse was present in either of the two previous pregnancies. The women continued to take her antenatal care at our institute. She presented at 39 weeks 6 days of gestation spontaneous labor pains and a history of early rupture of membranes. On pelvic examination, the prolapsed uterus was pink in color, edematous, showed ulceration and keratinization along the posterior lip of the cervix. Due to prolonged labor and non-reassuring fetal heart rate, a decision was made for emergency cesarean delivery and a live baby girl with birth weight of 3160 grams was delivered. Post operatively; the lesions and edematous tissue were treated with daily dressings of magnesium sulfate and glycerin packs. The prolapsed uterus was manually repositionable inside the pelvic cavity by one week and completely resolved by a month.

Case 2

A 34-year-old gravida 3 para 2 living 2 with a body mass index (BMI) of 21.20 kg/m², noticed a mass, protruding from the vagina in the 15th week of her pregnancy in 2015. Her previous two deliveries were uncomplicated spontaneous full-term vaginal

deliveries, one in 2010 and the other in 2013. Both babies weighed over three kgs and there was no past history of pelvic trauma, stress incontinence, or prolapse during or following the pregnancies. Patient complained of a mass being felt on movement but not at rest. She visited the hospital in her 16th week of gestation in 2015 with complaints of worsening discomfort associated with the uterine prolapse. Pelvic examination revealed a stage 3 uterine prolapse (POP-Q classification) with minimal edema and no signs of ulcerations. After manual repositioning of the prolapse, a no. 5 ring pessary in size of 7 x 7 cm was placed behind the cervix into the posterior fornix and it was periodically replaced. The pessary was removed at 39th week of pregnancy following spontaneous rupture of membranes. She delivered vaginally, a live healthy baby boy of 2860 kgs birth weight with an Apgar score of 10/10 on 25th of September 2015. At the time of discharge three days after delivery, the patient's uterine prolapse was completely resolved.

Case 3

A 30-year-old gravida 2 para 1 living 1 with body mass index (BMI) of 22.36 kg/m² presented to our institute at 18 weeks of gestation with complaints of a mass descending out from the vagina since the last five days. Her first pregnancy had prolonged second stage of labor and required the use of forceps to deliver a 3450 kgs baby boy. There was no previous history of pelvic organ prolapse prior to or after her first delivery. On examination a uterine prolapse was noted, cervix was extended about four centimeters beyond the hymen (POP-Q stage 3). Cervix showed signs of moderate congestion with no ulceration. Patient was admitted and managed conservatively with daily dressings with magnesium sulphate to reduce the congestion and prolapse was managed with insertion of an appropriately sized vaginal pessary. After congestion was reduced patient was discharged and presented to hospital again at 37 weeks + 2 days with symptoms of labor. She delivered a live healthy female baby of birth weight 3104 grams on 15th of March. Intrapartum and postpartum periods were uneventful. One month follow up after delivery showed reduction in size of the prolapse to stage 1 (POP-Q classification) which was managed conservatively with daily Kegel's exercises. On a three-month postpartum follow-up prolapse had completely resolved and she did not require further management.

Case 4

A 27-year-old gravida 2 para 1 living 1 was admitted to our institute after going into spontaneous labor following premature rupture of membranes at 36 weeks 2 days of gestation with an irreducible uterine prolapse. Her previous pregnancy was a normal vaginal delivery at term. A healthy baby boy of birth weight 3150 grams was delivered. There was no history of prolapse, pelvic trauma and stress incontinence during or after the pregnancy. In her current pregnancy the patient did not have any antenatal visits and only complained of a lump protruding from the vaginal opening from the last two weeks.

Pelvic examination was done with patient in lithotomy position. It revealed a stage 3 uterine prolapse (POP-Q classification). No signs of ulceration or desiccations were noted. As vaginal delivery was not possible due to cervical dystocia, patient was taken up for cesarean delivery. A live female baby of birth weight 2308 grams was delivered. On postpartum day four the patient was discharged. At that time cervical prolapse had completely resolved. A follow up examination done one month after delivery confirmed that there was no recurrence of the uterine prolapse.

Discussion

Uterine prolapse is the gradual downward displacement of the uterus into the vaginal canal due to weakening and stretching of the muscles and ligaments of the pelvic floor⁷. Initially the incidence was higher, but with a gradual decrease in parity and a gradual increase in cesarean sections, the incidence has reduced⁸.

The etiology behind prolapse in pregnancy is multifactorial. Parity, malnutrition, race, vaginal delivery, short interval between consecutive pregnancies, increased strain on the support of the uterus and normal physiological changes in pregnancy causing cervical elongation can all play a major role in causation³.

The cases that we have reported were taken from 2016 to 2020. All four cases reported were multiparous women. Literature suggests that multiparous women have a greater displacement of vaginal tissue compared to nulliparous women, and the vaginal wall muscularis is thinner and has a greater elastic fiber

content compared to that in nulliparous women⁸. This predisposes multiparous women to a higher incidence of uterine prolapse. In the first case, the patient had a previous history of prolonged labor. Prolonged, or difficult delivery is one of the most prominent causes in the genesis of uterine prolapse⁹. In the second stage of labor there is a progressive descent of the fetal head caused by strong forceful uterine contractions. These contractions increase the intrauterine pressure and when associated with further maternal bearing down, can further increase the intrauterine pressure to a level as high as 19 kPa. When this stage of labor becomes prolonged it can lead to ischemic necrosis of the pelvic tissues (including nerves and muscles) and stretch injuries that may be a risk factor for later developments of pelvic floor disorders¹⁰.

None of the patients in this case series had symptoms of urinary incontinence. All four cases presented with features of pelvic heaviness and mass sensation of per vaginam. Most cases present in the third trimester with an acute onset of symptoms that disappear after delivery. In other case reports, the main symptoms that the patients presented with were pelvic heaviness, lower backache, and urinary tract symptoms such as the inability to pass urine or increased urinary urgency⁹.

In our case series, two patients who presented with vaginal prolapse in the second trimester were treated with vaginal ring pessary. For uterine prolapse, treatment options are very limited but most cases are best managed when they present early on in the antenatal period as in two of our cases. Conservative management of antenatal uterine cervical prolapse is consisting of genital hygiene and bed rest in a slight Trendelenburg position¹¹. As surgical management is not feasible in pregnancy, a vaginal pessary can be an alternate option. These devices are usually made of silicone and come in a variety of shapes and sizes. They are inserted in the vagina to prevent the uterus from prolapsing out of the vagina. As long as they are properly fitted using the correct size, cleaned and replaced at least every three to six months, most of the complications associated with pessaries can be avoided. These complications include vaginal discharge, bleeding, erosion, pain and constipation¹².

During the time of delivery, most cases of uterine prolapse do not inhibit the patient from vaginal delivery. Two of the four cases reported delivered vaginally without any complications in the intrapartum or postpartum periods. The two cases

where emergency section was required were due to prolonged labor, fetal distress, and the presence of cervical dystocia. Cervical dystocia is one of the dreaded complications of prolapsed uterus during labor, with a high rate of maternal and fetal morbidity and mortality¹³. This can occur due to the inability to maintain appropriate cervical dilatation due to a prolapse¹⁴.

Conclusion

Pelvic organ prolapse in pregnancy, although rare, can affect the quality of life for a pregnant women. Understanding the etiology and focusing on conservative management during the antenatal period of pregnancy can help alleviate the symptoms and reduce complications associated with prolapse in pregnancy. Ultimately, when properly managed these patients can undergo a normal, uncomplicated, spontaneous vaginal delivery with an outcome of a healthy baby.

Ethical clearance - Ethical committee BLDE university, Shri B M Patil Medical college Hospital, Research centre

Source of funding - Nil

Conflict of Interest - Nil

References

1. Gray TG, Radley SC. Pelvic organ prolapse. In *Urologic Principles and Practice 2020* (pp. 487-497). Springer, Cham.
2. Zeng C, Yang F, Wu C, Zhu J, Guan X, Liu J. Uterine prolapse in pregnancy: two cases report and literature review. *Case Reports in Obstetrics and Gynecology*. 2018 Oct 22;2018.
3. Tsikouras P, Dafopoulos A, Vrachnis N, Iliodromiti Z, Bouchlariotou S, Pinidis P, Tsagias N, Liberis V, Galazios G, Von Tempelhoff GF. Uterine prolapse in pregnancy: risk factors, complications and management. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2014 Feb 1;27(3):297-302.
4. Horowitz ER, Yogev Y, Hod M, Kaplan B. Prolapse and elongation of the cervix during pregnancy. *International Journal of Gynecology & Obstetrics*. 2002 May;77(2):147-8.
5. Yogev Y, Horowitz ER, Ben-Haroush A, Kaplan B. Uterine cervical elongation and prolapse during pregnancy: an old unsolved problem. *Clinical and experimental obstetrics & gynecology*. 2003 Jan 1;30(4):183-5.
6. Emmerson S, Young N, Rosamilia A, Parkinson L, Edwards SL, Vashi AV, Davies-Tuck M, White J, Elgass K, Lo C, Arkwright J. Ovine multiparity is associated with diminished vaginal muscularis, increased elastic fibres and vaginal wall weakness: implication for pelvic organ prolapse. *Scientific reports*. 2017 Apr 4;7(1):1-3.
7. De Vita D, Giordano S. Two successful natural pregnancies in a patient with severe uterine prolapse: A case report. *Journal of Medical Case Reports*. 2011 Dec;5(1):1-3.
8. Memon HU, Handa VL. Vaginal childbirth and pelvic floor disorders. *Women's health*. 2013 May;9(3):265-77.
9. Abdalla A. Genital Prolapse at the End Term of Pregnancy: A Case Report. *Gynecology & Obstetrics Case Report*. 2017;3(2):0-.
10. Bureau M, Carlson KV. Pelvic organ prolapse: a primer for urologists. *Canadian Urological Association Journal*. 2017 Jun;11(6Suppl2):S125.
11. Verma ML, Tripathi V, Singh U, Rahman Z. Salvage from cervical dystocia in third degree uterovaginal prolapse: Duhrssen's incision. *BMJ Case Rep*. 2018 Feb 14;2018:bcr2017223821.
12. Atilgan AE, Altuntaş SL. Pregnancy with preexisting total uterine prolapse. *Clin. Med. Rev. Case Rep*. 2020;7:315.

Assessment of Third Molar Impaction Pattern in the Mandible and in the Maxilla

Pratik Rupakar¹, Jignesh Maheswari², Sanjay Yadav³, Darshan Dudhat⁴,
Krishna Shah⁵, Shrikant Patel⁶

¹PhD scholar, Gujarat University & Associate Professor, Department of Dentistry, G.M.E.R.S. Medical College & Hospital, Gandhinagar, Gujarat

²Assistant Professor, Department of Dentistry, Banas Medical College and Research Institute, Palanpur, Gujarat

³Second Year Post-graduate, Department of Oral & Maxillofacial pathology, Government Dental College and hospital, Ahmadabad, Gujarat

⁴American Dental Design, United States, ⁵BDS, Private Practitioner, Gandhinagar, Gujarat

⁶Reader, Department of Oral & Maxillofacial pathology, Pacific Dental College, Udaipur, Rajasthan

How to cite this article: Pratik Rupakar, Jignesh Maheswari, Sanjay Yadav, Darshan Dudhat, Shrikant Patel, Krishna Shah et al. Assessment of Third Molar Impaction Pattern in the Mandible and in the Maxilla. Volume 13 Issue 3 July-September 2022

Abstract

Aim: The aim of this study was to compare characteristics of erupted and impacted third molars in the mandible and the maxilla using quantitative measurements and determine any relationship between the eruption/impaction pattern of third molars in both jaws with available eruption space and tooth inclination.

Material and Methods: Patients who visited to the Department of Oral and Maxillofacial Surgery at tertiary care institute of India were screened for eligibility to join our study. The eruption status of the third molars in both jaws were examined on orthopantomographs by measuring the distance from the line tangent to the highest points of occlusal cusps of the third molar to that of the adjacent second molar. The presence of available space for the eruption was determined by the ratio of the mesiodistal length of the third molar crown to the length of the alveolar arch distal to second molars.

Results: There was sufficient space for the eruption of third molars in 17.6% of the cases in the mandible as opposed to 61.7% of the cases in the maxilla. In the mandible, 37.7% of third molars were in vertical position, 37.1% were in mesioangular position, and 19.9% were in distoangular position. In the maxilla, 62.5% of third molars were in vertical position and 33.12% were in distal inclination. The presence of favorable parameters does not warrant full eruption of third molars in both jaws.

Conclusion: Removal of impacted third molars is the most commonly employed procedure in oral surgery practice. Pain and pericoronitis were the most common symptoms usually associated with level A impaction and vertical position.

Keywords: impacted third molars, Mandible, Maxilla, Pericoronitis

Corresponding Author: Pratik Rupakar

22, Shiv Darshan Bunglows, B/H Swagat Rail Forest-1,
Por-kudasan road, Kudasan, Gandhinagar.-382421

E-mail: researchguide86@gmail.com, pratikrupakar@yahoo.com

Introduction

Tooth impaction is a pathological situation in which a tooth cannot or will not erupt into its normal functioning position.¹ In human dentition, the third molars have the highest impaction rate of all teeth. The major factors related to tooth impaction are lack of space, limited skeletal growth, increased crown size and late maturation of the third molars.² Although impacted third molars may remain symptom free indefinitely, they could give cause for various symptoms and pathologies, such as pericoronitis, pain, swelling, distal caries, bone loss, root resorption of adjacent teeth, odontogenic cysts and tumors.³ It is considered that the occurrence of pathology resulting from impaction has a multifactorial origin.⁴ Eruption status, position and angulation have an impact on these symptoms.⁵

Third molar impactions are rarely observed after second molar extraction, suggesting an increase in eruption space.⁶ Recent studies have also demonstrated that premolar extraction therapy as part of orthodontic treatment leads to a reduced frequency of third molar impaction in both the maxilla and mandible.⁷

There have been a number of reports on the association of third molar impaction with the available space for an eruption in the alveolar arch and with the inclination of the teeth.⁸⁻¹¹ A deficiency of space in the alveolar arch and/or unfavorable inclination of third molar have been the chief factors implied in the failure of third molars to erupt. However, studies on these two factors have been mainly on the mandible with scarce reports comparing both of the jaws.^{9,10} Moreover, most of the studies used the Pell and Gregory classification system for the vertical and horizontal impaction level and Winter classification system for the angulation. These traditional classification systems utilize the anatomical landmarks as a reference point and are subjective. Although a high level of intra and interexaminer agreement was achieved for classification of inclination of third molars by the Winter criteria, the classification of third molars following the Pell and Gregory criteria were shown to lack both intra and interexaminer reproducibility.¹²

The aim of this study was to compare characteristics of erupted and impacted third molars in the mandible and the maxilla using quantitative measurements and determine any relationship between the eruption/impaction pattern of third molars in both jaws with available eruption space and tooth inclination.

Material and Methods

Patients who visited to the Department of Oral and Maxillofacial Surgery at tertiary care institute of India were screened for eligibility to join our study. Those over 20 years of age and those who had orthopantomographs for radiographic examination were selected by retrospectively. The exclusion criteria of the study were tooth agenesis other than third molars; previous extraction of any permanent teeth (including third molars); previous orthodontic treatment, dentoalveolar surgery or maxillofacial trauma; developmental anomalies such as ectodermal dysplasia, cleft lip or plate; asymmetric deformity on the face; and radiographs of poor quality.

A total of 500 individuals, who met the inclusion/exclusion criteria and agreed to join the study, were included. Ethical approval was taken from the institutional ethical committee and written informed consent was taken from all the participants.

Orthopantomographs were examined to determine the presence of third molars. Where present, measurements were performed for spatial positioning of third molars.

Retromolar space width was calculated as the distance from distal contact point of the lower second molar to the junction of the anterior border of the ramus with the body of the mandible, landmarked as intersection of the mandibular occlusal plane with the anterior border of ramus. Tuber space width was calculated as the distance from the distal contact point of the upper second molar to the line tangent to the posterior wall of the maxilla. Crown width of the third molars was determined by measuring the greatest distance between the mesial and distal surface of the crown. The presence of sufficient space for the eruption was calculated by the ratio of eruption space width in the maxillary and the mandibular alveolar arch to the third molar crown width. A classification was made accordingly: a ratio of at least 1 indicating available space; a ratio of 1-0.67 indicating a mild lack of space; a ratio of 0.66-0.33 indicating a moderate lack of space; and a ratio of 0.32-0 indicating a severe lack of space.

The inclination of the third molars was determined by their sagittal relationship to the adjacent second molar. Lines tangential to the highest points of occlusal cusps of the third molar and the second molar were drawn. The angle formed between the intersected lines gave the degree of third molar

inclination relative to the second molar. Accordingly, third molars positioned 170°–190° to the second molar were classified as vertical. An angle above 190° was regarded as distoangular (191°–225°, partially distoangular and 226°–260°, fully distoangular) while an angle below 170° was regarded as mesioangular (135°–169°, partially mesioangular and 100°–134°, fully mesioangular). Those positioned in an angle between 80° and 99° were regarded as horizontal. The other was classified as ectopic.

Eruption level of third molars was recorded measuring the distance from the occlusal table of the third molar to that of the adjacent second molar. Eruption level of mandibular third molars was classified as: (–1)0 mm fully erupted; 0.1–4.9 mm, infraocclusion; 5–9.9 mm, intermediate impaction; 10 mm and above, deep impaction. Eruption level of maxillary third molars was classified as 0–1 mm, fully erupted; 1.1–6 mm, infraocclusion; 6.1–10.9 mm, intermediate impaction; 11 mm and above, deep impaction.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

Results

Among 500 individuals, 240 (48%) were female and 260 (52%) were male. The mean age was 24.9 with the minimum being 20 and maximum being 51 years of age. While 50 (10%) mandibular third molars on the right and 43 (8.6%) on the left were missing, 98 (19.6%) maxillary third molars on the right and 117 (23.4%) on the left were missing. Therefore, 907 mandibular third molars and 785 maxillary third molars were evaluated.

Table 1 shows the means \pm standard deviations of parameters related to all third molars examined in this study. Mandibular third molars had a wider mesiodistal crown length compared to their maxillary counterparts. The space available for the eruption of third molars on the alveolar arch was shorter in the mandible than that in the maxilla.

Table 2 shows the frequency and percentage

of parameters related to third molars. There was sufficient space for the eruption of third molars in 17.6% of the cases in the mandible as opposed to 61.7% of the cases in the maxilla. In the mandible, 37.7% of third molars were in vertical position, 37.1% were in mesioangular position, and 19.9% were in distoangular position. In the maxilla, 62.5% of third molars were in vertical position and 33.12% were in distal inclination. The eruption/impaction level of third molars in both jaws was correlated with the inclination of teeth and with the crown/available space ratio. In addition, the inclination of the third molars correlated with available eruption space.

The predominant impaction type was vertical in both jaws, which was followed by partial mesial inclination in the mandible (22.7%) and partial distal inclination in the maxilla (39.6%). When there is sufficient space for eruption, 12.5% of third molars in the mandible as opposed to 63.7% third molars in the maxilla got impacted. In the mandible, the deepest impaction was observed in teeth with horizontal orientation, followed by fully mesioangular and partially mesioangular position. In the maxilla, partial mesioangular teeth had the deepest impaction.

As a whole, 75.5% of maxillary and 56.2% of mandibular fully erupted third molars were vertically oriented. The second most common inclination for full eruption for both jaws was partial distal angulation. More than half of the third molars (65.3%) in the mandible as opposed to 15.5% in the maxilla were fully erupted even when there was inadequate space on the alveolar arch to accommodate the full mesiodistal length of the crown. However of these teeth with favorable parameters, 26.4% of mandibular and 59.4% of maxillary third molars had a chance to fully erupt.

Table 1: Mean values of parameters related to the third molars in the mandible and maxilla

Variable	Mandible	Maxilla
Crown width (mm)	10.6 \pm 1.2	9.3 \pm 1.0
Available eruption space (mm)	7.5 \pm 2.6	10.3 \pm 2.6
Ratio of eruption space/crown	0.6 \pm 0.2	1.3 \pm 0.4
Inclination (°)	166.1 \pm 30.4	185.4 \pm 14.2
Level of impaction (mm)	2.4 \pm 2.1	3.1 \pm 3.2

Table 2: Spatial orientation of third molars

Variable	Mandible (907) (%)		Maxilla (785) (%)	
Presence of space for third molars				
Sufficient space	160	17.6	485	61.7
Mild lack of space	332	36.6	175	22.2
Moderate lack of space	338	37.3	77	15.8
Severe lack of space	77	8.5	48	6.11
Inclination of third molars				
Horizontal	48	5.3	-	
Fully mesioangular	150	16.5	10	1.27
Partially mesioangular	187	20.6	56	7.13
Vertical	342	37.7	491	62.5
Partially distoangular	140	15.4	220	32.11
Fully distoangular	38	4.19	8	1.01
Level of third molar eruption/impaction				
Fully erupted	150	16.5	300	38.21
Infraocclusion	500	55.2	320	40.76
Intermediate impaction	170	18.7	150	19.1
Deep impaction	85	9.39	15	1.91

Discussion

Failure of Mandibular third molars to erupt is most affected by a lack of space in the alveolar arch between the distal of the second molar and the ascending ramus. Bjork et al.¹³ noted that in cases of mandibular third molar impaction, the alveolar arch space behind the second molar was reduced in 90 per cent of cases. The growth was in a predominantly vertical component in those with impacted mandibular third molars.¹⁴⁻¹⁶

When we exclude the teeth in infraocclusion in the analysis of data, the most commonly impacted third molars in the mandible were partially mesioangular or mesioangular inclination and in the maxilla in vertical or partially distoangular position. Such findings conform to the previous reports^{17,18,19,20}.

In the mandible, the most apparent reason for the highest frequency of third molar impaction was reported to be the lack of space in the alveolar arch distal to the second molar.²¹ Mandibular first molar extraction was shown to increase the space for mandibular thirdmolar eruption and decrease their impaction.²² Kim et al.²³ reported that premolar extraction and concomitant mesial movement of the molars during space closure as part of orthodontic

treatment led to increased eruption space for third molars and reduced the frequency of third molar impaction in both the maxilla and mandible. Furthermore, most mandibular and maxillary third molars erupted into a good or acceptable position to replace the second molars after their extraction for orthodontic purposes.^{24,25, 26}

In the mandible, 26.7% of such teeth erupted to fully functional level while the rest were in infraocclusion. Interestingly in the maxilla, 59.6% of teeth having favorable parameters fully erupted but 11.4% of these had >6 mm of impaction.

We considered the age of 20 as the stable time point for the eruption and angulation movements of the third molars and therefore included subjects older than 20 years of age in the present study. Nevertheless, longitudinal observational studies have shown that some changes in eruption status and the sagittal inclination of third molars may occur even after the age of 20.^{27,28} One of the most common third molar extraction indications includes pericoronitis which is associated with partially (but not full impacted) impacted third molars. , Bataineh et al²⁹reported that pericoronitis cases were much more frequently seen in female patients than male patients. Likewise Yamalik

and Bozkaya³⁰ found a predominance of females for pericoronitis.

Conclusion

Removal of impacted third molars is the most commonly employed procedure in oral surgery practice. Pain and pericoronitis were the most common symptoms usually associated with level A impaction and vertical position. Characteristics of erupted and impacted third molars in the mandible and the maxilla are the important point of the surgical procedures.

Ethical approval was taken from the institutional ethical committee and written

Informed consent was taken from all the participants.

Source of funding- Nil

Conflict of Interest: None declared

References

- Hassan AH: Pattern of third molar impaction in a Saudi population. *Clin Cosmet Investig Dent* 2010;2:109-113.
- Akarlan ZZ, Kocabay C: Assessment of the associated symptoms, pathologies, positions and angulations of bilateral occurring mandibular third molars: is there any similarity? *Oral Surg Oral Med Oral Pathol Oral Radiol* 2009;108:e26-e32.
- Polat HB, Özcan F, Kara I, et al: Prevalence of commonly found pathoses associated with mandibular impacted third molars based on panoramic radiographs in a Turkish population. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2008;105:e41-e47.
- Almendros-Marqués N, Berini-Aytés L, GayEscoda C: Influence of lower third molar position on the incidence of preoperative complications. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2006;102:725-73.
- Polat HB, Ozan F, Kara I, Ozdemir H, Ay S. Prevalence of commonly found pathoses associated with mandibular impacted third molars based on panoramic radiographs in Turkish population. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2008;105:e417.
- Gooris CGM, Artun J, Joondeph DR. Eruption of mandibular third molars after second molar extractions: a radiographic study. *Am J Orthod Dentofacial Orthop* 1990;98:161-167.
- Kim T, Artun J, Behbehani F, Artese F. Prevalence of third molar impaction in orthodontic patients treated non-extraction and with extraction of 4 premolars. *Am J Orthod Dentofacial Orthop* 2003;123:138-145.
- Hattab FN, Alhaija ES. Radiographic evaluation of mandibular third molar eruption space. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1999;88:285-91.
- Kruger E, Thomson WM, Konthasinghe P. Third molar outcomes from age 18 to 26: Findings from a populationbased New Zealand longitudinal study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2001;92:1505.
- Artun J, Thalib L, Little RM. Third molar angulation during and after treatment of adolescent orthodontic patients. *Eur J Orthod* 2005;27:5906.
- Celikoglu M, Miloglu O, Kazanci F. Frequency of agenesis, impaction, angulation, and related pathologic changes of third molar teeth in orthodontic patients. *J Oral Maxillofac Surg* 2010;68:9905.
- AlmendrosMarqués N, BeriniAytés L, GayEscoda C. Evaluation of intraexaminer and interexaminer agreement on classifying lower third molars according to the systems of Pell and Gregory and of Winter. *J Oral Maxillofac Surg* 2008;66:8939.
- Björk A, Jensen E, Palling M. Mandibular growth and third molar impaction. *Acta Odont Scand* 1956;14:231-271.
- Capelli J. Mandibular growth and third molar impaction in extraction cases. *Angle Orthod* 1991;61:223-229.
- Kaplan RG. Some factors related to mandibular third molar impaction. *Angle Orthod* 1975;45:153-158.
- Richardson ME. The etiology and prediction of mandibular third molar impaction. *Angle Orthod* 1977;47:165-172.
- Kruger E, Thomson WM, Konthasinghe P. Third molar outcomes from age 18 to 26: Findings from a populationbased New Zealand longitudinal study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2001;92:1505.
- Artun J, Thalib L, Little RM. Third molar angulation during and after treatment of adolescent orthodontic patients. *Eur J Orthod* 2005;27:5906.
- Celikoglu M, Miloglu O, Kazanci F. Frequency of agenesis, impaction, angulation, and related pathologic changes of third molar teeth in orthodontic patients. *J Oral Maxillofac Surg* 2010;68:9905.
- Hashemipour MA, TahmasbiArashlow M, FahimiHanzaei F. Incidence of impacted mandibular and maxillary third molars: A radiographic study in a Southeast Iran population. *Med Oral Patol Oral Cir Bucal* 2013;18:e1405.

21. Mollaoglu N, Cetiner S, Güngör K. Patterns of third molar impaction in a group of volunteers in Turkey. *Clin Oral Investig* 2002;6:10913.
22. Bayram M, Ozer M, Arici S. Effects of first molar extraction on third molar angulation and eruption space. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2009;107:e1420.
23. Kim TW, Artun J, Behbehani F, Artese F. Prevalence of third molar impaction in orthodontic patients treated nonextraction and with extraction of 4 premolars. *Am J Orthod Dentofacial Orthop* 2003;123:13845.
24. DelaRosaGayC, ValmasedaCastellón E, GayEscodaC. Spontaneous thirdmolar eruption after secondmolar extraction in orthodontic patients. *Am J Orthod Dentofacial Orthop* 2006;129:33744.
25. Ghougassian SS, Ghafari JG. Association between mandibular third molar formation and retromolar space. *Angle Orthod* 2014;84:94650.
26. Richardson ME: Lower third molar space. *Angle Orthod* 1987;57:155-161.
27. Hattab FN. Positional changes and eruption of impacted mandibular third molars in young adults. A radiographic 4year followup study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1997;84:6048.
28. Sandhu S, Kaur T. Radiographic study of the positional changes and eruption of impacted third molars in young adults of an Asian Indian population. *J Oral Maxillofac Surg* 2008;66:161724.
29. Bataineh AB, Albashaireh ZS, Hazza'a AM: The surgical removal of mandibular third molars: a study in decision making. *Quintessence Int* 2002;33:613-617.
30. Yamalık K, Bozkaya S: The predictivity of mandibular third molar position as a risk indicator for pericoronitis. *Clin Oral Investig* 2008;12:9-14.

