

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

Volume 4

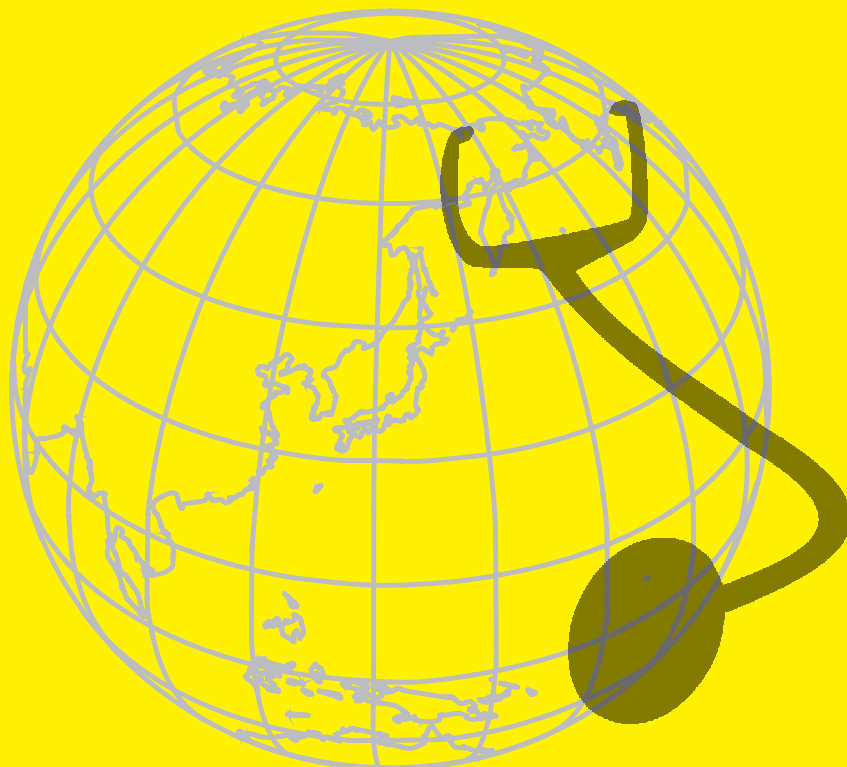
Number 3

July - September 2013



Indian Journal of Public Health Research & Development

An International Journal



Website:

www.ijphrd.com

Indian Journal of Public Health Research & Development

EDITOR

Prof. R K Sharma
Dean (R&D), Saraswathi Institute of Medical Sciences, Hapur, UP, India
Formerly at All India Institute of Medical Sciences, New Delhi
E-mail: editor.ijphrd@gmail.com

ASSOCIATE EDITOR

Dr. Manish Chaturvedi, (*Associate Professor*)
Community Medicine School of Medical Sciences & Research, Sharda
University, Greater Noida

ASSISTANT EDITOR

Dr. Sonu Goel (*Assistant Professor*)
Hospital Administration Post Graduate Institute of Medical Education &
Research, Chandigarh

INTERNATIONAL EDITORIAL ADVISORY BOARD

- Dr. Abdul Rashid Khan B. Md Jagar Din**, (*Associate Professor*)
Department of Public Health Medicine,
Penang Medical College, Penang, Malaysia
- Dr. V Kumar** (*Consulting Physician*)
Mount View Hospital, Las Vegas, USA
- Basheer A. Al-Sum**,
Botany and Microbiology Deptt, College of Science,
King Saud University, Riyadh, Saudi Arabia
- Dr. Ch Vijay Kumar** (*Associate Professor*)
Public Health and Community Medicine, University of Buraimi, Oman
- Dr. VMC Ramaswamy** (*Senior Lecturer*)
Department of Pathology, International Medical University, Bukit Jalil,
Kuala Lumpur
- Dr. Linah Askari**, (*PhD, Star Laureate 2006 Assistant Professor*)
Psychology, Institute of Business Management, Clifton, Karachi,
Pakistan
- Kartavya J. Vyas** (*Clinical Researcher*)
Department of Deployment Health Research,
Naval Health Research Center, San Diego, CA (USA)
- Prof. PK Pokharel** (*Community Medicine*)
BP Koirala Institute of Health Sciences, Nepal
- Dr. Sunil Mehra** (*Paediatrician & Executive Director*)
MAMTA Health Institute of Mother & Child, New Delhi

SCIENTIFIC COMMITTEE

- Dr. Ruchi Sogarwal** (*Senior Technical Advisor*) Program & Research,
MAMTA Health Institute for Mother and Child, New Delhi
- Dr. Anju Ade** (*Associate Professor*)
Navodaya Medical College, Raichur, Karnataka
- Dr. E. Venkata Rao** (*Associate Professor*) Community Medicine,
Institute of Medical Sciences & SUM Hospital, Bhubaneswar, Orissa.
- Dr. Amit K. Singh** (*Associate Professor*) Community Medicine,
VCSG Govt. Medical College, Srinagar – Garhwal, Uttarakhand
- Dr. R G Viveki** (*Associate Professor*) Community Medicine,
Belgaum Institute of Medical Sciences, Belgaum, Karnataka
- Dr. Santosh Kumar Mulage** (*Assistant Professor*)
Anatomy, Raichur Institute of Medical Sciences Raichur (RIMS), Karnataka
- Dr. Gouri Ku. Padhy** (*Associate Professor*) Community and Family
Medicine, All India Institute of Medical Sciences, Raipur
- Dr. Ritu Goyal** (*Associate Professor*)
Anaesthesia, Saraswathi Institute of Medical Sciences, Panchsheel Nagar
- Dr. Anand Kalaskar** (*Associate Professor*)
Microbiology, Prathima Institute of Medical Sciences, AP
- Dr. Md. Amirul Hassan** (*Associate Professor*)
Community Medicine, Government Medical College, Ambedkar nagar, UP
- Dr. N. Girish** (*Associate Professor*)
Microbiology, VIMS&RC, Bangalore
- Dr. BR Hungund** (*Associate Professor*) Pathology, JNMC, Belgaum.
- Dr. Sadhna Awasthi** (*Associate Professor*)
Community Medicine, SDMT Medical College, Haldwani
- Dr. Shailendra Kumar** (*Associate Professor*)
Community Medicine, Medical College, Muzaffernagar
- Dr. Rajib Roy** (*Assistant Professor*)
Obstetrics & Gynecology, ESI Medical College, Kolkata

NATIONAL EDITORIAL ADVISORY BOARD

- Dr. Ranabir Pal** (*Additional Professor*) Community Medicine and
Family Medicine, All India Institute of Medical Sciences, Jodhpur
- Prof. Sushanta Kumar Mishra** (*Community Medicine*)
GSL Medical College – Rajahmundry, Karnataka
- Prof. D.K. Srivastava** (*Medical Biochemistry*)
Jamia Hamdard Medical College, New Delhi
- Prof. Bhavna Pant** (*Community Medicine*) Subharti Medical College, Meerut
- Prof. M. Sriharibabu** (*General Medicine*) GSL Medical College,
Rajahmundry, Andhra Pradesh
- Prof. Pankaj Datta** (*Principal & Prosthodontist*)
Indraprastha Dental College, Ghaziabad
- Prof. Samarendra Mahapatro** (*Pediatrician*)
Hi-Tech Medical College, Bhubaneswar, Orissa
- Dr. Abhiruchi Galhotra** (*Additional Professor*) Community and Family
Medicine, All India Institute of Medical Sciences, Raipur
- Prof. Deepti Pruthvi** (*Pathologist*) SS Institute of Medical Sciences &
Research Center, Davangere, Karnataka
- Prof. G S Meena** (*Director Professor*)
Maulana Azad Medical College, New Delhi
- Prof. Pradeep Khanna** (*Community Medicine*)
Post Graduate Institute of Medical Sciences, Rohtak, Haryana
- Prof. Jaya Chaturvedi** (*Obstetrics & Gynecology*)
Himalayan Institute of Medical Sciences, Dehradun

Print-ISSN: 0976-0245 Electronic - ISSN: 0976-5506, Frequency: Quarterly (Four issues per volume)

Indian Journal of Public Health Research & Development is a double blind peer reviewed international journal. It deals with all aspects of Public Health including Community Medicine, Public Health, Epidemiology, Occupational Health, Environmental Hazards, Clinical Research, and Public Health Laws and covers all medical specialties 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) and is indexed with Index Copernicus (Poland). It is also brought to notice that the journal is being covered by many international databases. The journal is covered by EBSCO (USA), Embase, EMCare & Scopus database. The journal is now part of DST, CSIR, and UGC consortia.

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.

Editor

Dr. R.K. Sharma
Institute of Medico-legal Publications
4th Floor, Statesman House Building, Barakhamba Road,
Connaught Place, New Delhi-110 001

Printed, published and owned by

Dr. R.K. Sharma
Institute of Medico-legal Publications
4th Floor, Statesman House Building, Barakhamba Road,
Connaught Place, New Delhi-110 001

Printed at

Devtech Publishers & Printers Pvt. Ltd., Faridabad

Published at

Institute of Medico-legal Publications
4th Floor, Statesman House Building, Barakhamba Road,
Connaught Place, New Delhi-110 001



Indian Journal of Public Health Research & Development

www.ijphrd.com

Contents

Volume 4 Number 3

July-September 2013

1. Assessment of Infrastructure Facilities, Manpower and Services in Primary 01
Health Centres of Chittoor District, Andhra Pradesh
N Bayapa Reddy, A Sreedhar Kumar, T S R Sai, Ravi Prabhu, R K Singh
2. One Year Study of Clinicopathological Pattern of Gynaecological Malignancies in a Tertiary Care Hospital 06
Usha Doddamani, Linganand Pujar, G B Doddamani, Sunita Pujar
3. A Well-aware Mode of Contraceptive and Grossly Underutilized among Married Males in Nagpur, India 10
Ajeet Saoji, Shilpa Hajare, Jaydeep Nayse
4. A Study of Quality of Care and Customer Satisfaction in the Obstetrics and Gynaecology 15
Department of the Government Medical College Hospital - Garhwal (Uttarakhand)
Amit Kumar Singh, Divya Goswami, S N Nagaonkare
5. Posterior Reversible Encephalopathy Syndrome (PRES) Following Disulfiram Intoxication - A Case Report 19
Anindita Mishra, V Mythri Priyadarshi
6. Evaluation of Vaginal versus Abdominal Hysterectomy for Non Prolapsed 23
Uterus with Benign Gynecological Disease
Agarwal Anjana, Krishna Hema
7. Perception of Causes, Consequences and Solutions to Global Warming among School Children in Delhi 27
Garg A, Lal P
8. Socio-Demographic Determinants of Mental Health Problems among Rural Elderly Population 33
Sreedhar Kumar, P Rajasekhar, N Bayapa Reddy, T S R Sai, G Ravi Prabhu, N Swarnalatha
9. A Study of Vancomycin Resistance in Enterococci from Urinary Specimens at a 39
Tertiary Care Hospital in Meerut
Ashutosh Rawat, Anita Pandey, Molly Madan
10. An Application of Bootstrap Regression Method in Age Dependency Structure to the Community 44
Atanu Bhattacharjee, Hemanta Saikia
11. Candida Rugosa - An Emerging Cause of Nosocomial Candidemia 49
Bornali Sarmah Dutta, Ajanta Sharma, N K Hazarika, Purnima Barua
12. A Study of Prevalence and Associated Factors of Uterus Prolapse in Doti District of Nepal 53
Damaru Prasad Paneru
13. Incidence of Metabolic Syndrome and Diabetes Mellitus in Raipur City 58
of Chattishgarh State- A Preliminary Study
Dhananjay Yadav, Shweta Tarar, Neha Ghosh, R P Tiwari, PS Bisen, GBKS Prasad
14. Limb Body Wall Complex- A Rare Case Report 63
Dhananjaya B S, Kokila S, Sunil Kumar Nanda, Nanda Gopal, Rachel Mathew
15. A Community Based Study on the Prevalence of Disability and Rehabilitative Services 66
Provided to the Disabled Person in the Rural Area of Tamil Nadu
Bayapa Reddy N, A Piramanayagam, Pallavi Madithati, Nagarjuna Reddy N, R K Singh, Sai Narasimhareddy Chandamuri
16. Pelvic Lipoma in a Case of Stage-II Cervical Carcinoma - A Case Report 71
Anindita Mishra, Vinay Nyapathy

II

17. Sexual Behavior and Practice Assessment of Truckers and Migrants as an Evaluation of Targeted 76
Interventions (TI) Project for HIV Prevention and Control, Himachal Pradesh, India
Pardeep Bansal, Ashok Bhardwaj, Surinder Kashyap, Dinesh Kumar
18. Cervical Length and Risk of Hemorrhage in Pregnancies with Placenta Previa 81
Karya Urmila, Varma Khushboo, Singh Shakun, Gupta Abhilasha
19. A Comparative Study of Lipid Profile in Tobacco Chewers in Pune District 86
Sandeep Kumar Sharma, U K More
20. Cross Sectional Study of Adherence to Prescribed Medications among Individuals 90
Registered at a High Risk Clinic in a Rural Area in Bangalore, India
Farah Naaz Fathima, Deepthi N Shanbhag, Shailendra Kumar B Hegde, Bibin Sebastian, Stephanie Briguglio
21. Determination of Sex from Metric Evaluation of Cephalic Dimensions in North Indian Population 95
Geethanjali H T, Asha K R, Vinay Kumar K, Lakshmi Prabha R, Gangadhar M R
22. Blood Pressure Pattern in Pregnant Women of Different Body Mass Index in three Trimesters of Pregnancy 98
Gul Ar Navi Khan, Nazia Ishrat, Noor Afshan Sabzposh
23. Emergency Peripartum Hysterectomy: A Retrospective Study at a Tertiary Care Hospital in Karnataka 103
Halesha B, Raju V S, Chandrashekar K, Sahana K P
24. Socio-Demographic Correlates of Anaemia among Married Women in Rural Area of Maharashtra 107
Haralkar S J, Khandekar S V, Pore P D, Haralkar A S, Tapare V S, Rayate M V
25. Prevalence of Carcinoma Cervix in Rural Punjab and Need to Create Awareness 111
Regarding Cervical Cancer
Harpreet Kaur, Sharanjit Kaur, Lajja Goyal, Parminder Kaur
26. The Socio-Cultural Factors behind the Rare Incidence of Cancers in Perumal Thevanpatti 116
(Virudu Nagar District, Tamil Nadu)
P Indra(alias)MuthuMeena, K Ramalingam, Rekha Govindan, B Aathavan
27. Socioeconomic Status and Oral Health Inequity in Karnataka 120
Jayachandra Megalamananegowdru, Vijayanath V
28. A Study of Fat Parameters in Sedentary and Non-sedentary Subjects in Davangere, Karnataka 125
Jayalakshmi MK, Prabhu Raj N, Shanmukhappa NJ, Smilee Johncy S
29. Oral Myiasis - A Case Report 130
Kamala R, Shoyeb Shaikh, Abhishek Sinha, Arti Saluja Sachdev
30. Delivery Practices and their Determinants in Urban Slums of Amritsar City, Punjab, India 133
Gill KP, Devgun P, Mahajan SL, Chopra A
31. Total Sanitation Campaign: Human Rights Impact Assessment of a Health Program 138
Kapil Kumar Singh
32. Perception and Practices Regarding Menstruation in Women of Reproductive Age Group in Urban Slums 143
Khurshid Parveen, Manish Chaturvedi, Deoki Nandan, Ved Shrotria
33. Adverse Events Following Immunisation and Global Scenario in Vaccine Pharmacovigilance 148
Reena Verma, Kingshuk Lahon
34. Myasthenia Gravis Aggravated by Lower lobe Tuberculosis- A Case Report 154
Aithal KR, Mahabalshetti AD, Patil BS, Rajoor UG
35. Knowledge, Attitudes and Practices Regarding Highly Pathogenic 158
Avian Influenza among Adult Population of Bangladesh
Mohammad Azizur Rahman, Rezaul Karim
36. Psychological Distress Measurement among Infertile Indian Women Undergoing in-Vitro Fertilization 164
Lalit Kumar, Arvind Kumar, Suneeta Mittal, G Sumuna, A Bahadur, Leema Maiti

37. Psychological Assessment of Primiparous Women During the Ante & Postnatal Period a Longitudinal Study of 3 Years <i>Leema, Rohini Sehgal, Suneeta Mittal, Shobha, VL Jindal, Arvind Kumar, Lalit</i>	170
38. A Study on Nutritional and Immunization Status of Under Five Children in an Urban Slum of Bhubaneswar, Odisha <i>Lipilekha Patnaik, Sumitra Pattanaik, E Venkata Rao, Sibabratta Patnaik, Trilochan Sahu</i>	176
39. Knowledge, Attitude and Practices (KAP) among Patients of Epilepsy Attending Tertiary Hospital in Bhubaneswar, Odisha <i>Sarangî Lisa, Parhi Laxmidhar</i>	180
40. Analytical Study of Water Safety Parameters in Ground Water Samples of Uttarakhand in India <i>Sandeep Gaur, M C Joshi, H S Jos, Sandeep Saxena</i>	185
41. Role of Imprint Cytology in the Diagnosis of Upper Gastrointestinal Tract Lesions <i>M Sanjeevreddy, S K Kittur, R B Jakareddy, Sunita Y Patil, B R Yeliker</i>	190
42. A Study of Research Pattern of Postgraduate Dissertations in Pathology <i>Manjula, Shashikala P, Padmamma S</i>	196
43. A Study of Life Quality Factors and Fatigue in Breast Cancer Patients <i>Maryam Didehdar Ardebil, Zinatossadat Bouzari, Shahla Yazdani, Ali Morad Heidari Gorgi, Mehdi Farhanghi, Mahtab Zeinal Zadeh</i>	199
44. Screening for Cervical Cancer in Pregnancy-Our Experience <i>Meena Priyadhashini V, Seetha Panicker</i>	202
45. Visual Inspection with Acetic Acid (VIA) Vs Cervical Cytology as Cervical Cancer Screening Tools in South India <i>Leena MS, Mohd. Shafee, Kokiwar PR, Jogdand GS</i>	207
46. Activity- specific Balance Confidence (ABC) level of Elderly Slum-dwellers of North India <i>Goel PK, Muzammil K, Kumar S</i>	213
47. A Pilot Project to Develop in Vivo Detection of Ricin through Fluorescence Sandwich ELISA Technique <i>Poonam Kachhawa, Kamal Kachhawa, Om Kumar</i>	217
48. Bacteriological Study of Pathogenic Staphylococci with Special Reference to Vancomycin Susceptibility <i>P Samatha</i>	222
49. Effect of Traffic Noise on Hearing in City Bus Drivers of Bangalore <i>Pushpa K, Girija B, Shivakumar Veeraiah</i>	227
50. A Retrospective Study of Cataract Surgery in Patients with Uveitis <i>Rahul Bhargava, Prachi Kumar, S K Sharma, Anuraag Mishra</i>	231
51. Socio-demographic and Clinical Profile of HIV / AIDS Cases Expired in a Tertiary Care Centre in North Karnataka, India <i>Nayak J J, Viveki R G, P R Viveki</i>	238
52. Follicular Ameloblastoma with Granular Changes affecting Mandible & Maxilla - A Case Report <i>Rakesh Shah, Amit Mahajan, Rushit Patel</i>	244
53. Household Water Treatment following Emergencies and Disasters- A Review <i>Ramandeep Singh Gambhir, Ramandeep Kaur Sohi, Amaninder Kaur Randhawa, Vikram Bansal, Simarpreet Singh</i>	249
54. Blood Filled Blister in the Oral Mucosa - A Diagnostic Challenge <i>Ranjani Shetty, Ashok L, Sujatha G P</i>	253
55. Cytomorphological Profile of Pediatric Lymphadenopathy at Tertiary Care Centre <i>T R Rashmikumari, Isha Garg</i>	257

IV

56. Assessment and Evaluation of Depression and Loneliness among People 261 Living with HIV in Selected Places of Coastal Andhra Pradesh <i>S K Mishra, Usha kiran Behera, Sipra Komal Jena</i>	261
57. Presence of Candida in Oral Dysplastic Lesions - A Casual Involvement or a Causal Role? 267 <i>Sima Odedra, Jyoti Chawda, Rahul Rupapara, Pratik Rupakar</i>	267
58. The Study of Arthroscopic Reduction of Tibial Spine Avulsion Fractures in Adults 272 <i>Anirudh C Kulkarni, Vishalakshi A Kulkarni, Chetan G, Pavan Belehalli, Sreekantha, Remya</i>	272
59. Dental Caries Risk Assessment- A Review 275 <i>K Jayaprakash, Gupta Neha, R Thanuja, Khurana Suchi</i>	275
60. A Qualitative Study Investigating the Concerns, Awareness and Behaviour of 281 HIV Sero-Discordant Heterosexual Couples in South India <i>S Soni, Naveen R, D Richardson, GD Ravindran</i>	281
61. The Study of Sensorineural Hearing Loss in Pseudoexfoliation Syndrome 287 <i>Sameena Kokab, Jyothi Chavadaki, Neelkant S, Sreekantha</i>	287
62. A Comprehensive Review on Breast Cancer 291 <i>Arjun Patidar, S C Shivhare, Umesh Ateneriya, Sonu Choudhary</i>	291
63. Comparison of I-gel and LMA-Supreme Laryngeal Mask Airway in Laparoscopic Surgery: 298 A Prospective Randomized Study <i>Arati Srivastava, Pradeep Tyagi</i>	298
64. Giant Cell Tumour of Tendon Sheath: A Clinicopathological Study 302 <i>Sarita Devdhar, Roopak Aggarwal, P P Bhadami, Geeta Deshmukh</i>	302

Assessment of Infrastructure Facilities, Manpower and Services in Primary Health Centres of Chittoor District, Andhra Pradesh

N Bayapa Reddy¹, A Sreedhar Kumar², T S R Sai³, Ravi Prabhu⁴, R K Singh⁵

¹Assistant Professor (Community Medicine), Chennai Medical College Hospital and Research Center, Trichy, Tamil Nadu, ²Assistant Professor (Community Medicine), Alluri Sitarama Raju Academy of Medical Sciences, Eluru, Andhra Pradesh, ³Professor and Head (Community Medicine), N. R. I. Medical College, Mangalagiri, Andhra Pradesh, ⁴Professor and Head (Community Medicine), S. V. Medical College, Tirupati, Andhra Pradesh, ⁵Assistant Professor (Community Medicine), Chennai Medical College Hospital and Research Center, Trichy, Tamil Nadu

ABSTRACT

Background: Since their establishment, the Primary Health Centers (PHCs) are being criticized for their inability to perform up to the expectations because of various reasons among which inadequate infrastructure and manpower is one reason.

Objective: To assess the infrastructure facilities and manpower among the selected PHCs of Chittoor District.

Materials and Method: This cross-sectional study was conducted among 22 stratified randomly selected PHCs of Chittoor District, Andhra Pradesh which had 88 PHCs i.e. 25.0% of the total existing PHCs of the District. PHCs established within the last 5 years were excluded from the study. Assessment of the existing infrastructure and equipment and the manpower and health services being provided by the PHCs with respect to the Indian Public Health Standards was done. The data has been analyzed by Microsoft excel using proportions.

Results: Each PHC on an average had 10 sub-centres, covering the population of 49,728. 63.6% of PHCs were providing in-patient services and 63.6%, the emergency services. 43.9% and 36.3% of the PHCs failed to meet the IPH Standards with respect to having Medical Officer and Lady Medical Officer. Only 59.0% of PHCs were conducting deliveries despite the presence of labour room. Sufficient quantity of drugs was present in only 71.9% of PHCs.

Conclusions: Not all the PHCs were providing the in-patient as well as emergency services including MTP and round the clock services. Most PHCs were not staffed as per the IPHS norms and were also without sufficient quantity of drugs.

Keywords: Primary Health Centre, Infrastructure, Manpower, Health services, Indian Public Health Standards

INTRODUCTION

Following the proposal of reorganization of Primary Health Centres by the Sixth Five Year Plan (1980-85), the Indian Public Health Standards (IPHS)¹

for PHCs have been prepared keeping in view the infrastructure facilities (building, instruments, equipment and drugs) and manpower available for effective functioning of PHCs. Since their establishment, the PHCs are constantly criticized for ineffective delivery of healthcare services to the community. In this context, the present study has been taken up to find out the existing level of infrastructure facilities including equipment and medicines, manpower at the PHCs and to find out the type and quality of health services being provided to assess the functioning of PHCs.

Corresponding author:

Bayapa Reddy

Assistant Professor

Dept of Community Medicine

Chennai Medical College Hospital and Research Center, Irungalur, Trichy-621105, Tamil Nadu, India

E mail: bayapreddy916@gmail.com

Mobile: +919486400865

MATERIALS AND METHOD

This cross-sectional study was conducted during one year period from October, 2010 to September, 2011, among 22 stratified randomly selected PHCs (25.0% of total PHCs of the District) of the three Divisions of

Chittoor District, Andhra Pradesh). PHCs established within last five years were excluded from the study as they were still in the establishing phase. The data was collected by means of a pre-structured and pre-tested questionnaire.

RESULTS

Table 1: Availability of Health staff, Equipment and other supplies as per IPHS criteria

Norms as per IPHS criteria	PHCs having norms as per IPHS criteria (N=22)				Staff position		Total staff required			
	Yes		No.		Existing		Deficient			
Health Personnel	No.	(%)	No.	(%)	No.	(%)	No.	(%)		
3 Medical Officers	01	(4.5)	21	(95.5)	37	(56.1)	29	(43.9)	66	(100.0)
Lady Medical Officer	14	(63.6)	08	(36.4)	14	(63.6)	08	(36.4)	22	(100.0)
AYUSH Medical Officer	07	(31.8)	15	(68.2)	07	(31.8)	15	(68.2)	22	(100.0)
2 Pharmacists	00	(0.0)	22	(100.0)	22	(50.0)	22	(50.0)	44	(100.0)
5 Staff nurse	00	(0.0)	22	(100.0)	33	(30.0)	77	(70.0)	110	(100.0)
Health Educator	19	(86.4)	03	(13.6)	19	(86.4)	03	(13.6)	22	(100.0)
Health Supervisor (Male)	20	(90.9)	02	(9.1)	20	(90.9)	02	(9.1)	22	(100.0)
Health Supervisor (Female)	19	(86.4)	03	(13.6)	19	(86.4)	03	(13.6)	22	(100.0)
2 Lab technicians	01	(4.5)	21	(95.5)	21	(47.7)	23	(52.3)	44	(100.0)
Equipment										
Cold chain equipment	22	(100.0)	00	(0.0)						
Incubator/warmer	01	(4.5)	21	(95.5)						
Suction apparatus	12	(54.5)	10	(45.5)						
Wheel chair	12	(54.5)	10	(45.5)						
Oxygen cylinder	14	(63.6)	08	(36.4)						
Stretcher and trolley	10	(45.5)	12	(54.5)						
Delivery table	18	(81.8)	04	(18.2)						
Examination tables	22	(100.0)	00	(0.0)						
Sufficient quantity of										
Drugs	16	(72.7)	06	(27.3)						
Vaccines	18	(81.8)	04	(18.2)						
Contraceptives	22	(100.0)	00	(0.0)						
Operation Theater	21	(95.5)	01	(4.5)						
Sufficient OT equipment	01	(4.5)	21	(95.5)						
Separate areas for septic and aseptic deliveries	01	(4.5)	21	(95.5)						

Regarding staff position as per IPHS criteria, only one PHC has 3 Medical Officers while 2/3rd of PHCs are having lady Medical Officer and 1/3rd, AYUSH Medical Officer. None of the PHCs have sufficient staff nurses and pharmacists but majority have sufficient para-medical staff. Regarding emergency equipment, oxygen cylinder is present in 2/3rd of the PHCs and suction apparatus, in just above 50.0% (54.5%) while only one PHC has incubator. Even though more than 90.0% (94.5%) of PHCs have operation theatre, only

one PHC is having sufficient OT equipment. Even though 81.8% of PHCs have delivery tables, in only 1 PHC (4.5%) separate areas for septic and aseptic deliveries are present. Majority of PHCs are having drugs and vaccines in sufficient quantity while all of them have contraceptives adequately. With respect to staff position, the deficiency is more for Medical Officer (especially lady and AYUSH Medical Officers), staff nurse, lab technician and pharmacist.

Table 2: Availability of Facilities (N=22)

	Type of Facility		Availability		
	No.	Yes (%)	No.	No (%)	
Own building for PHC with proper gate and boundary wall in good shape	20	(90.9)	02	(9.1)	
Separate toilet for males & females	09	(40.9)	13	(59.1)	
Source of drinking water (N=22)	Own	12	(54.6)		
	Panchayat	09	(40.9)		
	No source	01	(4.5)		
Electricity & alternative power supply		22	(100.0)	00	(0.0)
Proper Bio-medical waste disposal		04	(18.2)	18	(81.8)
Residential facility for Staff	Medical Officers	09	(40.9)	13	(59.1)
	Nurses	09	(40.9)	13	(59.1)
	Pharmacist	07	(31.8)	15	(68.2)
	Other Staff	07	(31.8)	15	(68.2)
Communication and transport facilities	Telephone	21	(95.5)	01	(4.5)
	Mobile phone (Medical Officers)	22	(100.0)	00	(0.0)
	Computer (Desk top)	21	(95.5)	01	(4.5)
	Vehicles availability at PHC	07	(31.8)	15	(68.2)
Other facilities	Display of boards in local language	21	(95.5)	01	(4.5)
	Citizen charter	04	(18.2)	18	(81.8)
	Rogi Kalyan Samithi	20	(90.9)	0	(9.1)
	External monitoring of services	13	(59.0)	09	(41.0)
	Suggestions and complaints' Box	01	(4.5)	21	(95.5)
	Duty rooms for nurses	05	(22.7)	17	(77.3)

Majority (90.9%) of PHCs have their own building with proper gate and boundary wall with electricity or alternative power supply to all the PHCs (100.0%). Separate toilets for males and females are available in 40.9% of PHCs. 94.5% of PHCs have water supply facility and 18.2%, the facility for proper disposal of bio-medical waste. Less than 50.0% of the PHCs have residential facility for staff while more than 90.0% have

telephone and computer facility but none of them have internet facility. The main source of contact for Medical Officers is their personal mobile phone. Only 31.8% of PHCs are having transport facility. More than 90.0% of PHCs display the boards consisting of services being provided in local language and have Rogi Kalyan Samithi while only few (18.2%) display citizens' charter.

Table 3: Availability of Services (N=22)

	Type of Services		Availability of Services	
	No.	Yes (%)	No.	No (%)
Regular, routine services				
OPD services	22	(100.0)	00	(0.0)
In-patient services	14	(63.6)	08	(36.4)
Emergency services	14	(63.6)	08	(36.4)
Referral services	22	(100.0)	00	(0.0)
Nutrition services	21	(95.5)	01	(4.5)
School Health Programmes	22	(100.0)	00	(0.0)
Communicable Disease Surveillance	21	(95.5)	01	(4.5)
Minor surgeries	09	(40.9)	13	(59.1)
AYUSH services	07	(32.8)	15	(67.2)
MCH including Family Welfare services				
Routine MCH services	22	(100.0)	00	(0.0)
24 hours delivery services	13	(59.1)	09	(40.9)
MTP Services	08	(36.4)	14	(63.6)
Family Planning- Sterilization services	14	(63.6)	08	(36.4)
Laboratory Services				
Routine Lab investigations	22	(100.0)	00	(0.0)
Sputum testing for AFB	14	(58.0)	08	(42.0)
Rapid test for HIV	01	(4.5)	21	(95.5)
Rapid tests for pregnancy	11	(50.0)	11	(50.0)
Special investigations (BT, CT, Blood grouping)	05	(22.5)	17	(77.5)

Regular OPD, referral, MCH, school health and lab services are being provided by all the PHCs while more than 90.0% are providing nutrition and disease surveillance services. In-patient and emergency services are being provided by only 63.3% of PHCs. AYUSH services exist in only 1/3rd of the PHCs. 24 hour deliveries are being carried out in 59.1% of PHCs while only 36.4% provide MTP services. Sputum testing for AFB is the most frequent lab test being done followed by rapid test for pregnancy. Only one PHC is conducting rapid test for HIV.

DISCUSSION

Around 95.0% of PHCs were easily accessible to the public. The average distance of the PHC from the farthest village in its jurisdiction was 20.4 km (range 6-45 km) and the average time to reach the PHC from such a village was more than 60 minutes (range 20-120 min). The average distance of the nearest referral unit from PHC was 17.3 km (range 5-27 km). The present study showed that each PHC on an average had ten Sub-centres and covered a population of 49,728 (range: 23,953 to 116,000) both of which were far higher than the Indian Public Health Standards norms.¹ The average daily out-patient attendance was 112 among which 58 were male and 54 were female patients.

None of the PHCs had adequate staff as per IPHS criteria, especially regarding Medical Officer [Male (43.9%) and female (36.4%) and AYUSH Medical Officers (68.2%)], Staff Nurse (77.0%), Pharmacist (50.0%) and Laboratory Technician (52.3%). But the situation was better regarding the strength of the paramedical staff.

Routine [wheel chair (34.5%) and stretcher and trolley (45.5%)] as well as emergency apparatus [oxygen cylinder (63.6%), suction apparatus (54.5%) and incubator (4.5%)] were absent in most of the PHCs and delivery table, in few PHCs (18.2%). Drugs and vaccines were present in most of the PHCs. Among PHCs having OT (95.5%), only 4.5% had sufficient equipment and minor surgeries were being performed in only 59.0% of PHCs.²⁻⁴ Out of 94.5% of PHCs having facilities to conduct deliveries, only one (4.5%) had separate areas to conduct septic and aseptic deliveries.

All the PHCs had their own building with electricity and alternative power supply facilities, having gate and boundary wall in good shape in 90.9% of PHCs. The mean area of PHC was 1.7 acres. 40.9%

of PHCs had separate public toilets for males and females and 18.2%, bio-medical waste disposal facilities. Among those having water supply (95.5%), majority (54.6%) had own supply and the rest (40.9%), panchayat source.

Less than 50.0% of PHCs had residential facility for Medical Officers and nurses (40.9% each) and pharmacists and other staff (30.8% each). Even though 95.5% of PHCs had telephone and computer facilities, personal mobile phones were the main source of communication for Medical Officers and none of the PHCs had internet facility. Duty rooms for nurses were absent in 77.8% of PHCs.

Majority of PHCs had prominent display of boards in local language regarding the services available (95.5%) and Rogi Kalyan Samithi (90.9%) while few maintained citizen charter (18.2%), suggestions and complaints box (4.5%) and external monitoring (59.1%). 90.0% of PHCs were doing primary management of wounds, burns, poisoning and snake bite. Only 63.6% were providing the in-patient and emergency services probably because of scarcity of equipment and staff and also non-staying of the staff at headquarters due to lack of residential facilities for Medical Officers and nurses (50.1%) and other staff (68.2%). Hence all the PHCs were referring the cases to higher center which can be reduced hugely by providing equipment as well as residential facilities. Contrary to IPHS and National Rural Health Mission norms,⁵ AYUSH services were absent in 68.2% of PHCs. Despite having the OT, only 40.9% were conducting minor surgeries probably because of lack of sufficient equipment in 95.5% of PHCs.

As against norms,⁶ family planning including sterilization (63.6%), 24 hour delivery (59.1%) and MTP services (36.4%) were not being provided by all PHCs mainly because of high deficit of lady Medical Officer (36.4%) and staff nurse (77.0%), lack of trained doctor (66.6%), lack of facilities like labour room (11.1%), sufficient water supply (11.1%) and delivery table (18.2%) and the availability of better health center nearby (11.1%). Except the routine lab tests, tests like sputum examination for AFB (58.0%), pregnancy test (50.0%), blood grouping (22.5%) and rapid test for HIV (4.5%) were being done in only few PHCs mainly due to deficiency (52.3%) of lab technicians and reagents and non-training of the technicians to perform these tests which made it difficult to conduct deliveries at such a PHC.⁷

CONCLUSIONS

The average population covered by PHC exceeded the norms and majority of PHCs were awfully short of the staff and infrastructure facilities resulting in failure of delivering effective healthcare services and thus achieving the health related Millennium Development Goals.^{8,9}

RECOMMENDATIONS

Appointing adequate staff, providing them residential, vehicle and internet facilities at headquarter for better transport and communication, paying rural and transport allowances, regular refreshing training courses for staff of different cadres and performance appraisal in the form of awards and cash increments, improving the infrastructure facilities including equipment and regular monitoring of PHCs by external agencies to improve the quality of services and periodically conducting such studies to come out with necessary recommendations from time to time are some of the measures to be taken to improve the functioning of PHCs.

LIMITATIONS

The present study is first of its kind in this part of world and hence there are no studies to compare the results of the current study with other studies and hence there is not much statistical analysis and much references.

ACKNOWLEDGEMENTS

The author mentions his sincere thanks to Sri V. Kiran, Medico Social Worker, Department of Community Medicine, S.V. Medical College, Tirupati for helping immensely in data collection. The author would also like to thank Dr K. Ashok Kumar Reddy, Professor, Department of Community Medicine and Dr N. Swarnalatha, Associate Professor, Department of Community Medicine, S.V. Medical College, Tirupati for their extended co-operation and valuable suggestions in gathering and reviewing the literature.

Conflict of Interest : None.

REFERENCES

1. Evaluation study on Functioning of Primary Health Centres (PHCs) assisted under Social Safety Net Programme (SSNP). Planning Commission, Government of India, New Delhi 2001. Available from: <http://planningcommission.nic.in/reports/peoreport/peoevalu/peosnp.pdf> page 7 (accessed on 7th November, 2011).
2. Indian Public Health Standards (IPHS) for Primary Health Centres, Draft Guidelines, Directorate General of Health Services, MOHFW, GOI, April 2005.
3. National Health Policy 2002. Ministry of Health and Family Welfare, Government of India, New Delhi.
4. Health Sector Reforms in India- Initiatives from Nine States; Bureau of Planning, Directorate General of Health Services; Ministry of Health and Family Welfare, Government of India in collaboration with WHO, 2004; p27.
5. National Rural Health Mission 2005-2012- Reference material 2005. Ministry of Health and Family Welfare, Government of India.
6. Park K. Text Book of Preventive and Social Medicine. 20th ed. Jabalpur, India: Banarasidas Bhanot Publishers; 2011. Chapter 22, Healthcare of the Community; p.803, 804.
7. Report of Working Group on Health for All by 2000. Ministry of Health and Family Welfare, Government of India, New Delhi.
8. Millennium Development Goals: Progress towards the health-related Millennium Development Goals, Fact sheet N 290, World Health Organization, 2011. Available from: <http://www.who.int/mediacentre/factsheets/fs290/en/index.html> (accessed on 20th November, 2011).
9. World Health Organization-Primary Health Care. Report of International Conference on Primary Health Care, Alma-Ata, USSR, 1978; p.6-12.

One Year Study of Clinicopathological Pattern of Gynaecological Malignancies in a Tertiary Care Hospital

Usha Doddamani¹, Linganand Pujar², G B Doddamani³, Sunita Pujar⁴

¹Assistant Professor, Department of OBG, ²Professor, Department of OBG, ³Professor, Department of Medicine, ⁴Associate Professor, Department of Biochemistry, S. Nijalingappa Medical College, Bagalkot, Karnataka

ABSTRACT

AIM: To study the clinicopathological pattern of gynaecological neoplasm with emphasis on their age, incidence, clinical features, type of malignancy, tumour stage at presentation and histological type.

MATERIALS AND METHOD: This is a hospital based prospective study conducted in department of Obstetrics and Gynaecology at Karnataka Institute of Medical Sciences, Hubli, Karnataka from July 2004 to June 2005. During this period 100 cases of female genital tract malignancies were studied. After taking detailed history, physical examination and investigations, necessary surgical procedures were done. Tumours were staged clinically and typed histopathologically.

RESULTS: Out of 100 cases of gynaecological malignancies, 82% were cervical cancers, 14% ovarian, 2% vulval and 1% each of endometrium and vaginal cancers. Gynaecological cancers were most common in age group between 40 & 60 years. Squamous cell carcinoma was commonest histological type in cervical vaginal & vulval cancers. Whereas serous adenocarcinoma and endometrial adenocarcinoma were commonest histological type in ovary & endometrium. Most of the cases were diagnosed in very advanced stage causing increase in morbidity & mortality.

CONCLUSION: Cervical cancer is the most frequent gynaecological malignancy. Most of the cases were in advanced stage of the disease. Since it is a preventable disease national screening and awareness programmes are necessary to reduce the burden of cancer and improve the health of women.

Keywords: Cancer, Cervix, Ovary, Endometrium, Vagina, Vulva

INTRODUCTION

Gynaecological cancers are a public health problem worldwide, however the incidence of different gynaecological malignancies vary geographically. In western countries endometrial cancer is more prevalent, whereas cervical cancer is most frequent in the developing countries¹ Organised screening has contributed to decrease in incidence and mortality of cancers of cervix over the past 50 yrs in developed countries². However women in developing countries are yet to profit from the benefit of screening programmes and therefore cervical cancer rate remains high³. Ovarian cancers are associated with the highest mortality which mostly remain asymptomatic in early stages and are diagnosed at an advanced stages^{4,5}.

Therefore this study is aimed at increase in the knowledge on the subject and provides baseline data on the topic. These findings could have significant implication on health planning and clinical practice.

MATERIAL AND METHOD

This study was carried out in Department of Obstetrics and Gynaecology at Karnataka Institute of Medical Sciences, Hubli, Karnataka from July 2004 to June 2005. The institutional ethical committee approved the study and written consent was taken from all subjects.

A prospective review of 100 cases of genital tract cancers with emphasis on age, anatomic areas, presentation, histologic type and stage of disease were

studied. A detailed proforma was made for each type of genital tract cancer. All patients had thorough evaluation by taking history, examination and investigations. Only biopsy proven cases were included in the study. The staging and grading system of the FIGO was used. Clinical staging was done in carcinoma cervix, vulva and vagina and confirmed by surgical staging while all patients with carcinoma ovary and endometrium were evaluated surgically.

RESULTS

Out of 100 cases studied cancer of cervix (82%) was found to be the commonest gynaecological malignancy followed by carcinoma ovary (14%). (Table-1). Majority of the patients of carcinoma cervix were in the age group between 41- 50 yrs followed by 31-40 yrs.(Table-2). The youngest patient was 24 yrs old and oldest patient was 70 yrs old. The frequency of carcinoma cervix increased from 3rd parity onwards. More than 80% patients belonged to low socioeconomic status and were illiterate. The most common symptom was bleeding per vagina followed by white discharge per vagina. Majority of the cases of carcinoma cervix present in advanced stage of the disease i.e 68% cases presented with clinical stage 3.(Table-3). Squamous cell carcinoma (94%) was the commonest histological type. Adenocarcinoma was seen in 6% cases.(Table-4).

Table1. Relative frequency of female genital tract malignancies.

Malignancies	No. of Patients	Percentage
Carcinoma Cervix	82	82%
Carcinoma Ovary	14	14%
Carcinoma Endometrium	1	1%
Carcinoma Vulva	2	2%
Carcinoma Vagina	1	1%
Total	100	100%

Table 2. Age distribution of individual malignant tumors of female genital tract.

Age	Ca.cervix	Ca.Ovary	Ca.Uterus	Ca.Vulva	Ca.Vagina
< 20 yrs	-	1	-	-	-
21-30 yrs	8	1	-	-	-
31-40 yrs	21	2	-	-	-
41-50 yrs	29	3	-	1	1
51-60 yrs	19	6	1	1	-
> 61 yrs	5	1	-	-	-
Total	82	14	1	2	1

Table 3. Stage of the disease.

Stage	Ca. Cervix	Ca. Ovary	Ca.Uterus	Ca. Vulva	Ca.Vagina
Stage 1	7	3	1	-	1
Stage 2	19	1	-	2	-
Stage 3	56	7	-	-	-
Stage 4	-	3	-	-	-

Table 4. Histological types.

Site	Histological types	No.
Ca. Cervix	Squamous cell carcinoma	77
	Adenocarcinoma	5
Ca. Ovary	Serous cystadenocarcinoma	9
	Mucinous cystadenocarcinoma	3
	Dysgerminoma	1
	Granulosa cell tumor	1
Ca. Endometrium	Adenocarcinoma	1
Ca. Vulva	Squamous cell carcinoma	2
Ca. Vagina	Squamous cell carcinoma	1

Ovarian cancers were the second most common gynecological malignancy. The commonest affected age group was 51-60 yrs. Ovarian tumors were seen more frequently with lower parity (<3rd parity). The major presenting feature was pain abdomen and mass per abdomen. Other symptoms were abdominal distension, decreased appetite, loss of weight and dyspepsia. Staging laparotomy was done in which majority of the cases were in advanced stage of the disease (50%). Serous cystadenocarcinoma was commonest histological type followed by mucinous cystadenocarcinoma. One case each of dysgerminoma and granulose cell tumor were also observed.

Of 100 cases studied 2 cases were carcinoma vulva. They belonged to advanced age group. They presented with lump and pruritis in perineal region. One case had a past history of carcinoma cervix. Biopsy showed moderately differentiated squamous cell carcinoma. Both patients belonged to stage 2 .

There was only one case of carcinoma vagina belonging to age 48 yrs. Biopsy showed squamous cell carcinoma. One case of carcinoma endometrium was observed, she was 58 yrs old presented with post menopausal bleeding per vagina and was known case of hypertension and diabetes. Biopsy revealed well differentiated adenocarcinoma. There was no case of fallopian tube cancer.

DISCUSSION

Our study showed that cervical cancer was the most frequent of gynecological malignancies. This finding was consistent with many other studies^{2,6,7}. But in contrary to other studies ovarian tumours was the most common gynaecological malignancies^{8,9}.

Epidemiological studies have consistently indicated that risk of carcinoma cervix is strongly influenced by poor personal hygiene, multiparity, early

age of sexual activity, lack of medical care due to low socioeconomic status and genital Human papilloma virus infection^{10,11,12}. Low prevalence in muslim countries is due to better personal hygiene, adherence to social norms and religious practices and male circumcision¹³. The peak incidence of cervical cancer in this study was 41-50 yrs age group as compared to the reported 41-50 yrs age group in other studies¹⁴. We also observed that 94% of our patients had squamous cell carcinoma which is bit higher compared to earlier reports¹⁵ and only 6% had adenocarcinoma.

The second most common tumour was ovarian tumour and maximum cases were seen in 51-60 yrs .Other studies showed same age incidence¹⁶. Patients with ovarian tumours are usually asymptomatic in early stage. The common symptoms are pain abdomen and mass per abdomen. The pain is acute when there is some complication, while dull pain is due to capsule distension¹⁷. Among our patients 13 cases(93%) had pain abdomen and 6 cases(43%) mass per abdomen. While in this study the commonest tumor was epithelial cell tumors (86%) followed by germ cell tumor (7%) and sex cord cell tumor (7%). This was consistent with other study¹⁸. The events leading to malignant transformation within these cells are uncertain, but risk factors that appear to be related to the development of ovarian cancers include genetic, environmental and hormonal factor¹⁹.

Carcinoma vulva was seen in 2 cases out of 100 cases of genital malignancies studied. They present in old age and various stages²⁰. There was only one case of carcinoma vagina. Histological type was mainly squamous cell carcinoma in carcinoma vulva and vagina²¹. Our study observed only one case of carcinoma endometrium and biopsy revealed adenocarcinoma.

Most of our cases came to us in very advanced stage. 90% of cases were in stage 2 & 3 in carcinoma cervix and 70% of cases were in stage 3 & 4 in carcinoma ovary. Carcinoma vagina, vulva & endometrium were seen in earlier stage, i.e stage 2. This was similar to other studies.²²

CONCLUSION

We conclude from this study that carcinoma cervix was the most frequent gynaecological malignancy followed by carcinoma ovary. They presented in very advanced stage. Strategies for screening general population and high risk groups for early diagnosis

and management need to be adopted to reduce mortality and morbidity from these tumors.

REFERENCES

1. Stewart BW., Kleihues P., Editors. World Cancer Report. Lyon: World health organization, *International Agency for Research on Cancer*; 2003.
2. Franco EL., Franco ED., and Ferenczy A. Cervical Cancer: Epidemiology, prevention and the role of human pappiloma virus infection. *Canadian Med. Ass. J.* 2001; 164: 1017- 1025.
3. Babarinsa IA., Akang EEU. and Ademole IF. Pattern of gynecological malignancies at the Ibadan Cancer Registry (1976-1995) *Nig. Qt. J. Hosp. Med.* 1998; 8: 103-106.
4. Howe HL., Wingo PA., Thun MJ., Ries LA., Rosenberg HM., Feigal EG., et al. Annual report to the nation on the status of cancer (1973 through 1998), featuring cancers with recent increasing trends. *J Nati Cancer Inst.* 2001. 93; 824-42.
5. Monaghan JM. Dewhurst's Textbook of Obstetrics and Gynecology for postgraduate, 6th Edition, Blackwell science Ltd, Oxford, 1999.
6. Chhabra S., Sonak M., Prem V., Sharma S. Gynecological malignancies in a rural institute in India. *J Obstet Gynaecol* 2002;22: 426-9.
7. Galadanci HS., Mohammed AZ., Uzoho CC., Jido TA., Ochicha O. Gynecological malignancies seen in a tertiary health facility in Kano, Northern Nigeria. *Trop J Obstet Gynecol* 2003; 20: 105-8.
8. Jamal S., Mamoon N., Mushtaq S., Luqman M., Moghal S. The pattern of gynecological malignancies in 968 patients from Pakistan . *Ann Saudi Med.* 2006; 26: 382-84.
9. Nasira Sabiha Dawood., Kiran Peter., Nadira Sultana., Azhar Mubarik. Clinico pathological pattern of gynecological malignancies amongst families of Ex- servicemen. *J Med Sci.(Peshawar, Print)* July 2009; Vol. 17, No. 2: 95-98.
10. Critchlow CW., Wolner-Hanssen P., Eschenbach DA., Kiviat NB., Koutsky LA., Stevens CE., et al. Determinants of cervical ectopia and of cervicitis: age, oral contraception, specific cervical infection, smoking, and douching. *Am J Obstet Gynecol.* 1995;173: 534-43.
11. Haverkos HW., Soon G., Steckley SL, Pickworth W. Cigarette smoking and cervical cancer: Part 1: a meta-analysis. *Biomed Pharmacother*,2003. 57: 67-77
12. Hildesheim A., Gravitt P., Schiffman MH., Kurman RJ., Barnes W., Jones S., et al.

- Determinants of genital human papilloma virus infection in low income women in Washington, D.C. *Sex Transm Dis.* 1993; 20: 279-85.
13. Drain PK., Halperin DT., Hughes JP., Klausner JD., and Bailey RC: Male circumcision, religion, and infectious diseases: An ecological analysis of 118 developing countries. *BMC Infect Dis.* 2006; 6: 172-75.
 14. Dhakal HP., Pradhan M. Histological pattern of gynecological cancers. *J Nepal Med Assoc* 2009; 48(176): 301-5.
 15. Tavassoli FA., Devilee P., Editors. Pathology and Genetics: Tumours of the breast and female genital organs. Lyon: World Health Organization. *International Agency for Research on Cancer*; 2003.
 16. Ahmed M., Malik TM., Afzal S., Mubarak A. Clinicopathological study of 762 ovarian tumors at Army Medical College Rawalpindi. *Pak J Pathol* 2004; 15: 147-52.
 17. Sheik MA., Akthar J., Batool T., Naqvi R., Jalil S., et al. A study of ovarian lesions in pre menarche girls. *J Coll Physicians Surg Pak* . 2007; 17: 162-5.
 18. Shahla Baloch., Meharunnissa Khaskheli., Arshad Mehmood Malik., Aneela Sheeba., Imdad A. Khushk. Clinical spectrum and management of ovarian tumours in young girls upto 20 years of age. *J Ayub Med Coll Abbottabad.* 2008; 20 (4): 14-17.
 19. Balen AH and Rutherford AJ. Ovarian neoplasm and subfertility treatment. *Brit. J. Obst. Gynae.* 1998; 105: 584-591.
 20. Piura B., Rabinovich A., Cohen Y., Friger M., Glezerman M. Squamous cell carcinoma of the vulva in the south of Israel: A study of 50 patients. *J Surg Oncol.* 1998; 67: 174-81.
 21. Wu X., Matanoski G., Chen VW., Saraiya M., Coughlin SS., King JB., et al. Descriptive epidemiology of vaginal cancer incidence and survival by race, ethnicity, and age in the United States. *Cancer* . 2008; 113(10 Suppl): 2873-82.
 22. Farhat Nasreen. Pattern of gynaecological malignancies in tertiary hospital. *JPMI* 2002; Vol.16(2): 215 220.

A Well-aware Mode of Contraceptive and Grossly Underutilized among Married Males in Nagpur, India

Ajeet Saoji¹, Shilpa Hajare², Jaydeep Nayse²

¹Associate Professor, ²Assistant Professor, Department of Community Medicine, NKP Salve Institute of Medical Sciences and Research Center, Nagpur, India

ABSTRACT

Vasectomy is safer, simpler, less expensive and equally as effective as female sterilization. Yet, in India female sterilization prevalence exceeds vasectomy prevalence by a factor of 37 to 1 with a current rate of 4.4%. A population based cross-sectional study was undertaken in a rural health training centre field practice area of a tertiary care hospital. A structured questionnaire was designed, and administered by interview to all consenting participants to investigate the level of knowledge, perception and potential demand about vasectomy among married males in India. Data analysis was done by using Epi info version 3.5.1 software. The awareness of vasectomy was found to be 97%, but their knowledge level was low (54.0%) and 13.0% had no knowledge. The association of knowledge on vasectomy among men and level of education as well as occupation was found statistically significant. Although the majority of participants (54.0%) indicated an approval for a vasectomy, only 1% men were actually practicing it. The potential demand for vasectomy was found to be 21.0%. Publicity through the media removing misconceptions and individual counseling by doctors and health workers may popularize vasectomy and promote acceptance.

Keywords: Public Health, Vasectomy, Men, Potential Demand, Perception

INTRODUCTION

Vasectomy is safer, simpler, less expensive and equally as effective as female sterilization. Yet, in India female sterilization prevalence exceeds vasectomy prevalence by a factor of 37 to 1 with a current rate of 4.4%.^[1,2] From the National family planning program inception in the 1950s through the mid-1970s, vasectomy played a dominant role. Out of 32.7 million sterilizations registered by the Indian government's family planning program between 1956 and 1980, 65% were vasectomies.^[3] By the late 1970s, however, vasectomy use had begun to decline drastically. Even when men are aware of vasectomy, their information

is frequently incomplete or incorrect. Evidence shows that patients who are knowledgeable about their conditions are able to actively participate in shared decision-making.^[4]

The perceptions surrounding vasectomy may have a significant role in the willingness to consent to such a procedure. These perceptions are driven by the information men receive from diverse sources, which may vary in their accuracy and reliability. Failure to ensure patients' reception of accurate information may result in refusal of vasectomy by some men. Culture and beliefs can also significantly influence the attitude toward vasectomy. Kishori Mahatet al showed that culturally biased misconceptions about vasectomy were the main reason for a number of men refusing this procedure regardless of its necessity.^[5] Frequently cite examples of attitudes which discourage the use of vasectomy include men's lack of interest in or responsibility for avoiding pregnancy, the association of vasectomy with castration, fear of the procedure and fear of failure.^[6]

Corresponding author:

Saoji Ajeet

Associate Professor

Department of Community Medicine,

NKP Salve Institute of Medical Sciences and Research Center, Nagpur, India.

E-mail: ajeet.saoji@rediffmail.com

Mobil: +91 9822715183, Fax: +91 07104232905

However, A recent review of male involvement in family planning concluded that modern male methods (condoms and vasectomy) are underutilized, not because men oppose family planning, but because providers are unwilling or unable to provide men information and services to meet men’s needs. Policy-makers and providers lack of attention to the method, and sometimes even prejudices against it, are often obstacles to vasectomy services.^[7,8] Experience indicates that the promotion of vasectomy by the media and service providers and high-quality services draw clients and increase adoption rates.^[7,9]

A WHO expert committee has defined five methods in 1975 to evaluate the success of Family Planning Programmes. One of them is the evaluation of knowledge; attitude, motivation and behavior among people.^[10] The existing data on men’s views or attitudes and behaviors concerning vasectomy as an important part of reproductive health is very limited in India. Considering the importance of these factors, the study therefore investigated the level of knowledge, perceptions and practices about vasectomy among married males.

MATERIAL AND METHOD

Study Design: A population based cross-sectional study was undertaken in a rural health training centre field practice area of a tertiary care hospital at Nagpur, India from December 2010 to June 2011.

Materials: Data was collected by carefully designed questionnaire which had been pre-tested; targeting married men aged 20-49 years old which were randomly selected. A structured questionnaire was designed, and administered by interview to all consenting participants. Details of the themes from which the items in the questionnaire were formulated are shown in Table 1. The score is the sum of 10 variables created by using a simple dichotomous scale (yes = 1/no = 0). Scores were not constructed in reference to an absolute gold standard, but rather were used for their relative values as simple tools in the analysis of men’s knowledge of vasectomy. The knowledge section of the questionnaire consisted of 10 items; a score of 0–2 was defined as none, 3–5 as low, 6–8 as adequate, and 8–10 as high. This study protocol was approved by institutional ethics committee of a tertiary care hospital.

Table 1. Structure of questionnaire listing the various themes constituting the various items

Structure of questionnaire by themes
Socio-demographic characteristics: Name, age, religion and type of family
Socio-economic power: Level of education and employment
Number of children, completion of family
Heard of vasectomy?
Knowledge: method, risk, benefits
Approval or disapproval of vasectomy as a method of permanent sterilization in men
Discuss with physician/health service provider
Present mode of contraception
Would you be interested in undergoing vasectomy after completion of family
Intention to undergo vasectomy after having the desired number of children
Source of information: How and where did you get information?

Statistical Analysis: Data analysis was done by using Epi info version 3.5.1 software. Chi-square test was used to determine the association of various risk factors with the variables. Univariate analysis for risk calculation was done by odds ratio and their 95% Confidence Intervals.

RESULTS

Total 200 men, participated in this study. The

average age of the respondent was 32.8 years and about (70.0%) falling in the age group of 25-39 years. Majority of the respondents had completed education upto high school (43.0%), and were farmers and daily wage earners (54.0%). Around (39.0%) belong to lower middle class followed by middle class (31.0%). Majority of them were having two children (43.5%) and were staying in nuclear family (61.0%). (Table-2)

Table 2. Sample Characteristics

Parameters	Frequency	Percentage
Age (years)		
20-24	13	6.5
25-29	49	24.5
30-34	44	22.0
35-39	48	24.0
40-44	31	15.5
45-49	15	7.5
Educational Status		
Illiterate	9	4.5
Primary/ Mid school	48	24.0
High school	86	43.0
Intermediate	32	16.0
Graduate/ Post graduate	25	12.5
Occupation		
Employees(govt./private)	67	33.5
Business	25	12.5
Labor/farmer/daily wages/unemployed	108	54.0
Socio-economic classification		
Lower class	36	18.0
Lower middle class	78	39.0
Middle class	62	31.0
Upper middle class	16	8.0
Upper class	8	4.0
Type of family		
Nuclear	122	61.0
Third generation/ Joint	78	39.0
No of children		
None	26	13.0
1	50	25.0
2	87	43.5
2 & more	36	18.5

The awareness in respondents was observed by determining how many of them had heard of vasectomy ("operation in men who do not desire anymore children"). Interestingly the awareness of vasectomy was found to be (97%) all men were aware, but their knowledge level was low (54.0%) and (13.0%) had no knowledge (Table-3). When association between educational status and level of knowledge on vasectomy among men was seen it was found that the level of knowledge increased with increase in level of education ($p = 0.00614$, chi-square for linear trend) (Table-4). Participants who were employees (govt. / private) also did better than those who were not ($p=0.04$, OR= 1.84, 95% CI= 0.97-3.48). Association with age, socioeconomic status, and type of family was found to be insignificant.