To Assess the Practices of Nurses Towards Catheter Care for Prevention of Catheter Associated Urinary Tract Infection Among Patients Admitted in Tertiary Care Hospital Bathinda (Punjab)

Simaranjit Kaur¹, Rajwant Kaur Randhawa², Deepika R Singh³

¹PhD Scholar, Medical Surgical Nursing, Desh Bhagat University, Mandi Gobindgarh

²Professor cum Principal, Community Health Nursing College of Nursing, Desh Bhagat University (Mandi Gobindgarh)

³Professor cum Principal, Child Health Nursing, College of Nursing, Rayat Bhara University (Kharar)

How to cite this article: Simaranjit Kaur, Rajwant Kaur Randhawa, Deepika R Singh et al. To Assess the Practices of Nurses Towards Catheter Care for Prevention of Catheter Associated Urinary Tract Infection Among Patients Admitted in Tertiary Care Hospital Bathinda (Punjab). Volume 13 Issue 3 July-September 2022

Abstract

Nursing is an art science and an essential health care profession in which the skilled knowledgeable persons are committed to provide care to sick peoples and strive for the, protection and promotion of health and prevention against diseases and helps to minimize the risk and risk related injuries .Thus the present Study was planned to assess the practices of staff nurses towards catheter care to prevent CAUTI among Patients Admitted in Tertiary Care Hospital, Bathinda (Punjab) **Objectives** 1.To assess the Practices of nurses towards catheter care for prevention of CAUTI among patients 2.To find out the association between practices of nurses towards catheter care for prevention of CAUTI among patients with their socio demographic variables. Descriptive survey design was used. A Quantitative Non experimental Approach was adopted to conduct the Study. 200 staff nurses were selected using Non Probability convenience Sampling Technique .The present study included staff nurses working in intensive care units, cardiac care unit, surgery, medical, orthopaedic and gynaecological and obstetrical wards. A prevalidated tool comprising Socio demographic variables and Self structured practice checklist were used to collect the data. **Results:** depicts that that majority of staff nurses i.e. 87 (79.09%) were in the age group of 21-30 years. Most of them i.e.78 (70.91%) were females. About 31(28.18%) of staff nurses were presently working in surgery ward followed by 26 (23.64%) in CCU, almost equal number of staff nurses 23(20.91%) and 21 (19.09%) were working in ICU and orthopaedic ward respectively whereas only 9 (8.18%) working in Gynae and Obstetrics ward. Most of staff nurses 57(51.82%) were Bsc.Nursing by qualification .Most of staff nurses 57 (51.82%) were having 3-5 years of experience in present area. Half of the staff nurses 59(53.64%) had attended training regarding infection control. Most of the staff nurses 71(64.55%) were having Adequate level of practices. There was Statistically Significant Association found between practices and professional qualification and any training attended regarding CCB. **Conclusion:** In the present study it is concluded that most of the participants have adequate level of practices towards catheter care for prevention of CAUTI and needs further focus and support to improve nursing care quality.

Key Words: CAUTI, CCB,Catheter, Attitude, Nurses

Introduction

Nursing is an art and an important health care profession in which skilled people are committed to providing sick people and striving to prevent,

protect and promote health and disease prevention and help reduce risk and related injuries. ¹ According to the Nursing Urological Nursing Association and Associate Urological Nursing (2008), Nurses 'awareness of the use of the nurses' procedure and

the use of an internal catheter are essential. Nurses' intervention can reduce catheter-related infections during hospitalization². According to the CDC in 2015 reports of 75% of patients presented with a catheter associated with urinary tract infections and a major public health problem related to illness and financial costs³. Urine catheters should only be used if necessary. If a catheter is to be used, it should be removed as soon as possible rather than increase the risk of infection. Previous research shows in critical care situations that most nurses have little knowledge about CAUTI.

Nurses do not even know when a patient should be placed and why a catheter. Even Fakih, in 2008 found that most physicians and nurses were not aware of any signs of catheter implantation and no management should monitor the presence of an unnecessary catheter. Many hospitals do not have strict guidelines for preventing CAUTI⁴.

Nurses must have sufficient knowledge of the insertion, repair, removal or prevention of installation. In this way he can save the lives of patients and prevent infections. Although catheter is used for therapeutic purposes, overuse has become a common practice that increases the risk of infection.

It is noteworthy that under normal circumstances all patients had a catheter inserted into the ICUs and even some had their intestines implanted for a long time and were not properly cared for. Nurses are responsible for catheter care and are responsible for the use of general care in ICUs because the use of urine catheterization in the Intensive Care Unit (ICU) can be up to 100%⁵.

Urinary cauterization is a procedure that should be performed under an aseptic procedure by trained nurses otherwise it can cause CAUTI. The best way to prevent CAUTI is to avoid catheterization. Unfortunately, attention is focused on various issues in order to reduce CAUTI. To reduce the risk of CAUTI simple procedures should be followed such as keeping the catheter system closed, maintaining urine flow and reducing the length of catheterization time⁶.

The CDC reports in 2013 that 99,000 HCAI-related deaths each year, which are much higher compared to AIDS, breast cancer and auto accident-related deaths combined and exceeded \$ 40 billion in health care costs.⁷

It is thought that the duration of the catheter stay in the urine is very important for the concern of the

catheter associated with urinary tract infections. Less chances of insertion of the internal catheter and immediate removal may reduce the risk of catheter-related infections⁸. Studies show countless literature that supports the most common and most common type of infection in hospitalized patients with a urinary tract-related infection.⁹

Nurses are usually initially responsible for injecting patients with a catheter and then providing care to patients implanted with a catheter to prevent catheter-associated UTI. They need to follow proper and safe procedures while performing procedures related to the urinary catheter.

Through this domain, the authors conducted this study to provide insight into the practices of nurses in catheter care in order to prevent CAUTI among patients in a tertiary care hospital. It will also provide an opportunity to determine any non-compliance with prevention recommendations and improve hospital infection control policy.

Statement

To assess the practices of nurses towards catheter care for prevention of Catheter Associated Urinary Tract Infection among patients Admitted in Tertiary Care Hospital, Bathinda (Punjab)

Objectives

1. To assess the practices of nurses towards catheter care for prevention of Catheter Associated Urinary Tract Infection among patients
2. To find out the association between practices of nurses towards catheter care for prevention of Catheter Associated Urinary Tract Infection among patients with their socio demographic variables.

Materials and Methods

Research approach: Quantitative non experimental approach

Research design: Cross sectional Descriptive survey study was used to assess the practices of nurses towards catheter care for prevention of catheter associated urinary tract infection. A cross-sectional is that study that collects information from a population at specific time of period.

Setting: The setting for this research was Medical, Surgical, Orthopaedic, ICU, CCU, Gynae and Obstetrics wards of Adesh hospital, Bathinda.

Population: Data was collect from all staff nurses who were working in Medical, Surgical, Orthopaedic, ICU, CCU, Gynae and Obstetrics wards of Adesh hospital, Bathinda.

Sampling: Convenience sampling technique was used to enroll all the staff nurses in the study

Study time: The data was collected in the Month of Oct 2020

Research Tool

A prevalidated tool comprising Socio demographic variables consist of 7 variables

Modified catheter care bundle checklist: Catheter insertion (16 steps)

Catheter care on going (14 steps)

Urine collection care (6 steps)

Catheter removal (14 steps)

SPSS version 21 is statistical computer software for data analysis. The data will be analysis on SPSS version 21. Cross sectional descriptive study was done on frequencies, tables, charts, graphs.

Data Collection Procedure

In this study modified checklist was used. This observational checklist developed by the national institute of health and modified by researcher. Total steps of procedure is 50 and for each step yes or no marked with score 1or 2. Maximum score was 50 and minimum 0.

DAY/ TIME	PROCEDURE DONE	METHOD OF DATA COLLECTION	OUTCOME
Day 1 st	Catheter insertion	observational checklist	Insertion of catheter observed
Day 2 nd	Catheter care twice a day	observational checklist	Catheter maintenance care observed

DAY/ TIME	PROCEDURE DONE	METHOD OF DATA COLLECTION	OUTCOME
Day 3 rd	Catheter care twice a day	CAUTI assessment	Physical signs and symptoms assessed
Day 4 th	Urine sample collection for culture	observational checklist	Steps of Sample collection observed
Day 5 th	Catheter care twice a day or removal	CAUTI assessment	Physical signs and symptoms reassessed or observed for catheter removal
Day 6 th	Culture Report / Catheter care twice a day or removal	CAUTI assessment	Urine culture report ,Physical signs and symptoms reassessed or observed for catheter removal
Day 7 th	Catheter removed	--	observed for catheter removal

Ethical Consideration

Ethical principle was performed during research study. Permission was taken from the Ethical committee of Desh Bhagat University. I was taken permission from the medical superintendent of Adesh hospital. Give complete information to the participant related to research. It makes sure that no harm will be given to the participant. Study was beneficial. All nurses were having open opportunity to participate in research. No one was being forced to participate in research. Informed consent will be signed by nurses. Before signing consent nurses will be informed about purpose, methodology, risk and benefits of investigation

Results

The present study was carried out in the month of Oct 2020 in different wards of the hospital. A total of 110 staff nurses were included in study.

Table 1: Frequency and Percentage distribution of Practices Staff nurses towards catheter care bundle for prevention of CAUTI. N=110

Level for catheter care bundle	Percentage of scores	f	%
Inadequate	(0-42)	18	16.36
Adequate	(43-47)	71	64.55
Excellent	(48-50)	21	19.09

Maximum score =50 Minimum score =00

Data presented in table: 1 shows that level of staff nurses towards CCB was categorized into 3 levels: inadequate, adequate and excellent. Most of staff nurses 71 (64.55%) were having adequate level followed by 21 (19.09%) were excellent whereas 18 (16.36%) staff nurses reported inadequate level towards catheter care bundle for prevention of CAUTI.

Table 2: Mean, Median, Range, Standard deviation of CCB scores of practices of staff nurses towards catheter care bundle for prevention of CAUTI

N=110

Overall Catheter care bundle	Mean±SD	Median	Range
	45.109±2.379	45	43-47

Data presented in table: 2 indicate that mean score of staff nurses was 45.109±2.379; median was 45 with range 43-47.

There is no significant association of nurses compliance with age ($\chi^2=2.511$, $p=0.643$), gender ($\chi^2=1.418$, $p=0.492$), area of work ($\chi^2=2.794$, $p=0.947$), years of experience ($\chi^2=5.998$, $p=0.199$), any training attended regarding infection control ($\chi^2=2.652$, $p=0.265$). However, there is the significant association of professional qualification ($\chi^2=12.878$, $p=0.012$) and any training attended regarding CCB ($\chi^2=5.995$, $p=0.165$) As the p- value of all the variables are greater than 0.05 level of significance except that of for professional qualification ($p=0.012$) and any training attended regarding CCB ($p=0.165$) which is shown to be highly significant.

Discussion

Similar study conducted by Assanga PA et al with total population 95 staff nurses were selected variables were 71% (67) were females with males being 29%

(28). The age distribution was; 42.1% (40) were 30 to 39 years, 34.7% (33) were 40 to 49 years, 17.9% (17) were 20 to 29 years and 5.3% (5) were 50 to 59 years. Higher diploma holders were 53.7% (51), diploma holders were 22.1% (21), Bachelor's degree holders were 23.2% (22) and Master in nursing degree holders were 1.1% (1). Half 50% (47) of staff nurses attended training regarding infection control.¹⁰

Almost half of nurses had a bachelor degree in this study. This is consistent with a study conducted by Opina and Oducado (2014)¹¹, who found that 76.7% of nurses in Philippines were holding a bachelor degree, and contradicted with another study conducted by Sobeih and Nasr (2015)¹² who reported that 75.5% of nurses in Egypt have a diploma in nursing.

Most of the staff nurses in this study attended an educational or training program on infection control. A similar result was found by Mukakamanzi (2017)¹³, who revealed that 69.2% of nurses had training on infection control practices. While this result contradicted with Sobeih and Nasr (2015)¹², who stated that all nurses did not attend any training regarding infection control

The result of the present study revealed that the majority of nurses had adequate level toward CAUTI prevention. This finding is inconsistent with Sobeih and Nasr (2015), who stated that only 12.5% of the studied nurses had competent level of practices as regards urinary catheter care while this result contradicted with Selim et al. (2018)¹⁴ and Mukakamanzi (2017), who found that a high percentage of nurses has shown a good implementation of different practices towards catheter CAUTI prevention.

Limitations

The Sample size was small, as many participants were not be able to include in the study due to the COVID-19 pandemic, hence a large sample size be required in order to generalize these results to the whole population

Conclusion

The study was conducted in Adesh hospital Bathinda among 110 staff nurses. In this research practices of nurses studied towards catheter care for prevention of catheter associated urinary tract infection. It is concluded that most of the participants have adequate practices towards catheter care for prevention of

CAUTI and needs further focus and support to improve nursing care quality. Many nurses agreed to take active part to enhance their knowledge and change attitude to improve quality care. All the health care personnel should have regular training regarding prevention of CAUTI, and all efforts should be made by hospital authorities to include prevention of CAUTI in its high priority list.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

References

- Potter, P A, Perry, A G, Stockert P & Hall A. Fundamentals of nursing; Elsevier Health Sciences.9th ed; 2016
- Gotelli JM, Merryman P, Carr C, McElveen, Sarah L Kerin. A quality improvement project to reduce the complications associated with indwelling urinary catheters; *Urologic Nursing*.2008; 28(6):465.
- Centre of Disease Control catheter associated urinary tract infection Guideline. Fast Facts.7th .2015
- Fakih, M. G., Dueweke, C., Meisner, S., BerrielCass, D., Savoy-Moore, R., Brach et al. Effect of nurse-led multidisciplinary rounds on reducing the unnecessary use of urinary catheterization in hospitalized patients. *Infection Control & Hospital Epidemiology*.2018; 29(9): 815-819.
- Datta, P., Rani, H., Chauhan, R., Gombar, S., & Chander, J. Health-care-associated infections: Risk factors and epidemiology from an intensive care unit in Northern India. *Indian journal of anaesthesia*.2014; 58(1): 30.
- Labib, M., & Spasojevic, N. Problem of Catheter Associated Urinary Tract Infections in Sub-Saharan Africa. *Recent Advances in the Field of Urinary Tract Infections*.2013 July: DOI: 10.5772/55371
- Health Research and Educational Trust (HRET). American Hospital Association (AHA).2013
- Chenoweth CE, Gould, CV, & Saint, S et al. Diagnosis, management, and prevention of catheter-associated urinary tract infections. *Infectious disease clinics of North America* 28(1): 105-119. DOI: 10.1016/j.idc.2013.09.002
- Meddings J, Rogers MA, Macy M & Saint S. Systematic review and meta-analysis: reminder systems to reduce catheter-associated urinary tract infections and urinary catheter use in hospitalized patients. *Clinical Infectious Diseases* 51(5): 550-560. DOI: 10.1086/655133.2010
- Assanga P., Omondi A. L and Inyama H. K: Evaluation of the Utilization of Catheter Associated Urinary Tract Infection Bundle among Critical Care Nurses - Kenyatta National Hospital American Journal of Nursing Science 2016; 5(5): 201-212.
- Opina, M.L.F., & Oducado, R.M.F. Infection control in the use of urethral catheters : Knowledge and practices of nurses in a private hospital in Iloilo city, Asia Pacific Journal of Education, Arts and Sciences 2014;1(5):93-100.
- Sobeih, H.S., & Nasr, M.H. Indwelling urinary catheter management: Effect of an interactive workshop on nurses' practice and perception. *New York Science Journal* 2015;8(5); 117-126.
- Mukakamanzi, J. Knowledge, attitude and practices of nurses towards the prevention of catheter-associated urinary tract infection in selected Referral Hospitals in Rwanda. 2017
- Selim, S.M., El-Seoud, A.R.A., Mohamed, A.A.H., & Ibrahim, S.A.A.R. Effect of infection control program on catheter-associated urinary tract infection in intensive care units at Zagazig University Hospital. *Zagazig University Medical Journal* 2018;24(5): 420-436

Do adolescent girls of Coastal Karnataka, India have Knowledge of Integrated Child Development Services (ICDS) Scheme? What is their perception and utilization rate? – A cross sectional study

Sivanesan S¹, Kumar A², Kulkarni M M², Kamath A³

¹Assistant Professor, Department of Community Medicine, Government Theni Medical College, Theni, Tamil Nadu, India

²Associate Professor, Department of Community Medicine, Kasturba Medical College, Manipal Academy of Higher Education, Manipal, Karnataka, India

³Professor and head, Department of Data sciences, Prasanna School of Public Health, Manipal Academy of Higher Education, Manipal, Karnataka, India

How to cite this article: Sivanesan S, Kumar A, Kulkarni M M, Kamath A et al. Do adolescent girls of Coastal Karnataka, India have Knowledge of Integrated Child Development Services (ICDS) Scheme? What is their perception and utilization rate? – A cross sectional study. Volume 13 Issue 3 July-September 2022

Abstract

Background: Adolescence is a critical phase in the life of woman. At this stage, she would stand at the beginning of adulthood. This stage is in midway between childhood and womanhood and it is the most eventful for mental, emotional, social and psychological health and well-being. The life-cycle approach for holistic development of a child remains unaddressed if adolescent girls are excluded from the nutritional and developmental programmes.

Aims/Objectives: To study the awareness, utilization and perception of ICDS scheme by adolescent girls in coastal Karnataka.

Methodology: A community based cross sectional study was conducted among 66 adolescent girls in the field practice area of a tertiary care Hospital in South India.

Results: All the adolescent girls were registered. But only 2 beneficiaries were given services in rotation basis for the period of 6 months. Among the study subjects, larger proportion were aware of Supplementary Nutrition SN (97%) followed by Iron & Folic Acid supplementation IFA (43.9%) and Nutrition & Health Education NHED (25.8%). Majority were utilizing SN (97%) followed by IFA supplementation (30.3%) and NHED (25.8%). SN food of good quality (60.9%) followed by average quality (37.5%) and of adequate quantity (93.8%). It was also found that 92.4% adolescent girls were satisfied with SN.

Conclusions: It is vital to register all the adolescent girls, and ensure that they all avail the ICDS services regularly to improve the nutritional status. There is a necessity to improve the quality and quantity of food provided as per the hope of mothers to ensure better utilization.

Keywords: Awareness, utilization, perception, ICDS, Adolescent girls

Introduction

Adolescence is a critical phase in the life of woman. At this stage, she would stand at the beginning

of adulthood. This stage is in midway between childhood and womanhood and it is the most eventful for mental, emotional, social and psychological health and well-being. The life-cycle approach for

holistic development of a child remains unaddressed if adolescent girls are excluded from the nutritional and developmental programmes.^{1,2}

The Adolescent Girls (AG) Scheme, implemented by the Ministry of Women and Child Development under Umbrella Integrated Child Development Services (ICDS), primarily aims at breaking the inter-generational life-cycle of nutritional and gender disadvantage and provide them with a helpful and caring environment for self-development. The key objective of this scheme is to facilitate, educate and empower AGs so as to enable them to become self-reliant and aware citizens. Over 40 years in implementation, the success of ICDS in tackling under-nutrition among children remains a matter of great concern. It has been found repeatedly that there is discrepancy in expected and actual delivery of services.²

Scheme for Adolescent Girls was sanctioned in the year 2010 and was implemented in 205 districts across the country. Later, the expansion and universalisation of the Scheme for Adolescent Girls was done in additional 303 districts in 2017-18 and the remaining districts in 2018-19 with the simultaneous phasing out of Kishori Shakti Yojana (KSY). Thus, at present all districts in the country are covered under Scheme for Adolescent Girls. There are two major components under the Scheme - Nutrition and Non Nutrition Component.³

Nutrition component includes Take Home Ration (THR) or Hot Cooked Meal (HCM) for 11-14 years Out of school girls - Nutrition Provision Rs. 9.50 per day (600 calories; 18-20 gram of protein and recommended daily intake of micronutrients per day for 300 days in a year.). The financial norms will be Rs. 9.5/- per beneficiary per day for 300 days in a year. This would be inclusive of the cost of micronutrient fortification. Non-Nutrition Component includes Iron and Folic acid (IFA) supplementation, Health check up and referral services and Nutrition and Health Education (NHED) Sessions, Counselling / Guidance on family welfare, Adolescent Reproductive and Sexual Health (ARSH), child care practices, Life Skill Education and accessing public services.³ Hence the current study was undertaken to study the awareness, utilization and perception of ICDS scheme by adolescent girls in coastal Karnataka.

Methodology

The community based cross sectional study was carried out during the period October 2013 to March 2016 in the field practice area of Department of Community Medicine, Kasturba Medical College, Manipal University, Manipal, South India among adolescent girls. It is situated along the coastal belt of Udupi District covering a population of 45,246 spread out over 13 villages. These villages have a similar population in terms of occupation, socio-economic status and food habits. The total literacy rate in the field practice area is 87.5% with female literacy of 84.1% and sex ratio of 1036.8/1000 males.

The Department of Community Medicine provides health care services to this population through a network of five Rural Maternity and Child Welfare homes (RMCW homes)/ centres.

In the field practice area, IMR is 3.83 per 1000 live births and nil MMR; all the expectant mothers had undergone Institutional deliveries. All the children less than five years of age and expectant mothers were immunized and effective couple protection rate was 50%.

Inclusion Criteria: The adolescent girls who were registered at least for six months prior to the study in the anganwadi centres (AWCs).

Exclusion Criteria: The adolescent girls who did not fulfil the inclusion criteria or who were not willing were excluded.

Ethical Clearance: Ethical Committee approval was obtained from the Institutional Ethics Committee (IEC), Kasturba Hospital before the commencement of study vide letter no. IEC 494/ 2013. Along with the permission from Child Development Project Officer (CDPO), Udupi project was obtained before the start of the study.

Sample Size: According to the study conducted by Kumar P and Garg M in 2008,⁴ Quick appraisal of SN component of ICDS in Udupi and Karkala, utilization rate was 3%, as only 2 adolescent girls were receiving benefits for every 6 months in rotation, 50 of them were considered to be part of our study. In total 38 AWCs were present in the field practice area, 1-2 adolescent girls were selected from each centre.

Consent: Written Informed consent was obtained before interviewing the mothers of adolescent girls.

Data Collection: House to house visit was conducted and mothers were interviewed. Details regarding socio-demographic factors, awareness, utilization and perception about ICDS services like supplementary nutrition, nutrition and health education, immunization, health checkups and referral services were obtained from them. Regarding supplementary nutrition, details of food received any interruption in utilization, their perception and reasons for underutilization were collected from the mothers.

Data analysis: Data was entered and analysed in Statistical Package for Social Sciences (SPSS version 15.0) as it is licensed with the Manipal University. Results were expressed in percentages and proportions with 95% confidence interval. Statistical tests like Chi square test and Fischer's exact test were used to assess significance of categorical variables.

Results:

A total of 66 adolescent girls were enrolled in the study. Table 1 shows larger proportion of the study subjects (86.4%) were Hindus. Larger proportion of the mothers of adolescent girls were educated up to middle school (31.8%) followed by High school (28.8%) and were homemakers (47%). Larger proportion of the fathers of adolescent girls were educated up to middle school (36.4%) followed by High school (29.1%) and were involved in skilled jobs (36.4%) followed by unskilled jobs (29.1%) and semiskilled jobs (25.5%). About 68.2% adolescent girls belonged to BPL family. All the adolescent girls were registered. Whereas, 64 (97%) were utilizing ICDS services.

Table 1: Socio demographic characteristics of Adolescent girls in the study (n = 66)

S. No	Factor	Category	n (%)
1	Religion	Hindu	57 (86.4)
		Muslim	8 (12.1)
		Christian	1(1.5)
2	Literacy of mother	Illiterate	10 (15.2)
		Primary school	6 (9.1)
		Middle school	21 (31.8)
		High school	19 (28.8)
		Post high school diploma	8 (12.1)
		UG/PG	2 (3)

Conti..Table 1: Socio demographic characteristics of Adolescent girls in the study (n = 66)

S. No	Factor	Category	n (%)
3	Literacy of father *(n=55)	Illiterate	3(5.5)
		Primary school	9(16.3)
		Middle school	20(36.4)
		High school	16(29.1)
		Post high school diploma	4(7.3)
		UG/PG	3 (5.4)
4	Occupation of mother	House wife	31 (47)
		Unskilled	9(13.6)
		Semi-skilled	20 (30.3)
		Skilled	5 (7.6)
		Professional/White collar	1 (1.5)
5	Occupation of father *(n=55)	Unemployed	3 (5.5)
		Unskilled	16 (29.1)
		Semi-skilled	14 (25.4)
		Skilled	20 (36.4)
		Professional/White collar	2 (3.6)
6	Ration card	BPL	45 (68.2)
		APL	20 (30.3)
		No card	1(1.5)

*some data of father is missing because of demise or separation of father.

Table 2 depicts, larger proportion of the study subjects was aware of SN (97%) followed by IFA supplementation (43.9%) and NHED (25.8%). None were aware of health check-up and referral services. This could be because the adolescent girls were busy with their schooling.

Table 2: Awareness of ICDS services among adolescent girls (n=66)

Services	n (%)
Supplementary nutrition	64 (97)
Iron folic acid supplementation	29 (43.9)
Nutrition and Health Education	17 (25.8)

Table 3: Utilization of ICDS services by the Adolescent girls: (n=66)

Services	n (%)
Supplementary Nutrition	64 (97)
Iron and folic acid supplementation	20 (30.3)
Nutrition and Health Education	17 (25.8)

The most common reason for non-utilization was mothers of adolescent girls did not go to AWC to avail services. The most common reason for interruption of services was mothers were working and did not go to AWC to receive benefits

Table 4: Perception of Supplementary nutrition among adolescent girls: (n=64)

	Category	n (%)
Quality	Good	39 (60.9)
	Average	24 (37.5)
	Poor	0
	Don't know	1 (1.6)
Satisfaction of quality of food	Yes	61 (95.3)
	No	3 (4.7)
Quantity	Adequate	60 (93.8)
	Inadequate	3 (4.7)
	Don't know	1 (1.5)
Quantity as per norm	Yes	22 (34.4)
	No	37 (57.8)
	Don't know	5 (7.8)

As shown in Table 4, larger proportion of the study subjects was of opinion: SN food of good quality (60.9%) followed by average quality (37.5%) and of adequate quantity (93.8%). It was also found that 92.4% adolescent girls were satisfied with SN. As observed by the investigator, only 34.4% of the study subjects had received SN as per norm. This can be because before January 2015, the food was measured and given to the beneficiaries

Discussion

Table 1 shows larger proportion of the study subjects (86.4%) were Hindus. found to be in contrast to the study done in Urban Belagavi reporting larger proportion of the study subjects to be Muslims (58%) followed by Hindus (41%).⁵ Table 3 depicts the most common service utilized by the study subjects was supplementary nutrition (97%) followed by IFA supplementation (30.3%) and NHED (25.8%). Similarly, the study done by Chudasama RK et al reported 87% of registered adolescent girls were availing services.⁶ But the findings, nearly 81.7% celebrated NHED followed by 86.7% adolescent girls had attended reproductive health education was in contrast to our study.⁶ On contrary, the study done in Urban Belagavi reported 73.4% adolescent girls attended health education session followed by health

check-up 70.7%.⁵ The study by Shavi et al to assess the utilization of ICDS services by adolescent girls in urban slums of Bellary City affirmed utilization to be 43% and the most common service availed was SN (67%) found to be lesser in comparison to our study.⁷ The study by Shavi et al had reported the common reason for not availing the services as lack of awareness not observed in the present study.⁷

Majority (60% - 70%) were not aware of services like health, nutrition counselling, advocacy, and village health and sanitation. The study by Rathore et al stated quality of SN was satisfactory in all the AWCs.⁸ SN was acceptable to 98.1% beneficiaries. The study by Madhavi H et al observed larger proportion (40.1%) AWCs had poor beneficiaries satisfaction score followed by 33.3% AWCs had moderate satisfaction score. The study by Pandey V et al reported benefits from AWCs were beneficial to 81.9% beneficiaries in such a way that it gives additional nutrition (52.6%), imparting education (23.5%), Immunization (12.1%) and children become healthy (11.9%).¹⁰ The study by Ram PV et al identified larger proportion of the study subjects (63%) had average level of satisfaction. While only 1.4% were well satisfied and about 35.6% were poorly satisfied with the services provided by ICDS scheme in the AWC.¹¹

Conclusion

All the adolescent girls were registered in the AWCs, only 2 girls were utilizing the ICDS service for 6 months in rotation basis. Among the study subjects, larger proportion were aware of SN (97%) followed by IFA supplementation (43.9%) and NHED (25.8%). None were aware of health check-up and referral services. Majority were utilizing SN (97%) followed by IFA supplementation (30.3%) and NHED (25.8%). SN food of good quality (60.9%) followed by average quality (37.5%) and of adequate quantity (93.8%). It was also found that 92.4% adolescent girls were satisfied with SN. It is vital to register all the adolescent girls, and ensure that they all avail the ICDS services regularly to improve the nutritional status and learn life skill education to sustain their life in future. There is a necessity to improve the quality and quantity of food provided as per the hope of mothers to ensure better utilization.

Acknowledgement: NIL

Conflicts of Interest: NIL

Funding: None.

References

1. National Institute of Public Co operation & Child Development. Research on ICDS: An Overview, (1996-2008) Volume 3 New Delhi, India; 2009. [cited March 17 2022] Available from url: <https://www.nipccd.nic.in/file/reports/icdsvol3.pdf>.
2. ICDS Scheme. Ministry of women and child development, Government of India. Available from URL: <https://wcd.nic.in/> Accessed on 10.2.22
3. ICDS Scheme. Ministry of women and child development, Government of India. Available from URL: <https://dwcd.karnataka.gov.in/info-2/INTEGRATED+CHILD+DEVELOPMENT+SERVICES+SCHEME/en>. Accessed on 10.2.22
4. Kumar P and Garg, Meenakshi. Quick appraisal of SN component of ICDS 9th and 10th January 2008:Report on ICDS project Udupi and Karkala taluk. DCWC Bulletin. January-March.2008. Vol XII. Issue 1
5. Sharma M, Angolkar M, Narasannavar A, Murthy S, Oza M. Perception towards functioning of anganwadis and utilization of ICDS services by the adolescent girls of Urban Belagavi - A cross sectional study. International Journal. 2015;3(6):1431-5
6. Chudasama RK, Kadri AM, Verma PB, Patel UV, Joshi N, Zalavadiya D, and Bhola C. Evaluation of Integrated Child Development Services Program in Gujarat, India. Indian Pediatr.2014;51: 707-711.
7. Shavi, Tejesh. A study of utilization of ICDS services by adolescent girls at anganwadi centres. New Indian Journal of Surgery, Oct 2011; 2 (4): 321.
8. Rathore MS, Vohra R, Sharma BN, Chaudhary RC, Bhardwaj SL, Vohra A. Evaluation of Integrated child development services program in Rajasthan, India. Int J Adv Med Health Res 2015; 2(2): 95-101.
9. Madhavi H, Singh HK, Bendigiri ND: Utilization of Integrated Child Development Services (ICDS) Scheme and beneficiaries-satisfaction in rural area of Gulbarga district. Pravara Medical Review 2011 ; 3(3):13-17
10. Pandey V, Awasthi S, Srivatsava VK, Nigam AK, Srivatsava PK. Study of nutritional status of children attending ICDS services in Lucknow. Indian J. Prev. Soc. Med. Apr-Jun 2011; 42(2):142-144.
11. Ram PV, Dasgupta A, Pal J, Parthasarathi R, Biswas R, Naiya S. A Cross-Sectional Study on Client Satisfaction of Anganwadi Centres under Integrated Child Development Services (ICDS) Scheme in a Slum of Kolkata. Natl J Community Med 2014; 5(1): 88-92.