Table 3. Distribution of the level of knowledge on vasectomy in the study sample

Level of knowledge	Frequency	(%)
High	22	11.0
Adequate	57	28.5
Low	108	54.0
None	13	6.5
Total	200	100

Table 4. Association between Educational status and level of knowledge

Educational status	Level of Knowledge		Total	Odds Ratio
	High/Adequate	Low/None		
Illiterate	3	6	9	1.00
Primary/ Middle	15	33	48	0.91
High	30	56	86	1.07
Intermediate	15	17	32	1.76
Graduate/ PG	16	9	25	3.56
Total	79	121	200	

$\chi^2 = 7.51$ $p = 0.00614$, Chi-square for linear trend.

The main source of information about vasectomy was predominantly a friend or relative (50%), followed by the mass media (28.5%) like newspaper, television, radio etc. Health care professionals (19.0%) and other sources (2.5%) ranked the lowest. We tested whether the source of information was associated with the level of knowledge and found a strong association for respondent receiving information from the mass media ($p=0.016$, OR= 2.13, 95% CI= 1.09-4.17) or a health care professional ($p=0.02$, OR= 2.22, 95% CI= 1.02-4.85) was more likely to have high or adequate levels of knowledge.

The current level of contraceptive use as reported by the men in the study was assessed for both male and female methods of contraception. About (62.5%) of the respondents reported current use of some kind of contraceptive method. When we analyzed the use of specific contraceptive methods, we found that female sterilization was the most preferred one (36.0%), followed by condom (11.0%), oral contraceptive pills (5.5%), intrauterine devices (4.5%) and miscellaneous (4.5%). While surprisingly, the permanent method of vasectomy was used by only 1.0% of men. Overall use of contraceptive methods by females was significantly higher than by males ($n= 400$ $p<0.0001$, OR= 4.31, 95% CI= 2.65- 7.09). About 37.5% of the respondents were not using any kind of contraceptive method.

Perception of vasectomy was determined by asking the question "Do you approve or disapprove of men having this operation?" Out of 200 respondents 54.0%

approved while 46.0% disapproved of vasectomy as a method of sterilization. Reasons for approval of vasectomy was mainly due to no adverse effects post-surgery (33.0%), followed by reason like it is easy (27.0%), others approved vasectomy citing that it is painless (16.5%), it is reversible 9.5% and there were few other reasons (14.0%). While for disapproval of vasectomy, majority of respondents (28.5%) think women are best suited for such operations, 24.0% think vasectomy will adversely affect their income, 19.5% think it will lead to general weakness/kamjori might result in reduced sexual performance, 14.5% of respondents have fear of surgery and 13.5% disapprove vasectomy citing various other reasons.

Although the majority of participants 54.0% indicated an approval for a vasectomy, only 1% men were actually practicing it. To ascertain further, we tried to find out potential demand for vasectomy among study participants after excluding those respondents, if either of the spouse has undergone sterilization, by asking a question regarding the intention to undergo vasectomy after having the desired number of children. The potential demand for vasectomy was found to be 21.0%. When tested whether the potential demand for vasectomy was associated with the level of knowledge it was found to significant ($n=126$, $p=0.03$, $OR=2.53$, $95\% CI=0.96-6.77$). Similarly, potential demand was higher amongst those who approve vasectomy as family planning measure in men ($n=126$, $p=0.016$, $OR=2.13$ $CI=1.09-4.17$).

DISCUSSION

In this study, the most of the respondents (97.0%) were aware about vasectomy as method of sterilization in men, though only 1% was practicing. This finding parallels the findings of Dutta et al, in Delhi, who found that 77% of men were aware about vasectomy and only 1.8% was practicing.^[11] The awareness in this study among respondents was found to be higher than that mentioned in NHFS III for rural population in Maharashtra which was 79%.^[12] Even when men are "aware" of vasectomy, the information they have frequently is incomplete or incorrect. A large proportion of participants described themselves as having very little information (54.0%) about vasectomy. This is consistent with the findings of Akpamu U et al, who found that the all participants in the study claimed to be aware of family planning and have knowledge of male contraceptives. However, only 23.2% have adequate knowledge of vasectomy.

^[12] While there was a relatively low level of knowledge on vasectomy among men, there were significant effects of occupation and education on level of knowledge. Participants having high level of education and who are employees (govt. / private) did better than those who are not.

The information that they did acquire was sourced mainly from family and friends (50%) with little input from health care providers and media. It is therefore evident that not only are the men deprived of information, but also the information that they do access is not from a reliable, evidence-based source. Health professionals need to ensure that the information given to men is accurate and imparted at a level that is appropriate to the men concerned. This will empower men to participate in decision-making and enable them to participate meaningfully in the family planning options. The results of the "Get a Permanent Smile" campaign demonstrate that NSV is a viable contraceptive choice for Ghanaian men when a targeted media campaign is coupled with interventions to provide quality client-centered vasectomy services.^[9] Similarly 'Vasectomy Promotion project' at Dar Es Salaam showed that some men could be persuaded to go for vasectomy if service providers established the service and made concerted efforts to educate people about its nature and purpose and inform them about its availability.^[7]

Perception of vasectomy may have a significant role in willingness to undergo such a procedure. About 54.0% of respondents in this study approved vasectomy as men having this operation as a family planning method. In a study by Akpamu U et al, on acceptance of vasectomy as a male method of contraceptive, (1.6%) of the respondents agrees and another (5.2%) agrees conditionally.^[12] No adverse effects post-surgery, simple, painless were among the most powerful drivers for positive perception in this study.

On probing the reasons for disapproval revealed few concerns which were frequently mentioned by respondents like they think women are best suited for such operations, vasectomy will adversely affect their income, it will lead to general weakness/kamjori might result in reduced sexual performance, fear of surgery. More or less similar findings were reported in other studies where it was also found that these perceptions were the most important factors in determining men's decision to have a vasectomy.^[6, 11, 13, 14]

In India it has now become a custom that only women undergo sterilization. In this study, although the majority of participants 54.0% indicated an

approval for a vasectomy, only 1% men were actually practicing it, which is less than national statistics of 4.4%. To ascertain further, we tried to find out potential demand for vasectomy among study participants which was found to be 21.0%. Adequate knowledge and positive perception among men were associated with potential demand for vasectomy. A study conducted in Nepal had similar findings. Only 39.0% had the intention to accept vasectomy after having the desired number of children.^[5]

Limitations of the study

The current study should be interpreted in light of some limitations. This is basically because the study area is field practice area of a tertiary care hospital and hence the results from this study cannot be generalized to the entire population. However, when the difficulties related to traditional taboos for men's talking about family planning are considered, the present study provides valuable information on factors influencing the acceptance of vasectomy among married males in Nagpur.

CONCLUSION

The study reveals that, in this population with a high degree of awareness, over half of the men who had heard of the operation approve of it as a means of contraception. Nonetheless, there is a widespread lack of knowledge regarding the procedure itself, and a substantial segment of the population has negative perceptions or doubts about the effect of vasectomy on health, disposition, sexual drive and performance, income and fear of surgery. Publicity through the media removing misconceptions and individual counseling by doctors and health workers may popularize vasectomy and promote acceptance.

REFERENCES

1. Family welfare statistics in India, 29 August 2011 Statistics Division Ministry of Health and Family Welfare Government of India, National Rural Health Mission.
2. National Family Welfare statistics in India. Section – e; survey findings (nfhs, dlhs & facility survey)-Ministry of Health and Family Welfare, Government of India 2009.

3. Ross JA, Huber DH. Acceptance and prevalence of vasectomy in developing countries. *Studies in Family Planning* 1983;14(3):67-73.
4. Coulter A, Parsons S, Askham J. *Where Are the Patients in Decision- Making About Their Own Care?* Copenhagen, Denmark: WHO Regional Office for Europe; 2008.
5. Mahat K, Pacheun O, Taechaboonsersak P. Intention to Accept Vasectomy among Married Men in Kathmandu Nepal. *Asia J Public Health* 2010~1 (1):814
6. Scott B, Alam D, Raman S. Factors affecting acceptance of vasectomy in Uttar Pradesh: Insights from community-based, participatory qualitative research. *The RESPOND Project Study Series: Contributions to Global Knowledge—Report No. 3.* New York: Engender Health/The RESPOND Project. 2011.
7. Muhondwa E, Rutenberg N.A. Study of the effects of the vasectomy promotion project on knowledge, attitudes, and behaviour among men in Dar Es Salaam. *The Population Council* August, 1997.
8. The ACQUIRE Project Vasectomy Advocacy Package: Safe, Cost-Effective, and Underutilized Advocacy Brief No. 5 John M. Pile.
9. The ACQUIRE Project. 'Get a Permanent Smile' *Increasing Awareness of, Access to, and Utilization of Vasectomy Services in Ghana.* New York: The ACQUIRE Project/Engender Health, 2005.
10. WHO, Techn. Rep. Ser., No: 569, 1975.
11. Dutta M, Kapilashrami MC, Tiwari VK. Knowledge, awareness and extent of male participation in key areas of reproductive and child health in an urban slum of Delhi. *Health and Population-Perspectives and Issues*, 2004;27 (2): 49-66,
12. Akpamu U *et al.* Knowledge and Acceptance of 'Vasectomy as a Method of Contraception' amongst Literate Married Men in Ekpoma, Nigeria. *Afr. J. Biomed. Res*, 13 (May 2010); 153 – 156.
13. Khan ME, Patel BC. Male involvement in family planning: A KAP study in Agra district Uttar Pradesh. *New Delhi: Population Council*, 1997
14. Murthy SR, Rao MD. An analysis of factors influencing the acceptability of vasectomy in Andhra Pradesh. *Health and Population-Perspectives and Issues*, 2003;26 (4): 162-182.

A Study of Quality of Care and Customer Satisfaction in the Obstetrics and Gynaecology Department of the Government Medical College Hospital - Garhwal (Uttarakhand)

Amit Kumar Singh¹, Divya Goswami², S N Nagaonkare³

¹Associate Professor, Dept of Community Medicine, ²Assistant Professor, Dept of Obst. & Gynae, ³Professor & H.O.D, Dept of Community Medicine, VCSG Govt Medical Science & Research Institute, Srikot, Srinagar (Pauri), Uttarakhand, India

ABSTRACT

Background: Health services in India is mainly shared by the Public health sector, Private health sector and by some voluntary organizations, Public health services mainly serve the middle class and lower middle class population in India. Lack of funds and human resource is a major factor contributing to compromised services rendered in this sector.

Objectives: The present study was planned to assess the quality of care provided and the patient's satisfaction level in the obstetrics and Gynaecology department of the Government Medical College hospital of Garhwal, Uttarakhand.

Material & Method: The study was conducted as a hospital based cross sectional study. A predesigned structured questionnaire was devised and 5 newly admitted patients were interviewed daily between 5-7 pm for a period of two months. The infrastructure and other facilities were assessed by direct physical observation.

Result: In the present study it was observed that the department is mainly suffering with lack of manpower and supply of essential drugs. Patients expect better services from the hospital as well as they conclude that the behaviour of the doctors and the paramedical staffs needs further improvement.

Conclusion: The department needs better infrastructure, human resource facilities and there is a need to improve the quality of care as well as patient satisfaction.

Keywords: *Quality, Satisfaction, Cost, Infrastructure, Cleanliness, Behaviour*

INTRODUCTION

Healthcare in India features a universal health care system run by the constituent states and territories of India. The Constitution charges every state with "raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties". The National Health Policy was endorsed by the Parliament of India in 1983 and updated in 2002.^[1] However, the government sector is understaffed and underfinanced; poor services at state-run hospitals force many people to visit private medical practitioners.

Government hospitals in India provide treatment at taxpayer expense. Most essential drugs are offered free of charge in these hospitals. Government hospitals provide treatment either free or at minimal charges. In-hospital treatment costs depend on financial condition of the patients and facilities utilized by them but are usually much less than the private sector. For instance, a patient is waived treatment costs if he is below poverty line as in our hospital.

For a health care organization to be successful, monitoring customer's perceptions is a simple but important strategy to assess and improve their

performance^{1,2}. Andaleeb proposed and tested a five-factor model that included communication with patients, competence of the staff, their demeanour, quality of the facilities and perceived costs³. There are very few studies in India that measure patient satisfaction with the services provided by health care organizations. The present study was carried out in the obstetrics and gynaecology department of the hospital keeping in view the present location of the hospital as it is located in the mid Himalaya's on the national highway to Kedarnath and Badrinath and caters patients of the hilly region as well as it provides emergency services to the travellers and tourists on the way. As it's the first Government Medical College of the state and its hospital is upgraded from 300 beds to 500beds to provide quality care to the population of Garhwal region.

OBJECTIVES

1. To assess the quality of care of the obstetrics and gynaecology department of the VCSG Government Medical College – Garhwal.
2. To assess the level of satisfaction of patients coming to this hospital in the department of obstetrics and gynaecology.

MATERIALS AND METHOD

The study was carried out in the only Government medical college of the Garhwal region of Uttarakhand which is situated in the foothills of the Himalayan region, and which drains the patients mainly from the hilly regions of the Garhwal zone. It caters to patients coming from mixed population from both rural and urban region.

However, being a public hospital, most of the services are free or highly subsidised; therefore, a large proportion of its clientele comprises poor and lower middle class people, who cannot afford to go to private hospitals. It serves all sections of people living in the vicinity, and, being a specialist hospital also caters to referred cases from nearby areas.

The hospital in this study was started in 1984 with a view to offer rational ethical care to hilly people and now has been upgraded to a 500 bedded tertiary care hospital attached to a Medical college, the obstetrics

and gynaecology department has 62 indoor beds and the bed occupancy remains in between 80 – 110%.

We selected the patients and their attendants as the participants of this study and they were interviewed using a predesigned structured Questionnaire daily between 5- 7Pm.

The Predesigned questionnaire was devised to collect information from the respondents as well as to assess the facilities and infrastructure available, which included:

1. Infrastructure and facilities available.
2. Time taken by the doctor and paramedical staffs to attend the patients.
3. Quality of General care.
4. Attitude of Doctors and other staffs of the department.
5. Cost of care in the hospital.
6. Section of the services which needs improvement.

Study Area

The study was conducted in the obstetrics and gynaecology department of the Veer Chandra Singh Garhwali Govt. Medical Science and Research Institute – Srinagar, Garhwal (Uttarakhand)

Type of study

Hospital based cross sectional study.

Study period

The study was conducted over a period of Two months (1st July 2011 – 31st Aug 2011)

Study sample: The sample size was 300 indoor patients admitted in the ward, every day 5 (five) newly admitted patients were interviewed after selection by simple random sampling method during 5- 7 pm, for the assessment of the services and the other facilities provided direct physical observation was made.

Statistical Analysis

The data was analyzed by using Simple percentage and Chi-Square test in SPSS version 15.

FINDINGS

Table 1 : Record Keeping and Infrastructure

Areas	Main Strength	Main Problem	Action Required
Record keeping	In wards, records are well updated and clearly written in 66% of the records.	In the labour room insufficient data collection, incomplete recording of the procedures performed in 12% of the cases.	Strengthening of record keeping system is required more in wards as compared to labour room.
Equipments	Essential equipments are available	Ultrasound machine is not properly used and needs proper maintainace, 2 CTG machines are there but not working.	ventouse need to installed, and proper maintainace of USG machine is required.
Basic infrastructure	Adequate as per requirement.	Separate emergency operation theatre is required for Caesarean Section. The present OT is not connected to the Labour room and is far away.	Separate emergency operation theatre needs to be constructed

Table 2. Availability of Essential Drugs

Drugs	Labour room	wards
Oxytocin	28% patients has to buy from outside	72% patients has to buy from outside
Methergin	32% patients has to buy from outside	78% patients has to buy from outside
Misoprostolol	All the patients has to buy from outside	All the patients has to buy from outside
Magnesium sulphate	46% cases of eclampsia has to buy from outside	Not applicable, as there is no patient in the ward
Adrenaline, Inj. Lasix, Atropine etc..	1% of patients has to buy from outside	4% of patients has to buy from outside

Table 3. Human Resources and their behaviour

There is a deficiency of 23.5 % Doctors, 27.5 % of Nurses and 14 % Supportive staffs as per the norms. The behaviour of health personnel was also rated:

Health personnel	Excellent	Very Good	Good	Poor.	Action required
Doctor	42 (14%)	111 (37%)	84 (28%)	63 (21%)	Needs improvement
Nurses	63 (21%)	87 (29%)	99 (33%)	51 (17%)	
Supportive staff	21 (7%)	54 (18%)	99 (33%)	126 (42%)	

$\chi^2 = 82.671$, P value is < 0.0001

Table 4. Assessment of services in the department

Area	Excellent	Very Good	Good	Poor	Action Required
Access to Hospital	33 (11%)	66 (22%)	144 (48%)	57 (19%)	Needs improvement
Cost of Care	9 (3%)	51(17%)	117 (39%)	123 (41%)	
Cleanliness of the department	6 (2%)	39 (13%)	126 (42%)	129 (43%)	

$\chi^2 = 68.334$, P value is < 0.0001

DISCUSSION

The present study was undertaken to assess the facilities provided in the obstetrics & gynaecology department of Govt. medical college, Garhwal - Uttarakhand, the department is having good infrastructure but it needs a separate operation theatre for caesarean section cases also the present operation theatre is far away from the labour room. The department is suffering with shortage of human resource, 23.5% doctors and 27.5% of nurses were deficient, ultrasound machine is present but not utilized properly. Ventouse facility needs to be made available and record keeping system needs improvement especially in wards.

Patients coming to this healthcare are mostly from the remote and difficult geographic terrain of the state, 43% of them rated the overall services as good, 48% of the patients said that the approach to the hospital has been good because of 108 services, air ambulance will be good option for emergency cases in future.

43% of the patients rated the cleanliness of the department as poor. The services are free for the patients who are below poverty line but 87% of the patients responded that they have to buy at least one drug from outside. For the behaviour of the health care staffs 31% patients rated it as good and only 14% assessed it as excellent.

CONCLUSION

The department is catering the patients coming from the Garhwal region; this is the only tertiary care centre in the region and is providing the specialized services to the area. The department needs improvement in infrastructure as well as more human resource support. Patients are generally satisfied with the services provided and they appreciated the services

of 108 emergency services in the region but they conveyed that the cost of services should be further minimized as well as the emergency drugs should be made available in the department. Cleanliness of the department needs improvement. On an average the patients consider that the behaviour of all the health care staffs needs improvement.

ACKNOWLEDGEMENT

We are highly obliged to the head of the institute, Principal/Dean for giving us the opportunity to conduct the study and the cooperation of the patients and their attendants, who eagerly participated in the study, is also highly appreciated.

Conflict of Interest

The result of the present study will be useful in planning and management of infrastructure, human resources. The result of the response of the patients will be useful for policy making and enhancing the performance of the doctors as well as the supportive healthcare staffs.

REFERENCES

1. National Health Policy 2002
2. Repert MI, Babakus E. Linking quality and performance. Quality orientation can be a competitive strategy for health care providers. *J Health Care Mark*, 1996;16:39-43.
3. Gombeski WR, Jr Miller PJ, Hann JH, Gillete CM, Belinson JL, Bravo LN, Curry PS. Patient call back program: a quality improvement, customer service and marketing tool. *J Health Care Mark*, 1993; 13:60-65.
4. Andaleeb SS. Determinants of customer satisfaction with hospitals: A managerial model. *International Journal of Health Care Quality Assurance* 1998. 11:181-187

Posterior Reversible Encephalopathy Syndrome (PRES) Following Disulfiram Intoxication - A Case Report

Anindita Mishra¹, V Mythri Priyadarshi²

¹Associate Professor, Department of Radiodiagnosis, ²Post graduate student, Department of Radiodiagnosis G.S.L. Medical College & Hospital, Rajahmundry, Andhra Pradesh

ABSTRACT

Posterior reversible encephalopathy syndrome (PRES) also known as reversible posterior leuko-encephalopathy (RPLS) is a syndrome characterized by headache, confusion, seizures and visual loss. It may occur due to a number of causes, predominantly malignant hypertension, eclampsia and some medical treatments.

We present a case of PRES due to disulfiram intoxication in a chronic alcoholic patient. The condition was diagnosed on MRI which showed the typical radiological features. The patient recovered completely with complete reversal of radiological changes after the causative agent disulfiram was discontinued.

Keywords: Disulfiram, Reversible, Encephalopathy, MRI, White Matter

INTRODUCTION

Posterior reversible encephalopathy syndrome (PRES) is a proposed clinico-radiological entity characterized by headache, altered mental status, cortical blindness, seizures, other focal neurological signs and typical findings of T2 hyperintensities in the posterior sub-cortical white matter¹. A variety of different etiologies have been reported like hypertension, pre-eclampsia, eclampsia, treatment with chemo-therapeutic agents like cyclosporine A and tacrolimus, neurotoxicity, uraemia and porphyria. PRES due to disulfiram intoxication is an extremely rare condition. To our knowledge only one case of PRES following disulfiram intoxication has been reported till date². It is important for the clinician as well as the radiologist to be familiar with this clinically frightening but potentially reversible condition to assure timely diagnosis and treatment and prevent persistent deficits.

CASE REPORT

A 75 year old male with history of chronic alcoholism on treatment for alcohol addiction presented to the emergency department with two episodes of seizures in the last twelve hours, altered

sensorium and visual blurring. On neurological examination the patient was confused, disoriented to time and place, had retrograde amnesia for the past few days and weakness of both lower limbs. The blood pressure was 130/80mm of Hg.

Laboratory findings showed normal blood picture. Liver function tests showed slightly abnormal hepatic enzymes (GPT: 75 IU/L (N<45) and GOT: 36IU/L (N<35). Renal function tests were within normal limits. (Serum creatinine: 1.2 mg/dl)

Initial diagnosis of Wernicke-Korsakoff's syndrome with polyneuropathy was made in the emergency room and high doses of thiamine (1.5g/day) were administered.

The patient was sent for MRI when there was no significant improvement. MRI showed confluent areas of hyperintensities in bilateral subcortical white matter predominantly in the occipital and parieto-occipital areas in T2WI sequences (Fig-1), in fluid attenuated inversion recovery (FLAIR) sequences (Fig-2) and apparent diffusion coefficient (ADC) map (Fig-3). Diffusion weighted images were relatively normal (fig-4).



Fig. 1. T2 weighted axial image showing confluent white matter hyperintensities in bilateral occipital regions (arrows).



Fig. 2. T2 FLAIR axial images showing confluent white matter hyperintensities in bilateral occipital regions. The lesions are more prominent on FLAIR images (arrows)

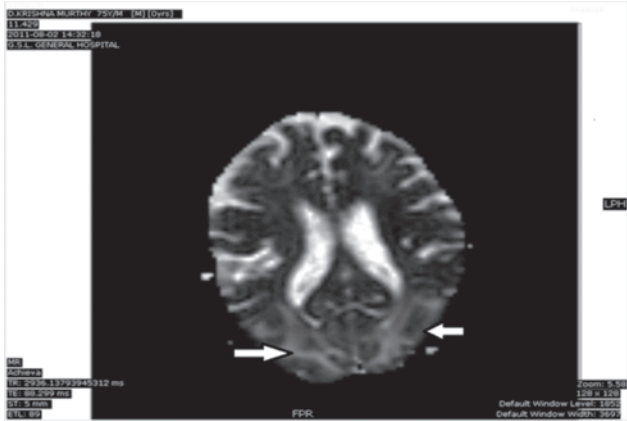


Fig. 3. ADC (Apparent diffusion coefficient) map showing hyperintensities in bilateral sub cortical white matter of occipital regions (arrows).

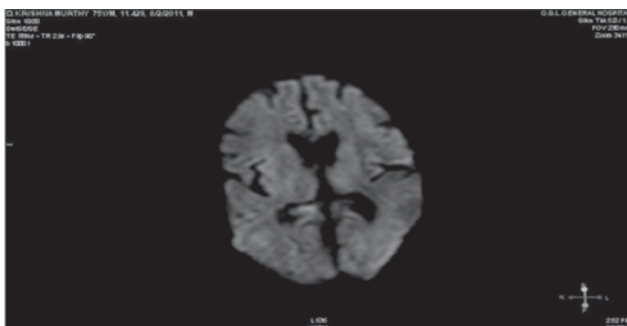


Fig. 4. Diffusion weighted images showing no significant restricted diffusion.

A radiological diagnosis PRES was made. The final diagnosis was PRES and acute polyradiculoneuropathy due to disulfiram intoxication. Disulfiram was discontinued and neurological rehabilitation was continued. There was complete clinical recovery within four weeks. A follow up MRI taken three weeks after symptom onset showed almost complete disappearance of PRES lesions (Fig-5 & 6)

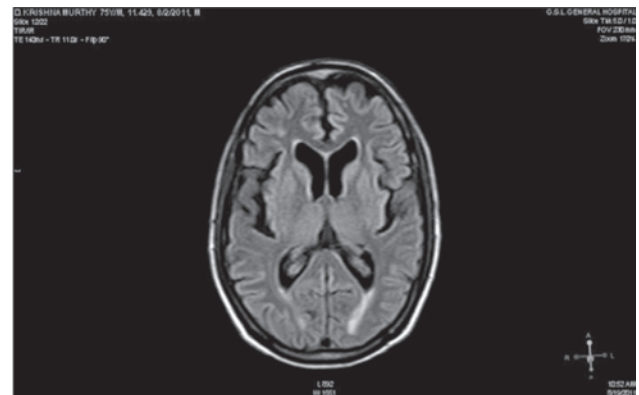


Fig. 5. T2 FLAIR axial images taken 3 weeks after the initial presentation showing almost complete resolution of white matter lesions.

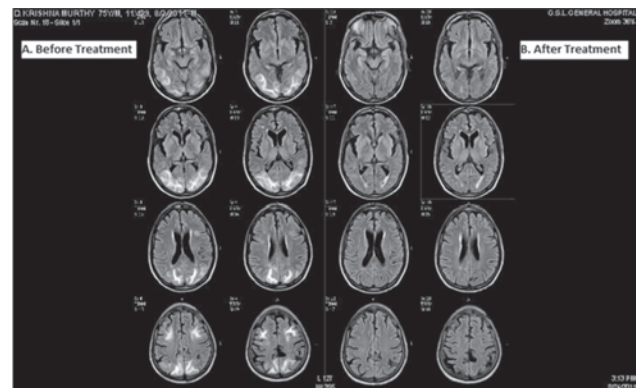


Fig. 6. Comparative axial T2 FLAIR images before (A) and after (B) treatment showing significant radiological improvement with almost complete disappearance of lesions.

DISCUSSION

PRES is a clinical entity that is important to recognize early because the clinical and imaging findings are usually reversible. It refers to vascular mediated phenomena with characteristic neurologic and imaging findings when there is a failure of cerebral autoregulation^{3, 4}. The clinical findings make up a recognizable syndrome characterized by headache, decreased alertness, altered mental functioning, seizures and visual loss including cortical blindness⁴. Acute elevation of blood pressure is the most common precipitant. The syndrome may also be seen with renal

decompensation, preeclampsia/eclampsia, fluid retention and treatment with certain drugs including immunosuppressant and chemotherapeutic agents^{4,6}. Cyclosporine is the most commonly implicated immune-suppressive drug. Rarely disulfiram intoxication has also been reported to cause PRES.²

The mechanism underlying this syndrome is likely a breakdown in cerebral perfusion auto-regulatory mechanisms brain-capillary leak syndrome with regions of vasodilatation and vaso-constriction, particularly in arterial boundary zones. Sympathetic innervation to the vasculature has been shown to initiate the vaso-constrictive protection to brain from marked increases in blood pressure and other breakdown in auto-regulatory mechanism⁵. Because the anterior circulation is better supplied with sympathetic innervation than the posterior circulation it is theorized to be better protected during elevation blood pressure and other insults which result breakdown of auto-regulatory mechanisms. The syndrome is unusual in children and is usually associated with systemic disease and organ transplant atation⁷. The clinical signs and MRI findings are characteristic. MRI shows confluent areas of signal abnormalities that are typically seen in a bilaterally symmetric pattern that may be limited to the subcortical white matter but frequently involves the overlying cortex. High signal intensity is usually seen on the T2 – weighted sequences usually in the regions supplied by the posterior circulation (occipital, parietal, and posterior temporal lobes, posterior fossa) but may also involve frontal lobes and corpus callosum⁵. Mild mass effect with sulcal effacement is seen. Haemorrhagic foci can be found particularly in patients with thrombocytopenia, and are best depicted on gradient echo images as focal areas of hypointensity⁸. Contrast enhancement may also be seen in the regions of signal abnormality. Typically the clinical and imaging findings are reversible after the cause is removed and the clinical and imaging findings establish the diagnosis without the need for biopsy. However the cases documented in literature in which biopsy was performed; these white matter abnormalities have been shown to be correlated with white matter edema on pathology⁹. Diffuse weighted sequences may be normal or may demonstrate increased diffusion in these regions, supporting the concept of increased interstitial fluid and not ischemia^{10, 11, 12}. The changes in T2 weighted MR images result from fluid extravasation into the interstitium, which is called vasogenic edema¹⁰. In the hypertensive

encephalopathy model, increases in blood pressure lead to vasoconstriction in order to maintain constant perfusion to brain. Once a certain threshold is reached the auto regulatory mechanisms fail, the cerebral vasculature dilates passively from the mechanical effects of increased pressure within the vessel and fluid leaks across the blood brain barrier^{10, 13}. A similar mechanism is theorized to be responsible for PRES lesions in drug toxicity. In contradistinction, cytotoxic edema in the setting of acute stroke results from decreased activity of the Na-K pump across the glial cell membrane. When this happens, water becomes trapped inside the cell leading to cell death. Diffusion-weighted diffusion in cytotoxic edema yields marked hyper-intensity on DWI, with hypo-intensity on ADC maps^{10, 13}. Vasogenic edema on the other hand results in increased motion of water molecules in the interstitium so it yields hyper-intense ADC values and hypo to isointense signal on DWI^{10, 13}. Therefore the classic PRES case presents with areas of abnormal T2 signal that are normal on DWI but have increased ADC values that reflect vasogenic edema. However in cases with prolonged seizures or hypertension, frank ischemia or infarction may occur leading persistent deficits.

CONCLUSION

The clinical presentation of PRES is nonspecific and includes headache, nausea, vomiting seizures, altered sensorium and visual changes. When recognized promptly, the symptoms and radiologic abnormalities can be reversed by rapid control of blood pressure or withdrawal of the offending drug. When undiagnosed, the patient can progress to ischaemia, massive infarction and death. Because the syndrome is reversible, prompt diagnosis is essential so that treatment can be directed towards the causative agent before permanent damage occurs. The key to diagnosis in PRES is the image, but the suspicion must be raised by the clinician. Both the radiologist and clinician should be familiar with this underdiagnosed, clinically frightening but potentially reversible syndrome to facilitate prompt treatment and avoid persistent deficits.

REFERENCES

1. Recurrent posterior reversible encephalopathy syndrome (PRES); G Hageman, T Ugur, O W Witte and C Fitzek. Journal of Human Hypertension. (2004)18,287-289. doi:10.1038/sj.jhh.1001664.

2. Posterior reversible encephalopathy syndrome following disulfiram intoxication. Sandra Coppens. Gilles Naeije. Nicolas Mavroudakis. *J Neurolo*(2011)258:1548-1550. DOI 10.1007s00415-011-5945-9
3. Schwartz RB, et al. Hypertensive encephalopathy-findings on CT, MR imaging and SPCT imaging in 14 cases *AJR* 1992;159(2):379-383.
4. Hinchey J et al. A reversible posterior leukoencephalopathy syndrome. *N Engl J Med* 1996; 334(8)494-500.
5. Port JD, Beuchamp NJ. Reversible intracerebral pathologic entities mediated by vascular autoregulatory dysfunction. *Radiographics* 1998; 18(2)353-367.
6. Sanders TG et al. Brain in eclampsia-MR imaging with clinical correlation. *Radiology* 1991; 180(2):475-478.
7. Jones BV, Egelhoff JC, Patterson RJ. Hypertensive encephalopathy in children. *AM J Neuroradiol* 1997;18(1):101-106
8. Weingarten K, et al. Detection of acute intracerebral haemorrhage on MR imaging - ineffectiveness of prolonged inter echo interval pulse sequences. *AM J Neuroradiol* 1991; 12(3):475-479
9. Lanzino G et al. Reversible posterior leukoencephalopathy following organ transplantation-description of two cases. *Clin Neurol Neurosurg* 1997;99(3):222-226
10. Schwartz RB, et al. Diffusion-weighted MR imaging in hypertensive encephalopathy: clues to pathogenesis. *AM J Neuroradiol* 1998; 19(5):859-862.
11. Coley SC et al. Quantitative MR diffusion mapping and cyclosporine-induced neurotoxicity. *AM J Neuroradiol* 1999; 20(8):1507-1510.
12. Engelter ST, et al. Assessment of cerebral microcirculation in a patient with hypertensive encephalopathy using MR perfusion imaging. *AM J Roentgenol* 1999;173(6):1491-1493
13. Ay H, Buonanno FS, Schaefer PW, et al. Posterior leukoencephalopathy without severe hypertension: Utility of diffusion weighted MRI. *Neurology*. 1998; 51:1369-1376.

Evaluation of Vaginal versus Abdominal Hysterectomy for Non Prolapsed Uterus with Benign Gynecological Disease

Agarwal Anjana¹, Krishna Hema²

¹Associate Professor, Department of Obstetrics & Gynecology, ²Senior Resident, Department of Obstetrics & Gynecology, Hind Institute of Medical Sciences, Safedabad Barabanki, UP

ABSTRACT

Introduction: Vaginal hysterectomy is most common gynecological operation. It has many advantages, like low morbidity rate and early discharge from hospital, over abdominal hysterectomy when performed for benign gynecological conditions.

Objective: To report experience with vaginal hysterectomy performed for benign gynecological conditions.

Method: 122 hysterectomies were performed in 3 years, from Jan 2009-Dec 2011; One hundred twelve women had vaginal hysterectomy for the uterus having size less than 14 weeks. Demographic and other useful scientific data were noted and analyzed to come to the conclusion that vaginal hysterectomy is safer operation than abdominal hysterectomy even for non prolapsed uterus.

Result: Almost 83.92 % cases had no complication and there were no life threatening complications. However 02 (1.78%) cases needed conversion to abdominal route without any serious morbidity.

Conclusion: Vaginal hysterectomy is simpler, feasible and uneventful treatment modality for gynecological indications other than utero-vaginal prolapse.

Keywords: Vaginal Hysterectomy, None prolapsed Uterus, Morcellation

INTRODUCTION

Hysterectomy is one of the most common surgical procedure performed in gynecology by abdominal or vaginal route. It is well known that vaginal Hysterectomy carries the least morbidity & mortality having many advantages over abdominal hysterectomy in terms of low morbidity, early recovery, low complication rate, early resumption of work and low cost. Besides these facts there is no visible scar on Abdomioperineal region. Vaginal Hysterectomy in large size uterus could be performed easily by bisection, myomectomy and/or debulking.

The aim of the present study was to report our experiences in performing Non descent vaginal hysterectomy (NDVH) for benign gynecological conditions by different surgical techniques that makes vaginal hysterectomy simpler, feasible and uneventful.

MATERIALS AND METHOD

This prospective study was conducted at Hind Institute of Medical sciences, a Rural Medical College & Hospital, Safedabad Barabanki (UP).

All patients for hysterectomy having benign gynecological conditions, without prolapse e.g. DUB, Leiomyoma, Adenomyosis, and PID etc. were included in the study for a period of three years from Jan 2009 to Dec 2011.

Inclusion criteria for vaginal hysterectomy were mainly, uterine size not exceeding 14 weeks and having adequate access with good uterine mobility.

Exclusion criteria included uterus with severely restricted mobility, Suspicion of malignancy, complex adnexal mass and size more than 14 weeks.

Those patient who were not fulfilling the inclusion criteria for vaginal hysterectomy, underwent abdominal hysterectomy. Cases having suspicion of adnexal mass clinically were evaluated by TVS also.

Detailed history and thorough clinical examination was done in each case. A written informed consent was taken in all the cases with prior counseling of the possibility of conversion to abdominal hysterectomy if needed. After giving anesthesia all cases were reassessed in Operation Theater, to see the size & mobility of uterus and the condition of the adnexa on both sides.

METHOD OF OPERATION

All cases were performed under regional anesthesia either spinal or epidural. After cleaning & draping, cervix was held with volsellum and vigorous massage was done through both lateral fornices, which facilitated the uterocervical descent.

Saline infiltration (with 15-20ml) was done anteriorly in vesico-cervical plane and posteriorly in cervico vaginal plane in all cases and circumferential incision was made around the cervix. Pubovesicocervical ligament was cut and bladder was mobilized upwards. Both anterior and posterior pouches were opened one after another. Mackenrodt's and uterosacral ligaments were clamped, cut and ligated on both side. Then clamping of uterine vessels was done bilaterally followed by morcellation techniques in bigger sized uterus (like Bisection, Myomectomy with bisection and/or Debulking). In total hysterectomy, last clamp was applied on round ligaments, ovarian ligaments and medial part of the fallopian tubes and in cases of salpingo-oophorectomy, round ligament was clamped separately followed by clamping of infundibulopelvic ligaments. After delivery of the uterus hysterectomy was completed in usual manner. Data regarding age, parity, size of uterus, time of operation, complications and hospital-stay was recorded. All patients were given antibiotic coverage. Catheterization with Foley's catheter was done in all cases for 24-48hours.

RESULT

Hysterectomies were carried out during the study period for 122 patients. In which 112 cases were done through vaginal route and 10 by abdominal route. (Table – 01)

Table 1. Hysterectomy from Jan 2009 to Dec 2011.

S. No.	Type of hysterectomy	No.
1.	Total no of hysterectomy	122
2.	Vaginal hysterectomy	112
3.	Abdominal hysterectomy	10

Table 02 shows various indications for NDVH, including dysfunctional uterine bleeding (41.07%) the commonest indication, followed by fibroid (25%), adenomyosis (14.3%) and pelvic inflammatory diseases (8.03%). In abdominal hysterectomy fibroid was the commonest indication followed by complex adnexal mass. Table – 03 shows distribution of cases according to the age. Sixty cases (53.58%) were in the age group of 41-45 yrs and only eight cases (7.14 %) were above the 50 yrs of age.

Table 2. Indications for NDVH

S. No.	Indication	No of Patient	Percentage
01	Dysfunctional uterine Bleeding.	46	41.07%
02	Fibroid	28	25.0%
03	Adenomyosis	16	14.3%
04	Chronic PID	09	8.03%
05	Cervical Factors (CIN)	08	7.14%
06	Ovarian cyst	03	2.7%
07	Previous surgery with DUB	02	1.78%

Table 3. Age wise distribution

S. No	Age group(Yrs)	No of patient	Percentage
01	35-40	28	25.00%
02	41-45	60	53.58%
03	46-50	16	14.28%
04	>50	08	7.14%

Sixty cases (53.58%) had parity three having favourable factor for vaginal route of surgery, i.e. vaginal laxity. Followed by parity two and four respectively (Table – 04).

Table 4. Parity wise distribution

S. No	Parity	No of patient	Percentage
01	Nulliparous	02	1.78%
02	One	06	5.35%
03	Two	37	33.03%
04	Three	60	53.57%
05	Four	07	6.2 %

Table – 05 Shows different techniques to reduce the size of uterus to facilitate the surgical removal of bigger size uterus. Different morcellation techniques were

employed successfully in 48 patients (42.85%). Bisection was used most frequently (33.92%).

Table 5. Morcellation – Technique.

S. No	Technique	No. of patient	Percentage.
01	No morcellation	64	57.14%
02	Bisection	38	33.92%
03	Myomectomy with bisection	06	5.35%
04	Debulking	04	3.57%

Hysterectomy was done for 68 cases (60.71%) and hysterectomy with bilateral salpingo-oophorectomy was done for 41 cases (36.60%) followed by hysterectomy with unilateral salpingo-oophorectomy in 3 cases (2.67%). (Table – 06)

Table 6. Type of operation

S. No	Type	No of patient	Percentage
01	Hysterectomy	68	60.71%
02	Hysterectomy with Bilateral salpingo-oophorectomy	41	36.60%
03	Hysterectomy with unilateral salpingo-oophorectomy	03	2.67%

Table – 07, Surgery was uneventful in 94 cases (83.92%). Difficulty was encountered in opening the posterior pouch in 8 cases (7.14%). Excessive bleeding during surgery was present in 6 cases (5.35%) and required blood transfusion. There was bladder injury in 2 cases (1.78%), however immediate repair of bladder was done successfully. Two patients needed conversion to abdominal route, one for slippage of uterine pedicle and other was due to inaccessibility of left adnexa.

Table 7. Peroperative- complications

S. No	Complications	No. of patient	Percentage
01	Uneventful	94	83.92%
02	Difficulty in opening posterior pouch	08	7.14%
03	Primary hemorrhage	06	5.35%
04	Bladder injury	02	1.78%
05	Conversion to abdominal route	02	1.78%

Most of the patients (76.8%) had uterine size of 6-8 weeks and only 3.6% patient had uterine size more than 12 weeks. (Table – 08)

Table 8. Size of uterus

S. No	Size of the uterus	No of patient	Percentage
01	6-8 weeks	86	76.8%
02	10-12 weeks	22	19.6%
03	12-14 weeks	04	3.75%

Operation could be completed in most of the cases in 40-50 minutes (75%), and were discharged in 4-5 days. (Table – 09)

Table 9. Operative - Time

S. No	Time	No of Patient	Percentage
01	35 min to 40 min	06	5.35%
02	40min to 50 min	84	75.0 %
03	> 50 Min	22	19.64%

DISCUSSION

The aim of this study was to determine the benefits of vaginal hysterectomy for non descent uterus versus abdominal hysterectomy. The indications for vaginal hysterectomy in this study were, DUB, Fibroid uterus, Adenomyosis & PID etc and similar indications for hysterectomy have been reported by others ¹⁻².

Dorsey JW etal³ reported that no patient with uterus more than 12 weeks underwent vaginal hysterectomy but 30.6% with uterus more than 12 weeks were operated by laparoscopic assisted vaginal hysterectomy (LAVH).

In the present study in 3.6% cases hysterectomy was carried out for about 14 weeks size uterus through vaginal route, but prior reduction of size was done by different morcellation techniques.

As larger size of the uterus has been found to be a major hindrance to the approach through the vaginal route^{1,2,3,4}, different authors have described various techniques to reduce the size of the uterus prior to removal through the vagina. Adam Magos et al⁵ selected women with fibroid uterus between 14-20 weeks size and described bisection, myomectomy, morcellation and coring to reduce the uterine size.

Vaginal uterine morcellation is the key to a successful operation and obviates the need for either abdominal or laparoscopically assisted hysterectomy solely to deal with moderate uterine enlargement^{6,7}.

Uterine morcellation at the time of vaginal hysterectomy is safe and facilitates the removal of moderately enlarged and well supported uteri and is

associated with decreased hospital stay and per operative morbidity rate compared with the abdominal route⁸.

Simple adnexal mass up to 6cm and mild to moderate endometriosis was not associated with any increased risk⁹. It has been demonstrated that ovaries are visible and accessible to transvaginal removal in most cases¹¹. Bilateral salpingo-oophorectomy at the time of vaginal hysterectomy was not independently associated with operative time or blood loss¹⁰. In our study bilateral salpingo-oophorectomy was done for 36.6% of cases.

Lower segment caesarean section and nulliparity has been reported to impede vaginal surgery due to lesser laxity of the uterine ligamental support and narrower vagina². However in our study two patients with previous LSCS and two nulliparous women, underwent vaginal hysterectomy successfully. Sheth¹² reported a very low incidence of bladder injury (0.1%) - According to him access to the uterovesical pouch can be obtained through the uterocervical - broad ligament space without laparoscopic assistance and without bladder trauma. In our case bladder injury in two cases (1.78%), repaired peroperatively without any urinary morbidity after discharge from the hospital.

CONCLUSION

Vaginal hysterectomy is safe, feasible and patient friendly in most of the women requiring hysterectomy for benign conditions and should therefore be attempted. The short term clinical outcome in VH is superior to TAH. Vaginal hysterectomy should be a primary method for removal of uterus, if not contraindicated.

REFERENCES

1. DAVIS A, Wizza E, Bournasn. O conner H nd magos A. How to increase the proportion of hysterectomies performed vaginally. *Am J Obstet Gynecology* 1998;179(4):1008-12

2. Ottosen C, Lingman G, Ottosen L. Three methods for hysterectomy; A randomized, prospective study of short term outcome. *B.JOG* 2000;107: 1380-1385.
3. Dorsey JH, Steinberg EP, Holt Z PM. Clinical indications for hysterectomy route; patient characteristics or physician preference. *Am J Obstet Gynecol.* 1995;173 (5); 1452-60
4. Dancoisne P, Abossolo T, Orvain E, Tauaillon J, Sommer JV, Riviere JP, Amat D. Criteria for choice of vaginal hysterectomy for lesions other than invasive cancer. *Rev-Fr-Gynecol Obstet*, 1994 jan; 89 (1): 11-14
5. Magos A, Bournas N, Sinha R, Richardson RE and O' Connor H. Vaginal Hysterectomy for the large uterus. *BJOG*, 1996; 103: 246-251
6. Unger JB. Vaginal hysterectomy for the women with a moderately enlarged uterus weighing 200 to 700 gm. *Am J Obstet Gynecol.* 1999; 108 (6):1337-44
7. Hoffman MS, Decesare S and Kalter C. Abdominal hysterectomy versus transvaginal morcellation for the removal of enlarged uteri. *Am J obstet Gynecol.* 1994; 171 (2): 309-15
8. Taylor SM, Romero AA, Kammerer-Doak DN et al. Abdominal hysterectomy for the enlarged myomatous uterus compared with vaginal hysterectomy with morcellation. *Am J Obstet Gynecol.* 2003;189:1579-83
9. Oath KS, Khalil M. Changing the route of hysterectomy: the result of a policy of attempting the vaginal approach in all cases of dysfunctional uterine Bleeding. *EUR J Obstet Gynecol Report Biol* 2006;125:243-7
10. Brian C. Cooper and Damiel H. Riddick. *Journal of Gynecologic Surgery.* 2005; 21: 9-12
11. Kovac SR, Cruik Shank SH. Guidelines to determine the route of Oophorectomy with hysterectomy. *Am J Obstet Gynecol.* 1996; 1483-1488.
12. Sheth SS, Malpani AN. Vaginal hysterectomy following previous cesarean section. *Int J Gynecol Obstet* 1995; 50: 165-169.

Perception of Causes, Consequences and Solutions to Global Warming among School Children in Delhi

Garg A¹, Lal P²

¹Senior Resident, Department of Community Medicine, ²Professor, Department of Community Medicine, Maulana Azad Medical College, Delhi

ABSTRACT

Background: Global warming has emerged as one of the most important environmental issues ever to confront humanity having wide health & environmental implications. Awareness especially among children and youth is necessary to combat this challenge.

Objectives: To study the perceptions of school students with regard to climate change, its potential health & environmental impacts and their behaviour towards tackling the issue.

Setting and Design: This observational study was conducted in a government boys school in rural Delhi.

Material and Method: All students of classes 9th, 10th and 11th who were willing to participate were included in the study. A self-administered, semi-structured questionnaire was used and responses were evaluated.

Statistical Analysis Used: Proportions, percentages and chi-square test.

Results: In all, 290 students participated in the study. Majority (78.9%) had heard about global warming and most students correctly attributed it to decreasing green cover (57.6%) and rising pollution (53.1%). Majority were aware of the increased chances of epistaxis but only some knew of its other health implications. Majority (96.5%) felt the need to take action and suggested increasing the green cover as a possible solution (85.1%). However, there were gaps in knowledge of students and some misconceptions were also observed. Further, knowledge did not necessarily translate into students' actions. Eleventh graders were better informed regarding global warming than lower two grades.

Conclusion: It is imperative to include the issue of global warming at all levels in school curriculum with emphasis on its health impacts and focusing on early years of schooling.

Keywords: Global Warming, School Children, Perception, Health, Environment

INTRODUCTION

Global warming has emerged as one of the most important environmental issues ever to confront humanity.^[1] Humans are already exposed to the effects of climate-sensitive diseases like malnutrition, diarrhoea and malaria which kill millions around the globe apart from increasing threat to health from dirtier air and water, decreased food supplies and more flood-related accidents.^[2,3] Many causes of climate change are anthropogenic in nature through lifestyles, consumption, and choices that pollute and exploit

resources in an unsustainable manner.^[4] Unconscious human behaviour and lack of understanding about global warming further contributes to aggravating the problem. The present study was envisaged to study the perceptions of Indian school students with regard to climate change, its potential health & environmental impacts and their behaviour towards tackling the issue.

MATERIALS AND METHOD

This cross sectional study was carried out among students of a government senior secondary boys school

located in rural Delhi. The study was conducted during the month of October 2010 after obtaining due permission from the school authorities. All students studying in all three sections each of classes 9th, 10th and 11th were included in the study.

A semi-structured, self administered questionnaire was designed and pretested for the study. It assessed the perceptions of students with regard to various challenges facing the environment, global warming & its consequences and possible mitigation measures. The questionnaire was administered on the spot to the students and the investigator visited the school twice to include the absenting students. Data was analyzed in the SPSS 17.0 software. Chi-square test was applied and p value of <0.05 was considered significant.

FINDINGS

Out of the total 335 students studying in the classes ninth, tenth and eleventh of the school, 30 students were unavailable during the study and 15 students

refused to participate in the study. In all, 290(581.7%) participated in the study. The age of the participants varied from 12 to 19 years with the mean age being 15.4±1.2 years.

Majority of the students from all grades regarded pollution as the major environmental problem being faced today. One-fourth of the students regarded climate change as an environmental problem and there was a significant difference in knowledge amongst students of the three grades with regard to this aspect ($p<0.05$). Majority students regarded increase in pollution and decrease in the green cover as the main causes for the environmental problems with a significant difference in the knowledge of students from the three grades ($p<0.05$). Other reasons attributed for the environmental problems were increase in number of vehicles & factories and the increase in population (Table 1). Some students 24(8.2%) did not give any opinion about the issues concerning the environment.

Table 1: Students perception of the Environmental problems and their causes

Issues	Total N=290(%)	Class 9 th n=86(%)	Class 10 th n=106(%)	Class 11 th n=98(%)	P value
Environmental Problems					
Air pollution	210(72.4)	63(73.2)	84(79.2)	63(64.3)	>0.05
Water and soil pollution	155(53.4)	41(47.7)	57(53.8)	57(58.2)	>0.05
Climate change	66(22.8)	16(18.6)	18(17.0)	32(32.6)	<0.05
Decreased plant cover	14(4.8)	2(2.3)	2(1.9)	10(10.2)	<0.01
Rising sea level	3(1.0)	0(0.0)	3(2.8)	0(0.0)	>0.05
Causes of the environmental problems					
Rising pollution levels	211(72.8)	54(62.8)	85(80.2)	72(73.5)	<0.05
Decreasing plant cover	187(64.5)	42(48.8)	69(65.1)	76(77.5)	<0.001
Increasing vehicular traffic	64(22.1)	20(23.2)	20(18.9)	24(24.5)	>0.05
Increase in factories	57(19.7)	17(19.8)	21(19.8)	19(19.4)	>0.05
Increase in population	43(14.8)	5(5.8)	14(13.2)	24(24.5)	<0.01
Plastic usage	34(11.7)	7(8.1)	12(11.3)	15(15.3)	>0.05
Increased use of chemicals	19(6.6)	4(4.6)	3(2.8)	12(12.2)	<0.05
Burning fossil fuels	10(3.4)	1(1.2)	6(5.7)	3(3.1)	>0.05
Others(smoking, decreased rain)	7(2.4)	3(3.5)	3(2.8)	1(1.0)	>0.05

Most of the students (78.9%) had heard about global warming. More than half of them correctly attributed it to decreasing plant cover and rising pollution. In this aspect, knowledge of the eleventh grade students was significantly better than that of the lower two

grades ($p<0.001$). However, many students 40(11.4%) were not aware of the causes of global warming and some (10.3%) particularly from the higher grade had the misconception that ozone hole leads to global warming. (Table 2)

Table 2: Students' knowledge regarding the cause of global warming

Cause of rising global temperature	Total N=290(%)	Class 9 th n=86(%)	Class 10 th n=106(%)	Class 11 th n=98(%)	P value
Decreasing plant cover	167(57.6)	37(43.0)	59(55.7)	71(72.4)	<0.001
Environmental pollution	154(53.1)	30(34.9)	64(60.4)	60(61.2)	<0.001
Increase in vehicular traffic	73(25.2)	18(20.9)	24(22.6)	31(31.6)	>0.05
Increase in factories emissions	59(20.3)	17(19.8)	23(21.7)	19(19.4)	>0.05
Increases use of fossil fuels	35(12.1)	10(11.6)	12(11.3)	13(13.3)	>0.05
Rising population and over use of resources	32(11.0)	4(4.6)	13(12.2)	15(15.3)	>0.05
Wastage of electricity	8(2.8)	0(0.0)	7(6.6)	1(1.0)	<0.01
Misconception					
Ozone depletion	30(10.3)	5(5.8)	10(9.4)	15(15.3)	>0.05

Majority of the students in all grades knew that rising temperatures could lead to epistaxis. However, more than one third students particularly from higher grade wrongly believed that global warming increases the chances of skin cancer (p<0.001). Students of class 9th were significantly better informed about the increased risk of vector born diseases due to climate change than those of others (p<0.001). Few knew that global warming can lead to increase in the cases of

diarrhoea, skin infections and mental problems. Further, Majority students were aware of the dangers of natural disasters and risk of decrease in drinking water supply. About one-third students, particularly from eleventh grade, knew about the risk of submersion of low lying areas in the sea (Table 3). Few students however did not know about the health effects (2.3%) and other potential impacts (5.1%) of global warming.

Table 3: Students' knowledge regarding the impact of global warming

Impact of rising temperatures	Total N=290(%)	Class 9 th n=86(%)	Class 10 th n=106(%)	Class 11 th n=98(%)	P value
On human health					
Epistaxis/ unconsciousness	189(65.2)	52(60.5)	80(75.5)	57(58.2)	<0.05
Diarrhoea	48(16.6)	21(24.4)	12(11.3)	15(15.3)	<0.05
Vector borne diseases(dengue & malaria)	34(11.7)	23(26.7)	6(5.7)	5(5.1)	<0.001
Boils and other skin problems	8(2.7)	0(0.0)	6(5.7)	2(2.0)	>0.05
Mental problems	2(0.7)	0(0.0)	0(0.0)	2(2.0)	>0.05
Misconceptions					
Skin cancer	118(40.7)	16(18.6)	36(34.0)	66(67.3)	<0.001
Lung cancer	36(12.4)	11(12.8)	15(14.1)	10(10.2)	>0.05
Pneumonia	29(10)	12(13.9)	11(10.4)	6(6.1)	>0.05
Other Problems					
Natural disasters	189(65.2)	49(57.0)	72(67.9)	68(69.4)	>0.05
Decrease in drinking water	171(59.0)	55(63.9)	65(61.3)	51(52.0)	>0.05
Submersion of low lying areas/ islands	101(34.8)	24(27.9)	32(30.2)	45(45.9)	<0.05
Rise in sea level/Melting glaciers	11(3.8)	2(2.3)	3(2.8)	6(6.1)	>0.05
Decreased agriculture production	6(2.1)	1(1.2)	1(0.9)	4(4.1)	>0.05
Extinction of life	2(0.7)	0(0.0)	1(0.9)	1(1.0)	>0.05
Misconceptions					
Increased crop production	8(2.7)	4(4.6)	3(2.8)	1(1.0)	>0.05
Increase in ice on mountain tops	10(3.4)	5(5.8)	1(0.9)	4(4.1)	>0.05

An overwhelming majority felt that action should be taken to control rising global temperatures. Most of the students (85.2%) across the three grades favoured increasing the Plant cover as a possible solution. Many believed that decreasing pollution & vehicular traffic while others believed that saving

water and electricity can help. Only a few students suggested renewable energy sources as a possible solution. However, some students had a wrong belief that increasing use of CNG vehicles can help to reduce rising temperatures. (Table 4)

Table 4: Students' knowledge regarding mitigation measures

Mitigation Measures	Total N=290(%)	Class 9 th n=86(%)	Class 10 th n=106(%)	Class 11 th n=98(%)	P value
Planting more trees	247(85.2)	69(80.2)	89(84.0)	89(90.1)	>0.05
Reduce environmental pollution	118(40.7)	24(27.9)	58(54.7)	36(36.7)	<0.001
Reduce vehicular traffic	94(32.4)	26(30.2)	34(32.1)	34(34.7)	>0.05
Save water	53(18.3)	10(11.6)	28(26.4)	15(15.3)	<0.05
Save electricity	47(16.2)	8(9.3)	20(18.9)	19(19.4)	>0.05
Reduce factories	24(8.3)	4(4.6)	12(11.3)	8(8.2)	>0.05
Not burning plastics/crackers	9(3.1)	2(2.3)	4(3.5)	3(3.1)	>0.05
Motivate and involve others	7(2.4)	2(2.3)	1(0.9)	4(4.1)	>0.05
Use renewable source of energy	6(2.1)	1(1.2)	0(0.0)	5(5.1)	<0.05
Misconceptions					
Increase use of CNG vehicles	33(11.4)	12(13.9)	12(11.3)	9(9.2)	>0.05
Decrease use of plastics	37(12.7)	6(7.0)	13(12.3)	18(18.4)	>0.05

Majority students, more so from higher grades claimed to contribute in reducing global warming by planting trees themselves. Some did so by decreasing the use of vehicles. More students of eleventh grade claimed to be involved in saving water and electricity,

decreasing the use of plastics and motivating other people for the same (Table 5). Many students (21.7%) however, did not report any personal initiatives to combat climate change.