Body Image Perception and Its Relationship with Adolescents Nutritional Status in Pekanbaru City during the Covid-19 Pandemic

Sofya Maya¹, Yanti Ernalina¹, Nofvitri Syuryadi¹,
Nur Pelita Sembiring¹, Tahrir Aulawi¹

¹Lecturer, Faculty of Agriculture and Animal Science, State Islamic University of Sultan Syarif Kasim Riau

How to cite this article: Sofya Maya, Yanti Ernalina, Nofvitri Syuryadi, Nur Pelita Sembiring, Tahrir Aulawi et al. Body Image Perception and Its Relationship with Adolescents Nutritional Status in Pekanbaru City during the Covid-19 Pandemic. Volume 13 Issue 3 July-September 2022

Abstract

Offline learning during the Covid-19 pandemic can change adolescents' lifestyles, including dietary patterns that have an effect on increasing body weight so that it can have an impact on negative body image perceptions. This study aimed to determine the relationship between body image perception and adolescents nutritional status in Pekanbaru City during the Covid-19 pandemic. The research design was a cross sectional study. The research sample was adolescents in Pekanbaru City with an age range of 12-25 years old, totaling 194 people. The data was obtained from the results of filling out the questionnaire independently which was distributed to sample via Google Form. Data analysis used the spearman correlation test with p value $< 0,05$. Total samples who were satisfied with their bodies were 33,0% and dissatisfied were 67,0%. The nutritional status of sample were 4,6% very thin, 13,4% thin, 68,0% normal, 9,8% overweight, and 4,2% obesity. The results showed that there was a significant relationship between body image perception and adolescents nutritional status in Pekanbaru City during the Covid-19 pandemic ($p=0,000$; $r=0,609$). The problem of dissatisfaction with body image can make a adolescent have negative thoughts and have an impact on abnormal nutritional status. The need for a psychological approach to adolescents in increasing their confidence in their own body image.

Keywords: *adolescents, body image, covid-19, nutritional status*

Introduction

Adolescence is a transitional period from childhood to adulthood which is marked by development in all aspects or functions of the body to enter adulthood. During adolescence, there are changes in attitude, changes in thinking, and changes in body size and shape that lead to a negative body image¹. A negative body image is a person's perception of being dissatisfied with his/her body image.

The results of research conducted on Riau University students in 2013 showed that there were 51,7% of students (late adolescent) who were

dissatisfied with their body image². The results of research on junior and senior high school students in several Indonesian schools also showed that adolescents dissatisfied with their body image. The results of research in one of junior high school in Surabaya showed that 55,6% of adolescents had a negative body image. Similar results were also found in Aceh, namely 57,8% students in SMAN 4 Banda Aceh had a negative body image³. Research on students in SMPN 8 Pekanbaru showed that 37,5% students dissatisfied with their body image⁴. As a result of the a negative body image perception, it can cause adolescents to do an excessive diet in order to

get the desired body image⁵ without paying attention to health impacts. Some examples of excessive diets are skipping meals, replacing main meals with snacks, vomiting their food, and smoking⁴. Deviant eating behavior like this will have an impact on adolescent health problems.

During the Covid-19 pandemic, the government in several regions in Indonesia imposed large-scale social restrictions to reduce the spread of the virus. This has an impact on the learning system in Indonesia which must be done online. Adolescents who do online learning from their home will experience changes in eating pattern and physical activity. These changes include a decrease of physical activity (38,0%) and an increase of sitting frequency (28,6%), as well as an increase frequency of consumption meals and snacks⁶. The same results were also shown in the other research⁷, namely students who did online learning during the Covid-19 pandemic experienced dietary patterns that was not in accordance with the recommended balanced nutrition guidelines, namely 44,9% of students had a main meal frequency of 2 times a day and snacks 3 times a day. This type of eating pattern can increase adolescent body weight so that it will have an impact on negative body image perceptions.

Riskesdas report in 2018 showed that the prevalence of nutritional status according to BMI for Age in adolescents aged 13-15 years old in Pekanbaru city was 3,69% very thin, 7,46% thin, 73,09% normal, 8,96% overweight, and 6,8% obesity. This number exceeds the prevalence of Riau Province (2,68% very thin, 7,15% thin) and exceeds the national prevalence (1,9% very thin, 6,8% thin, and 4,8% obesity)⁸. If online learning continues and the eating behavior of adolescents does not comply with the recommended balanced nutrition guidelines, it will increase the incidence of overweight or obesity. This will increase the negative body image perception in adolescents during the covid-19 pandemic. Research on body image perception in adolescents associated with nutritional status during the Covid-19 pandemic has not been widely carried out. Therefore, the purpose of this study was to determine the relationship between body image perception and adolescents nutritional status in Pekanbaru City during the Covid-19 pandemic.

Method

The type of this research was descriptive analytic with a cross sectional design. Data collection from November until December 2021. The research sample was adolescents in Pekanbaru City with an age range of 12-25 years old⁹ totaling 194 people. The data was obtained from the results of filling out the questionnaire independently which was distributed to sample via Google Form. The questionnaire contains questions about sample's characteristics (age, weight, height, gender, occupation), body image perception, dietary changes during the Covid-19 pandemic, frequency of snacks, fruits, and vegetables consumption during the Covid-19 pandemic. Data analysis used was univariate analysis which was displayed in the form of a frequency distribution table and bivariate analysis using the Spearman correlation test with p value <0.05.

Results

The research sample was adolescents in Pekanbaru City with an age range of 12-25 years old. The results of the univariate analysis including gender, age, occupation, nutritional status, body image perception, level of body image satisfaction, dietary changes during the Covid-19 pandemic, and frequency of snacks, fruits and vegetables consumption during the Covid-19 pandemic are shown in Table 1.

Table 1: Characteristics of Research Sample

Characteristics	Total (n)	Percentage (%)
Gender		
Male	38	19,5
Female	156	80,5
Age		
13-15 years old	10	5,2
16-18 years old	39	20,1
19-25 years old	145	74,7
Occupation		
Senior High School student	13	6,7
College student	162	83,5
Entrepreneur	5	2,6
Other	14	7,2

Conti.. Table 1: Characteristics of Research Sample

Characteristics	Total (n)	Percentage (%)
Nutritional Status		
BMI for Age		
Very thin	0	0,0
Thin	4	2,1
Normal	34	17,5
Overweight	8	4,1
Obesity	3	1,6
BMI		
Very thin	9	4,6
Thin	22	11,3
Normal	98	50,5
Overweight	11	5,7
Obesity	5	2,6
Body Image Perception		
Thin	55	28,3
Normal	102	52,6
Overweight	36	18,6
Obesity	1	0,5
Level of body image satisfaction		
Satisfied	64	33,0
Dissatisfied	130	67,0
Dietary changes during the Covid-19 pandemic		
Increase	89	45,9
No changes	87	44,8
Decrease	18	9,3
Frequency of snacks consumption during the Covid-19 pandemic		
Frequently (>1 time/day)	176	90,7
Infrequently (<1 time/day)	18	9,3
Frequency of fruits consumption during the Covid-19 pandemic		
Frequently (>1 time/day)	64	33,0
Infrequently (<1 time/day)	130	67,0
Frequency of vegetables consumption during the Covid-19 pandemic		
Frequently (>1 time/day)	117	60,3
Infrequently (<1 time/day)	77	39,7

Based on gender, most of the research samples were female (80,5%) and other were male (19,5%). The nutritional status of the sample was categorized into nutritional status for early adolescents (12-16 years old) using BMI for Age and nutritional status for late adolescents (17-25 years old) using BMI. Based on the nutritional status of early adolescents (12-16 years old) 17,5% of the sample had normal nutritional status with an average of z-score of BMI for Age was $0,2 \pm 2,5$. In late adolescents (17-25 years old), most of the nutritional status of sample was normal (50,5%) with an average BMI of $21,3 \pm 3,8$. Most of the samples had a negative their body image perception (67,0%). During the Covid-19 pandemic, most of the samples had increase in dietary (45,9%) compared to before the Covid-19 pandemic.

Bivariate analysis used the Spearman test to see the relationship between the characteristics sample (gender, age), body image perception, frequency of snack consumption, frequency of fruit consumption, frequency of vegetable consumption, and dietary patterns during the Covid-19 pandemic with the adolescents nutritional status in Pekanbaru City. The results of the bivariate analysis are shown in Table 2.

Table 2: Relationship between the characteristics sample (gender, age), body image perception, frequency of snack consumption, frequency of fruit consumption, frequency of vegetable consumption, and dietary patterns during the Covid-19 pandemic with adolescents nutritional status

Characteristics	Body Image		Total		p value
	Positive	Negative	n	%	
Gender					0,960
Male	14 (7,2%)	24 (12,3%)	38	19,5	
Female	50 (25,8%)	106 (54,7%)	156	80,5	
Age					0,102
13-15 years old	3 (1,5%)	7 (3,6%)	10	5,2	
16-18 years old	11 (5,7%)	28 (14,4%)	39	20,1	
19-25 years old	50 (25,8%)	95 (49,0%)	145	74,7	
Body Image Perception					0,000*
Thin	16 (8,2%)	39 (20,1%)	55	28,3	
Normal	48 (24,8%)	54 (27,8%)	102	52,6	
Overweight	0 (0,0%)	36 (18,6%)	36	18,6	
Obesity	0 (0,0%)	1 (0,5%)	1	0,5	

Conti.. Table 2: Relationship between the characteristics sample (gender, age), body image perception, frequency of snack consumption, frequency of fruit consumption, frequency of vegetable consumption, and dietary patterns during the Covid-19 pandemic with adolescents nutritional status

Characteristics	Body Image		Total		P value
	Positive	Negative	n	%	
Dietary changes during the Covid-19 pandemic					0,192
Increase	35 (18,0%)	54 (27,9%)	89	45,9	
No changes	22 (11,3%)	65 (33,5%)	87	44,8	
Decrease	7 (3,6%)	11 (5,7%)	18	9,3	
Frequency of snacks consumption during the Covid-19 pandemic					0,013*
Frequently (>1 time/day)	62 (32,0%)	114 (58,8%)	176	90,7	
Infrequently (<1 time/day)	2 (1,0%)	16 (8,2%)	18	9,3	
Frequency of fruits consumption during the Covid-19 pandemic					0,423
Frequently (>1 time/day)	24 (12,4%)	40 (20,6%)	64	33,0	
Infrequently (<1 time/day)	40 (20,6%)	90 (46,4%)	130	67,0	
Frequency of vegetables consumption					0,910
Frequently (>1 time/day)	39 (20,1%)	78 (40,2%)	117	60,3	
Infrequently (<1 time/day)	25 (12,9%)	52 (26,8%)	77	39,7	

Based on the results in Table 2, it can be concluded that there was a significant relationship between body

image perception and nutritional status ($p=0,000$). Body image perception and nutritional status had positive correlation with a correlation coefficient value was 0,609 which means it had a strong relationship ($r=0,70-0,90$)¹⁰. The frequency of snacks consumption during the Covid-19 pandemic also had a significant relationship with nutritional status ($p=0,013$) but had a very weak relationship as indicated by the correlation coefficient value was 0,194.

Discussion

Early adolescent begins at the age of 12-16 years old and ends around the age of 17-25 years old⁹. The most of adolescents pay attention and attach importance to their physical appearance so that they try to do something to make their physical appearance look better¹¹. Female adolescents have a higher dissatisfied of their body image than male¹² causing a negative body image. This is in line with the results of this study, namely 67,0% of adolescents who had a negative body image where dissatisfaction with body shape tends to be more experienced by female adolescents (54,7%) than male adolescents (12,3%). Changes in the form of increased body fat during puberty cause female adolescent to often feel dissatisfied with their body image¹³.

Overweight and obesity adolescents tend to have a negative body image, especially in female adolescent¹⁴. This study also showed that 19,1% of overweight and obesity adolescent had a negative body image. In addition, there was a significant relationship between body image perception and adolescents nutritional status. The same results were also shown in the several studies^{4,15}. This showed that the problem of body image dissatisfaction can make a female adolescent have negative thoughts and have an impact on abnormal nutritional status¹⁵.

Body image dissatisfaction was also found in adolescents with normal nutritional status (27,8%). This showed that sample with an ideal body weight tend to judge their body size to be larger than their actual body size and perceive the addition of body fat as something embarrassing¹⁶. Negative body image is influenced by many factors such as mass media, friends¹⁶, and is influenced by the trend of women with young, tall, long legs, and very thin⁴.

The online learning process during the Covid-19 pandemic can change the adolescents lifestyle, including dietary patterns¹⁷. This research showed

that most sample (45,9%) had an increase in their diet during the covid-19 pandemic. The same results were also shown in the several study¹⁸, namely, during the Covid-19 pandemic, dietary patterns such as breakfast, food variety, protein consumption, vegetables consumption, fruits consumption, fluids consumption, supplements, and spices was increased significantly compared to before the pandemic. During the pandemic, people are encouraged to stay at home, causing modified sample eating behavior and tends to consume more food. Dietary changing, such as eating food without hunger and overeating, may contribute to long-term intake-related health effects. Long stays at home during this time of the pandemic allow unrestricted access to food, thus causing individuals to consume food outside of mealtimes. This causes disruption of the metabolic cycle which can lead to dysmetabolism and obesity¹⁹.

Dietary changes adolescent in this study was the increase in the frequency of snack consumption, which was 90,7% of sample consuming snacks more often than before the Covid-19 pandemic. The results of this study also showed that there was a significant relationship between the frequency of snack consumption during the Covid-19 pandemic and the adolescents nutritional status. Snacks that are usually consumed by adolescents was contain high fat, high calory, high sugar, and low fiber. These snacks give a big contribution to the intake of calory and cholesterol in a day. This is can give an impact risk of obesity in adolescents if adolescents do not do physical activity regularly²⁰. Offline learning in pandemic period give impact in change of lifestyle adolescents, namely low physical activity but high energy consumption. This is can give impact in adolescents nutritional status such as increasing body weight.

Consumption of vegetables and fruits is recommended during the Covid-19 pandemic because vegetables and fruits has high antioxidants and vitamins that can improve the body's immune system²¹. The results of this study showed that 67,0% of adolescents are in the infrequent category (<1 time/day) in consuming fruits and 60,3% of adolescents are in the frequent category (>1 time/day) in consuming vegetables during the Covid-19 pandemic. Low fruit consumption is positively correlated with weight gain which can lead to obesity, so it is necessary to improve fruit consumption during the Covid-19 pandemic²².

Dietary that are not in accordance with the Guidelines for Balanced Nutrition during the Covid-19

pandemic can affect the adolescents nutritional status and give impact in a negative body image. Negative body image can also cause adolescents, especially female adolescents, to make various efforts to achieve the ideal body weight according to their perception. If it is not balanced with right knowledge, these efforts can have an impact on their nutritional status⁴.

Conclusion

There was a relationship between body image perception and adolescents nutritional status in Pekanbaru City during the Covid-19 pandemic. The problem of dissatisfaction with body image can make a adolescent have negative thoughts and have an impact on abnormal nutritional status. The need for a psychological approach to adolescents in increasing their confidence in their own body image.

Source of funding : Self funded

Ethical Clearance : No Ethical Issue

Conflict of Interests : Nil

References

1. Siagian A. *Citra Tubuh dan Gangguan Makan pada Remaja*. Sumatera Utara: Universitas Sumatera Utara. 2011
2. Haslinda L, Ernalina Y, Wahyuni S. *Citra Tubuh, Perilaku Diet, dan Kualitas Hidup Remaja Akhir Mahasiswa Fakultas Kedokteran Universitas Riau*. *Jurnal Ilmu Kedokteran*. 2015;9(2): 95-98.
3. Yusintha, AN, Adriyanto. Relationship between Eating Behavior and Body Image with Nutritional status of Adolescent Girl Age 15-18 Years. *Amerta Nutrition*. 2018. 147-154.
4. Marlina Y, Ernalina Y. The Relationship Between Body Image Perceptions and Nutritional Status of Junior High School Students in Pekanbaru. *Journal of Community Health*. 2020;6(2): 183-187
5. Verawati R. *Hubungan antara Body Image dengan Pola Makan dan Status Gizi Remaja Putri di SMP Al Islam 1 Surakarta* [tesis]. Surakarta: Universitas Muhammadiyah Surakarta. 2015.
6. Ammar A, Brach M, Trabelsi K. Effects of COVID-19 home confinement on eating behaviour and physical activity: Results of the ECLB-COVID19 international online survey. *Nutrients*. 2020;12(6): 1-14.
7. Utami AM, Kurniati AM, Ayu DR, Husin S, Liberty IA. *Perilaku Makan Mahasiswa Pendidikan Dokter*

- di Masa Pandemi Covid-19. *Jurnal Kedokteran dan Kesehatan*. 2021;8(3): 179-192.
8. Kementerian Kesehatan RI. Laporan Nasional Riskesdas 2018. Kementerian Kesehatan RI: Badan Penelitian dan Pengembangan Kesehatan. 2018.
 9. Kementerian Kesehatan RI. Profil Kesehatan Indonesia Tahun 2009. 2009. Available from <http://www.depkes.go.id>
 10. Guilford, J.P. *Fundamental Statistic in Psychology and Education*. 3rd Ed. New York: McGraw-Hill Book Company, Inc. 1956.
 11. Tarwoto, Aryani R, Nuraeni A, Miradwiyana B, Nurbayani S. *Kesehatan Remaja Problem dan Solusinya*. Jakarta: Salemba Medika. 2010.
 12. Papalia, Diane E. *Human Development (Psikologi Perkembangan)*. Jakarta: Kencana. 2011.
 13. Virgandiri S, Lestari DR, Zwagery RV. Relationship of Body Image with Eating Disorder in Female Adolescent. *Journal of Nursing Science*. 2020;8(1):53-59
 14. Wati DK, Sumarmi S. Citra Tubuh Pada Remaja Perempuan Gemuk Dan Tidak Gemuk: Studi Cross Sectional Study. *Amerta Nutrition*, 2017;398-405.
 15. Bimantara MD, Adriani M, Suminar DR. The Relationship between Body Image and Nutritional Status of Female Students in Senior High School 9 Surabaya. *Amerta Nutrition*. 2019; 85-88.
 16. Nomate, ES, Nur ML, Toy SM. Teman Sebaya, Citra Tubuh, Pola Konsumsi, dan Status Gizi Remaja Putri. *Unnes J. Public Heal*. 2017; 6:1-4.
 17. Noviasy R, Susant R. Change in Eating Behaviour among College Student on Nutrition Department during The Pandemic Covid-19. *Jurnal Kesehatan Masyarakat Mulawarman*. 2020; 2(2): 90-99.
 18. Dieny FF, Jauharany FF, Tsani AFA, Nissa C. Eating Behavior before and during the Covid-19 Pandemic among Adolescents and Adults in Indonesia. *Aceh Nutrition Journal*. 2021; 6(2): 128-138.
 19. Zarrinpar A, Chaix A, Panda S. Daily Eating Patterns and Their Impact on Health and Disease. *Trends in Endocrinology and Metabolism: TEM*. 2016; 27(2): 69-83.
 20. Keast, Debra R, Theresa AN, Carol EON. Snacking is Associated with Reduced Risk of Overweight and Reduced Abdominal Obesity in Adolescents: National Health and Nutrition Examination Survey (NHANES) 1999-2004. *The American Journal of Clinical Nutrition*. 2010; 92: 428-435.
 21. Kementerian Kesehatan RI. Panduan Gizi Seimbang pada Masa Pandemi Covid-19. 2020. Available from <https://infeksiemerging.kemkes.go.id>
 22. Sidor A, Rzymiski, P. Dietary Choices and Habits during COVID-19 Lockdown: Experience from Poland. *Nutrients*. 2020; 12(6):1657.

High Prevalence of Nasal carriage of Methicillin Resistant Coagulase Negative *Staphylococci* among Medical Students in a Tertiary Care Institution in North India

*Sonia Khatter¹, Awadhesh Kumar², CV Madhumidha³,
Shruti Yadav⁴, Iqbal R Kaur⁵

¹Professor, ²Senior Resident, ³MBBS student, ⁴MBBS student, ⁵Professor, Department of Microbiology,
ESIC Medical College and Hospital, Faridabad, Haryana

How to cite this article: *Sonia Khatter, Awadhesh Kumar, CV Madhumidha, Shruti Yadav, Iqbal R Kaur et al. High Prevalence of Nasal carriage of Methicillin Resistant Coagulase Negative *Staphylococci* among Medical Students in a Tertiary Care Institution in North India. Volume 13 Issue 3 July-September 2022

Abstract

Introduction: MBBS students during rotational clinical postings run the risk of being colonised by critical hospital pathogens such as Methicillin-resistant staphylococci (MRSA and MRCoNS). **Methods:** This study was conducted on 150 undergraduate MBBS students from August to September 2018 to determine prevalence of nasal colonization rates of MRSA /MRCoNS in them. One sterile cotton tipped swab per student was used to collect specimen from the anterior nares. This was inoculated on 5 % Sheep Blood agar. Isolated suspected *Staphylococci* colonies were speciated and Methicillin resistance was determined by disc diffusion tests as per standard protocols. Overall prevalence of MRCoNS (22%) among students was significantly higher compared to MRSA(4%). MRCoNS colonisation was also significantly higher in clinic going students. **Conclusion:** Compared to MRSA, little information is available on epidemiology of CoNS/MRCoNS among healthcare workers as these bacteria are considered harmless commensals. Findings of this study suggest that those involved in patient care including medical students may be carriers of MRCoNS similar to MRSA and could be potential sources of infection to vulnerable patients.

Keywords: Nasal Carriage; MRCoNS; MBBS students

Background

Staphylococci are important commensal bacteria, which are frequently responsible for opportunistic and hospital-acquired infections in humans. The most frequent carriage site is the vestibulum nasi (anterior nares), which serves as reservoir for the spread of the pathogen¹. On the basis of coagulase test, *Staphylococci* are divided in two types: *Staphylococcus*

aureus (*S.aureus*), which is coagulase positive and the rest Coagulase negative staphylococci. Up to 30% of the human population are asymptotically and permanently colonized with nasal *S. aureus*¹.

Methicillin-resistant staphylococci (MRS) are now considered significant public health pathogens involved in the community and health-care settings. Methicillin Resistant *Staphylococcus aureus* (MRSA)

*Corresponding Author, Sonia Khatter, Professor,

Department of Microbiology, ESIC Medical College and Hospital, Faridabad

Haryana, India. 121001.

Mobile: 9810692484

Email: maliksonia3012@gmail.com

strains have rapidly emerged and become a major problem immediately after the Methicillin was introduced². Usually, MRSA infection is preceded by nasal colonization, anterior nares being the ecological niches of *S. aureus*³.

Colonized hospital staff such as asymptomatic nasal carriers act as reservoirs for the spread of MRSA within hospitals leading to nosocomial outbreaks resulting in increased mortality, morbidity, prolonged hospital stay of patient and escalated cost of treatment⁴. Screening for MRSA among hospital staff is an important component of hospital infection control strategy. Similar to MRSA, nasal carriage constitutes a significant and a common reservoir of CoNS, which are associated with an increased risk of nosocomial infections⁵. However, little data is available for CoNS/MRCoNS colonization in hospital staff.

MBBS undergraduate students undergo rotational postings in different clinics and are exposed to hospital environment as well as closely interact with the patients. Hence, students are at increased risk of being colonised by the hospital bacterial flora and can easily transmit them to vulnerable patients.

Hence, this study was planned to determine prevalence of nasal colonization rates of *Staphylococcus aureus*/MRSA and CoNS/MRCoNS in undergraduate medical students as well as to compare the difference in the colonization rates of these bacteria among preclinical and clinical sciences medical students.

Materials and Methods

Approval from the Institute's Ethics Committee was taken before commencement of the study. This was a hospital based cross sectional study, which was conducted from August 2018 to September 2018 in the department of Microbiology, ESIC Medical College & Hospital, Faridabad, a tertiary care teaching hospital. For this study, 150 undergraduate MBBS students (300 MBBS students in the Medical College in three batches of students with 100 students in each batch). Assuming average prevalence of 22% in health care workers, 95% CI, sample size of 141 was calculated.) The study conditions were explained to all the participants and written informed consent was taken before collecting their samples. Those suffering from any clinically evident infection or with history of intake of antibiotics in the previous 30 days were excluded from the study.

One sterile pre-moistened cotton tipped swab per student was used to collect specimen from both the anterior nares. The swab was then inoculated immediately on 5 % Sheep Blood agar and incubated overnight at 37^o C in a candle jar in 5-10% CO₂ condition. Isolated suspected *Staphylococcus* colonies were further identified on the basis of colony character, Gram staining reaction, biochemical test like catalase, coagulase test using standard methods.

After confirmation of *S.aureus*/Coagulase negative staphylococci, colonies from pure culture were screened for Methicillin resistance by disc diffusion method using 30 µg cefoxitin disk (as a surrogate for mecA mediated oxacillin resistance).

Plates were incubated at 33-35^oC in ambient air. Reading was done after 16-18 hours.

Any *S. aureus* isolate with zone diameter ≤ 21 mm were considered to be MRSA as per Clinical and Laboratory Standards Institute (CLSI) guidelines. CoNS isolates were considered Methicillin resistant or MRCoNS when zone diameter was ≤ 24 mm⁶.

Results and Discussion

A total of 150 medical (MBBS) students comprising 50 students in first year, 50 students in second year and 50 in third year were enrolled in this study. The general demographic features of these students are given in Table:1.

Table 1: General Demographic Features of MBBS students

	Ist year	2 nd Year	3 rd Year
Number	50	50	50
Average age in years	19.3	21.1	22
M:f	1.2:1	1.3:1	1.1:1

Overall, CoNS were the commonest colonising nasal flora isolated in 58.8%(88/150) of medical students, while nasal colonization of *S. aureus* among all students was 23.2% (35/150). Other bacterial flora isolated from nasal swabs including diphtheroids, micrococci, viridans streptococci, enterococci, and Aerobic spore bearers constituted 15.4%. Cultures were sterile in 4(2.6%).

No significant difference was observed between girls and boys w.r.t nasal colonization of staphylococci. Year wise nasal colonisation of staphylococci is given in Table:2.

Table 2: Distribution of different Staphylococci among MBBS students

Bacteria Isolated N(%)	Ist year 2017 batch(%) Preclinical	2nd year 2016 batch (%) Clinical	3 rd Year 2015 batch(%) Clinical
<i>S.aureus</i> N=35(23.2%)	16/50 (32%)	8/50 (16%)	11/50 (22%)
CoNS N=88(58.8%)	25/50 (50%)	32/50 (64%)	31/50 (62%)
Other bacteria* N=23(15.6%)	7/50 (18%)	9/50 (50%)	7/50 (16%)
Sterile Cultures N=4(2.6%)	2/50 (4%)	1/50 (2%)	1/50 (2%)

Prevalence of MRSA and MRCoNS is given in table 3.

Table 3: Year wise Nasal Carriage Rate of Methicillin Resistant Staphylococci

Bacteria	Ist year 2017 batch(%) Preclinical	2nd year 2016 batch (%) Clinical	3 rd Year 2015 batch(%) Clinical	P value
Total MRSA 6/150 (4%)	5/50 (10%)	Nil	1/50 (2%)	<0.05%
Total MRCoNS 33/150 (22%)	1/50 (2%)	17/50(34%)	15/50 (30%)	<0.05%

Overall prevalence of MRSA among all students was 4% (6/150). Several studies have reported rates of nasal carriage of MRSA among healthcare staff ranging from 5.2%-25.5%^{7,8,9}. Our rate of 23.2% *S.aureus* and 4% MRSA is comparable to Baroja et al,2021 from Ecuador¹⁰. A study from south India has reported prevalence rate of 19.7% of *S.aureus* nasal colonization in 2nd year students, who had started clinical postings with MRSA rate of 11.1%¹¹. Another study from Manipal reported *S.aureus* prevalence of 52.7% and 6% MRSA, while similar studies from the same institute on foreign students of Thailand and Malaysia reported no MRSA¹².

Overall prevalence of MRCoNS among students was 22% (33/150) and significantly higher than MRSA.

We hypothesized that exposure to hospital environment would increase nasal bacterial colonization among students of clinical sciences as compared to preclinical sciences students, who have no such exposure to hospital environment. In a study from Nepal on medical students, the nasal colonization by *S.aureus* and MRSA was observed to be significantly higher among clinical sciences students as compared to preclinical sciences students¹³. In contrast, we observed a significantly higher prevalence of both *S.aureus* and MRSA in preclinical group of students. MRSA carriage rate was 10%, 0% and 2% in Ist, 2nd and 3rd professional students respectively ($P<0.05$). This could be indicative of a higher prevalence of MRSA in the general community.

We found a significantly high nasal carriage of MRCoNS in clinic going students of 2nd year (34%) and 3rd (30%) year compared to just 2% in preclinical students ($P<0.05$). This indicates that frequency of colonization with MRCoNS among students was increasing over time with increasing clinical exposure. Compared to MRSA, there is little information available on the epidemiology of CoNS/MRCoNS among HCWs or Healthcare settings. A probable cause of lower detection of MRCONS in routine surveillance studies conducted on hospital staff could be that unlike MRSA, CoNS are dismissed as harmless commensals and no effort is made to identify them or process them for antimicrobial susceptibility tests. There is a possibility that many healthcare personnel harbouring CoNS/MRCoNS might be going undetected and may be spreading highly resistant CoNS to the vulnerable patients. Nasal carriage constitutes a significant and a common reservoir of CoNS associated with an increased risk of nosocomial infections⁵. Resistance genes among CoNS are easily transferable horizontally to other staphylococci including *S.aureus* thus, facilitating the spread of antibiotic resistance¹⁴. There are higher chances of these bacteria being Methicillin resistant. Treatment of such infection can pose great challenges as compared to MRSA. In a study from Jordan, of all the CoNS isolated from the nasal swabs collected from the inpatients, 73% were MRCoNS⁵. In an earlier study, there was 60% prevalence of MRCoNS among nursing personnel with frequency of colonisation increasing overtime¹⁵.

Conclusion

The findings of this study suggest that MRCoNS colonised healthcare personnel may be silent transmitters of nosocomial infections. Hence, similar to MRSA, healthcare personnel should also be screened for MRCoNS. Careful infection control practice, including judicious use of antibiotics with frequent handwashing, will remain critical policies for limiting spread of such strains. Such simple epidemiological studies of screening the students for critical nosocomial pathogens provide an excellent opportunity for sensitizing the students to the risk of hospital acquired infections as well as the need of hand hygiene.

Ethical Clearance: The study was approved by the Institute's Ethics Committee

Conflict of interest: None declared

Source of funding: None other than institutional funds

References

- Sakr A, Brégeon F, Mège JL, Rolain JM, Blin O. *Staphylococcus aureus* Nasal Colonization: An Update on Mechanisms, Epidemiology, Risk Factors, and Subsequent Infections. *Frontiers in Microbiology* 2018;9:2419. Published 2018 Oct 8. doi:10.3389/fmicb.2018.02419
- Lakhundi S, Zhang K. Methicillin-Resistant *Staphylococcus aureus*: Molecular Characterization, Evolution, and Epidemiology. *Clinical Microbiology Reviews* 2018; 31(4), e00020-18. <https://doi.org/10.1128/CMR.00020-18>
- Abdella HM, Zaki WK, Elnaggar MK. Risk of Nasal Colonization of Methicillin-resistant *Staphylococcus aureus* (MRSA) in Tropical medicine Department in Ain Shams University Hospitals. *Egyptian Journal of Medical Microbiology* 2010; 19(2):95-102.
- Emmaneinim M, Jabalameli F, Leeuwen WBV, et al. Nasal carriage rate of methicillin resistant *Staphylococcus aureus* among Iranian healthcare workers: a systemic review and meta-analysis. *Rev Soc Bras Trop* 2017;50:590-7.
- Al-Tamimi M, Abu-Raideh J, Himsawi N, et al. Methicillin and vancomycin resistance in coagulase-negative *Staphylococci* isolated from the nostrils of hospitalized patients. *Journal of Infection in Developing Countries* 2020;14(1):28-35. doi: 10.3855/jidc.11025. PMID: 32088681.
- Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptibility testing; Seventeenth Information Supplement. CLSI document M100-S17, *Clinical and Laboratory Standards Institute* Wayne Pennsylvania. 2016. no. 1. Vol. 27.
- El Aila NA, Al Laham NA, Ayesh BM. Nasal carriage of methicillin resistant *Staphylococcus aureus* among health care workers at Al Shifa hospital in Gaza Strip. *BMC Infectious Diseases* 2017; 17(1):28. doi: 10.1186/s12879-016-2139-1. PMID: 28056831; PMCID: PMC5217237.
- Giri N, Maharjan S, Thapa TB, et al. Nasal Carriage of Methicillin-Resistant *Staphylococcus aureus* among Healthcare Workers in a Tertiary Care Hospital, Kathmandu, Nepal. *International Journal of Microbiology* 2021; 10:2021:8825746. doi: 10.1155/2021/8825746. PMID: 34422056; PMCID: PMC8373499.
- Agarwal L, Singh AK, Sengupta C, Agarwal A 2015, Nasal carriage of Methicillin- and Mupirocin-resistant *S. aureus* among health care workers in a tertiary care hospital. *Journal of Research in Pharmaceutical Practices* 2015;4(4):182-186. doi:10.4103/2279-042X.167046.
- Baroja I, Guerra S, Coral-Almeida M, et al. Methicillin-Resistant *Staphylococcus aureus* Nasal Colonization Among Health Care Workers of a Tertiary Hospital in Ecuador and Associated Risk Factors. *Infection & Drug Resistance* 2021; 25(14):3433-3440. doi: 10.2147/IDR.S326148. PMID: 34471363; PMCID: PMC8403571.
- Nagamadhavi V, Samatha P. Assessing the Prevalence of *Staphylococcus aureus*, Particularly MRSA, from Anterior Nares of Medical Students. *Indian Journal of Microbiology Research* 2016;3(1):22-23.
- Radhakrishna M, Taneja A & Rao P. Nasal Carriage of *Staphylococcus aureus* with Special Emphasis on Methicillin-Resistant *Staphylococcus aureus* Among Students of A South Indian Medical College - Prevalence and Antibiogram Pattern. *Asian Journal of Pharmaceutical and Clinical Research* 2016; 9(2),129-132. <https://doi.org/10.22159/ajpcr.2016.v9s2.13274>.
- Bhatta DR, Hamal D, Shrestha R, et al. Nasal and Pharyngeal Colonization by Bacterial Pathogens: A Comparative Study between Preclinical and Clinical Sciences Medical Students. *Canadian Journal of Infectious Diseases & Medical Microbiology* 2018. 7258672. doi:10.1155/2018/7258672. PMID: 29983836; PMCID: PMC6011148.
- Otto M. Coagulase-negative staphylococci as reservoirs of genes facilitating MRSA infection: Staphylococcal commensal species such as *Staphylococcus epidermidis* are being recognized as important sources of genes promoting MRSA colonization and virulence.

Bioessays : News and Reviews in Molecular, Cellular and Developmental Biology 2013;35(1):4-11. DOI: 10.1002/bies.201200112. PMID: 23165978; PMCID: PMC3755491.

15. Lee YL, Cesario T, Tran Chi, et al .Nasal colonization by methicillin-resistant coagulase-negative Staphylococcus in community skilled nursing facility patients, *American Journal of Infection Control* 2020;28: 269-272, ISSN 0196-6553, <https://doi.org/10.1067/mic.2000.103243>.

Psychological Health and Its Determinants among Elderlies of Prayagraj.

Sucheta Singh¹, Khurshid Parveen², Gyan Prakash³, Richa Singh⁴

¹Junior Resident, Department of Community Medicine, M.L.N Medical College, Prayagraj, U.P, India.

²Professor & Head, Department of Community Medicine, M.L.N Medical College, Prayagraj, U.P, India.

³Associate Professor, Department of Community Medicine, M.L.N Medical College, Prayagraj, U.P, India.

⁴Assistant Professor, Department of Community Medicine, M.L.N Medical College, Prayagraj, U.P, India.

How to cite this article: Sucheta Singh, Khurshid Parveen, Gyan Prakash, Richa Singh et al. Psychological Health and Its Determinants among Elderlies of Prayagraj. Volume 13 Issue 3 July-September 2022

Abstract

Background: The definition of health by World Health Organization acknowledges mental wellbeing as one of the important component of healthy life. At present around 17.13 million older adults are suffering from mental health problems in India. Hence, in order to determine the current scenario of psychological health issues faced by people in their old age and the factors associated with various problems in Prayagraj, this study was taken up.

Objective: To determine prevalence of psychological health illness and their associated factors in elderly population.

Material and Method: This cross-sectional community based study was done on 483 elderly population of Prayagraj. The data was collected using interview method by pretested structured questionnaire. The psychological problems were assessed using validated GHQ-H scale. The data was analysed on epi info version 7 and chi-square test was used at p value < 0.05 significance.

Results: The prevalence of definitive Psychiatric morbidity among the elderly population was found at 13.7%. Gender, marital status, education status and certain physical morbidities like oro-dental problems, hearing impairment and respiratory problems were found to be significantly associated with psychological health in elderly age group.

Conclusions: psychological illness among the elderly population in the community is rather prevalent which goes unnoticed and it was found to be significantly associated with Female gender, Living without spouse, and having some physical morbidities.

Keywords: Elderly population, Definitive psychiatric morbidity, determinants.

Introduction

The demographic transition and population projections of India indicates that the growth rate of the Indian elderly population (60 years and above) is comparatively faster than other countries of the World. The life expectancy at birth has also increased from 62.5 years to 66.8 years from 2000 to 2011.^[1] Rapid advances in medicine, public health, nutrition and sanitation have led to large cohorts advancing

to old age accounting for more than 100 million, and projections predict a figure of 324 million, i.e., 20% of the total population, by 2050.^[2] The working population who supports the dependents such as elderlies in the population is decreasing while the old people themselves are experiencing continued degeneration and deterioration of both physical and mental health. As a result, these individuals are experiencing feelings of a lack of wellbeing.

Corresponding Author: Dr. Khurshid Parveen

Dept. of Community Medicine,

MLN Medical College, Prayagraj, UP.

Email: drkparveen@gmail.com

Contact No.: 8318741173

'National Policy on Older Persons' adopted by the government of India in January, 1999 defines 'senior citizen' or 'elderly' as a person who is of age 60 years or above.^[3] In most of the Indian studies, the cut-off age for the elderly is found to be 60 years as compared to 65 years in international studies. Traditionally, the primary source of care and material support for the elderly individuals has been the family but due to urbanization and modernization there have been major transformations in the family's structure and values. As a result of socio-demographic changes, older adults at times become weak due to health-related problems including psychosocial ones. According to WHO data, one in four older adults experiences some mental disorder, such as depression, anxiety, or dementia globally. At present around 17.13 million older adults are suffering from mental health problems in India^[1].

Psychosocial problems are needed to be probed and addressed because they are of vital importance especially in old age as it is accompanied by feelings of loneliness, concerns of death, unpleasant thoughts and it is also dominated by negative feelings. Furthermore, detection of psychological morbidity and its appropriate management at earlier stage shortens the duration of suffering and improve the overall quality of life. Viewing it, to assess mental health among the elderly, exploring the psychological problems is of utmost importance. Hence, in order to determine the current scenario of psychological health issues faced by people in their old age and the factors associated with various problems in Prayagraj district, this study was conducted.

Material and Method

Study Design: Cross-Sectional community based study.

Study Setting: Urban and rural areas of Prayagraj district.

Study Duration: The study was conducted from March 2020 to October 2021.

Study Population: All elderly population (age 60 years and above) of Prayagraj district.

Study Unit: Individual of age 60 years and above

Inclusion Criteria

- Elderly population of age 60 and above.

- Residents of the study area.
- Subjects willing to participate in the study

Exclusion Criteria

- Those who refused to participate in the study or those who were unable to answer the assessment questionnaire due to serious hearing problems or severe communication disorder.
- Guests visiting the household.

Objective: To determine prevalence of psychological health illness and their associated factors in elderly population.

Sample Size Calculation: The sample size was calculated to be 436 considering the prevalence as 3.4% from previous study^[3], then adding 10% of non-response error, the sample size was estimated to be 480.

Sampling Technique: Multistage Random sampling was done.

Total sample size was divided into rural and urban proportionately. So, it was decided to select 109 elderly subjects in urban and 327 in rural areas for the same depending upon the average population and composition of Prayagraj district. It was estimated that elderly population from a total four randomly selected urban colonies (from two randomly selected urban wards) and six randomly selected villages of randomly selected blocks will complete the sample size.

Data collection: After obtaining clearance from institutional ethical committee, the randomly selected villages and colonies were visited and individuals aged 60 years and above were approached. First individual in each village or ward was selected randomly. House-to-house visit was done and complete enumeration of elderly individual in the selected areas was done. A total of 121 elderly from urban and 362 from rural were enumerated. The sampled population was further evaluated for exclusion criteria. The participants were briefed about the study and its purpose of doing. After informed consent and assuring full confidentiality to the study participants, interview was carried out using pre-structured, coded questionnaires.

Tools Used

- GHQ-H^[4]: a standardized Hindi version of Goldberg's General Health Questionnaire containing 60 items was used for evaluating the overall psychological status in elderly population. The questionnaire has been proved to be helpful in the identification of patients with minor psychiatric illnesses and also serves the epidemiologists as a screening device. A score of 1 has to be given for any item present in column 3rd and 4th and the sum total is to be calculated.
- Chi square test was used at significance to established the relation between various cofactors of psychological illness.
- Epi info version 7 for analysis of data.

Results

A total of 483 subjects (rural and urban) were enrolled in the study. The socio-demographic profile of study participants is shown in table 1. There were 288 male and 195 female participants in the study. Out of total 483 participants, 405 elderly were living with spouse (married) and 78 were not living with spouse (unmarried/ divorced/ widow-widower) and there were 71.8% of the study participants living in a joint family. Around half i.e., 56.5% of the study participants were formally educated. In the present study, based on employment, two groups were created. Retired, homemakers and those who were not working due to their ill health or disability were included in non-employed group. Three hundred and ninety four participants were non-employed and remaining 89 participants were employed. Majority of the elderly participants were found in the lower-lower socioeconomic class and very few (20.4%) were in the upper class of Revised Modified BG Prasad classification.

Table 1: Sociodemographic Profile of the Elderly Participants

		N=483	%
Age	60-74 years	407	84.2
	75 years and above	76	15.8
Gender	Male	288	59.6
	Female	195	40.4
Religion	Hindu	402	83.2
	Muslim	75	15.5
	Christians	6	1.3

Marital Status	Married	405	83.8
	Unmarried/ divorced/ widow- widower	78	16.2
Type of family	Nuclear family	136	28.2
	Joint family	347	71.8
Educational status	Formally educated	273	56.5
	Not formally educated	210	43.4
Employment status	Employed	89	18.4
	Non-employed	394	81.5
Socioeconomic Status	Upper	99	20.4
	Upper Middle	39	8
	Lower Middle	41	8.4
	Upper Lower	95	19.6
	Lower-Lower	209	43.2

In the sample population of 483, 66 (13.7%) were found to have definitive psychiatric morbidity. The presence of psychiatric morbidity was 18% among females and 10.4% among male participants and this was found to be significant. The prevalence of psychiatric morbidity was found to be low among the married individuals (10.6%) compared to those who were unmarried/ divorced/ widow-widower (29.48%). Definitive psychiatric morbidity was found to be more prevalent among individuals who did not have formal education (17.61%) compared to those having formal education (10.62%). Psychiatric morbidity was present among 12.35% of employed and 13.95% of non- employed elderly participants. The prevalence of psychiatric morbidity was 14.14%, 10.25%, 12.19%, 24.21% and 9.56% among the socioeconomic class I, II, III, IV and V. Gender, marital status, presence or absence of formal education was found to have association with definitive psychiatric morbidity among the elderly participants. This association was found to be statistically significant at p value < 0.05. using chi-square test. As depicted in table 3 most of the elderly were found to be suffering from eye problems i.e., 124 (25.6%) were having refractory errors in their eyes, 47 (9.7%) were found to have cataract and there were 94 (19.5%) individuals having both cataract with refractory errors. There were 205 elderly with oro-dental problems and 56 were having mild or moderate form of hearing impairment. In the study, 99 individuals were found to have hypertension and 92 (19%) were having Diabetes. There were 44 (9.1%) elderly participants found to have respiratory illnesses. Physical morbidities such as hearing impairment, respiratory problems, and oro-dental problems were found to

have statistically proven significant association with definitive psychiatric morbidity.

Table 2: Psychological Illness and Its Determinants

		N= 483	Definitive Psychiatric morbidity (%)	p - value
Age	60-74 years	407	54 (13.2)	0.5568
	75 years and above	76	12 (15.7)	
Gender	Male	288	30 (10.4)	0.01155
	Female	195	36 (18.5)	
Marital Status	Married	405	43 (10.6)	0.001174
	Unmarried/ divorced/ widow-widower	78	23 (29.48)	
Type of family	Joint family	136	43 (12.3)	0.193348
	Nuclear family	347	23 (16.9)	
Educational status	Formally educated	273	29 (10.62)	0.026474
	Not formally educated	210	37 (17.61)	
Employment status	Employed	89	11 (12.35)	0.69146
	Non employed	394	55 (13.95)	
Socioeconomic Status	Class I	99	14 (14.14)	0.789053
	Class II	39	4 (10.25)	
	Class III	41	5 (12.19)	
	Class IV	95	23 (24.21)	
	Class V	209	20 (9.56)	

Table 3: Relation between Psychological Illness and Physical Illnesses

Physical Illness	N=483	Definitive Psychiatric Morbidity		p - value
		Present	Absent	
Visual impairment	265 (54.9%)	38	14.33	0.633927
Hearing Impairment	56 (11.5)	14	25	0.008624
Oro-Dental problems	205 (42.4)	39	19.02	0.00323
Hypertension	99 (20.4)	12	12.12	0.616071
Diabetes	92 (19)	14	15.21	0.629843
Respiratory problems	44 (9.1)	13	29.54	0.001295

Discussion

In the present study, 84.2% of the elderlies were in the age group of 60-75 years and remaining 15.8% were in the age group of 75 years and above. Similar age distribution pattern was observed by the study done by **Seby et al.**^[5] and **Manaf et al.**^[6] where majority i.e., 66.3% and 78.3% of the study participants were in the age group of 60-74 years. In the present study, 16.2% were divorced/unmarried/widow/widower. Study by **Datta et al.**^[7], **Suwamane et al.**^[8] and **Bandla et al.**^[9] on elderly population has revealed comparatively higher percentage of widowed individuals. This discrepancy could be due to the reason that in our study, very few were in the age-group of 75 years and above.

In the present study, 71.8% of the elderly were living in a joint family and remaining 28.2% were living in a nuclear family. In terms of educational status of the population studied, 43.4% elderlies were not formally educated whereas 56.5% of the elderlies were found to be formally educated. Other studies by **Patel et al.**^[10] done on elderlies in Jodhpur revealed 53.6% of the participants to be illiterate. The percentage of literacy quoted by **Seth et al.**^[11] in their study was as low as 12.5% in the elderly population of Uttar Pradesh. In our study, majority (81.5%) of the participants were non-employed and only 18.4% were engaged in some kind of employment. The percentage of non-employed participants in other studies done on elderlies by **Seth et al.**^[11] and **Manhas et al.**^[12] was reported to be 50.7% and 61.6% respectively. In the present study, 62.8% of the study participants were from class IV and class IV socioeconomic status. In the present study, more than half i.e., 54.9% of the participants were found to be suffering from visual impairment. The findings are similar to the study by **Seby et al.**^[5] where the most common physical illness among elderlies was visual impairment (41.5%). In our study, Oro-dental problems was prevalent in 42.4% of the sample population and 9.1% were found to be suffering from respiratory illness. The prevalence of Hypertension and Diabetes in our study was found to be at 20.4% and 19% respectively. Similarly, **George et al.**^[13] and **Das et al.**^[14] in their study reported prevalence hypertension at 21.3% and 27.2% and diabetes was reported at 17.4% and 21.7% respectively.

In our study, when assessed through GHQ-H scale, 66 out of 483 participants scored > 17 and hence the prevalence of psychiatric morbidity was established at 13.7%. Other studies done on elderly have found

the prevalence of psychological illnesses to be much higher than the present study. **Suwanmanee et al.**^[8] conducted a study among geriatric population of Thailand using GHQ-28 scale and found the prevalence of poor mental health at 20.8%. In other studies, the prevalence of psychiatric morbidity reported by **Nair et al.**^[15], **Singh et al.**^[16], **Bandla et al.**^[9], and **Seby et al.**^[5] was 33.9%, 34.2%, 59.2% and 26.7% respectively. The reason for comparatively low prevalence of psychiatric morbidity among elderly population in our study may be because other studies included cognitive impairment including dementia in psychiatric illnesses which were assessed using different scales and might have led to increased prevalence of psychiatric illness. Other reasons could be due to socio-demographic picture of the present study where majority of the participants were from rural areas, lower socioeconomic class, and male participants outnumbering female participants. Moreover, the study was done during the pandemic when school going children were attending online classes at home, employed ones were following work from home, son and daughter living far in foreign countries came home. Staying with family members throughout day made elderly person feel more emotionally secure compared to other days when school children were busy with their school routine, others were busy in workplace when whole day elderly person used to spend time alone feeling more lonely.

The prevalence of psychiatric morbidity was found to be significantly higher among the females (18.5%) compared to males (10.4%). This association of psychiatric morbidity with the female gender was found to be statistically significant. This could be due to lack of social support, financial constraints, more family responsibilities and delay in help seeking behavior. **Datta et al.**^[7] also revealed similar findings where higher percentage of females (42.9%) compared to male (30.1%) were found to have mental illness. Psychiatric morbidity was found more prevalent among those living in a nuclear family (16.9%). Those participants who were either widow, unmarried or divorced were found to higher prevalence of definitive psychiatric morbidity (29.48%) compared to the married ones (10.6%). Similarly other studies^[17, 18, 19] have found marital status to be one of the determinant for poor psychological health in old age. In the present study, 10.7% of formally educated individuals were found to be suffering from definitive psychiatric morbidity whereas 17.1% of those who were not

formally educated were suffering from definitive psychiatric morbidity. This difference in prevalence among these two groups was found to statistically significant. Similarly, **Pilania et al.**^[18] and **Sengupta et al.**^[17] had reported higher prevalence of one of the psychiatric problem i.e., depression among those who were illiterate. **Bandla et al.**^[9] and **Nagoor et al.**^[20] also reported in their study that psychiatric morbidity was more prevalent among illiterates compared to those who were literate. In our study, psychiatric morbidity was seen more among individuals having some or the other physical illness. Physical illnesses such as orodental problems, hearing impairment and respiratory problems were found to have significant association (at p value= 0.00323, 0.008624, 0.001295 respectively) with psychiatric morbidities in old age. This could be due to the fact that inconvenience and despair due to physical illness brings elderly more prone for stress, fear of being burdened and emotionally unhappy. Similarly **Pruchno et al.**^[21], **Suwanmanee et al.**^[8] and **Garatachea et al.**^[22] reported that elderlies who had good physical health or those with no chronic illness were found to have good mental health.

Conclusion

The present study focused on psychological aspects of the health in old age. It can be stated that psychological illness among the elderly population in the community is rather prevalent and it goes unnoticed most of the time. Various factors like being married and staying with spouse, having formal education and living in a joint family were found to be protective factors against psychiatric morbidities. Female gender and physical illnesses such as respiratory problems, hearing impairment and oro-dental problems were found to have significant association with definitive psychiatric morbidity in old age.

Recommendations

Awareness about mental health should be enhanced in the community by involving ASHA, voluntary health workers, and Camps by mental health professionals. Mass media, newspaper and radio can also be used. Early detection at community level can be done by increasing credibility for health care system among community. Awareness about geriatric health clinic in medical colleges and its utilization should be made.

Ethical Clearance: received from Institutional Ethics Committee of Moti Lal Nehru Medical College,

Prayagraj.

Source of Funding- Self

Conflicts of Interest- Nil

References

1. Tiwari SC, Pandey NM, Singh I. Mental health problems among inhabitants of old age homes: A preliminary study. *Indian J Psychiatry* 2012; 54(2):144-148.
2. Phoebe SL, Irudaya RS. An aging India: perspectives, prospects and policies. *J Aging Soc Policy.* 2003;15(2-3):1-9.
3. Boralingaiah P, Bettappa P, Kashyap S. Prevalence of Psycho-Social Problems among Elderly in Urban Population of Mysore City, Karnataka, India. *Indian J Psychol Med.* 2012; 34(4):360-364.
4. Gautam S, Nijhawan M, Kamal P. Standardisation of Hindi version of Goldbergs's General health Questionnaire. *Indian J. Psychiat.*1987;29 (1):63-66.
5. Seby K, Chaudhury S, Chakraborty R. Prevalence of psychiatric and physical morbidity in an urban geriatric population. *Indian J Psychiatry.* 2011;53:121-7.
6. Manaf MRA, Mustafa M, Rahman MRA, Yusof KH, Abd Aziz NA. Factors Influencing the Prevalence of Mental Health Problems among Malay Elderly Residing in a Rural Community: A Cross-Sectional Study. *PLoS ONE.*2016;11(6):e0156937.
7. Datta PP, Gangopadhyay N, Sengupta. Association of psychological morbidity with socio-demographic characteristics among elderly: A cross-sectional study from Eastern India. *Int J Med Public Health.* 2013;3(2):94-99.
8. Suwanmanee S, Nanthamongkolchai S, Munsawaengsub C, Taechaboonsermsak P. Factors Influencing the Mental Health of the Elderly in Songkhla, Thailand. *J Med Assoc Thai.* 2012;95(6):8-15.
9. Bandla S, Gopalan S, Nappinai NR, Mathumathi S, Sivachidambaram B. A study of psychiatric morbidity in geriatric population living in old age home and community. *AP J Psychol Med.* 2016;17(2):90-4.
10. Patel V. Mental health in low- and middle-income countries. *Br Med Bull.* 2007;81-82(1):81-96.
11. Seth RK. Morbidity pattern and psychosocial problems of elderly in a rural population of Uttar Pradesh, India: a cross-sectional study. *Int J Res Med Sci.* 2016;5(1):162.
12. Manhas RS, Manhas GS, Manhas A, Thappa JR, Akhter R, Sharma R. Psychiatric Morbidity among Geriatric Patients Attending Psychiatric OPD of Tertiary Care Hospital. *JMSCR.* 2019;7(6):491-497.
13. George LS, Deshpande S, Krishna Kumar MK, Patil RS. Morbidity pattern and its sociodemographic determinants among elderly population of Raichur district, Karnataka, India. *J Family Med Prim Care.* 2017;6(2):340-344.
14. Das S, Arun P, Rohilla R, Parashar K, Roy A. Anxiety and depression in the elderly due to COVID-19 pandemic: a pilot study. *Middle East Curr Psychiatry.* 2021;28(1):67.
15. Nair SS, Raghunath P, Nair SS. Prevalence of Psychiatric Disorders among the Rural Geriatric Population: A Pilot Study in Karnataka, India. *Cent Asian J Glob Health.* 2015;4(1):138.
16. Singh AP, Kumar KL, Reddy CMPK. Psychiatric Morbidity in Geriatric Population in Old Age Homes and Community: A Comparative Study. *Indian J Psychol Med.* 2012;34(1):39-43.
17. Sengupta P, Benjamin AI. Prevalence of depression and associated risk factors among the elderly in urban and rural field practice areas of a tertiary care institution in Ludhiana. *Indian J Public Health.* 2015;59(1):3-8.
18. Pilania M, Bairwa M, Khurana H, Kumar N. Prevalence and predictors of depression in community-dwelling elderly in rural Haryana, India. *Indian J Community Med* 2017; 42(1):13-18.
19. Alam MN, Singh SP, Gupta VS, Bhawnani D, Soni GP. A study on mental health status and its determinants in elderly people of Raipur city, Chhattisgarh, India. *Int J Community Med Public Health.* 2016;3(11):2982-2986.
20. Nagoor K, Darivemula SB, Reddy N B, Patan SK, Deepthi CS, Chittooru CS. Prevalence of mental illness and their association with sociodemographic factors in the rural geriatric population in Chittoor, Andhra Pradesh, India: A community-based study. *J Edu Health Promot.* 2018;7:165.
21. Pruchno RA, Wilson-Genderson M, Heid AR. Multiple Chronic Condition Combinations and Depression in Community-Dwelling Older Adults. *J Gerontol A Biol Sci Med Sci.* 2016; 71(7):910-915.
22. Garatachea N, Molinero O, Martinez-Garcia R, Jimenez-Jimenez R, Gonzalez-Gallego J, Marquez S. Feelings of well-being in elderly people: Relationship to physical activity and physical function. *Arch Gerontol Geriatr.* 2009;48(3):306-312.

Personality profile of patients with alcohol related disorders: A cross sectional study in a Medical College of Eastern India

Sulagna Saha¹, Somsubhra Chattopadhyay², Subhendu Datta³,
Ningomban Heramani Singh⁴

¹Senior Resident, Department of Psychiatry, College of Medicine and Sagore Dutta Hospital, Kolkata, India

²Associate Professor, Department of Psychiatry, College of Medicine and Sagore Dutta Hospital, Kolkata, India

³Assistant Professor, Department of Psychiatry, Medical College and Hospital, Kolkata, India

⁴Professor, Shija Hospitals and Research Institute Pvt.Ltd, Imphal, India

How to cite this article: Sulagna Saha, Somsubhra Chattopadhyay, Dr.Subhendu Datta, Prof. Dr.Ningomban Heramani Singh et al. Personality profile of patients with alcohol related disorders: A cross sectional study in a Medical College of Eastern India. Volume 13 Issue 3 July-September 2022

Abstract

Background: In India, one of the most common substance for which people seek treatment is alcohol. 17.1% of adult population consume alcohol in India with male to female ratio being 17:1. Various factors have been associated with the onset and maintenance of substance use disorders, for example, family history, getting involved with deviant peer group, presence of other psychiatric comorbidities and personality factors.

Methods: 70 people with alcohol related disorders diagnosed by DSM 5 were interviewed with SADQ and NEO FFI3 to assess severity of alcohol related disorders and personality of those patients.

Results: The study shows that most of the AUD patients were male. Mean age of AUD patients was 40.96±8.319. Majority of the AUD patients belonged to rural background. Patients with mild physical dependency had high conscientiousness (40.33±4.73) followed by agreeableness (38.00±5.57) and openness to experience (35.00±3.46). Patients with severe alcohol dependence had high neuroticism (32.25±4.22) and high extraversion (31.50±3.94). **Discussion:** Previous studies showed agreeableness and conscientiousness were high in alcohol related disorders. Our findings are also in the same way but openness to experience was neutral in our study. Hence, there was significant association between the personality profile factors and alcohol dependence and severity of alcohol dependence.