Table 5: Students' practices that help in reducing global warming

Students' practices:	Total N=290(%)	Class 9 th n=86(%)	Class 10 th n=106(%)	Class 11 th n=98(%)	P value
Planting trees/plants	183(63.1)	44(51.2)	70(66.0)	69(70.4)	<0.05
Reducing environmental pollution	37(12.7)	8(9.3)	15(14.1)	14(14.3)	>0.05
Decreasing use of vehicles	54(18.6)	17(19.8)	21(19.8)	16(16.3)	>0.05
Saving water	52(17.9)	12(13.9)	29(27.3)	11(11.2)	<0.01
Saving electricity	39(13.4)	4(4.6)	22(20.7)	13(13.3)	<0.01
Not burning plastics/crackers	25(8.6)	9(10.4)	9(8.5)	7(7.1)	>0.05
Motivating and involving others	16(5.5)	2(2.3)	2(1.9)	12(12.2)	<0.01
Decreasing use of paper	5(1.7)	2(2.3)	2(1.9)	1(1.0)	>0.05

Majority students mentioned television (71.4%) to be the commonest source of information about global warming followed by newspaper and magazines (54.8%). Other sources were teachers (21.7%) and close contacts including parents, siblings & friends (14.1%), the books (11.7%) & internet (11.7%).

The present study explored the ideas of Indian secondary school students of grades ninth, tenth and eleventh with regard to global warming. Although many students were aware of the global environmental problems and pollutants but they seem to believe that all types of pollutants contribute to all the environmental problems.

Majority students felt that decreasing green cover and increasing pollution were responsible for the rising temperatures. Many students knew that rising

temperatures can lead to health problems such as epistaxis, natural disasters and decreased availability of drinking water but only few were aware of the other health and environmental impacts of global warming.

A little difference was observed in the knowledge level with respect to the causes and mitigation measures regarding global warming. However, there was a difference in the knowledge level between students of different grades. Eleventh graders seem to be much better informed regarding causes, impacts and possible mitigation measures to decrease global warming. The influence of educational level on the knowledge has also been reported previously.^[5]

However, despite the higher level of knowledge due to their educational level, some students had wrong notions irrespective of their grade. Previous

studies have also documented that students erroneously link greenhouse effect with ozone layer depletion and with skin cancers.^[5,6] The students in the current study too carry these misconceptions which tend to increase with the educational level of the students.

Although majority students stressed on the need of increasing the green cover, the students in general had little clue regarding possible solutions to the problem. Not many students were able to identify renewable energy sources as a possible solution and only few students appreciated the role individuals can play on their part by saving electricity & water and by promoting recycling of paper. Similar findings have been reported by Daniel et al among school students in their study.^[7] We also observed that the knowledge of students did not necessarily translate into the actions. Similar gap in the knowledge and practices among school children has been reported earlier by Boyes and Stanisstreet among Turkish school children.^[8]

Mass media like television along with newspaper and magazines were the major sources of information about global warming in the current study. Similar findings were observed by Pandve and Raut among medical students in Pune city.^[9]

Overall, a sizable number of study subjects had either no or limited knowledge of the causes & impact of global warming and its possible mitigation measures. Also, there were huge gaps in the students' knowledge with regard to an issue of such vital importance. With global warming expected to have a major impact on Asia particularly India,^[1] continuous and sustainable efforts are required to create awareness and ensure mass participation in combating the challenge.^[10] Environmental education is the most effective way of reducing people's insensitivity to the environment and to change their mindset.^[11] Children and youth especially, being the future of the country, should be more sensitive to the environment.^[10-13] The children are more receptive to health education and are likely to integrate new behaviours into their daily routines.^[14] Moreover, they can be important agents of behaviour change in the community and schools^[15] and can play an important role in the issue.

CONCLUSION

In the light of the observations made in the current study, it is imperative to include the issue of global warming at all levels in the school curriculum. The

behaviour of children can be easily changed during childhood; therefore the knowledge should be shared in the early years of schooling. Although, curriculum has already incorporated some essential components, however there is still room for improvements with emphasis on health aspects. Further, there is a need to address the issues widely, especially on wrong notions prevalent among the students. Mass media like television and newspaper can play a vital role in spreading awareness on the issue. The study explored the knowledge and beliefs of the school children from a government school in rural background and has limited scope for generalization. Therefore, studies among students in different educational settings are needed to design any health education material related to global warming.

ACKNOWLEDGEMENT

The authors are thankful to the authorities and students of Government senior secondary boys school, Prahlad Pur Bangur, Delhi for their kind cooperation in conducting this study

Conflict of Interest: None

REFERENCES

1. Intergovernmental Panel on Climate Change. Climate change 2007: the physical science basis-summary for policy makers. Available at: www.ipcc.ch/SPM2feb07.pdf.
2. Climate change will erode foundations of health. Available from: <http://www.who.int/mediacentre/news/releases/2008/pr11/en/index.html>.
3. Majra JP, Gur A. Climate change and health: Why should India be concerned? *Indian J Occup Environ Med* 2009;13:11-6.
4. Nichols A, Maynard V, Goodman B, Richardson J. Health, climate change and sustainability: A systematic review and thematic analysis of the literature. *Environ Health Insights* 2009;3:63-88.
5. Boyes E, Stanisstreet M. School students' Ideas about the "Greenhouse Effect" a decade on. *Canadian Journal of Environmental Education* 2001;6:77-101.
6. Boyes E, Stanisstreet M. The Ideas of Secondary School Children Concerning Ozone Layer Damage. *Global Environmental Change* 1994;4:311-24.
7. Daniel B, Stanisstreet M, Boyes E. How can we best reduce global warming? School students' ideas and misconceptions. *International Journal of Environmental Studies* 2004;61:211-22.

8. Kilinc A, Boyes E, Stanisstreet M. Turkish school students and global warming: beliefs and willingness to act. *Euroasian Journal of Mathematics, Science & Technology Education* 2011;7:121-34.
9. Pandve HT, Raut A. Assessment of awareness regarding climate change and its health hazards among the medical students. *Indian J Occup Environ Med* 2011;15:42-5.
10. Pandve H. Global warming: Need to sensitize general population. *Indian J Occup Environ Med* 2007;11:86-7.
11. Boyes E, Skamp K, Stanisstreet M. Australian Secondary Students' Views about Global Warming: Beliefs about Actions, and Willingness to Act. *Research in Science Education* 2009;39:661.
12. Taber F, Taylor N. Climate of Concern: A Search for Effective Strategies for Teaching Children about Global Warming. *International Journal of Environmental & Science Education* 2009;4: 97-116.
13. Pandve HT, Deshmukh PR, Pandve RT, Patil NR. Role of youth in combating climate change. *Indian J Occup Environ Med* 2009;13:105.
14. Greenberg MT, Weissberg RP, O'Brien MU, Zins JE, Fredericks L, Resnik H et al. Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *Am Psychol* 2003;58:466-74.
15. Rohde JE, Sadjimin T. Elementary-school pupils as health educators: role of school health programmes in primary health-care. *Lancet* 1980;1:1350-2.

Socio-Demographic Determinants of Mental Health Problems among Rural Elderly Population

Sreedhar Kumar¹, P Rajasekhar², N Bayapa Reddy³, T S R Sai⁴, G Ravi Prabhu⁵, N Swarnalatha⁶

¹Assistant Professor (Community Medicine), A. S. R. Academy of Medical Sciences, Eluru, A.P, ²Assistant Professor (Physiology), P. E. S. Institute of Medical Sciences and Research, Kuppam, A. P, ³Assistant Professor (Community Medicine), Chennai Medical college Hospital and Research Center, Trichy, Tamil Nadu, ⁴Professor and Head (Community Medicine), N. R. I. Medical College, Mangalagiri, A. P, ⁵Professor and Head (Community Medicine), S. V. Medical College, Tirupati, A. P, ⁶Associate Professor (Community Medicine), S. V. Medical College, Tirupati, A. P

ABSTRACT

Background: Mental health problems like depression, cognitive impairment, anxiety, sleep disorders etc. arising out of senility, neurosis and living conditions are common in geriatric population.

Objectives: To study the psychiatric morbidity among the rural elderly in relation to their socio-demographic profile.

Materials and Method: A community based cross-sectional study was conducted among 400 rural elderly subjects aged >60 years living in three randomly selected villages of RHC Chandragiri. Cognitive functioning was assessed by Mini Mental Status Examination and the depression, by Geriatric Depression Scale-Shorter version. Data was analysed with Epi-info software using proportions, chi-square and z tests.

Results: Majority of the subjects were widows/widowers, illiterates, living with family, showing economic dependency. The prevalence of cognitive impairment was 43.25%, with a mean MMSE score of 23.32±4.4 and that of depression were 47.0% and 6.16±3.4 respectively. Cognitive impairment, depression and disturbed sleep pattern were associated with female sex, age, illiteracy, poverty, loneliness and poor status in family.

Conclusions: The study showed a definite association between socio-demographic factors and psychiatric morbidity. Encouraging the NGOs working for the elderly, running of separate clinics and effective implementation of schemes like old age pension are some of the measures to be taken.

Keywords: Geriatric, Socio-Demography, Depression, Cognitive Impairment, Sleep Disorders, Mini Mental Status Examination, Geriatric Depression Scale

INTRODUCTION

Emergence of nuclear families, increased cost of living and change in priorities of family has adversely affected the elderly in India. Senility, poor health, widowhood, dependency, helplessness and low self-esteem are the risk factors that influence both the extent

and severity of mental morbidity and quality of life. Nearly 4 million Indian elderly are mentally ill.¹ Psychiatric morbidity which increases with age is more prevalent in geriatric (43.32%) than in non-geriatric group (4.66%).² Prevalence of depression, the most common problem ranges between 13 and 22%.³ Ageing declines the cognitive functioning due to senile changes. If the goal of "Health for All" is to be achieved, policy makers and administrators must pay more attention on various issues of this group. In this context, the present study focused on important mental health problems like cognitive impairment, depression and sleep pattern abnormalities to provide some insight into future work.

Corresponding author:

Sreedhar Kumar

Assistant Professor

Department of Community Medicine, Alluri Sitarama Raju Academy of Medical Sciences (ASRAMS), Eluru, Andhra Pradesh. PIN-534005

MATERIALS AND METHOD

A community based cross-sectional study was conducted between January and June, 2011 among 400 rural elderly subjects aged 60 years and above (200 males and 200 females selected by proportionate sampling technique) living in three randomly selected villages, one from each of the three sub-centres of RHC Chandragiri, 12 Km from Tirupati, A.P. 400 was the sample size calculated with 50.0% as the minimum prevalence of morbidity among elderly population and 5.0% as the allowable error. Socio-economic status was assessed by Uday Pareek's Classification.⁴

Folstein's Mini Mental Status Examination⁵ scale was used to assess subject's cognitive functioning in

terms of orientation (time and place), attention, memory power and literary ability. Based on score (maximum: 30), subjects were graded as normal (≥ 24), mild (20-23), moderate (10-19) and severely (≤ 10) impaired.

Yesavage's Geriatric Depression Scale-Shorter version,⁶ a 15 question instrument was used to assess whether (>5) or not (≤ 5) subject was having depression based on score, the subjects were categorized as Depression Absent (≤ 5) and Present (>5). Sleep pattern among subjects was categorized as 'normal' and 'disturbed' (difficulty in falling asleep, reduced duration and poor quality of sleep).

RESULTS

Table 1: Socio-demographic profile of study subjects (N= 400).

Variable	Category	Male No. (%)	Female No. (%)	Total	Statistical significanc
Age group (in years)	60-69	85 (42.5)	110 (55.0)	195 (48.75)	
	70-79	86 (43.0)	49 (24.5)	135 (33.75)	
	≥ 80	29 (14.5)	41 (20.5)	70 (17.5)	
Marital Status	Married	133 (66.5)	64 (32.0)	197 (49.3)	$\chi^2=47.6$ (S*)
	Widowed	66 (33.0)	135 (67.5)	201(50.2)	
	Divorced	01 (0.5)	01 (0.5)	02 (0.5)	
LiteracyStatus	Illiterate	90 (45.0)	161 (80.5)	251(62.8)	$\chi^2=68.46$ (S*)
	Primary	43 (21.5)	31 (15.5)	74 (18.5)	
	Secondary	53 (26.5)	08 (4.0)	61 (15.2)	
	Hr. secondary & above	14 (7.0)	00 (0.0)	14 (3.5)	
Living arrangement	Alone	55 (13.75)			
	With spouse/ children	323 (80.75)			
	With others	22 (5.5)			
CurrentOccupation	None + housewife	144 (72.0)	163 (82.5)	307 (76.75)	$\chi^2= 5.74$ (S)
	Skilled+ unskilled	55 (27.5)	37 (18.5)	93 (23.25)	
Socio-economic status	Upper	08 (2.0)			
	Middle	231 (57.75)			
	Lower + BPL	161 (40.25)			
Economic dependency	Independent	188 (47.0)			
	Partially dependent	49 (12.25)			
	Totally dependent	163 (40.75)			
Status of the subjectin family	Respected & consulted	121 (30.25)	*S=P<0.001 S=P<0.005		
	Looked after well	161 (40.25)			
	Just looked after	63 (15.75)			
	Neglected	55 (13.75)			

Majority (48.75%) are in 60-69 year group, in ≥ 80 age group females (20.5%) outnumber the males (14.5%). Overall prevalence of widowhood and illiteracy was 50.2% and 62.8% respectively, far higher among females (67.5% and 80.5%) than males (33.0%

and 45.0%). Majority is currently not in any occupation (77.5%), belongs to middle (57.75%) and lower class including BPL (40.25%) and depends financially, partially (12.25%) or totally (40.75%). 13.75%, totally neglected by children are living alone.

Table 2: Distribution of elderly subjects by cognitive status and its determinants.

Sociodemographic variable	Category	Cognitive impairment			Total No. (%)	Statistical significance
		No impairment No. (%)	Mild No. (%)	Moderate & severe No. (%)		
SexMMSE score (Mean +SD)	Male	130 (65.0)	40 (20.0)	30 (15.0)	200 (100.0)	$\chi^2 = 11.09$ (S*)
	Female	97 (48.5)	59 (29.5)	44 (22.0)	200 (100.0)	
	Total	227 (56.75)	99 (24.75)	74 (18.5)	400 (100.0)	
	Male: 24.63 + 4.49; Female: 22.02 + 3.92				23.32 + 4.4	Z=6.21 (S*)
Age group(in years)	60-69	141 (72.3)	38 (19.7)	16 (8.2)	195 (100.0)	$\chi^2 = 51.0$ (S*)
	70-79	64 (47.4)	43 (31.8)	28 (20.8)	135 (100.0)	
	>80	22 (32.4)	18 (25.7)	30 (42.9)	70 (100.0)	
Literacy Status	Illiterate	92 (36.6)	93 (37.1)	66 (26.3)	251 (100.0)	$\chi^2 = 102.75$ (S*)
	Primary	63 (85.1)	05 (6.8)	06 (8.1)	74 (100.0)	
	Secondary	58 (95.1)	01 (1.6)	02 (3.3)	61 (100.0)	
	>Higher secondary	14 (100.0)	00 (0.0)	00 (0.0)	14 (100.0)	
SocioEconomic Status	Upper	05 (62.5)	02 (25.0)	01 (12.5)	08 (100.0)	$\chi^2 = 38.4$ (S*) *S=Significant at 1% level
	Middle	160 (69.3)	46 (19.9)	25 (10.8)	231 (100.0)	
	Lower & BPL	62 (38.5)	51 (31.7)	48 (29.8)	161 (100.0)	
	Total	227 (56.75)	99 (24.75)	74 (18.5)	400 (100.0)	

Overall prevalence of cognitive impairment is 43.25%, more among females (51.5%), >80 age group (68.6%), illiterates (63.4%) and subjects of lower class including BPL (61.5%). Among females, MMSE score is lesser (22.03+3.92) than even the overall score (23.32+ 4.4).

Table 3: Determinants of Depression among study subjects.

Sociodemographic variable	Category	Depression		Total No. (%)	Statistical significance
		PresentNo. %	AbsentNo. (%)		
Sex	Male	75 (37.5)	125 (62.5)	200 (100.0)	$\chi^2 = 14.49$ (S*)
	Female	113 (56.5)	87 (43.5)	200 (100.0)	
Depression score (Mean + SD)	Males: 5.53 ± 3.28	Females: 6.80+3.10		6.16 ± 3.40	Z=3.97 (S*)
Age group (in years)	60-69	78 (40.0)	117 (60.0)	195 (100.0)	$\chi^2 = 6.16$ (S)
	70-79	72 (53.3)	63 (46.7)	135 (100.0)	
	≥80	38 (54.3)	32 (45.7)	70 (100.0)	
Socio-Economic Status	Upper	02 (25.0)	06 (75.0)	08 (100.0)	$\chi^2 = 75.57$ (S*)
	Middle	69 (29.9)	162 (70.1)	231 (100.0)	
	Lower+ BPL	117 (72.7)	44 (27.3)	161 (100.0)	
Living arrangement	Alone	48 (87.3)	07 (12.7)	55 (100.0)	$\chi^2 = 61.53$ (S*)
	With spouse/Children	130 (40.2)	193 (59.8)	323 (100.0)	
	With others	10 (45.5)	12 (54.5)	22 (100.0)	
Economic dependency	Independent	89 (47.3)	99 (52.3)	188 (100.0)	$\chi^2 = 7.75$ (S)
	Partially	31 (63.3)	18 (36.7)	49 (100.0)	
	Totally	68 (41.7)	95 (58.3)	163 (100.0)	
Dependency in ADL	Independent	168 (44.8)	207 (55.2)	375 (100.0)	$\chi^2 = 12.64$ (S*)
	Dependent	20 (80.0)	05 (20.0)	25 (100.0)	
Literacy Status	Illiterate	148 (58.9)	103 (41.1)	251 (100.0)	$\chi^2 = 42.79$ (S*)
	Primary & secondary	37 (27.4)	98 (72.6)	135 (100.0)	
	>Higher secondary	03 (21.4)	11 (78.6)	14 (100.0)	
	Total	188 (47.0)	212 (53.0)	400 (100.0)	

S*=Significant at 1% level; S=Significant at 5% level.

Overall prevalence of depression is 47.0%, more among females (56.5%), illiterates (58.9%), ≥ 80 age group (54.3%), lower class and BPL (72.7%), those living alone (87.3%) and showing dependency

physically (80.0%) and financially (63.3%). Females have higher mean score of depression (6.80 + 3.10) than the overall mean score (6.16 + 3.40).

Table 4: Distribution of elders based on Sleep pattern and its determinants.

Socio-demographic variable	Category	Sleep pattern		Total No. (%)	Statistical significance
		NormalNo. (%)	DisturbedNo. (%)		
Sex	Male	134 (67.0)	66 (33.0)	200 (100.0)	$\chi^2=1.56$ (NS)
	Female	122 (61.0)	78 (39.0)	200 (100.0)	
Age group (in years)	60-69	151 (77.4)	44 (22.6)	195 (100.0)	$\chi^2=37.2$ (S)
	70-79	78 (57.8)	57 (42.2)	135 (100.0)	
	≥ 80	27 (38.6)	43 (61.4)	70 (100.0)	
Socio-Economic Status	Upper	07 (87.5)	01 (12.5)	08 (100.0)	$\chi^2=19.58$ (S)
	Middle	161 (69.7)	70 (30.3)	231 (100.0)	
	Lower & BPL	88 (54.7)	73 (45.3)	161 (100.0)	
Living Arrangement	Alone	31 (56.4)	24 (43.6)	55 (100.0)	$\chi^2=12.82$ (S)
	With spouse/ children	214 (66.3)	109 (33.7)	323 (100.0)	
	With others	11 (50.0)	11 (50.0)	22 (100.0)	
	Total	256 (64.0)	144 (36.0)	400 (100.0)	

NS= Not Significant; S= Significant at 1% level

Disturbed sleep pattern (36.0%), slightly higher among females (39.0%) than males (33.0%) is seen mainly in ≥ 80 age group (61.4%), lower class and BPL (45.3%) and those living lonely (43.6%) or with others (50.0%).

DISCUSSION

Present study revealed females showing high prevalence of widowhood (67.5% vs 33.0%) and illiteracy (80.5% vs 45.0%) than males. Illiterates outnumbered in both the sexes (45.0% and 80.5%). All those not living with spouse/children (19.3%) were widows/widowers, totally neglected by children. Subjects were categorized as financially 'independent' (getting pension or earning), 'partially dependent' (living with family with old age pension) and 'totally dependent' (no income). Less prevalence of economic dependency among subjects (53.0%) than other studies⁷⁻¹¹ was because of retired employees among them. Regarding status in family, subjects were divided into 'neglected' (subjects living alone, totally neglected by children), 'just looked-after' (providing basic needs), 'looked-after well' (basic needs and medical care) and 'respected and consulted' (taking decisions or involving in family issues). Low prevalence of economic dependency was the reason for less number of totally neglected subjects (13.75%) than Elango S⁸

(38.0%) and Kishore S¹² (55.8%). Financially totally dependents were just looked-after (15.8%) while old age pensioners were being looked after well (41.2%). But where only couples were present, the status was unaffected by economic dependency. Thus economic dependency and living arrangement were main factors deciding the status of the subject in the family.

The study showed high prevalence of cognitive impairment (43.25%) than Singh VB et al.¹³ (5.0%) and Anil Goswami et al.¹⁴ (18.03%) probably because of differences in literacy status and composition of subjects. Similar to Anil Goswami et al.¹⁴ (23.7% vs 12.2%), high prevalence of impairment among females (51.5%) was due to high illiteracy rate and females in ≥ 80 age group. Similar to Anil Goswami et al.¹⁴ (58.4%), prevalence of impairment increased after 69 years of age (52.6%) and the severity, especially in ≥ 80 age group (42.9%) which showed higher prevalence than two earlier age groups together (29.0%). High prevalence and severity of impairment associate with low literacy status as seen in illiterates (63.6% and 26.3%) than literates (19.8% and 11.4%). The high prevalence (61.5%) and severity (29.8%) of impairment in lower class than other class subjects was because of more illiterates in lower class. The high prevalence of impairment in upper class than middle class was probably because of few subjects in upper class.

Similar to Jain RK⁷ (45.9%) and Venkoba Rao A et al.¹⁵ (43.0%), high prevalence of depression among subjects (47.0%) than Singh VB et al.¹³ (18.0%) was due to high prevalence of widowhood, illiteracy, economic dependency and poor status in family. Increased prevalence and severity of depression among females was due to high prevalence of poor health, widowhood, economic dependency and poor status in family in females, similar to Singh VB et al.¹³ (37.5% vs 14.28%), Anil Goswami et al.¹⁴ (63.2% vs 44.5%) and Jain RK et al.⁷ (5.1+8.26). Subjects showed high prevalence of depression especially after 69 years as shown by an increase of 13.3% in 70-79 age group due to increased widowhood, dependency and health deterioration with age. Illiteracy, economic dependency and loneliness were reasons for higher prevalence of depression in lower class (72.7%) than the other classes together (54.9%) and in illiterates (58.9%) than literates (48.8%). Less prevalence of depression among financially totally dependent subjects (41.7%) than partial dependents (63.3%) might be because of proper care and security. Burden of earning despite poor health, loneliness and negligence by children (regarding those living alone) were main reasons for depression among independent subjects. High prevalence of depression (80.0%) among physically dependent subjects might be because of poor health and status in family.

Prevalence of disturbed sleep pattern of study subjects (36.0%) differs from Singh VB et al.¹³ (3.5%), Singh CP¹⁶ (28.66%), Jain RK⁷ (43.9%) and Anil Goswami et al.¹⁴ (58.36%) probably because of difference in prevalence of factors responsible for depression and the same was the case regarding difference between male (33.0%) and female subjects (39.0%). Disturbed sleep pattern increased with age as shown by increase in its prevalence (19.0%) with age and the same was the case with decreased social status (12.5% to 45.3%). Increased dependency and poor status in family were reasons for this. Poor status in family might be responsible for disturbed sleep pattern among those living with family members. Normal sleep pattern in those living exclusively with spouse was because of security and good status in family, absence of which led to disturbed sleep pattern among those living with others/alone.

CONCLUSIONS

The study revealed a strong relation between socio-demographic factors like female sex, age, illiteracy, poverty, widowhood, loneliness, physical and financial

dependency and poor status in family and the psychiatric morbidity of the subjects. Old age homes and separate clinics in the existing PHC system, facilities for organizations working for the welfare of the aged and effective implementation of the on-going schemes like old age pension are some of the measures to be taken.

ACKNOWLEDGEMENTS

The author mentions his sincere thanks to Dr P.G. Deotale, Professor and Head, Department of Community Medicine, ASRAMS, Eluru for allowing utilizing the internet facility of the Department and for his extended co-operation.

Conflict of Interest: None.

REFERENCES

1. Indira JP. Aging, disability and disabled older people in India. *J Aging Soc Policy*;15(2-3):85.
2. Tiwari SC. Geriatric psychiatric morbidity in rural Northern India: Implications for the future. *Age Ageing*, 1999; 28(2):161-68.
3. Joshi PC and Sengupta SN. Health issues, 2004; html: 3, 4.
4. Bhaskar Rao T. *Sociology in Medicine*. 2nd ed. Hyderabad: Paras Medical Publishers; 1998. Chapter 7, Social Stratification and Health: Uday Pareek's Scale of socio-economic status.
5. Folstein MF, Folstein SE, Mc Hugh PR. Mini Mental State. A practical method for grading the cognitive status of patients for the clinicians; *J Psychiatr Research*, 1975; 12(3):189-98.
6. Jerome A Yesavage. Geriatric Depression Scale (Short version). *Psychopharmacol Bull*, 1998; 24(4):709-11.
7. Jain RK, Aras RY. Depression in geriatric population in urban slums of Mumbai. *Indian J Public Health*, 2007; 51(2).
8. Elango S. A study of health and health related social problems in the geriatric population in rural area of Tamil Nadu, 1998. *Indian J Public Health*; 42(1):7-9.
9. Archana, Panda K. Life satisfaction among elderly females in Delhi; *Help Age India Research and Development Journal*, 2005; 11(1):21-28.
10. Shashikant, Mishra P, Anil Goswami. Morbidity among elderly persons residing in a resettlement colony of Delhi; *Indian J Prev Soc Med*, 2004; 35(1-2):1-9.
11. Venkata Rao T, Ezhil R, Jabbar S, Ramakrishnan R. Prevalence of disability and handicaps in geriatric population in rural South India; *Indian J Public Health*, 2005; 49(1):11-17.

12. Kishore S, Garg BS. Socio-medical problems of aged population in a rural area of Wardha District. *Indian J Public Health*, 1997; 41(2):43-49.
13. Singh VB, Nayak KC, Kataria K, Verma, Jain P, Sidhu D, Kumar V, Verma KK, Agarwal H. Psychiatric co-morbidities in patients attending geriatric clinic at a tertiary care hospital; *Journal of The Indian Academy of Geriatrics*, 2005; 2:65-269.
14. Anil Goswami, Reddiah VP, Kapoor SK, Bir Singh, Dey AB, Dwivedi SN, Kumar G. Prevalence and determinants of cognitive impairment in rural elderly population in India; *Help Age India Research and Development Journal*, 2006; 12(2):8-15.
15. Venkoba Rao A. National Task Force Study on Problems of the aged seeking psychiatric help. ICMR 1987. Mental health status of the elderly. *ICMR Bulletin*, 1996; 26(5).
16. Singh CP. Socio-economic status and health conditions of landless rural aged in Haryana; *Help Age India Research and Development Journal*, 2005; 11(1):7-15.
17. Anil Goswami, Reddiah VP, Kapoor SK, Bir Singh, Singh U, Dey AB, Dwivedi SN, Kumar G. Prevalence and determinants of disability in the rural elderly population in Northern India; *Indian Journal of Physical Medicine and Rehabilitation*, 2005; 16(2):39-44.

A Study of Vancomycin Resistance in Enterococci from Urinary Specimens at a Tertiary Care Hospital in Meerut

Ashutosh Rawat¹, Anita Pandey², Molly Madan²

¹Assistant Professor, ²Professor, Department of Microbiology, Subharti Medical College, Swami Vivekananda Subharti University, Meerut, UP, India

ABSTRACT

Owing to the paucity of information on vancomycin resistance in enterococci from India, in the present study, enterococci isolated from urine specimen were studied for their antibiotic susceptibility & screened for vancomycin resistance.

A total of 106 enterococci isolates obtained in pure and significant numbers ($>10^5$ cfu/ml) from urine specimens were subjected to agar screen method of Clinical & Laboratory Standards Institute (CLSI) for presence/absence of vancomycin resistance. Minimum inhibitory concentration (MIC) was performed by agar dilution method. Antibiotic susceptibility pattern including susceptibility to high level gentamicin (120 µg/ml) was tested by Kirby Bauer disc diffusion method.

Two out of hundred & six (1.9%) isolates were vancomycin resistant enterococci (VRE). Both were *Enterococcus faecalis* with MIC >32 µg/ml. Although the frequency of isolation of VRE is not very high in our setting as compared to West, the problem may just be emerging. All patients with suspected UTI who have significant bacterial counts should be screened for vancomycin resistance.

Keywords: *Enterococci, Vancomycin, Resistance, Urine*

INTRODUCTION

Enterococci are normal human commensals adapted to the nutrient enriched, oxygen depleted, and ecologically complex environments of oral cavity, gastrointestinal tract, and vaginal vault. Until recently these ordinary bowel commensals languished as misclassified streptococci, have now been recognized as the agents of nosocomial infection with increasing frequency.

The role of enterococci as pathogen has become increasingly important, not only because of their documented pathogenic potential but also because of the increasing antimicrobial resistance of some of the strains. Resistance to a number of antimicrobial drugs is characteristic of genus *enterococcus*, although some species are intrinsically more resistant than others. A number of newly acquired mechanisms of resistance have emerged in *enterococcus* species during the past decade, including the high-level aminoglycoside resistance, beta-lactamase production, high level ampicillin resistance. But the most dramatic and

clinically worrisome trend has been the emergence of vancomycin resistant enterococci (VRE). Initially described in United Kingdom, France, Germany and Spain these organisms have rapidly spread to the U.S and other parts of the world becoming a significant clinical problem

Enterococci ranks second only to *E. coli* as a sole agent of nosocomial urinary tract infections¹. There has been significant increase in the rate of isolation of *enterococcus* species from urine specimen, especially from hospitalized patients on indwelling catheters.

Enterococci are intrinsically resistance to cephalosporins, anti-staphylococcal penicillins, low concentration of clindamycin, aminoglycosides and trimethoprim². They are considerably less susceptible to penicillins than streptococci and have developed resistance to most available antibiotics with ability to transfer the resistant determinants to other pathogens. Thus there is urgent need for improved understanding of resistance mechanisms, and the development of alternative treatment and prevention options.

Although the major problem in treatment of vancomycin resistant enterococci (VRE) infection arises in endocarditis, the urinary tract is the commonest site from where

bacteraemia can occur. Therefore this study was planned to have better insight into the resistance pattern of enterococci in urinary isolates.

MATERIALS AND METHOD

A total of 106 isolates of enterococci out of urine samples received in bacteriology laboratory from different wards, outdoor patient departments, intensive care units and nursery were processed.

Each sample was subjected to standard microbiological techniques for isolation and characterization of enterococci on the basis of cultural and biochemical characters according to Faclam & Collins Scheme³. These isolates were then subjected for their antimicrobial susceptibilities.

The antimicrobial susceptibility test was done by Kirby-Bauer disc diffusion method on Muller Hinton agar using commercially prepared antimicrobial discs (Hi-media laboratories). The panel of antibiotics selected for antimicrobial susceptibility testing included erythromycin (15µg), penicillin (10µg), ampicillin (10µg), chloramphenicol (30µg), linezolid (30µg), vancomycin (30µg), teichoplanin (30µg), ciprofloxacin (5µg), tetracycline (30µg), nitrofurantoin (300µg), high content gentamicin (120µg) and levofloxacin (5µg).

Standard control strains of *Staphylococcus aureus* ATCC 25923 & *E. faecalis* ATCC 29212 (vancomycin sensitive) were used. Zones were measured after full 24 hours of incubation. The zone diameters measured around each disc were interpreted on basis of CLSI guidelines⁴ and isolates was reported as susceptible, intermediate and resistant. All intermediate zones were taken as resistant.

High level aminoglycoside resistance (HLAR) was detected by disc diffusion screening method. Isolates with zone diameters of ³10mm are categorized as susceptible. The absence of zone of inhibition corresponds to presence of HLAR. Strains giving d" 7 mm zones were categorized as having high level resistance to aminoglycosides.

Detection of vancomycin resistance was done by agar screen method and confirmation was done by estimation of minimum inhibitory concentraion (MIC) using agar dilution method.

RESULTS

The present study comprised of 106 enterococcal isolates from urine specimens received in the laboratory of Subharti Medical College hospital over a period of one year. All significant isolates were identified presumptively as enterococcus species on the basis of cultural and biochemical characteristics. These isolates were further identified up to species level using various biochemical tests. *E. faecalis* was in 94/106 (88.7%), *E. faecium* in 8/106 (7.5%) & *E. durans* in 4/106 (3.8%) of the enterococcal isolates (Table 1). Most of the enterococci were from surgery ward (33%) followed by paediatric ward (27.4%). Hospital acquired enterococcal infection (75.5%) was higher than community acquired (24.5%) infection (Table2).

Table 1. Enterococcus Species Isolated From Urine Samples (N =106)

Enterococcus species	Number of isolates	Percentage
<i>E. faecalis</i>	94	88.7%
<i>E. faecium</i>	8	7.5%
<i>E. durans</i>	4	3.8%

TABLE 2. Frequency of Urinary Enterococcal isolates from various hospital wards (n=106)

Wards	No. of isolates	Percentage
Surgery	35	33.02%
Paediatric	29	27.4%
Orthopedic	8	7.5%
Gynaecology	3	2.8%
Medicine	5	4.7%
OPD	26	24.5%

As evident from table 3, all 106 isolates were sensitive to teicoplanin. All 8 isolates of *E faecium* were sensitive to quinupristin-dalfopristin. Most of enterococci were resistant for erythromycin (81.13%), levofloxacin (77.35%), tetracycline (75.47%), ciprofloxacin (75.47%) and nitrofurantoin (67.92%), high-content gentamicin (58.49%) and chloramphenicol (52.83%). However only few of them were resistant to ampicillin (26.41%) and penicillin (26.41%). On the contrary most of enterococci were susceptible to linezolid (92.5%).

TABLE 3. Antimicrobial susceptibility pattern of Urinary Enterococcal Isolates (N=106)

Antibiotics	Resistant	Resistant %	Sensitive	Sensitive %
Erythromycin	86	81.13	20	18.87
Levofloxacin	82	77.35	24	22.65
Tetracycline	80	75.47	26	24.53
Ciprofloxacin	80	75.47	26	24.53
Nitrofurantoin	72	67.92	34	32.08
Gentamicin (high content)	62	58.49	44	41.51
Chloramphenicol	56	52.8	50	47.17
Ampicillin	28	26.4	78	73.59
Penicillin	28	26.4	78	73.59
Linezolid	8	7.5	98	92.5
Vancomycin	8	7.5	98	92.5
Teichoplanin	0	0	106	100
Quinupristin-dalfopristin	102	96	4	4

A total of 7 (6.6%) strains showed intermediate susceptibility (zone diameter of 15-16mm) for vancomycin and one was resistant by disc diffusion method. These 8 isolates were subjected to MIC determination by agar dilution method as per CLSI guidelines⁴. Only two showed growth when spot inoculation was done on Brain Heart Infusion (BHI) agar containing 6µg/ml vancomycin and were thus screened positive for vancomycin resistance (Table 4). Six isolates had MIC of ≤ 6µg/ml were sensitive and two isolates showed MIC of >32 mg/ml were resistant to vancomycin (Table 4 & 5).

Table 4. Screening of Vancomycin Resistance by Agar Screen Method.

Test method	No. of isolates tested	Sensitive	Resistant
Agar screen with 6µg/ml Vancomycin	8	6	2

Table 5. Minimum Inhibitory Concentration (MIC) of Vancomycin.

Testmethod	No. of isolates tested	MIC (µg/ml)					
		2	4	8	16	32	>32
Agar dilution	2	-	-	-	-	-	2

DISCUSSION

Enterococci are found in intestine of all animals and humans⁵ and are the second most common cause of nosocomial infection⁶. Out of the 20 or more enterococcal species only *E.faecalis* and *E.faecium* commonly colonize and infect humans in detectable numbers⁷. *E. faecalis* is isolated from 80% of human infections such as nosocomial bacteraemia, surgical wound infection, urinary tract infection, intra-abdominal & pelvic infections, meningitis and device

related infections. *E. faecium* is isolated from most of the remainder. The infection caused by other enterococcal species are rare⁸.

The pathogenesis of infections caused by enterococci has been linked to their increasing antimicrobial resistance⁷.

The present study was based on laboratory findings and included the patients attending the OPD or admitted to SMC hospital during March 2010 to February 2011. A total of 106 clinical isolates were studied for their biotype & resistance pattern.

E. faecalis is the most predominant species among all isolates. Other Indian studies too have recognized *E. faecalis* as the most common species^{9,10}. In contrast in some of the studies *E. faecium* has outnumbered *E. faecalis* isolates reflecting a changing trend owing to more resistant nature of *E.faecium*⁹.

High prevalence of enterococci in hospitalized patients can be attributed to their prolonged stay in hospital, instrumentation, invasive procedures and surgical interventions. Overall comparison showed isolation of 46/86 (53.55%) enterococci from surgical wards and 34/86 (39.5%) from medical wards. These findings were comparable to distribution of enterococci species in hospitals in other studies¹².

Penicillin is the main stay of therapy for infections due to enterococci and the organism developing resistance to this drug has important clinical implications. Despite many such reports mostly from West, we do get fair number of enterococci that are sensitive to penicillin and ampicillin in vitro¹³. In this study 73.5% isolates were sensitive to penicillin & ampicillin each. Prevalence of strains with erythromycin resistance has shown steady increase. Our finding of 81% strains resistant to erythromycin is in accordance to the above fact. erythromycin resistance plasmids and transposons are commonly found in enterococci. Out of the quinolones tested 75.47% were resistant to ciprofloxacin and 77.35% were resistant to levofloxacin. Enterococci is among the least susceptible gram positive bacteria to quinolones¹⁴. Quinupristin-dalfopristin is a streptogramin antibiotic approved by FDA for treatment of infections associated with vancomycin resistant *E.faecium* bacteraemia. Most isolates of *E.faecium* but not of *E.faecalis* are susceptible in vitro. De novo resistance to quinupristin-dalfopristin has been reported¹⁵. All the 8 isolates of *E. faecium* were susceptible to quinupristin-dalfopristin.

Linezolid belongs to new class of synthetic antibiotics called oxazolidinones with good antienterococcal activity. It appears from the previous studies that in vitro selection of resistant mutants does not occur readily. Our finding of 92.5% susceptible & 7.5% resistant enterococci was similar.

High level resistance to aminoglycosides is an alarming problem as this resistance overcomes the synergy of bactericidal therapy in combination with penicillins and glycopeptides. High level gentamicin resistance (HLGR) was observed in overall 58.5% enterococcus isolates. Resistance to high concentrations of aminoglycoside antibiotics is usually mediated by aminoglycoside modifying enzymes and is wide spread among enterococci^{5,14}.

The most recent resistant trait to emerge in enterococci is resistance to vancomycin. In 1988 Uttley et al were the first to report isolation vancomycin resistant enterococci in England. In present study only 2 out of 106 isolates (1.8%) were resistant to vancomycin (MIC>32µg/ml). Both isolates were of *E. faecalis*. First was isolated from an adult male admitted in orthopedic ward whereas second was isolated from a paediatric age group male patient admitted in surgery. Similar to our findings most of the workers have found low rate of vancomycin resistance in their studies. Bhat et al (1997)¹², Jones et al (1995)¹⁶, CDC (1993)¹⁷ & Mac Namara et al (1995)¹⁸ have reported 0% & 0.23 %, 5.6%, 7.9% and 2% VRE respectively. All the isolates were sensitive to teicoplanin including the VRE isolates (van B phenotype).

Antibiotic selective pressure exerted by extensive use of third generation cephalosporins and drugs with potent activity against anaerobes have been reported to predispose to VRE colonization and infection. Though the frequency of isolation of VRE was not very high in our setting compared to the West, it appears that this may just be the beginning of the problem.

Every hospital must have an antibiotic policy in place that should be strictly followed to curb the emergence of resistant nosocomial pathogens like VRE. Since patients with UTI due to VRE can develop difficult to treat life threatening clinical sepsis, screening of symptomatic patients with significant isolates of enterococci obtained in pure culture is recommended.

REFERENCES

- Schaberg DR, Zervos MJ. Intergeneric and interspecific gene exchange in gram-positive enterococci. *Anti Microb Agents Chemother.*1986;30:817-822.
- Murray, B.E. The life and times of the enterococcus. *Clin. Microbiol.Rev.*1990;3:45-65. Facklam RR, Collins MD. Identification of enterococcus species isolated from human infection by a conventional test scheme. *J Clin Microbiol* 1989;27: 731-734.
- Performance Standards for Antimicrobial Disk Susceptibility Tests; Approved Standard- Tenth Edition CLSI document M2-A10. CLSI Wayne, Pa.
- Robert C Moellering Jr: Enterococcus species, *Streptococcus bovis* and *Leuconostoc* species. In: Principles and Practice of Infectious Disease, 5th edition (Mandell GL, Douglas RG, Bennet JE, eds). Philadelphia: Churchill Livingstone, 2000;pp2147-2166
- Low DE, Willey BM, Betschel S, Kreiswirth B: Enterococcus: pathogens of the 90's. *Eur J Surg Suppl* 1994; 573:19-24.
- Facklam RR, Sahn DF and Tiexeira LM: Enterococcus In: Manual of clinical microbiology, 7th editon (Murray PR, Barron EJ, Pfaller MA, Tenover PC, Tenover RH eds). Washington DC ASM press, 1999; pp297-305.
- Huycke MM, Sahn DF, Gilmore MS. Multiple-drug resistant enterococci: The nature of problem and agenda for the future. *Emerg. Infect. Dis.* 1998; 4:239-249
- Desai PJ, Pandit D, Mathur M, A Gogate. Prevalence, identification and distribution of various species of enterococci isolated from clinical specimens with special reference to urinary tract infection in catheterized patients. *Indian Journal of Medical MICROBIOLOGY* 2001;19(3):132-137.
- Randhawa V.S, Kapoor L, Singh V and Mehta G. Aminoglycoside resistance in enterococci isolated from paediatric septicaemia in a tertiary care hospital in north India. *Indian J Med Res* 119 (Suppl) May 2004, 77-79
- Karmarkar M.G, Gershom ES. &. Mehta P. R. Enterococcal infections with special reference to phenotypic characterization & drug resistance. *Indian J Med Res* 119 (Suppl) May 2004, pp 22-25.

12. Bhat KG, Paul C and Bhat MG. Neonatal bacteraemia due to high level aminoglycoside resistance (HLAR) enterococci. *Indian J Pediatr.* 1997; Jul-Aug: 64(4):537-539
13. Jesudason MV, Pratima VL, Pandian R, Abigail S. Characterization of penicillin resistant enterococci. *Ind J Med Microbiol.*1998.16 (1): 16-18
14. Cetinkaya Y, P. Folk and C.Glen Mayhall. Vancomycin Resistant Enterococci. *Clinical Microbiology reviews* 2000: 13; 4; 686–707.
15. Collins, L. A., Malanoski GJ, Eliopoulos GM, Wennersten CB, Ferraro MJ, and Moellering RC. In vitro activity of RP 59500, an injectable streptogramin antibiotic, against vancomycin-resistant gram-positive organisms. *Antimicrob. Agents Chemother.* 1993;37:598–601.
16. Jones, R. N., Erwin M. E., and Anderson S. C. Emerging multiply resistant enterococci among clinical isolates: validation of E test to recognize glycopeptide resistant strains. *Diagn. Microbiol. Infect. Dis.* 1995; 21:95–100.
17. Centers for Disease Control and Prevention. 1993. Nosocomial enterococci resistant to vancomycin—United States, 1989–1993. *Morb. Mortal. Weekly Rep.* 42:597–599.
18. Mac Namara EB, King EM and Smyth EG. A survey of antimicrobial susceptibility of clinical isolates of enterococcus species from Irish hospitals. *J Antimicrobial Chemother.* 1995; 35:185-189.

An Application of Bootstrap Regression Method in Age Dependency Structure to the Community

Atanu Bhattacharjee¹, Hemanta Saikia²

¹Research Scholar, Department of Statistics, Gauhati University, Guwahati, ²Research Scholar, Jawaharlal Nehru School of Management, Assam University, Silchar, Assam

ABSTRACT

The age dependency is an important factor to contribute to the economic structure of a family. In this work, the effect of age dependency on the economic sustainability in the families of Varanasi city has been observed. To deal with small sample size problem the boot strapping method has been used. The relevant calculations are done using the software R. It has been found that the presences of young dependent people make the families economically poor. However, the presences of old age people in the family make it economically sustainable.

Keywords: Bi-Square, Huber Estimator, M-Estimator, Re-Sampling Method

INTRODUCTION

When a relationship is to be established between a dependent variable and independent variable, then an equation relating the dependent to the independent variable is called as simple or bivariate linear regression model. In literature, the variable Y and X have several different names that are used interchangeably. Some of them are, Y is called the dependent, explained, response, predicted or regressand variable and X is called the independent, explanatory, control, predictor or regressor. Multiple regression is an extension of bivariate regression technique which includes several independent variables unlike the bivariate regression. However, there are some assumptions that should have to be fulfilled for bivariate or multiple regression models to be valid. These assumptions are imperative, as it is only under these assumptions that the ordinary least square estimates yield unbiased, consistent and efficient estimates of the unknown parameters. But often it has been seen that these assumptions are not achieved in real life situations. When the regression model does not satisfy the fundamental assumptions, the prediction and estimation of the model may become doubtful. In that case, robust regression can provide an alternative to a least-square regression model when fundamental assumptions are not achieved by the nature of the data.

By 2050 the portion of less than 15 years age group people will drop down to 6% in Asian population and

65 and above age groups will rise to 14.8%¹. So, in both the way the dependency portion of the people in the Asia will increase. The age-dependency ratio can be useful as an important indicator for the population structure in any area. The economic dependences of earning among the population in different geographic location can be compared by the of age dependency ratio. It relates to the number of individuals that are likely to be "dependent" on the support of others for their daily living. The youth and elder peoples in the family who are capable to earn can support the dependent one. The age dependency is the number of individuals aged less than 20 and of those aged 65 over to the population aged 20 to 64 years². The age dependency ratio can be separated in two parts (i) The young-dependency ratio (for individuals aged less than 20) and (ii). The old-age-dependency ratio (for persons aged 65 and more), both can calculate with respect to the number of individuals age between 20 to 64 years. The Organization for Economic Co-operation and Development (OECD) has obtained the age-dependency ratio in Korea and Czech by 55% and above 80% in Mexico. It has also projected that the age-dependency ratio will exceed 100% in the in the country like Japan and Spain by 2050. Kevin et al.³ have discussed and compared the contributing factor for the age dependency. In this work, we have compared the age dependency structure in Varanasi city. The re-sampling procedure has been applied for robust estimation. Here, we have used the bootstrapping technique among different types of re-

sampling methods for robust inference. In this connection it can be stated that Efron et al. ⁴ have elaborated the bootstrap methods with application to Jackknife method.

Objectives of the study

The goals of this work are given below -

- (i) To test if the older age group people really dependent on the younger age or not.
- (ii) To find out if the presence of the older age group people make family more economically sustainable or not.

MATERIAL AND METHOD

The relevant data for the study has been collected from the household survey in the middle class community in Varanasi city of Uttar Pradesh, India. The household selected from the community are from three different centre of the city, i.e. Shivpur, Kabir Chauraha and Bhelupur. The cluster sampling procedure has been adopted to collect the household data. A total of 265 individuals have been interviewed from the 50 households in the mentioned community.

Statistical model

The robust regression becomes useful to deal with heavy tailed error distribution. It is also beneficial when least-square estimation is not suitable. In this connection it can be mentioned that the bootstrapping methods become useful to obtain the confidence interval for non-normal error distribution for the dependent and covariates. However, the bootstrapping is widely accepted tool in nonlinear modelling than linear modelling to obtain the standard errors of the covariates. In the robust regression modelling the M-estimator is efficient to deal with linear model. The model can be explained by⁵

$$y_i = \alpha + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_k x_{ik} + \varepsilon_i = \chi_i \beta + \varepsilon_i \quad (1)$$

If the fitted model can be formulated to,

$$y_i = \alpha + b_1 x_{i1} + b_2 x_{i2} + \dots + b_k x_{ik} + \varepsilon_i = \chi_i^1 b_1 \quad (2)$$

where, b_1, b_2, \dots, b_k are the regression coefficient for the covariates of interest $x_{i1}, x_{i2}, \dots, x_{ik}$ respectively.

Then the M-estimator can be obtained from the objective function

$$\sum_{i=1}^n [\rho(e_i)] = \sum_{i=1}^n \rho(y_i - x_i' b) \quad (3)$$

where ρ is the residual of the objective function. The properties of ρ^6 can be elaborated by

- (i) $\tilde{n}(e) \geq 0$
- (ii) $\rho(e) = 0$
- (iii) $\rho(e) = \rho(-e)$
- (iv) $\rho(e_i) \geq \rho(e_i')$ for $|e_i| > |e_i'|$

From the equation (3), the objective function can be formulated through

- a. Least Square estimator
- b. Huber estimator
- c. Bi-square estimator

Fox ⁶ has discussed the objective function and weighted function for the Least-Square estimator, Huber estimator and Bi-square estimator. In case of Least-Square estimator the objective function and weight function are

$$\rho_{LS}(e) = e^2 \quad (4)$$

$$W_{LS}(e) = 1 \quad (5)$$

The objective function and weight function for the Hu

$$\rho_H(e) = \begin{cases} \frac{1}{2} e^2 & \text{for } |e| \leq k \\ k|e| - \frac{1}{2} k^2 & \text{for } |e| > k \end{cases} \quad (6)$$

$$W_H(e) = \begin{cases} 1 & \text{for } |e| \leq k \\ \frac{k}{|e|} & \text{for } |e| > k \end{cases} \quad (7)$$

The equation for the objective function and weight function to obtain the bisquare estimator can be written as

$$\rho_H(e) = \begin{cases} k^2 & \text{for } |e| \leq k \\ 6 \left\{ 1 - \left[1 - \left(\frac{e}{k} \right)^2 \right]^3 \right\} & \text{for } |e| > k \end{cases} \quad (8)$$

$$W_H = \begin{cases} \frac{k^2}{\left[1 - \left(\frac{e}{k} \right)^2 \right]^2} & \text{for } |e| \leq k \\ 0 & \text{for } |e| > k \end{cases} \quad (9)$$

In the above mentioned equation k is directly related with outlier and is known as a tuning constant. When “ k ” is increases then resistance of the estimator decreases. However, finding the value of ‘ k ’ is not a very complicated matter. To fix the value of “ k ” the least-trimmed squares (LTS) can be useful. If the residuals of the fitted regression model be

$$e_i = y_i - (a + b_1 x_{i1} + b_2 x_{i2} + \dots + b_k x_{ik}) = y_i - x_i' b \quad (10)$$

Then the LTS of the residual is

$$LTS(b) = \sum_{i=1}^m (e^2)_{(i)} \tag{11}$$

where,

$$m = \frac{n}{2} + \frac{k+2}{2} \tag{12}$$

Resampling method

Bootstrap resampling method is an emerging powerful tool for constructing inferential procedures in modern statistical data analysis. It is an alternative to the traditional statistical technique of assuming a particular probability distribution. For example, it would be reasonably common practice to assume that the data are normally distributed. The usual assumption to make about data that are being bootstrapped is that the observations are independent and identically distributed. If this is not satisfied then the bootstrap can be misleading. In order to apply bootstrap, a model must be fitted to the data, including an estimate of the unknown distribution of the unobserved errors (Leger et al.⁷).

Bootstrapping can be easily implemented in R software which is an open source environment and language for statistical computing and graphics. Figure1 shows the comparative picture of the plot between Bi-square and Huber estimate. The boot strapping procedure is useful to obtain the resample from the original data set. In R software, we have used the ‘rlm’ function to obtain the Huber and bi-square estimates. *In order to obtain sample, the re sampling procedure has been adopted to allow the asymptotically distribution of the samples.* As results, it has been found that the value of coefficient for the number of old and number of child are less in place of bi-square estimate or compared to other estimates. In non-linear model, the residuals are assumed to be independent and identically distributed to estimate the standard error for the boot-strapping regression. Let, $T = t(s)$ is statistics to be estimate from the population $\theta = t(P)$. In classical approach, we assume that the parameter of interest distributed as a normal in the population and based on our random sample T to be follows normally distribution. However, it is difficult to assume the distribution of T . To deal with such difficulties T can be assumed to be distributed asymptotically. The bootstrapping is the assumption free approach with respect to population distribution.

In case of nonparametric boot strapping, a sample of size n is drawn from the element of S by sampling with replacement techniques. The estimated sample is

$$S_1^* = X_{11}^*, X_{12}^*, X_{13}^*, \dots, X_{1n}^* \tag{13}$$

In equation (13), the original sample S , may be obtain with replacement procedure. In the sampling procedure it is assumed that the sample S is the true representation of the probability P and each element X_i in S has $1/n$, of selection like the original selection of the sample S from the population P . In this procedure the b^{th} such bootstrapping of the sample can be denoted by

$$S_b^* = X_{b1}^*, X_{b2}^*, X_{b3}^*, \dots, X_{bn}^* \tag{14}$$

The average of the bootstrapping statistics is

$$T^* = \sum_{b=1}^R \frac{T_b^*}{R} \tag{15}$$

The variance and confidence interval can be obtained by

$$V^*(T)^R = \sum_{b=1}^R \frac{(T_b - T^*)^2}{R-1}$$

$$\theta = (T - b^*) \pm Z_{1-\frac{\alpha}{2}} SE^*(T^*)$$

where, $SE^*(T^*) = \sqrt{V(T)}$ and $SE(T^*)$ is the bootstrapping standard error.

In this work, the fitted value of Y_i has been obtained by the expectation of the response variable from the boot strapping sample. In the second stage, the residual for Y_i has been obtained by fixed-x boot.

The assumed hypothesis in this work is the coefficient for the number of child and number of old is same (i.e. $H_0: \beta_1 = \beta_2$). The advantage to use the boot strapping method is that, it provides the statistical inference for the complex sampling design. However, in this work we have assumed that samples are independent but the cluster and stratified sampling scheme has been avoided.

Application

The bootstrapping method has been applied in the primary data on income from the community of Varanasi city. In the classical approach, the ‘rlm’ function has been applied to obtain the covariates coefficient. The applied bootstrapped function has been given in the appendix II. The results obtained from the procedures like Bi-square, Huber and LS are

given on Table 1. The plots obtained from these procedures are given in figure 2. Once the bootstrapping has been done through different argumentation, we plot the boot objectives drawn by a histogram and normal quantile-replication for one of the coefficients. The figure 3 shows the trap of the bootstrap sampling to the coefficient of the number of child and number of old.

Table 1: Estimation of the parameters through LS, Bi-square and Huber method

	Parameter	Value	C.I	t value
LS	(Intercept)	55.42	(67.63,43.20)	0.00
	Child	-1.27	(2.68,-5.22)	0.53
	Old	1.613	(3.09,0.12)	0.44
Huber	(Intercept)	60.10	(77.54,42.65)	6.75
	Child	-1.85	(2.20,-5.90)	-0.89
	Old	0.84	(5.01,-3.33)	0.39
Bi-square	(Intercept)	60.50	(78.57,42.42)	6.56
	Child	-1.90	(2.314,-6.11)	-0.88
	Old	0.77	(5.08,-3.54)	0.35

Findings

The coefficients of the regression parameters for different procedure are not same. The results are given in table 1. The obtained models are like,

for LS, $Income\ Status = 55.42 - 1.27*child + 0.61*Old$

for Huber, $Income\ Status = 60.10 - 1.85*child + 0.84*Old$

for Bi-square, $Income\ Status = 60.50 - 1.90*child + 0.77*Old$

In LS, the coefficients child and old have value (95% C.I.) of -1.27 (2.68,-5.22) and 1.61 (3.09, 0.12) respectively. The posterior mean of autoregressive coefficient r is 0.08 with 95% HPD interval (0.04, 0.22). In Huber, the sampling procedure has been completed by child and old at -1.85 (2.20,-5.90), 0.84 (5.01,-3.33) with a 95% confidence interval on intercept value by 60.10 (78.57, 42.42). The coefficients of bi-square are child and old have the value -1.90 and 0.77 respectively. The graphical display of this method is can be seen in figure 2.

CONCLUSION

In some situations working with nonparametric regression requires more care than parametric

regression. In this problem we used it in the simple independent random sampling scheme but it can be use in other sampling scheme as well. At the time of bootstrapping it is need to take in mind that the way sampling has been done from the population the same need to play at the time to resample from the sample. The analysis of data from small sample size of the cross sectional studies may lead to misinterpretation of the data or, worse, to invalid statistical inferences on the significance of certain factors. With the use of bootstrapping, which is easy to implement and gives efficient estimates for the regression coefficients with small sample size, the effective covariates may be under estimate or over estimate. However, bootstrapping gives scope to obtain appropriately accounted for the inferential procedures. Thus, it can be concluded that the income level of the community of Varanasi is sustainable due to the presences of old persons in the family. The presence of more children makes the family economically poor. The older age people are not dependent on the younger age people in the family.

ACKNOWLEDGEMENT

The authors would like to thank Dr. T.B.Singh, Professor, Division of Biostatistics, Banaras Hindu University for his supervision to collect the data. The authors are also thankful to Dr. Dibyojyoti Bhattacharjee, Reader, Department of Business Administration, Jawaharlal Nehru School of Management, Assam University, Silchar; for his help while preparing the paper.

REFERENCE

1. Nair PS, Chacko AT, Nair S. Age Structural Transition in South Asia: Economic Consequences [Internet]. 2009 [cited 2011]. Available from: www.iussp2009.princeton.edu/download.aspx?submissionId=91038
2. Parks K. Text book of Preventive and Social Medicine. Jabalpur, India: Bhanot Publishers; 2006.
3. Kevin Kinsella and David R. Phillips. Global Aging: The Challenge of Success. Population Bulletin 2005; 60(1) [cited 2011]. Available from: <http://secamlocal.ex.ac.uk/people/staff/dbs202/cag/courses/MT37C/course/node13.html>

4. Efron B. Bootstrap Methods: Another Look at the Jackknife [Internet]. *The Annals of Statistics* 2005; 7(1):1-26.
5. Huber PJ. Robust Estimation of a Location Parameter [Internet]. *Annals of Mathematical Statistics* 1964; 35:73-101 [cited 2011]. Available from: <http://www.oecd.org/dataoecd/4/24/38148786.pdf>
6. John Fox. Robust Regression, 2002[cited 2011] Available from: <http://cran.r-project.org/doc/contrib./Fox-Companionappendix-robust-regression.pdf>.
7. Leger C, Politis DN, Romano JP. Bootstrap Technology and Applications [Internet]. Technical Report 1991; 54-91 [cited 2011]. Available from: <http://www.oecd.org/dataoecd/4/24/38148786.pdf>.