Key words: Alcohol, Personality, Severity

Introduction

In India, one of the most common substance for which people seek treatment is alcohol. Various factors have been implicated in initiation and maintenance of substance use disorders, for example, family history, getting involved with deviant peer group, presence of other psychiatric comorbidities and personality factors. The conception of personality in substance users has been shifted from “addictive personality” to recognition that certain

personality traits specifically impulsivity, sensation-seeking, novelty-seeking, low agreeableness and conscientiousness, high neuroticism are associated with substance use disorders and influence their development, maintenance and course. It has also been reported that personality traits have an effect on treatment-seeking, compliance and outcome of substance use disorders. Among various psychoactive substances, the association between personality and alcohol use has been most widely studied.¹

The links between these personality dimensions and substance related behavior appear to be mediated

by different reinforcement processes. Neurotic personality traits (e.g., anxiety and depression proneness) have been shown to be linked to drinking behavior through a negative reinforcement process. There is also evidence supporting separate anxiety- and depression- related motives for drinking, with each motive being distinctly related to alcohol consumption and alcohol problems in a young adult. By contrast, research has shown that individuals prone to depression are more likely to drink to cope with their negative affect. Sensation seeking, or the desire for intense and novel experiences, has been linked to elevated substance use patterns and self-report motives for alcohol use that involve enhancement of positive affect.²

The most unfortunate aspect of the phenomenon of substance use has been the alarming rise of addiction among the youths of this region and consequent increase in the substance related crimes. Therefore, there arose a need for studying the personality profiles of substance users to differentiate them from general population and formulate different treatment plans to curb the menace of drugs and explosion of substance related violence/ crimes.³

Material and Methods

This is a cross-sectional and non-interventional study. Those seeking treatment for alcohol dependence in the Psychiatry out-patient department of Regional Institute of Medical Sciences (RIMS), Imphal, Manipur during September 2019 to August 2020 were included in this study. Patients were recruited through the convenience sampling and were assessed single time. The study protocol was approved by the Ethics Review Board of the Institute. Written consent was taken and those fulfilling the diagnosis of alcohol use disorder as per DSM⁴ were further assessed. The Inclusion criteria were patients who were diagnosed as alcohol use disorder according to DSM-5 criteria in age range of 18yrs to 65yrs. The Exclusion criteria were any patients having major psychiatric/physical disability such as psychosis or organic brain disorders and were dependent on other substances like opioids, cannabis, amphetamine type substances (ATS), etc. (except for tobacco). Considering the prevalence of alcohol dependent population in adults (> 18 yrs.) to be 17.1 the sample size was taken as 70. Socio-demographic details like age, sex, marital status, educational level, occupation, income, family type, religion, place of residence were recorded using

a semi-structured proforma. Detailed history of substance use was collected from the patient/patient party attending the Department of Psychiatry to establish Alcohol Use

Disorder as per DSM-5 criteria. SADQ (Severity of alcohol dependence questionnaire)⁵, a 20-item questionnaire designed to measure the degree to which help-seeking problem drinkers were experiencing the syndrome of alcohol dependence, was applied to assess the severity of dependence. The NEO Five-Factor Inventory-3 (NEO-FFI-3)⁶- a 60-item version of the NEO-PI-3 comprising of 60 items, 12 belonging to each of the following five subscales: Neuroticism, Extroversion, Openness to experience, Agreeableness, and Conscientiousness answered on a five-point Likert scale ranging from strongly disagree (0) to strongly agree (4), was applied to the patients to assess their personality profile.

Statistical analysis

Data was analyzed using SPSS version 23 for Windows. Descriptive statistics like mean, standard deviation, percentage and proportion has been used. Chi-square test/Fisher's exact test, ANOVA test has also been used to test the level of significance. Results on categorical measurements like gender, residence, marital status, employment status, family type, duration of use, frequency of relapse, family history of substance abuse were presented in frequency and percentages. Chi-square test has been used to find the association between study parameters like alcohol dependence and residence, marital status, employment status, duration of alcohol dependence, family history of alcohol dependence, while Fisher's Exact test has been used to find the association between study parameters like alcohol dependence and age distribution, gender, socioeconomic status, family type, age of initiation, frequency of relapse etc. ANOVA test has been applied to study the association between study parameters like alcohol dependence with personality profile factors, personality profile factors with severity of alcohol dependence. P-value of <0.05 is taken as significant.

Results

In this study a total of 70 patients presenting to the Department of Psychiatry, RIMS, Imphal with history of substance abuse were taken. The maximum number of patients with alcohol use disorder belonged to the

age range of 31-40 yrs. The mean age of patients in AUD group was 40.96 ± 8.319 .

Majority of the patients in AUD were males (98.6% each) with only 1 female in AUD group. Since p value is insignificant there is no relation between gender and alcohol dependence. Out of 70 patients in AUD group 37 were from rural residence. Hence there exists a significant relation between residence and alcohol dependence. 88.6 % of patients in AUD group were married with rest 8.6% unmarried and 2.9% divorced. There exists significant difference in the marital status of patients with alcohol dependence. 66 patients were employed in AUD group out of 70. There is no significant relationship between employment status and alcohol dependence. 78.6% in AUD group belonged to middle class with 20% belonging to lower middle class and 1.4 % belonging to upper middle class. There exists significant relationship between the socioeconomic status and alcohol dependence. 90% of patients in AUD belonged to nuclear family. There is no significant relationship between family type and alcohol dependence.

Table 1: Sociodemographic Profile of Patients

Variables		Percentage	P value
Age in years	under 30	6(8.6)	0.000
	31-40	33(47.1)	
	41-50	24(34.3)	
	51 and older	7(10.0)	
Gender	Male	69(98.6)	1.000
	Female	1(1.4)	
Residence	Urban	33(47.1)	0.000
	Rural	37(52.9)	
Marital Status	Married	62(88.6)	0.000
	Unmarried	6(8.6)	
	Divorced	2(2.9)	
Employment Status	Unemployed	4(5.7)	0.056
	Employed	66(94.3)	
Socioeconomic status	Upper middle class	1(1.4)	0.000
	Middle class	55(78.6)	
	Lower middle class	14(20)	
Family Type	Nuclear	63(90)	0.063
	Joint	7(10)	

60% patients had initiated drinking alcohol in 21-30 years of age. There is a significant relationship between age of initiation and alcohol dependence. Majority of the AUD patients (44.3%) had duration of use in 11-20 years range. There is no significant relationship between duration of substance abuse and alcohol dependence. 94.3% of AUD patients had relapsed less than 4 times and 5.7% of AUD patients had relapsed 4 or more times. There is a significant relationship between frequency of relapse and alcohol dependence. 80 % of AUD patients had family history of substance abuse. There is no significant relationship between family history of substance abuse and alcohol dependence.

Table 2: Substance Use Profile Of Patients

Variable	Percentage	P value	
Age of Initiation in years	<20	14(20.0)	0.000
	21-30	42(60.0)	
	>31	14(20)	
	<10	28(40.0)	0.061
Duration of Use (years)	11-20	31(44.3)	
	>21	11(15.7)	
Frequency of Relapse	<4	66(94.3)	0.004
	≥ 4	4(5.7)	
Family history of substance abuse	Yes	56(80)	0.541
	No	14(20)	

Table 3: NEO Five-Factor Inventory-3

variables	Alcohol use disorder (Mean \pm SD)	P value
Neuroticism	24.40 \pm 5.17	0.001
Extraversion	26.74 \pm 4.18	0.001
Openness to experience	28.97 \pm 4.20	0.319
Agreeableness	30.23 \pm 4.22	0.001
Conscientiousness	32.51 \pm 4.94	0.001

Conscientiousness (32.51 \pm 4.94) and agreeableness (30.23 \pm 4.22) were high in AUD group.

Table 4: A comparison of study variables in SADQ SEVERITY of AUD patients

variables	SADQ SEVERITY			P value
	Mild physical dependency (Mean \pm SD)	Moderate dependency (Mean \pm SD)	Severe alcohol dependence (Mean \pm SD)	
Neuroticism	20.00 \pm 2.00	22.93 \pm 3.65	32.25 \pm 4.22	0.001
Extraversion	27.33 \pm 5.13	25.67 \pm 3.45	31.50 \pm 3.94	0.001
Openness to experience	35.00 \pm 3.46	28.73 \pm 3.91	28.58 \pm 4.80	0.037
Agreeableness	38.00 \pm 5.57	30.76 \pm 3.52	25.83 \pm 2.52	0.001
Conscientiousness	40.33 \pm 4.73	33.53 \pm 3.77	25.92 \pm 3.15	0.001

Patients with mild physical dependency had high conscientiousness (40.33 \pm 4.73) followed by agreeableness (38.00 \pm 5.57) and openness to experience (35.00 \pm 3.46). Patients with severe alcohol dependence had high neuroticism (32.25 \pm 4.22) and high extraversion (31.50 \pm 3.94). Hence, there exists significant relationship between neuroticism, extraversion, agreeableness, conscientiousness with the degree of severity of alcohol consumption among the AUD group.

Discussion

The present study conducted at Department of Psychiatry, Regional Institute of Medical Sciences, Imphal included 70 patients aged between 18-65 years who had history of substance dependence using alcohol. All the patients were interviewed after receiving consent and those who satisfied the inclusion criteria were taken up for the study. All the patients were assessed for sociodemographic profile, personality profile and severity of substance abuse.

The maximum number of patients abusing alcohol were in the age group of 31-40 years (47.1%) followed by 41-50 years (34.3%). The people who were dependent on alcohol under 30 years were 8.6% and 51 years or older were 10%. In an Indian study conducted by Gupta SK et al¹(Kedia Gupta et al., 2017b) it was found that majority of the AUD patients were in the age group of 25-45 years (45%). This was also supported by other studies done by Bottlender M et al⁷ and Martin ED et al⁸.

Male preponderance was seen in this study in AUD (98.6%) with only 1 female (1.4%) in the groups. This was also consistent with the finding in the study by Nevid et al., 2019⁹; Zilberman et al., 2018¹⁰, Kornør and Nordvik, 2007¹¹, M C Cormick et al., 1998¹², where

majority were male patients. There were 90 subjects in the study conducted by Poonam et al., 2019¹³ i.e. 87 (96.7%) were males and 3 (3.3 %) were females in the study.

Out of 70 patients in the AUD group 37 (52.9%) belonged to rural background. This was supported by a study done by Kedia Gupta et al.¹, 2017b which found that the AUD patients belonged mainly to rural background (50%).

In the AUD group 88.6% of the patients were married, 8.6% were unmarries and 2.9% divorced. Similar results were shown in study done by Kedia Gupta et al., 2017b with 82% patients married in AUD group. Western studies by Bottlender M et al⁷ showed 66% of the patients were married, 16% divorced, 18% single.

Around 94.3% of the patients in AUD group were employed. Study done by Kedia Gupta et al., 2017¹ showed that majority of the participants in the ADS group were employed (73.6%) including 30% who were self-employed.

The results showed that majority of AUD patients (78.6%) were from middle class, followed by lower middle class (20%) and upper middle class (1.4%). In the study done by Kedia Gupta et al., 2017¹ both the AUD (75%) were from middle class background.

Around 90% of AUD patients belonged to nuclear family. This was supported by Kedia Gupta et al., 2017¹ where majority of respondents belonged to nuclear families and other studies like Hokm Abadi et al., 2018¹⁴, and Zilberman et al., 2018¹⁰.

The mean age of initiation of alcohol abuse was 26.27 years with standard deviation of 5.310. majority of the AUD (60%) had age of initiation of alcohol use in 21-30 years age group. Study done by Bottlender

and Soyka, 2005⁷ also supports alcohol initiation mean age of 29 years but in the Indian study of Kedia Gupta et al., 2017¹ showed age of initiation to be 18.82 with SD of 5.04.

The study shows 44.3% of AUD patients had duration of alcohol abuse between 11-20 years duration. Similarities were found in studies conducted by Hingson et al., 2006¹⁵ and Terracciano et al., 2008¹⁶. The mean duration of alcohol use was 15 years as per Bottlender and Soyka, 2005⁷.

Around 94.3% had relapsed less than 4 times in the AUD patient group and 5.7% had relapsed 4 or more times. Similar findings were found in other studies done by Woicik et al., 2009².

The study shows that AUD patients had positive family history of substance abuse in 80% cases. These findings were supported by Raketic D et al.¹⁷ who found positive family history in 82% of AUD patients.

In the AUD group agreeableness (30.23±4.22) and conscientiousness (35.31±4.94) were much higher. Openness to experience in both the groups had neutral value. Bozkurt et al., 2014¹⁸ showed that severity of impulsivity and dimensions of impulsivity were higher in alcohol-dependent inpatients than in healthy controls. There was negative correlation between impulsivity with reward dependence, persistence, self-directedness and cooperativeness, but impulsivity was positively correlated with novelty seeking, harm avoidance, depression and anxiety. Impulsivity was predicted by high depression and temperament dimensions (high novelty seeking, harm avoidance and low reward dependence). Combinations of personality dimensions that predict dimensions of impulsivity differed. The meta-analysis by Malouff et al., 2007¹⁹ showed alcohol involvement was associated with low conscientiousness, low agreeableness, and high neuroticism. Without adjustment for non-perfect reliability of measures, conscientiousness, agreeableness, and neuroticism explained 5%, 3%, and 2% of the variance in alcohol use, respectively.

The study showed that neuroticism (32.25±4.22) was more in severe alcohol dependence patients and so was extraversion (31.50±3.94), agreeableness (38.00±5.57) and conscientiousness (40.33±4.73) were more in the mild physical dependency group. In a study conducted by Luchetti et al., 2018²⁰ Openness to experience had similar ranges in all the 3 dependency groups. Higher conscientiousness

and openness were associated with reduced risk of heavy drinking. Higher conscientiousness and agreeableness, and lower extraversion and openness were associated with lower probability of alcohol consumption. Impulsiveness was associated with increased risk of heavy alcohol consumption, whereas conscientiousness, the openness, and the assertiveness were associated with reduced the probability of heavy drinking. Self-discipline and deliberation were associated with increased incidence of abstinence, along with lower scores on impulsiveness, excitement seeking, positive emotions, and most facets of openness (except for ideas and values).

Conflict of Interest: Nil

Source of funding - Self

References

- Gupta SK, Ambekar A, Dhawan A, Mehta M. Personality profile of alcohol and injecting opioid users: A comparative study from India. *Asian J Psychiatr* 2017 Feb 1;25(4):142-6.
- Woicik PA, Stewart SH, Pihl RO, Conrod PJ. The substance use risk profile scale: A scale measuring traits linked to reinforcement-specific substance use profiles. *Addict Behav* 2009 Dec 1;34(12):1042-55.
- Ganapathi L, McFall AM, Srikrishnan AK, Kumar MS, Anand S, Lucas GM, et al. Young people who inject drugs in India have high HIV incidence and behavioural risk: a cross-sectional study. *J Int AIDS Soc* 2019 May ;22(5):e25287.
- Hasin DS, O'Brien CP, Auriacombe M, Borges G, Bucholz K, Budney A, et al. DSM-5 criteria for substance use disorders: recommendations and rationale. *Am J Psychiatry* 2013 Aug;170(8):834-51.
- Stockwell T, Murphy D, Hodgson R. The severity of alcohol dependence questionnaire: its use, reliability and validity. *Br J Addict* 1983 Jun;78(2):145-55.
- McCrae RR, Costa Jr PT. A contemplated revision of the NEO Five-Factor Inventory. *Pers Individ Dif* 2004 Feb 1;36(3):587-96.
- Bottlender M, Soyka M. Impact of different personality dimensions (NEO Five-Factor Inventory) on the outcome of alcohol-dependent patients 6 and 12 months after treatment. *Psychiatry research* 2005 Jul 15;136(1):61-7.
- Martin ED, Sher KJ. Family history of alcoholism, alcohol use disorders and the five-factor model of personality. *J Stud Alcohol* 1994 Jan ;55(1):81-90.

9. Nevid JS, Gordon AJ, Barris A, Sperber JE, Haggerty G. Personality profiles of patients with alcohol use disorder and opioid use disorder in an inpatient treatment setting. *J Subst Abuse Treat* 2019 Feb 1;97:91-6.
10. Zilberman N, Yadid G, Efrati Y, Neumark Y, Rassovsky Y. Personality profiles of substance and behavioral addictions. *Addict Behav* 2018 Jul 1;82:174-81.
11. Kornør H, Nordvik H. Five-factor model personality traits in opioid dependence. *BMC psychiatry* 2007 Dec;7(1):37-40.
12. McCormick RA, Dowd ET, Quirk S, Zegarra JH. The relationship of NEO-PI performance to coping styles, patterns of use, and triggers for use among substance abusers. *Addict Behav* 1998 Jul 1;23(4):497-507.
13. Poonam B, Karun B, Angad SH, Hemank W, Dhruvendra L, Shradha P. Assessment of personality factors among patients presenting with different substance use disorders. *J Evol Med Dent Sci* 2019 May 20;8(20):1656-62.
14. Hokm Abadi ME, Bakhti M, Nazemi M, Sedighi S, Mirzadeh Toroghi E. The relationship between personality traits and drug type among Substance Abuse. *J Health Res* 2018 Oct 10;8(6):531-40.
15. Hingson RW, Heeren T, Winter MR. Age of Alcohol-Dependence Onset: Associations with Severity of Dependence and Seeking Treatment. *J Am Acad Child Adolesc Psychiatry* 2007 Mar;46(3):417-28.
16. Terracciano A, Löckenhoff CE, Crum RM, Bienvu OJ, Costa PT. Five-Factor Model personality profiles of drug users. *BMC psychiatry* 2008 Dec 1;8(1):22-37
17. Raketec D, V Barisic J, M Svetozarevic S, Gazibara T, Kiscic Tepavcevic D, D Milovanovic S. Five-Factor Model Personality Profiles: The Differences between Alcohol and Opiate Addiction among Females. *Psychiatr Danub* 2017 Mar 20;29(1):74-80.
18. Bozkurt M, Evren C, Can Y, Evren B, Cetingok S, Yilmaz A. Relationships of personality dimensions with impulsivity in alcohol-dependent inpatient men. *Nord J Psychiatry* 2014 Jul 1;68(5):316-22.
19. Malouff JM, Thorsteinsson EB, Rooke SE, Schutte NS. Alcohol involvement and the five-factor model of personality: A meta-analysis. *J Drug Educ* 2007 Sep;37(3):277-94.
20. Luchetti M, Sutin AR, Delitala A, Stephan Y, Fiorillo E, Marongiu M, et al. Personality traits and facets linked with self-reported alcohol consumption and biomarkers of liver health. *Addict Behav* 2018 Jul 1;82:135-41.

Clinical and Diagnostic Profile of Interstitial Lung Disease

Syed Abdul Aleem

Consultant Pulmonologist, Care Hospital, Musheerabad, Hyderabad

How to cite this article: Syed Abdul Aleem et al. Clinical and Diagnostic Profile of Interstitial Lung Disease, Volume 13 Issue 3 July-September 2022

Abstract

Background: Interstitial lung disease are clinically challenging and diverse group of over 300 disorders. These heterogeneous group of disorders share few common clinical radiological and pathological profiles.

Objective: To analyse these Clinical, spirometric, laboratory, radiological and bronchoscopic profile of various ILDs.

Methods: It is an Institutional based prospective study of 50 cases of Interstitial Lung Disease presenting to pulmonology department. After Obtaining Informed Consent patients were subjected to detailed Clinical, spirometric, laboratory, radiological and bronchoscopic examination. Initially a total of 60 patients were enrolled in the study .Out of which 4 patients were excluded based on exclusion criteria and 6 patients were lost to follow up.

Results: After Analysing 50 ILD patients, it showed a female preponderance, presenting mostly in 36-55 year age group with shortness of breath and cough as the predominant complaints. Majority of the patients showed exercise oxygen desaturation and a restrictive abnormality in spirometric evaluation. Radiologically, reticulonodular pattern was the most common presentation on CXR and reticular opacities on HRCT. Most common HRCT pattern was UIP pattern with basal predominance. The most common cause of ILD was IPF (30%) followed by LDCTD which comprised 28% of the cases.

Conclusion: Patients, in their third to fifth decade, especially females, presenting with complaints of breathlessness and cough, with exercise oxygen desaturation, should be evaluated for ILD with complete profile to identify the disease at an early stage.

Keywords: Prospective study, Interstitial lung disease profile, female preponderance, exercise oxygen desaturation, UIP pattern, IPF.

Introduction

Interstitial lung disease represent a large and heterogeneous group of over 300 disorders, many of them belonging to the category of orphan diseases and are characterized by varying degrees of fibrosis and inflammation of the lung parenchyma or interstitium. The interstitial lung disease represent many features in common such as similarities of symptoms, comparable appearance of chest imaging studies, consistent alterations in pulmonary physiology and typical histological features.¹

Current estimates of incidence and prevalence of ILD are higher than historical estimates. The

prevalence of all ILD is estimated at 1 in 3000 to 4000 globally.² Among those, Idiopathic Pulmonary Fibrosis is the most common disease representing at least 30% of the incident cases. The disease process extends into alveolar spaces, acini, bronchiolar lumen and bronchioles. The inflammation usually referred to as alveolitis is associated with spread to adjacent portions of interstitium and vasculature, resulting in derangement of alveolar capillary architecture leading to alveolo-capillary membrane damage and loss of gas exchange units eventually ending in interstitial fibrosis.³ The scarring and distortion of lung tissue leads to deranged gas exchange & ventilator function.

Clinical evaluation is the foremost and central pillar for suspecting the presence of ILD. A wealth of diagnostic information can be obtained from initial evaluation. History must include a review of environment factors, occupational exposures, medication and drug usage and family medical history.⁴ In addition to respiratory symptoms, extra-pulmonary features of associated disease may provide important hints to the correct diagnosis.

Materials and Methods

Study Design: Random prospective study.

Study Duration: January 2021 to January 2022

Study Setting: Patients presenting to Pulmonology Out-Patient Department (OPD) and In-Patient Department (IPD), Care Hospital.

Sample Size: 50 patients

Inclusion Criteria

Patients with clinical history suggestive of interstitial lung disease like cough, SOB on exertion, with or without extra-thoracic manifestations like arthralgias, skin rashes or pigmentation, dry mouth, dry eyes and features suggestive of Raynaud's phenomenon (digital pain and bluish discoloration on exposure to cold) etc.

1. Patients with Velcro rales on respiratory examination suggestive of ILD.
2. Radiological appearance suggestive of ILD.
3. Known cases of Connective Tissue Disease (CTDs) presenting with features suggestive of ILD.

Exclusion Criteria

1. ILD like infections eg. Miliary tuberculosis and Pneumocystis jirovecii pneumonia (PJP).
2. ILD like malignancies eg. Lymphangitis carcinomatosa or Miliary carcinomatosa.
3. Pulmonary Kochs co-existing with ILD.
4. Occupational lung disease.

After obtaining a written informed consent in all these patients, a detailed history was taken and a thorough clinical examination was done as well and then subjected to investigations. A total of 60 patients were enrolled in the study. Out of which 4 patients

were excluded based on exclusion criteria and 6 patients were lost to follow up.

All the patients were thoroughly evaluated with respect to history, clinical examination, Spirometry, exercise oxygen desaturation testing, 2D Echo, Laboratory investigations including comprehensive connective tissue disease profile in selected cases, radiological examination and FOB with BAL.

A thorough clinical examination was done in all cases. Any positive findings like clubbing, peripheral lymphadenopathy, abnormal breath sounds, Velcro rales were noted. Examination of the cardiovascular system was done for any loud P2 and features of cor pulmonale. A 2D-ECHO was done in all cases suspected to be having cardiovascular co-morbidity apart from conducting a detailed examination of the respiratory system. Examination of the musculoskeletal system was done for detecting any joint manifestations. Examination of the nervous system, eye and GIT were done to look for any co-existent abnormalities.

Routine lab Investigations were done in all cases including Haemoglobin, Total and Differential counts, blood urea, serum creatinine, AEC, RBS, and a complete urine examination. Serum ACE, calcium and other investigations were done wherever felt appropriate.

Statistical Analysis: Data was analysed after entering into Microsoft excel sheet and frequency tables were calculated and test of significance was applied wherever necessary as the present study is a descriptive study.

Observation and Results

Table 1: Distribution based on Demographics, symptoms and spirometry

Gender	Frequency (n=50)	Percentage
Male	18	36%
Female	32	64%
Age Group (in yrs)		
15-25	2	4%
26-35	6	12%
36-45	13	26%
46-55	16	32%

Conti..Table 1: Distribution based on Demographics,symptoms and spirometry

Gender	Frequency (n=50)	Percentage
56-65	12	24%
66-75	1	2%
Symptoms		
Cough	46	92%
Dyspnoea on exertion	50	100%
Chest pain	4	8%
Arthritis	7	14%
Skin lesions	6	12%
Dysphagia	4	8%
GERD	20	40%
Haemoptysis	2	4%
Spirometry		
Could perform	42	84%
Could not perform or not done	8	16%

Out of the 50 patients in this study, 18 are males and 32 are females. Female predominance was seen with 64% of the study population and 36% are males. In females, ILD occurred most commonly in 36-55 year age group (42%) in males ILD occurred most commonly in the 46-65 year age group (28%) age range is 18 to 70 years.

Amongst the study population, dyspnoea on exertion was the predominant symptom (100%), followed by cough (92%) and GERD (40%).

In some cases where the general condition of the patient is poor and those in acute exacerbations, spirometry was not done.84% of the study population could perform a pulmonary function test and 16% could not perform the same.

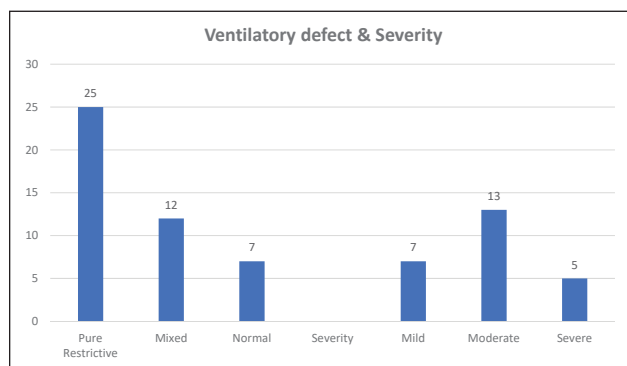


Figure 1: Profile of the ventilatory defect, severity

Restrictive defect was the predominant defect among the patients of the study group (57%) with mixed defect seen in 27%.

Based on the results of the pulmonary function tests, moderate restrictive defect was observed in 52% of the study population. 28% showed a mild restrictive defect.

Table 2: Profile of exercise test performance

Exercise test Result	Frequency (n=50)	Percentage
Complete Test	30	60%
Incomplete Test	10	20%
Did not perform	10	10%
Result		
Positive	22	74%
Negative	8	26%
TIME		
SPO 2 (mean)		
PRE-EXERCISE	95.15%	
POST-EXERCISE	88.45%	

60% of the study population successfully completed the exercise test, while it was incomplete in 20% of the study cases. 10% did not perform the exercise testing.74% of the cases in our study showed a positive exercise test result (desaturation of >4%) and 26% showed a negative test result.

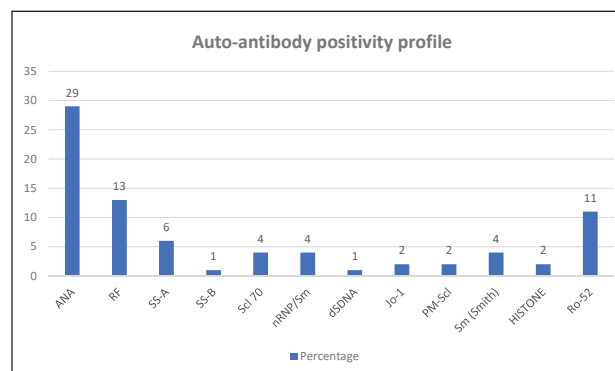


Figure 2: Profile of auto-antibody positivity

Amongst the study population with positive auto-antibodies, ANA was the most frequently encountered auto-antibody (58%), followed by RF (26%) and Ro-52 (22%).

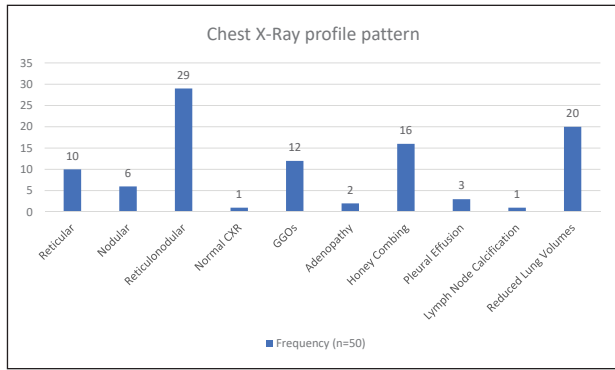


Figure 3: Chest X-ray Profile

Amongst the study population, reticulo nodular opacities were the predominant findings on the chest x-ray (58%), followed by reduced lung volumes (40%), honey combing (32%) and ground glass opacities (28%).

Table 3: HRCT Profile and pattern

HRCT Abnormality	Frequency (n=50)	Percentage
Linear Opacities	30	60%
Nodules	4	8%
Reticular Opacities	32	64%
Ggos	28	56%
Consolidation	4	8%
Honeycombing	26	52%
Cysts	1	2%
Traction Bronchiectasis	20	40%
Mosaic Attenuation	8	16%
Mediastinal Adenopathy	13	26%
Pleural Effusion	3	6%
Pleural Thickening	2	4%
Progressive Massive Fibrosis (Pmf)	2	4%
Emphysema	4	8%
HRCT PATTERN		
UIP	28	56%
NSIP	11	22%
COP	3	6%
AIP	1	2%
LIP	1	2%
OTHERS	6	12%

In the study population, reticular opacities were the most common findings noted on HRCT (64%), followed by linear opacities (60%), ground glass opacities (56%), honey combing (52%) and traction bronchiectasis (40%). UIP pattern was the most frequent noted pattern on HRCT (56%). NSIP and COP constituted 22% and 6% respectively.

Table 4: Aetiology profile

Aetiology	Frequency (n=50)	Percentage
IPF	15	30%
Non-IPF IIPs	4	8%
LDCTD	14	28%
CTD-ILD	8	16%
Pneumoconiosis	2	4%
Pulmonary Alveolar Proteinosis	2	4%
Sarcoidosis	2	4%
Hypersensitivity Pneumonitis	3	6%

IPF was the most common diagnosed interstitial lung disease in our study population (30%), followed by LDCTD (28%) and CTD-ILD (16%). MCTD and RA were equally predominant (50% each) amongst those cases in our study who were diagnosed with CTD-ILD.

Discussion

Interstitial lung disease are a heterogeneous group of diseases involving lung interstitium. They have features in common like similarities of symptoms, comparable radiographic appearances, consistent alterations in the pulmonary physiology and typical histological features. In literature, most of the studies on ILD have included miliary tuberculosis, lymphangitis carcinomatosa and tropical pulmonary eosinophilia.^{5,6} In the present study infectious and malignant causes of ILD were excluded. In all studies on ILD in the literature, all IIPs were considered as IPF and some studies have further divided IIPs into IPF and non-IPF IIPs. In the present study, IIPs were divided into IPF, non-IPF IIPs and Lung Dominant Connective Tissue Disease (LDCTD). The rationale behind this classification is that in some ILDs, an underlying autoimmune disease is suspected but the patients do not meet the criteria for a final diagnosis of CTD.⁷

Furthermore, in the Sen et al study, the third most common cause of ILD was CTD-ILD (18%),⁸ and in our study the CTD-ILD was the second most common cause constituting 16% of the cases. Sarcoidosis was the second most common ILD in Sen et al study (22%) whereas in our present study there were 4% cases of sarcoidosis. In Muhammed Shafeeq K et al study Spirometry showed restrictive abnormality in 64.3%, mixed in 31.4% and normal reports in 4.3%.⁹ In our study restrictive abnormality was seen in 50% of the patients, mixed in 24% and normal in 14% of the cases.

In a study by Lima et al, clinical profile of patients, who had lung biopsy were analyzed most common cause was IPF (51.5%) Collagen Vascular Disease – pulmonary fibrosis (15.2%) and Hypersensitivity pneumonitis (9%).¹⁰ In our study too the most common ILD was IPF and CTD-ILD constituted 16% of the cases. Furthermore, UIP was the most common pattern in IPF and CTD-ILD which concurred with the findings in our study.

In a study done by Vijet al, a group of ILD patients having features of auto immune disease but not meeting the criteria for connective tissue disease were identified and their prevalence and characteristics were determined. Any extra thoracic symptom or sign suggestive of connective tissue disease and a serologic test reflective of autoimmune process, if present was considered as a case of AIF-ILD in this study. AIF-ILD was identified in 32% , IPF in 29% and CTD-ILD in 19%.¹¹ In our study too LDCTD which was analogous to AIF –ILD, constituted 28%, IPF -30% and CTD-ILD-16%, the results very close to those in the study done by Rekha Vij. et al.

In a Olga Tourin et al study, Out of 31 patients . A total of 18 cases of IPF were identified out of which 4 cases were LDCTD and a total of 8 cases of NSIP were identified out of which 2 were LDCTD. So, a total of 6 cases of LDCTD were identified in 31 cases which accounted for nearly 20% of the cases.¹² This study bears resemblance to ours. In the present study, 14 cases of LDCTD were identified accounting for 28% of the cases because, the study population went through similar investigations like HRCT imaging and screening for auto antibodies like our study group and no surgical biopsy was done.

In a study by Mittoo S et al, unrecognised collagen vascular diseases were identified in a group of ILD patients. Around 15% of collagen vascular diseases

were found among this study group.¹³ In our study too the CTD-ILD comprised 16% of the cases.

Limitations

- Our study is small and done in a tertiary care hospital of a specific region and so it may not represent the whole population.
- DLCO testing was not done in functional evaluation of ILD patients in our study due to technical issues.
- Biopsy which is a definitive mode of diagnosis in few ILDs, was not done as it was cumbersome, invasive and was not acceptable to most of the patients.
- Occupational lung diseases were not included.

Conclusion

Patients, in their third to fifth decade, especially females, presenting with complaints of breathlessness and cough, with exercise oxygen desaturation, should be evaluated for ILD with complete profile to identify the disease at an early stage.

Ethical Clearance: Ethical Clearance was obtained from the institutional ethics committee of Care Hospital prior to the commencement of study.

Source of funding: Self

Conflict of interest: Nil

References

1. Mapel DW, Hunt WC, Utton R, Baumgartner KB, Samet JM, Coultas DB: Idiopathic pulmonary fibrosis: survival in population based and hospital based cohorts. *Thorax* 2000;53:469-476
2. Coultis DB, Zumwalt RE, Black WC, Sobonya RE: The epidemiology of interstitial lung disease. *Am J Respir Crit Care Med* 1994; 150: 967-972.
3. Popper MS, Bogdonoff ML, Hughes RL. Interstitial rheumatoid lung disease. A reassessment and review of the literature. *Chest* 1972;62(3):243-50.
4. Frank ST, Weg JG, Harkleroad LE, et al. Pulmonary dysfunction in rheumatoid disease. *Chest* 1973; 63(1):27-34.
5. Keane MP, Lynch JP 3rd: Pleuropulmonary manifestations of systemic lupus erythematosus. *Thorax* 2000;55:159-166.

6. Costabel U, Guzman J, Bonella F, et al. Bronchoalveolar lavage in other interstitial lung diseases. *Semin Respir Crit Care Med* 2007;28(5):514-24.
7. Mittoo S, Gelber AC, Christopher-Stine L, Horton MR, Lechtzin N, Danoff SK. Ascertainment of collagen vascular disease in patients presenting with interstitial lung disease. *Respir Med*. 2009; 103 (8): 1152 - 1158
8. Swensen SJ, Viggiano RW, Midthun DE, et al. Lung nodule enhancement at CT: multicenter study. *Radiology* 2000; 214:73.
9. Shafeeq MK, Nair S, Mathew M, et al. Aetiology and clinicradiological profile of interstitial lung disease in a tertiary care centre. *Pulmon* 2011;13(1):12-5
10. Lima TRL, Guimarães FS, Silva LA, et al. Relationship between functional capacity, joint mobility and pulmonary function in patients with systemic sclerosis. *J Bodyw Mov Ther* 2015;19(1):17-24.
11. Vij R, Strek ME. Diagnosis and treatment of connective tissue disease-associated interstitial lung disease. *Chest* 2013;143(3):814-24
12. Olga Tourin, Charlene D. Fell, Tracy Elliot, Sharon Le Clercq, Marvin Fritzer, Lung-Dominant Connective Tissue Disease" In Patients Evaluated For Interstitial Lung Disease B43. DRUG INDUCED AND CONNECTIVE TISSUE RELATED LUNG DISORDERS. May 1, 2011, A3034-A3034
13. Mittoo S, Gelber AC, Christopher-Stine L, Horton MR, Lechtzin N, Danoff SK. Ascertainment of collagen vascular disease in patients presenting with interstitial lung disease. *Respir Med*. 2009; 103 (8): 1152 - 1158

Effect of Yoga and Exercises to improve Physical Function and Quality of Life in Elderly: A Systematic Review of Randomized Controlled Trials

Kumari B N P¹, K.K. Shiny John², ManikyaLatha J³, Divya P D⁴,
A Maria Therese⁵, Judie Arulappan⁶

¹Principal, EashwariBai Memorial College of Nursing, Secunderabad, Telangana, India.

²Vice Principal, EashwariBai Memorial College of Nursing, Secunderabad, Telangana, India.

³Associate Professor, EashwariBai Memorial College of Nursing, Secunderabad, Telangana, India.

⁴Assistant Professor, EashwariBai Memorial College of Nursing, Secunderabad, Telangana, India.

⁵Professor, Mother Theresa Post Graduate Research Institute of Health Sciences College of Nursing, Puducherry, India.

⁶Assistant Professor, Department of Maternal and Child health, College of Nursing, Sultan Qaboos University,
Muscat, Sultanate of Oman.

How to cite this article: Kumari B N P, K.K. Shiny John, ManikyaLatha J, Divya P D, A Maria Therese, Judie Arulappan et al. Effect of Yoga and Exercises to improve Physical Function and Quality of Life in Elderly: A Systematic Review of Randomized Controlled Trials. Volume 13 Issue 3 July-September 2022

Abstract

Introduction: Aging is a natural process associated with many functional and structural changes. These changes include impaired self-regulation, changes in tissues organs and also affects mood, physical status and social activity. There are adverse changes in cognitive behaviour, perceived sensation and thinking process. Regular physical activity can alleviate many health problems, yet many older adults are inactive. Yoga is one of the scientific and popular lifestyle practice considered as the integration of mind, body and soul¹.

However, there is scarcity of scientific information where yoga's effect is examined on overall well being and on multiple health outcomes simultaneously in elderly. Therefore, we conducted this systematic review of available RCT,s on this subject.

Methods: We performed a systematic search of RCT's published between 2015-2020 in English language using database including Pubmed Medline, Google scholar studies conducted on older adults with physical ability. QOL and physical function as intended outcomes have been included. Data extraction, critical appraisal was done and decisions on quality of life were made on mental consensus.

Results: Out of all identified studies, only 4 studies comprising 275 participants fulfilled the inclusion criteria and met the quality assessment. 3 month follow-up done, Yoga group had a higher score compared with the control group (mean difference 0.9, 95 % CI, 0.3 to 2.0). Yoga group also had superior health status and mental well being (Vs. Control) at 3 months, with mean differences in QOL scores of 0.12(95% CI 0.03 to 0.21) and 6 (95% CI, 1 to 11) respectively. We anticipate that practicing yoga will improve well being and mental health.

Conclusion: The adapted yoga programme appeared to be feasible and potentially beneficial in terms of improving mental and social wellbeing and health related quality of life in elderly people.

Keywords: Yoga, Exercise, Elderly, Quality of Life, Physical and Mental Wellbeing, Systematic Review

Introduction

The world's population is ageing. Virtually every country in the world is experiencing growth in the number and proportion of older persons in their population. Globally, the population aged 65 and over is growing faster than all other age groups¹.

Population ageing is poised to become one of the most significant social transformations of the twenty-first century. Older persons are increasingly seen as contributors to development, whose abilities to act for the betterment of themselves and their societies should be woven into policies and programmes at all levels⁴.

Physical activity plays an important role in reducing the risk of chronic disease and disability with increasing age and promoting independence in older age as it impacts on both physical and mental health⁶.

Yoga is a mind-body physical activity that includes a combination of stretching and holding movements and postures. Yoga is growing in popularity among older people and is associated with significant health benefits such as improved strength, flexibility, balance and mobility and mood. The physical and mental benefits associated with yoga suggest that it has the potential to produce improvements in the overall quality of life¹².

Quality of Life (QOL) is a multi dimensional concept that incorporates the different domains of health; physical, mental, emotional and social functioning and how these impact on overall health status. QOL encompasses more than just direct measures of population health, life expectancy and causes of death, and acknowledges that an individual's capacity to interact and participate with their environment is important for maximizing overall quality of life³.

The current systematic review aimed to answer the following questions:

1. What is the effect of yoga on QOL in elderly
2. What is the effect of exercises on improvement of physical function in elderly

In order to make recommendations based on the highest level of evidence, this review only included randomized controlled trials (RCTs).

Materials and Methods

We have conducted systematic review methods on yoga and exercises, physical function and QOL. Studies were reported as per PRISMA guidelines.

We performed a systematic search in electronic databases including PUBMED, MEDLINE, GOOGLE SCHOLAR, MENDELIC. The review explored studies published between 2015-2020 in English language with all identified index terms and key words. For search in different databases following key words and MESH terms were used in combinations. Yoga, exercises, physical function, QOL, elderly and RCTs. The search was also extended to peerreviewed journals and references of similar studies were also reviewed thoroughly to gather maximum number of eligible studies for this systematic review.

Inclusion Criteria

1. Design: Randomized Controlled Trials
2. Participants: 65 years and above
3. Interventions: Yoga, Physical Exercises. No limitation was placed on the type, duration and frequency of yoga programme.
4. Control: No intervention, usual care or wait list control.
5. Outcome Measured: Physical Function and Quality of Life

Two reviewers (DPD & MLJ) independently searched and did screening of the records for title and abstracts. Later, full text articles were extracted and assessed to identify eligibility for inclusion by two reviewers (KBNP & DPD) independently. Two reviewers (KBNP & MTA) cross checked all the data and solves any discrepancy between two reviewers if present.

Randomized Controlled Trials which were included in this systematic review were from United Kingdom, Austria & Sweden & Brazil.

A total of 529 studies (excluding duplicates) were identified. After screening, 4 eligible randomized controlled trials were included for our systematic review to evaluate the effect of yoga and exercises on physical function & QOL.

Characteristics of included studies

The four studies included in the systematic review had a total of 275 participants. Table 1 provides a summary of the characteristics of trials including the participant's age, gender, intervention details, results and outcome measures.

S. NO:	TOTAL SAMPLE	GROUP	NO: OF SUBJECTS
1	52	Intervention Group	25
		Control Group	27
2	80	Intervention Group	39
		Control Group	41
3	91	Intervention Group	61
		Control Group	30
4	52	Intervention Group	26
		Control Group	26
TOTAL			275

Participants

The mean age of participants ranged from 60 to 80 years. Participants were recruited from both community and residential aged care settings. Three of the studies included participants who were healthy community dwelling older adults, one recruited participants with Osteoporosis. Both men and women were included in all but two studies which included females only and 76% (312/406) of included were female.

Intervention

In all studies, the experimental group received a physical yoga and/or exercises intervention. The included yoga styles were asana, pranayama, relaxation techniques, mental focus and philosophy; Participants in the yoga group attended ten yoga sessions during a 12 week period for 75 minutes duration (approximately one class per week)(1). All yoga interventions were delivered by qualified & trained yoga instructors with some using props such as chairs, blankets, blocks etc to provide comfort and support. The mean proportion of yoga sessions attended ranged from 71 to 74%.

The intervention for 12 weeks, twice a week for approximately 1 hour. The training unit lasted about 30minutes and included a 5 min warmup (mobilization) & six strength exercises, which were performed in two sets, with 12-15 repetitions, until muscular exhaustion, on the principle of progressive

increasing exertion. The strength training included the following exercises: mini squats inform of a chair, 'beetles' exercise for the abdominal muscles, hip extension in standing position reverse butterfly, chest press and shoulder press against elastic resistance. The exercises were designed to stimulate all major muscle groups¹⁰.

In addition, the importance of health enhancing physical activity was discussed with the participants. A total of eight nutritional messages (such as fluid intake, animal and plant protein; energy intake) were discussed during each home visit. The subjects were provided with a hand book covering all eight nutritional themes.

Intervention group participated in a 12 week balance training programme with three 45 minute sessions per week. The exercises in the balance training program were progressive and specific to functional balance and incorporated dual and multi task exercises like counting, carrying a tray, or having to avoid obstacles. Every session included exercises while sitting on a large balance ball, while standing and while walking².

The exercises differed across sessions to achieve variety but every exercise was repeated later on in the program, often in a more challenging form. The groups consisted of 6 to 10 participants, with 2 or 3 physical therapists present at each session to ensure participant safety and allow individual progression of exercises².

The intervention lasted for 24 weeks. The participants took part in a twice weekly group exercise session approximately 60 mts each with load and intensity adjusted regularly. At all times , training sessions were conducted by a fully qualified physical therapist. At the beginning and the end of the exercise sessions, arterial blood pressure and radial pulse were measured and the participants performed stretching exercises. Once a week, participants were wearing a heart rate monitor to ensure training safety and maintenance of heart rate within individually determined zones that were based on maximal predicted heart rate. Aerobic training involved 20mts of walking at 60% to 75% HR for the first 4 weeks, then gradually increased to 30mts by the 12th week. As the intervention progressed, maintenance of the HR at the training frequency was obtained with an increase in the walking speed, observed in the distance walked⁵.

Adverse Events

There was one non-serious adverse event, which was probably related to the yoga programme; here, the participant reported that specific exercises aggravated her existing lower back pain during the first couple of sessions, but that this problem soon subsided and did not occur again for the remainder of the course.

One participant in the interventional group reported an adverse event (back pain) that may have been associated with the exercise program. Most frequently anticipated adverse events are muscle strains, soreness, knee pain, Achilles tendon, back spasms, neck pain, vertigo, migraine reoccurrence of prior lower back pain or shoulder problems.

Findings

We combined different search methods as mentioned in study selection and a total of 647 studies were extracted from different databases. After screening 4 eligible randomized controlled Trials were included for our systematic review to evaluate the effect of yoga on physical function and QOL.

Discussion

This systematic review included 4 trials of moderate to high methodological quality that found exercises and yoga improved QOL, physical and mental wellbeing in people aged 60 years and over.

1. In this study, the 5 - level EQ-5D and WEMWBS were used to assess health status and mental well - being respectively. Although there is no consensus, changes in the EQ-5D utility index and WEMWBS of 0.10(24) and between 3 and 8 points (25), respectively, have been recommended as clinically important. In this trial, we observed that scores on these questionnaires were, on average, 0.12 and 6 points higher, respectively in the Yoga group at 3 months.

This 10-week adapted Yoga programme showed a relatively low attrition rate of 16% with the reasons for withdrawal being unrelated to the intervention. The feasibility of the Yoga programme was also demonstrated by the ease of recruitment in a short period of time from a small geographical area, and excellent attendance with two thirds of the

participants attending at least 8 of the 10 classes. The interview responses indicated that participants found the programme to be suitable for their abilities and enjoyable. Finally, the Yoga programme appeared to be safe.

2. The combined nutrition and exercise intervention did not lead to significant improvements in QOL compared to social support only. Although the physical performance and physical activity shows a significant improvement, there were no significant changes in the physical health domain. It can e expected that an active lifestyle preserves physical function in older adults, which in turn leads to higher levels of QOL scores in domains related to physical health. The present study was not able to demonstrate greater values in the physical health domain.
3. This study demonstrates that a specific progressive balance training programmes, focusing on dual and multitask exercises, can have an impact on objectively measures physical activity levels in older adults with osteoporosis. We found that participants who had taken part in a balance training program had a statistically significant higher scores for physical activity after 12 weeks.
4. The older adults in the intervention group showed significant cognitive and functional improvement after 6 months of aerobic and strength exercises with a medium to large effect size. At the same time, the group presented with significant deterioration in cognition with a large effect size, as well as a worsening of the functional reach test scores, while its conditioning and lower limb muscle endurance showed no significant changes.

Outcome Measures

Quality of life and physical ability were measured in all included trials.

1. The yoga group had better self reported health status and mental well being at 3 months than the control group
2. At the end of the intervention, a significant difference in past, present and future activities and changes in physical activity related

parameters in favour of the intervention group was observed.

3. A significantly higher proportion of participants in the intervention group has improvement in overall health.
4. Post intervention, significant differences were observed in cognition, conditioning, muscle endurance and balance.

Conclusion

For elderly, yoga may provide a broad range of healthcare benefits for the mind and body. Yoga may be practiced to maintain health, reduce particular symptoms commonly associated with skeletal pain, and assist in pain relief, and enhance well-being. We anticipate that practicing yoga may improve subjective wellbeing and mental health and may result in significant improvement in depression, pain and sleep quality. Furthermore, regular yoga practice can increase mindfulness of the body state and can restore the mind body balance among elderly people. The intervention may encourage participants to develop further interest in continuing the physical activity even after the completion of the study.

There is a requirement of well-designed community based follow up studies to assess long term changes and outcomes. We feel that with yoga being a practical, easy and feasible exercise that it can help in emotional and physical betterment and ultimately wellbeing in an elderly group. This project aimed to encourage participants to initiate and continue a yoga based activity after study completion. We anticipate significant improvements in several health domains. The intervention would benefit participants, their families and society in terms of (anticipated) lower health costs. Moreover, the study results may be of broader use in other settings. We would use the standardised measurements and blinded follow up assessments to reduce the assessment bias.

Conflict of Interest: Authors have no conflict of interest in carrying out these systematic review.

Source of Funding: Nil

Ethical Clearance: The project was a systematic review and meta analysis so, do not require ethical approval as there was no direct information or intervention performed on human sample. Institutional ethical committee has refrained authors from ethical permission.

References

1. Blumenthal JA, Emery CF, Madden DJ, Coleman RE, Riddle MW, Schniebolck S et al. Effects of exercise training on cardiorespiratory function in men and women older than 60 years of age. *American journal of cardiology*. 1991;67(7) :633-9
2. C. E. Garber, B. Blissmer, M. R. Deschenes et al. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults. *Medicine & Science in Sports & Exercise*. 2011;43(7) :1334-59.
3. Chang Y-W, Chen W-L, Lin F-G et al. Frailty and its impact on health related quality of life. A cross sectional study on elder community dwelling preventive health service users. *PLoS one Journal*. 2012; 7(5) : e38079.
4. E. E. E. Camboim, M. O. Nóbrega, R. M. B. Davim et al. Benefits of PA in the third age for the quality of life. *J Nurs Recife*. 2017; 11(6): 2415-22.
5. Feldman H, Scheltens P, Scarpini E, et al. Behavioral symptoms in mild cognitive impairment. *Neurology*. 2004;62(7):1199-1201.
6. Germain CM, Vasquez E, Batsis JA . Physical Activity, Central adiposity and functional limitations in community dwelling older elders. *Journal of Geriatric Physical therapy*. 2016; 39(2): 71-6.
7. Masel MC, Ostir GV, Ottenbacher KJ. Frailty, mortality, and health related quality of life in older Mexican Americans. *J Am Geriatr Soc*. 2010;58(11): 2149-53.
8. Mirza SS, Ikram MA, Bos D et al .Mild cognitive impairment and risk of depression and anxiety a population based study. *Alzheimers Dement*. 2017;13(2):130-139.
9. O Loughlin JL, Robitaille Y, Boiv . Incidence and risk factors for falls and injurious falls among the community dwelling elderly. *AMJ Epidemiology*. 1993; 137(3):342-51.
10. Olsen K, Taylor JP, Thomas A. Mild cognitive impairment: safe to drive. *Maturitas*. 2014;78(2):82-85.
11. Petersen RC, Caracciolo B, Brayne C et al. Mild cognitive impairment: a concept in evolution. *J Intern Med*. 2014;275(3):214-228.
12. Puts MT, Toubasi S, Atkinson E, Ayala AP, Andrew M , Ashe MC, Bergman H, Ploeg J Mc Gilton KS
13. S Musich, S. S. Wang, K. Hawkins. The Frequency and Health Benefits of Physical Activity for Older Adults. *Population Health Management*. 2017; 20 (3): 199-207.
14. Wiles JL, Leibling A, Guberman N. The meaning of aging in place to older people. *The Gerontologist*. 2012; 52(3): 357-66.
15. World Health Organization, PA for health. More active people for a healthier world. Draft global action plan on PA 2018-2030.

A Study on Socio-Economic Status and Consumption Pattern of Tibetan Refugee Households in Ladakh Settlement, India

Tenzin Namgha¹, Tsering Dolkar²

¹Assistant Professor, BA Department, Dalai Lama Institute for Higher Education (Affiliated to Bangalore University) Mysore Road, Hejjala Post, Bidadi Hobli, RamanagarDistt.Bangalore.

²Research Scholar, BA Department, Dalai Lama Institute for Higher Education (Affiliated to Bangalore University) Mysore Road, Hejjala Post, Bidadi Hobli, RamanagarDistt.Bangalore.

How to cite this article: Tenzin Namgha, Tsering Dolkar et al. A Study on Socio-Economic Status and Consumption Pattern of Tibetan Refugee Households in Ladakh Settlement, India. Volume 13 Issue 3 July-September 2022

Abstract

Background: The refugee population is deprived of nutritious food mainly due to household socioeconomic characteristics such as income, education, and occupation. The study highlights the socio-economic status of Tibetan refugees in Ladakh settlement in India. It also covers their dietary pattern such as protein, carbohydrates, fibers, and fats. This study also examines the association between socioeconomic status and food consumption patterns.

Methodology: Tibetan refugees in the Ladakh settlement formed the participant for this study. 142 household data were collected to understand the socio-economic status and food consumption pattern among Tibetan refugees in Ladakh. A structured interview questionnaire was employed to obtain the data. The data were statistically analyzed using descriptive statistics.

Results and Conclusion: The result indicated that the Majority of Tibetan refugees in Ladakh belongs to lower and upper-lower socioeconomic status. The food consumption pattern has changed drastically from traditional food to a more carbohydrate-rich diet. The association between socioeconomic status and fruit consumption was found to be significant ($p > 0.018$). Also, education affects soft drink consumption as low-educated consume more compared to educated respondents ($p > 0.034$). Tibetan refugees in Ladakh lack awareness about dietary diversity. They consume a diet rich in fats and carbohydrates which may have health implications in the long run.

Keywords: Socioeconomic status, Food Consumption pattern, Tibetan Refugees, Ladakh, India

Introduction

Socio-economic status is an important determinant of the household dietary pattern.⁽¹⁾

Low-income countries tend to consume unhealthy diets of high energy, cholesterol, saturated fats, and fewer fibers.⁽²⁾ The majority of refugee households deal with food insecurity.⁽³⁾ Studies about refugees focusing on dietary changes and their implication on health were less covered, especially among Tibetan refugees in India. The transition from traditional food to energy-dense food may cause a long-term impact on their health.⁽⁴⁾ Also, a study on dietary changes in

the refugee community was given due importance in recent times.⁽⁵⁾ Developing countries such as India have a low socio-economic background in terms of poor education, health, sanitation, infrastructure, and food insecurity. They are hosting several world refugees from Bangladesh, Sri Lanka, Afghanistan, and Tibet. Tibetans have been living in Ladakh settlements irrespective of its harsh climate and remote accessibility. Refugees are faced with various problems in the host country in terms of foreign language, accessibility to medical emergencies, and discrimination.⁽⁶⁾ The majority of refugees fall under the low socio-economic category.⁽⁷⁾ This may affect the

dietary intake of the refugee households. Demographic variables and socio-economic factors affect changes in food habits post-migration.⁽⁸⁾ A systematic review of socioeconomic differences in food habits in Europe indicated that lower socio-economic status has an unhealthier consumption pattern.⁽⁹⁾ Educational level and household income significantly impacted eating habits.⁽¹⁰⁾ A study conducted on Saharawi refugees living in Algeria concluded that low socio-economic status lacks dietary diversity.⁽¹¹⁾ Refugees are often reported to be unfamiliar with food in the host country.⁽⁵⁾ A study on refugees living in Thailand concluded that there is a lack of quality and nutritious food which may have serious implications on health.⁽¹¹⁾ This study highlights one such refugee that of Tibetans in Ladakh settlement which is unexplored by previous researchers. It is clear from the previous study that refugees are vulnerable and changes in dietary habits post-migration may affect their health.

Thus, an attempt will be made to understand the consumption pattern of Tibetan refugees in Ladakh and their overall socio-economic status. The study used modified Kuppaswamy's socioeconomic scale⁽¹²⁾ for measuring the socio-economic status of Tibetan households.

Objectives of the Study

- To understand the socio-economic status of Tibetan refugee households in Ladakh.
- To understand the food consumption pattern of Tibetan refugee households in Ladakh.
- To examine the association between socioeconomic status concerning household characteristics and consumption patterns.

Methodology

The study was conducted between September 2020 to October 2020 during the first wave of covid. The study is a representation of the whole Tibetan settlement in Ladakh. Ladakh settlement has 12 camps scattered with approximately 50 households each. 14 households were selected randomly covering all the settlements except for camp 3 and 11 due to the covid containment zone at the time. Ethical committee approval was taken. A structured interview schedule was employed to draw the information from the respondents. The settlement officer was approached for a supporting letter and the secretary gave consent

to conduct the survey. The interview took about half an hour for each questionnaire and 142 households formed the final sample of respondents of the study. Questionnaires consist of Part A dealing with the socio-demographic profile of the households and Part B on the consumption pattern of the households. Data were analyzed using SPSS 20.

Results and Discussion

The majority of the respondents (82%) falls between 20-60 years of age. The male and female respondents were 64.8% and 35.2% respectively. The data revealed that 64.8% are illiterate and 41.5% are unemployed. 75.3% of the household has below Rs. 20000 monthly income. The following figures manifest gender, education qualification, occupation, monthly income, monthly expenditure and facilities, and socio-economic status of the respondent household.

Socio-economic status of the respondent households

One of the main objectives of the study is to analyze the current socio-economic status of Tibetan refugees in Ladakh settlements using Kuppaswamy's scale.

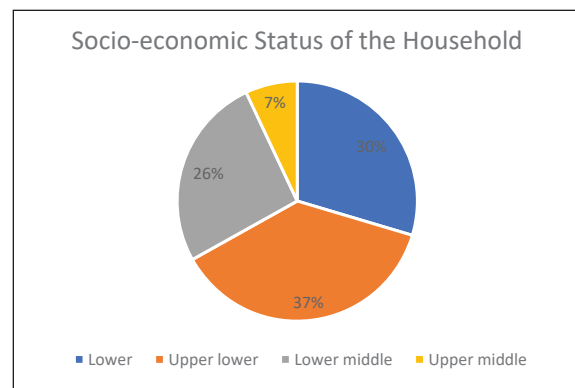


Figure 1: Overall Socio-economic Status of the Respondent Household

The majority of the respondent (67%) falls in the category of lower and upper-lower socioeconomic status according to Kuppaswamy's socioeconomic scale.

Consumption pattern of Tibetan refugees in Ladakh settlement in India

The consumption pattern was analyzed using descriptive statistics of the frequency of various food items.

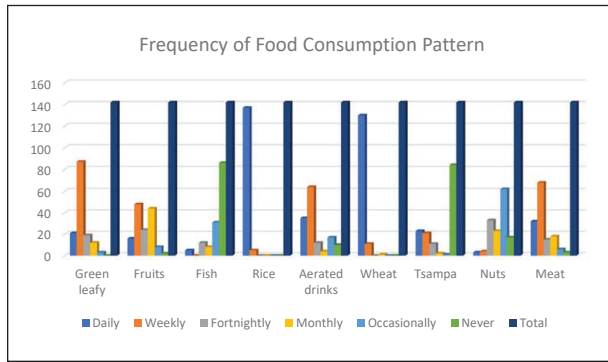


Figure 2: Food consumption pattern of Tibetan refugees in Ladakh settlement in India

Consuming green leafy vegetables is important for overall health.⁽¹³⁾ However, Tibetans in Ladakh consume less green leafy vegetables and fruits. Rice and wheat were the main staple food. Fish are rarely consumed by households. Soft drinks such as Coke and Pepsi were consumed rampantly. Traditional food such as Tsampa which is made of Barley or wheat has been replaced by rice and consumed nuts occasionally. It is interesting to find that Tibetans in Ladakh are consuming meat on regular basis and expressed the scarcity of green leafy vegetables in extreme climate.