Candida rugosa - An Emerging Cause of Nosocomial Candidemia

Bornali Sarmah Dutta¹, Ajanta Sharma², N K Hazarika³, Purnima Barua⁴

¹Demonstrator, Department of Microbiology, ²Associate Professor, Department of Microbiology, ³Professor & HOD Department of Microbiology, Gauhati Medical College & Hospital, ⁴Assistant Professor, Department of Microbiology, Jorhat Medical College & Hospital, Assam, India

ABSTRACT

Fungemia is usually nosocomial and develops in the setting of antimicrobial therapy, cancer chemotherapy, bowel surgery or the use of intravenous plastic catheters. Here we report a case of intravenous catheter associated fungemia caused by *Candida rugosa*. Multiple samples of blood and catheter tip were cultured on Blood Agar, Sabouraud's Dextrose Agar media. Morphology was studied on Corn Meal Agar and HiChrome Candida Differential Agar. The isolate was further confirmed by biochemical tests and Mini API (bioMerieux, Etoile, France). The strain was also confirmed by molecular analysis in reference centre. Antifungal susceptibility test was done following M-44A Clinical and Laboratory Standard Institute (CLSI) guidelines. The isolate was labeled as *Candida rugosa*. The isolate was sensitive to nystatin and itraconazole. The patient expired subsequently despite antifungal therapy. *Candida rugosa* may represent an emerging pathogen associated with invasive medical procedures causing serious systemic infection and associated with high mortality rates.

Keywords: Blood stream infection, Nosocomial, *Candida rugosa*, Diabetes mellitus

INTRODUCTION

The epidemiology of invasive fungal infection has changed along with a tremendous increase in the frequency of candidemia during the last two decades.¹ Currently, candidemia is the fourth most frequent nosocomial bloodstream infection (BSI) in United States of America, accounting for 8-15% of all hospital acquired BSI.²

C. rugosa has been rarely reported as a human pathogen and is a rare agent of candidemia. It is associated with a very high mortality rate despite antifungal therapy.³

Diabetes mellitus is considered as an important risk factor for candidemia. The clinical course of candidemia is more severe in patients with diabetes mellitus. Therefore, there is a pressing need to improve the outcome of candidemia, especially among the patients who are at high risk for candidemia. Here we report a case of candidemia due to *Candida rugosa* in a critically ill female patient with diabetes mellitus.

CASE REPORT

A 60 year old female patient was admitted to a tertiary care hospital with history of decreased

mentation and abnormal movements of the body of two days duration. Her medical history was remarkable for Type 2 Diabetes Mellitus and hypertension. The patient was on oral hypoglycemic and antihypertensive drugs. Examination revealed severe pallor and a peripheral blood pressure of 200/100 mm of Hg. Systemic examination revealed a Glasgow Coma Scale (GCS) score of 8/15 with bilateral extensor plantar reflexes. Her investigations revealed Hb-7.2g/dl, Total Leucocyte Count of 11,000/mm³ (88% neutrophils, 10% lymphocytes, 2% monocytes), ESR- 50mm AEFH, RBC count of 2.10x10⁴/mm³, Random Blood Sugar-37mg/dl, HbA_{1c}10, Serum sodium-148mmol/L, Serum potassium-4.8mmol/L, Serum calcium-8.7mol/L, Serum creatinine-1.6mg/dL. The patient was hospitalized with a diagnosis of hypoglycemic coma. She underwent volume repletion with intravenous dextrose and mannitol infusion. Antimicrobial therapy was initiated with Ceftriaxone (1g BD). The hospital course of the patient was complicated by several febrile episodes, leukocytosis and the patient was subsequently shifted to Intensive Care Unit (ICU) seven days after admission. Repeated blood culture yielded *Escherichia coli* sensitive to

Piperacillin+Tazobactam. Examination of the cerebrospinal fluid did not reveal any abnormality. The antimicrobial therapy was modified by adding Piperacillin+Tazobactam (4.5gm thrice daily). The clinical course of the patient did not show any marked improvement even after treatment with antibiotics for seven days while the serum glucose level kept rising in due course of time. Fifteen days after admission in the ICU, patient had developed severe respiratory distress and a further decrease in the GCS score (4/15) was observed following which she was intubated. A repeat blood culture was carried out.

Blood was collected aseptically from two different sites in two sets of Brain Heart Infusion broth and incubated at 37°C and 25°C. It was then subcultured into Blood Agar, Sabouraud's Dextrose Agar with chloramphenicol (0.05mg/mL). Culture revealed growth of *Candida* species characterized by white, creamy, wrinkled colonies. (Fig-1) Repeated blood culture along with culture of the intravenous catheter tip yielded similar results. The germ tube test was negative. Growth on HiChrome Candida Differential Agar (HiMedia Laboratories, Mumbai, India) revealed



Fig. 1. *C.rugosa* colonies on SDA with chloramphenicol.

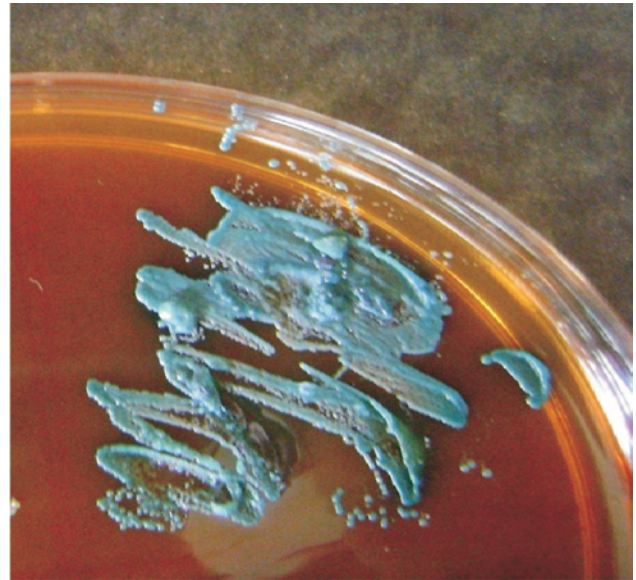


Fig. 2. Pale blue colonies of *C.rugosa* in HiChrome Candida Agar.

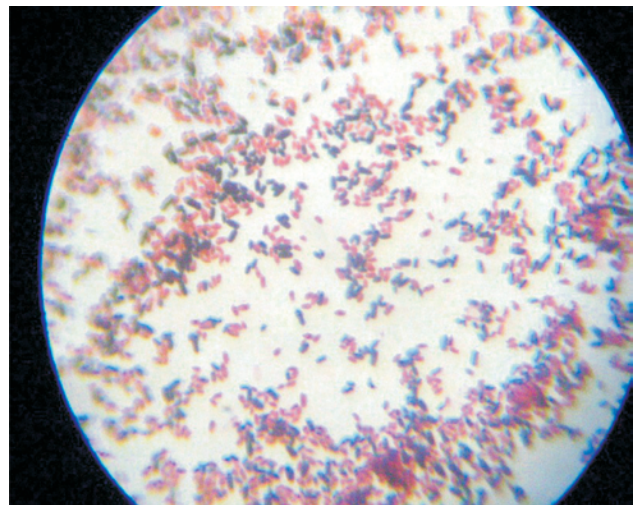


Fig. 3. Gram Stain showing Gram variable yeast cells (X1000).

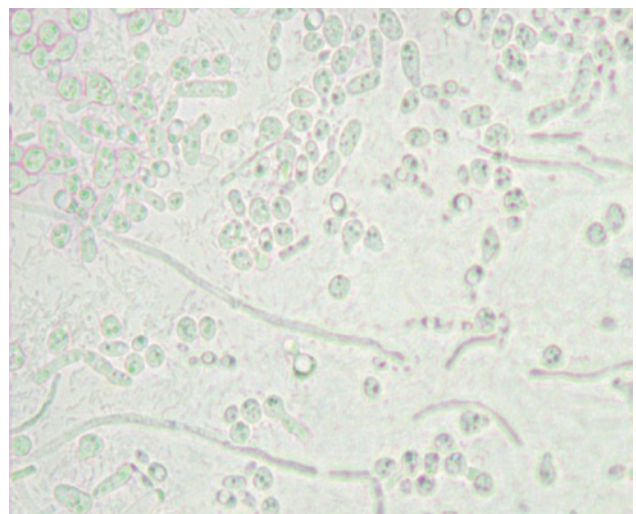


Fig. 4. *C.rugosa* in CMA with Tween 80 (X400).

pale blue colonies. (Fig-2) Gram stained smear showed Gram variable yeast cells. (Fig-3) Morphology on Corn Meal Agar with Tween 80 showed the presence of hyphae and blastoconidia in typical arrangement. (Fig-4) Using standard procedure, sugar fermentation and assimilation test was carried out. The isolate fermented glucose, xylose and galactose and assimilated glucose, galactose and xylose.⁴ Based on these findings the isolate was labeled as *Candida rugosa*. Diagnosis was further confirmed by using Mini API (ID 32C system; bioMérieux, Etoile, France). Molecular analysis of the strain carried out at the Post Graduate Institute of Medical Education And Research (PGIMER), Chandigarh, also revealed the strain to be *Candida rugosa*.

Antifungal susceptibility was done by disk diffusion method following M44-A Clinical and Laboratory Standard Institute (CLSI) guidelines, isolate was sensitive to nystatin and itraconazole. *Candida krusei* ATCC 6258 was used as reference strain,⁵ The patient was put on itraconazole 200mg once daily, but expired after the first dose.

DISCUSSION

Although quite rare as a cause of invasive fungal infections, *Candida rugosa* has been cited as a possible "emerging fungal pathogen". Fungemia due to this species was unrecognized prior to 1985, when catheter-related fungemia was reported in two different institutions in the United States⁶. Since then various studies conducted in different regions have shown that, the incidence of BSI due to *C. rugosa* varies from 5%-18.4%.^{3,7} Very limited data on *C. rugosa* bloodstream infection is available from India. A prospective laboratory based surveillance study done in a level I trauma centre in North India reported that *C. rugosa* accounted for 18.4% of the isolates from BSI⁷. This shows that the frequency of *C. rugosa* as a cause of candidal infection has been increasing. With the increase in number of immunocompromised individuals worldwide, an ever increasing number of previously rare species, such as *C. rugosa* are truly emerging as opportunistic pathogen.

The source of infection in our patient can be explained by the isolation of *Candida rugosa* from the catheter tip and bloodstream on repeated culture. Various reports suggest that, *C. rugosa* may cause catheter-related fungemia in seriously ill patients.³

Our isolate was susceptible to nystatin and itraconazole. A study conducted during a period between 1997 to 2003 investigated on the susceptibility pattern of *Candida rugosa* from different geographical locations, and reported decreased susceptibility pattern of the fungus to fluconazole with varying susceptibilities to voriconazole.⁸

In addition to the apparent emergence of *Candida rugosa* as a cause of clinical infection, there also seems to be a trend towards the emergence of resistance to fluconazole and voriconazole over time.⁸ Furthermore, the isolates obtained from blood cultures demonstrated the highest level of resistance to both agents. This is a matter of concern and thus reinforces the importance of identifying the isolates of *Candida* causing BSI along with understanding of the epidemiology and associated risk factors. The presence of azole resistance among the isolates necessitates a routine antifungal susceptibility testing of the isolates to institute an early and appropriate antifungal agent for treating the patients to curtail the mortality rate.

ACKNOWLEDGEMENT

The authors gratefully acknowledge Dr Arunaloke Chakrabarti, Professor, Dr M.R. Shivaprakash, Additional Professor, Mrs Sunita Gupta, Senior Laboratory Technician, Mycology Division, PGIMER, Chandigarh for doing the molecular typing of the isolate.

Conflict of Interest: Nil

REFERENCES

1. Morse SS. Factors and determinations of disease emergence. *Revue Scientifique et Technique*. 2004; 2:443-446.
2. Kao AS, Brandt ME, Pruitt WR et al. The epidemiology of candidemia in 2 United States cities: results of a population-based active surveillance. *Clin Infect Dis* 1999; 29: 1164-70.
3. Ostrosky- Zeichner L, Rex J, Bennet J, Kullberg B. Deeply invasive candidiasis. *Infect Dis Clin* 2002; 16: 821-35.
4. Milne LJR. Fungi. In: Collee JG, Fraser AG, Marmion BP, Simmons A.(eds) Mackie & Mc Cartney Practical Medical Microbiology. 14th edition. London, Churchill Livingstone, 1996:695-717.
5. Clinical and Laboratory Standards Institute. Method for antifungal disk diffusion

- susceptibility testing of yeasts. Approved Guideline. Document M 44-A CLSI. 2004; 24 (15), Wayne PA.
6. Pfaller MA, Diekema DJ. Rare and emerging opportunistic fungal pathogens: concern for resistance beyond *Candida albicans* and *Aspergillus fumigatus*. *J Clin Microbiol.* 2004; 42:4419-4431.
 7. Singh RI, Xess I, Mathur P, Behera B, Gupta B, Misra MC. Epidemiology of Candidemia in critically ill trauma patients: Experiences of a level I trauma centre in North India. *J Med Microbiol.* 2010; DOI: 10.1099/jmm.0.023739-0.
 8. Pfaller MA, Diekema DJ, Colombo AL et al. *Candida rugosa*, an emerging fungal pathogen with resistance to Azoles: Geographic and temporal trends from the ARTEMIS DISK antifungal surveillance program. *J Clin Microbiol.* 2006; 44:3578-3582.

A Study of Prevalence and Associated Factors of Uterus Prolapse in Doti District of Nepal

Damaru Prasad Paneru

Lecturer (Public Health), School of Health and Allied Sciences, Pokhara University, Kaski Nepal

ABSTRACT

Background: Uterus Prolapse is a condition in which uterus drops down from its normal position. In extreme stages, it out of the vagina; which constitute a widespread chronic problem in hilly regions of Nepal. Objective of the study was to estimate the prevalence of uterus prolapse and its associated factors in Doti district of Nepal.

Methodology: This was community based cross sectional study; conducted among the 360 women of the Doti district who were undergone a pregnancy at least once during her life. Three stage probability sampling procedure was adopted. Face to face interview was conducted with respondents using pre-tested, structured interview schedule. Data were analyzed by statistical package for Social Sciences (16 Version). Percentage, mean, were calculated and Chi Square test and R2 tests were applied.

Results: Nearly half of the respondents were over age 35 years with one in every five belongs to age group 21-25 years; and 33.3% were dalits/schedule castes. Majorities (75%) of the respondents were illiterate and housewives. Nearly 96% of the respondents were married before 20 years of age. Literacy status, caste, age of respondents, age at marriage, parity and time to resume work after delivery were independently and significantly associated with Uterus prolapse ($p < 0.05$) where strongest variation was observed due to parity. Moreover, the type of delivery at first, second, third and fourth child birth, age at marriage, numbers of children, parity, age at first child births were observed to be strongly associated factors; that explained 40 percent variations in Uterus prolapse.

Conclusions: Illiterates and high parity women were suffered greatly from the Uterus prolapse. Women's empowerment, limiting frequent pregnancies and provision of educational opportunities are recommended for the prevention of uterus prolapse.

Keywords: *Uterus prolapse, Prevalence, Associated factors, Treatment*

INTRODUCTION

World Health Organization estimates that the global prevalence of reproductive ill health accounts for 33 percent and genital prolapse 2-20 percent among the women of under age 45 years.¹ Pelvic organ prolapse is a very common condition, may also be called Uterus prolapse, genital prolapse or uterovaginal prolapse.² This is widespread chronic problem among women in Nepal; particularly in hill areas. More than one million Nepali women suffer from Uterus prolapse and the majorities of them belong to the reproductive age group.³ Uterus Prolapse do not makes the distinction between young and old women, and it is observed among adolescents to old as eighty years.⁴

Medically, four stages of Uterus Prolapse are defined as: Stage I: Descent of the uterus to any point in the vagina above the hymen, Stage II: Descent to the hymen- descends of uterus in pressure and goes back to position if manual support is given, Stage III: Descent beyond the hymen- descends frequently and continuously and Stage IV: Total aversion or procidentia.⁵⁻⁷ A woman presenting with the complaints with either one or more of the following signs and symptoms: A feeling of fullness or pressure in pelvis and vagina especially when standing for long periods of time, increased discomfort on strain, coughs, bear down or lift, feeling of incomplete voiding of urine, recurrent bladder infections was considered "Uterus prolapse" case.⁸ This study was conducted to estimate the prevalence of uterus prolapsed and to identify factors the associated with Uterus prolapse in Doti district of Nepal.

MATERIALS AND METHOD

This was the community based cross-sectional study; conducted in Doti district of Nepal during November 2009 to April 2010. Women who have experienced pregnancy at least once during her life span constituted the sample population. The existing condition of prolapse was identified by self reported history of at least two of the following complaints: Feelings of something coming down per vagina or feeling of pressure or protrusion or bulge, backache or dragging pain in the pelvis, difficulty in passing urine and stool and sitting or excessive white or blood stained discharge per vagina.

Three stage random sampling was followed for study. At the first stage, the whole district (50 Village Development Committees and one Municipality) was divided into in five clusters plus a municipality cluster on the regional basis; having ten VDCs in each cluster. Two VDCs from each of the cluster was selected randomly in the second stage. Third stage involved the selection of three wards from of each of the selected VDC by lottery method. Thus, there were 60 respondents from each cluster, 30 from each selected VDC, 10 from each of the selected wards were chosen to account 360 desired respondents for the study. Sample population was determined by:

$$n = z^2pq/d^2$$

Where, letters have their usual meanings. Value of Z at 95% CI = 1.96 (two tail test). $p = 0.25$, $q = 1 - p$, $d = 5\%$

Data were collected by trained female enumerators using structured pre-tested questionnaire by face to face interview. Collected data were analysed using SPSS (16 Version). Descriptive statistics (percentage, mean and median); and Chi square and R^2 were applied to observe association.

FINDINGS

Demographic information of Respondents

Nearly half of the respondents were over age 35 years with one in every five belongs to age group 21-25 years. Three out of every four were illiterates. Almost all got married before 20 years of age. Majorities (69.4%) underwent their first pregnancy and child birth between 16- 20 years. About a quarter of women experienced e"6 pregnancies during their lives. (Table 1)

Table 1: Demographic Information (n= 360)

Respondents by Age

Age Group (In years)	Frequency	Percent
16-20	14	3.9
21-25	73	20.3
26-30	62	17.2
31-35	47	13.1
>35	164	45.6
Literacy		
Illiterate	257	71.4
Literate	103	28.6
Age at Marriage (in years)		
10-15	150	41.7
16-20	199	55.3
21-25	11	3.1
Age at First Child Birth (in Years)		
<16	38	10.6
16-20	250	69.4
21-25	68	18.9
26 or more	4	1.1
Parity (Numbers)		
5 and below five	260	72.2
6-10	93	25.9
11 and more	7	1.9

Uterus prolapse related information

Of 360 respondents, 303 were found to have understandings of Uterus prolapsed. Those who have understanding, only they were included for further analysis and the association was observed among them.

Table 2: Uterus prolapse related information

Respondents by status of Uterus Prolapse (n= 303)		
Yes	109	35.97
No	194	64.03
Symptoms (N= 109, Multiple responses)		
Feeling of something coming down	107	98.17
Bleeding/ spotting	49	44.95
Difficulty in sittings and walking	98	89.91
Backache	109	100
Whitish discharge	53	48.62
Pain abdomen/pain in waist region	107	98.17
Difficulty in passing stool and urine	26	23.85
Visible bulging or protrusion Per vagina	57	52.29

Almost 36% women had some degree of uterus prolapse and visible protrusion was reported among 52% prolapse cases; suggesting the stage of complication. All the respondents reported backache,

something coming down per vagina and pain around the waist region (> 98%) as major symptoms experienced by them.

Factors associated with Uterus prolapse

There was very high level of association between age of the respondents, parity, time to resume work after delivery and existing disease status during the post-partum period and the Uterus prolapse as depicted in table 3.

Table 3 Factors associated with Uterus prolapse

Education status				
Literacy	Uterus Prolapse		Total	Test (P value)
	Yes	No		
Illiterate	88(80.73)	127(65.46)	215	x ² (P = 0.005)
Literate	21(19.27)	67(34.54)	88	
Total	109(100)	194(100)	303	
Caste				
Brahmin	7 (33.33)	14 (66.67)	21 (100)	x ² (P<0.05)
Chhetri	52 (30.95)	116 (69.05)	168 (100)	
Dalit	46 (48.42)	49 (51.58)	95 (100)	
Others	4 (21.05)	15 (78.95)	19 (100)	
Total	109 (35.97)	194 (64.03)	303 (100)	
Age of Respondents				
16-20	0 (0)	13(6.7)	13	x ² Value 28.932 (P = 0.000).
21-25	12 (11)	50 (25.77)	62	
26-30	14(12.84)	41(21.13)	55	
31-35	16 (14.67)	22 (11.34)	38	
>35	67(61.46)	68(35.05)	135	
Total	109(100)	194 (100)	303	
Parity				
1.00	4 (3.67)	29 (14.95)	33 (10.89)	x ² value 58.963 (p =.000)
2.00	11(10.09)	39(20.10)	50(16.50)	
3.00	14 (12.84)	40(20.62)	54(17.82)	
4.00	11 (10.09)	30 (15.46)	41(13.53)	
5.00	15(13.76)	23(11.86)	38(12.54)	
6.00	12 (11.01)	19 (9.79)	31(10.23)	
7.00	16 (14.68)	9(4.64)	25(8.25)	
8 or more	26 (23.85)	5(2.58)	31(10.23)	
Total	109(100)	194	303(100)	
Resume works after delivery				
immediately after delivery (< 42 days)	101(92.66)	150 (77.31)	251(82.83)	Fisher's Exact Test (P<0.05)
After six weeks of delivery	8(7.34)	44 (22.68)	52(17.17)	
Total	109 (100)	194 (100)	303(100)	

Figures in the parenthesis indicate percentages of the respective frequency

The relative contribution of each factor and combined effects were measured by coefficient of

multiple determinations (R²); indicating that type of delivery at first, second, third and fourth child birth, age at marriage, numbers of children, parity of women, age at first child birth have had 40% attribution as depicted in table 4.

Table 4. Effects of Variables on Uterus Prolapse

Independent variables	R ² Value (%)
Parity of women	18.6
No. of Children	12
Type of delivery at first, second, third and fourth child birth, age at marriage, No. of children, parity of women, age at first child birth	40
Age at marriage, parity of women, type of delivery at first, second, third and fourth child birth	39.7

Treatment related information

Only less than four out of every ten patients received services against uterus prolapse; majority of them were under medical treatment followed by use of ring pessary (32.50%) as shown in table 5.

Table 5: Treatment of Uterus Prolapse (n= 109)

Treatment received status	Frequency	Percent
Yes	40	36.70
No	69	63.30
Type of treatment received		
Ring Pessary	13	32.5
medicine intake on advice of health workers	23	57.5
Surgery/operation	4	10

DISCUSSION

Majorities of the respondents in this study were more than 35 years age followed by 20-25 years with median age 35 years. Large numbers of (71.40%) of respondents were illiterate. Most of the respondents got married before the 20 years of age. About eight out of every ten delivered their first child before 20 years age life. These evidences are somehow corresponding with national scenario of Nepal.

Prevalence of Uterus prolapse was reported to be 35.97 percent. Deuwa et al and Bonetti et al also reported the prevalence of Uterus prolapse 33.00% and 25.00% in western districts of Nepal; of them 95% were self reported cases respectively.^{8,9} The prevalence of Uterus prolapse was estimated to be 37.00% in Sarlahi and Siraha; district indicating that that the burden of Uterus prolapse among the Nepalese women is still high.

All women with Uterus prolapse explained the backache followed by feeling of heaviness or something coming down per vagina and pain around the waist region (>98%) as major manifestations. Visible protrusion of prolapsed contents was reported by more than half of prolapse cases; showing the greater degree of severity of prolapse. Other commonly experienced symptoms include bleeding or spotting per vagina, whitish watery discharge, Painful sexual act, stool and urinary incontinence and difficulty in weight lifting and sitting or walking. Rortveit et al, Thapa, Bonetti et al and CAED reports also revealed similar findings that difficulty in weight lifting, and sitting, walking, protrusion of pelvic contents per vagina, painful sexual act, pain in low abdominal area, pelvic pain, and urinary incontinence etc were common manifestations of uterus prolapse.^{3,4,8,10}

Pant reported that about 11% have had onset of uterus prolapse before the age of 25 years and nearly half of the respondents with a prolapse were married before 15 years of age.¹¹ CAED report revealed that 22.2% Acchami women reported the onset of Uterus Prolapse before 20 years of age and 43.80% have had onset between 20-29 years age.⁴ Most of the prolapse cases were belongs to illiterate groups (80.73%) and almost all with the prolapse got married before the age of 20 years. Gurung et al. reported that more than 50.00% Uterus prolapse cases were due to early marriage, early pregnancies and bearing many children (major predictors) of Uterus prolapse and Kumari found significantly higher prevalence among women with higher parity in her study.^{12,13}

Resuming work immediately after delivery (within 42 days of delivery) i.e. postpartum period was strongly associated with the onset of Uterus prolapse. Pant observed that majorities of Bishwokarma/dalits (95.27%) and Brahmin (91.09%) women were resumed to work soon following delivery respectively.¹¹ Marahatta identified that 64.3% respondents resumed their work after one month of child birth and 26.7% started to work within 2-3 weeks of delivery.² The reported disorders during pregnancy and after deliveries were whitish discharge urine retention typhoid piles, bleeding pain abdomen Muscle cramps in legs, gastric pain coughing burning urination, chest pain, headache, fever, swelling of legs and body parts.

This study identified that higher numbers of parity have strongest attribution. The cumulative effects of type of delivery at first, second, third and fourth child birth, age at marriage, numbers of children, parity of

women, age at first child birth have was observed to be the strongest accountings for 40 percent variation due to these factors. Similarly, 39.70 % variation was due to low age at marriage; parity, type of delivery at first, second, and third and fourth child birth followed by 38.90% contribution was due to type of delivery at first, second, third and fourth child birth parity cumulatively.

Out of every ten, nearly four respondents with Uterus prolapse received services for prolapse Most of them had taken medical treatment on advice of health workers followed by use of ring pessary (32.5%) and one in out of every ten have had surgical treatment. Kumari found that 57.00% patients having Uterus prolapse had not taken any services. Of those who received services, only 27% consulted doctors for the treatment.¹³

Conclusion and recommendations

The prevalence of Uterus prolapse was estimated to be 35.98%. Almost all (98.17%) reported that feeling of something coming down or protrusion from vagina as most frequently experienced symptom followed by difficulty in sittings and walking(89.91%). Various factors as literacy status, caste, age of respondents, age at marriage; parity, associated diseases after delivery significant contribution for Uterus prolapse and the strongest variation was observed due to parity of women. Less than 40% had received treatment of Uterus prolapse and most of the service recipients were taking medicines as advised by health workers followed by ring pessary as treatment methods. Mobile health clinics should be organized as short term and medium term strategies and encourage early identification and of prolapse through preventive services.

ACKNOWLEDGEMENTS

Author is thankful to the study participants & research advisor - Dr Samjhana Dhakal, MD (Gyne & Obs). He is grateful to Nepal Health Research Council for the financial support.

Conflict of Interest : None

REFERENCES

1. IOM/UNFPA. Status of reproductive morbidities in Nepal [A reproductive morbidity on clinic based study]. Tribhuwan University, Maharajgunj, Kathmandu 2006.

2. Marahatta RK, Shah A. Genital prolapse in women of Bhaktapur, Nepal. *Nepal Med Coll J.* 2003 Jun; 5(1):31-3
3. S. B Thapa. Uterus Prolapse: Prevalent among Nepalese women who were deprived of general health services. Booklet on Uterus Prolapse; received through Sancharika Samuha Nepal) the Kathmandu Post. 2007-05-08; 21:56:13.
4. Uterus Prolapse Study Report. Center for Agro-Ecology and Development, Nepal 2007.
5. D.C Dutta. A text book of Obstetrics. 3rd Edition, 2005.
6. Park. K. Text book of Preventive and social Medicine. 19th edition. M.S Banarasidas Bhanot 1167, Premnagar, Jabalpur 482001, India, 2007.
7. Shirish N. Daftron. A Mannual of Obstetrics. 2nd edition, 2002 ISBN-818147013
8. Bonetti TR, Erpelding A, Pathak LR. Listening to "felt needs": investigating genital prolapse in western Nepal. Health Sector Support Programme, German Agency for Technical Cooperation (GTZ), Nepal. *Reproductive Health Matters.* 2004 May; 12(23):166-75.
9. Deuwa A. et al Uterus Prolapse: Prevalent among Nepalese women. Safe motherhood network, Kathmandu , 2004.
10. Rortveit G, Brown JS, Thom DH, Van Den Eden SK, Creasman JM, Subak LL. Symptomatic Pelvic organ Prolapse: Prevalence and risk factors in Population based, Racially diverse cohort. *Obstetric Gynecology,* 2007 Jun: 109(6): 1396-403 (Available from www.pubmed.com)
11. Pant PR. Utero- Vaginal Prolapse in Far western region of Nepal. *Journal of Institute of Medicine,* august 2009; 31:2:19-21.
12. Gurung G, Rana A, Amatya A, Bista DK, Joshi AB, Sayami J. Pelvic organ prolapse in rural Nepalese women of reproductive age groups: What makes it so common? *N. J. Obstet. Gynaecol* 2007 Nov-Dec; 2 (2): 35 - 41
13. Kumari S, Walia I, Singh A. Self reported Uterus Proplase in a resettlement colony of North India. *Journal of Midwifery Women's Health,* 2000 July – August (4): 343- 50. (Available from www.pubmed.com).

Incidence of Metabolic Syndrome and Diabetes Mellitus in Raipur City of Chattishgarh State- A Preliminary Study

Dhananjay Yadav¹, Shweta Tarar², Neha Ghosh³, R P Tiwari⁴, PS Bisen⁵, GBKS Prasad⁶

¹Research Scholar at School of Studies in Biochemistry, Jiwaji University Gwalior, Madhya Pradesh, ²MSc Student, Pt. Ravishankar Shukla University Raipur, ³Research Scholar at School of Studies in Biochemistry, Jiwaji University Gwalior, Madhya Pradesh, ⁴Scientist R & D Division, RFCL, Okhla Industrial area, New Delhi, ⁵Emeritus Scientist School of Studies in Biochemistry & Biotechnology, Jiwaji University Gwalior, Madhya Pradesh, ⁶Professor & Head, School of Studies in Biochemistry & Biotechnology, Jiwaji University, Gwalior, India

ABSTRACT

Metabolic syndrome (MS) is a cluster of metabolic abnormalities and serves as a precursor of cardiovascular disorders (CVD). The objective of the study was to determine the prevalence of MS and its association with Diabetes mellitus (DM) in an urban setup of Raipur city of Chattishgarh State. A cross sectional study was conducted on 400 randomly selected subjects (men 186, women 214 of age group 10-80 years) in the study region. Anthropometric variables, blood pressure, and lipid profile were monitored besides blood glucose in the study population. The incidence of MS and DM were worked out as per the criteria of National Cholesterol Education Programme-ATPIII (NCEP-ATPIII) and World Health Organization. The incidence of MS was found to be 15% and 5% by ATPIII and WHO criteria respectively. According to NCEP-ATPIII criterion, women recorded significantly high incidence of MS (65%) as compared to males (35%). About 28% of subjects with MS exhibited type II DM (males 16.6% and females 11.6%). On the other hand, the incidence of type II DM was found to be 6.7% in non-metabolic syndrome group of subjects as per NCEP-ATPIII criterion. By WHO criteria, 65% of the subjects with MS exhibited type II DM (males 35% and females 30%) while the incidence is 6.9% in non-metabolic syndrome group of subjects. Subjects in age group of 41-65 years showed the highest incidence of MS irrespective of the criteria employed. The incidence of MS differed significantly by the two criteria employed and it was more by NCEP-ATP-III criteria. The prevalence of type II DM was significantly high in subjects with metabolic syndrome and it was more in males of age group of 41-65 yrs.

Keywords: Diabetes Mellitus, Metabolic syndrome (MS), Hyperlipidemia, Hyperglycemia, Blood Pressure

INTRODUCTION

MS is a cluster of metabolic abnormalities that includes glucose intolerance, hypertension, elevated triglycerides, low HDL cholesterol, and obesity¹. Subjects with MS are at increased risk of developing DM² and CVD³. Type II DM, itself is a syndrome involving insulin dysfunction in conjugation with gross abnormalities in glucose homeostasis and lipid

metabolisms affecting several millions of population all over the world⁴. Studies have reported the rising prevalence of IGT, diabetes and associated risk factors in urban India. It is estimated that approximately 33 million adults in India have diabetes now a days and the number is likely to increase to 70 million by 2025⁵. The studies have also reported greater insulin resistance, higher body fat, higher plasma insulin levels in Indians as compared to Europeans^{6,7}. The major risk factors of type II diabetes includes obesity, particularly abdominal obesity and higher body fat mass besides family history and thus the MS. Recent studies emphasize the impending nature of worldwide MS and diabetes epidemic^{8,9} attributed mainly to sedentary life styles coupled with unhealthy eating habits.

Corresponding author:

Dhananjay Yadav

C/o Prof. GBKS Prasad

School of Studies in Biochemistry

Jiwaji University, Gwalior, India - 474 011

Phone : 09584709268

E.mail: dhanyadav16481@gmail.com

MATERIALS & METHOD

Study region and selection of subjects:

The study was conducted in randomly selected population (n=400) of Raipur city of Chattishgarh State. The subjects in the age range of 10-80 years were selected for the study and information's such as age, sex, life style, family history of diabetes and other diseases/disorders were recorded. The subjects were categorized into four groups i.e Adolescent (13-19 Year), Young adult (20-40 Year), Middle adult hood (41-65 Year), and Maturity (>65 year) on the basis of age factor¹⁰.

Anthropometric measures: Height, weight and waist circumferences were also measured with the subject barefooted and lightly dressed. The abdominal circumference (waist) was measured at the end of expiration by wrapping the tape at the level of the umbilicus. Body Mass Index (BMI) was calculated as weight (Kg) divided by height (m) squared (kg/m²).

Blood sample collection: Blood samples were collected from each subject and plasma was separated by centrifuging blood at 2000rpm for 10 min and analyzed immediately for fasting blood glucose by glucose oxidase-peroxidase method¹¹, Total cholesterol, triglycerides and HDL-C were analyzed by CHOD-PAP¹²; by GPO-PAP Trinder¹³ and phosphotugstic acid method¹⁴respectively

Diagnostic criteria of type II diabetes mellitus: The DM was diagnosed as per the following criteria of American Diabetes Association¹⁵

- Subjects with fasting plasma glucose level of 126 mg/dl or higher.
- Subjects with postprandial glucose level of 200 mg/dl or higher.

Criteria of the metabolic syndrome: MS was diagnosed according to the criteria of the NCEP-ATP-III¹⁶ or WHO¹⁷.

NCEP-ATP III criterion

Subjects with any combination of three or more of the following components were considered having MS:

- Waist circumference >102 cm for men and >88 cm for women.
- Plasma triglycerides \geq 150 mg/dl.

- HDL cholesterol < 40mg/dl for men and < 50mg/dl for women.
- Blood pressure \geq 130/ \geq 85 mm Hg (using non-physicians electronic Blood Pressure machine)
- Fasting plasma glucose \geq 110 mg/dl.

WHO Criterion

The WHO definition of 1999 includes impaired glucose regulation or diabetes and or insulin resistance. The term impaired glucose regulation was taken into include, i.e. impaired fasting blood glucose; IFG =110-125 mg/dl impaired tolerance; IGT = (140-199 mg/dl) and or DM; FBG \geq 126, as well as two or more of the following components:

- Elevated arterial blood pressure \geq 140/90 mmHg.
- Raised plasma triglyceride (\geq 150 mg/dl).
- Low HDL-cholesterol, (<35 mg/dl for men and <39 mg/dl for women).
- Central obesity (WHR: >0.90 for men and >0.85 for women) and/or BMI (>30 kg/m²).
- Microalbuminurea (urinary albumin excretion rate \geq 20 min or albumin: creatinine ratio \geq 30 mg/g).

Statistical Analysis: Data were analyzed using one-way ANOVA (Bonferroni t-test) employing Sigma Stat, Statistical software, Version 1.0.

Findings

The incidence of MS as per the aforesaid criteria viz. NCEP-ATP III and WHO among the study population in Raipur City was found to be 15% and 5% respectively (Fig.1). High incidence of MS was

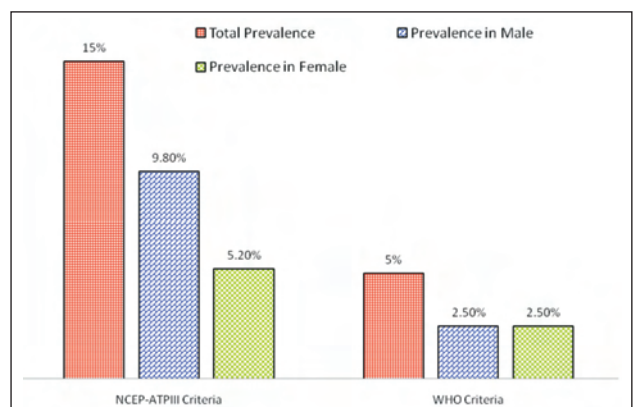


Fig. 1. Incidence of metabolic syndrome by NCEP-ATP III & WHO criteria.

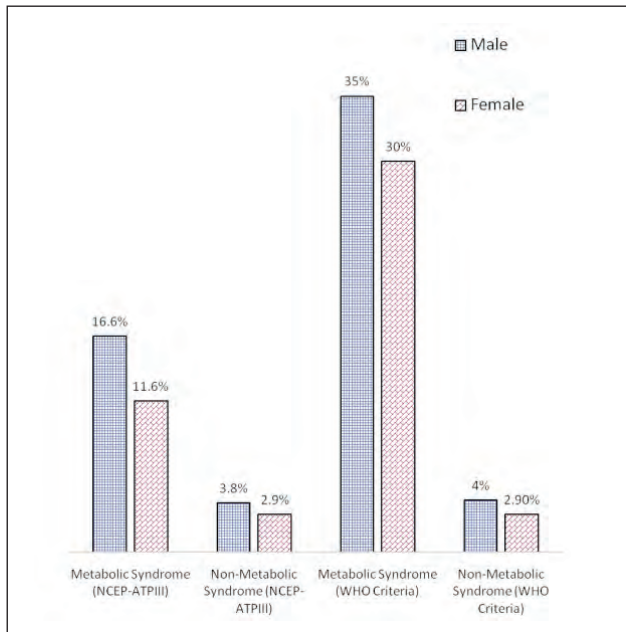


Fig. II. Prevalence of type II diabetes mellitus among subjects with metabolic syndrome.

recorded in the age group of 20-65 years (Table-I) irrespective of the criteria employed. About 75% of subjects with MS as per ATP III criterion exhibited high blood pressure and 76.6% exhibited hypertriglyceridemia ($P \leq .001$) (Fig.3). In MS group, the incidence of diabetes was high in males by any of the criterion. The incidence of type II DM in the study population was significantly ($P \leq .05$) high among the subjects with MS (28%) as compared to that of non-metabolic syndrome group (6.7%). Among the subjects

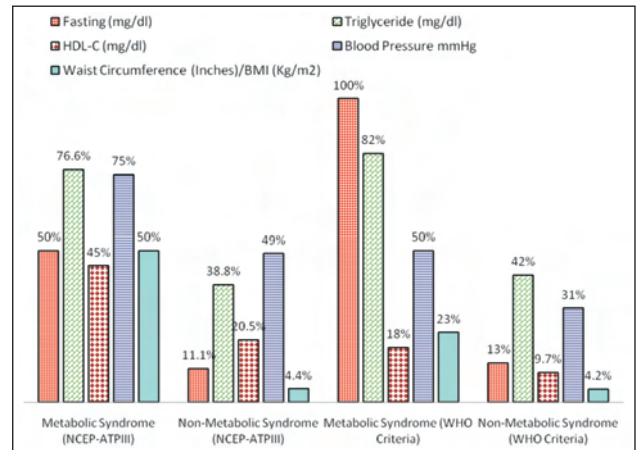


Fig. III. Percentage of subjects showing variation in Biochemical parameters by NCEP-ATPIII and WHO Criteria.

with type II DM in MS group 85% had elevated ($P \leq .001$) blood pressure and 71% exhibited hypertriglyceridemia. The variation in biochemical parameters of metabolic and non metabolic syndrome groups is shown in Fig 3. Age wise variation in biochemical parameters of study population is presented in Table II. Middle adulthood age group (41-65 years) showed high elevations in BMI, blood pressure, triglycerides and showed the highest incidence of MS irrespective of the criteria employed. Elevations in blood glucose, triglyceride, blood pressure and lowering of HDL-C are significantly higher in subjects of MS as compared to non-metabolic syndrome.

Table I. Prevalence of metabolic syndrome in different age group using WHO & NCEP-ATPIII criteria

Age groups	WHO Criteria	NCEP-ATPIII Criteria
Adolescent (13-19years) (n=20)	5.5%	1.7%
Young Adult (20-40years) (n=226)	33.4%	38.3%
Middle Adulthood (40-65years) (n=132)	55.5%	55%
Maturity >65years (n=20)	5.5%	5%

Table II. Biochemical parameters of study population

Age Group	Waist Circumference (Inches)	BMI (Kg/m2)	Fasting blood glucose (mg/dl)	Blood Pressure (mmHg)		Triglyceride (mg/dl)	HDL-C (mg/dl)
				Systolic	Diastolic		
Adolescent (13-19years) (n=20)	28.8±5.7	19.9±5.4	82.6±14.4	124.7±8.6	83.5±6.1	156±63.8	60.6±20.9
Young Adult (20-40years) (n=226)	31.6±4.5	21.6±3.8	88.6±22.3	136.7±17.8	90.7±13.6	154.1±70.5	61±18.4
Middle Adulthood (40-65years) (n=132)	32.7±5.9	23.5±4.7	103.1±40.6	138.5±19.7	86.7±11.1	161±59.5	62.2±19.3
Maturity >65years (n=20)	32.3±6.2	23.1±4.7	102.8±45.4	137.1±16.7	90.8±17	147.1±39.1	59.8±26.1

By WHO criterion, 44.4% of subjects with MS exhibited high blood pressure and 83.3% exhibited hypertriglyceridemia (Fig. 3). The incidence of DM was high (65%) among the subjects with MS as compared to that of non-metabolic syndrome group (6.9%). The subjects with MS as well as DM exhibited significantly high levels of ($P \leq .001$) triglyceride (86%), and blood pressure (57%).

There is a significant association between DM and MS characterized by significantly elevated levels of triglycerides, fasting blood glucose, central obesity etc. in this study population. Patients with MS are often characterized by abnormal lipid profile and there is an appearance of hypertriglyceridaemia and small dense LDL-C, together with low HDL-C¹⁸. Diabetes and hypertension frequently coexist, and their combination furnishes additive increase in the risk of life-threatening cardiovascular events¹⁹. Similar studies made in the Tehran population²⁰ reported hyperlipidemia in about 69% and hyperglycemia in 11% of subjects with MS. The overall incidence of type II DM among study population was found to be 10% in Raipur city. The study of Indian National Urban Diabetes Survey reported²¹ 13.5% type II diabetes prevalence in Chennai, 12.4% in Bangalore, 16.6% in Hyderabad, 11.7% in Kolkata, 9.3 % in Mumbai and 11.6% in Delhi.

CONCLUSION

The present study on limited population of Raipur city recorded high incidence of MS associated with type II DM. The fact that a significant portion of subjects with MS exhibited dyslipidemia in association with DM & Blood Pressure indicates that they are at high risk of CVD. Identifying subjects with MS and high risk of CVD is the prerequisite for working out preventive strategies. Though the study confined to limited population, this is the report of prevalence of DM and MS at Raipur city of Chhattisgarh State in India.

ACKNOWLEDGEMENTS

The study was supported in part by research grants from University Grants Commission, New Delhi and DRDO, New Delhi and there is no conflict of interest among the authors.

There is no conflict of interest among authors

REFERENCES

1. Alberti KG, Zimmet P, Shaw J: The metabolic syndrome—a new worldwide definition. *Lancet* 2005; 366:1059-1062.
2. Haffner SM, Valdez RA, Hazuda HP, Mitchell BD, Morales PA, Stern MP. Prospective analysis of the insulin-resistance syndrome (syndrome X). *Diabetes* 1992; 41:715-722.
3. Isomaa B, Almgren P, Tiinamajja T, Forsen B, Lahti K, Nissen M, Taskinen MR, Groop L. Cardiovascular Morbidity and Mortality Associated With the Metabolic Syndrome. *Diabetes Care* 2001; 24:683-689.
4. Wang J, Thornton JC, Heymsfield SB, Pierson RN Jr. The relationship between body mass index and body cell mass in African-American, Asian, and Caucasians adults. *Acta Diabetol.* 2003; 40:305-308.
5. King H, Aubert RE, Herman WH. Global burden of diabetes 1995-2025: prevalence, numerical, estimates, and projection. *Diabetes Care* 1998 ;21:1414-31.
6. Chandalia M, Abate N, Garg A, Stray-Gundersen J, Grundy SM. Relationship between generalized and upper body obesity to insulin resistance in Asian Indian men. *J Clin Endocrinol Metab* 1999; 84:2329-2335.
7. Joshi SR. Metabolic Syndrome-emerging clusters of the Indian phenotype. *J Assoc Physicians India* 2003; 51:445-446.
8. Murray CJ, Lopez AD. Mortality by cause for eight regions of the world: global burden of disease study. *Lancet* 1997; 349:1269-1276.
9. Mokdad AH, Bowman BA, Ford ES, Vinicor F, Marks JS, Koplan JP. The continuing epidemics of obesity and diabetes in the United States. *JAMA* 2001; 286:1195-2000.
10. Martin Briner, Erik Erikson page, 1999, on Briner's site about learning theories, USMA Department of Mathematical Sciences, Center for Assessment and Program Evaluation (CAPE), United States Military Academy at West Point. Accessed 24 November 2006.
11. Trinder P. Determination of glucose in blood using glucose oxidase with an alternative oxygen acceptor. *Annal Clin Biochem* 1969; 6: 24-27.
12. Deeg R, Ziegenhorn J. Kinetic enzymatic method for automated determination of total cholesterol in serum. *Clin Chem* 1983; 29:1798-802.
13. Trinder P. Triglyceride estimation by GPO-PAP method. *Ann Clin Biochem* 1969; 6:24-7.
14. Burstein M, Scholnick HR, Morfin R. Rapid method for the isolation of lipoprotein from

- human serum by precipitation with polyanions. *J Lipid Res* 1970; 11:583-7
15. American Diabetes Association Diagnosis and Classification of Diabetes Mellitus *Diabetes Care* 2004; 27:S3-S10.
 16. National Institutes of Health: Executive Summary. In Third Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adults Treatment Panel III), *JAMA* 2001; 285:2486- 2497.
 17. Alberti KGMM, Zimmet PZ, for the WHO consultation. Definition, diagnosis and classification of diabetes mellitus and its complication. Part 1. Diagnosis and classification of diabetes mellitus. Provisional report of a WHO consultation. *Diabet Med* 1998; 15:539-53.
 18. Erbas T. Metabolic syndrome. *Acta Diabetol* 2003; 40:401-404.
 19. Mancia G. The association of hypertension and diabetes: prevalence, cardiovascular risk and protection by blood pressure reduction. *Acta Diabetol* 2005; 42:17-25.
 20. Ghoddusi K, Ameli J, Kachuee H, Pourfarziani V, Saadat A, Karami Q. Association of diabetes mellitus and dyslipidaemias in the Tehran population. *Eastern Mediterranean Health Journal* 2008; 14:647-653.
 21. Ramachandran A, Snehalatha C, Kapur A, Vijay V, Mohan V, Das AK. High prevalence of diabetes and impaired glucose tolerance in India: National Urban Diabetes Survey. *Diabetologia* 2001; 44:1094-1101.

Limb Body Wall Complex- A Rare Case Report

Dhananjaya B S¹, Kokila S¹, Sunil Kumar Nanda², Nanda Gopal³, Rachel Mathew⁴

¹Associate Professor, Dept of OBG, ²Assistant Professor, Dept of Biochemistry, ³Professor and Head, Dept of OBG,

⁴Postgraduate Student, Dept of OBG, Sri Siddhartha Medical College, Agalakote, BH Road, Tumkur, Karnataka

ABSTRACT

Body stalk anomaly or Limb Body Wall Complex (LBWC) is rare and fatal developmental polymalformation, with at least two of the following features: exencephaly and facial clefts, thoraco and/or abdominoschisis (midline defect) and limb defect with an incidence of one in 14,000 to 1 in 75,000 pregnancies. A 25 year old gravida two, abortion one presented at 20 weeks of gestation with an ultrasound report showing abdominal wall defect with herniated abdominal contents floating in amniotic fluid, gross thoraco-lumbar kyphoscoliosis, multiple vertebral anomalies, right clubfoot and continuous juxtaposition of fetus to placenta. Pregnancy was terminated to expell a live male abortus (250gm) with placenta. Fetal autopsy confirmed clinical and scan diagnosis of LBWC.

Keywords: Limb Body Wall Complex, Polymalformation, Abdominoschisis

INTRODUCTION

Body stalk anomaly or Limb Body Wall Complex (LBWC) is rare and fatal developmental polymalformation, with at least two of the following features: exencephaly and facial clefts, thoraco and/or abdominoschisis (midline defect); and limb defect,¹ with an incidence of one in 14,000 to 1 in 75000 pregnancies.² This case report illustrates the sonographic, pathologic and x-ray findings in a large body stalk malformation.

MATERIALS AND METHOD

A 25 year old gravida two, abortion one presented at 20 weeks of gestation with an ultrasound report showing abdominal wall defect with herniated abdominal contents floating in amniotic fluid, gross thoraco-lumbar kyphoscoliosis, multiple vertebral anomalies, right clubfoot and continuous juxtaposition of fetus to placenta. She had spontaneous abortion of grossly normal fetus at 18 weeks gestation two years back. There was no relevant medical or drug history. After informed consent, pregnancy was terminated to expell a live male abortus (250gm) with placenta. Fetal autopsy confirmed clinical and scan diagnosis of LBWC (fig- 1 and 2) and revealed situs inversus; hydrocephalus; low set ears; merocardia (central heart), anterior abdominal wall defect-extending from sternum to suprapubic region, evisceration of liver, stomach and intestines, Subhepatic caecum, right clubfoot, absent left half of

pelvis and lower limb, hypospadiasis, empty scrotal sacs, saccrococcygeal teratoma and broad short umbilical cord (2cm) connecting fetus tightly to the placenta. Fetal karyotype was 46 XY and fetogram findings are shown in figure 3.



Fig. 1. Situs inversus, hydrocephalus, low set ears; anterior abdominal wall defect, evisceration of liver, stomach and intestines, Subhepatic caecum, right clubfoot, absent left half of pelvis and lower limb, hypospadiasis, empty scrotal sacs.



Fig. 2. Gross thoraco-lumbar kyphoscoliosos, absent left half of pelvis and lower limb, sacrococcygeal teratoma.



Fig. 3. The X-ray examination demonstrates hypoplasia of the thorax, spinal kyphoscoliosis, lumbosacral hemivertebrae, right clubfoot and absent left lower limb.

FINDINGS

Pregnancy was terminated to expell a live male abortus (250gm) with placenta. Fetal autopsy confirmed clinical and scan diagnosis of LBWC (fig-1) and revealed situs inversus; hydrocephalus; low set ears; merocardia (central heart), anterior abdominal wall defect-extending from sternum to suprapubic region, evisceration of liver, stomach and intestines into the pseudo sac of amnion; Subhepatic caecum with appendix, lobulated left kidney, bladder dimpling, gross thoraco-lumbar kyphoscoliosos, right clubfoot,

absent left half of pelvis and lower limb, hypospadias, empty scrotal sacs, sacrococcygeal teratoma and broad short umbilical cord (2cm) connecting fetus tightly to the placenta. Fetal karyotype was 46 XY and fetogram findings are shown in figure 2.

ACKNOWLEDGEMENT

We thank the management of sri Siddhartha Medical College for their support in conducting the research work..

DISCUSSION

Rapid growth of embryo during 4th-5th week causes body folding. The formation of head, tail and two lateral folds separates the intra from the extra-embryonic coelom forming primitive gut and anterior part of diaphragm. The body stalk on ventral part of embryo, elongates to form umbilical cord. These malformations occur sporadically without sex predisposition, due to germ disc defect, causing abnormal body folding, with persistence of the extraembryonic celomic cavity, lateral body-wall defect (thorax, abdomen or both), evisceration of abdominal organs into amnioperitoneal sac, lower or upper limb reduction and short or absent umbilical cord, kyphoscoliosis (Aplasia or hypoplasia of thoracolumbar musculature).⁴ Etiology is unknown. Cocaine abuse,² early amnion rupture with early embryonic blood flow compromise are attributing causes. The various phenoypes depend on the degree of aberrant development of each of the four folds. Body stalk anomaly is usually diagnosed during the second trimester transvaginal ultrasound by characteristic findings as in the above case or for evaluation of an elevated maternal serum á-fetoprotein. It may be associated with central nervous system, cardiac, urogenital, placental abnormalities; midfacial clefts, limb defects and amniotic bands. It is difficult to diagnose during first trimester due to physiological mid-gut herniation. Similar cases have been reported by Yaprak Engin Üstün, Djakovic A.^{1, 4} It should be differentiated from other similar conditions like pentalogy of Cantrell (cephalic body fold defects-anterior diaphragmatic hernia, ectopia cordis, sternal cleft, cardiac defects, upper midline omphalocele), caudal body fold defect (bladder exstrophy, imperforate anus, partial colonic agenesis, single umbilical artery, hypogastric omphalocele), amniotic

band syndrome (limb deformities - amputations and constrictions without internal malformations, kyphoscoliosis and short umbilical cord), extra-amniotic pregnancy, gastroschisis (paramedian abdominal wall lesion with herniation of visera into the amniotic fluid without covering membrane and normal umbilical cord insertion) and omphalocele (median herniation of the intestines into the umbilical cord). Although it's a fatal anomaly few babies have been saved. It's important to distinguish body stalk anomaly from other anterior wall defects to determine their prognosis and management options. Prenatal diagnosis of this anomaly would permit the early termination of pregnancy or avoidance of surgical intervention.

Conflict of Interest : There are no conflict of interest

REFERENCES

1. Yaprak Engin Üstün, Yusuf Üstün, Ilgýn Türkçüođlu, Aybe Kafkaslý, Zercan Kalý.. Prenatal Diagnosis of Body Stalk Anomaly: A Case Report. Ýnönü Üniversitesi Týp Fakóltesi Dergisi 2007; 14(4): 257-259
2. C. PAUL, N. ZOSMER, D. JURKOVIC and K. NICOLAIDES. A case of body stalk anomaly at 10 weeks of gestation. Ultrasound Obstet Gynecol 2001; 17: 157- 159
3. Djakovic A, Blissing S, Vólker HU, Dietl J. Body stalk anomaly-a case report on a rare congenital defect. Zentralbl Gynakol 2006; 128(6):369-71.
4. J. M. Martinez, A. Fortuny, C. Comas, B. Puerto, A. Borrell, M. Palacio, O. Coll. Body stalk anomaly associated with maternal cocaine abuse. Prenatal Diagnosis 1994; 14(8): 669-672.

A Community Based Study on the Prevalence of Disability and Rehabilitative Services Provided to the Disabled Person in the Rural Area of Tamil Nadu

Bayapa Reddy N¹, A Piramanayagam², Pallavi Madithati³, Nagarjuna Reddy N⁴, R K Singh⁵, Sai Narasimhareddy Chandamuri⁶

¹Assistant Professor (Community Medicine), Chennai Medical college Hospital and Research Center, Trichy, Tamil Nadu, ²Associate Professor (Community Medicine), Chennai Medical college Hospital and Research Center, Trichy, Tamil Nadu, ³Tutor (Biochemistry), ⁴Junior Resident, (Paediatrics), Kanchi Kamakoti Child Trust Hospital Chennai, Tamil Nadu, ⁵Assistant Professor (Community Medicine), Chennai Medical College Hospital and Research Center, Trichy, Tamil Nadu, ⁶Junior Resident, (Paediatrics), Kanchi Kamakoti Child Trust Hospital Chennai, Tamil Nadu

ABSTRACT

Background: In the past three decades, the concept of disability has shifted from individual impairment to a more social phenomenon. Thus disability became a complex phenomenon. It is social problem where the disabled population become a liability to the society. Interventions usually included medical rehabilitation and the provision of social assistance. Poverty can cause disability with its associated malnutrition, poor health services, improper sanitation, unsafe living and working conditions.

Objective:

1. To assesses the socio demographic distribution of disability.
2. To study the pattern and extent of rehabilitative services provided to the disabled persons in rural area of Tamil Nadu.

Materials and Method: A community based cross-sectional study was conducted between August 2010-and December 2011 in randomly selected 19 villages of Lalgudi Taluk of Trichy district Tamil Nadu state, India.

Method: The age group of population between 5- 70 years were included. The minimum sample size was 15600. After adding the non response error of 5% another 780 people were added and total studied population was 16,404 at the field practice area of Valadi a Rural Health Training Centre (RHTC), of Chennai Medical College Hospital and Research Centre, Trichy. Data were analysed by means, proportions and Chi-Square test.

Results: In the study area it was noticed that overall disability rate was 0.85%, and both male and female disability rate was almost same (0.8%). The studied population comprised of Hindu (82.4%), Christians (12.8%) and Muslims (2.8%). The community status of studied population majority 86 (61.4%) were belonging to Backward category (BC). The physical status of disability showed the majority of them were locomotor type (44.2%) followed by mental disorder (27.8%), Deaf & Dumb (13.5%), and Visual (10.0%). Majority of the disabilities were due to the congenital causes 85 (60.7%), second most common cause was accident 29 (20.7%). Out of 140 disabled, only 61 (43.5%) were assisted with financial support, and remaining 79 (56.5%) were not supported by any type of assistance.

Conclusion and Recommendation: Disability has emerged as an important public health problem in our study area. There is a large gap found between the felt need of the disabled and service provided to them by the government and other organizations. There is a need for community assistance and community based rehabilitation (CBR).

Keywords: Disability, Rehabilitative Services, Community Based Rehabilitation (CBR), Tamil Nadu

INTRODUCTION

Disability has often been defined as any restriction or lack (resulting from an impairment physical, mental, or psychological) of ability to perform an activity in the manner or within the range considered normal for a human being to lead a normal life. In the past three decades, the concept of disability has shifted from individual impairment to a more social phenomenon. Thus disability becomes a complex phenomenon. It is a social problem where the disabled population becomes a liability to the society. Interventions usually include medical rehabilitation and the provision of social assistance. Poverty can cause disability with its associated malnutrition, poor health conditions and improper sanitation, unsafe living and working conditions, professional and accidental. Conversely, the presence of disability can push people in a life of poverty because of so many barriers the disabled people face difficulties to lead normal daily routine work, to taking part in education, employment, social activities, and indeed all aspects of daily life. Studies showed that ten percent of the world population suffers from various disabilities (WHO).¹ In India, however, varying prevalence (1-4%)² has been reported in different geographical areas and around 80% of the disabled population resides in rural areas. In developing countries, it was estimated that not more than 2%-3% of the disabled were benefit from rehabilitation services.

MATERIALS AND METHOD

A community based cross-sectional study was conducted between August 2010 and December 2011 in a randomly selected 19 villages of a Lalgudi Taluk in Trichy district, Tamil Nadu state, India, the study group was between the age group of 5- 70 years. The minimum sample size was calculated with $4pq/l^2$ by taking into consideration of average prevalence rate

of disability in India (2.5%) with precision of 10%, the sample size comes to 15600. After adding the non response error of 5% another 780 population was added. Finally the studied population was 16,404 in the field practice area of Rural Health Training Centre at Valadi, Chennai Medical College Hospital & Research Centre, Trichy. The data were collected with the help of pre-tested interview schedule by making enquiry by house-to-house survey. In this study, "Disability" was taken into account when any routine 'activity limitation' was reported by the respondents. For the Visual disability complete loss of vision was taken in to account and complete Hearing loss for Deaf. Heads of the families were asked about the presence of any type disability (locomotor, visual, speech, auditory, mental, etc.) among the family members. The domains in the interview schedule included personal, geographical economical, social, causes of disability, family profile, presence of disability, details of disability (origin, duration and severity), effect of disability on the daily routine life of the respondent, details of treatment sought, rehabilitation provided by the different agencies and the dependency status of the disabled. The data were tabulated and statistically analyzed using percentages, means and chi-square test.

RESULTS

Out of 16404 Subjects, 140 individuals were found to be disabled. In the study area it was noticed that overall disability rate was 0.85%, and the disability rate among both male and female was almost same (0.8%). The studied population comprised of Hindu (82.4%), Christians (12.8%) and Muslims (2.8%). Among the studied population Backward Category (BC) was 86 (61.4%) followed by Scheduled Category 49 (35.0%) and only Five (3.5%) belonged to Open Category (OC). Majority (44.2%) of the disabled were of locomotor type followed by mental disorder (27.8%), Deaf & Dumb (13.5%), and Visual (10.0%). The disability of Deaf and dumb alone accounts for 1.4% respectively. Single disability was found to be 85% and only 15% were having multiple disability. The Mean age of the disabled population was 37 years with male : female ratio is 1 : 1.08, a total of 67 females with average age of 37.6 yrs (median 35yrs) and a total of 73 males with average age of 36.5 yrs (median 35yrs).

Corresponding author:

Bayapa Reddy

Assistant Professor

Dept of Community Medicine

Chennai Medical College Hospital and Research Center, Irungalur, Trichy-621105, Tamil Nadu, India

E mail: bayapreddy916@gmail.com

Mobile: +919486400865

Table 1: Distribution of study population based on Age and Sex

Age group	Sex				Total	
	Male Total= 8295		Female Total= 8109			
	Number	%	Number	%	Number	%
10-May	3	4.10%	0	0%	3	2.10%
20-Nov	9	12.30%	15	22.30%	24	17.10%
21-30	22	30.10%	15	22.30%	37	26.40%
31-40	10	13.60%	9	13.40%	19	13.50%
41-50	11	15.00%	9	13.40%	20	14.20%
51-60	11	15.00%	13	19.40%	24	17.10%
61-70	7	9.50%	6	8.90%	13	9.20%
Total	73	100%	67	100%	140	100%
Socioeconomic status						
social class IV	15	20.50%	14	20.80%	29	20.70%
social class III	26	35.60%	25	37.30%	51	36.40%
social class II	28	38.30%	21	31.30%	49	35.00%
social class I	4	5.40%	7	10.40%	11	7.80%
Total	73	100%	67	100%	140	100%

χ^2 value: 0.128 p value : 0.72 NS the distribution of study group was not significant difference between male and female.

Majority of the disabilities were due to the congenital causes 85 (60.7%), second most common cause was accident 29 (20.7%), other causes were 26 (18.5%). Most of the mental disorders (39) and Deaf & Dumb (19) were due to congenital (genetic causes) 32 (82.0%) and 19 (100.0%) respectively.

Table 2: Distribution of study population based literacy status

Type of Disability	Illiterate	Primary	Secondary	Higher secondary	Degree	Post graduate	Total (%)
Deaf	1	0	1	0	0	0	2 (1.4%)
Deaf & Dumb	11	0	8	0	0	0	19 (13.5%)
Dumb	1	0	1	0	0	0	2 (1.4%)
Locomotor	16	6	26	10	2	2	62 (44.2%)
Mental	27	4	6	2	0	0	39 (27.8%)
Multiple Organ	2	0	0	0	0	0	2 (1.4%)
Visual	9	0	2	3	0	0	14 (10.0%)
Total	67 (47.9%)	10 (7.14%)	44 (31.4%)	15 (10.7%)	2 (1.4%)	2 (1.4%)	140(100.0%)

Literate was considering as per the WHO norms.

The literacy rate of the general population in rural Tamil Nadu was 80.3%. Among the disabled population the literacy rate was 52.1% and the difference of literacy status among male and female of the general population of Tamil Nadu was 12.7%, which was almost same among the disabled population. Details of dependency were given in Table-3.

Table 3: Distribution of study population based their Dependency status

Dependency	Types of disabilities							Number (%)
	Deaf	Deaf & Dumb	Dumb	Locomotor	Mental	Multiple Organ	Visual	
Minimal	2	11	1	29	6	0	7	56 (40.0%)
Mild	0	7	1	10	4	0	2	24 (17.1%)
Moderate	0	1	0	13	16	0	3	33 (23.5%)
Fully	0	0	0	10	13	2	2	27 (19.2%)
Total	2	19	2	62	39	2	14	140 (100.0%)

Out of 140 disabled only 61 (43.5%) were assisted with financial support, and majority of the remaining 79 (56.5%) were not availing any type of assistance.

Among the deserted group majority were illiterates 42.1% (27). In the remaining deserted group (10) 15.1% were have primary education. Among the 61

supported, majority of them were getting assistance from the government 53 (86.8%), only five (8.1%) were assisted by NGO, only two (3.2%) were receiving pension from their employer and One (1.6%) person got the insurance of INR 50,000/. Among the fully dependent only one (3%) got the three wheeler cycle by the Government, and four persons (12%) were using three wheeler cycles by self financing.

DISCUSSION

The objective of the present study is to analyze the prevalence of disabled population in rural pockets of Tamil Nadu in different socio- demographic distribution and of different types of disability. The overall prevalence of disability in this study was 0.85%. But in other studies the prevalence was much more. In National Sample Survey Organisation's comprehensive surveys on disability, estimated 21 millions of disabled persons (roughly around 2 percent of the population)³ World Bank Report⁴ on disabled persons in India, has observed the prevalence of disability between 5 to 8% one or other reasons. In another study conducted in Chandigarh, it was reported that the prevalence of disability was 1.8%.⁵ This variation may be due to the different criteria they followed. In this study the statement of either the individual or house hold was taken into account for this study. And complete loss of vision was taken into account for visual disability and complete Hearing loss for Deaf. In others studies <6/60-3/60 visual acuity for visual disability, and 26-40 Db for hearing disability criteria was followed.

The average age of disabled was 37 years (median 35) and there was no gender difference in the prevalence of disability. The prevalence of disability was maximum between 21 -50 years. Same results were found in population census of 2001.⁶ This study found that locomotor type of disability was commonest disability followed by mental disorder. The prevalence of disability was highest (73.9%) among the Middle class (Social Class II & III) and lowest in social class I. The same results were found in the similar study conducted in Karnataka.⁷ Mental disabilities were the highest in the early ages and younger working age population. Whereas visual and hearing disabilities were the highest in the aged, and the onset of visual and hearing disabilities were higher in the older age

groups. Similar findings were recorded in other studies also, but they found that disability was predominant among females.⁸⁻¹⁰ In this study Literacy rate was 52.1% among the disabled people, which is much lower than the general population (80.3%). Literacy rate was the highest among the locomotor type of disability whereas the lowest rate was seen among mentally disabled. Similar findings were reported in a study conducted in Kerala.¹¹

The findings of the study showed that majority of the disabled opt for some kind of aid. Similar study conducted in Tamil Nadu found that 98% of the visually disabled did not use spectacles, and only 1.5% of them expressed the need for spectacles. According to our study, only 6.4% of the disabled were employed in contrast to 26% at the national level.¹²

Conclusions and Recommendations

The Constitution of India ensures equality, freedom, justice and dignity of all individuals and implicitly mandates an inclusive society for all including persons with disabilities. Very little importance and care have been given for the disabled persons and a policy decision is felt need of the hour to help and sustain the rehabilitation activity of disabled. There is a large gap between the felt need and service provided to this category. Hence there is need for community assistance and community based rehabilitation. To provide these the government has to launch "The District Rehabilitation Centre" scheme to provide comprehensive rehabilitation services to the rural disabled in our country. Under this project has to provide services like surveys of disabled population, prevention, early detection and medical intervention and surgical correction, fitting of artificial aids and appliances, therapeutic services and employment to the disabled people with free of cost. And government has to provide free travel passes in buses and trains. A National Information Centre on Disability and Rehabilitation has to set up to provide a database for comprehensive information on all facilities and welfare services for the disabled within the country.

LIMITATIONS

For this type of studies we need specialist that was out of our reach due to limitations of the study.

ACKNOWLEDGEMENTS

The author mentions his sincere thanks to the staff of Rural Health training Centre and Department of Community Medicine, Chennai Medical college Hospital and Research Center, Trichy, Tamil Nadu for helping immensely in data collection.

Conflict of Interest: None.

REFERENCES

1. The World Health Organization. The World Health Report 1998. Life in 21st Century: A Vision for all. WHO: Geneva; 1998.
2. Census of India 2001. Final Population Total and Household Amenities and Assets Chandigarh. Directorate of Census Operations: Chandigarh, UT; 2004.
3. Government of India. Ministry of Social Justice and Empowerment. No.3-1/1993-DD.III National Policy for Persons with Disabilities; Disability India network. <http://www.disabilityindia.org/nationalpolicyfordisable.cfm> accessed on 13/03/12.
4. People with Disabilities in India: From Commitments to Outcomes, by Human Development Unit, South Asia Region, The World Bank.
5. Singh A. Burden of Disability in Chandigarh village, *Indian J Community Med*, 2008; 33: 113-115.
6. Registrar General of India: Census of India 2001, Data on Disability, Vol.-III. Disability India statistical data. Dimension of Disability in India, chapter 4. http://mospi.nic.in/Mospi_New/upload/disability_india_statistical_data_11mar2011/Chapter%204-Dimension_Disability.pdf Accessed on 4/3/2012.
7. Pati RR. Prevalence and Pattern of Disability in a Rural Community in Karnataka, *Indian J Community Med*, 2004; 24: 186-7.
8. Sharma KL, Prasad BG. An epidemiological study of blindness in Banki block of Barabanki district, Uttar Pradesh, *Indian J Med Res* 1962; 50: 842.
9. Patel S. An Empirical Study of Causes of Disability in India. *Internet Journal of Epidemiology*, 2009; 6: 2.
10. Kumar R et al. An epidemiological study of disability in rural India. *Indian Journal of Disability and Rehabilitation* 1992; 6: 69-74.
11. Mini GK. Disabled People in Kerala. Disability Indian Network. 2006. Available at <http://www.disabilityindia.org/djartaug06A.cfm>. Accessed on 10/3/2012.
12. National Sample Survey organization. A report on disabled persons. Department of statistics, Government of India: New Delhi; 2003.

Pelvic Lipoma in a Case of Stage-II Cervical Carcinoma - A Case Report

Anindita Mishra¹, Vinay Nyapathy¹

¹Associate Professor, Department of Radiodiagnosis, G.S.L. Medical College & Hospital, Rajahmundry, Andhra Pradesh

ABSTRACT

Retroperitoneal pelvic lipomas are so rare that there are only few cases reported in literature. Current imaging techniques such as USG, CT & MRI are helpful in diagnosis. A case of pelvic lipoma in a patient with stage-II cervical carcinoma is described. Initial ultrasound showed an irregular mass in the cervix with suggestion of an echogenic lesion in left side of pelvis. Plain and contrast enhanced CT showed a homogenous fat attenuation mass in the left side of pelvis with a faintly visible capsule which did not enhance post contrast. MRI permitted unequivocal diagnosis of lipoma. The usefulness of various imaging methods is discussed in correctly diagnosing the entity and avoiding unnecessary surgery in asymptomatic patient.

Keywords: MRI, Pelvic lipoma, Cervical carcinoma, Benign Tumour

INTRODUCTION

Pelvic tumours that contain fat are common findings in women. Majority of these tumours are benign cystic ovarian teratomas¹. While most of these tumours are treated by surgical resection lipomatous uterine tumours and benign pelvic lipomas may require no therapy¹. Benign pelvic lipomas are uncommon retroperitoneal tumours composed of mature lipocytes and minimal fibrous tissue². They are well defined encapsulated masses that tend to produce mass effect rather than invade adjacent structures¹.

We present a case of retroperitoneal pelvic lipoma incidentally diagnosed in a patient with cervical carcinoma and discuss the utility of ultrasound, CT and MRI in diagnosing the tumour and differential diagnosis. Because of the benign nature of these tumours they require no treatment unless they are symptomatic¹.

CASE REPORT

A 44 year old lady with known cervical carcinoma referred from Oncology Department for USG Scan with complaints of fullness in the pelvis. Initial ultrasound reveals an ill-defined mass in the cervix.

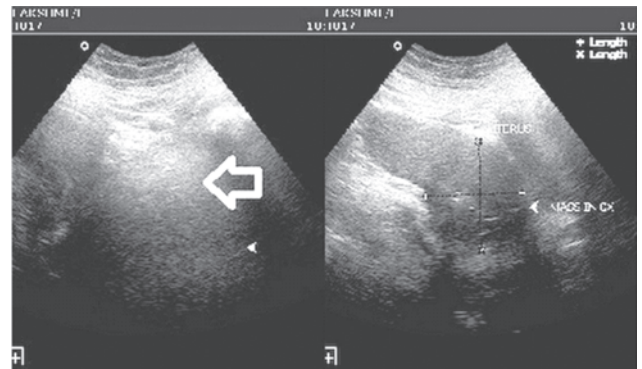


FIG. 1: Ultrasound of the pelvis as an irregular hypoechoic lesion in the cervix (arrow head).The lipoma is seen as an echogenic lesion posterior to the cervical mass (arrow).

There was an echogenic lesion in the left side of the pelvis (Fig 1) CT scan showed a well-defined fat attenuation lesion with a faintly visible capsule and few thin septations in the left side of pelvis posterior to the cervix causing mass effect over the bowel loops and pushing it to the right side and extending through the left sciatic foramen into the gluteal region causing significant widening of the sciatic foramen (Fig 2). The capsule did not enhance post contrast (Fig 3). MRI was advised to further confirm the benign nature of the lipomatous tumour and also for staging of cervical carcinoma.

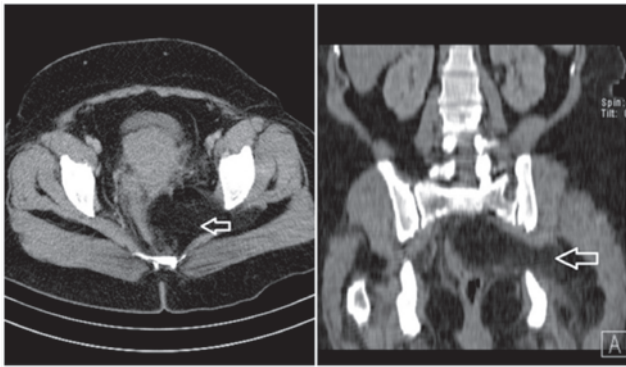


FIG 2: Plain CT scan showing the lipoma as a homogenous fat attenuation lesion with a faintly visible capsule in the left side of pelvis extending through the left sciatic foramen (arrow).

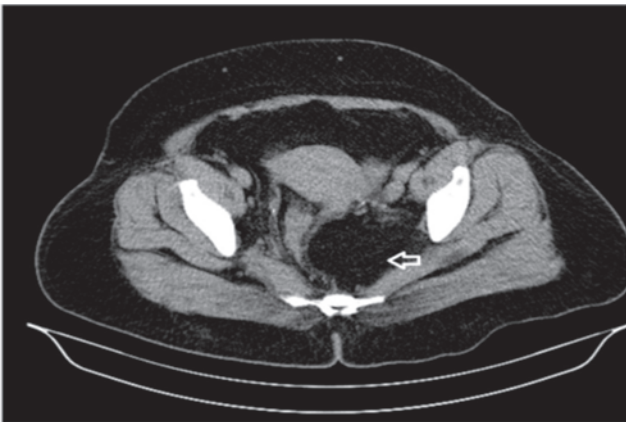


FIG 3: CECT Scan showing the lipoma as a homogenous fat attenuation lesion with a faintly visible capsule in the left side of pelvis (arrow) there is no enhancement post contrast.

MRI showed a well-defined irregular infiltrative mass lesion measures $5.5 \times 5.5 \times 5.2$ (AP \times W \times H) in the posterior aspect of cervix involving the body of uterus, posterior fornix of vagina (upper 2/3rd), bilateral parametrial infiltration, infiltrating into the anterior wall of rectum and a deep inguinal lymph node measuring 12×12 mm (Fig. 4 & 5).



FIG. 4: T2 weighted sagittal images showing a mass in the cervix (short arrow), A lipoma is seen superior the mass lesion (long arrow)

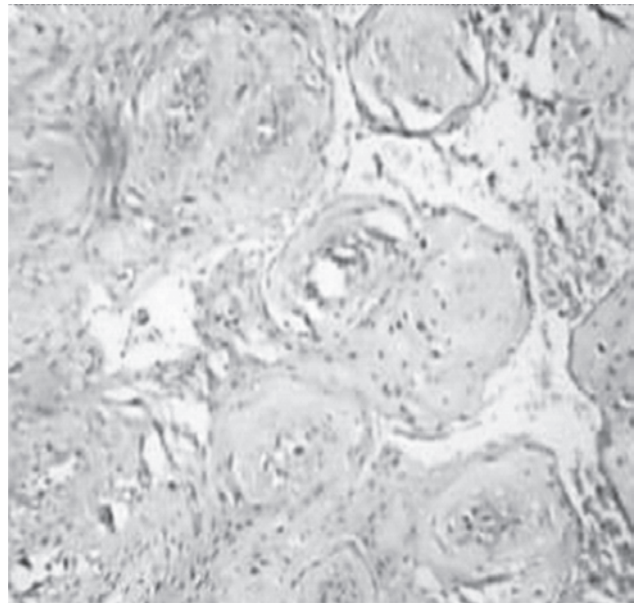


FIG. 5: Cervical biopsy photomicrograph showing moderately differentiated squamous cell carcinoma of cervix showing malignant cells arranged in islands, whorls and papillary structures.

A large well defined fat-intensity lesion was seen measuring $6.8 \times 8.7 \times 6.3$ cm (AP \times W \times H) in the left side of pelvis posterior to the cervical mass causing mass effect over the bowel loops and rectum and pushing it to right side extending through the left sciatic foramen into the gluteal region causing significant widening of the sciatic foramen (Fig. 6).



FIG. 6: T2 weighted coronal image shows lipoma as an encapsulated homogeneously hyperintense mass with thin internal septations in the left side of the pelvis extending beyond the sciatic foramen (Intra & extra pelvic component - arrow)

The mass is hyperintense on T1WI and T2WI, encapsulated, with few thin septations (Fig. 7 & 8). There is complete loss of signal on fat suppression (Fig. 9).

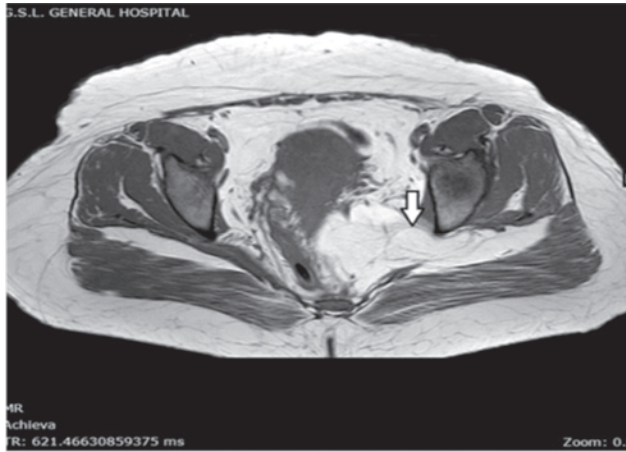


FIG. 7: T1 Weighted axial image shows lipoma as a well-defined encapsulated homogenously hyperintense lesion (arrow) in the pelvis extending beyond the sciatic foramen with thin septations.

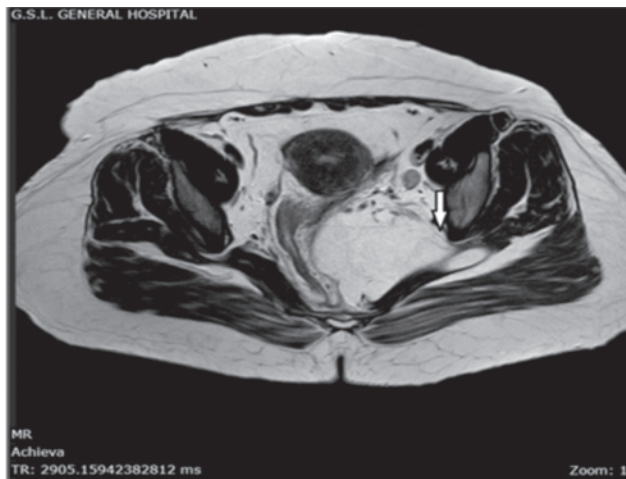


FIG. 8: T2 Weighted axial image shows lipoma as a homogeneously hyperintense lesion with thin internal septations in the left side of pelvis (arrow).

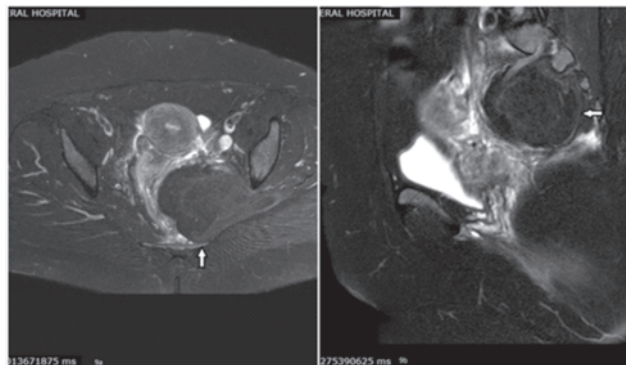


FIG. 9 a & b: Lipoma is seen as a homogenous diffusely hypointense mass lesion in the fat suppression axial & sagittal images (arrows).

DISCUSSION

Lipomas are the most common benign tumours of adipose tissue among adults² and usually occur in mid adulthood (40-60yrs). Lipomas can occur anywhere in the trunk, extremities, mediastinum and pelvis. People with other disorders such as adiposis dolorosa, Madelung's disease, Bannayan Riley –Ruvalcaba syndrome, Cowden syndrome, Gardner's syndrome are at increased risk of developing multiple lipomas. On karyotyping, conventional lipomas show rearrangements of 12q 14-15 6p and 13q regions³. Lipomas lack the MDMK and CDK4 amplification of liposarcoma⁴. Retroperitoneal pelvic lipomas are extremely rare². Primary retroperitoneal tumors represent 0.2% of all neoplasms. Out of these, about 80% of the tumors are malignant neoplasms⁵. Retroperitoneal lipomas are extremely rare, and represent about 2.9% of all primary retroperitoneal tumors⁶.

A Lipoma is a benign tumour composed of encapsulated adipose tissue interspersed with thin fibrous septae³. Malignant transformation of lipoma to liposarcoma is virtually unknown⁴. Pelvic lipomas are retroperitoneal masses composed of mature lipocytes and minimal fibrous tissue. They are well defined encapsulated masses that tend to produce mass effect rather than invade adjacent structures¹. These benign lesions may grow to large proportions but have no propensity to mutate⁴. On gross pathologic examination a lipoma is an encapsulated yellow greasy mass.

Sonographically lipomas are hyper-echoic. On CT they are of homogenous fat density with a few thin low density septae and a faintly visible capsule which does not show contrast enhancement. Solid elements and soft tissue components are notably absent⁴. CT can be diagnostic in cases of lipomatous tumours of the pelvis when there is a low density mass with HU measuring between -40 to -100. On MRI, the fatty component is high in signal intensity on T1 weighted images. On fat suppression techniques there is complete loss of signal in a pure lipoma which will confirm macroscopic fat content⁷. Chemical shift artefacts along the frequency – encoding axis may also be seen and will further verify the fatty substance. MRI is the most helpful modality in assessing the organ of origin because of its multiplanar capability, tissue-specific characteristics and the ability to distinguish between adnexal tissue, uterus and pelvic fat. MRI also best displays the internal architecture of these fatty

tumours. MRI readily enables the detection of the capsule and thin septations that may be present in a pure lipoma⁷. A non-invasive sharply circumscribed encapsulated homogeneously hyper-intense mass on T1 & T2 WI is diagnostic of a pelvic lipoma. The most common differential diagnosis of a benign pelvic lipoma is a well differentiated liposarcoma.

Liposarcomas usually present at 50-70yrs of age. On CT a liposarcoma appears as a large round or lobulated retroperitoneal fat attenuation mass with few internal septations and fibrous strands and occasional non adipose solid appearing regions⁴. Solid areas usually enhance and are poorly defined with no clear demarcation between them and fat. These non-fatty areas are hypo intense relative to skeletal muscle on T1WI and iso to hyper intense on T2WI. Rarely cystic areas, calcifications and ossification may be seen which indicate dedifferentiation and poor prognosis. The most important indicators of malignancy in a lipomatous pelvic tumor are male sex, size greater than 10cms, presence of thick septae, and presence of globular and nodular non adipose solid areas and less than 75% fat⁸. The presence of non-adipose solid areas and invasive lipogenic component identifies an otherwise nonspecific lipomatous pelvic mass as a liposarcoma.

The other differential diagnosis of fat containing retroperitoneal lesions includes retroperitoneal teratomas which have characteristic features. On USG and CT they appear as encapsulated round or ovoid fatty lesions with dense calcification. The most characteristic radiologic findings of mature retroperitoneal teratoma are a complex mass that contains a well circumscribed fluid component of variable volume, adipose tissue and/or sebum. A fat fluid level has also been described in a well differentiated liposarcoma of the retroperitoneum. Immature teratomas have coarse calcification, dominant soft tissue component and smaller fat foci in the form of a fat fluid level, and calcification in a linear strand or congealed pattern⁹.

Ovarian teratomas are common germ cell tumors in women. Mature cystic teratomas are also known as dermoid cysts. Adipose tissue is seen in 67-75% cases, and teeth are present in 31% cases. On USG they are characterised by echogenic sebaceous material and calcification. On CT when there is fat attenuation within a cyst with a fat fluid level with or without calcification in the wall, it is diagnostic of mature cystic teratoma. On MR imaging fat suppressed images can

specifically identify the sebaceous content.

Myelolipomas and angiomyolipoma may also be considered in the differential diagnosis of retroperitoneal fat containing tumors but they have characteristic radiological features and typical site of origin.

Myelolipoma most frequently arises from the adrenal gland but may be seen in the retroperitoneum. It is composed of a variable mixture of mature fat and haematopoietic elements. Myelolipoma is typically seen on USG as a hyperechoic mass with more hypoechoic regions in the predominantly myeloid components. CT frequently demonstrates large amounts of fat with areas of interspersed high attenuation tissue. On MR imaging non uniform mixture of fat and marrow components is seen as hyperintense signal on T1WI and heterogeneously hyperintense signal on T2WI. Fat suppressed MR shows selective signal loss of fatty component.

Angiomyolipoma is the most common benign tumor of the kidney composed of varying amounts of blood vessels, smooth muscle, and mature adipose elements. On sonography, angiomyolipomas appear hyperechoic with acoustic shadowing. On CT these lesions appear typically well defined cortical masses of predominantly fat attenuation with heterogenous soft tissue attenuation interspersed throughout with enhancement of vascular element post contrast. On MR imaging intratumoral fat appears as high signal intensity on T1WI with loss of signal intensity on the fat suppressed images. The chemical misregistration artefact on spin echo images and the India ink artefact due to chemical shift interference between the fat and water interface are also used for diagnosing angiomyolipomas.

MRI enables unequivocal diagnosis of the organ of origin, tissue of origin and invasion into adjacent structures⁷. MRI is 100% sensitive and 83% specific in identifying a well differentiated liposarcoma. MRI is 100% specific in the diagnosis of a simple lipoma¹⁰. Because of the differences in treatment, prognosis and long term follow up it is important to distinguish benign pelvic lipomas from well differentiated liposarcomas. MRI is highly sensitive in the detection of well differentiated liposarcomas and highly specific in the diagnosis of simple lipomas.

In our case the patient underwent radiotherapy as the cervical carcinoma was inoperable. Conservative management was proposed for the lipoma.

CONCLUSION

MRI is the best modality for determining the presence of fat, identifying non adipose solid areas within a mass and the internal architecture of a retroperitoneal lesion and also for detection of invasion into adjacent structures. Because of the differences in treatment, prognosis and long term follow up it is important to distinguish benign pelvic lipomas from well differentiated liposarcomas. MRI is highly sensitive in the detection of well differentiated liposarcomas and highly specific in the diagnosis of simple lipomas.

ACKNOWLEDGEMENTS:

Dr. P. B. Anand Rao, Department of Oncology, GSL Medical College & Hospital

Conflict of Interest:

This article is seen and approved by all the authors. We also disclose that none of the authors have any commercial associations that might give rise to a conflict interest in connection with the submitted article.

REFERENCES

1. Gerald D. Dodd III, Ronald F Budzik, Jr. Lipomatous tumours of the pelvis in women: Spectrum of imaging findings. *AJR* 155:317- 322. Aug '1990. 0361 – 803X/90/1552 – 0317 American Roentgen Ray society. PMID: 2115259
2. Kyoung Rok Lee, Tae Jin Seo, Jun Ho Cho et al. – A case of Large Retroperitoneal Lipoma Mimicking Liposarcoma. – *Korean J Gastroenterol* 2010 Jun; .55(6):394-398. PMID: 20571308
3. Robbins SL. Pathologic basis of disease. Philadelphia: WB Saunders Co, 1974: 158 -9
4. Craig WD, Fanburg-Smith JC, Henry LR, Guerrero R, Barton - Fat-containing Lesions of the Retroperitoneum: Radiologic-Pathologic Correlation; *JH.Radiographics*. 2009 Jan-Feb; 29 (1):261-90.1 PMID: 19168848.
5. Armstrong JR, Cohn I Jr Primary malignant retroperitoneal tumors. *Am J Surg*. 1965 Dec; 110 (6):937-43. PMID: 5891845.
6. Pai MR, Naik R, Raghuvver CV; Primary retroperitoneal tumours a 25 year study. *Indian J Med Sci*. 1995 Jun; 49(6):139-41. PMID: 8821915
7. LU Lau MD and R F Thoeni MD., Uterine lipoma: advantage of MRI over Ultrasound. *British Journal of Radiology* (2005) 78, 72 – 74. 2005 British Institute of Radiology. PMID: 15673537
8. Kransdorf MJ, Bancroft LW, Peterson JJ, Murphey MD, Foster WC, Temple HT - Imaging of fatty tumors: distinction of lipoma and well-differentiated liposarcoma; *Radiology*. 2002 Jul; 224(1):99-104. PMID: 12091667.
9. Na-young Shin ,Myeong-Jin Kim, Jae-Joon Chung, Yong-Eun Chung, Jin-Young Choi, Young-Nyun Park-The differential imaging features of fat-containing tumors in the peritoneal cavity and retroperitoneum: the radiologic pathologic correlation. *Korean journal of Radiology*. 2010; 11: 333-345. PMID: 20461188
10. Gaskin CM, Helms CA - Lipomas, lipoma variants, and well-differentiated liposarcomas (atypical lipomas): results of MRI evaluations of 126 consecutive fatty masses. *AJR Am J Roentgenol*. 2004 Mar; 182(3):733-9. PMID: 14975977.
11. Gunter Deppe, Vinay K.Malviya, Jacques Hercule, Norbert Gleicher, Detroit, Michigan and Chicago, Illinois. – Retroperitoneal pelvic lipoma. - *Journal of the National Medical Association*, vol. 78, No. 1, 1985. PMID: 4046056 PMID: PMC2571129
12. Hull WB, Blumenfeld ML, Jacques .D: Large paravaginal pelvic lipoma .A case report. *J Reprod Med – 1999, Jul; 44(7) 636 -8*. PMID: 10442330
13. Shelth S. Fishman EK, Buck JL, Hamper UM, Sanders RC. The variable sonographic appearances of ovarian teratomas: correlation with CT. *AJR* 1988: 151: 331-334. PMID: 3293377
14. Buy JN; Ghossain MR, Moss AA, et al. Cystic teratoma of the ovary: CT detection. *Radiology* 1989: 171: 697-701. PMID: 2717741
15. Dodd GD III Lancaster KT, Moulton JS. Ovarian lipoleiomyoma: a fat containing mass in the female pelvis. *AJR* 1989: 153; 1007 -1008. PMID: 2678992

Sexual Behavior and Practice Assessment of Truckers and Migrants as an Evaluation of Targeted Interventions (TI) Project for HIV Prevention and Control, Himachal Pradesh, India

Pardeep Bansal¹, Ashok Bhardwaj², Surinder Kashyap³, Dinesh Kumar⁴

¹Associate Professor, Department of Community Medicine, ²Professor and Head, Department of Community Medicine, Dr. Rajendera Prasad Government Medical College, Kangra, Himachal Pradesh, India, ³Ex-Principal, Indira Gandhi Medical College, Shimla, Himachal Pradesh, India, ⁴Assistant Professor, Department of Community Medicine, Dr. Rajendera Prasad Government Medical College, Kangra, Himachal Pradesh, India

ABSTRACT

Sexual behavior trucker and migrant play an important role in disease spread as engagement with female sexual worker (FSW). Data is limited about sexual behavior and practice of trucker and migrant population and vital to understand the HIV epidemic in India. Present study was done as an evaluation of TI efforts in Himachal Pradesh to document sexual behavior and practice among truckers and migrants.

Method: Total 5 TI sites for trucker and 3 for migrants was evaluated, sample of 100 respondents (500 trucker; 300 migrant) were interviewed. The samples for migrant population were completed construction sites and proportionally from each truck union for trucker. Respondents were interviewed consecutively till the number was completed. For truckers, the sample was completed.

Results: Stakeholders were aware about sexual (73.1%), blood (69.4%), and injection (60.6%) as common mode of transmission for HIV and observed significantly ($p=0.00$) more among truckers than migrants. About 51.4% stakeholders had sexual contact within last one month and significantly ($p=0.00$) more among truckers (55.6%) than migrants (44.3%) and half of them had with wife or husband. Only 41.6% reported intercourse without condom. STI knowledge and awareness level was observed less for STIs as and significantly less among migrants than truckers.

Conclusion: Project staff interacted with the stakeholders and spread the HIV awareness. However, knowledge about STI was low in both trucker and migrants. Overall HIV knowledge and safe sexual practice was significantly more ($p=0.00$) among truckers than in migrants.

Keywords: Targeted Intervention, Sexual Behaviour, Trucker, Migrant

INTRODUCTION

Sexual behavior trucker and migrant play an important role in disease spread as engagement with female sexual worker (FSW). They experience occupational stress and are prone to substance abuse¹ and risky sexual behavior.^{1,2} In addition they also experience sexual abuse and early sex debut.³ They constitute significant bridge group for Human Immunodeficiency Virus (HIV) and Sexually Transmitted Infection (STI) and harbors significant proportion of male clients for FSW.⁴ Developmental activities like industrialization in almost every state of India lead to increase movements of trucker and migrant across the geographic boundaries. These

groups have been targeted for preventive and promotional activities to reduce high risk behavior under the targeted intervention (TI) program in India. Government of India and its development partners spend an average US \$104 (INR4680) per HIV infection averted and US \$10.7 (INR483) per DALY averted.⁵ Activities are being delivered with involvement of non-governmental organizations (NGOs) under national AIDS Control Program (NACP) in India considering the best mode to reach out to these socially marginal groups. Like every state in India the Himachal Pradesh state has also undergoing developmental activities with influx and efflux of trucker and migrants. Data is limited about sexual behavior and practice of trucker and migrant population but important to understand

the HIV epidemic in India. Present study was done as an evaluation of TI efforts in Himachal Pradesh to document sexual behavior and practice among truckers and migrants.

METHOD

As per 2001 census, Himachal Pradesh state with population of 60,77,248 spread across 55,673 km² and almost all (90.0%) of population resides in rural area. TI projects were started in year 2001-02 through involvement of 9 NGOs over six districts. Five TI projects were allocated for interventions among truckers and four among migrant population. Evaluation of these projects was carried out in January and February 2003 with structured and pretested questionnaire. Knowledge and awareness towards disease and project activities of project coordinator, outreach worker, peer educator and condom depot holder was assessed qualitatively. Evaluation was carried out by a team of faculty member (1), resident (1) and interns (2) of department of Community Medicine, Indira Gandhi Medical College, Shimla after one day training. Team visited all the NGOs as per pre-decided dates for onsite interview with project staff and observation of activities. From each TI, 100 stakeholders i.e., trucker and migrants were selected randomly and interviewed about their sexual behavior and practice using structured and pretested questionnaire.

The samples for migrant population were completed from different focal points of construction sites at Bhawanagar, Karchham and Chamera projects in case of migrant population. At Kala Amb, this

number was proportionally drawn from different factories. Respondents were interviewed consecutively till the number was completed. For truckers, the sample was completed proportionally from each truck union in the area. In case of only one truck union, the whole sample was drawn from one area. Due representation was also given to the cleaners of the trucks. Interviews were conducted consecutively to complete sample size.

RESULTS

Total nine NGO were visited and 100 primary stakeholders from each TI area (500 truckers and 300 migrant) were interviewed. Average 3480 stakeholders through interpersonal and 4682 with focus group discussions were contacted by per TI. Average of 1899 patients per TI with sexually transmitted infection (STI) were contacted and counseled. Each TI distributed average of 23125 condom pieces to the stakeholders.

Knowledge and source of knowledge about HIV and STI was assessed. Stakeholders were aware about sexual (73.1%), blood (69.4%), and injection (60.6%) as common mode of transmission for HIV and observed significantly ($p=0.00$) more among truckers than migrants. Awareness level was observed less for STIs as only 38.8% stakeholders were aware about discharge as symptom and only 35.9% knows sexual as mode of transmission of disease. Stakeholders received information mainly form project staff and mass media for HIV and STIs. Awareness level was observed significantly ($p=0.00$) among migrants. TI project staff reported STI cure rate of 69.9%and significantly high ($p=0.00$) among trucker (82.2%) (Table: 1)

Table 1: HIV/AIDS and STI knowledge and its source among truckers and migrants in Himachal Pradesh, 2003.

Variable	TI-Trucker N=500	TI-Migrant N=300	χ^2 , p value	TI-Both N=800
HIV-Knowledge				
Sexual	387 (77.4)	198 (66.0)	12.4, 0.00	585 (73.1)
Blood	378 (75.6)	177 (59.0)	23.7, 0.00	555 (69.4)
Infected Syringes / Needles	356 (71.2)	129 (43.0)	62.0, 0.00	485 (60.6)
Mother to Child	252 (50.4)	12 (4.0)	182.0, 0.00	264 (33.0)
Do not know	21 (4.2)	2 (0.7)	8.3,0.00	23 (2.9)
HIV-Source of Knowledge				
Project persons	352 (70.4)	166 (55.3)	18.6, 0.00	518 (64.8)
Mass Media	343 (68.6)	150 (50.0)	27.4, 0.00	493 (61.6)
Friends & Relatives	257 (51.4)	38 (12.7)	120.8, 0.00	295 (36.9)
Others	83 (16.6)	0 (0.0)	55.5, 0.00	83 (10.4)

Table 1: HIV/AIDS and STI knowledge and its source among truckers and migrants in Himachal Pradesh, 2003. (contd.)

Variable	TI-Trucker N=500	TI-Migrant N=300	χ^2 , p value	TI-Both N=800
STI-Knowledge				
Sexual	195 (39.0)	92 (30.7)	5.6, 0.01	287 (35.9)
Blood	109 (21.8)	29 (9.7)	19.3, 0.00	138 (17.3)
Excess body Heat	93 (18.6)	9 (3.0)	41.2, 0.00	102 (12.8)
Unhygienic Conditions	86 (17.2)	13 (4.3)	28.6, 0.00	99 (12.4)
Do not know	12 (2.4)	3 (1.0)	2.0, 0.15	15 (1.9)
Sex during Menses	11 (2.2)	4 (1.3)	0.77, 0.38	15 (1.9)
STI-Source of Knowledge				
Project persons	185 (37.0)	79 (26.3)	9.65, 0.00	264 (33.0)
Mass Media	112 (22.4)	62 (20.7)	0.33, 0.56	174 (21.8)
Friends & Relatives	101 (20.2)	36 (12.0)	8.8, 0.00	137 (17.1)
Others	31 (6.2)	3 (1.0)	12.4, 0.00	34 (4.3)
STI- Symptoms Knowledge				
Discharge	207 (41.4)	103 (34.3)	3.73, 0.05	310 (38.8)
Genital Ulcer	191 (38.2)	94 (31.3)	3.85, 0.04	285 (35.6)
Scrotal Swelling	159 (31.8)	66 (22.0)	8.91, 0.00	225 (28.1)
Inguinal Bubo	88 (17.6)	29 (9.7)	9.4, 0.00	117 (14.6)
Others	35 (7.0)	8 (2.7)	6.9, 0.00	43 (5.4)
Total STI cases				
Cured	37 (82.2)	21(55.3)	7.1, 0.00	58 (69.9)
Motivated by staff	19 (42.2)	17 (44.7)	0.0, 0.81	36(43.4)

Sexual practice showed that 51.4% stakeholders had sexual contact within last one month and significantly ($p=0.00$) more among truckers (55.6%) than migrants (44.3%) and half of them had with wife or husband. Only 41.6% reported intercourse without condom and 10.8% of stakeholders reported intercourse with commercial sexual worker (CSW). Thirty two percent of individuals reported less than five time sexual activity over last three months. Age at first sexual intercourse was also asked and 48.8% of individual had. Mostly started sexual activity between 16 to 20 year of age and reported first sexual intercourse with wife/ husband (36.3%) and casual sexual worker (31.5%) (Table: 2).

Table 2: Sexual behavior and practice of truckers and migrants in Himachal Pradesh, 2003.

Variable	TI-Trucker N=500	TI-Migrant N=300	χ^2 , p value	TI-Both N=800
Sexual History-Frequency				
< One Month	278 (55.6)	133 (44.3)	9.53, 0.00	411(51.4)
1 – 12 Months	127 (25.4)	73 (24.3)	0.11, 0.73	200 (25.0)
> 12 Months	55 (11.0)	19 (6.3)	4.86, 0.02	74 (9.3)
Sexual History-Last 3 months				
< 5 times	147 (29.4)	110 (36.7)	4.5, 0.03	257 (32.1)
5 – 10 times	86 (17.2)	48 (16.0)	0.19, 0.65	134 (16.8)
11 – 15 times	70 (14.0)	8 (2.7)	27.3, 0.00	78 (9.8)
> 15 times	41 (8.2)	3 (1.0)	18.7, 0.00	44(5.5)
Condom not used	222 (44.4)	111 (37.0)	4.2, 0.03	333 (41.6)
Sexual History-Contact				
Wife / Husband	252 (50.4)	156(52.0)	0.19, 0.66	408 (51.0)
Casual Sex Worker	80 (16.0)	39 (13.0)	1.3, 0.24	119 (14.9)
Commercial Sexual Worker	70 (14.0)	16 (5.3)	14.6, 0.00	86 (10.8)
Regular Partner	37 (7.4)	14 (4.7)	2.3, 0.12	51 (6.4)
Other	21 (4.2)	0 (0.0)	12.9, 0.00	21 (2.6)

Table 2: Sexual behavior and practice of truckers and migrants in Himachal Pradesh, 2003. (contd.)

Variable	TI-Trucker N=500	TI-Migrant N=300	χ^2 , p value	TI-Both N=800
Sexual History-Age (year) at first sexual intercourse				
0-15	11 (2.2)	26 (8.7)	17.7, 0.00	37 (4.6)
16 - 20	225 (45.0)	165 (55.0)	7.5, 0.00	390 (48.8)
21 - 25	204 (40.8)	36(12.0)	74.0, 0.00	240 (30.0)
> 25	20 (4.0)	1 (0.3)	9.8, 0.00	21 (2.6)
Sexual History-First sexual partner				
Wife / Husband	198 (39.6)	92(30.7)	6.4, 0.00	290 (36.3)
Casual Sex Worker	146 (29.2)	106 (35.3)	3.2, 0.07	252(31.5)
Commercial Sexual Worker	89 (17.8)	27 (9.0)	11.7, 0.00	116 (14.5)
Regular Partner	25 (5.0)	3 (1.0)	8.8, 0.00	28 (3.5)
Others	2 (0.4)	0 (0.0)	-	2 (0.3)

DISCUSSION

Mobility and migration increases the vulnerability and high chances of HIV transmission. Truck drivers and migrants together form route HIV epidemic into general population because of their reported high risk sexual behavior.⁶ It has potential to further increase the epidemic by raising the size of sex worker, number of multiple sexual partners and raising the demand for sex. As mostly migrant and truck driver are male and remain alone and apart from unsafe sexual behavior. NACP extended the HIV preventive services to these groups through TI project with training and allocation of funds to NGOs. In India, the TI activities has been scaled up and improved across the India as an important strategy to reduce the disease transmission.⁷ The TIs reported to be cost effective^{5,8} at all stages of HIV epidemic⁸ and reduction of 47% (1.6 million) prevalent and 36% (2.7 million) cumulative HIV cases is expected by 2015.⁵

Suitable environment and long distance travel together create risk enabling environment for engagement of sexual intercourse.¹ Reported HIV (2.4%) prevalence among truckers reemphasize it an important high risk group.⁹ Study from India reported HIV prevalence of 4.6% among truckers.¹⁰ Unsafe sexual behavior among migrants is also a concerning cause, study from India reported 17.0% prevalence of sexual intercourse with FSW and 31.0% either FSW or non spousal unpaid sex worker in last 2 years.¹¹ Present study reported around 30.0% and 18.0% prevalence of commercial or causal intercourse among truckers and migrants respectively. Study reported non use of condom among migrants at the time of intercourse.¹² Present study showed about 40.0% of migrants did not use condom during sexual intercourse in last three months. Study among

migrants of India reported one or more non spousal partners among migrants as compare to non migrants.¹³ High prevalence of sex with multiple partner, pre and extra marital relations was also reported from tribal populations in India.¹⁴

TI in India has shown expansion and along with increase use of condom during sexual intercourse. Significance decline in HIV and syphilis observed in high prevalence states and high intensity TI districts.¹⁵ In present study the improved knowledge of HIV and from TI project staff among trucker and migrant reflects effectiveness of TI services. Significantly high ($p=0.00$) level of HIV knowledge and safe sexual practice among trucker than in migrants was reported in the present study. Knowledge about STI was observed to be poor in present study in both the population groups. STI cure rate was observed to be higher among truckers than in migrants. Evidence about efficiency and effectiveness of services about FSW is available but limited are for trucker and migrants. It is important to understand the sexual network dynamics and reorients the TI strategy for HIV prevention and control especially in migrants.

CONCLUSION

Progress of all these TI was found to be satisfactory. There are recommended areas of program that need special attention.

RECOMMENDATIONS

Quality of both interpersonal and record maintenance has to be ensured so that correct and concise message is communicated and understood by the target population.

Conflict of Interest: None

REFERENCES:

1. Apostolopoulos Y, Sönmez S, Shattell M, Kronenfeld J, Smith D, Stanton S. Cruising for truckers on highways and the internet: sexual networks and infection risk. *AIDS Educ Prev* 2011;23(3):249-66.
2. Verma RK, Saggurti N, Singh AK, Swain SN. Alcohol and sexual risk behavior among migrant female sex workers and male workers in districts with high in-migration from four high HIV prevalence states in India. *AIDS Behav* 2010;14:S31-9.
3. China. Lin D, Li X, Fang X, Lin X. Childhood sexual abuse and sexual risks among young rural-to-urban migrant women in Beijing. *AIDS Care* 2011;S23:113-9.
4. Subramanian T, Gupte MD, Paranjape RS, Brahmam GN, Ramakrishnan L, Adhikary R; IBBA Study Team. HIV, sexually transmitted infections and sexual behaviour of male clients of female sex workers in Andhra Pradesh, Tamil Nadu and Maharashtra, India: results of a cross-sectional survey. *AIDS* 2008;22:S69-79.
5. Prinja S, Bahuguna P, Rudra S, Gupta I, Kaur M, Mehendale SM, et al. Cost effectiveness of targeted HIV prevention interventions for female sex workers in India. *Sex Transm Infect* 2011 Jun;87(4):354-61. Epub 2011 Mar 29.
6. Ramjee G, Gouws E. Prevalence of HIV among truck drivers visiting sex workers in KwaZulu-Natal, South Africa. *Sexually Transmitted Diseases* 2002;29(1):44-9.
7. Verma R, Shekhar A, Khobragade S, Adhikary R, George B, Ramesh BM et al. Scale-up and coverage of Avahan: a large-scale HIV-prevention programme among female sex workers and men who have sex with men in four Indian states. *Sex Transm Infect* 2010;86:i76-82.
8. Vickerman P, Terris-Prestholt F, Delany S, Kumaranayake L, Rees H, Watts C. Are targeted HIV prevention activities cost-effective in high prevalence settings? Results from a sexually transmitted infection treatment project for sex workers in Johannesburg, South Africa. *Sex Transm Dis* 2006;33:S122-32.
9. Atilola GO, Akpa OM, Komolafe IO. HIV/AIDS and the long-distance truck drivers in south-west Nigeria: a cross-sectional survey on the knowledge, attitude, risk behaviour and beliefs of truckers. *J Infect Public Health*, 2010 3(4):166-78. Epub 2010 Nov 9.
10. Pandey A, Benara SK, Roy N, Sahu D, Thomas M, Joshi DK, IBBA Study Team. Risk behaviour, sexually transmitted infections and HIV among long-distance truck drivers: a cross-sectional survey along national highways in India. *AIDS* 2008;22:S81-90.
11. Saggurti N, Verma RK, Jain A, RamaRao S, Kumar KA, Subbiah A, et al. HIV risk behaviours among contracted and non-contracted male migrant workers in India: potential role of labour contractors and contractual systems in HIV prevention. *AIDS* 2008;22:S127-36.
12. Deb AK, Deb M, Saha MK, Chakraborty S, Bhattacharya SK, Detels R. HIV transmission potential among local and migrant factory workers in Kolkata, India. *AIDS Behav* 2009;13(5):928-38. Epub 2009 Mar 24.
13. Saggurti N, Schensul SL, Verma RK. Migration, mobility and sexual risk behavior in Mumbai, India: mobile men with non-residential wife show increased risk. *AIDS Behav* 2009;13(5):921-7. Epub 2009 Apr 25.
14. Mishra S, Swain BK, Babu BV. Sexual risk behaviour among migrant tribals living in urban slums of an eastern Indian city: implications on the spread of HIV. *Coll Antropol* 2008;32(1):1-4.
15. Kumar R, Mehendale SM, Panda S, Venkatesh S, Lakshmi P, Kaur M et al. Impact of targeted interventions on heterosexual transmission of HIV in India. *BMC Public Health* 2011;11:549.

Cervical Length and Risk of Hemorrhage in Pregnancies with Placenta Previa

Karya Urmila¹, Varma Khushboo², Singh Shakun³, Gupta Abhilasha⁴

¹Professor, Department of Obstetrics and Gynecology, ²Resident, Department of Obstetrics and Gynecology, L.L.R.M. Medical College, Meerut, ³Assistant Professor, Department of Obstetrics and Gynecology, ⁴Professor & Head, Department of Obstetrics and Gynecology, L.L.R.M. Medical College, Meerut, UP, India

ABSTRACT

Aim: To find out the relationship between ultrasonographic cervical length and risk of antepartum hemorrhage, preterm delivery and emergency caesarean section in pregnancies with placenta previa.

Material and Methods: We performed transvaginal cervical-length measurements on all singleton gestations with placenta previa admitted in our hospital at or beyond 24 weeks of gestation over a span of one year. A complete follow-up of pregnancy was obtained in all cases till delivery and a retrospective chart review was then performed for these cases to investigate the relationship between cervical length and maternal and neonatal outcome. Results: Overall 70 patients comprised the study, in whom placenta previa persisted till delivery. Cervical length measurement was <30 mm in 27 (38.6%) cases while it was >30 mm in 43 (61.4%) cases. Cervical length ranged from 20 to 50 mm with a mean of 35.6±0.90 mm. Majority of subjects (51.9%) in whom measurements were done between 28-32 weeks had cervical length <30 mm, however, all the subjects (100%) in whom measurements were done after 32 weeks of gestational age had cervical length >30 mm.

The association between gestational age and cervical length was statistically significant ($p < 0.001$). Forty five patients (64%) presented with antepartum bleeding. Among the women with shorter cervical length, 25 (92%) had antepartum bleeding ($p < 0.001$) and 22 (81%) had emergency caesarean section ($p < 0.001$). In comparison, those with longer cervical length, 20 (46%) had bleeding episode and 14 (32%) had emergency caesarean section. Likewise, of the 27 subjects who had cervical length <30 mm, 25 (92%) had preterm delivery and two (8%) had term delivery. Significant association was present between short cervical length and preterm delivery ($p = 0.029$). Also cervical length <30 mm, presence of antepartum hemorrhage and first episode of hemorrhage <32 weeks were significantly associated with stillbirth/NICU admission ($p < 0.05$).

Conclusion : In pregnancies with placenta previa, a third-trimester transvaginal sonographic cervical length of 30 mm or less is associated with increased risk for hemorrhage, emergency caesarean section and preterm birth.

Keywords: Placenta Previa, Antepartum Hemorrhage, Transvaginal Sonography, Cervical Length

INTRODUCTION

Placenta previa has been diagnosed increasingly in recent decades, due to the widespread use of ultrasound and the rising rates of caesarean section. It is estimated to occur in 0.5 % of pregnancies¹. About 1/3rd of cases of antepartum hemorrhage (after 28 weeks of pregnancy but before delivery) belong to placenta previa and these women are at increased risk of prepartum maternal bleeding and emergency preterm caesarean section leading to perinatal complications. Furthermore, in these cases the higher chance of postpartum complications, including uterine

atony and placenta accreta, is well established. However, the risk of maternal hemorrhage or prematurity is unpredictable.

Placenta previa is defined as placenta partially or completely implanted over lower uterine segment. The traditional classification of placenta previa describes the degree to which the placenta encroaches upon the cervix in labour and is divided into low-lying, marginal, partial, or complete placenta previa. The etiology of hemorrhage is formation of the lower uterine segment and dilatation of the internal os, with tearing of placental attachments, compounded by the

inability of the lower uterine segment myometrium to constrict the torn vessels.¹ This can lead to massive and unpredictable hemorrhage and emergent preterm delivery. Indeed, neonatal mortality is increased threefold in pregnancies with placenta previa with the major cause being prematurity.^{2,3}

There is a clear relationship between ultrasonographic cervical length and preterm birth, particularly among women with a prior preterm birth.^{4,5} Mechanism of hemorrhage in placenta previa likely includes cervical effacement, it is plausible that there is an association among ultrasonographic cervical shortening, bleeding, and preterm birth. The aim of our study, therefore, is to determine if transvaginal ultrasound assessment of cervical length predicts the risk of prepartum bleeding or preterm emergency caesarean section due to massive hemorrhage in women with placenta previa diagnosed in second and third trimester of pregnancy.

MATERIAL AND METHOD

The study was performed on antenatal women admitted in Gynecology and Obstetric wards of SBVP hospital, LLRM Medical College, Meerut over a period of one year, when placenta previa was diagnosed clinically and sonographically. We performed transvaginal cervical length measurement between 28 to 34 weeks of gestation in the patients included in the study. All the subjects were followed till they subsequently delivered in our hospital.

All patients were counselled regarding transvaginal scan and informed consent was taken.

For study purposes, a cervical length of 30 mm or less was termed short. Cervical length measurements were performed for the study protocol only and were not reported to the attending clinician; thus, the clinicians were blinded to cervical length measurements throughout the study period. Data collected included socio-demographic information, past and previous obstetric history with special reference to previous caesarean section, previous dilatation and curettage, and previous history of placenta previa. Findings on ultrasonography including type of placenta previa, position of placenta (anterior, posterior or lateral) and cervical length were noted.

Placenta previa was termed complete if the placenta completely covered the internal os and was termed incomplete if the placental edge partially covered or

reached the margin of the internal os.⁶ In our study we included antenatal women with diagnosed placenta previa and excluded women with other causes of antepartum hemorrhage. Following subjects were excluded from the study.

- Gestational age <20.0 and e"36.0 completed weeks;
- Multiple pregnancy;
- Threatened preterm labor or premature rupture of membranes;
- History of cervical cone biopsy;
- Presence of cerclage;
- Sonographic suspicion of fetal anomaly or fetal growth restriction;
- History of maternal bleeding disorder or hypertensive disease complicating pregnancy.

Transvaginal sonography was carried out using a phased convex multifrequency TRANSDUCERS (C3 7EP /10 ED ENDO-CAVITY (4 MHZ~9MHZ /150° / 10 MM) with a 150° aperture angle (USSMSN-9001, Medison SA-8000se ultrasound system, Korea). Cervical evaluation was performed according to a standardized technique: women were asked to void their bladder before the examination. A true sagittal plane was obtained in order to visualize the full length of the cervical canal and cervical length was measured three times by placing the callipers on the internal and external os. The shortest measurement was then recorded.

A complete follow-up of pregnancy was obtained in all cases. Maternal outcome information was recorded in terms of presence or absence of antepartum bleeding, gestational age at first bleeding episode, gestational age at delivery, mode of delivery (elective caesarean or emergency caesarean due to significant hemorrhage or vaginal delivery). Perinatal outcome including apgar scores, birth weight, admission to neonatal intensive care unit or perinatal mortality were also recorded.

Statistical analysis

Data are reported as means and SDs. Continuous variables (cervical lengths) were compared using Student's t-test and chi square test. A two-tailed value of $P < 0.05$ was considered statistically significant.

OBSERVATIONS AND RESULTS

A total of 92 women with placenta previa were identified and enrolled in the study. Of these 70 (76%) women had placenta previa at delivery. Twenty-seven women (39%) with placenta previa had cervical lengths 30mm or less. Mean age of subjects was 29.5±5.1 years. Majority of subjects were in age group 26-35 years

(68.6%). Majority of subjects were multigravida. There were only seven (10%) primigravida. Thirty (43%) of cases were third gravida or more. Nineteen (27 %) of patients had previous history of one or more caesarean section and 10 (14%) had placenta previa in previous pregnancy. Twenty cases (29%) had previous history of dilatation and curettage. Maternal demographic characteristics are presented in Table 1.