Association between socioeconomic status and household size

The association between socioeconomic status concerning household characteristics and consumption patterns was presented. It was evident

from a previous study that socio-economic status was influenced by household size. ⁽⁷⁾In this study, a cross-tabulation was run to see the association between them.

Table 1: Association between socioeconomic status and household size

Number of people in the Household Lower	Socio-economic status				Total
	Upper lower	lower middle	upper-middle		
<4	22	14	8	1	45
4-6	17	31	23	9	80
7-8	3	8	4	0	15
9-10	0	0	2	0	2
Total	42	53	37	10	142

Source: Field data

Pearson chi-square .012

The significant Pearson chi-square indicates that low socio-economic status is associated

with a lower number of people in the household and vice-versa. Simultaneously, a cross-tab was run to see the association between socioeconomic status and various food groups. However, it was found insignificant for food groups like green vegetables, rice, non-veg except fruit consumption.

Table 2: Association between socioeconomic status and fruit consumption

Daily	FRUITS						Total
	Weekly	Fortnightly	Monthly	Occasionally	Never		
Lower	0	8	10	18	5	1	42
Upper lower	10	20	8	12	2	1	53
lower middle	4	19	4	10	0	0	37
upper-middle	2	1	2	4	1	0	10
Total	16	48	24	44	8	2	142

Source: Field data Pearson chi-square .018

There is indicated that lower socioeconomic status does not consume fruits daily whereas those upper lower and lower-middle consume on a daily

and weekly basis. The study also found that socio-demographic variable like education is highly associated with the consumption of soft drinks.

Table 3: Association between the level of education and soft drink consumption

	AERATED DRINKS						Total
	Daily	Weekly	Fortnightly	Monthly	Occasionally	Never	
Illiterate	27	43	8	1	9	4	92
Primary	2	8	0	1	1	2	14
Middle school	1	2	0	0	1	2	6
High School	3	4	2	0	1	0	10
Intermediate	0	3	1	0	3	2	9
Graduate	0	3	1	1	1	0	6
Profession	2	0	0	0	0	0	2
Others	0	1	0	1	1	0	3
Total	35	64	12	4	17	10	142

Source: Field data Pearson chi-square .034

Illiterates consume more unhealthy items such as soft drinks on a daily and weekly basis compared to graduates and above. High consumption of soft drinks will lead to increased body weight and obesity. (14)

Discussion

The majority of Tibetan's socio economic status in Ladakh was found to be lower and upper-lower as per Kuppaswamy's scale. 41.5 % of the sample respondents were unemployed. 39.4 % are having a household monthly income of less than ten thousand. They are mainly construction labourers and daily wage earners. Women in the households engage in small businesses like carpet weaving and apron making for extra income. 82.4 % of the respondents are in the age category of 20-60 and 64.8% are illiterate. Drop-outs youth choose the army or VTC (Vocational Training Centre). Lack of career counseling was found to be a serious problem in the settlement leading to many youths joining the army and every household has one or more members in the army. Forward migration to western countries is meagre in number compared to other Tibetan refugee settlements in India. Presently, youth are migrating to western and European countries for better living standards. Leisure activities in the camp are snooker and gym for most of the youth. 98.6% of the respondents reported daily power cuts. Some of the college drop outs work as tourists guides, beauticians, and artists (thang ka painting). There are challenges faced by Tibetans in Ladakh of discrimination in

terms of employment and legal issues. Access to health facilities is another major challenge faced by the people. The settlement hospital (Troten funded by Central Tibetan Administration funded) is lacking in the quality of services and medicine. Sonam Norbu Memorial Hospital (SNMH) is the facility used for childbirth which is nearby the settlement. During medical emergencies, they visit bigger cities like Delhi and Chandigarh. The consumption pattern of Tibetan refugees in Ladakh has shifted from their traditional food. 50% of the respondents do not consume Tsampa (wheat grain) substituting with rice. Consumption of aerated drinks like Coke and Pepsi is high which may lead to various health issues in the long run. Household size has a positive influence on socio-economic status. Households having a maximum number of people have higher socio-economic status. In other words, household socio-economic status tends to increase with the increasing household size. This may be because a higher number of people are involved in daily wages which contribute to the household income. The Government of India has provided ration cards to all the Tibetan refugees living in Ladakh meeting the legal status of staying in India. In addition to that, 87.3 % of Tibetans in Ladakh have been provided with other benefits of Anapurna Yojana. The majority of Tibetan households in Ladakh are provided with rice and atta (wheat flour) every 26th of the month depending upon the size of the households. The government supplement has become the main staple food for the settlement people which indirectly lead to the consumption of carbohydrates daily resulting in less fibre-rich food.

Future Research

This study used a descriptive approach to understanding the socio-economic status and food consumption pattern of Tibetan refugees in Ladakh while keeping the food security framework in mind. However, future research can be focused more on examining how Tibetans in Ladakh cope with the current situation and how do they meet the nutritional requirement by applying a qualitative approach.

Conclusion

This study is the first detailed analysis of Tibetan refugees in Ladakh. It tries to understand the socio-economic status of Tibetan refugees in Ladakh by using Kuppuswamy's scale. Also, the study throws some light in terms of their livelihood of education, health, and other livelihood alternatives in the settlement. This study describes the socio-economic status, consumption pattern, and their association. However, future researchers can focus on analyzing the reason for low socioeconomic status compared to other Tibetan refugee settlements and the association between changing dietary patterns and health. Also, why NGOs and the Tibetan government are unable to create a conducive environment for growth and development. Therefore, policy intervention from various NGOs and the Tibetan government is needed for uplifting the livelihood of the people in the settlement especially in creating employment opportunities and community awareness programs on dietary diversity.

Conflict of interest

Nil

Source of funding

This study was not funded by any organizations or government.

Ethical Clearance

Taken from the institutional ethics committee

References

1. Morseth M, Grewal N, Kaasa I, Hatloy A, Barikmo I, Henjum S. Dietary diversity is related to socioeconomic status among adult Saharawi refugees living in Algeria. *BMC Public Health*. 2017;17(1).
2. Mayén A, Marques-Vidal P, Paccaud F, Bovet P, Stringhini S. Socioeconomic determinants of dietary patterns in low- and middle-income countries: a systematic review. *The American Journal of Clinical Nutrition*. 2014;100(6):1520-1531.
3. Hadley C, Zodhiates A, Sellen D. Acculturation, economics and food insecurity among refugees resettled in the USA: a case study of West African refugees. *Public Health Nutrition*. 2007;10(4):405-412.
4. RENZAHO A, BURNS C. Post-migration food habits of sub-Saharan African migrants in Victoria: A cross-sectional study. *Nutrition & Dietetics*. 2006;63(2):91-102.
5. Wang Y, Min J, Harris K, Khuri J, Anderson L. A Systematic Examination of Food Intake and Adaptation to the Food Environment by Refugees Settled in the United States. *Advances in Nutrition: An International Review-Journal*. 2016;7(6):1066-1079.
6. Kang C, Tomkow L, Farrington R. Access to primary healthcare for asylum seekers and refugees: a qualitative study of service user experiences in the UK. *British Journal of General Practice*. 2019;69(685):e537-e545.
7. Ayine R, Tumwine F, Kabumbuli R. Socioeconomic status and livelihood of refugees in a self-reliance situation in Kyangwali refugee settlement. *Ghana Journal of Geography*. 2017;9(3):64-83.
8. Wandel M, Råberg M, Kumar B, Holmboe-Ottesen G. Changes in food habits after migration among South Asians settled in Oslo: The effect of demographic, socio-economic and integration factors. *Appetite*. 2008;50(2-3):376-385.
9. Tehranipour, Lipsky, Leong. A comparative study of switching schemes in isotropic networks. *IEEE International Conference on Systems Engineering*. 1989;.
10. Miyaki K, Song Y, Taneichi S, Tsutsumi A, Hashimoto H, Kawakami N et al. Socioeconomic Status Is Significantly Associated with the Dietary Intakes of Folate and Depression Scales in Japanese Workers (J-HOPE Study). *Nutrients*. 2013;5(2):565-578.

-
11. Banjong O, Menefee A, Sranacharoenpong K, Chittchang U, Eg-kantrong P, Boonpraderm A et al. Dietary Assessment of Refugees Living in Camps: A Case Study of Mae La Camp, Thailand. *Food and Nutrition Bulletin*. 2003;24(4):360-367.
 12. MODIFIED KUPPUSWAMY SCALE [Internet]. I hate ps.com. 2021 [cited 5 August 2021]. Available from: <http://www.ihatepsm.com/blog/modified-kuppuswamy-scale>
 13. Mariammal A, Hemalatha G, Saravanakumar R, Murugan P, Beulah A. Study of the Socio-Economic Status and Consumption Pattern of Green Leafy Vegetables among Selected of Farm Women. *International Journal of Current Microbiology and Applied Sciences*. 2019;8(08):1190-1197.
 14. Vartanian L, Schwartz M, Brownell K. Effects of Soft Drink Consumption on Nutrition and Health: A Systematic Review and Meta-Analysis. *American Journal of Public Health*. 2007;97(4):667-675.

Clinicohematological profile of patients with Pancytopenia

Vineet Chaturvedi¹, Jasvinder Kumar², Roopak Aggawal³,
Granth Kumar⁴, Pinki Pandey⁵

¹Associate Professor, Department of Pathology, Uttar Pradesh University of Medical Sciences, Saifai, Etawah

²Post Graduate 3rd year, Department of Pathology, Uttar Pradesh University of Medical Sciences, Saifai, Etawah

³Associate Professor, Department of Pathology, Uttar Pradesh University of Medical Sciences, Saifai, Etawah

⁴Associate Professor, Department of Medicine, Uttar Pradesh University of Medical Sciences, Saifai, Etawah

⁵Professor & Head, Department of Pathology, Uttar Pradesh university of Medical Sciences, Saifai, Etawah

How to cite this article: Vineet Chaturvedi, Jasvinder Kumar, Roopak Aggawal, Granth Kumar, Pinki Pandey et al. Clinicohematological profile of patients with Pancytopenia. Volume 13 Issue 3 July-September 2022

Abstract

Background: Pancytopenia is common and important clinico-hematological problem encountered in our daily clinical practice. The pattern of diseases leading to Pancytopenia is expected to vary in different population groups with difference in age pattern, nutritional status, and prevalence of infective disorders. The severity of pancytopenia and the underlying pathology determine the management and prognosis

Objectives: To study the etiology and clinic-hematological profile in patients of peripheral blood pancytopenia

Materials and Methods: This was a prospective study conducted at Uttar Pradesh University of medical sciences, Saifai, Etawah during the period of January 2019 to June 2021.

Results: A total of 202 patients (108 males and 94 females) were diagnosed to have pancytopenia. Most of the patients presented with generalized weakness and fever. The commonest physical finding was pallor, followed by splenomegaly. The various causes of pancytopenia included infections (n=138), megaloblastic anaemia (MA) (n=44), drugs, aplastic anaemia and subleukaemic leukaemia. We found a significant association between megaloblastic anaemia and pancytopenia

Conclusion: The present study concluded that infection and megaloblastic anaemia are the most common cause of pancytopenia.

Keywords: Pancytopenia, Megaloblastic anaemia, infections

Introduction

Pancytopenia is an important clinicohematological entity encountered in our day-to-day clinical practice.^[1] It is a disorder in which all three major formed elements (RBC, WBC, and platelets) are decreased in

number^[2]. Till 1919 Pancytopenia was not separate entity this term was used for Hypoplastic anemia which was most common cause of Pancytopenia in Western countries^[3]. The causes can be many ranging from viral fevers, megaloblastic anaemia (MA), autoimmune disorders, bone marrow failure

Address for Correspondence: Jasvinder Kumar

Post Graduate 3rd year, Department of Pathology, Uttar Pradesh University of Medical Sciences, Saifai, Etawah-206130

Email : jasvindersaini653@gmail.com

syndrome and hematological malignancies [2,4]. Most common cause of pancytopenia and bicytopenia as in various studies was megaloblastic anemia [5]. Pancytopenia and bicytopenia incidence have a bi-modal presentation seen in children and adults mainly in the 3rd and 4th decades. Male to female predominance is 1.4 and 2.6 to 1 seen in the literature. While conditions such as multiple myeloma and myelodysplastic syndrome are more prevalent in older patients, acute leukemia and parvovirus B19 infection are more common in younger patients [6]. Geographic and socio-cultural influences determine the major causes of pancytopenia, especially for megaloblastic anemia. The clinical pattern and outcome depend on the etiology [3,4]. The severity of pancytopenia and the underlying pathology determine the management and prognosis of the patients [4]. The present study was undertaken to study the profile of adult patients presenting with pancytopenia

Materials and methods

The present prospective study was undertaken for a period of 2.6 years, conducted at Uttar Pradesh University of medical sciences, Saifai, Etawah during the period of January 2019 to June 2021. All adult patients with pancytopenia were included. Inclusion criteria were presence of all three of the following: Hemoglobin (<9gm%), total leucocyte count (TLC), <4000/ul, platelet count <1,00,000/ul. Two ml of EDTA (ethylene diamine tetraacetic acid) anticoagulated blood was collected and processed through sysmex automated hematology analyser and 9 hematology parameters were obtained, which included hemoglobin, RBC count, total leucocyte count, DLC, platelet count, MCV, MCH, MCHC and PCV. Peripheral smear was stained with leishman stain for all the cases and examined in detail.

Result

A total of 202 patients who presented with pancytopenia were studied. They consisted of 108 males and 94 females with a male to female ratio of 1.15:1. The mean age of the patients was 36.4 years (range 18-85 years). Presenting complaints and physical findings are shown in table 1

Table 1: Presenting complaints and physical findings in Pancytopenia

1.	Generalized weakness	202
2.	Fever	72
3.	Bleeding manifestation	06
4.	Dyspnea	82
5.	Weight loss	11
6.	Chills and rigors	08
7.	Pallor	202
8.	Splenomegaly	48
9.	Hepatomegaly	32
10.	Bony tenderness	02
11.	Lymphadenopathy	01

The commonest mode of presentation was generalized weakness, other main symptoms were dyspnea, fever and weight loss. Pallor was noted in all cases. Splenomegaly and hepatomegaly were seen in cases of megaloblastic anaemia, followed by leukemia and malaria. Bony tenderness was seen in multiple myeloma. Lymphadenopathy was noted in sub leukemic leukemia.

Various causes of pancytopenia were infections (n=137[68.7%]), megaloblastic anaemia (n=52[24%]), drugs (n=07[4.7%]), aplastic anaemia (n=03[1.04%]), subleukemic leukemia (n=02[.04%]) and multiple myeloma (n=01[0.52%]). Table 2 depicts the various etiologies of pancytopenia in our study.

Table 2: Distribution of various causes of Pancytopenia

1.	Infections Malaria (73) Dengue (31) Presumed viral infection (32) HIV (1)	137 (67.8%)
2.	Megaloblastic anaemia	52 (25.7%)
3.	Drugs	07 (3.4%)
4.	Aplastic anaemia	03 (1.48%)
5.	Subleukaemic leukaemia	02 (1%)
6.	Multiple myeloma	01(0.5%)

The predominant blood picture was dimorphic anaemia (47.52 %), followed by Macrocytic anaemia(30.69%), peripheral smear shows macro-ovalocytes [fig 1]

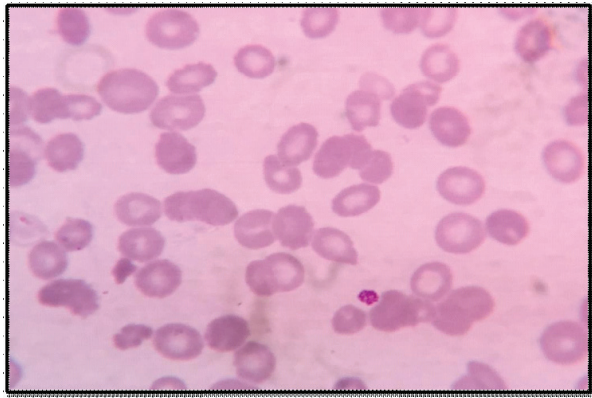


Figure 1: Megaloblastic anaemia. Peripheral smear showing macroovalocytes. Leishman's stain. (1000x)

Normocytic normochromic anaemia constituted 14.35% of the cases and Microcytic hypochromic anaemia (7.42 %). Leucopenia and thrombocytopenia were seen in all cases.

We have encountered 2 patients of subleukaemic leukaemia both were of AML (acute myeloblastic leukaemia). Bone marrow was hypercellular. Erythroid and megakaryocytic series were reduced. Majority of the cells were myeloblasts constituting more than 50% of cells in marrow. Bone marrow aspirate showed myeloblast with auer rods [fig 2].

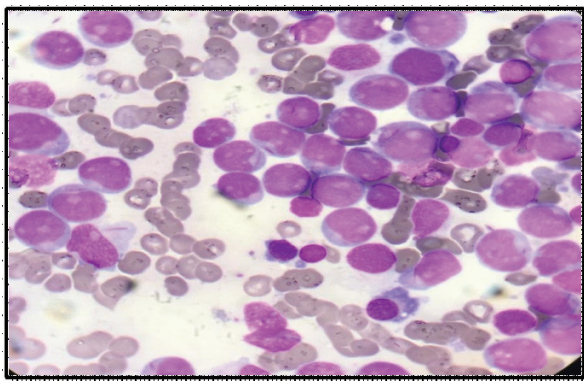


Figure 2: AML. Bone marrow aspiration showing myoblasts and promyelocyte showing Aur rods. Giemsa stain. (1000x)

Malarial infestation was seen in 73 patients. Pancytopenia with schizonts of P. Vivax malaria in peripheral smear [fig 3]. The patients recovered after antimalarial treatment.



Fig. 3: Peripheral smear showing Plasmodium vivax schizonts. Leishman's stain. (1000x)

Discussion

We studied a total of 202 cases of pancytopenia. The age of our patients ranged from 18-83 years, with a mean age of 35.6 years. Pancytopenia common in 3rd and 4th decade have been observed in other studies also [7,8,9].

The most common cause of pancytopenia in our study was infections (67.8%). However, most of the other studies had shown megaloblastic anaemia as the most common cause. I think infection as a common cause is related to the socioeconomic status and unhygienic condition of the surrounding villages where I work.

Comparison of causes of pancytopenia in various studies

Khunger et al ^[10]	Megaloblastic anaemia (72%)	Aplastic anaemia (28%)
Jain et al ^[9]	Hypersplenism (29.2%)	Infections (25.6%)
Tilak V et al ^[3]	Megaloblastic anaemia (68%)	Aplastic anaemia (7.7%)
Akhtar Munir et al ^[11]	Malignant hematological disorders (33.1%)	Megaloblastic anemia (18.2%)
Pooja et al. ^[12]	Megaloblastic Anemia (37.5%)	Aplastic anemia (20%)
Neelema Bahal et.al ^[13]	Megaloblastic Anemia (39.61 %)	Aplastic anemia (22.2%)
Present study	Infections (67.8%)	Megaloblastic anaemia (25.7%)

Malaria and dengue were the most common infection encountered. No serious bleed was noted in this group of patients. We had 73 cases of malaria presented with pancytopenia. Hamid and Shukry also found malaria to be a common cause of pancytopenia [14]

We had 32 cases of presumed viral infections which were self-limiting, and we did not do extensive diagnostic evaluation. The viral infections, other than dengue, which could cause pancytopenia are parvovirus B19, cytomegalovirus, herpes simplex virus, and Epstein bar virus [15-17]

We had only one case of HIV who presented with pancytopenia due to HIV per se; the pancytopenia in rest of the HIV were due to drugs such as zidovudine and cotrimoxazole.

In our study, we had only 6/202 (2.6%) cases aplastic anaemia (3 cases), subleukaemic leukaemia (2 cases), and multiple myeloma (1 case) which is lower than that observed in the other studies [7,8,10,18,19]. This is because we had consciously excluded the already diagnosed cases of bone marrow failure, hematological malignancies, and those on chemotherapeutic drugs. This has been done to evaluate the causes of pancytopenia in general clinical practice

Conclusion

The etiology of pancytopenia can be diverse with reversible and benign causes being the most common. In our study, the most common cause of pancytopenia was infection and megaloblastic anaemia, and the count recovered in most cases on recovery from the disease. This study indicates the higher incidence of nutritional deficiency in young age group. The main reason for this can be due to low socio-economic status, inadequate nutrition, poor hygiene, and lifestyle modification. So, this age group should be main target for education regarding the factors described above and medication which reduce the clinical burden of megaloblastic anemia in our country

Ethical Clearance - Taken from institutional ethical committee

Source of funding - Self

Conflict of interest - None

References

1. Kar M, Ghosh A. Pancytopenia. *Journal, Indian academy of clinical medicine* 2002; 3:29-341
2. Weinzierl EP, Arber DA. The differential diagnosis and bone marrow evaluation of new-onset pancytopenia. *Am J Clin Pathol* 2013; 139:9-29
3. Sangwan S et al/*International Journal of Biomedical and Advance Research* 2018;9(3):112-116.
4. Beck N, Lanzer P, editors. *Diagnostic Hematology*. 1st ed. London: Springer-Verlag; 2009. p9-50.
5. Dhooria et al: *Journal of Advances in Medicine and Medical Research*, 2020, 32(4):56-65l.
6. Jain A, Naniwadekar M. An etiological reappraisal of pancytopenia-largest series reported to date from a single tertiary care teaching hospital. *BMC Blood Disorders*. 2013 Dec; 13(1):1-9.
7. Kumar R, Kalra SP, Kumar H, Anand AC, Madan H. Pancytopenia- A six-year study. *J Assoc Physicians India* 2001;49: 1078-81.
8. Gayatri BN, Rao KS. Pancytopenia: A clinico-hematological study. *J Lab Physicians* 2011;3: 15-20.
9. Jain A, Naniwadekar M. An etiological reappraisal of Pancytopenia-largest series reported to date from a single tertiary care teaching hospital. *BMC Hematol* 2013; 13:10.
10. Khunger JM, Arulsevi S, Sharma U, Ranga S, Talib VH. Pancytopenia- A clinico-hematological study of 200 cases. *Indian J Pathol Microbiol* 2002; 45:375-9.
11. Munir A, Shah SF, Ata T, Asim NS, Farooq M. Prevalence of nonmalignant disorders in patients with pancytopenia/bicytopenia: A bone marrow study of 148 cases in DHQ KDA Hospital and LMH Hospital, Kohat. *Pak J Med Health Sci* Apr-Jun.2014;8(2):438-9
12. Agarwal P, Asbah Shams PP, Kumar H, Nigam A. Evaluation of pancytopenia in adults through haematological parameters and bone marrow studies. *Indian Journal of Pathology and Oncology*. 2018 Oct; 5(4):548-53.
13. Bahal N, Malviya A, Ahuja S. Clinico-haematological & Aetiological Profile of Bicytopenic/Pancytopenic Children in Dehradun, India--A 5-Year Study. *Journal of Evolution of Medical and Dental Sciences*. 2021 May 3; 10(18):1347-53.
14. Hamid GA, Shukry SA. Patterns of pancytopenia in Yemen. *Turk J Hematol* 2008; 25:71-4.

15. Miron D, Luder A, Horovitz Y, Izkovitz A, Shizgreen I, Ben David E, et al. Acute human parvovirus B-19 infection in hospitalized children: A serologic and molecular survey. *Pediatr Infect Dis J* 2006; 25:898-901.
16. Mishra B, Malhotra P, Ratho RK, Singh MP, Varma S, Varma N, et al. Human parvovirus B19 in patients with aplastic anemia. *Am J Hematol* 2005; 79:166-7.
17. Brown KE, Young NS. Parvoviruses and bone marrow failure. *Stem Cells* 1996; 14:151-63.
18. Knodke K, Marwah S, Buxi G, Vadav RB, Chaturvedi NK. Bone marrow examination in cases of pancytopenia. *J Acad Clin Med* 2001; 2:55-9.
19. Biswajit H, Pratim PP, Kumar ST, Shilpi S, Krishna GB, Aditi A, et al. Aplastic anemia: A common hematological abnormality among peripheral pancytopenia. *N.AmJMedSci* 2012; 4:384-8

Effect of Antihypertensive Drugs Therapy Concognitive Functions and Asymmetric Dimethylarginine (Adma) Levels In Hypertensive Patients

Yavatesh Joshi T¹, Riddhi Gor²

¹Resident, Department of medicine, MMIMSR, ambala

²Assistant Professor, Department of Obstetrics and Gynaecology, baroda medical college

How to cite this article: Yavatesh Joshi T, Riddhi Gor et al. Effect of Antihypertensive Drugs Therapy Concognitive Functions and Asymmetric Dimethylarginine (Adma) Levels In Hypertensive Patients. Volume 13 Issue 3 July-September 2022

Abstract

The purpose of this study is to evaluate cognitive functions and its association with Asymmetric Dimethylarginine (ADMA) levels in hypertensive patients treated with antihypertensive drugs.

Methods: At least 100 subjects of hypertension were proposed for this study keeping in mind the time constraint and limitation of resources.

Results: Treatment with antihypertensive medications caused change in HMSE score from 24.51 ± 2.27 at day 1 to 25.64 ± 2.31 at four weeks. Treatment with antihypertensive medications caused change in ADMA levels from 15519.65 ± 7311.63 ng/L at day 1 to 12314.47 ± 10696.09 ng/L at four weeks.

Conclusion: Treatment with antihypertensive medications caused change in HMSE score from 24.51 ± 2.27 at day 1 to 25.64 ± 2.31 at four weeks.

Keywords: hypertension, dimethylarginine, drug therapy, concognitive

Introduction

Hypertension or raised blood pressure (BP) is a major public health problem and has emerged as the most important risk factor for morbidity and mortality globally. Hypertension is one of the well-established risk factor for cardiovascular and cerebrovascular disease and other associated complications. The prevalence of hypertension in urban areas of India is 24 – 30% and 12-14% in rural areas.¹ The rates for hypertension in percentage are projected to increase up to 22.9 and 23.6 for Indian men and

women, respectively by the year 2025. Every fourth individual in India aged above 18 years have raised blood pressure.²

The available evidence indicates that hypertension may also acts as risk factor for the adverse cognitive outcomes. Several epidemiological studies had shown that hypertension may be associated with a range of adverse cognitive dysfunctions, including cognitive decline, mild cognitive impairment, and dementia. Although, studies suggest impairment of cognitive functions in hypertension however, there is still little consensus about the effectiveness of

Corresponding Author: Yavatesh Joshi T, Resident

Department of Medicine

MMIMSR, Ambala

yavateshjoshi@gmail.com

treating hypertension to prevent or slow this cognitive decline associated with raised blood pressure.^{3,4} Thus, relationship between raised blood pressure (BP) and cognitive functions is biologically complex and is still not fully understood.

Asymmetric dimethyl arginine (ADMA) is an endogenous molecule and differs from arginine due to addition of two methyl groups. It is formed by the methylation of arginine residues in proteins via protein arginine methyl transferases. ADMA can be used as a marker for detection of endothelial dysfunction caused by oxidative stress. It is an endogenous inhibitor of nitric oxidase synthase (NOS), an essential enzyme for the synthesis of NO. It acts as endogenous competitive inhibitor of nitric oxide synthase (NOS) and physiologically generated during the methylation of protein arginine residues and released during proteolysis.³ Previous studies have demonstrated that plasma ADMA concentration is increased in patients with hypertension and increased ADMA is correlated with cognitive impairment.⁴ However, whether there is a relationship between the change of plasma ADMA levels and cognitive functions in patients treated with antihypertensive drug therapy remains unknown.

Various previous studies suggest that antihypertensive drugs used for control of raised BP can control the cognitive impairment associated with hypertension. While there are also other studies that suggest that antihypertensive drugs are not effective to provide protection from cognitive impairment. Furthermore randomized, controlled clinical trial data available on the efficacy of antihypertensive drug treatment on prevention of dementia are conflicting.^{5,6} There are number of small studies available which show the association between ADMA concentrations and cognitive decline in older adults.

Keeping in the mind the association among ADMA, hypertension and cognitive dysfunctions, the present study was undertaken to examine the effect of antihypertensive drugs on cognitive function in hypertensive patients and on the serum levels of ADMA.

Methods

Study Design

Prospective clinical study.

Study Duration

The study was conducted from November 2019 to October 2021.

Ethical Clearance

Ethical clearance to conduct study was obtained from Institutional Ethics Committee-Human Research (IEC-HR).

Subjects

At least 100 subjects of hypertension were proposed for this study keeping in mind the time constraint and limitation of resources. However, due to pandemic, enrolment of patients was not feasible for long duration of time so due to this situation inclusion of number of participants were reduced to at least 50 and duration of the follow up of study was modified to four weeks after duly permission for completion of work at time.

Inclusion Criteria

1. Newly diagnosed patients of essential hypertension or previously diagnosed patients of essential hypertension who were not taking or on irregular antihypertensive medication.
2. Patients of either sex with age between 30-55 years.
3. Patients willing to give written informed consent.

Exclusion Criteria

1. Patients of secondary hypertension
2. Patients known to have psychological and behavioural disorders or any other CNS disorder that could interfere with the memory and psychomotor functions
3. Patients on any other medications (e.g. sedatives, antipsychotics, antidepressants, antihistaminic) that may affect memory and psychomotor functions
4. Patient with metabolic syndrome, diabetes, dyslipidaemia, , inflammatory disease, liver damage, renal failure, history of coronary artery disease and history of cerebrovascular disease

5. Patient who required antihypertensive drugs (clonidine, methyldopa) that may have central effects.
6. Pregnant and lactating women.

Procedure

Participants

All newly diagnosed patients of essential hypertension or previously diagnosed patients of essential hypertension who were not taking or on irregular antihypertensive medication at time of enrolment and needed antihypertensive therapy, aged between 30 years to 55 years.