Table 1 : Maternal demographic/clinical characteristics and sonographic findings in pregnancies with placenta previa according to cervical length.

	Cervical length <30mm (n=27)	Cervical length >30 mm (n=43)	p
Age	28.5±6.0	30.0±5.2	0.139
Nulliparity	3 (11%)	4 (9.3%)	0.881
Previous d & c	9 (33.3%)	11 (25.5%)	0.563
Previous caesarean section	8 (29.6%)	11(25.5%)	0.760
Previous H/o placenta previa	6 (22.2%)	4 (9.3%)	0.168
Smoking	2 (7.4%)	6 (13.9%)	0.441
Substance abuse	2 (7.4%)	6 (13.9%)	0.441
Complete placenta previa	19 (70%)	21(48.8%)	0.09
Anterior placenta previa	18(66.7%)	16(37.2%)	0.187

There were no significant differences in maternal age, parity, prior caesarean delivery, prior dilatation and curettage, history of placenta previa in previous

pregnancy, reported substance abuse, or smoking between the cervical length 30 mm or less and more than 30 mm groups.

Table 2 : Maternal outcome for pregnancies with placenta previa according to cervical length.

Outcome	Total	Cervical length <30mm n=27(%)	Cervical length >30 mm n=43(%)	P
Antepartum hemorrhage	45	25 (92%)	20 (46%)	<0.001
Gestational age at first bleeding episode (weeks)	-	29 (22-34)	33 (22-38)	0.06
Preterm delivery	39	25(92%)	14 (32%)	<0.001
Emergency caesarean section	36	22(81%)	14 (32%)	<0.001
Elective caesarean section	27	1 (4%)	26 (61%)	<0.001
Caesarean hysterectomy	7	6 (22%)	1 (2%)	<0.05

Women with placenta previa and short cervix were more likely to develop antepartum hemorrhage (92%) compared with those with longer cervixes (46%) (p<0.001). Women with a short cervix were more likely to have preterm delivery, 92% compared with 32% (p<0.001). Similarly, there were more chances of emergency caesarean section as a result of significant

hemorrhage 74% compared with 27% in those with cervical length>30 mm (p<0.001). Elective caesarean section was done more in the women having longer cervical length (>30 mm). This was a significant association. The probability of caesarean hysterectomy was also significantly greater in short cervix group than longer cervix group.e

Table 3: Shows association of different demographic and clinical variables with antepartum hemorrhage.

S. N	Variable	No hemorrhage (n=26)		Hemorrhage (n=44)		Significance of difference	
		No.	%	No.	%	x ²	p
1.	Previous history of caesarean section						
	No	20	76.9	31	70.5	1.867	0.393
	1	6	23.1	10	22.7		
	2 or more	0	0.0	3	6.8		

Table 3: Shows association of different demographic and clinical variables with antepartum hemorrhage. (contd.)

S. N	Variable	No hemorrhage (n=26)		Hemorrhage (n=44)		Significance of difference	
		No.	%	No.	%	χ^2	p
2.	H/o Placenta previa in previous pregnancy	3	11.5	7	15.9	0.255	0.614
3.	Previous h/o dilatation and curettage	3	11.5	17	38.6	5.880	0.015
4.	Smoking	2	7.7	4	9.1	0.041	0.840
5.	Substance abuse	0	0	6	13.6	3.878	0.049
6.	Complete placental previa	15	57.7	25	56.8	0.005	0.943
7.	Location of placenta previa						
	Anterior	8	30.8	26	59.1	5.637	0.060
	Posterior	16	61.5	17	38.6		
	Lateral	2	7.7	1	2.3		
8.	Cervical length <30 mm	2	7.7	25	56.8	16.646	<0.001

No significant association between hemorrhage was observed with previous history of caesarean section, previous history of placenta previa, smoking, complete placenta previa, and location of placenta previa. As compared to those without a previous history of dilatation and curettage, those having previous history

of dilatation and curettage had significantly higher proportion of patients with hemorrhage ($p=0.015$). Substance abuse was also found to be significantly associated with haemorrhage ($p=0.049$) There was a significant association between cervical length (<30mm) and hemorrhage ($p<0.001$).

Table 4 : Neonatal outcome according to cervical length.

	Total	Cervical length <30mm(n=27)	Cervical length >30mm (n=43)	P
Birth weight(gms)		1950±533	2535±287	<0.0001
Apgar scores at 5min<6	13	7	6	0.225
Still birth	2	2	0	0.145
Neonatal admission	19	11	8	0.056
Neonatal death	10	9	1	<0.001

The mean birth weight was 2294.2 ±466 gms. Birth weight in the short cervix group (1950±533) gms was lower than the longer cervix group (2535 ±287) gms. This difference was statistically significant.

A total of 12 (17.1%) babies had Apgar score between 3 to 6 and 1 (1.4%) had Apgar score <3. Apgar scores did not vary significantly among the two groups. There were 19 (27.9%) admissions to neonatal intensive care unit. Two babies were stillborn and nine out of 68 neonates expired. Stillbirths, neonatal admissions and mortality were more in the short cervix group, however only neonatal death was significantly associated with shorter cervical length.

DISCUSSION

Placenta previa complicates only 0.5% of pregnancies¹, however, it is one of the leading causes of maternal morbidity and mortality due to antepartum and intrapartum hemorrhage. Hemorrhage typically occurs in the third trimester as

the lower uterine segment becomes more defined and the internal os dilates. However, women who are more prone to severe bleeding require emergency premature deliveries are not likely to be recognised in the preclinical stage. Consequently, all asymptomatic women with complete placenta previa detected in the third trimester are usually scheduled for elective caesarean section around 36 weeks of gestation unless vaginal bleeding occurs earlier. However, obstetric management is not tailored specifically to the patient because individual risk of hemorrhage is difficult to predict.

In our study, the chance of prepartum bleeding among women diagnosed sonographically with placenta previa in the third trimester was approximately 60%, while the risk of emergency caesarean section due to massive hemorrhage was almost one in two. The majority of patients had preterm delivery comprising almost 61%. Our study seems to suggest that the shorter the cervix at the time of Sonographic diagnosis, the higher the risk of severe

prematurity and emergency caesarean section due to significant maternal hemorrhage. Women with placenta previa and cervical length <30 mm were three times more likely to deliver preterm than those with cervical length more than that. The risk of developing antepartum bleeding was twice more in those with shorter cervix than those with longer cervix. Similarly, they were 2.5 times more prone to have emergency caesarean section resulting from massive hemorrhage.

The increased risk of preterm hemorrhage in women with complete placenta previa and short cervix could be explained by the fact that with a short cervix the chance of spontaneous preterm labour is increased. Sonographic detection of a short cervix has been demonstrated consistently to predict earlier occurrence of labour^{7,8}.

CONCLUSION

Our study suggests that in women with placenta previa, shortening of the cervix may predict an earlier placental detachment with massive hemorrhage. We suggest an appropriate management of such cases in terms of maternal and neonatal health. Adequate facilities for blood arrangement and critical care for the patient should be provided.

The main limitation of our study is the small number of women enrolled, but, if our observations are confirmed in large series, transvaginal measurement of cervical length could become part of routine third trimester scan in women with placenta previa in order to predict the risk of severe complications related to maternal and neonatal health.

ACKNOWLEDGEMENT

The authors are grateful to the Dr. Yasmeen Usmani, Lecturer, Department of Radiodiagnosis, L.L.R.M. Medical college, Meerut for providing prompt and accurate sonography and valuable guidance for this work.

Conflict of Interest : None

Source of Funding

Under the " Janni Suraksha Yojna" scheme of National Rural Health Mission program by the The

Ministry of Health and Family Welfare, Govt of India, the antenatal investigations including ultrasound are provided free in our institution.

ETHICAL STANDARD

The study was approved by the Ethics Approval Committee of LLRM Medical college in its meeting on 6th November 2011

REFERENCES

1. Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Rouse DJ, Spong CY. Obstetrical hemorrhage, Williams obstetrics, 23rd ed. New York (NY): McGraw-Hill; 2009, p.769–73.
2. Crane JM, Van den Hof MC, Dods L, Armson BA, Liston R. Neonatal outcomes with placenta previa. *Obstet Gynecol* 1997;177:210–4.
3. Ananth CV, Smulian JC, Vintzileos AM. The effect of placenta previa on neonatal mortality: a population-based study in the United States, 1989 through 1997. *Am J Obstet Gynecol* 2003;188:1299–304.
4. Iams JD, Goldenberg RL, Meis PJ, et al. The length of the cervix and the risk of spontaneous premature delivery. National Institute of Child Health and Human Development Maternal Fetal Medicine Unit Network. *N Engl J Med* 1996;334:567–72.
5. Owen J, Yost N, Berghella V, et al. Mid-trimester endovaginal sonography in women at high risk for spontaneous preterm birth. *JAMA* 2001;286:1340–8.
6. Dashe JS, McIntire DD, Ramus RM, Santos-Ramos R, Twickler DM. Persistence of placenta previa according to gestational age at ultrasound detection. *Obstet Gynecol* 2002;99:692–7.
7. Rozenberg P, Gillet A, Ville Y. Transvaginal sonographic examination of the cervix in asymptomatic pregnant women: review of the literature. *Ultrasound Obstet Gynecol* 2002; 19: 302–311.
8. Palacio M, Sanin-Blair J, S´anchez M, et al. The use of a variable cut-off value of cervical length in women admitted for preterm labour before and after 32 weeks. *Ultrasound Obstet Gynecol* 2007; 29: 421–426.
9. Oyelese Y, Smulian JC. Placenta praevia, placenta accreta, and vasa praevia. *Obstet Gynecol* 2006; 107: 927–941.

A Comparative Study of Lipid Profile in Tobacco Chewers in Pune District

Sandeep Kumar Sharma¹, U K More²

¹Assistant Professor, Department of Biochemistry, Saraswathi Institute of Medical Sciences, Panchsheel Nagar, U.P. India., ²Associate Professor, Department of Biochemistry, Dr. D.Y. Patil Medical College Pune, Maharashtra, India

ABSTRACT

Objective: The present study was undertaken to assess the association between the tobacco chewing and alteration in plasma lipid profile.

Method: 300 cases of tobacco chewing between the ages of 20-50 years were included in the study and 300 age matched non-tobacco users served as control. Serum lipid profile was determined by enzymatic methods by kits obtained from Sigma-Aldrich.

Results: High density lipoprotein cholesterol was significantly lower in tobacco chewers than the controls. Total cholesterol, low density lipoprotein cholesterol, very low density lipoprotein cholesterol and, triglycerides was significantly higher in tobacco chewers as compared to non-tobacco user control group.

Conclusion: Our findings suggest that tobacco chewing causes significant dyslipidemia in the direction that increases the cardiovascular risk.

Keywords: TC-Total cholesterol, LDLc- Low density lipoprotein cholesterol, VLDLc- Very low density lipoprotein cholesterol, HDLc- High density lipoprotein-cholesterol, TG-Triglyceride

INTRODUCTION

The use of tobacco leaf to create and satisfy nicotine addiction was introduced to Columbus by Native Americans and it rapidly spread to Europe¹. Health effects of tobacco have been proven through numerous epidemiological studies since past 50 years. According to W.H.O. report (2002) tobacco is the most important preventable cause of overall mortality as well as cardiovascular mortality worldwide². The world health report (2003) concludes that consumption of tobacco products are the world's leading preventable cause of death, responsible for about 5 million deaths a year mostly in poor countries and poor population³.

Smokeless tobacco use is found among more than one-third (38.1%) of the men and around one-tenth

(9.9% of the women), according to the third round of the National Family Health Survey-3, conducted in 2005-2006⁴.

While guthka continues to gain in popularity, unprocessed tobacco leaf is actually the most widely used form of smokeless tobacco. As many as 19.4% of rural and 7.4% of urban households consume leaf tobacco⁵.

Although nicotine is the main constituent of tobacco responsible for addiction, the user also gets exposed to all the toxic and carcinogenic chemicals contained in smokeless tobacco.

Like an opiate that targets the reward pathway in the brain, nicotine also produces feelings of pleasure and well-being. Nicotine stimulates secretion from the adrenal glands, causing a sudden increase in blood sugar, blood pressure, heart rate and respiration. These rewarding and stimulating effects, coupled with the unpleasant withdrawal syndrome contributes to tobacco dependence⁶.

Many of the health problems associated with tobacco use are a consequence of nicotine. Since the

Corresponding author:

Sandeep Kumar Sharma

Assistant Professor

Department of Biochemistry, Saraswathi Institute of Medical Sciences, Panchsheel Nagar, U.P. India

Tel: +919598019308

E-mail: dr_sandeepsharma44@yahoo.com

blood nicotine levels which result from smokeless tobacco use are similar to those from cigarette smoking, the nicotine related health effects of smoking would also be expected to result from using smokeless tobacco^{7,8,9}. Compared to nonsmokers, smokers tend to have elevated levels of low density and very low density lipoproteins and reduced levels of high density lipoproteins, a lipid profile strongly associated with increased risk of atherosclerosis and coronary heart disease^{10,11}. To date, only few studies have been conducted to determine the effects of smokeless tobacco use on lipid metabolism.

Keeping in view the paucity of data of adverse effect of tobacco chewing on lipid profile, this study is carried out to assess the impact of active tobacco chewing on lipid profile and to compare it with controls.

MATERIAL AND METHOD

Three hundred cases of tobacco chewing which had been on various pan masala guthka etc, attending all clinical departments of Dr. D.Y.Patil Medical College Pune, India, from January 2009 to October 2010 were selected for the present study. Patients suffering with diabetes mellitus, nephrotic syndrome, myxoedema and familial hypercholesterolemia, obesity and menstrual disorder, which might affect the blood lipid, were excluded. Three hundred healthy individuals preferably relatives of patients were selected to serve as normal control. After an overnight fast of 14-16 hours, 5 ml blood samples of patient and control were collected in vacuum tubes and allowed to clot at room temperature for 60-120 minute followed by centrifugation at 3000 rpm for 10 min. at 40C. Serum was stored at -20C, for estimation of lipid profile.

Estimation of triglyceride

Estimation of triglyceride was performed by method described by Kaplan¹² by using commercially available kit from Sigma- Aldrich. In brief, 10 micro liter of serum was mixed with 1000 micro liter of reaction solution. The absorbance of sample was measured against the reaction solution at 540 nm, due to the formation of Quinonimine dye, which is directly proportional to the total triglyceride concentration in the sample.

Estimation of total cholesterol

Estimation of total cholesterol was performed by Pelkonen *et al*¹³. CHOD-PAP method by using commercially available kit from Sigma-Aldrich. In brief, 0.02 ml of serum was mixed with 2 ml of reaction solution (Enzyme solution with colour reagent). The absorbance of samples was measured at 540nm against the reagent blank value.

Estimation of serum HDLc

Estimation of serum HDLc was performed as described by Nikkila *et al*¹⁴. CHOD-PAP method by using commercially available kit from Sigma-Aldrich. In brief, 0.2 ml of serum was mixed with 0.5 ml of precipitating reagent solution and centrifuged at 4000 rpm for 10 minute. 0.1 ml of clear supernatant was mixed with 1 ml of reaction solution. The intensity of colour produced was directly proportional to the concentration of HDL cholesterol in the sample. The absorbances of samples were measured at 540 nm against the reagent blank value.

Estimation of serum LDLc and VLDLc

Estimation of LDLc and VLDLc was calculated by Friedwald equation¹⁵.

$$[LDLc]=[TC] - [HDLc] - [TG/5]$$

Triglyceride /5 is an estimate of VLDL- cholesterol concentration.

OBSERVATIONS AND RESULTS

The study was conducted on 300 cases of different age group who were on tobacco chewing. 300 healthy age matched nontobacco users individuals served as control.

Table No. - 1 shows the distribution of cases according to age group. The result shows maximum patients 48.0% were in the age group of 40 - 50 years followed by 36% were in age group of 30-39 years, while the least 16% were in age group of 20-29 years.

Table No. 1. Distribution of cases according to age

Age group (Years)	No of patients	Percentage
20-29	48	16.0%
30-39	108	36.0%
40-50	144	48.0%
Total	300	100%

Table No. 2. Comparison of lipid profile between tobacco chewers & controls

Study group	Total cholesterol	LDL-cholesterol	VLDL-cholesterol	Triglyceride	HDL-cholesterol
Control	160.79±28.77	98.7±27.16	21.0±4.24	104.85±21.20	49.63±6.54
Chewer	184.65±42.49*	127.58±29.53*	24.93±4.82*	124.63±24.12*	44.41±10.30*

*p < 0.001 Compared to control

Table No. - 2 shows TC, LDL_c, TG, VLDL_c levels to be significantly increased and HDL_c is significantly decreased (p < 0.001) in tobacco chewers as compared to control.

DISCUSSION

Tobacco is in legal use everywhere in the world, it causes far more deaths than all other psychoactive substances combined. In studying the tobacco habits in developing countries, indigenous forms of smoking, as well as chewing, which are characteristic of certain regions; have to be taken into account¹⁶. More people die from tobacco related diseases other than cancer such as stroke, myocardial infarction, aortic aneurysm and peptic ulcer.

The most common form of tobacco chewing in India is the betel quid which usually consists of the betel leaf, areca nut, lime and tobacco. It is common for the poorer people to rub with the thumb flakes of sun – dried tobacco and slaked lime in the palm of their left hand until the desired mixture is obtained. The mixture is then put into the mouth in small at frequent intervals during the day and slowly sucked and swallowed after dilution with saliva.

In the present study it is observed that tobacco chewing was more prevalent among the lower socioeconomic status subjects. There was also a greater incidence of family history of tobacco use among these groups.

In this study levels to TC, LDL_c, VLDL_c, HDL_c, TG were measured in 300 chewers, 300 controls. It is found that TC, LDL_c, VLDL_c, TG levels are significantly higher in chewers in comparison to non tobacco users controls. Similarly HDL_c were significantly lower in chewers as compared to controls. These results are in favour of previous study carried out by BK Gupta et al¹⁷. In which mean value of total cholesterol, LDL_c and TG was found to be significantly higher in tobacco chewers as compared to controls.

Our results are also in agreement with results of Khurana M et al¹⁸, Bahattin ADAM et al¹⁹, Cecily S. Ray²⁰ stating that tobacco chewers had a significantly higher total cholesterol, LDL_c and TG levels compared

to controls. It should be remembered that lipid profile is strongly influenced by physical activity and dietary habits. However more research is needed to demonstrate the effect of physical activity, dietary habits on alteration of lipid profile by nicotine and to find the correlation between consumption of tobacco and alteration of lipid profile

Some people commit suicide by drowning, but many by addiction. A uniquely human habit, tobacco has been identified as a major Coronary heart disease risk factor²¹ with several possible mechanisms including nicotine stimulation of adrenergic drive raising both blood pressure and myocardial oxygen demand as well as alteration in lipid metabolism with fall in “protective” HDL_c etc.

CONCLUSION

The result showed that the mean values of serum TC, LDL_c, VLDL_c and TG were significantly higher in tobacco chewers than in controls. The mean values of HDL_c were significantly lower in chewers than in controls. From the results of the present study, it may be concluded that tobacco chewing induces dyslipidaemic state in the direction of increased risk of coronary artery disease. So it is strongly recommended to avoid nicotine addiction for the benefit of cardiac health.

REFERENCES

1. David M. Burns – Nicotine Addiction – Chapter 375 – Harrison’s principles of Internal Medicine; Vol. II ; 16th Edition ; 2005; 2573-2576.
2. World Health Report 2002. Reducing Risks, Promoting Healthy Life; Geneva. World Health Organization; 2002; 47-98.
3. World Health Report 2003. Neglected Global Epidemics, three growing threats. World Health Organization 2003; 85-95.
4. International institute for Population Sciences and ORC Macro International. National Family Health Survey (NFHS-3), 2005-2006: India, IIPS, Mumbai, 2007, vol. II, pp. 426-429.
5. Jojn, R.M., Household’s tobacco consumption decisions: evidence from India. J. South Asian Dev., 2006, 1, 119-147.

6. Henningfield, J.E. and Benowitz, N.L., Pharmacology of nicotine addiction. In Tobacco: Science, Policy and Public Health (eds Boyle, P. Et al.), Oxford University Press, Oxford, 2004, pp. 129-147.
7. Hoffmann D, Harley NH, Fisenne I, Adams JD, Brunnemann KD: Carcinogenic agents in snuff. JNCI 1986; 76:435-437.
8. Benowitz NL, Hallsm, Herning RI, Jacob piii, Jones RT, Osman AL: Smokers of low-yield cigarettes do not consume less nicotine. N. Engl J Med 1983; 309: 139-142.
9. Russel MAH, Jarvis MJ, West RJ, et al: Buccal absorption of nicotine from smokeless tobacco sachets (letter). Lancet 1985; 2(8468):1370.
10. Shennan NM, Seed M, Wynn V: Variation in serum lipid and lipoprotein levels associated with changes in smoking behavior in non-obese Caucasian males. Atherosclerosis December 1985; 58(1/3):17-25.
11. Brunner D, Altman S, Loebel K, Schwartz S, Levin S: Serum Cholesterol and triglycerides in patients suffering from ischemic heart disease and in healthy subjects. Atherosclerosis 1977; 28: 197-204.
12. Kaplan, M.M. Clinical and laboratory assessment of thyroid abnormalities. Med. Clin. North. Amer.1985; 5:69-71.
13. Palkonen, R., Foegelholm, R., Nikkila, E.A. Increase in serum cholesterol during Phenytoin treatment. Br. Med. J.1975;4:85-87.
14. Nikkila, E.A., Kaste, M., Ehnbolm, C., Viikari, J. Increase in serum high-density lipoprotein in Phenytoin users. Br. Med. J.1978; 2: 99-103.
15. Friedewald WT, Levy RI, Fredrickson DS. Estimation of the concentration of low-density lipoprotein cholesterol in plasma, without use of the preparative ultracentrifuge. Clin Chem 1972; 18:499-502.
16. Pais P, Fay MP, Yusuf S. Increased risk of acute myocardial infarction associated with Qbedi and cigareete smoking in Indians: final report on tobacco risks from a case-control study. Indian Heart J2001; 53; 731-5.
17. Cluette Brown J. Mulligan J. Doyle K. Hagan S. Osmolski T. And Hojnocki J: Oral nicotine induces an atherogenic lipoprotein profile. Proc Soc Exp Biol Med 182:409-413.1986.
18. Khurana M, Sharma D, Khandelwal PD. Lipid profile in smokers and tobacco Chewers—a comparative study.The Journal of the Assosiation of Physicians of India 48(9):895-7,2000Sep.
19. Richter, P. And Watson, C., Chemistry and toxicology. In Bidi Smoking and Public Health (eds Gupta P.C. and Asma, S.), Ministry of Health and Family Welfare, Government of India, 2008, pp. 61-100.
20. Ritesh Gupta,MD, MPH,Hitinder Gurm, MD; John Bartholomew, MD Smokeless Tobacco and Cardiovascular Risk. Arch Intern Med. 2004; 164:1845-1849.
21. Gupta R. Sharma SC, Gupta VP, Gupta KD. Smoking and alcohol intake in a rural Indian Population and correlation with hypertension and coronary heart disease prevalence. J. Assoc Physicians India 1995; 43: 153-8.

Cross Sectional Study of Adherence to Prescribed Medications among Individuals Registered at a High Risk Clinic in a Rural Area in Bangalore, India

Farah Naaz Fathima¹, Deepthi N Shanbhag¹, Shailendra Kumar B Hegde²,
Bibin Sebastian³, Stephanie Briguglio⁴

¹Assistant Professor, Department of Community Health, St. John's Medical College, Sarjapura Road, Koramangala, Bangalore, ²Assistant Professor, Department of Community Medicine, Sree Siddhartha Medical College, Sree Siddhartha University, Tumkur, Karnataka, ³Medical Intern, Department of Community Health, St. John's Medical College, Sarjapura Road, Koramangala, Bangalore, ⁴Overseas Elective Student, University of South Florida, Tampa, United States of America

ABSTRACT

Introduction: Non-communicable diseases (NCDs) contributed 63% of the 57 million global deaths in the year 2008 and cardiovascular diseases (CVDs) accounted for the maximum number of NCD deaths. For proper prevention and control of CVDs, it is important that patients strictly adhere to the prescribed drug regimens.

Objectives: To assess adherence to prescribed pharmacological medications among individuals registered at a 'rural cardiovascular disease - high risk clinic' in Bangalore and to identify the factors associated with adherence.

Materials and Method: This cross-sectional study included all patients registered at a cardiovascular disease high risk clinic at a private primary care centre in a village, near Bangalore during November - December 2009. A pre-structured interview schedule in the local language was administered to all study subjects. Morisky's Medication Adherence Scale (MMAS) was used to assess adherence to medications.

Results: Out the 162 patients, 85 (52.5%) were females. Most patients had hypertension (45.7%) followed by those with hypertension and diabetes (30.2%). Sixty-five patients (40.1%) were fully adherent to the prescribed medications while 95 (58.6%) were partially adherent and 2 (1.3%) were completely non-adherent. Age and the perceived expense of medications were found to be having statistically significant association with adherence. There was no statistical association between adherence and gender, educational status, occupation, religion, marital status, side effects of drugs, presence of care giver and number of drugs prescribed.

Conclusions: Only 40.1% were fully adherent to prescribed pharmacological medications. Perceived expense of medications and age appear to be factors that influence adherence.

Keywords: Adherence; Cardiovascular diseases (CVDs); hypertension; diabetes mellitus; Morisky's medication adherence scale (MMAS)

INTRODUCTION

Non-communicable diseases (NCDs) are the leading causes of death globally; every year killing

more people than all other causes put together and they strike hardest at the world's low and middle income populations. NCDs contributed 63% (36 million) of the 57 million global deaths in the year 2008. Cardiovascular diseases (CVDs) account for the maximum number of NCD deaths. In the year 2008, CVDs accounted for 17 million deaths (48% of NCDs). Diabetes Mellitus caused an additional 1.3 million deaths. Over 80% of deaths due to CVDs and diabetes occurred in low and middle income countries such as India¹. In India, NCDs accounted for 53% of all deaths in the year 2005 while CVDs contributed 29% of these deaths².

Corresponding author:

Farah Naaz Fathima

Assistant Professor

Department of Community Health, St. John's Medical College, Sarjapura Road, Koramangala, Bangalore

Phone: +91 - 80 - 2206 5043, 2563 3620

Mobile: +91 - 098868 94586

Fax: +91 - 80 - 2552 0777, 2563 3620

Email: doc.farah@gmail.com

Despite a rapid growth of NCDs globally, most of its impact can be averted through well-understood, cost-effective and feasible interventions such as proper medications and regular monitoring¹.

Adherence is defined by the World Health Organization (WHO) as "the extent to which a person's behaviour i.e. taking medications, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider"³. The WHO describes poor adherence as the most important cause of uncontrolled blood pressure and estimates that 50–70% of people do not take their antihypertensive medication as prescribed⁴.

For proper prevention and control of CVDs, it is important that the patients follow the recommendations regarding both drug intake and lifestyle changes. The importance of adherence to a drug regimen lies in the fact that the patient can benefit completely only if he takes his drugs as advised by his doctor, that is in the proper dose and at the recommended time. But, adherence to medications is dependent on numerous factors and has been shown to vary from 0 to 100% in different populations studied^{4,5,6,7}. There are different methods to measure adherence to a drug such as direct observation, interview schedules and questionnaires, counting the number of pills remaining at the end of a certain time period, rate of prescription refills, clinical response to medications, maintaining a diary and so on. In this study, we have used the Morisky's Medication Adherence Scale (MMAS).

OBJECTIVES

Objectives of this study are

1. To assess adherence to prescribed pharmacological medications among individuals registered at a 'rural cardiovascular disease - high risk clinic', Bangalore, South India
2. To identify the factors associated with adherence among these patients.

MATERIALS AND METHOD

A cross sectional study was conducted among all patients registered and attending a cardiovascular disease high risk clinic set up in a village called Tarabanahalli outside of Bangalore, which caters to patients coming from the surrounding six villages. The study investigators contacted the patients at the clinic;

however, those patients who could not be contacted at the clinic were paid home visits. Those patients who could not be contacted even after two home visits and those patients who denied consent were excluded from the study group. The study was conducted in the months of November-December 2009.

Assuming an adherence rate of 50%, an estimated sample size of 150 patients would be required at an absolute precision of 8% and an alpha error of 5%. A pre-structured interview schedule in the local language, comprising two sections was developed for the purpose of this study. Section 1 of the schedule was designed to collect socio-demographic details of the study population while section 2 comprised of the Morisky's Medication Adherence Scale⁸ to assess the adherence and questions to identify the factors affecting adherence. MMAS measures both intentional and unintentional adherence with a sensitivity of 85.7% and specificity of 72.5% and is based on forgetfulness, carelessness, stopping medication when feeling better, and stopping medication when feeling worse. Total score ranges from 0 (non-adherent) to 4 (fully adherent); scores of 1, 2, and 3 imply moderate adherence. The MMAS has a high reliability and validity and has been particularly useful in chronic conditions such as hypertension. Consent was obtained at the time of interview from each patient.

FINDINGS

A total of 162 patients formed our study group. The proportion of females (85, 52.5%) was higher than that of males (77, 47.5%). Mean age was found to be 59.75 years (± 12.47) and 79 (48.8%) of the patients were aged 60 years and older. A majority (79.1%) of the study population had received some formal education. The rate of illiteracy was higher among females (71%) as compared to males (30%). The majority of the study population was found to be married and currently living with spouse (73.5%) while the remainder were widows and widowers (26.5%). Most of the patients worked in the agricultural sector.

The majority of the study population (95.7%) belonged to class 4 (lower middle; 34%) and class 5 (poor; 61.7%) of the modified B G Prasad's socioeconomic classification scale⁹. Hindus formed a majority of the study population (69.1%) followed by Christians (27.8%) and Muslims (3.1%).

Most of the patients attending the clinic were those with hypertension (45.7%) followed by dual morbidity

of hypertension and diabetes (30.2%). [Figure 1]

Adherence to prescribed pharmacological medications (MMAS Scores) & associated factors

Sixty-five patients (40.1%) were fully adherent to the prescribed medications while 95 patients (58.6%) were partially adherent and 2 patients (1.3%) were completely non-adherent [Table 1]. The mean MMAS score for the entire study population was found to be 3.2 (Males = 3.3; Females = 3.1). However, there was no statistically significant difference in the mean MMAS scores between males and females (*p* value = 0.11 >0.05).

The following factors were studied to have an association with adherence: age, gender, perceived expense of medications, education status, occupation, religion, marital status, side effects of the drugs, help available to take the medicines and the number of medications prescribed. Table 2 shows the MMAS scores of the study population by age and by the perceived expense of medications. These two factors were found to be having statistically significant association with adherence.

A significantly higher proportion of individuals 60 years of age or older were fully adherent to the

prescribed medications as compared to those under the age of 60 years. Similarly, a significantly higher proportion of those individuals who perceived that their medicines were non-expensive were fully adherent as compared to those who perceived that their medicines were expensive. It was also found that, there was no statistical association between adherence and gender, educational status, occupation, religion, marital status, side effects of drugs, help available to take the medicines and number of drugs prescribed.

Tables and Figures

Figure 1: Distribution of the study population by morbidity

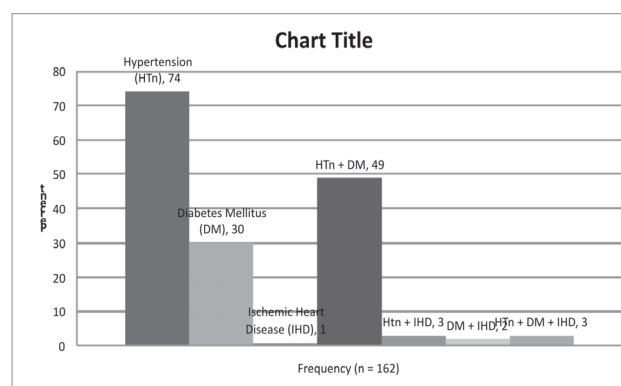


Table 1: Distribution of the population by MMAS Scores & Gender

Gender	Non adherent	Moderately adherent	Fully adherent	Total	Mean MMAS Scores
Males	0 (0)	43 (55.8)	34 (44.2)	77 (47.5)	3.3
Females	2 (2.3)	52 (61.2)	31 (36.5)	85 (52.5)	3.1
Total	2 (1.3)	95 (58.6)	65 (40.1)	N = 162 (100)	3.2

Table 2: MMAS scores of the study population by age and by the perceived expense of medications

Risk factors found to have significant association with adherence	Non adherent and Moderately adherent (%)	Fully adherent (%)	Total (%)	Chi squares and 'p' values
Age < 60 yrs	56 (67.5)	27 (32.5)	83 (51.2)	Chi square = 4.08; 'p' value < 0.05
Age ≥ 60 yrs	41 (51.9)	38 (48.1)	79 (48.8)	
Medicines perceived as expensive	55 (72.4)	21 (27.6)	76 (46.9)	Chi square = 9.30; 'p' value < 0.05
Medicines perceived as non-expensive	42 (48.8)	44 (51.2)	86 (53.1)	
Total	97 (59.9)	65 (40.1)	N = 162 (100)	

DISCUSSION

This study was conducted among patients attending a rural cardiovascular disease high risk clinic. A total of 162 patients were included in the study

group. Results indicated that 40.1% of the study population were fully adherent to the prescribed medications while 58.6% were partially adherent and 1.3% was completely non-adherent. In other words, almost 60% of the study population did not adhere to

the prescribed medications and hence, may not be able to keep their chronic illnesses under control. These individuals are more likely to suffer from the complications of these chronic illnesses, compared to the fully adherent individuals.

Studies worldwide have indicated that despite the availability of effective medical therapy, more than 50% of all hypertensive patients do not take any treatment¹⁰ and more than 50% of those on treatment have blood pressures over the 140/90 mm Hg threshold¹¹, which is considered hypertension. However, just as non adherence to medications is a problem with hypertension, it may also be an issue in the treatment of other chronic NCDs.

A statistically significantly higher percentage of sampled individuals aged 60 years and older were fully adherent (48.1%) as compared to those under the age of 60 years (32.5%). This could possibly be attributed to the fact that most elderly individuals (individuals aged 60 years and older) depend on their caretakers who remind them about the drugs to be taken and thus the elderly may have better adherence or maybe the older individuals are more aware of their medical issues and take doctors' orders more seriously.

However, we did not find a statistically significant difference between those individuals who had help available in taking their medicines versus those who did not. Our study may not have had a large enough sample size to detect this difference or some other piece of the methodology may not have captured this difference. This is one possible limitation. Further research is needed to address this topic.

Perceived expense of medications is one of the most important factors in determining adherence¹². Rural families of developing countries such as India may have a particularly difficult time paying for medications. A statistically significantly higher proportion of those individuals who perceived that their medicines were non expensive (51.2%) were fully adherent as compared to those who perceived that their medicines were expensive (27.6%).

CONCLUSION

Non-communicable diseases accounted for 53% of all deaths in India in the year 2005 while cardiovascular diseases contributed 29% of these deaths². Despite a rapid growth of NCDs globally, most of its impact can be averted through feasible interventions such as

proper medications and regular monitoring¹. Adherence to prescribed treatment is imperative to effective control of the disease.

This study found that among the rural population sampled, 40.1% were fully adherent to prescribed pharmacological medications. This study also found a statistically significant association between age and adherence ($p < 0.05$). Those individuals who were 60 years of age or older were more fully adherent (48.1%) as compared to those under the age of 60 years (32.5%) ($p < 0.005$). There was no statistically significant association found between adherence and gender, educational status, occupation, religion, marital status, side effects of drugs, help available to take the medicines and number of drugs prescribed. Perceived expense of medications appears to be one barrier to adherence. Only 27.6% of the study sample was found to be fully adherent to prescribed perceived expensive medications, while 51.2% were fully adherent to prescribed perceived non expensive medications. There is a need for further research to unearth factors associated with adherence since adherence to prescribed medications is imperative to the effective control of chronic NCDs.

ACKNOWLEDGEMENTS

We thank all patients registered at the high risk clinic at Tarabanahalli for participating in this study. We thank Dr. Sr. Helen, Dr. Lucy Nora and their team at Nirmala Health Centre, Tarabanahalli, Bangalore for permitting us to do this study.

Conflict of Interest: None declared

REFERENCES

1. Global status report on non-communicable diseases 2010. World Health Organization. Ch 1 – Burden: mortality, morbidity and risk factors. p.9.
2. Reddy KS, Shah B, Varghese C, Ramadoss A. Responding to the threat of Chronic Diseases in India. *Lancet* 2005; 366: 1744 – 9.
3. Sabaté E, editor. Ch. XIII – Hypertension. In: Adherence to long-term therapies - Evidence for action. World Health Organization. Geneva: WHO Press. 2003. p. 129 - 36.
4. Sabaté E, editor. Ch III – How does poor adherence affect policy makers and health managers? In: Adherence to long-term therapies - Evidence for action. World Health Organization. Geneva: WHO Press. 2003. p 27.

5. Haynes RB, McDonald HP, Garg AX. Helping patients follow prescribed treatment: clinical applications. *JAMA*. 2002; 288: 2880 - 3.
6. Krousel-Wood M, Hyre A, Muntner P, Morisky D. Methods to improve medication adherence in patients with hypertension: current status and future directions. *Curr Opin Cardiol*. 2005; 20: 296–300.
7. DiMatteo MR. Variations in patients' adherence to medical recommendations: a quantitative review of 50 years of research. *Med Care*. 2004; 42: 200–209.
8. Morisky D, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. *Med Care*. Jan 1986; 24(1): 67 - 74.
9. Agarwal AK. Social Classification: The need to update in the present scenario. *Ind Jour Com Med*, Jan 2008; 33(1): 50 – 1.
10. Inkster ME, Donnan PT, MacDonald TM, Sullivan FM, Fahey T. Adherence to antihypertensive medication and association with patient and practice factors. *J Hum Hypertens*. 2006. 20: 295 - 297.
11. Falaschetti E. Ch 7 - Blood Pressure. In: Sproston K, Primatesta P, editors. *Health Survey for England 2003*. National Centre for Social Research, Department of Epidemiology and Public Health at the Royal Free and University College Medical School. 2004. London: TSO. p 181–220. (Risk Factors for Cardiovascular diseases; vol.2)
12. Taira DA, Wong KS, Frech-Tamas F, Chung RS. Copayment level and compliance with antihypertensive medication: analysis and policy implications for managed care. *Am J Manag Care* 2006; 12(11): 678-83.

Determination of Sex from Metric Evaluation of Cephalic Dimensions in North Indian Population

Geethanjali HT¹, Asha KR², Vinay Kumar K¹, Lakshmi Prabha R³, Gangadhar M R⁴

¹Associate Professor in Anatomy, Mandya Institute of Medical Sciences, Mandya, Karnataka, ²Associate Professor in Anatomy, Sri Siddhartha Medical College, Tumkur, Karnataka, ³Professor & HOD, Dept of Anatomy, Professor & HOD, Dept of Anatomy, Sri Siddhartha Medical College, Tumkur, Karnataka, India, ⁴Associate Professor, Dept of Anthropology, Manasa Gangothri, University of Mysore, Mysore

ABSTRACT

Aim: Sex determination occupies a relatively central position in the identification necessitated by medico legal experts or medical jurisprudence. The present study aims to determine sex by Cephalic Index among 100 North Indian medical students (50 males, 50 females).

Method: Cephalic dimensions were taken in 100 North Indians using standard anthropometric instruments. Cephalic index was calculated. Results were statistically analysed.

Results: Statistical analysis indicated the cephalic index of males was significantly higher than those of females ($p < 0.01$).

Conclusion: From the present study it can be inferred that cephalic dimensions can be successively used to determine sex in the above said population, with special reference to medico legal cases and population based studies.

Keywords: Sex determination, Cephalic index, Identification, North Indian Population

INTRODUCTION

Forensic anthropology is conceptualized more broadly as a field of forensic assessment of human remains and their environments.¹ One of the commonly used methods in forensic anthropology is the metric and the morphological assessment under anthropometry, which includes somatometry also.² These methods can be used to establish the identity of the individual. Identification is the determination of an individuality of a person based on certain physical characteristics.³ Proper analysis of the forensic remains includes determination of the species, race, sex, age and stature of the individual. Sexual differences are well marked in pelvis and skull as an accurate determination of sex can be done in over 90% of cases with pelvis and skull considered alone.¹

Due to paucity of information available on the sexual differences in the present population, this study was undertaken. The present study aims at determining sex of the individual based on metric evaluation of cephalic dimensions which in turn is useful to establish partial identity of an individual in North Indian population.

MATERIALS AND METHOD

The present study was undertaken in the Department of Anatomy, Sri Siddhartha Medical College, Tumkur, amongst 100 North Indian medical students, aged between 20-30 years. The student population of Tumkur comes from all over India. The division of North Indian subjects was based on their region of origin and taking into account other zonal divisions of India.⁴ The total sample consisted of 50 North Indian females and 50 North Indian males. All the subjects included in the present study were healthy and free from any apparent symptomatic deformity of the cranium.

In the present study, head length and head breadth of each individual were measured using standard anthropometric instruments (anthropometer and

Corresponding author:

Geethanjali H T

Assistant Professor,

Department of Anatomy, Sri Siddhartha Medical College, Tumkur, Karnataka, India.

Email: gitanjaliht@gmail.com

Phone: 09964468415

spreading calipers with blunt ends) in centimetres to the nearest millimetre. All the measurements were taken by one observer in order to avoid inter-observer bias. Measurements were recorded according to Singh and Bhasin.⁵

Maximum head length was measured as the straight distance between glabella (g) and opisthocranium (op) i.e., the most projecting point on the dorsal surface of the head in the mid-sagittal plane using spreading caliper with blunt ends. Instrument was held in such a manner that the tips of the caliper were free to touch the head. Undue pressure was not applied while taking the measurement.

Maximum head breadth was measured as the straight distance between the two eurya (eu) i.e. most laterally placed points on the sides of the head using spreading caliper with blunt ends. Spreading caliper was held in front of the subject in such a way that the joint of the caliper was in the mid-sagittal plane of the head). Cephalic index was calculated by dividing the Head breadth by Head length and the quotient was multiplied by 100.

Analysis was done using Statistical software namely SPSS 15, Stata 8.0, MedCalc 9.0 and Systat 11.0. The data were statistically analyzed to determine sex by cephalic index.

RESULTS

Descriptive statistics for cephalic dimensions among North Indian males (NIM) and females (NIF) are shown in Tables 1, 2 and 3. As shown in Table 1, mean value of head length among North Indian males was 18.26 and in females it was 17.51. In Table 2, we can see that mean value of head breadth among North Indian males was 15.11 and in females it was 14.73.

In Table 3, mean value of cephalic index among North Indian males was 84.27 and in females it was 82.80. In North Indian males, cephalic index was more than 83. In North Indian females, cephalic index was less than 83.

Table 1: Measurements (cm) of Head Length in Males and Females (n=100)

Study group	Minimum	Maximum	Mean	SD
NIM	16.70	19.60	18.26	0.60
NIF	16.70	18.70	17.51	0.67

Table 2: Measurements (cm) of Head Breadth in Males and Females (n=100)

Study group	Minimum	Maximum	Mean	SD
NIM	13.30	16.80	15.11	0.86
NIF	13.60	15.70	14.73	0.52

Table 3: Mean value of Cephalic index in Males and Females (n=100)

Study group	Mean
NIM	82.80
NIF	84.27

DISCUSSION

In Forensic situations like deliberate mutilation of the dead bodies for destroying evidence, terrorist bomb attacks, mass disasters e.g., plane crashes, earthquakes, etc. many a times, the exhumed remains are in fragmentary state.⁶ In such a scenario, sex determination forms an important aspect of identification.

The present study was aimed to establish the correlation between Cephalic index and sex in the above said population. Statistically significant ($p < 0.01$) differences were seen in cephalic dimensions (higher in males than females.) The Cephalic index of males (84.27) was significantly higher than those of females (82.80). The reason for this significance cannot be immediately explained but it agrees with sexual dimorphism.⁷ It is also important to note that, the rates of skeletal maturity in males and females vary during the course of growth and development.⁸ The data will be of immense use in clinical, medico-legal, anthropological and archeological scenarios.

Oladipo & Olotu determined the cephalic index for Ijaw tribe male and female as 80.98 and 78.24 respectively.⁹ They also worked out the cephalic index of Igbo tribe male and female as 79.04 and 76.83 respectively.

The present study strongly confirms sexual dimorphism in the cephalic dimensions and cephalic index as earlier studies have reported that these are more in males than females.

Investigations carried out on the cephalic index of male and female of Gurung community in Nepal revealed a significant gender difference, with male having a cephalic index of 83.1 which is lower than female with cephalic index of 84.6. This can be

attributed to regional, geographic, ethnic, racial and dietary characteristics of the study group.¹⁰

CONCLUSION

The significance of gender, age and population specific craniometric data is of multifold, in the field of both Physical Anthropology and Forensic Anthropology, in the former for study of various populations and in the latter as a part of criminal investigations for sex determination.

Determination of sex is one of the important aspect of forensic analysis of human skeletal remains and also in establishing partial identity of the unidentified and dismembered bodies. From the present study we infer that Cephalic dimensions and/or Cephalic index can be successfully used to predict sex of the individual in North Indian population and also can be a reliable indicator in forensic examination especially in medico legal condition when a decapitated head is found and other parts of the body being unavailable for examination. The evidence suggests that the value of population, gender and age specific data on cephalic indices cannot be underestimated.

REFERENCES

1. Krogman WM, Yırcan MY. The human skeleton in forensic medicine, 2nd edition. Thomas Publication, 1986. P. 4-5, 302-327.
2. Yırcan MY. Encyclopedia of Forensic Sciences. Elsevier Publications, Vol 1.p.245.
3. Asha KR, Reddy PS, Lakshmi Prabha Subhash, Mestri SC. Stature estimation using finger length in the Indian population. Journal of South India Medicolegal Association 3 (2001) 19-22
4. Srinivasan P (2002). The TTK Zonal Road Atlas of India. Chennai.TTK Health care Ltd: pp7-89.
4. Singh IP, Bhasin MK. A Laboratory manual of biological anthropology. Delhi: Kamla Raj Enterprises. 1968; pp 1-35.
5. Sinha, Varun. "We first fished out remains from drain". Indian Express. 2006-12-30. Archived from the original on 2008-10-05. <http://www.webcitation.org/5bMDvWkGC> Retrieved on 27-02-2007.
6. Olotu J, Eroje A. Oladipo, G Edibamode, E. Anthropometric study of the facial and nasal length of adult Igbo ethnic group in Nigeria. Internet J. Biol. Anthropol., 2(2), 2009.
8. Williams PL, Bannister LH, Berry MM, Collins P, Dyson M, Dussek J E.Gray's Anatomy: The anatomical basis of medicine and surgery. 38th Ed. New York, Churchill Livingstone, 2000.
9. Oladipo GS & Olotu J. Anthropometric comparison of cephalic indices between the Ijaw and Igbo tribes. Global Journal of Pure and Applied Sciences, 12(1):137-8, 2006.
10. Lobo SW, Chandrashekar TS, Kumar S. Cephalic index of Gurung community of Nepal—an anthropometric study. Kathmandu Univ. Med.J 3(3):263-26, 2005.
11. Abolhasanzadeh A, Farahani MR (2003). Standard international classification of head shapes of 22-24 years old in Tehran. J. Res. med. 26(4): 281-5

Blood Pressure Pattern in Pregnant Women of Different Body Mass Index in three Trimesters of Pregnancy

Gul Ar Navi Khan¹, Nazia Ishrat², Noor Afshan Sabzposh³

¹Assistant Professor, Department of Physiology, ²Senior Resident, Department of Obstetrics & Gynaecology, ³Professor, Department of Obstetrics & Gynaecology, J.N.Medical College, A.M.U., Aligarh, (U.P)

ABSTRACT

Study of blood pressure changes during pregnancy is essential for understanding the complications of pregnancy like birth defects, gestational diabetes, preeclampsia, bleeding disorder etc. Determinants of blood pressure (Systolic blood pressure SBP, Diastolic blood pressure DBP) influenced by the pre-pregnancy body mass index (BMI) and its values gradually changes during all the three trimesters. At present, little is known about the association of BP parameters in different grades of BMI in all the trimesters of pregnancy so our objective of study was to elucidate the aforesaid relationship. We have selected 200 pregnant women from antenatal clinics of obstetrics & gynaecology, J.N. Medical College, A.M.U., Aligarh. Pre-pregnancy Body Mass Index (BMI) was calculated by using Quetlet's Index. On the basis of BMI, all participants were divided into three groups, underweight, normal, overweight. Reading of blood pressure of participating women was taken by using a standard mercury sphygmomanometer in each period of trimesters. Mean values was calculated and compared between different BMI groups in all the trimester of pregnancy. The statistical software SPSS (version 16) was used for data analysis. We have applied unpaired t- test. SBP, DBP of underweight, overweight pregnant women were not significantly decreased from first to second trimester and it were not significantly increased in third from second trimester, while pregnant women of normal weight, there was significantly fall in SBP, DBP in mid pregnancy fall which further increased up to third trimester. This non significant fall in BP parameters in underweight and overweight pregnant women in mid pregnancy was related to the increase in the risk of development of preeclampsia. The cause of preeclampsia may be explained by the mechanism involved in endothelial dysfunction which is to be discussed later on. We found that level of risk for complications of pregnancy is increased with abnormal BP parameters pattern in pregnant women having different BMI thus women of unhealthy weight side should be offered preconception counseling, nutritional consultation, exercise program and careful screening of obstetrics complications during pregnancy.

Keywords: Pregnancy, BP monitoring, Preeclampsia, BMI

INTRODUCTION

Blood pressure studies in the pregnancy reflect information regarding pregnancy outcomes. In human pregnancy there is vast change occur in cardiovascular system which include an initial fall in systemic vascular tone, 40% increase in the cardiac output and an equally great expansion of the plasma volume simultaneously during the first 8 weeks of pregnancy and persisting

throughout the pregnancy¹. These changes are thought to insure adequacy of uteroplacental perfusion through the different stages of pregnancy². Several studies has been done over the normal pattern of blood pressure in pregnancy which showed that initial decrease in diastolic blood pressure (DBP) during the 13 to 20 weeks of gestation then further increases to slightly above the previous value^{3,4}. Pregnancy is also influenced by body mass index (BMI) so pre-pregnancy body mass index is a parameters which influences the blood pressure throughout the pregnancy. BMI can be divided into underweight, normal weight, overweight or obese. All these grades of BMI affecting blood pressure parameters through different mechanism. In pregnant women, increased adiposity, as measured using pre-pregnancy BMI, has

Corresponding author:

Gul Ar Navi Khan

Assistant Professor

C-6, 2nd Floor, Rizvi Apartment Extention, Medical Road, Aligarh-202002(U.P)

Mob: 9411981244

E mail- dr.gular@rediffmail.com

been consistently associated with important medical complications of pregnancy, such as pre-eclampsia, gestational diabetes mellitus, abruptio placentae and operative delivery^{5,6,7}.

In pregnant women who are clinically healthy, blood pressure, most notably diastolic blood pressure, falls steadily until the middle of gestation and then rises again until delivery⁸. In women who develop preeclampsia, this midpregnancy fall in blood pressure does not occur; instead, blood pressure tends to remain stable during the first half of pregnancy and then rise continuously until delivery⁸. It is also the case that, even before preeclampsia manifests itself, these women have higher blood pressure levels in early pregnancy than pregnant women who remain normotensive⁸.

Research indicates that hypertensive diseases of pregnancy, including preeclampsia, may be early manifestations of essential hypertension and cardiovascular disease in later life. It has therefore been postulated that pregnancy may be a "stress test" that reveals women with hypertensive tendencies^{9,10}.

When blood pressure is high before 20 weeks it is more likely to be chronic hypertension (i.e. preexisting or occurring before pregnancy)¹¹. If it is pregnancy induced high blood pressure, it usually occurs after 20 weeks of pregnancy, condition is known as preeclampsia where there is appearance of protein in urine, with swelling of feet, ankles and face in addition to raise blood pressure¹². The most severe form of BP in pregnancy is called eclampsia with seizures (fits, convulsions) in mother endangering life of both fetus and mother. Blood pressure (BP) levels and body mass index (BMI) are known as risk factors for preeclampsia and gestational hypertension. In pregnant women, increased adiposity, as measured using Pre-pregnancy BMI is of global concern. There are few instances where investigators have assessed the extent to which the body mass index had clinically important consequences on maternal blood pressure levels during the different trimester of pregnancy. Thus our aim of study is to observe the association of BP with pre-pregnancy BMI in a large population of pregnant women in different trimester of pregnancy.

MATERIAL AND METHOD

This prospective study was conducted in the Department of Physiology in collaboration with

Department of Obstetrics & Gynaecology, J.N. Medical College, A.M.U., Aligarh. 200 Pregnant women were selected from antenatal clinics of obstetrics & gynaecology, J.N. Medical College, A.M.U., Aligarh. Details of each pregnant woman was filled in antenatal visit performa which include the questions regarding smoking history, physical activity, alcohol consumption, socioeconomic & educational status and investigation like hemoglobin, urine albumin or protein or sugar. Females who had major disorder (cardiac, respiratory, renal or hematological disorder) and those taking antihypertensive medications or cholesterol lowering medications were not considered in the study. Pre-pregnancy Body Mass Index (BMI) was calculated by widespread using Quetlet's Index, which is body weight (in kg) divided by height (in meter²). On the basis of BMI, all students were divided into three groups that is under weight whose BMI^{13,14} was less than 18.5kg/m², normal whose BMI was between 18.5 and 24.9kg/m² and overweight whose BMI was more than 25 kg/m². Body weight was measured with shoes off and wearing the least possible clothes (to the nearest 0.5kg) with subject standing on the digital weighing scale. Height was measured in cm (to the nearest 0.5 cm) with the subject standing in an erect position without shoes against a vertical scale attached on the wall. Reading of blood pressure of participating women of different BMI group was taken in each period of trimesters. First trimester is first 12 weeks, second trimester is 13 to 28 weeks and third trimester is 29 to 40 weeks of gestation¹⁵. For B.P measurement, three readings were taken at 3min. interval in sitting condition, on the left arm by using a standard mercury Sphygmomanometer and their average value was recorded. Systolic blood pressure (SBP) and Diastolic blood pressure (DBP) were defined as the points of the appearance and disappearance of Korotkoff sounds, respectively. Mean values of SBP and DBP was calculated and compared between different BMI groups in all the trimester of pregnancy. The statistical software SPSS (version 16) was used for data analysis. We have applied unpaired t- test. Comparative significance of change of SBP, DBP in different trimester of pregnancy was assessed among pregnant women of different BMI. P value < 0.05 was taken as significant.

OBSERVATION & RESULTS

A total of 200 pregnant women of different pre-pregnancy body mass index participated in the study.

Table No. 1, showed the distribution of pregnant women according to the different grades of body mass index. Maximum (52%) females were of normal pre-pregnancy body mass index. 33.5% were obese and 14.5% were of underweight.

Table No. 1 Distribution of Pregnant women according to the different grades of body mass index.

S. No.	Characteristics	Cut-off values	Grade	Pregnant women(n=200) No. (%)	Mean values of BMI
I	BMI	<18.5	Under weight	29 (14.5)	16.52±0.94
		≥18.5 - <24.9	Normal	104(52)	22.48±1.48
		>25.0	Overweight	67 (33.5)	27.36±1.54

Table No. 2, showed the mean values of blood pressure parameters in different groups of BMI in all the three trimester of pregnancy. Mean values of SBP was increased from first trimester to third in all the groups of BMI. DBP was decreased from first to second then increased from second to third trimester in underweight and normal BMI groups but it gradually increased from first to third trimester in overweight females.

Table No. 2. Mean values of blood pressure parameters in different groups of BMI in all the three trimester of pregnancy

S.No.	Trimester ofPregnancy	Underweight		Normal		Overweight	
		SBP	DBP	SBP	DBP	SBP	DBP
1.	First- First 12 weeks	137.0±5.56	85.0±2.66	118.0±8.30	84.4±5.37	130.0±1.83	77.0±2.88
2.	Second- 13 to 28 weeks	139.4±4.98	83.43±3.81	120.8±7.44	73.56±6.34	132.9±1.59	78.66±1.96
3.	Third- 29 to 40 weeks	145.8±3.66	86.6±2.81	124.8±6.32	83.43±4.74	140.8±1.66	80.41±2.34

SBP- Systolic blood pressure, DBP- Diastolic blood pressure

Table No. 3 showed the comparative significance of change of blood pressure (SBP, DBP) in different trimesters of pregnancy. We have seen that SBP,DBP of underweight, overweight pregnant women were not significantly decreased from first to second trimester and it were not significantly increased in third from second trimester. While pregnant women of normal weight, there was non significant increases in SBP from first to second and third trimester. At the same time there was significantly fall in DBP in second trimester from first trimester known as mid pregnancy fall which further increased up to third trimester in normal weight pregnant women.

Table No. 3. Comparative significance of change of blood pressure (SBP, DBP) in different trimesters of pregnancy

S.No.	Trimester ofPregnancy	Underweight		Normal		Overweight	
		SBP	DBP	SBP	DBP	SBP	DBP
1.	First Trimester versus Second Trimester	0.205	0.382	0.243	0.021**!	0.228	0.500
2.	Second Trimester versus Third Trimester	0.263	0.344	0.342	0.004**!	0.736	0.364

(*P value < 0.05 was taken as significant.)

SBP- Systolic blood pressure, DBP- Diastolic blood pressure

DISCUSSION

The present study is intended to understand the association of BP with pre-pregnancy BMI in a large population of pregnant women in different trimester of pregnancy. In healthy pregnant women, blood pressure, most notably diastolic blood pressure, falls

gradually until the mid trimester and then rises again until delivery. In healthy pregnancies, this mid pregnancy fall in diastolic pressure is a physiological phenomenon that is triggered by a decrease in total peripheral vascular resistance, which is due in turn to vasodilatation starting in early gestation¹⁶. In our study

we found that diastolic pressure of pregnant women of normal BMI decreases significantly from first trimester to second trimester and it further increases significantly from second to third trimester thus we found normal physiological mid pregnancy fall in diastolic pressure in normal weight pregnant women only. While we have seen that SBP,DBP of underweight, overweight pregnant women were not significantly decreased from first to second trimester and it were not significantly increased in third from second trimester so in these women midpregnancy fall in blood pressure was not seen rather blood pressure tends to remain stable during the first half of pregnancy and then rise continuously until delivery. The lack of such a fall in underweight, overweight pregnant women, which has been also noted in patients with preeclampsia, suggests failure of this normal cardiovascular adaptation to pregnancy which might be due to endothelial dysfunction^{17,18}. Recent studies have provided evidence that endothelial dysfunction, as indicated by a lower flow-mediated vasodilatation, precedes the development of preeclampsia, suggesting that endothelial dysfunction is a possible cause of preeclampsia^{17,19}. Etiology of preeclampsia is not clear exactly but it is thought that pathophysiology of preeclampsia is endothelial cell dysfunction and intense vasospasm which is related with placental factors induced by impaired perfusion to placenta. Endothelial cell injury occur by oxidative stress and inflammatory mediators, causes intravascular coagulation so there is loss of fluid which increases the vascular sensitivity to vasopressors leads to vasospasm, responsible for abnormal blood pressure change during pregnancy. Endothelial cell injury and vasospasm both are in a vicious cycle. The study by Dekker GA et al²⁰ have postulated the hypothesis to know the pathophysiology of preeclampsia in which they described four etiologies i.e., Placental ischemia, Very low-density lipoprotein versus toxicity, Immune maladaptation, Genetic imprinting. Another study by Roberts et al., (1989)²¹ and Roberts and Redman, (1993)²² which focused the etiologies of preeclampsia suggest that inappropriate systemic endothelial activation and dysfunction were the causes and therefore complication associated with it are more prominent in women having diabetes, obesity, thrombophilias, chronic hypertension, etc. (Dekker and Sukcharoen, (2004)²³, Redman and Sargent, (2005)²⁴ and Sibai et al., (2005)²⁵. All the above studies defined the etiologies and mechanism of preeclampsia which is supporting our study where role of abnormal

pre-pregnancy body mass index on blood pressure parameters in all the three trimester has been established and the mechanism responsible for its pathophysiology. Our study well correlates the BP changes during different trimester in all the grades of BMI and some mechanism of its cause except in underweight where the mechanism behind these changes in blood pressure is not fully understood. Now it has been well established that abnormal body mass index affect blood pressure parameters in pregnant women which may be lead to preeclampsia which further affects mother as well as fetus.

CONCLUSIONS

- In pregnant women, abnormal body mass index, as measured using pre-pregnancy BMI, has been consistently associated with important medical complications of pregnancy, such as preeclampsia.
- Preeclampsia is also a leading cause of perinatal and maternal mortality.
- In view of the above risks the American College of Obstetricians and Gynecologists (ACOG) has recommended that-
- Body mass index BMI should be recorded for all women at the initial prenatal visit, and that Information concerning the maternal and fetal risks of a very elevated BMI in pregnancy should be provided.
- Preconception counseling for obese women who are planning a pregnancy.
- Women at an unhealthy weight should be offered both nutrition consultation and an exercise program.
- Consultation with weight loss specialists before attempting another pregnancy.
- Although physical activity alone produces only a modest reduction in weight compared with dieting alone.
- According to the American College of Sports Medicine (ACSM) who are obese or overweight can begin with activities such as walking starting with a 5 minute workout and gradually working up to their goal over many weeks.

Conflict of Interest: None

REFERENCES

1. Hytten FE, Leitch I. The physiology of Human Pregnancy. 2nd edn. Oxford: Blackwell Scientific Publications, 1971.
2. Weir RJ, Paintin DB, Brown JJ et al. A serial study in pregnancy of the plasma concentrations of renin, corticosteroids, electrolytes and proteins, and of hematocrit and plasma volume. *J Obstet Gynaecol Br Commonw* 1971; 78:590.
3. MacGillivray I, Rose GA, Rowe B. Blood pressure survey in pregnancy. *Clin Sci* 1969; 37: 395.
4. Gallery EDM, Hunyor SN, Ross M et al. Predicting the development of pregnancy-associated hypertension. The place of standardised blood pressure measurement. *Lancet* 1977; 1: 1273.
5. Castro LC, Avina RL. Maternal obesity and pregnancy outcomes. *Current Opinion in Obstetrics and Gynecology* 2002; 14:601–606.
6. Kaiser PS, Kirby RS. Obesity as a risk factor for cesarean in a low-risk population. *Obstetrics and Gynecology* 2001; 97:39–43.
7. Report of the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. *American Journal of Obstetrics and Gynecology* 2000; 183:S1–S22.
8. Hermida RC, Ayala DE, Iglesias M. Predictable blood pressure variability in healthy and complicated pregnancies. *Hypertension*. 2001; 38: 736–741.
9. Williams D. Pregnancy: a stress test for life. *Curr Opin Obstet Gynecol*. 2003; 15:465– 471.
10. Wilson BJ, Watson MS, Prescott GJ, Sunderland S, Campbell DM, Hannaford P, Smith WC. Hypertensive diseases of pregnancy and risk of hypertension and stroke in later life: results from cohort study. *BMJ*. 2003; 326:845– 849.
11. National High Blood Pressure Education Program Working Group report on high blood pressure in pregnancy. *Am J Obstet Gynecol* 2000; 183: S1-S22.
12. Creasy RK, Resnick R. *Maternal fetal medicine*, 4th: Philadelphia: W.B. Saunders Co; 1999.
13. WHO. Obesity: preventing and managing the global epidemic. Report of a WHO Consultation. WHO Technical Report Series 894. Geneva: World Health Organization, 2000.
14. WHO. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. WHO Technical Report Series 854. Geneva: World Health Organization, 1995.
15. thefreedictionary.com > trimester.
16. Duvekot JJ, Cherix EC, Pieters FA, Menheere PP, Peeters LH. Early pregnancy changes in hemodynamics and volume homeostasis are consecutive adjustments triggered by a primary fall in systemic vascular tone. *Am J Obstet Gynecol*. 1993; 169:1382–1392.
17. Savvidou MD, Hingorani AD, Tsikas D, Frolich JC, Vallance P, Nicolaides KH. Endothelial dysfunction and raised plasma concentrations of asymmetric dimethylarginine in pregnant women who subsequently develop pre-eclampsia. *Lancet*. 2003; 361:1511–1517.
18. Hermida RC, Ayala DE, Iglesias M. Predictable blood pressure variability in healthy and complicated pregnancies. *Hypertension*. 2001; 38: 736–741.
19. Garcia RG, Celedon J, Sierra-Laguado J, Alarcon MA, Luengas C, Silva F, renas-Mantilla M, Lopez-Jaramillo P. Raised C-reactive protein and impaired flow-mediated vasodilation precede the development of preeclampsia. *Am J Hypertens*. 2007; 20:98–103.
20. Dekker GA, Sibai BM. Etiology and pathogenesis of preeclampsia: current concepts. *Am J Obstet Gynecol*. 1998 Nov; 179(5):1359-75.
21. Roberts et al., (1989) J.M. Roberts, R.N. Taylor and T.J. Musci et al., Preeclampsia: an endothelial cell disorder, *Am. J. Obstet. Gynecol.* 161 (1989), pp. 1200–1204.
22. Roberts and Redman, (1993) J.M. Roberts and C.W.G. Redman, Pre-eclampsia: more than pregnancy-induced-hypertension, *Lancet* 341 (1993), pp. 1447–1451.
23. Dekker and Sukcharoen, (2004) G.A. Dekker and N. Sukcharoen, Etiology of preeclampsia: an update, *J. Med. Assoc. Thai.* 87 (Suppl. 3) (2004), pp. S96–S103.
24. Redman and Sargent, (2005) C.W. Redman and I.L. Sargent, Latest advances in understanding preeclampsia, *Science* 308 (2005), pp. 1592–1594.
25. Sibai et al., (2005) B. Sibai, G.A. Dekker and M. Kupfermink, Pre-eclampsia, *Lancet* 365 (2005), pp. 789–799.

Emergency Peripartum Hysterectomy: A Retrospective Study at a Tertiary Care Hospital in Karnataka

Halesha B¹, Raju VS², Chandrashekar K³, Sahana KP³

¹Assistant Professor, ²Professor, ³Postgraduate, Department of OBG, JJM Medical College, Davangere, Karnataka

ABSTRACT

Objectives: The main objectives of this study were to determine the incidence, maternal characteristics, indications, the maternal and perinatal outcomes at J.J.M. Medical College, Teaching Hospital, Davangere, Karnataka, India

Materials and method: This is a retrospective descriptive study done in the maternity unit of the J.J.M. Medical College Teaching Hospital, Davangere, Karnataka, India. From June 2009 to June 2011.

Results: The incidence of peripartum hysterectomy during the study period was 1.0/1000 deliveries. The main indication was uterine atony 15(60%) ,severe uterine bleeding from uterine rupture 8 (32%), placenta accreta 2 (8%) and all patients received blood transfusion. 62.5% of women belonged to the 26-30 year age group and 31% belonged to the 20-25 year age group. There were 4 mortalities (8%) one patient died on 4th post-op day due to acute renal failure and the other died 2 hours after surgery due to cardiac arrest.2 died secondary to DIC. Average hospital stay of the patients was 9 days.

Perinatal loss occurred in 14 cases (56%), majority due to pulmonary haemorrhage and prematurity.

Conclusions: The incidence of emergency peripartum hysterectomy is high. It is performed for young nulliparous women to elderly grand-multiparous women. The surgery is associated with significant maternal and perinatal morbidity and mortality. Timely expert management in a well resourced centre is advocated.

Keywords: *Hysterectomy, Uterine Rupture, Uterine Atony, Maternal Morbidity, Maternal mortality*

INTRODUCTION

Emergency peripartum hysterectomy is one of the life saving surgical procedures performed at the Maternity Unit of the Department of Obstetrics and Gynaecology, J.J.M. Medical College Teaching Hospital, Davanagere.

Life-threatening hemorrhage resulting from uterine rupture and atony has become rare events in the developed world but they continue to pose a major problem in obstetric care in developing countries^{2,3}.

The modern era of caesarean hysterectomies began in the 1940's and with improvement in anaesthetic techniques the indication widened to include elective sterilization. Several reports have confirmed the usefulness of peripartum hysterectomy for emergency cases of hemorrhage as well as for other gynecological conditions complicating pregnancy^{4,5}.

The aim of this study was to determine the incidence of peripartum hysterectomy, the indications,

the perinatal and maternal outcomes and the complications associated with the procedure at the Maternity Unit of the department of Obstetrics and Gynaecology, J.J.M. Medical college Teaching Hospital, Davangere.

PATIENTS AND METHOD

This was a retrospective descriptive study in which the hospital records of all the patients who underwent emergency peripartum hysterectomy from June 30, 2009 to June 30, 2011 were reviewed. Peripartum hysterectomy was defined as hysterectomy performed at the time of delivery or within forty-two days of delivery.

The hysterectomies were performed by Consultants and assisted by their Residents. There were minor differences in operating technique among the surgeons.

The age, parity, indication for the hysterectomy, type of hysterectomy, maternal and perinatal

outcomes, duration of hospital stay and complications were obtained from the records.

All the patients received prophylactic antibiotics peri-operatively. Most of the patients were managed postoperatively in the Intensive care units. Febrile morbidity was defined as a temperature of 38°C or more on any two consecutive days after surgery but excluding the first day.

RESULTS

There were 25 peripartum hysterectomies during the three-and-a half-year period from June 30, 2009 to June 30, 2011. During this same period there were a total of 25 obstetric hysterectomies in 24854 deliveries during the two year study period resulting in an incidence of 0.1%. Of the 25 cases, 14 were performed following 20913 vaginal deliveries giving an incidence of 0.06% and 11 were following 3641 Caesarean sections giving an incidence of 0.30%.

The peripartum hysterectomy rate, therefore, was 1/1,000 deliveries. 62.5% of women belonged to the 26-30 year age group and 31% belonged to the 20-25 year age group. The youngest patient in the study was 20 years old and the oldest was 35 yrs.

Table No. 1. Age & Parity Distribution of the Patients

AGE	Para 1	Para 2	Para 3	Para 4	Para 5	TOTAL
<20	1					1
20 – 25	2	3	3			8
26 – 30	2	7	5	1		15
>30			1			1
TOTAL	5	10	9	1		25

63% cases were unbooked for delivery and only 37% were booked cases. Low socio-economic status reflected on 90% cases.

Most common indication for obstetric hysterectomy in this study was atonic postpartum hemorrhage (15/25) not controlled by medical or other surgical methods-60%. The second most common indication was rupture uterus (8/25), an incidence of 32%. Placenta percreta was the indication in 2 cases (8%).

Of the eight cases of rupture uterus taken for peripartum hysterectomy, 4 cases had a history of previous LSCS. Three cases were due to injudicious use of Oxytocin and one was complicated by Couvelaire uterus resulting from abruptio placenta along with rupture. Out of the 15 cases of atonic PPH 9 were after vaginal delivery and 6 were after LSCS on table. 3 cases had history of prolonged labour delivered

at home. 11 cases of severe anemia were managed with multiple transfusions, intensive critical care and monitoring. Atonic with traumatic PPH was the indication in one case that revealed broad ligament hematoma distorting pelvic anatomy hence making it difficult to identify iliac vessels. 2 cases of placenta percreta was taken up for Elective LSCS followed by Caesarean hysterectomy.

Subtotal hysterectomy was performed in 16 cases (64%), total hysterectomy was performed in remaining 9 cases (32%).

Post-operative complications were pyrexia in 11 cases, lower respiratory tract infection in 5 cases, renal failure in 2 cases and 2 had DIC.

All cases were liberally transfused blood and blood products. 23 cases were on Dopamine drip (92%) to combat hypotension. Atonic PPH was managed with prostaglandins and oxytocics in all cases followed by Step-wise devascularisation in 12 cases (48) and B-lynch suture application in 5 cases, failing which hysterectomy was done. 23/25 cases required ICU care following the surgery (92%) and average ventilator care required lasted 28 hours.

There were 4 mortalities- one patient died on 4th post-op day due to Acute renal failure and the other died 2 hours after surgery due to cardiac arrest. 2 died secondary to DIC.

Perinatal loss occurred in 14 cases (56%), majority due to pulmonary haemorrhage and prematurity. Average hospital stay of the patients was 9 days.

DISCUSSION

Zelopet *al* review the literature regarding overall incidence and found the range to be 1 in 303 to 1 in 5000 deliveries, making a rate of 3.3–0.2 /1000 deliveries respectively⁶.

Peripartum hysterectomy, almost always an emergency surgery is associated with significant blood loss and high maternal - fetal morbidity and mortality. The incidence in our study was 0.1% which is comparable to Kastner et al (0.14%) and Mukherjee et al (0.15%). The incidence following vaginal delivery was 0.06% and that following caesarean delivery was 0.30% accounting for approximately 5 times higher risk. Rapidly increasing incidence of Caesarean section is a significant contributing risk factor as reported by Praneshwari Devi et al and Pawar (0.45%). In our study

the most common indication was PPH. In other studies rupture uterus was the most common indication as shown by Sinha et al (69.9%), Mantri et al (67.28%), Pawar et al (40%), and Pati et al (64.4%). Morbid adherent placenta accounted for 8% cases in our study while it accounted for 26% cases in the study by Praneshwari Devi et al.

Another study reported that the incidence of Morbid Adherent Placenta (MAP) has been increased from 0.5 to 3.9% and the well-known risk factors for MAP are placenta previa and previous caesarean birth. The emergency peripartum hysterectomy has been recommended as lifesaving procedure for MAP⁷.

Though total hysterectomy is the operation of choice, subtotal hysterectomy is quicker and hence preferable in moribund patients. Subtotal hysterectomy was the commonly performed surgery in our study as was in other studies⁸ which may be due to the instability of maternal condition requiring a simpler and speedy procedure with lesser degree of haemorrhage. It is not the surgery but the condition for which obstetric hysterectomy is performed that is responsible for morbidity and mortality. Post-operative morbidity and admission to ICU for critical care increases the duration of hospital stay.

The present study confirms the previous observations that emergency peripartum hysterectomy is associated with high perioperative maternal morbidity and mortality.^{9,10}

The maternal mortality in our study was 8% which is lesser than the reported studies from Pakistan^{9,10} but very high in comparison to developed countries.^{11,12} High mortality may be due to delay in arrival to hospital as in most of the developing countries health care system is poorly developed, most of the patients were un-booked, reached the hospital from some referral centers.

The two main indications post-partum hemorrhage and rupture uterus are significantly associated with grand multiparity, scarred uterus, lack of antenatal care, unsupervised labour at home, injudicious use of Oxytocin and low socio-economic status of the women. These factors are largely preventable by good antenatal care, early identification of high risk cases, and judicious use of oxytocics and alert supervision of labour.

Though peripartum hysterectomy is a lifesaving procedure in emergency obstetric condition, it

represents a painful dilemma for the obstetrician. The decision to perform this operation, especially in primis or in patients with no living children remains a difficult one. So it should be performed judiciously weighing the need to sacrifice the obstetric future of the patient in favor of patient life. Good antenatal care, identification and active management of high risk cases, early recognition of complications and timely caesarean section can reduce the obstetric catastrophies and subsequent incidence of peripartum hysterectomy.

CONCLUSION

Obstetric hysterectomy is a lifesaving procedure in most of the cases where indications should be crystal clear. Decision should be prompt and done by a confident surgeon. Performance of obstetric hysterectomy can be the difference between life and death for the patient. Every obstetrician should be trained to perform this procedure. In spite of this life saving measure there were a significant number of maternal deaths and be prevented by providing adequate antepartum and intrapartum care as well as easy availability of transport and blood transfusion facilities.

REFERENCES

1. Plauche WC. Caesarean hysterectomy: indications, technique, and complications. *Clin Obstet Gynecol*. 1986; 29: 318.
2. Chestnut DH, Eden, RD, Gall SA, Parker RT. Peripartum Hysterectomy: A Review of cesarean & postpartum hysterectomy. *Obstet Gynecol* 1985;65:365-70.
3. Clark SL, Yeh SY, Phelan JP, Bruce S, Paul RH. Emergency Hysterectomy for Obstetric haemorrhage *Obstet Gynaecol* 1984;64:376-80.
4. Mokgokong ER, Marivate M. Treatment of ruptured uterus. *Afr Med J* 1976; 50: 162.
5. Gonsoulin W, Kennedy RT, Guidry KH. Elective versus emergency caesarean hysterectomy cases in a residency program setting: A review of 129 cases from 1984 to 1988. *Am J Obstet Gynecol* 1991; 65(1): 91-94.
6. Zelop CM, Harlow BL, Ferigoletto FD, Safon LE, Saltzman DH. Emergency Peripartum hysterectomy. *Am J Obstet Gynecol* 1993;168:1443-8.
7. Armstrong CA, Harding S, Dickinson JE. Clinical aspects and conservative management of placenta accereta. *Obstetrician Gynecologist* 2004;6:132-7.

8. Ghatak DP, Rupture of the uterus. A Review of 146 cases. *Trop J ObstetGynaecol* 1990;8:41-4
9. Mahmood S, Ayaz A. Obstetrical hysterectomy. *J Sur Pak* 2005;10(3):20-3
10. Noor S, Majid S, Ruby N. An audit of obstetrical hysterectomy. *J Coll Physicians Surg Pak* 2001;11(10):642-5.
11. Zorlu CG, Turan C, I°ik AZ, Dani°man N, Mungan T, G°kmen O. Emergency hysterectomy in modern obstetric practice. Changing clinical perspective in time. *ActaobstetGynecolscand* 1998;77:186-90.
12. Gonsoulin W, Kennedy RT, Guidry KH. Elective versus emergency cesarean hysterectomy cases in a residency program setting. A Review of 129 cases from 1984 to 1988. *Am J ObstetGynecol* 1991; 65(1):91-4.

Socio-Demographic Correlates of Anaemia among Married Women in Rural Area of Maharashtra

Haralkar S J¹, Khandekar S V², Pore P D³, Haralkar A S⁴, Tapare V S⁵, Rayate M V⁶

¹Assistant Professor, Dept. of PSM, Dr. V.M. Govt. Medical College, Solapur, Maharashtra, ²Associate Professor, Dept. of Community Medicine, Bidar Institute of Medical Sciences, Bidar, Karnataka, ³Associate Professor, Dept. of PSM, Bharati Vidyapeeth Medical College, Pune Maharashtra, ⁴Lady Medical Officer, RCH centre, Majarewadi, Solapur, Maharashtra, ⁵Associate Professor, Dept. of PSM, Dr. V.M. Govt. Medical College, Solapur, Maharashtra, ⁶Professor and Head, Dept. of Community Medicine, K. V. Institute of Medical Sciences, Maduranthagam, Tamilnadu

ABSTRACT

Research question: What is the prevalence of anaemia among married women in reproductive age group and what are socio-demographic correlates of anaemia?

Settings and Design: Study design was cross-sectional. All the 529 married women in the reproductive age group (15-45 years) in Bhandarkawathe village were screened for anaemia and its correlates from period January 2004 to June 2004.

Methodology: Detailed information was collected on a pre-designed and pre-tested interview proforma about socio-demographic characteristics of anaemia by oral questionnaire method supplemented by physical examination and haemoglobin estimation.

Results: Among 529 women, 27.60% women were found to be anaemic. The prevalence of anaemia was maximum (36.19%) in the age group 25-35 years. The prevalence of anaemia was significantly higher in nuclear families (40.50%) as compare to joint family (23.77%). The prevalence of anemia was higher (31.52%) in women who were farm workers than women who were housewives (23.9%).

Keywords: Socio-Demographic, Anaemia, Married women, Prevalence, Reproductive Age

INTRODUCTION

Anaemia is a worldwide problem with highest prevalence in developing countries. Anaemia is found especially among women of childbearing age, young children, during pregnancy and lactation. Women of reproductive age are most affected and the estimated prevalence of anaemia is 11% in the developed world and 47% in the developing world ⁽¹⁾.

In India, according to NFHS-3, about 57.9% women are anaemic of which 54.6% are in urban areas and 59% in rural areas ⁽²⁾. 20-40% maternal deaths were found to be due to anaemia in India. The increased risk of anaemia in the women in reproductive age is due to the additional iron loss due to menstruation and the increased need for iron persists throughout the reproductive cycle.

Anaemia increases the risk of maternal and foetal mortality and morbidity. It causes abortion, premature births, post-partum hemorrhage and low birth weight. Anaemia causes a significant impairment of maximal

work capacity. It causes reduction in work performance and thereby productivity. This has great significance on the economy of the country.

The present study was planned to highlight the problem of anaemia in married women in the age group 15-45years.

MATERIALS AND METHOD

Study area and population: The study was conducted in Bhandarkawathe village, South Solapur taluka of Solapur district in Maharashtra state. It is approx. 40 kms from Solapur city. Community based preventive, promotive and curative services are provided to the population of Bhandarkawathe under Primary Health Centre, Bhandarkawathe. The total population of Bhandarkawathe village was about 5990 populations during Jan. to June 2004. The study population consisted of all 529 married women in the reproductive age group (15-45 years) in Bhandarkawathe village.

Study design and sample size: Study design was cross-sectional. All the 529 married women in the age group 15-45 years were screened for anaemia and its correlates.

Sampling technique: The list of 529 women in the age group 15-45 years was obtained from P.H.C., Bhandarkawathe. The interview was conducted at the respondent's home. Detailed information was collected on a pre-designed and pre-tested interview proforma prepared by first author about socio-demographic characteristics of anaemia by oral questionnaire method supplemented by physical examination and haemoglobin estimation. Due to feasibility and cost-effectiveness haemoglobin estimation was done by Sahali's haemoglobinometer.

Variables: Variables studied are Hb%, age, family

type, socioeconomic status, educational status, family size, age at marriage and occupational status

Data analysis: The collected data was analyzed with the help of statistical tools such as proportion, odds ratio, confidence interval and 'P' value etc.

OBSERVATIONS

The community based cross-sectional study was conducted at Bhandarkawathe village (Solapur district) comprised 529 women of reproductive age group (15-45 years) from period January 2004 to June 2004. Response rate was 100%. Among 529 women in the age group 15-45 years, 146 (27.60%) women were found to be anaemic (all categories). The prevalence of mild, moderate and severe anaemia among women of reproductive age group (15-45 years) was 10.77%, 14.78% and 2.65% respectively. (Table- I)

Table No. I Distribution of women according to severity of anaemia.

Severity of anaemia	Hemoglobin (gm %)	No. of women	Prevalence (%)
No anaemia	Cut off+	383	72.40
Mild anaemia	10-<Cut off+	57	10.77
Moderate anaemia	7-<10	75	14.78
Severe anaemia	< 7	14	2.65
Total		529	100.00

Cut off+ = 12gm% for non-pregnant women and 11gm% for pregnant women. ⁽³⁾

The percentage distribution of mild, moderate and severe anaemia was 39.04%, 51.37% and 9.59% respectively.

Table No. II Socio-Demographic correlation of anaemia.

Variables	Total (%) N=529	No. of Anaemic women	OR	C.I.	P- Value
Age					
15-25 yrs	74	24	2.91	1.55-5.46	P<0.01
25-35 yrs	257	93	3.30	2.06-5.28	P<0.001
35-45 yrs	198	29	1		
Type of family					
Nuclear	121	49	2.18	1.42-3.34	P<0.001
Joint	408	97			
Socioeconomic class (4)					
I (Upper)	98	14	1		
II (Upper middle)	160	30	1.38	0.69-2.76	P>0.05
III (Lower middle)	141	39	2.29	1.16-4.5	P<0.05
IV (Upper lower)	109	53	4.67	2.87-11.19	P<0.001
V (Lower lower)	21	10	5.45	1.95-15.22	P<0.01
Education					
Illiterate	241	80	1.67	1.13-2.45	P<0.01
Literate	288	66			
Family size					
< 3	217	37	0.38	0.25-0.58	P<0.001
≥ 3	312	109			
Age at marriage					
< 16	79	30	1.94	1.04-3.62	P>0.05
16-18	145	49	1.62	0.93-2.80	P>0.05
18-20	188	39	0.83	0.47-1.44	P>0.05
>20	117	28	1		
Occupation (5)					
Housewife	272	65	0.68	0.46-1	P<0.05
Farm Worker	257	81			

The prevalence of anaemia was maximum (36.19%) in the age group 25-35 years followed by 32.43% in the age group 15-25 years. The risk of occurrence of anaemia was 3.3 times in age group 25-35 years than in age group 35-45 years.

In relation to type of family, the prevalence of anaemia was significantly higher in nuclear families (40.50%) as compare to joint family (23.77%). The risk of occurrence of anaemia was more in nuclear families than in joint families (OR=2.18).

The prevalence of anaemia was maximum in lower socioeconomic status. An inverse association between socio-economic status (SES) and prevalence of anaemia was observed ($P<0.01$). The risk of occurrence of anaemia is maximum in Class IV socioeconomic group (OR=5.45).

A significant higher ($P<0.01$) prevalence of anaemia in literate reproductive women showed better awareness among literate mothers. Risk of occurrence of anaemia was 1.67 times more in illiterates than literates. A higher prevalence of anaemia ($P<0.01$) was found in women with family size >3 than those with family size <3 .

The prevalence of anaemia was maximum (37.97%) in reproductive women who married before 16 years of age. The risk of anaemia in married women (15-45 yrs) is not dependent on age at marriage. The prevalence of anemia was higher (31.52%) in women who were farm workers than women who were housewives (23.9%).

DISCUSSION

In our study overall prevalence of anemia among rural women in the age group 15-45 years was 27.60% which is far less than that of Maharashtra (51.1%) and India (58.2%) mentioned in National family health survey-3 (NFHS-3)⁽⁶⁾. The prevalence of mild, moderate and severe anaemia among women was 10.77%, 14.78% and 2.65% respectively. Massawe S.N. et al⁽⁷⁾ in their study it is found that 49% women in reproductive age group were anaemic and out of these, 1.6% were severely anaemic.

The prevalence of anaemia was maximum (36.19%) in the age group between 25-35 years followed by 32.43% in the age group 15-25 years. The prevalence of anaemia in age group 25-35 yrs is highly significant ($P<0.001$) than other age group. Slightly different finding observed in Massawe S.N. et al⁽⁷⁾ study that

54.4% anaemic women were in age group 16-19 yrs & 49.7% anaemic women were in age group 20-29 yrs.

In relation to type of family, the prevalence of anaemia was more in nuclear families (40.50%) as compare to joint family (23.77%) which is surprising and may be due to ignorance. Anaemia was significantly higher among women in the age group 15-45 years belonging to nuclear family than those belonging to joint family ($P<0.001$).

The prevalence of anaemia was maximum in lower socioeconomic status. An inverse association between socio-economic status (SES) and prevalence of anaemia was observed ($P<0.01$) which may be because of better availability of high quality food with higher SES and association of poverty, illiteracy, low purchasing power with lower socioeconomic status.

In our study, the prevalence of anaemia was 33.2% in illiterate and 22.92% in literate women. The anaemia in illiterate women is statistically significant ($P<0.01$) than in literate women this may be because of better awareness among literate mothers. Our findings are similar with the findings of Massawe S.N. et al⁽⁷⁾ study in which 50.5% anaemic women were illiterate. According to the findings of NFHS-3, in Maharashtra 50.9% anaemic women were illiterate and in India it was 60.2%.

A higher prevalence of anaemia ($P<0.01$) in women with family size >3 than those women with family size <3 may be due to exhausted iron stores due to repeated births.

A contrast finding was observed in study of Massawe S.N. et al⁽⁷⁾ in which the prevalence of anaemia was almost equal in family size 1, 2-4 and more than 5.

In our study, the prevalence of anaemia was maximum (37.97%) in reproductive women who married before the age of 16 years. The risk of occurrence of anemia is almost double (OR=1.94) when a women married before the age of 16 years which is statistically not significant ($P>0.05$).

The prevalence of anaemia was more in women who were farm worker (31.52%) than housewives (23.9%) which is statistically significant ($P<0.05$).

CONCLUSION

A significant association of anemia in reproductive women with type of family, SES, family size, education

and occupation was observed ($P < 0.01$). The risk of anaemia in married women is independent of age at marriage.

REFERENCES

1. WHO. The prevalence of anaemia in women. A tabulation of available information WHO/MCH/MSM/92.2 Geneva, Switzerland, 1992
2. K. Park - Park's textbook of Preventive & Social Medicine by – 20th Edition, 2009.
3. De-Meyer EM, Preventing & Controlling Iron Deficiency Anemia through Primary Health Care-WHO Geneva, 1989, 8-26.
4. S.E. status as suggested by Prasad B.G.-Changes Proposed in the Social Classification of Indian Families, Journal of Indian Medical Association, 55(16), 1970, 198-199.
5. Biostatistics Division and Control Cell: 'Central Technical Committee on Health & Nutrition, All India Institute of Medical Science, New Delhi, General Guidelines of Instruction of Data Collection & Tabulation Analysis, Integrated Child Development Services, Annual Survey (1985).
6. National Family Health Survey-3 India 2005-06, International Institute for Population Sciences, Mumbai, India.
7. Massawe S.N., E.N.Urassa, L. Nystrom, G. Lindmark: Anaemia in women of reproductive age in Dar-Es-Salaam, Tanzania, East African Medical Journal Vol. 79, No.9, Sept. 2002.

Prevalence of Carcinoma Cervix in Rural Punjab and Need to Create Awareness Regarding Cervical Cancer

Harpreet Kaur¹, Sharanjit Kaur², Lajja Goyal³, Parminder Kaur¹

¹Asst. Prof. Obs. & Gyne. G.G.S. Medical College, Faridkot, ²Lecturer, University College of Nursing, Faridkot,

³Asso. Prof. Obs. & Gyne, G.G.S. Medical College, Faridkot, Punjab, India

ABSTRACT

Background: Carcinoma of the cervix is the second most common cancer amongst women and one of the leading cause of cancer death.

Objectives: To study prevalence of cervical cancer in tertiary care centre and need to create awareness about it.

Method: 300 subjects in the age group of 18-70 years visiting OPD of a tertiary care centre were enrolled.

Results: The prevalence of cervical cancer was 7 cases in the study group of 300. The mean score of awareness regarding cervical cancer was 8.09 out of maximum score of 20. Only 37.7% had adequate knowledge whereas 187 (62.3%) had meagre knowledge.

Conclusion: The percentage of cervical cancer was found to be 2.3% and all the patients had squamous cell carcinoma while large percentage of study subjects (62.3%) were unaware regarding cervical cancer.

Method: 300 subjects between the age group of 18-70 years visiting Gynecological OPD of tertiary care centre from December 2009 to February 2010 were enrolled.

Keywords: Carcinoma Cervix, Pap smear, VIA (Visual Inspection with Acetic Acid), Colposcopy, Awareness

INTRODUCTION

Amongst females, the most common sites of cancer are breast and cervix. Cancer of the cervix is one of the leading causes of cancer deaths in women^[1] and it is the 2nd most common cancer among women all over the world^[2].

In most of the developing countries including India, carcinoma of the cervix is the most common malignancy in the females and a major public health problem. The prevalence of cervical cancer in India ranges between 20-50% of all genital tract malignancies.

In other population based cancer registries (PBCR) Barshi and Chennai PBCRs have always recorded the highest incidence of cervix cancer^[3].

The number of cervical cancer cases in three districts of Punjab mainly Ropar, Patiala and Bathinda are 42, 54 and 60 respectively^[4]. In Faridkot district of Punjab, cervical cancer accounts for 20% of all the

female cancers^[5]. A disproportionate share of the cervical cancer burden in the country is shouldered by low income group women.

Most of the deaths from cervical cancer are preventable if detected early. It is well known that for cervical cancer there exists premalignant and non-invasive stage i.e. carcinoma in situ before there is invasion of underlying tissue^[6].

Studies show that risk of developing cancer is 10 times greater in non-screened than screened women. The aim is to diagnose the disease at a stage when treatment is likely to be most effective in the hope that morbidity and mortality from the disease is reduced^[7].

The various tests available in routine for the early detection of pre-malignant lesions are PAP smear, VIA and colposcopy. For definitive diagnoses - histopathological examination is done.

Screening for detection of carcinoma cervix can be done by means of Pap smear^[8,9].

VIA has been consistently demonstrated to have a sensitivity equivalent to that of cytological screening to detect high grade lesion^[10].

Acetic acid application is routinely used to visualize abnormal epithelium. It is possible to recognize, the aceto whitening of the abnormal cervical epithelium with the naked eye and this constitutes a positive VIA test^[11].

Colposcopy is most frequently performed in response to the abnormal cervical smear or if cervix is clinically abnormal looking on naked eye examination.

NEED OF THE STUDY

India, which accounts for one sixth of the world population, also bears one fifth of the worlds burden of cervical cancer^[12].

With early detection and timely treatment in mind, the WHO recommends that resource poor nations screen all women atleast once in a lifetime with priority given to women at age of 35-40 when likely to progress, high grade but treatable dysplasias can be detected^[13].

Cervical cancer is the easiest female cancer to be prevented through screening^[14].

India’s national cancer control program emphasizes the importance of early detection and treatment but the country has no organized screening programme and many Indian women lack both awareness about

disease and access to prevention and treatment facilities^[15].

In Punjab, Malwa region is cancer prone area and in Faridkot area cervical cancer accounts for about 20% of all female cancers^[16].

Nwankwo KC^[17] in a cross sectional study noted only 15.5% of the respondents were aware of availability of cervical cancer screening services. The awareness significantly varied with the level of educational attainment (P <0.0001). The most important factor hindering the use of available cervical cancer screening services were lack of knowledge (49.8%) and the feeling that they had no medical problems (32%).

According to Sait KH (2009)^[18] the main reason for not having a pap smear was the lack of awareness.

PURPOSE

To assess the prevalence and the need to create awareness regarding cervical cancer among women aged 18-70 years visiting Gynecology OPD of a tertiary care centre from December 2009 to February 2010 (300 subjects).

OBJECTIVES

1. To assess the prevalence of cervical cancer.
2. The need to create awareness amongst women regarding cervical cancer.

FIGURE: RESEARCH DESIGN

Sample Characteristics

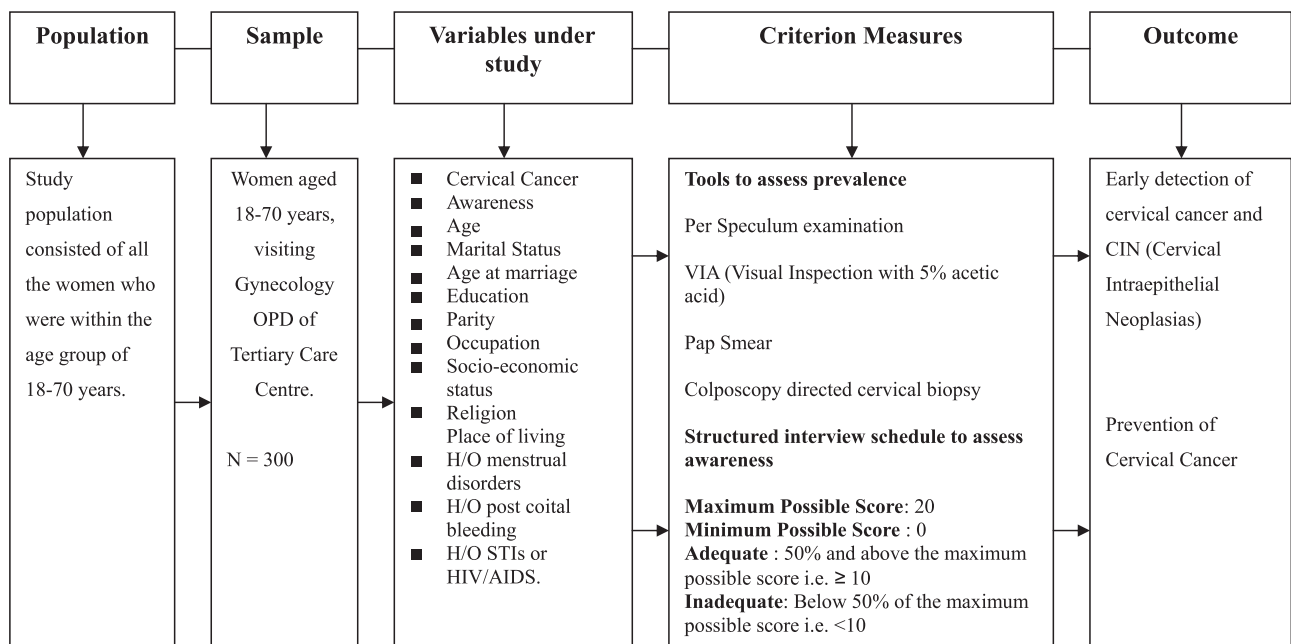


Table 1: Distribution of women according to selected demographic variables N=300

Demographic Characteristics	Women	
	N	%
Age (in years)		
• 18-30	127	42.3
• 31-43	96	32
• 44-56	60	20
• 57-70	17	5.7
Education		
• Illiterate	79	26.3
• Primary	49	16.3
• Middle	36	12
• Matric	57	19
• Senior Secondary	45	15
• Graduation	24	8
• Post-Graduation and above	10	3.3
Occupation		
• House Wife	248	82.7
• Labourer	22	7.3
• Skilled	10	3.3
• Professional	20	6.7
Place of Living		
• Rural	147	49
• Urban	153	51
Family Income per month (in Rupees)		
• Rs. ≤ 5,000	98	32.6
• Rs. 5,001 – 10,000	97	32.4
• Rs. 10,001- 20,000	72	24
• Above 20,000	33	11
Religion		
• Hindu	95	31.7
• Sikh	194	64.7
• Muslim	1	0.3
• Christian	4	1.3
• Others	6	2
Marital Status		
• Married	292	97.3
• Widow/Divorced	8	2.7
Age at Marriage		
• <18	67	22.3
• 18-21	154	51.3
• 22-25	58	19.3
• 26-29	14	4.7
• 30 and above	7	2.3
Parity		
• Zero	31	10.3
• One	61	20.3
• Two	98	32.7
• Three	63	21
• Four	47	15.7
History of Menstrual Disorders		
• Yes	115	38.3
• No	185	61.7
History of Postcoital Bleeding		
• Yes	22	7.3
• No	278	92.7
History of any STD or HIV/AIDS		
• Yes	9	3
• No	291	97

VARIABLE UNDER STUDY

1. Awareness Level
2. Cervical Cancer
3. Age
4. Education
5. Marital Status
6. Age at Marriage
7. Parity
8. Occupation
9. Monthly Income
10. Place of living
11. History of menstrual disorder
12. History of postcoital bleeding
13. History of any STD or HIV/AIDS

RELIABILITY OF TOOL

Reliability was computed by test retest method using Spearman’s Brown Prophecy formula.

Statistical analysis was performed using SPSS Version 14 software.

The level of significance, <0.05 was selected for the study.

RESULTS

Table 2: Prevalence of cervical cancer

Cervical Cancer cases per 300	Percentage	Cervical Cancer cases per 1000
7	2.3	23

The prevalence of cervical cancer was 2.3% or 23 per 1000.

Percentage distribution of the prevalence of cervical cancer among women.

Table 3: Mean, SD and Mean Percentage of the women’s awareness regarding cervical cancer.

Awareness	Mean Score	SD Percentage	Mean Score	Maximum Score	Minimum
Cervical Cancer	8.09	3.68	40.45	16	1
Max possible score	=	20			
Minimum possible score	=	0			

Table 4: Range and percentage distribution of level of awareness of women regarding cervical cancer. N = 300

Level of awareness	Range	N	Percentage
Adequate Knowledge	50% and above	113	37.7%
Inadequate Knowledge	<50% of maximum possible score	187	62.3%

Hence, it was concluded that majority of the women were not aware of cervical cancer while smaller number of the women had adequate awareness regarding cervical cancer.

SUMMARY

The prevalence of cervical cancer in the present study was found to be 2.3% and all the patients with cervical cancer had squamous cell carcinoma.

While a large percentage of the study subjects (62.3%) were unaware regarding cervical cancer.

DISCUSSION

In the present study 2.3% had squamous cell carcinoma. This is similar to the results of other studies such as (Bharani Bharti et al 2005)^[19], (Singh Kavita et al 2000)^[20].

The present study showed that majority of the women 62.3% had inadequate awareness and only 37.7% had adequate awareness regarding cervical cancer. This is similar to Tebu PM et al (2007)^[21] where 28% belonged to aware group compared with 72% who were unaware group. Wong LP et al (2009)^[22], Imam Zakariya Sardar et al (2003)^[23] population studies showed poor knowledge regarding cervical cancer.

From above cited discussion it can be concluded that women are not adequately aware of cervical cancer. Therefore, it is the need of the hour, to increase cervical cancer awareness in the community. It can be carried out by arranging the campaigns time to time. Government should take the initiative in this aspect.

CONCLUSION

The findings of the study revealed that prevalence of cervical cancer was 2.3%.

62.3% of the subjects were inadequately aware of cervical cancer.

The prevalence of cervical cancer is high in this area but women are inadequately aware of it. Therefore,

awareness campaigns should be arranged to make the people aware and prevent this deadly but preventable disease.

REFERENCES

1. Parkin DM, Bray F, Ferlay J. Estimating the world cancer burden. *Int J Cancer* 2001;94:153-6.
2. Himadree, Hindustan Times. *Aware & Safe*. New Delhi, April 12, 2010. Available from <http://www.hindustantimes.com/lifesty-news/wellness/Aware-ampsafe/Article1-529928.aspx>
3. National Cancer Registry Programme (NCRP, ICMR). Consolidated report of population based cancer registries 2004-2005. Bangalore: NCRP;2008.
4. NCRP 2002. <http://pbhealth.gov.in/pdf/CancerControl.pdf>
5. Development of an Atlas of Cancer in India. First All India Report 2001-2002 Vol. I and II. [www.canceratlasindia.org]: National Cancer Registry Programme (ICMR), Bangalore, 2004.
6. Baliga BS. Tissue basis of colposcopy. In : Principles and Practice of colposcopy, 1st ed. New Delhi: Jaypee Brothers; 2004. 1-2, 5, 13-16.
7. Wesley R, Sankaranarayanan R, Shyamalakumary B, Sridevi AN. Visual inspection with acetic acid in the early detection of cervical cancer and precursors. *Int J of Cancer* 1997;80:161-3.
8. Papanicolaou GN, Traut HF. Diagnostic value of vaginal smear in cancer of uterus. *Am Jr Obstet Gynecol* 1941-42;193-205.
9. Ayre JE. The vaginal smear precancer cells studies using a modified technique. *American Jr. Obstet Gynecol* 1949;53:109.
10. Chirenji ZM. Visual inspection with Acetic acid for cervical cancer screening; Test qualities in a primary care setting. *Lancet* 1999;353:869-73.
11. Sankaranarayanan R, Wesley R, Somnathan T, Dharad N. Visual Inspection of uterine cervix after application of acetic acid in detection of cervical cancer and its precursors. *Cancer* 1998;83:2150-6.
12. Ferlay J, Bray F, Pisani P, Parkin DM: GLOBOCAN 2002: Cancer Incidence, Mortality and Prevalence Worldwide. In IARC Cancer Base No. 5, Version 2.0. IARC Press, Lyon;2004.
13. International Agency for Research on Cancer (IARC): Handbooks of Cancer Prevention: Cervix Cancer Screening. Volume 10. Lyon, France: IARC;2005.
14. C.S. Dawn. Textbook of Gynaecology, Contraception and Demography, 14th edition, published by Dawn Books; 2003:163-164.
15. Consolidated report of hospital based cancer

- registries 2001-3, national cancer registry program. New Delhi: Indian Council of Medical Research; 2007.
16. National Cancer Registry Programme. (NCRP, Bangalore) 2001.
 17. Nwankwo KC, Aniebue UU, Aguwa EN, Anarado AN, Agunwah E. Knowledge attitudes and practices of cervical cancer screening among urban and rural Nigerian Women: a call for education and mass screening. *Eur J Cancer Care (Engl)*. 2010 Mar 23.
 18. Sait KH. Attitudes, knowledge and practices in relation to cervical cancer and its screening among women in Saudi Arabia. *Saudi Med J*. 2009 Sep;30(9):1208-12.
 19. Bharani Bharti, Phatak Satish R. Acetic acid visualization of the cervix, an alternative to colposcopy in evaluation of cervix at risk. *J Obstet Gynecol India* 2005 November/December;55(6):530-533.
 20. Singh N Kavita, Khare Shashi. Cervical screening in high risk cases with detail study of CIN cases. 44th All India Congress of Obstetrics and Gynaecology:128.
 21. Tebeu P M, Major A L, Rapiti E, Petignat P, Bouchardy C, Sando Z. The attitude and knowledge of cervical cancer by Cameroonian women; a clinical survey conducted in Maroua, the capital of Far North Province of Cameroon. *International Journal of Gynecological Cancer* July/August 2008;18(4):761-765.
 22. Wong L P, Wong Y L, Low W Y, Khoo E M, Shuib R. Knowledge on cervical cancer and the Pap smear test. *Singapore Med J* 2009;50 (1):49-53.
 23. Zakariya Imam Sardar, Rehman Fatima, Zeeshan Muhammad Malik, Maqsood Bilal, Asrar Sameen, Fatimal Noor et al. Perceptions and Practices of a Pakistani Population Regarding Cervical Cancer Screening. *Asian Pacific J Cancer Prev* 2008;9:42-44.

The Socio-Cultural Factors behind the Rare Incidence of Cancers in Perumal Thevanpatti (Virudu Nagar District, Tamil Nadu)

P Indra(alias)MuthuMeena¹, K Ramalingam², Rekha Govindan³, B Aathavan⁴

¹Research Scholar, Mother Teresa Women's University, Kodaikanal, Tamil Nadu, ²Scientist, Mediclone Research Centre, Mediclone Biotech Pvt Ltd, Chennai, Tamil Nadu, ³Associate Professor, Department of Biotechnology, Aarupadai Veedu Institute of Technology, Paiyanoor, Chennai, ⁴General Surgeon, LifeLine Hospital, Perungudi, Chennai

ABSTRACT

The nationwide cancer registration and systematic death registration is poor particularly, in rural India. It is just about 1% of the total registry. Based on the people's report, a house -to- house survey was conducted in Perumal Thevan Patti, a small village in Virudunagar district in Tamil Nadu to identify the number of existing cancer cases, and the number of cancer deaths that occurred in that village. Cancers of breast, uterus, stomach and rectum are found to be more prevalent in this village cohort of population. As multiple factors are responsible for significantly higher prevalence of cancers in this village, counselling strategies may be adopted to discourage the indiscriminate use of pesticides, tobacco chewing and alcohol consumption for preventing cancer in this area. A cancer registry should be maintained for elucidation of the role of pesticides and other pro carcinogenic factors in the etiology of cancer.

Keywords: Agriculture, Agricultural pesticides, Cancer, Occupational Exposure

INTRODUCTION

Cancer patterns vary not only through out the world but also between different population groups with in the same country¹. Literatures have revealed that out of ten million new cases of cancer diagnosed every year, about half are reported from the developing world. It is estimated that by 2020, over ten million people world wide will die of cancer every year and 70% of these will be from the developing world². Study of the magnitude and pattern of cancer is the first step in determining clues to the causes of cancer and a base line to plan and assess control measures. Epidemiological studies help in knowing what is happening and what can be done about it. In India though infectious diseases continue to be a public health problem, an increase in the occurrence of non communicable diseases has also been noted particularly in urban areas and in economically advanced states³. The focussed village Perumalthevan Patti belongs to Rajapalayam Taluk in Virudhunagar District (Tamil Nadu). The village, as per the records of the village administrative officer is grouped together and called as 'Pillaiyar Kulam Villages' in the survey

no:1027/1 with a total area of 1.85.0 acres. The population according to the Government census record is about 1032⁴. The entire village is surrounded by bare mountains. The main occupation of the people are cattle rearing and farming. About 53% of them are exservice men. The riverlet 'kayal kudi' often gets dried, people use borewell water for drinking purpose and other uses⁵. Villagers attributed higher occurrence of cancer due to unhygienic living conditions and poor quality of drinking water. Hence a study was planned to find out the prevalence of various types of cancer by a detailed predesigned and pretested questionnaire in the households. In the present study, a house to house survey revealed the prevalence of confirmed cancer cases and mortality due to the disease, seemed to be more unusual in view of the total number of population in the village. Thakur et al. (2008) have reported that confirmed cancer cases per 1 lakh per year was a meagre 125 in Talwandi Sabo and 72 in Chamkaur Sahib Community Development Blocks in Bathinda and Roop Nagar District respectively in Punjab state located in northern part of India. But in this study, 51 were affected out of the total population

of 1032. All the details collected were reviewed by a physician and a nurse independently to diagnose cancer cases.

METHOD AND MATERIALS

The questionnaire included enquiries about the symptoms of cancer, diabetes, stroke, heart diseases and chronic obstructive pulmonary diseases/asthma among members of the household and number of deaths in the household. For each reported death, verbal autopsy was done using a semi-structured questionnaire for the medically certified cause of death (M.C.C.D) and for any suspected case of death due to cancer in the household. A detailed history of symptoms, signs and investigation were taken for the survey of cause of death (S.C.D)⁶. The information and data about the flow of village population, cropping pattern, water sources and food sources were collected. A non healing ulcer or blister in mouth, unusual bleeding or discharge from genital tract in women, lump in the breast, difficulty in swallowing or indigestion, continuing of cough and hoarseness of voice, change in bowel or bladder habits and change in wart or mole were also recorded among the living members.

RESULT

From a population of about 1032, there were 51 histologically confirmed cancer cases in this village. Different types of cancer afflicted the village population and the recorded percentage of incidence is given in the Table I.

Table 1: The recorded incidence in Percentage

Sl. No.	Cancer In	Record ed % of incidence
1.	Stomach	35.29%
2.	Breast	11.6%
3.	Bone	7.84%
4.	Rectum, uterus and oesophagus	5.88%
5.	Lung, prostate and gall bladder	3.92%
6.	Intestine, ovary, brain, bladder, thyroid, pancreas, mouth, bladder and Wilm's Tumour	1.96%

The most common sites of confirmed cancer cases are briefed in Table II. Six leading sites of confirmed cancer cases were stomach, breast, bone, rectum, uterus and oesophagus. The leading sites of cancer death belonged to stomach, breast and rectum which were given in Table III.

Table 2: The most common sites of confirmed Cancer cases

Sl.No	Cancer in	Male	Female	Total
1.	Stomach	6	12	18
2.	Breast	1	5	6
3.	Bone	3	1	4
4.	Rectum	2	1	3
5.	Uterus	-	3	3
6.	Oesophagus	1	2	3
7.	Others	8	6	14

Table 3: The most common sites of Cancer Death

Sl.No	Cancer in	Male	Female	Total
1.	Stomach	1	4	5
2.	Breast	1	2	3
3.	Rectum	1	1	2
4.	Others	2	3	5

The sex of the village population who are affected by different types of cancer, survey of cause of death (S.C.D) due to cancer, medically certified cause of death (M.C.C.D) and the percentage of survival and mortality due to cancer were given in the Table III. Totally 21 males and 30 females were affected.

Table 4: Different types of Cancer afflicted the Population:

Sl.No	Cancer in	Male	Female	Incidence in total population (1032Nos)	Survey of cause of Death	Medically certified cause of Death	% of Mortality
1.	Stomach	6	12	18	1	4	27.78%
2.	Breast	1	5	6	1	2	50%
3.	Rectum	2	1	3	1	1	66.67%
4.	Intestine	1	-	1	-	-	0%
5.	Lung	1	1	2	-	-	0%
6.	Uterus	-	3	3	1	-	33.33%
7.	Ovary	-	1	1	1	-	100%
8.	Prostate	2	-	2	-	-	0%
9.	Brain	-	1	1	-	1	100%
10.	Bone	3	1	4	-	1	25%
11.	Oesophagus	1	2	3	-	-	0%
12.	Thyroid	-	1	1	-	-	0%
13.	Pancrease	-	1	1	-	-	0%
14.	Mouth	1	-	1	-	-	0%
15.	Bladder	-	1	1	-	-	0%
16.	Wilm's Tumour	-	1	1	-	1	100%
17.	Gall Bladder	2	-	2	-	-	0%

DISCUSSION

Out of the total population of 1032 individuals, 18 members had stomach cancer and among them 4, were medically certified deaths (MCCD). This was followed

by 6 members (Women) with breast cancer. Two of them were declared in M CCD. Four people suffered from bone cancer with one person certified as M CCD. Rectal cancer and uterine cancer was registered in 3 individuals in the total population. In rectal cancer 66.67% mortality rate while in uterine cancer 33.33% mortality rate were noticed. Gall bladder, lung cancer and prostate cancer were registered in 2 members respectively out of the total population. All these three types of cancer cases survived, at the time of recording the data. The lone case of ovarian cancer, brain cancer and wilm's tumour recorded patients did not survive. In contrast, the lone cases that were recorded of intestinal cancer, oesophageal cancer, thyroid cancer, pancreatic, oral, bladder cancer survived at the time of data collection.

Cancer related risk factors such as consumption of tobacco, betel nut chewing, smoking, consanguineous marriage, pesticide usage, taking spicy pickles, alcohol consumption, are shown in table III.

Table 5 : Percentage of risk factors among Cancer patients and other normal individuals in the cohort

Sl. No.	Parameters	Cancer patients in nos (out of 51)	Cancer patient in percentage Normal	individuals in number (981)	Normal individual in percentage
1.	Consanguineous marriage	48	94.11%	855	87.16%
2.	Tobacco chewing	45	88.26%	801	81.5%
3.	Smoking (includes all degrees)	38	75%	515	52.5%
4.	Pesticide Usage	50	98%	960	96.8%
5.	Taking spicy pickle	49	96%	865	88.24%
6.	Alcohol	46	90.2%	834	85%
7.	Betul nut chewing	40	78.4%	795	81%

Consanguineous marriage is even now practiced here^{7, 8}. About 94.11% of the people with cancer are married in this way. The people show poor consumption of fish as the fish food is not easily accessible. The cancer patients as well as normal individuals consumed scanty vegetables in their food. However the consumption of milk and its products are sufficient. Smoking is also a perennial practice in this population. Among the cancer patients, about 75% were smokers. As many belonged to army service, there is a huge consumption of alcohol. It comes to around 90.2% among the cancer patients. In the domestic practice, the people have the habit of mixing the grains they are storing for their use with pesticide like Gammaxine to avoid the devastation by the pests^{9, 10}. Tobacco chewing is also not un-common as it is practiced in around 88.26% among the cancer patients.

It was observed that most of the risk factors like participation in cultivation, usage of pesticides (which is about 98% of the total 51) spraying and storage of pesticides, consumption of non-vegetarian and spicy food, alcohol consumption, tobacco use, and drug abuse significantly more common in this village. It was reported by farmers that they were using 15-20 pesticides spray for a single cotton crop as against 8-10 recommended by agriculture experts¹¹. Acute occupational exposure to pesticides among sprayers was also high as they occasionally use protective devices while spraying. Residents of the area were also using empty pesticide containers for storing food items.

Taking spicy foods on most of the days were more common. A study carried out in the Indian diet has mentioned that spices and food additives play a role in the causation of cancer¹². Similarly a hospital based case control study done at Dibrugarh had found that consumption of very spicy foods, hot foods and beverages, high amounts of chilli, and leftover food was positively associated with the risk of oesophageal cancer¹³. However a hospital-based case-control study conducted in Coimbatore, South India revealed that consumption of spicy, fried foods and salted fish did not contribute to the risk of cancer but the consumption of pickles did¹⁴.

Since the alcohol consumption, smoking and betel nut chewing with tobacco are common in this village, the study conducted, suggests an association of cancer to the above socio cultural activities. Similar reports from other parts of the country and the world are available¹⁴.

Though cancer represents a multiple etiological disease and several factors like nutrition, life style, habits, environmental contamination and genetic predisposition have been attributed to this condition, the present study revealed the occurrence of many different cancer types and their prevalence in the haplo group mostly Dravidean population. The familial incidence of cancer was also recorded in the present epidemiology report. For instance, in a family, father suffered cancer of rectum while his daughter was affected by stomach cancer. In another family the mother had stomach cancer while her son is surviving with cancer in pharynx. Aunt and her niece were having cancer of uterus in one family. Both father and son were afflicted by cancer of stomach in one family. In yet another family, father had cancer in scrotum while his son and daughter had cancer in stomach. It

is to be noted that, according to a survey, in Chennai the incidence of colon cancer for male is 2/100000 and rectum cancer is 4.5/100000. For female it is 0.8/100000 and 2.6/100000 respectively¹⁵.

CONCLUSION

In the present study, irrespective of the sex, age at which the cancer disease pronounced was observed to be above 40 years significantly. Among the total cases of 51, 16 cases occurred after 40 years of age and 18 cases occurred after 50 years of age and after 60, the registered cases were 15. Thus the proportion of death due to cancer are more beyond 40 years of age. Considering the primary immuno deficiencies which will be more marked during senescence i.e. at 60 years of age, the reported incidence may be expected in view of nutritional deficiency in the village population. The recorded observation revealed that both stomach and breast cancer remained the predominant types in this village. They are followed by greater incidence of cancer in bone, rectum and oesophagus. The other types namely the cancer in thyroid, pancreas, ovary, bladder, gall bladder, wilm's gland, intestine, ovary and brain represented of the least incidence and many of the diseased in the above categories are still surviving.

As cancer registry reports the incidence of cancer statistically to 1,00,000 population, an equivalent proportion in the reported Perumalthevanpatti may go to 5,100 which is enigmatically an astounding number.