Methods: Subjects who fulfilled the inclusion criteria and sign the informed consent were recruited. Before applying HMSE cognitive score for cognitive functions the systolic blood pressure (SBP) and Diastolic blood pressure (DBP) was recorded using digital sphygmomanometer at first day and after four weeks in all the participants. Cognitive functions were assessed using HMSE cognitive score at first day and at four weeks.

Assessment of cognitive functions

Hindi Mental Status Examination (HMSE) cognitive screening test (Annexure 4) was performed to assess the cognitive functions of the participants at day 1 and after 4 weeks of treatment.

Estimations of biochemical parameters

Blood sample from each participant was taken with aseptic precautions for baseline investigations and for estimation of serum ADMA levels at day 1 (baseline) and the last day of 4 weeks of the treatment.

Baseline investigations: A complete clinical examination and investigations i.e., complete hemogram, liver function tests, renal function tests, blood sugar levels, ECG and lipid profile were carried out to rule out any disease referred to in exclusion criteria

Estimation of Asymmetric Dimethylarginine (ADMA) levels

For estimation of serum ADMA levels the samples were centrifuged at 4000 rpm for 10 minutes to remove

serum and were stored at -20°C until analysis. Serum ADMA levels were evaluated using commercially available Human Asymmetric Dimethylarginine (ADMA) ELISA kits. Serum ADMA was estimated twice in the study i.e. day 1 and after 4 weeks of treatment. According to the manufacturer, the assay method is as follows:

Results

Subjects Enrolled

In this study total 54 newly diagnosed hypertensive patients or in hypertensive patients on irregular antihypertensive drug treatment were enrolled and followed up for 4 weeks.

Demographic characteristics of participants

A total of 54 patients were enrolled, of which 26 (48.2%) were males, and 28 (51.8%) were females. Mean age of participants was 46.88 ± 8.5 years

Maximum patients belonged to age group of 41-50 years [24 (44.4 %)] followed by 51-55 and 30-40 years [19(35.18%) and 11 (20.37%) respectively]

16 (29.62%) patients were newly diagnosed case of hypertension while 38 (70.37 %) were having previously diagnosed case with irregular treatment history.

20 (37.0%) patients were uneducated.

Class of Antihypertensive drugs prescribed in study subjects

Distribution of participants according to antihypertensive drugs prescribed :

Most commonly prescribed antihypertensive medication was telmisartan in 34 (61.8 %) patients. Enalapril was prescribed in 11(20%) patients while amlodipine was prescribed in 7 (12.7%) patients. Combination of enalapril and amlodipine was prescribed in two (3.63%) patients.

Mean HMSE score at baseline (Day 1) and follow up (4 weeks) in study subjects (n=54):

HMSE score	Day 1	At week 4
Mean \pm SD	24.51 \pm 2.27	25.64 \pm 2.31

Mean HMSE score at day 1 before starting antihypertensive medications in all participants was

24.51 ± 2.27(mean ± SD), and it was 25.64 ± 2.31(mean ± SD), at week 4 after starting antihypertensive drug therapy (Table 3)

Mean ADMA levels (ng/L) at baseline (Day 1) and follow up (4 weeks) in study subjects (n=54):

ADMA (ng/L)	Day 1	At week 4
Mean ± SD	15519.65 ± 7311.63	12314.47 ± 10696.09

Mean ADMA levels (ng/L)at day 1 before starting antihypertensive medications in all participants was 15519.65 ± 7311.63 (mean ± SD), and it was 12314.47 ± 10696.09 (mean ± SD),at week 4 after starting antihypertensive drug therapy.

Mean HMSE score at baseline (Day 1) and follow up (4 weeks) in different group of antihypertensive drugs prescribed:

In telmisartan treated patients, mean serum HMSE score levels at the start of treatment was 24.57 ± 2.29 (mean ± SD), which were 25.97 ± 2.59 (mean ± SD) at four weeks after treatment.

In Enalapril treated patients , mean HMSE score at the start of treatment was 24.54 ± 2.5 (mean ± SD), which was 25.91 ± 2.34 (mean ± SD) at four weeks after treatment.

In Amlodipine treated patients, mean HMSE score at the start of treatment was 23.57 ± 1.9 (mean ± SD), which were 25.57 ± 0.97 (mean ± SD) at four weeks after treatment.

Patients prescribed with combination of Enalapril + Amlodipine had mean HMSE score at the start of treatment 22.0 ± 1.41 (mean ± SD), which were 24.0 ± 0.0 (mean ± SD) at four weeks after treatment.

Mean ADMA levels (ng/L)at baseline (Day 1) and follow up (4 weeks) in different group of antihypertensive drugs prescribed:

In telmisartan treated patients , mean serum ADMA levels (ng/L) at the start of treatment was 14597.06 ± 7266.57 ng/L (mean ± SD), which were 10704.97 ± 5680.05 ng/L(mean ± SD) at four weeks after treatment.

In Enalapril treated patients , mean serum ADMA levels (ng/L) at the start of treatment was 14961.45 ± 4849.5ng/L (mean ± SD), which were 16948.82 ± 21275.2 ng/L (mean ± SD) at four weeks after treatment.

In Amlodipine treated patients , mean serum ADMA levels (ng/L) at the start of treatment was 20492.0 ± 10526.1 ng/L (mean ± SD), which were 13390.71 ± 6179.8 ng/L(mean ± SD) at four weeks after treatment.

Patients prescribed with combination of Enalapril + Amlodipine had mean serum ADMA levels (ng/L) at the start of treatment 14016.0 ± 1343.5 ng/L (mean ± SD), which were 9526.5 ± 2568.92 ng/L(mean ± SD) at four weeks after treatment.

Correlation between HMSE score and ADMA levels :

Correlations	HMSE (Day 1)	HMSE (at 4 Week)
ADMA (Day 1)	0.059	0.254
ADMA (at 4 weeks)	-0.085	-0.02

The Pearson correlation between the ADMA premedication was positive but not significant when compared with HMSE on day 1 and week 4. The ADMA levels during post medication were negative but not significant with HMSE on day 1 and week 4.

Discussion

Essential hypertension is considered as a multifactorial disease and various environmental and genetic factors contribute in its aetiology. Despite recent advances in understanding and treating hypertension, the prevalence of hypertension is continuously rising. Approximately 40% of the adult population aged 25 and above are affected with hypertension, worldwide.

Various previous studies suggest that antihypertensive drugs used for control of raised blood pressure can control the cognitive changes associated with hypertension. While there are also other studies that suggest that antihypertensive drugs are not effective to provide protection from cognitive impairment. ⁷

Normal anatomical and functional integrity of the vascular endothelium is essential for the prevention of atherosclerosis, hypertension, and other cardiovascular diseases. Nitric oxide (NO) produced in endothelial cells by endothelial NO synthase (eNOS) is an important compound required for the anatomical and functional integrity of the vascular endothelium. eNOS enzyme mediates the conversion of the amino acid arginine into NO and citrulline. ⁸

In present study use of Enalapril, an ACE inhibitor caused change of HMSE score from 24.54 ± 2.31 to 25.91 ± 2.34 . Ohruit et al in their study showed that ACE inhibitor caused improvement in MMSE scores suggesting that central ACEIs may benefit cognitive function in patients with hypertension.¹¹⁵ In another study Yamada K *et al* showed that different types of ACE inhibitors have varying effects on cognitive impairment.⁹ However studies also show contradictory results where, ACE inhibitors did not affect cognitive functions or accelerated the development of dementia.

In this study, angiotensin receptor antagonists, telmisartan also cause change in mean HMSE score from 24.57 ± 2.29 to 25.97 ± 2.59 . Study shows that administration of losartan in elderly hypertensive patients affected memory function both the immediate as well as delayed one. Thus, angiotensin receptor antagonists can not only act as antihypertensive but also on impaired cognitive function. Also in animal models of learning and memory, drugs acting by inhibition of RAAS pathway, especially ACE inhibitors and angiotensin receptor antagonists have been demonstrated to have potential nootropic effects.⁹

One of the objectives of our study was to correlate the levels of ADMA level with cognitive dysfunction in hypertensive patients. In our study, we found insignificant correlation between HMSE score and ADMA level. Although there are studies showing correlation of MMSE scores with biomarkers but there is no study available correlating ADMA levels with HMSE score following treatment with antihypertensive medications.

Conclusions

In conclusion, the results of this study suggest

- Treatment with antihypertensive medications caused change in HMSE score from 24.51 ± 2.27 at day 1 to 25.64 ± 2.31 at four weeks
- Treatment with antihypertensive medications caused change in ADMA levels from 15519.65 ± 7311.63 ng/L at day 1 to 12314.47 ± 10696.09 ng/L at four weeks
- Mean HMSE cognitive score with telmisartan, amlodipine and enalapril class of antihypertensive medications were 24.57 ± 2.29 , 23.57 ± 1.9 , 24.54 ± 2.5 respectively at day

1 and 25.97 ± 2.59 , 25.57 ± 0.97 , 25.91 ± 2.34 , respectively at four weeks.

- Mean ADMA levels with telmisartan, amlodipine and enalapril class of antihypertensive medications were 14597.06 ± 7266.57 ng/L, 20492.0 ± 10526.1 ng/L, 14961.45 ± 4849.5 ng/L respectively at day 1 and 10704.97 ± 5680.05 ng/L, 13390.71 ± 6179.8 ng/L, 16948.82 ± 21275.2 ng/L, respectively at four weeks.

Ethical clearance- Taken from ethical committee of institution

Source of funding - Self

Conflict of Interest - Nil

References

1. Ingale AS, Dixit JV. Prevalence of hypertension, awareness and health seeking behaviour among adults residing in field practice area of urban health training centre, Government Medical College, Aurangabad. *National J Community Med.* 2017;8:31-36.
2. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet.* 2005; 365:217-223.
3. Launer LJ, Masaki K, Petrovitch H, Foley D, Havlik RJ. The association between midlife blood pressure levels and late-life cognitive function. *The Honolulu-Asia Aging Study. JAMA.* 1995;274:1846-1851.
4. Ninomiya T, Ohara T, Hirakawa Y, Yoshida D, Doi Y, Hata J, et al. Midlife and late-life blood pressure and dementia in Japanese elderly: the Hisayama study. *Hypertension.* 2011;58:22-8.
5. Vendemiale G, Romano AD, Dagostino M, de Matthaeis A, Serviddio G. Endothelial dysfunction associated with mild cognitive impairment in elderly population. *Aging Clin Exp Res* 2013;25: 247-255.
6. Reijmer YD, van den Berg E, Dekker JM, Nijpels G, Stehouwer CD, Kappelle LJ, et al. The metabolic syndrome, atherosclerosis and cognitive functioning in a non demented population: The Hoorn Study. *Atherosclerosis.* 2011;219: 839-845.
7. Alderton WK, Cooper CE, Knowles RG. Nitric oxide synthases: structure, function and inhibition. *Biochem J.* 2001 Aug;357(Pt 3):593-615.
8. Sarwar N, Gao P, Seshasai SR, Gobin R, Kaptoge S, Di Angelantonio E, et al. Emerging Risk Factors Collaboration Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a

- collaborative meta-analysis of 102 prospective studies. *Lancet*. 2010;375:2215-22.
9. Biessels GJ, Staekenborg S, Brunner E, Brayne C, Scheltens P. Risk of dementia in diabetes mellitus: a systematic review. *Lancet Neurol*. 2006;5:64-74.
 10. MacAllister RJ, Fickling SA, Whitley GS, Vallance P. Metabolism of methylarginine by human vasculature; implications for the regulation of nitric oxide synthesis. *Br J Pharmacol*. 1994;112:43-48.
 11. Yang YJ, Xiong JW, Zhao Y, Zhan JQ, Chen HB, Yan K, et al. Increased plasma asymmetric dimethylarginine is associated with cognitive deficits in patients with schizophrenia. *Psychiatry Res*. 2016;246:480-484.
 12. Applegate WB, Pressel S, Wittes J, Luhr J, Shekelle RB, Camel GH, et al. Impact of the treatment of isolated systolic hypertension on behavioral variables. Results from the systolic hypertension in the elderly program. *Arch Intern Med*. 1994;154:2154-2160.

Cervical Pap smear: A retrospective study on symptomatic women in a tertiary care hospital.

Vidhu Mahajan¹, Virender Mohan Rana², Anil Raina³, Nipun Kalsotra⁴,
Nidhi Gupta⁵, Surinder K Atri⁶

¹Assistant Professor, Department of pathology, Government Medical College Kathua

²Assistant Professor, Department of pathology, Government Medical College Kathua (Corresponding author)

³Assistant professor, Department of pathology, Government Medical College Kathua

⁴Consultant Orthopaedics, Department of Health, J&K Government

⁵Demonstrator, Pathology, Department of pathology, Government Medical College Kathua

⁶Professor and HOD, Department of pathology, Government Medical College Kathua

How to cite this article: Vidhu Mahajan, Virender Mohan Rana, Anil Raina, Nipun Kalsotra, Nidhi Gupta, Surinder K Atri et al. Cervical Pap smear: A retrospective study on symptomatic women in a tertiary care hospital. Volume 13 Issue 3, July-September 2022

Abstract

Background: Cancer of the cervix is an increasing health problem and an important cause of mortality in women worldwide. Cervical cancer ranks 2nd most common visceral cancer in females and stands 3rd in causing death in women in the world. Pap smear is used as primary screening test for detection of early cervical epithelial changes, cervical epithelial neoplasia and early stage of invasive cervical cancer. Recommendations for Pap smear generally starts around 21 years of age or within 3 years of onset of sexual activity and thereafter every 3 years

Methods: This retrospective study was conducted on 100 patients to evaluate all previously reported cervical smears in the Department of Pathology GMC Kathua, who came with different gynaecological complaints in Gynaecological OPD at GMC Kathua, J&K. Smears were obtained with the help of Ayre's spatula and cytobrush to collect specimen from transformation zone. The cellular material is quickly spread on 2 clean glass slides and fixed immediately by immersing them in copulin jar containing 95% ethyl alcohol. The smears were stained with Papanicolaou stain. After mounting the slides with DPX and examined under light microscope, they are reported by pathologists according to Revised Bethesda System.

Conclusion: Pap smear test is a simple, inexpensive, non-invasive and an OPD performed to detect various premalignant and malignant lesions of cervix. By conducting health camps, increasing awareness programmes and performing Pap smears, the incidence of cervical cancer can be greatly reduced.

Keywords: Pap smear, cervix, screening, cervical cancer

Introduction

Cancer of the cervix is an increasing health problem and an important cause of mortality in women worldwide. Cervical cancer ranks 2nd most common

visceral cancer in females and stands 3rd in causing death in women {breast and lung} in the world.¹ Due to the social and economic conditions, it accounts for 83% of mortality in developing countries.² Cervical cancer is a preventable disease as it has long preinvasive

stage. Its early detection and treatment can reduce the morbidity by 70% and mortality by 80%. For that, a robust screening has to be implemented.

George Papanicolaou had described cytological changes in cervical smears in 1928.³ PAP smear is used as primary screening test for detection of early cervical epithelial changes, cervical epithelial neoplasia and early stage of invasive cervical cancer. Recommendations for PAP smear generally starts around 21 years of age or within 3 years of onset of sexual activity and thereafter every 3 years. After 30 years of age with normal PAP smear, repeat screening every 5 years. When PAP test is abnormal a colposcopy examination of vagina is performed and cervical biopsy is needed to diagnose and prevent further progression to cervical cancer.

Materials and Methods

This retrospective study was conducted on 100 patients to evaluate all previously reported cervical smears in the Department of Pathology GMC Kathua, who came with different gynaecological complaints in Gynaecological OPD at GMC Kathua, J&K from July 2019 to June 2020. We took ethical clearance to do this retrospective study.

Inclusion criteria:

1. Women between 21-70 years of age.

Exclusion criteria:

1. Women below 21 years of age
2. Women without sexual exposure
3. Pregnant women
4. Women above 70 years of age

Procedure:

Smears were obtained with the help of Ayre's spatula and cytobrush to collect specimen from transformation zone. The cellular material is quickly spread on 2 clean glass slides and fixed immediately by immersing them in copulin jar containing 95% ethyl alcohol. The smears were stained with Papanicolaou stain. After mounting the slides with DPX and examined under light microscope, they are reported by pathologists according to Revised Bethesda System, 2014.

Statistical analysis:

Data was analysed by SPSS version 16 and descriptive statistics were presented as frequencies and percentages.

Results and Discussion

In this study we analysed 100 PAP smears reported in department of Pathology Government Medical College Kathua. Most of the patients (33%) fall in the category of 31- 40 years of age, followed by 28% in 21- 30 years of age, 21% in 41-50 years of age, (12%) in 51-60 years of age and 6% fall in 61-70 years of age group.

Among 100 women, the most common presenting chief complaint was discharge 33%, followed by pain lower abdomen, 19% spotting 15%, pruritis 14%, menorrhagia 8%, irregular periods 6%, prolapse 2%, burning micturition 3%. Gross appearance of cervix as per speculum was analysed and cervical erosion was the most common finding with 47%, followed by hypertrophy 37% and bleeding on touch 16%. Out of 100 cases 4% were reported as unsatisfactory, either due to inadequate material or haemorrhagic smears. NILM comprise maximum number of cases were reported as epithelial cell abnormality. Out of 82%, reported as NILM, 51% show normal cytological findings, 27% were inflammatory, 2% were of bacterial vaginosis, 1% of candidiasis and 1% show atrophic changes. Among 14% reported as ECA, ASCUS was most common finding with 6% cases, followed by LSIL with 4% cases, HSIL with 2% cases and squamous cell carcinoma with 2% cases.

In our study we have taken 100 PAP smears from the women presenting with different gynaecological complaints to gynaecology OPD of GMC Kathua in the age group of 21-70 years and analysed their smears. In our study maximum number of women (33%) were between 31- 40 years of age and minimum (6%) patients were in the age group of 61-70 years. Similar observations were made by other studies.^{4,5,6,7} Among the presenting symptoms, whitish discharge per vaginum (33%) was the most common finding as was also reported in similar studies.^{7,8,9} In our study, per speculum examination of cervix is performed and cervical erosion (45%) was the most common finding followed by hypertrophied cervix (34%). This observation is also found in other studies.^{7,10}

PAP smears in our study were broadly categorized as Unsatisfactory (4%), NILM (82%) and ECA (14%).

Unsatisfactory smears encompass smears having insufficient squamous component and obscuring elements covering more than 75% of epithelial cells. The unsatisfactory smears when compared to other studies show - Bukhari et al (1.8%) 11 were lower than our study, Bal et al (4.2%)¹² and Kapila et al (3.9%)¹³ show similar percentage, whereas Rathore SB et al (7.4%)¹⁴ and Kalyani R et al¹⁵ show higher percentage of unsatisfactory smears in their studies.

This study determines 82% of NILM as the most common category. This was in accordance with other studies in literature (5,16,17,18,19). Among NILM; nonspecific finding inflammation was the most common finding (25%) and atrophic vaginal smears were the least (1%) common finding. Similar observations were made in other reported studies (7,9) also. ECA category comprise (14%) in our study. The ECA (epithelial cell abnormality) include ASCUS, AGUS, LSIL, HSIL and carcinoma. The ECA rate in various other studies range between 1.2% to 16.60%.^{12,20,21,22,23,24,25} The most common finding in our study was found to be ASCUS, reported in ECA category, followed by LSIL -5%, HSIL -2% and squamous cell carcinoma -1%. In other studies, also ASCUS is the most commonly reported ECA. Frank malignancy was reported 1% in our study and this was comparable to other studies which reported malignancy in 0.7% of cases.²⁶ In our study the ASCUS rate is bit higher. It may be due to lack of awareness programme for Pap smear screening and people reported to hospital only when they have symptoms or are in advanced stage of disease.

Our study on Pap smear were able to classify most of inflammatory and malignant lesions and has shown the importance of Pap smear test in screening cervical cancer.

TABLE 1: Age wise distribution of patients.

AGE IN YEARS	NO. OF PATIENTS
21 -30	28
31-40	33
41-50	21
51-60	12
61-70	6
TOTAL	100

TABLE 2: Distribution of presenting chief complaints of patients

CHIEF COMPLAINTS	NO. OF PATIENTS
SPOTTING	15
WHITISH DISCHARGE	33
PAIN LOWER ABDOMEN	19
PRURITIS	14
MENORRHAGIA	8
BURNING MICTURATION	3
IRREGULAR PERIODS	6
PROLAPSE	2
TOTAL	100

TABLE 3: PATTERN OF DIAGNOSIS OF PAP SMEAR CYTOLOGY

DIAGNOSIS	NO. OF PATIENTS
UNSATISFACTORY	4
NILM	NORMAL -51 INFLAMMATORY - 27 VAGINOSIS - 2 CANDIDA -1 ATROPHIC - 1
ECA	14

TABLE 4: PATTERN OF ECA IN PAP SMEAR CYTOLOGY

CYTODIAGNOSIS	NO. OF PATIENTS
ASCUS	6
LSIL	4
HSIL	2
MALIGNANCY	2
TOTAL	14

Conclusion

Pap Smear test is a simple, inexpensive, non -invasive and an OPD performed to detect various premalignant and malignant lesions of cervix. By conducting health camps, increasing awareness programmes and performing Pap smears, the incidence of cervical cancer can be greatly reduced.^{26,27}

References

1. Parkin M, Bray F, Ferlay J, Pisani P. Global Cancer Statistics. *CA Cancer J Clin.* 2005;74-108.
2. Curado MP, Edward B, Shin HR et al. Cancer incidence in five countries .Vol IX.Lyon. IARC Scientific Publications.
3. George Nicholas Papanicolaou's new cancer diagnosis presented at the Third Race Betterment Conference, Battle Creek, Michigan, January 2-6.1928:528-34
4. Sunita A Bamanikar, Dadaso S Baravkar, Shirish S Chandanwale, Prachet Dapkekar, Study of Cervical Papsmears in a Tertiary Hospital. *Indian Medical Gazette.*2014;250-254.
5. Ranabhat S, Shrestha R, Tiwari M. Analysis of abnormal epithelial lesions in cervical Pap smears in Mid-Western Nepal. *Journal of Pathology of Nepal.* 2011;1(1):30-33.
6. Likhar KS, Saluja A, Gupta SG, Hazari RA, Likhar SK. Precancerous and cancerous lesions of cervix diagnosed by Pap's smear - A hospital based study. *J Evol Med and Dent Sci* 2014;3:1899-904.
7. Kaveri SB, Khandelwal S. Role of Pap smear N cervical biopsy in unhealthy cervix. *J Sci Innov Res.*2015;4:4-9.
8. Pradhan B, Pradhan SB, Mital VP. Correlation of Pap smear findings with clinical findings and cervical biopsy. *Kathmandu University Med J.* 2007;5:461-7.
9. Shrivastava M, Shrivastava OP, Jaiswal SS. Pattern of cervical smear cytology in Rural Medical College. *Pravara Med Rev* 2011;3:4-8.
10. Bamanikar SA, Baravkar D, Chandanwale S, Dharwadkar A, Paranjape S. Study of cervical cytology and its correlation with clinical and histopathological findings. *Clin Cancer Investig J.* 2016;5:403-8
11. Bukhari MH, Saba K, Qamar S, Majeed MM, Niazi S, Naeem S. Clinicopathological importance of Papanicolaou smears for the diagnosis of premalignant and malignant lesions of the cervix. *J Cytol.* 2012 Jan;29(1):20-5.
12. Bal MS, Goyal R, Suri AK, Mohi MK. Detection of abnormal cervical cytology in Papanicolaou smears. *J Cytol.* 2012 Jan;29(1):45-7
13. Kapila K, George SS, Al-Shaheen A, Al-Ottibi MS, Pathan SK, Sheikh ZA, et al. Changing spectrum of squamous cell abnormalities observed on Papanicolaou smears in Mubarak Al-Kabeer Hospital, Kuwait, over a 13-year period. *Med Princ Pract* 2006;15:253-9.
14. Rathod GB, Singla D. Histopathological V/S cytological findings in cervical lesions (Bethesda system) - A comparative study. *IAIM* 2015; 2(8):16-9.
15. Kalyani R, Sharief N, Shariff S. A study of PAP smear in Tertiary Hospital in South India. *J Cancer Biol Res.* 2016; 4(3):1084.
16. Atilgan R, Celik A, Boztosun A, Ilter E, Yalta T, Ozercan R. Evaluation of cervical cytological abnormalities in Turkish population. *Indian J Pathol Microbiol.* 2012 Jan-Mar;55(1):52-5
17. Selhi PK, Singh A, Kaur H, Sood N. Trends in cervical cytology of conventional Papanicolaou smears according to revised Bethesda System: A Study of 638 Cases. *IJRRMS* Jan-March 2014; 4(1):21-5.
18. Filipi K, Xhani A. Assessment of cervical cytological data in Albanian females. *Asian Pac J Cancer Prev* 2014;15:2129-32.
19. Abdullah LS. Pattern of abnormal Pap smears in developing countries: A report from a large referral hospital in Saudi Arabia using the revised 2001 Bethesda System. *Ann Saudi Med* 2007;27:268-72.
20. Turkish Cervical Cancer and Cervical Cytology Research Group. Prevalence of Cervical cytological abnormalities in Turkey. *Int J Gynaecol Obstet.* 2009;106:206-9.
21. Al Eyd GJ, Shaik RB. Rate of opportunistic Pap smear screening and patterns of epithelial cell abnormalities in Pap smears in ajman, United arab emirates. *Sultan Qaboos Univ Med J.* 2012 Nov;12(4):473-8
22. Mehmetoglu HC, Ganime S, Ozacakir A, Bilgel N. Pap smear screening in the primary health care setting: A study from Turkey. *N Am J Med Sci.* 2010 Oct; 2(10): 467472.
23. Altaf FJ. Cervical cancer screening with pattern of Pap smear. Review of multicenter studies. *Saudi Med J* 2006;27:1498-502.
24. Bhushan M. Warpe, Shweta Joshi-Warpe, Sarvesha S. Sawant. An institution-based cervical PAP smear study, correlation with clinical findings & histopathology in the Konkan region of Maharashtra state, India. *WIMJournal.* 2016;Vol-3:37-51
25. Balaha MH, Al Moghannum MS, Al Ghowinem N, Al Omran S. Cytological pattern of cervical Papanicolaou smear in Eastern region of Saudi Arabia. *J Cytol* 2011;28:173-7
26. Quinn M, Babb P, Jones J, Allen E. Effect of screening on incidence of and mortality from cancer of cervix in England: evaluation based on routinely collected statistics. *BMJ.* 1999 Apr 3;318(7188):904-8.
27. Peto J, Gilham C, Fletcher O, Matthews FE. The cervical cancer epidemic that screening has prevented in the UK. *Lancet (London, England).* 2004 Jul 17-23;364(9430):249-256.

Call for Papers / Article Submission

The editor invites scholarly articles that contribute to the development and understanding of all aspects of Public Health and all medical specialities. All manuscripts are double blind peer reviewed. If there is a requirement, medical statistician review statistical content. Invitation to submit paper: A general invitation is extended to authors to submit papers papers for publication in IJPHRD.

The following guidelines should be noted:

- The article must be submitted by e-mail only. Hard copy not needed. Send article as attachment in e-mail.
- The article should be accompanied by a declaration from all authors that it is an original work and has not been sent to any other journal for publication.
- As a policy matter, journal encourages articles regarding new concepts and new information.
- Article should have a Title
- Names of authors
- Your Affiliation (designations with college address)
- Abstract
- Key words
- Introduction or back ground
- Material and Methods
- Findings
- Conclusion
- Acknowledgements
- Interest of conflict
- References in Vancouver style.
- Please quote references in text by superscripting
- Word limit 2500-3000 words, MSWORD Format, single file

All articles should be sent to: **editor.ijphrd@gmail.com**

Send all payment to :

Institute of Medico-Legal Publications Pvt Ltd

Logix Office Tower, Unit No. 1704, Logix City Centre Mall

Sector- 32, Noida - 201 301 (Uttar Pradesh)

Ph.: 0120- 429 4015

E-mail: editor.ijphrd@gmail.com, Website: www.ijphrd.com



Indian Journal of Public Health Research & Development

CALL FOR SUBSCRIPTIONS

About the Journal

Print-ISSN: 0976-0245 **Electronic - ISSN:** 0976-5506, **Frequency:** Quarterly

Indian Journal of Public Health Research & Development is a double blind peer reviewed international Journal. The frequency is half yearly. It deals with all aspects of Public Health including Community Medicine, Public Health, Epidemiology, Occupational Health, Environmental Hazards, Clinical Research, Public Health Laws and covers all medical specialities concerned with research and development for the masses. The journal strongly encourages reports of research carried out within Indian continent and south east Asia.

The journal has been assigned International Standards Serial Number (ISSN). It is also brought to notice that the journal is being indexed / abstracted with many international databases.

Journal Title	Print Only
Indian Journal of Public Health Research & Development	INR 10,000

NOTE FOR SUBSCRIBERS

- Advance payment required by cheque/demand draft in the name of **"Institute of Medico-Legal Publications Pvt Ltd"** payable at New Delhi.
- Cancellation not allowed except for duplicate payment.
- Claim must be made within six months from issue date.
- A free copy can be forwarded on request.

Bank Details

Name of account : **Institute of Medico-Legal Publications Pvt Ltd**
Bank: **HDFC Bank**
Branch: **Sector-50, Noida-201 301**
Account number: **09307630000146**
Type of Account: **Current Account**
MICR Code: **110240113**
RTGS/NEFT/IFSC Code: **HDFC0000728**

Please quote reference number.

Send all payment to :

Institute of Medico-Legal Publications Pvt Ltd

Logix Office Tower, Unit No. 1704, Logix City Centre Mall

Sector- 32, Noida - 201 301 (Uttar Pradesh)

Phone: 0120- 429 4015, E-mail: editor.ijphrd@gmail.com, Website: www.ijphrd.com

Printed: Printpack Electrostat G-2, Eros Apartment, 56, Nehru Place, New Delhi-110019

Published at: Institute of Medico Legal Publications Pvt. Ltd., Logix Office Tower, Unit No. 1704, Logix City Centre Mall, Sector- 32,
Noida - 201 301 (Uttar Pradesh) Ph. No: +91 120- 429 4015