REFERENCE

1. Cancer control in developing countries – challenges and opportunities The International Network for Cancer Treatment and Research. www.inctr.htm
2. World Health Organization. Recommended guidelines for drinking water supply, Geneva: WHO, 1993.
3. Murray, C. J.; Lopez, A. D. Global Health status in developing countries: Global burden of Diseases and Injuries in SEARO, (Harvard School of Public Health). 1996, Vol. 1&2.
4. Official records of the Village Administration Officer, Perumal Thevan Patti
5. Kannan N. Virudunagar Mavattam. Kannagi Publications. 2006
6. Venkat Raman A and Balkrishna BY. Assessing Cancer Burden in Rural India: An analysis by cause death statistics. Asian Pacific Journal of Cancer Prevention. 2005, 6: 221-223.
7. Bittles AH. Consanguineous Marriage and childhood health. Developmental Medicine and child neurology. 2003, 45, 8, 571-576.
8. Ghadirian P, Narod S, Perret C, Lambert DM, Latreille J and Belanger DC, Hereditary breast cancer in 19 females and 2 males. European Journal of Cancer. 1995, 31:2:284-287.
9. Zham SH and Ward MH, Pesticides and childhood cancer. Environmental Health Perspectives. 1998, 106:3:893-16. Accessed on 2/3/06.
10. Dich J, Zahm SH, Hanberg A and Adami HO, Pesticides and cancer. Pubmed gov., 1997, 8:420-43.
11. J. S. Thakur¹, B. T. Rao¹, Arvind Rajwanshi, H. K. Parwana and Rajesh Kumar¹, Epidemiological Study of High Cancer among Rural Agricultural Community of Punjab in Northern India Int. J. Environ. Res. Public Health, 2008, 5(5) 399-407
12. Sinha, R.; Anderson, D. E.; McDonald, S. S.; Greenwald, P. Cancer risk and diet in India. JPostgrad Med, 2003, 49: 222-230.
13. Phukan, R. K.; Chetia, C. K.; Ali, M. S.; Mahanta, J. Role of dietary habits in the development of esophageal cancer in Assam, the northeastern region of India. Nutr Cancer, 2001, 39: 204-9.
14. Chitra, S., Ashok L, Anand, Srinivasan, V Jayanthi, Risk factors for esophageal cancer in Coimbatore, Southern India: a hospital-based case – control study. Indian J Gastroenterol, 2004, 23:19-21.
15. Pandey M, Krishnan Nair MK, and Sebastian P. Advances in Oncology. Jaypee Brothers (p) Ltd. 2000, 1:121-124.

Socioeconomic Status and Oral Health Inequity in Karnataka

Jayachandra Megalamanegowdru¹, Vijayanath V²

¹Assistant Professor, Department of Public Health Dentistry, Bapuji Dental College and Hospital, Davangere, Karnataka, ²Associate Professor, Department of Forensic Medicine & Toxicology, S. S. Institute of Medical Sciences & Research Centre, Davangere, Karnataka, India

ABSTRACT

Various studies conducted across the world have reported that people belonging to lower socioeconomic groups compared to higher socioeconomic groups have poorer oral health status. Studies conducted in India conversely are inconclusive and provide conflicting evidence. Most of the studies on oral health inequalities in India have stressed socioeconomic status (SES) as an important determinant of oral health. Inequalities in socioeconomic status underlie many health disparities in the world, including oral health. Occupational status, income and education are intrinsically related. In general, the population groups those suffer the worst oral health status are also those that have the highest poverty rates and the lowest education.

Higher income enable people to afford better housing and permit increased access to medical care. In the same time, a high level of education increases the opportunity to engage in oral health-promoting behaviors. On the other hand, differences in income and employment of parents generate inequalities in oral health status of children. All studies conducted in this field confirm the link between socioeconomic status and oral health, which justifies the struggle to identify the factors involved in generating and maintaining inequalities in both general and oral health.

Keywords: Socioeconomic Status, Income, Education Level, Oral Health, Inequalities

INTRODUCTION

One of the enduring puzzles of public health is why some populations are healthier than others. The answers to such apparently simple questions, although complex to formulate, are crucial in understanding oral diseases and how they might be eliminated or controlled through the development of appropriate public policies and programs. The need and demand for clear scientific evidence to inform and support the oral health policy-making process is greater than ever. The field of the social determinants of health is perhaps the most complex and challenging of all. It is concerned with key aspects of people's living and working circumstances and with their lifestyles(1). It is also concerned with the health implications of economic and social policies, as well as with the benefits that investing in health policies can bring(2).

The oro-dental diseases are emerging as considerable public health problems in India. Oral

problems are not only causing pain, functional and aesthetic problems but also lead to loss of working man-hours. Hence, in the long run, they are bound to have a significant impact on our economy³.

Poor oral health can be manifested through pain, functional limitation, psychological discomfort, handicap, physical disability, psychological disability and social disability⁴. People who are disadvantaged by socioeconomic status experience greater levels of oral disease than those from more affluent groups. This has been acknowledged by Australia's National Oral Health Plan⁵ which argues that "profound disparities exist across socio-economic groups in Australia... the incidence of caries and periodontal disease increases as socio-economic status decreases." Spencer⁶ has referred to this as the "polarization of the burden of [oral] disease".

Socioeconomically disadvantaged groups rate their oral health poorer than more advantaged groups and report more tooth loss and more problems with their teeth, mouth or dentures^{7,8} and are more likely to have a tooth extracted⁹. A significant misconception held by many is that poor oral health behavior is the reason why people on low incomes experience poor oral health. Contemporary research challenges this notion by showing that people from disadvantaged groups are as equally inclined to practice oral health self-care as those from more affluent groups⁽¹⁰⁾. By contrast; access to dental care is closely associated with income. People from advantaged areas are more likely to visit a dentist than people on low incomes and in turn this positively impacts on oral health¹⁰.

CURRENT SCENARIO

There is consistent evidence throughout India that people at a socioeconomic disadvantage suffer a heavier burden of oral health problems than their better-off counterparts¹¹. These socioeconomic inequalities in oral health are a major challenge for health policy, not only because most of the inequalities can be considered unfair but also because reducing the burden of oral health problems in disadvantaged groups offers great potential for improving the average oral health status of the population as a whole^{12,13}. The member States of World Health Organization (WHO) in the European Region have adopted a strategy for health for all that has as its first target: By the year 2000, the differences in health status between countries and between groups within countries should be reduced by at least 25%, by improving the level of health of disadvantaged nations and groups¹⁴. This is clearly a very ambitious target that not be realized everywhere. Nevertheless, it gives a clear focus to health policy and promotes the monitoring of quantitative changes over time in socioeconomic inequalities in health, which is essential to assess the effects of health policy interventions^{15,16}. The great differences in the health profiles of different nations and different groups within the same country or states have already been highlighted¹⁷. These differences or variations can be measured from standard health statistics^{17,18}. The term inequality has a moral and ethical dimension. It refers to differences which are unnecessary and avoidable but, in addition, are also considered unfair and unjust¹⁹. So, in order to describe a certain situation as inequitable, the cause has to be examined and judged to be unfair in the context of what is going on in the rest of society²⁰. Numerous studies have demonstrated that the health of

individuals from the lower end of the socioeconomic scale is markedly worse than that of individuals from the upper end¹³. This relationship exists across a broad range of health indicators, including dental health²².

Regarding oral health, the reasons of disparities are complex. Physical disabilities and general illnesses can limit the access to oral health services. But there are also inequalities which can be avoided and are unacceptable in the modern society, being caused mainly by the socioeconomic differences²³. The concept of socioeconomic inequalities in oral health can be defined as differences in the prevalence or incidence of oral health problems between individual people of higher and lower socioeconomic status²⁴.

Studies had shown that over the last decade, the differences in the oral health status between the individuals with a high socioeconomic status and those with a low socioeconomic status had markedly increased²⁵. Differences in the accessibility to the oral health services reflect the social and economical status of the individuals. Thus, monitoring of the progress regarding elimination of health inequalities require the improvement of data collection in terms of quality data and of use of standardized criteria regarding the establishment of socioeconomic status of individuals²⁵. There are several indicators that can be used in the evaluation of socioeconomic status. The most important indicators are occupational status, income and level of education. Each indicator covers a different aspect of social stratification and it is therefore preferable to use all three instead of only one²⁵. Often, information on education, occupation and income may be unavailable and being necessary to use proxy measures of socioeconomic status such as indicators of living standards (car ownership) which reflect the financial support of the individual²⁶. The most usual approach consists of classifying people based on their position in the labor market into a number of discrete groups or social classes. In its basic form, this approach distinguishes: higher-level employees, employers and professionals, lower-level employees, skilled laborers, unskilled laborers, unemployed. Children are classified according to the occupation of their parents, either their mother or their father¹². Income is a frequently used instrument to measure the socioeconomic status, being relevant for the realization of health strategies. The current income of the individual offers the possibility of a direct appreciation of life conditions, healthy habits and behavior; in the same time, it reflects the relative position in society. Inequalities generated by income are associated with

differences in mortality and morbidity rates, including oral health diseases²³. High incomes permit the access to good oral health services, a good environment for health and offer the opportunity to adopt appropriate oral health behavior²⁵. But income can present fluctuations in time, so that the income realized in a time period does not always reflect with accuracy the financial possibilities of the individual on long term²⁶. Of particular importance regarding the relationship between income and health status is that the existence of disease can affect in such a way the individual activity that it is directly in relation with obtaining an income and its value^{2,14}. Another practical problem in the measurement of income is the high non-response rate concerning personal and household income. Moreover, willing respondents may not report a real income²⁵. The latest studies showed that persons with low and very low incomes are 5 times more likely to have a bad oral health status compared with those with high incomes²⁶.

Education level is in general better reported in comparison with income (95% of individuals offer data regarding their level of education)²³. All adults can be evaluated according to the level of education, which is significantly different from the occupation. More, the level of education remain fixed for the majority of persons older than 25 years and unlike the income, it is not influenced by the health status¹². Characteristically, the level of education is appreciated according to the number of years spent by an individual in an educational institution, but it cannot be used for establish the socioeconomic status of children apart for knowing parents' level of education²³. Commonly, there is a relation of direct proportionality between the level of education and oral health related to quality of life²⁶. A high level of education offers the possibility to obtain and to understand information regarding oral health behavior and oral health promotion². Many studies have explored the relationship between oral health status and conventional measures of socioeconomic status. The latest studies showed that differences in income and employment level of parents generate inequalities in oral health status of children, mainly expressed by the level of dental caries^{27,28}. Today there is a great concern about the poorer dental health of children from deprived backgrounds.

Dentist-Population Ratio: With an increase in the number of dental colleges there also has been an improvement in the dentist to population ratio. At present the dentist to population ratio in India is

1:30,000²⁹. Almost three-fourths of the total numbers of dentists are clustered in the urban areas, which has only one-fourth of the country's population^{29,30,31}.

Many studies confirmed the link between inequalities in socioeconomic status and inequalities in oral health²⁶. They also provide some evidence of differences in oral health behaviors among the affluent and deprived²¹. This is, perhaps, not surprising. A number of investigators have confirmed that the measures of socioeconomic inequalities are sensitive to inequalities in oral health and, because of their spatial component, are likely to prove useful in the planning process^{21,22}. It is also the case that these measures provide a convenient way of classifying individuals by socio-economic status in studies where controlling for this factor is important in uncovering the nature and magnitude of other associations²².

However, the role and value of these measures in pursuing explanations of the link between social inequality and oral health has not yet been fully elucidated or explored. The point is to begin to identify the factors involved in generating and maintaining inequalities and their implications in terms of policy and health services delivery²¹.

The major missing link causing this unfortunate situation is the absence of a primary health care approach in dentistry. When the primary health care systems were implemented in the 1980s, dentistry was not adequately included³². This has left oral health far behind other health services. A common way of thinking among local planners is to increase the number of dentists to meet the workforce problem. They ignore the primary health care approach for oral health services, which can be executed by dental auxiliaries. Addressing the above principles could prevent many constraints that occur as a result of the prevailing conventional dental services. An oral health service based on such an approach requires a large number of dental auxiliaries rather than dentists³³.

CONCLUSION:

In conclusion, the link between socioeconomic status and health, including oral health, is well established although research in oral health has yet to reach its full potential in terms of enhancing our understanding of the key issue in health services research: what causes inequalities in oral health? The literature evidenced that these measures provide a way of controlling for socioeconomic status when it is examined the association between oral health and

other variables^{12, 21, 22}. Studies confirmed that socioeconomic indices are sensitive to variations in oral health and oral health behaviors and can be used to identify small areas with high levels of need for dental treatment and oral health promotion services^{22, 34}. As such, they are likely to provide a useful administrative tool.

While basic oral health education is important, the most effective way to improve oral health is to invest in health promotion programs that focus on common risk factors that contribute to poor oral health.

A common risk factor approach recognises that many diseases – such as heart disease, stroke, cancer, diabetes and dental caries – share common risk factors including smoking, poor diet, alcohol, stress, hygiene and trauma^{10,11}. Additionally, oral health promotion should consider the social determinants of health as factors as social exclusion, unemployment, stress, and addiction all contribute to poor (oral) health¹².

REFERENCES

1. Wilkinson R, Marmot M: Social determinants of health. The solid facts. WHO Regional Office for Europe, Copenhagen, 2003.
2. Daly B, Watt R, Batchelor P, Treasure E: Essential dental public health. Oxford University Press, 2002.
3. Parkash H, Duggal R, Mathur V P. Final report and recommendations "Formulation of Guidelines for Meaningful and Effective Utilization of Available Manpower at Dental Colleges for Primary Prevention of Oro-dental Problems in the Country". A GOI- WHO Collaborative Programme. 2007. New Delhi
4. AIHW Dental Statistics and Research Unit (2006) Social Impact of Oral Conditions Among Australian Adults, Research. Report No. 24, Australian Research Centre for Population Oral Health, The University of Adelaide.
5. National Advisory Committee on Oral Health (2004) Healthy Mouths Healthy Lives: Australia's National Oral Health Plan 2004-2013, A Committee Established by the Australian Health Ministers' Conference, p. 27
6. Spencer AJ (2004) Narrowing the Inequality Gap in Oral Health and Dental Care in Australia, Australian Health Policy Institute, The University of Sydney, p. 11.
7. Sanders A, Spencer AJ (2004) 'Social inequality in perceived oral health among adults in Australia', Australian and New Zealand Journal of Public Health, Vol. 28, No. 2: 159-166.
8. Australian Research Centre for Population Oral Health (2003) Social Impact of Oral Conditions Among Australian Adults, AIHW Dental Statistics and Research Unit, Report No. 24, The University of Adelaide
9. Carter KD, Stewart JF (2002) cited in Spencer AJ, Harford J (no date) Submission to the Senate Select Committee on Medicare, Australian Research Centre for Population Oral Health, The University of Adelaide, accessed from http://www.aph.gov.au/Senate/committee/medicare_ctte/fairer_medicare/submissions on 31 July 2006.
10. Sanders AE, Spencer AJ, Slade GD (2006) 'Evaluating the role of dental behavior in oral health inequalities', Community Dentistry and Oral Epidemiology, Vol. 34: 71-79.
11. Petersen PE: The world health report 2003. WHO, Geneva, 2003.
12. Kunst A, Mackenbach J: Measuring socio-economic inequalities in health. WHO, Regional office for Europe, Copenhagen, 1997.
13. Gluck GM, Morgenstein W M: Jong's community dental health. Mosby, 2003.
14. World Health Organization: Target for health for all. The health policy for Europe. Copenhagen, WHO Regional Office for Europe, 1992.
15. Dahlgren G, Whitehead M: Policies and strategies to promote equity in health. WHO, Regional Office for Europe, Copenhagen, 1992.
16. Locker D, Ford J: Evaluation of an area-based measure as an indicator of inequalities in oral health. Community Dent Oral Epidemiol. 1994, 22: 80-85.
17. World Health Organization: Atlas of health in Europe. WHO library cataloguing in publication data, 2003.
18. World Health Organization: European health for all data base. WHO, Geneva, 2004.
19. Whitehead M: The concepts and principles of equity in health. WHO Regional Office for Europe, 2000.
20. World Health Organization: World health report. Reducing risks, promoting healthy life. WHO Regional Office for Europe, Copenhagen, 2002.
21. Locker D: Deprivation and oral health: a review. Community Dent Oral Epidemiol. 2000, 28: 161-9.
22. Locker D: Measuring social inequality in dental health services research: individual, household and area-based measures. Community Dental Health 1993, 10: 139-150.
23. Healthy people 2010. US Department of Health and Human Services, 2000.
24. Locker D, Ford J: Using area-based measures of socioeconomic status in dental health services research. J Public Health Dent. 1996, 56: 69-75.

25. Whittle J, Whittle K: Household income in relation to dental health and dental health behaviours: the use of Super Profiles. *Community Dent Health*. 1998, 15: 150-154.
26. World Health Organization: World health report 2003. Shaping the future. WHO Regional Office for Europe, Copenhagen, 2003.
27. Gratrix D, Holloway P: Factors of deprivation associated with dental caries in young children. *Community Dent Health*. 1994, 11: 66-70.
28. Tickle M et al.: Inequalities in the dental treatment provided to children: an example from the UK. *Community Dent Oral Epidemiol*. 2002, 30: 335-341.
29. Shobha Tandon. Challenges to the Oral Health Workforce in India *Journal of Dental Education*, Volume 68, Number 7 Supplement; July 2004, 28-33
30. National Sample Survey Organization. Department of Statistics. GOI. 42nd and 52nd Round.
31. Mudur G. Inadequate regulations undermine India's healthcare. *BMJ* 2004;328,124.
32. Ahluwalia MS. Economic performance of states in post-reforms period. *Economic and Political weekly*, May 6 2000, 1648.
33. Parkash H, Duggal R, Mathur V P. Final report and recommendations "Formulation of Guidelines for Meaningful and Effective Utilization of Available Manpower at Dental Colleges for Primary Prevention of Oro-dental Problems in the Country". A GOI- WHO Collaborative Programme. 2007. New Delhi
34. Pine C et al.: Developing explanatory models of health inequalities in childhood dental caries. *Community dental health* 21 (Supplement) 2004, 86-95.

A Study of Fat Parameters in Sedentary and Non-sedentary Subjects in Davangere, Karnataka

Jayalakshmi MK¹, Prabhu Raj N², Shanmukhappa NJ³, Smilee Johncy S¹

¹Assistant Professors, ²Professor & Head, ³Professor, Department of Physiology, JJM Medical College, Davangere, Karnataka, India

ABSTRACT

Background: Recent studies in adolescents and adults have demonstrated significant relationship between physical inactivity and other adverse health practices, such as consumption of less-healthy foods or increased fat intake. Inactive individuals tend to consume more quantities of dietary fat. These data suggest that inactivity tends to cluster with other health behaviors that have adverse effect on the quantity and location of body fat deposition which results in obesity. A sedentary life style and especially poor cardio-respiratory fitness not only associated with the metabolic syndrome but could also be considered features of the metabolic syndrome. Epidemiological studies have shown an inverse relation between physical activity CHD and atherosclerosis. Approximately 2 million deaths are reported every year attributable to physical inactivity. A combination of improper diet, lack of physical activity and tobacco use is estimated to cause up to 80% of premature coronary heart disease.

Method: 53 healthy sedentary and 42 healthy non-sedentary male subjects were selected randomly from the general population of Davangere city. Weight, Height was taken. BMI was calculated. Fat parameters such as Body Fat Percentage (BF %), Fat Mass (FM), Fat Free Mass (FFM) and Fat Mass Index (FMI) were calculated from the formula.

Results: In our study fat parameters such as BF%, FM were increased. FFM decreased in sedentary subjects when compared to non-sedentary subjects. Physical inactivity causes excess fat accumulation which affects anthropometric and cardiovascular parameters. Although our study is by no means exhaustive, it provides a glimpse into the variety of adaptations /alterations in anthropometric parameters that occurs due to sedentary life style, even in the absence of overt disease.

Keywords: Body Fat Percentage, Fat Mass, Fat Free Mass, Sedentary lifestyle

INTRODUCTION

A sedentary lifestyle has been linked to elevated cholesterol, cardiovascular disease, hypertension, increased blood pressure, obesity, diabetes, increased stress, low endurance, and depression. In addition, sedentary living decreases bone density, which puts you at an increased risk of developing osteoporosis. Obesity is a progressing problem both in developed or developing countries. Relations between increased body fat and high mortality especially with

cardiovascular diseases, diabetes mellitus, and hypertension are well known. Several large studies suggest that abdominal obesity is closely related to cardiovascular risk.

The way that fat is distributed also plays an important role. Body fat that accumulates around the waist known as abdominal fat (an 'apple shape') poses a greater health risk than fat carried in the hips and thighs (a 'pear shape'). Men are genetically predisposed to weight gain around their waist, although there are exceptions. By contrast, women's body tends to be more 'pear shape'. Overweight men also tend have more visceral fat, which subsequently increases the risk of heart disease, metabolic syndrome and diabetes.¹

Corresponding author:

Jayalakshmi MK

Assistant Professor,

Department of Physiology, JJM Medical College,
Davangere, Karnataka, India

E-mail- jayalakshmimalavar@gmail.com

Mobile: 0944826309

Body Mass Index (BMI) has extremely high specificity but lower sensitivity compared to other tests

for estimating fat content of the body. Ideal body weight is defined as a BMI of 18.5 to 24.9 kg/m². Overweight is defined >25 to 29.9 kg/m² and obesity is defined as BMI > 30 kg/m². Abdominal adipose tissue has higher fat cell number, high blood flow, increased receptors for cortisol, testosterone and greater catecholamine induced lipolysis when compared with adipose tissue present elsewhere, which might explain its increase association with diabetes and other metabolic diseases.²

Those who remain or become inactive are usually heavier than those who are physically active.³ Within a permissive environment, the more common genetic factors involved in obesity regulate the distribution of body fat, the metabolic rate with its response to exercise and diet, the control of feeding and food preferences.⁴ Regular exercise improves insulin sensitivity, decreases plasma triglyceride levels and reduces cardiovascular morbidity and mortality.⁵ Energy balance is essentially equivalent to fat balance and since increased fat intake does not stimulate fat oxidation, clearly there is a potential for fat imbalance and hence obesity with high fat intake.⁶ High waist hip ratio (WHR) > 1.0 in men and > 0.85 in women indicates abdominal fat accumulation. Risks of metabolic complications increase in men with waist circumference (WC) >102 cms and women with WC > 88 cms.⁷

The adipose tissue is not simply a passive storehouse for fat but an endocrine organ that is capable of synthesizing and releasing into the blood stream an important variety of peptides and non-peptides compounds that may play a role in cardiovascular homeostasis. Adipose tissue is a significant source of Tumor Necrosis Factor- α (TNF- α), Interleukin-6, Plasminogen activator inhibitor - 1, Leptin, Angiotensinogen and Insulin like growth factor-1 (IGF-1).⁸

Excess of adipose tissue augments cardiac output, stroke volume, left ventricular filling pressure and expands intravascular volume. There is increased prevalence of high blood pressure associated with obesity results from a discrepancy between raised cardiac output and a relatively normal arterial capacity.⁹ Fat-free mass, fat mass, age and sex account for about 80% of the variance in BMR was related to a familial factor, suggesting that BMR is, at least partly genetically determined.¹⁰ The WHR is more significant than total degree of obesity and associated with

hypertension, dyslipidemia, insulin resistance and increased coronary artery disease mortality.¹¹

The effect of different patterns of body fat distribution on mortality confirms earlier clinical observations that an abdominal rather than gluteal distribution of fat increases susceptibility to health hazards including cardiovascular diseases and diabetes mellitus. Therefore distribution fat should be analyzed in its own right; independent of overall obesity by clinically obtaining WHR.¹² Individuals who are relatively inactive are more likely to gain weight than those who frequently engage in physical activity. The relative risk of gaining 5 kg or more during a 5 years follow-up study among inactive Finns was 1.6 in women and 1.9 in men.¹³

A 10% increase in body weight is associated with decline in parasympathetic tone accompanied by a rise in Mean heart rate and conversely, heart rate declines during weight reduction.¹⁴ Body fat and sympathetic nerve activity in healthy subjects were studied and it was found that resting rate of sympathetic nerve discharge to skeletal muscle was directly correlated with BMI and percent of body fat. In addition to body fat, muscle sympathetic nerve activity was correlated with age, plasma insulin concentration, and plasma lactate concentration. Together these four co-variants accounted for 58 % of the variance of the muscle sympathetic activity. It was concluded that in healthy humans, body fat is a major determinant of the resting rate of muscle sympathetic discharge. Overweight associated with sympathetic activation could represent one potential mechanism contributing to the increased incidence of cardiovascular complications in overweight subjects.¹⁵ Not only the age but also BMI, BF% and WHR influence serum lipids, apoproteins and fasting blood glucose in Thai women evidenced by the higher correlation coefficients.¹⁶

Systolic BP increased by 6 mmHg and diastolic BP by 4 mmHg for a 10% gain in body fat. Weight loss of 1 kg produced a 20% decrease in both systolic and diastolic blood pressure in hypertensive patients even when the sodium intake was kept constant. The most characteristic lipid disorder in obesity was elevated total cholesterol and triglycerides, high LDL cholesterol and low HDL cholesterol. For every 1 kg of weight loss, there was corresponding reduction by about 1% in total cholesterol and LDL, a rise by 1% in HDL and a reduction by 3% in triglycerides.¹⁷ There is evident linking increased physical activity to a more favorable

fat distribution (a lower proportion of visceral fat at a given BMI).¹⁸

Low level of physical activity is associated with an increased risk of weight gain and obesity.¹⁹ Lower physical activity was associated with higher subcutaneous adipose tissue and visceral adipose tissue volume in both the sex.²⁰ Higher fatness in sedentary subjects than in sportspersons, though BMI had insignificant variation.²¹ Central obesity significantly and independently contributes to cardiovascular outcome.²² Body mass index (BMI) and waist circumference are strongly correlate with total body adipose tissue but waist circumference is a better predictor of Intra-Abdominal Adipose Tissue (IAAT) than BMI.²³

METHODOLOGY

The study was undertaken to analyze the differences in certain fat parameters in healthy sedentary and non-sedentary subjects in the age group of 25 - 55 years. 53 sedentary subjects and 42 healthy non-sedentary male subjects were selected from the general population of Davangere city randomly. A simple two compartment model that divides the body into fat and fat free mass may be obtained using age and gender specific regression equations that incorporate the BMI of the individual, one such equation is that of Deurenberg, which is used in the practice.²⁴

The factors that may affect fat and fat-free mass includes the following: Gender, Age, Race, Food intake, Physical activity/ athletic training, Drugs/stimulants and disease.²⁵

The methodology adopted to determine the body fat percentage in the present study was based on BMI by using Deurenberg's equation.

The exclusion criteria in this study were

- Subjects suffering from endocrinal disorders
- Hypertensive individuals
- Subjects with renovascular and cardiovascular diseases.

All the subjects gave consent after explaining the procedure of the non-invasive technique to them. A brief personal history, childhood obesity, detailed history of exercise and a clinical examination of all the systems were done to exclude medical problems and to prevent confounding of results.

Weight and Height was taken, Body Mass Index (BMI) was derived by Quetlet's index from body weight (kg) / Height (m²) which were used for the calculation of fat parameters (Table.1)

Body Fat Percentage (BF %) was calculated by using the formula: $BF\% = 1.2 \times BMI + 0.23 \times Age - 10.8 \times Sex + 5$. (Where, Male = 1 and Female = 0).

Fat Mass (FM) was calculated in the following way

$FM = Weight \times BF\%$ and expressed in kgs.

100

Fat Free Mass (FFM) was calculated and expressed in kilograms (kg) by using the formula $FFM = Weight - Fat\ mass$.

Fat Mass Index (FMI) was calculated from Fat mass in (kg) / Height in (m²).²⁶

STATISTICAL ANALYSIS: The results were given as Mean \pm Standard Deviation and range values. Comparisons were made between sedentary and non-sedentary subjects. A p-value of 0.05 or less was considered as statistical significance.

RESULTS

There was statically significant increase in BF % & FM (kg) in sedentary subjects when compared to non-sedentary subjects. There was slight increase in Mean FMI (kg/m²) in sedentary subjects when compared to non-sedentary subjects which was statistically not significant. There was slight decrease in FFM (kg) in sedentary subjects when compared to non-sedentary subjects which was statistically not significant. (Table.2).

DISCUSSION

In our study BMI was increased in sedentary subjects. Recent studies in adolescents and adults have demonstrated significant relationship between physical inactivity and other adverse health practices, such as consumption of less-healthy foods or increased fat intake. Inactive individuals tend to consume more quantities of dietary fat. These data suggest that inactivity tends to cluster with other health behaviors that have adverse effect on the quantity and location of body fat deposition which results in obesity.²⁷ It is hypothesized that excess catecholamine triggers various adverse processes which, if persist, can lead or aggravate hypertension and insulin resistance.

Visceral fat but not peripheral fat mass was correlated with atherogenic effect.²⁸

The mean BF% was increased, the methodology adopted to determine the body fat percentage in the present study was based on BMI by using Deurenberg's equation whereas, most of the reports on body fat percentage were based on the use of techniques like bioelectrical impedance, hydrodensitometry, X-ray absorptiometry and skin fold thickness.

In our study there was increased FM (kg), FMI (kg/m²) and decreased FFM (kg) in sedentary subjects when compared to non-sedentary subjects.

CONCLUSION

The conclusions of our study are:-

- Body fat percentage and fat mass were increased significantly in sedentary subjects, there was slightly increased in FMI (kg/m²) in sedentary though statistically not significant.
- There was decreased Mean FFM (kg) in sedentary male subjects though statistically not significant.
- Though our study is by no means exhaustive, it does provides glimpse into the variety of adaptations /alterations in anthropometric and cardiovascular structure and function that causes adipose tissue accumulation, even in the absence of overt disease. Hormonal assay and lipid profile estimation along with fat parameters would have given a better understanding about sedentary life style and its consequences. We need to evaluate the strategies and efficacy of physical activity in various diseases. The benefits of regular physical activity are numerous, people who exercise live longer and healthier.

Table 1: Anthropometric parameters in sedentary and non-sedentary subjects

Anthropometry	Sedentary	Non-sedentary	Significance	
	Mean ±SD	Mean ±SD	t	p
Weight (kg)	80.22 ± 10.78	70.97 ± 7.53	8.2	< 0.001, HS
Height (cms)	165.35 ± 6.46	169.92 ± 6.20	0.007	>0.001, NS
BMI (kg/m ²)	29.2 ± 4.5	24.6 ± 2.6	5.83	< 0.001, HS

All values expressed as Mean ± SD.

Analysis for all parameters done by unpaired 't' test.

HS-Highly significant, S- Significant, NS- Not significant.

Table 2: Comparison of fat parameters between sedentary and non-sedentary subjects.

Group	BF%	FM (kg)	FFM (kg)	FMI(kg/m ²)	
	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	
Sedentary	29.1 ± 5.5	23.7 ± 6.7	55.2 ± 4.4	12.8 ± 7.0	
Non-sedentary	21.9 ± 3.9	15.8 ± 4.2	56.6 ± 6.1	11.5 ± 4.2	
Significance	t	7.07	6.66	1.22	1.09
	p	< 0.001, HS	< 0.001, HS	0.23, NS	0.28, NS

All values expressed as Mean ± SD.

Analysis for all parameters done by unpaired 't' test.

HS-Highly significant, S- Significant, NS- Not significant.

ACKNOWLEDGEMENTS

Authors are grateful to the Principal J.J.M.Medical College, Davangere for his support and encouragement, to the statistician and to all the volunteers who participated in this study.

REFERENCES

1. Matsuzawa Y, Shimomura I, Nakamura T, Keno Y, Tokunaga K. Pathophysiology and pathogenesis of visceral fat obesity. *Diabetes Res Clin Pract* 1994; 24: S111-6.
2. Thomas CS, Krishnaswami S. Distribution of body mass index in Indian patients with coronary artery disease. *Indian heart J* 1995; 47: 134-7.
3. Kopelman PG, Ian D, William C, Dietz H. *Clinical obesity in adults and children*. 2nded. Black Well Publications; 2005; 269-80.
4. Vohl MC, Sleddek R, Robitaille J, Gurd S, Marceau P, Richard D, et al. A survey of genes differentially expressed in subcutaneous and visceral adipose tissue in men. *Obes Res* 2004; 12:1217-22.
5. Koplan JP, Dietz WH. Caloric imbalance and public health policy. *JAMA* 1999; 282: 1579-81.
6. Zurlo F, Lillioja S, Knowler WC. Low ratio of fat and carbohydrate oxidation as a predictor of weight gain: study of 24-hr RQ. *Am J Physiol* 1990; 259: 650-7.
7. World Health Organization. WHO: Tech Rep Ser 916; 2003.
8. Hotamisligil GS, Arner P, Caro JF, Atkinson RL, Spiegelman BM. Increased adipose tissue expression of tumor necrosis factor-alpha in human obesity and insulin resistance. *J Clin Invest* 1995; 95:2409-15.
9. Messerili FH. Cardiovascular effects of obesity

- and hypertension. *The Lancet* 1982; 1165-1168.
10. Bogardus C, Lillioja S, Ravussin E. Familial dependence of the resting metabolic rate. *N Engl J Med* 1986; 315:96-100.
 11. Depress J P. Regional distribution of body fat, plasma lipoproteins and cardiovascular disease. *Atherosclerosis* 1990; 10: 497-511.
 12. Tanphaichitr V, Kulapongse S, Pakpeankitana R, Leelahagul P, Tamwiwat C, Lodaya S. Prevalence of obesity and its associated risk in urban Thais. Oomuray, Tarui S, Shimazu T, ed. *Progress in obesity research* 1990: 649453.
 13. Rissanen AM, Heliovaaram M, Knekt P, Reunanen A, Aromaa A. Determinants of weight gain and overweight in adult Finns. *Eur J Clin Nutr* 1991; 45:419-430.
 14. Hirsch J, Leibel RL, Mackintosh R, Aguirre A. Heart rate variability as a measure of autonomic function during weight change in humans. *Am J Physiology* 1991; 261:1418-23.
 15. Scherrer U, Randin D, Tappy L, Volleweider P, Jequier E, Nicod P. Body fat and sympathetic nerve activity in healthy subjects. *Circulation* 1994; 89:2634-2640.
 16. Leelahagul P, Soipet S, Achariyont P, Pakpeankitvatana R, Tanphaichitr V. Influence of body composition on risk factors for coronary heart disease in Thai women. *Pacific J Clin Nutr* 1995; 4:79-80.
 17. Jung R. Obesity as a disease. *British Medical Bulletin* 1997; 53(2):307-21.
 18. Siedell JC. Environmental influences on regional fat distribution. *International Journal of obesity* 1999; 15 (2):31-35.
 19. Jobb SA, Moore MS. Contribution of a sedentary lifestyle and inactivity to the etiology of overweight and obesity: current evidence and research issues. *Med sci Sports Exerc* 1999; 11:S534-41.
 20. Komiya H, Mori Y, Yokose T, Tajima N. Smoking as a risk factor for visceral fat accumulation in Japanese men. *Tohoku J Exp Med* 2006; 208: 123-132.
 21. Amith Bandyopadhyay. Anthropometry and body composition in soccer and volleyball players in West Bengal, India. *J Physiol Anthropol* 2007; 66: 384-94.
 22. Dhaliwal SS, Wellborn TA. Central obesity and multivariable cardiovascular risk as assessed by the Framingham prediction scores. *Am J Cardiol* 2009;103 (10); 1403-7.
 23. Klein S, Allison DB, Heymsfield SB, Kelly DE, Leibel RL, Nonas C, et al. Waist circumference and cardiovascular risk. *Am J Clin Nutr* 2007; 85: 1187-202.
 24. Deurenberg P, Wstrasted JA, Seidll J. Body mass index as a measure of body fatness; Age and sex specific prediction formulas" *Br J Nutr* 1991;65(2):105-114.
 25. Shetty PS, James WPT. "Body Mass Index, A measure of chronic energy deficiency in adults" In *FAO and Food and Nutrition, FAO, ROME* 1994; 56.
 26. Vanitallie TB, Yang MU, Heymsfield SB, Funk RC, Boileau RA. "Height normalized indices of the body's fat free mass and potentially useful indicator of nutritional status". *Am J Clin Nutr* 1990; 52:953-59.
 27. The role of lifestyle in health: epidemiology and consequences of inactivity. *Proceedings of the Nutritional Society.* 1996; 55:829-40.
 28. Heinz R, Bernhard M. Abdominal fat and sympathetic over activity. *Herz* 2003; 28:668-73.

Oral Myiasis - A Case Report

Kamala R¹, Shoyeb Shaikh², Abhishek Sinha³, Arti Saluja Sachdev⁴

¹Prof. and HOD, Department of Oral Medicine and Radiology, ²Professor, Department of Oral and Maxillofacial Surgery, ³Reader, Department of Oral Medicine and Radiology, ⁴P G Student, Department of Oral Medicine and Radiology, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow, UP, India

ABSTRACT

Oral Myiasis is a rare pathology caused by infestation of living tissues by larvae of Diptera fly (two winged). This clinical condition is more prevalent in tropical climates, with a higher risk of infestation in individuals with poor hygienic conditions, suppurative oral lesions, senility, mouth breathing during sleep, alcoholism, paralysis. This article presents a case of oral myiasis in a 9 year old girl with severe neurological deficit.

Keywords: Myiasis, Diptera, Maggots

INTRODUCTION

The term Myiasis derived from the Greek word "myia" meaning fly and "iasis" meaning disease was coined by Hope in 1840.¹ Myiasis was defined by Zumpt as 'the infestation of live human and vertebrate animals by dipterous larva, which at least for certain period feed on host's dead or living tissue, liquid body substances or ingested food'.²

Myiasis is the infestation of the body tissues of animals by the larvae, commonly known as maggots. The flies lay over 500 eggs directly on the diseased tissue. These eggs hatch and the larvae get their nourishment from the soft tissue. The usual symptoms are painful growth with ulceration and itching due to crawling movement of the larvae.³

Human myiasis is a rare condition that can occur in any part of the globe, but is more common in regions with a warm and humid climate.⁴ The most common anatomical sites for myiasis are the skin wounds, nose, sinuses, eyes, lungs, ears, anus, vagina and rarely in the oral cavity.⁵ Oral myiasis though a rare condition was described in the literature since 1909 by Laurence. The common predisposing factors for oral myiasis are the conditions leading to persistent mouth opening along with poor oral hygiene, infections, ulcerative lesions, facial trauma and carcinoma. Droma EB et al,

in their literature review have mentioned that incidence of myiasis is more in anterior maxillary region (as seen in our case) and men are more affected than women. Traumatic wounds in orofacial region when neglected by patients themselves or by their care takers can lead to development of myiasis.⁶

CASE REPORT

A 9 year old girl with cerebral palsy was referred to the Department of Oral Medicine and Radiology with the complaint of swelling in the upper lip since 3 days and presence of worms in the mouth since 1 day. History revealed trauma to the face 5 days back. She was poorly nourished, anaemic, afebrile. Extra oral examination revealed incompetent lips with a diffuse swelling in the upper lip region. (Fig. 1)



Fig. 1- Extraoral profile of the patient

Corresponding author:

Kamala R

(Prof. and HOD)

Department of Oral Medicine and Radiology

Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow

Ph no.- 09956936845, 07376253559

E mail id- kamalarawson@yahoo.com

Intraoral examination revealed maggots in the gingival sulcus i.r.t. 11, 21 and 22. Based upon the history and clinical examination, a provisional diagnosis of 'Oral Myiasis' was given. (Fig 2a and 2b)



Fig 2 a. Intraoral profile showing maggots in the gingival sulcus



Fig 2 b. maggots being removed

Management was done by irrigation with turpentine oil and normal saline to flush out the larvae. The maggots were removed one by one with the help of tweezers. (Fig. 3)



Fig. 3. The specimen of life maggots removed from the patient's mouth.

Patient was hospitalized, antibiotic therapy was started with intravenous rehydration. The wound was cleansed daily with saline. After 2 days of hospitalization, there were no larvae in the patient's mouth and she was discharged. The parents were advised for maintaining her orodental hygiene and follow up regularly because of the possibility of similar problem occurring again. Radiographic examination revealed no abnormality in the underlying bones or paranasal sinuses.

DISCUSSION

Musca nebulosa is the commonest Indian house fly. They are seen in abundance in human dwellings and are very active during summer and rainy season. The life cycle of a fly begins with the egg stage followed by the larva, the pupa and finally the adult fly. The conditions required for egg laying and survival of the larvae are moisture, necrotic tissue and suitable temperature.¹ The life cycle of a fly in larval stage (6-8 days) requires an intermediate host for mechanical support and suitable substrate to feed on. These larvae release toxins to destroy the host tissue. Proteolytic enzymes released by the surrounding bacteria decompose the tissue and the larvae feed on this rotten tissue.

Myiasis can be classified depending on the mode of infestation as

- i) Accidental myiasis; when larvae get ingested along with food,
- ii) Semi specific myiasis; when the larvae are laid on necrotic tissue of the wound and
- iii) Obligatory myiasis; in which larvae affects undamaged skin.⁷

Clinically it can be classified as

- i) Primary - is caused by biophagous larvae (feed on living tissues) and also called as obligatory myiasis.
- ii) Secondary - is caused by the necrobiophagous larvae (feed on dead tissues) and also called as facultative myiasis.⁸

According to ICD-10 Myiasis (B87) is classified into

- i) Cutaneous myiasis (B87.0)
- ii) Wound myiasis (B87.1)

- iii) Ocular myiasis (B87.2)
- iv) Nasopharyngeal myiasis (B87.3)
- v) Aural myiasis (B87.4)
- vi) Myiasis of other sites (genitourinary & intestinal) (B87.8)
- vii) Myiasis unspecified (B87.9) ⁹

Oral myiasis may present as an oral mucosal swelling, gum swelling, periodontal disease, palatal ulcerations, secondary infestation of cancrum oris, in oral wounds such as extraction wound, jaw bone fractures, oral leprosy lesion.¹⁰

The management of myiasis at an early stage is imperative to prevent severe damage to deeper tissues.¹¹ The traditional management of myiasis is the mechanical removal of the maggots. In case of multiple larvae and in advanced stages of development and tissue destruction, local application of several substances such as oil of turpentine, mineral oil, ether, chloroform, ethyl chloride, iodoform can be used to ensure complete removal of all larvae. These agents are supposed to asphyxiate the aerobic larvae and force them to a more superficial position making manual removal easier with less damage to tissues and larvae as well. Care should be taken not to rupture the maggots as it might cause allergic or foreign body reaction and secondary infection. Systemic treatment includes broad-spectrum antibiotics such as ampicillin / amoxicillin especially when the wound is secondarily infected.¹² Systemic ivermectin, (semi-synthetic macrolide antibiotic) may give favorable results in more severe cases.¹³

CONCLUSION

The patient in the present case was mentally retarded and dependant on her relatives for day-to-day activities which could be thought of as a contributing factor to her neglected oral hygiene. The poor oral hygiene, lack of manual dexterity, lip incompetence and history of preceding trauma were considered to be predisposing factors for larval infestation in this patient. The prevention of human myiasis is by education, but unfortunately in the developing countries some people live in low social condition, predisposing the occurrence of the infestation.

REFERENCES

1. Jain S, Gupta S, Jindal SK, Singla A. Oral myiasis in a cerebral palsy patient: A case report. *J Clin Exp Dent.* 2010;2(2):102-104.
2. Jyothi Sharma, Gowda Panchaksharappa Mamatha, Rachana Acharya. Primary oral myiasis: A case report. *Med Oral Patol Oral Cir Bucal.* 2008 Nov 1;13(11):E714-6.
3. Shafer's textbook of oral pathology, 6th edition
4. Tissiana Rosi-Schneider, Karen CHERUBINI, Liliane S.Yurgel, fernanda salum and Maria A. Figueiredo. Oral myiasis: A case report. *Journal of Oral Science* Vol 49, No 1, 85-88,2007.
5. Evandro Neves Abdo, Augusto César Sette-Dias, Cláudio Rômulo Comunian, Carlos Eduardo Assis Dutra, Evandro Guimarães de Aguiar. Oral myiasis: A case report. *Med Oral Patol Oral Cir Bucal* 2006;11:E130-1.
6. Charan Babu H. S, Bhagvandas Rai. A. Manju Ananthakrishnan Nair, Bipin A. Bulgannawar, Ravi Kalola, Mitul K Bhut. Traumatic Wound Myiasis in Maxillofacial Region - A Case Report. *INTERNATIONAL JOURNAL OF DENTAL CLINICS VOLUME 2 ISSUE 2 APRIL-JUNE 2010*
7. M. Moshref, G. Ansari, A. Lotfi. Oral Gingival Myiasis: A Case Report. *International Journal of Tropical Medicine.*
8. Baskaran M, Jagan Kumar B, Amrita Geeverghese. Cutaneous myiasis of face. *Journal of Oral and Maxillofacial Pathology* vol 11 issue 2 Jul-Dec 2007
9. Anjana Ravindran, Joseph Edward. Myiasis. *KDJ - Vol.32, No. 3, July 2009*
10. Kar-Hing Yeung, Albert Chun-Fung Leung, Alfred Chee-Ching Tsang. Oral Myiasis. *Hong Kong Dental Journal* 2004; 1: 35-36
11. Sunder Singh Dogra, Vikram K. Mahajan. Oral myiasis caused by *Musca domestica* larvae in a child. *International Journal of Pediatric Otorhinolaryngology Extra* 5 (2010) 105-107
12. Roszalina Ramli & Roslan Abd Rahman. Oral Myiasis: CASE REPORT. *Malaysian Journal of Medical Sciences*, Vol. 9, No. 2, July 2002, pp. 47-50
13. Elio Hitoshi SHINOHARA, Marcelo Zillo MARTINI, Humberto Gomes de OLIVEIRA NETO, André TAKAHASHI. Oral Myiasis Treated with Ivermectin: Case Report. *Braz Dent J* (2004) 15(1): 79-81 Oral

Delivery Practices and their Determinants in Urban Slums of Amritsar City, Punjab, India

Gill KP¹, Devgun P², Mahajan SL³, Chopra A¹

¹Assistant Professor, Department of Community Medicine, ²Professor and Head, Department of Community Medicine,

³Associate Professor, Department of Community Medicine, Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar, Punjab, India

ABSTRACT

Objective: The study was conducted to explore the delivery practices and various factors influencing these practices in various slum areas of Amritsar city in Punjab.

Methods: It was a cross-sectional study conducted in slums of Amritsar City. By adopting cluster sampling, thirty clusters of seven units each were taken to make a sample of 210 units. The women who had delivered within one year before the interview were taken as study units. They were interviewed with the help of a pretested proforma with a view to study their delivery practices. In order to evaluate the effect of various socio-demographic factors on choice of place of delivery, multivariate regression was applied.

Results: About one third (63.3%) of women delivered at home, 8% were taken to hospital for delivery because of some complication during labour and only 28.7% were planned hospital deliveries. Less than half of the home deliveries (48.5%) were conducted by skilled birth attendant. On multivariate regression analysis socio-economic status, parity and minimum three antenatal checkups during pregnancy emerged as significant determinants affecting the place of delivery.

Conclusion: Overall socioeconomic status of the families needs to be improved and every opportunity of contact of health facility with the mother should be utilized to promote institutional deliveries.

Keywords: *Delivery Practices, Determinants, Slums*

INTRODUCTION

The urbanization of different parts of the world constitutes a major demographic issue of the twenty first century. This is especially true for India, where it is estimated that the urban population is one of the largest in the world.¹ The unprecedented growth in the urban population in India has resulted in formation of bigger and smaller slums. People in slums are forced to live in overcrowded houses in abject poverty. In India, fifteen percent of urban population is living in slums.² Health of these slum dwellers poses serious concerns and challenges. Maternal and neonatal health problems are predominant among them. There are thousands of easily preventable maternal and child deaths each year.³

Although all women need pregnancy care, but the care during child birth is most important for the survival of women and newborn because timely treatment of complications during this period is

crucial. In order to improve maternal and newborn health and survival, World Health Organization (WHO) strongly advocates skilled care at every birth. Skilled attendant as defined by WHO is an accredited health professional such as a midwife, a doctor or a nurse who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirths and the immediate postnatal period, and in identification, management and referral of complications in women and newborns. The presence of such a skilled attendant is also one of the important indicators of progress towards Millennium Development Goal 5.⁴ But unfortunately, in urban slums, despite proximity to super-specialty hospitals, more than half (56%) of the deliveries occur at home in debilitating environment putting the life of both mother and newborn at risk. Only half of these home deliveries are assisted by skilled birth attendant as compared to 84% among urban non-poor.⁵

In Amritsar, one third of its population lives in slums.¹ But so far little effort has been made to understand the delivery practices and their determinants in these slums. Therefore, with the aim of exploring the delivery practices and various factors influencing these practices in different slum areas of Amritsar city the present study was conducted.

MATERIALS AND METHOD

According to records available in the Office of Municipal Corporation Amritsar, there are 108 pockets of slums in the city of Amritsar. By adopting cluster sampling, thirty clusters of seven units each were taken for study making a total of 210 study units. Study units were women who had delivered within one year before the time of interview. They were interviewed with the help of a pretested proforma. Modified Udai Pareek (MUP) scale was used to assess the socio-economic status. Data was compiled and analyzed with the help of SPSS for windows version 15. Crude and adjusted odds ratios (ORs) with 95% confidence interval (CI) were generated by univariate and multivariate logistic regression analyses for place of delivery as against various factors. The factors found to be significant on univariate analysis were only further studied by applying multivariate analysis whereas others found to be insignificant on univariate analysis were discarded.

OBSERVATIONS & RESULTS

Table 1: Distribution of respondent according to profiling features

Parameters		Number (n = 210)	Percentage
Nativity	Native	102	48.6
	Migrant	108	51.4
Caste	Scheduled caste	142	67.6
	Others	68	32.4
Religion	Hindu	146	69.5
	Sikh	53	25.2
	Others	11	5.3
Type of family	Nuclear	116	55.2
	Joint	94	44.8
Socio-economic status*	Upper	12	5.7
	Upper middle	43	20.5
	Lower middle	98	46.7
	Lower	57	27.1

*Modified Udai Pareek (MUP) Scale was used for socio-economic status

The Table 1 shows that nearly half (51.4%) of the women claimed themselves as migrants, about two third of them (67.6%) belonged to scheduled castes and almost equal percentage (69.5%) were Hindus. More than half (55.2%) of them were living in nuclear families. Majority of them (73.8) belonged to lower socioeconomic status whereas only 5.7% of them could qualify to be placed in upper socio-economic status.

Table 2. Distribution of respondent according to socio-demographic characteristics

Parameter		Number (n=210)	Percentage
Current Age	<20	21	10.0
	20-29	175	83.3
	≥30	14	6.7
Education	Literate	85	40.5
	Illiterate	125	59.5
Occupation	Working	51	24.3
	Housewife	159	75.7
Parity	1	79	37.6
	≥ 2	131	62.4

Table 2 depicts that a large majority of women were in the age group of 20-30 years and only forty percent (40.5%) of them were literate. Nearly one fourth (24.35) of them were engaged in income generating activities. Among all these women, about two third (62.4) were multiparous.

Table 3: Distribution of women according to their practices regarding place of delivery

Place of delivery	Number (n= 210)	Percentage
Home delivery	133	63.3
Shifted to hospital because of complications	17	8.0
Planned hospital delivery	60	28.7

The perusal of Table 3 explains that about two third (63.3%) of deliveries were home deliveries, 8% were taken to the hospital because of some complication during labour and only 28.7% were planned hospital deliveries.

Table 4: Distribution according to the birth attendant during home deliveries

Birth attendant	Number (n= 133)	Percentage
Skilled birth attendant	65	48.5
Unskilled birth attendant	49	37.1
Family members	19	14.4

Table 4 explores that less than half of the deliveries (48.5%) were conducted by skilled birth attendant. The rests of the deliveries were either conducted by unskilled birth attendant (37%) or by family members (14.4%).

Table 5: Distribution of respondents according to reasons for home deliveries

Reason	Number (n= 133)	Percentage
Family tradition	79	59.4
Economic	41	30.8
Others (fear of hospital, more caesarian sections, nobody to accompany)	13	9.8

The commonest reason observed for preference of home deliveries (Table – 5) was family tradition (59.4%) followed by economic constraints (30.8%). Other reasons like ‘fear of hospital’, ‘more caesarian sections in hospitals’, ‘nobody to accompany them’ were also explained by some (9.8%) of them.

Table 6: Logistic regression analysis of place of delivery in relation to socio-demographic factors

Parameter		Place of delivery		Crude OR (CI)*	P value	Adj. OR (CI)	P value
		Home (n=133) No. (%)	Hospital (n=77) No. (%)				
Nativity	Native (102)	54(52.9)	48(47.1)	0.41 (0.23- 0.73)	<0.01	0.62 (0.31- 1.23)	0.20
	Migrant (108)	79(73.0)	29(27.0)				
Socio-economic status*	Upper (55)	16(29.0)	39(71.0)	0.13 (0.07- 0.25)	<0.01	0.20 (0.08- 0.49)	<0.01
	Lower (155)	117(75.4)	38(24.6)				
Type of family	Joint (94)	48 (51.0)	46(49.0)	0.38 (0.21- 0.68)	<0.01	1.05 (0.5- 2.23)	0.89
	Nuclear (116)	85(73.3)	31(26.7)				
Education	Literate (85)	36 (42.3)	49(57.7)	0.21 (0.12-0.39)	<0.01	0.95 (0.41- 2.22)	0.92
	Illiterate (125)	97 (77.6)	28(22.4)				
Occupation	Housewife(159)	95 (60.0)	64(40.0)	0.52 (0.25- 0.85)	<0.05	0.65 (0.27- 1.57)	0.34
	Working (51)	38 (74.5)	13(25.5)				
Parity	1 (79)	33(41.8)	46(58.2)	0.22 (0.12- 0.40)	<0.01	0.45 (0.21- 0.95)	<0.01
	≥ 2(131)	100(76.3)	31(23.7)				
Contact with health worker	Yes (137)	78(57.0)	59(43.0)	0.43 (0.23-0.81)	<0.01	0.53 (0.25- 1.16)	0.12
	No (73)	55(75.3)	18(24.7)				
Minimum 3 ANC**	Yes (90)	38(42.2)	52(57.8)	0.20 (0.11- 0.35)	<0.01	0.46 (0.25- 0.85)	<0.05
	No (120)	95(79.2)	25(20.8)				

*Women belonging to different socio-economic strata were grouped together into upper and lower socioeconomic status for statistical analysis.

**Antenatal checkups

Regression analysis was applied to find out significant factors influencing the place of delivery (Table – 6). On univariate analysis, it was observed that women belonging to native families were 59% less likely to deliver at home (OR- 0.41, CI = 0.23-0.73, p= <0.01) in comparison to migrants. Similar findings were observed among women of higher socio-economic status who were 87% less likely to deliver at home (OR- 0.13, CI = 0.07-0.25). Odds of women delivering at home were less among those who were living in joint families (OR- 0.38, CI = 0.21-0.68, p= <0.01) in comparison to those in nuclear families. Also, education (OR- 0.21, CI = 0.12-0.39, p= <0.01), occupation of women (OR- 0.52, CI = 0.25-0.85, p= <0.01), parity (OR- 0.22, CI = 0.12-0.40, p= <0.01,

contacts with health worker (OR- 0.43, CI = 0.23-0.81, p= <0.01) and minimum three antenatal checkups during pregnancy (OR- 0.20, CI = 0.11-0.35, p= <0.01) were identified as highly significant factors affecting the place of delivery. But on multivariate analysis, only socio-economic status, parity and three antenatal checkups during pregnancy emerged as significant factors. Women belonging to upper socioeconomic status were 80% less likely to deliver at home (OR- 0.2, CI = 0.09-0.49, p= <0.01) on multivariate regression. Similarly, increasing parity had highly significant negative effect on the choice of place of delivery. Multiparous women were more likely to deliver at home in comparison to women giving birth to their first child (OR- 0.45, CI = 0.21-0.95, p= <0.01). Minimum three antenatal checkups during pregnancy also significantly affected the place of delivery. Women who had minimum three antenatal checkups during pregnancy were 54% less likely to deliver at home (OR- 0.46, CI = 0.25-0.85, p= <0.05).

DISCUSSION

In the present study of delivery practices in slums of Amritsar, it was observed that nearly half (51.4%) of the respondents claimed themselves to be migrants and about two third of them belonged to scheduled castes. Contrary to figures reported by DLHS III⁶ which reported that 65% household heads in Punjab were Sikhs, in the present study, nearly seventy percent (69.5%) of respondents were Hindus. These converse figures might have occurred because of migratory population from other states with predominant Hindu population. As the modern urban population is marked by a trend towards nuclear families, this inclination has crept into slums also. In the present study, nuclear families (55.2%) had a little edge over the joint families (44.8%). Socioeconomic status of the households also does not reflect any encouraging picture. Nearly three quarter of study subjects (73.8) belonged to lower socioeconomic status.

Table 2 depicts that majority of the respondents (83.3%) were in the age group of 20-30 years indicating high fertility rate in this age group. Though female literacy rate in Punjab has been reported to be 71.3%,⁷ in the present study, education level of study subjects was strikingly low. Only forty percent (40.5%) of respondents were literate. National Family Health Survey (NFHS) III results also reported similar findings. More than three quarter of poor women in Delhi (82%), Meerut (81%) and Kolkata (77%) had a little or no education.⁸ Nearly one fourth of them were engaged in income generating activities and about two third (62.4) were multiparous.

The perusal of birth practices (Table 3) shows that about one third (63.3%) of deliveries were conducted at home in the decrepit environment. These figures are higher than the figures reported by NFHS III⁵ which showed that 56% deliveries in slum areas were conducted at home. In Punjab, 63% births were reported to be institutional⁶ and the figures for Amritsar were above the average. It indicates that vigorous efforts need to be undertaken in order to bridge the gap.

It was observed (Table 4) that among women giving birth at home, less than half of the deliveries (48.5%) were conducted by skilled birth attendant. Similar findings were reported by NFHS III⁵ where 50.7% of home births were attended by skilled birth attendants as compared to 84% in non poor urban areas.

The commonest reason reported for preference of home delivery (Table – 5) was family tradition (59.4%) followed by economic constraints (30.8%). 'Fear of hospital', 'more caesarian sections in the hospitals', 'no body to accompany' were also reported by some of them. Similar findings were observed in slums of Mumbai⁹ and Indore¹⁰ where majority of respondent preferred home deliveries because of family traditions and economic constraints. Though Janani Surakshya Yojana is positive endeavor to promote hospital deliveries, the removal of these deep rooted, ingrained beliefs and traditions require further efforts and motivation.

Table –6 explains the results of logistic regression analysis. On univariate analysis, nativity, socioeconomic status, type of family, education and occupation of women, parity, contacts with health workers and minimum three antenatal checkups during pregnancy were identified as highly significant factors affecting the place of delivery. But on multivariate analysis, socio-economic status and parity emerged as highly significant determinants. These findings are in conformity with a study in Slums of Mumbai where it was reported that odds of home births increased with parity as well as decrease in socioeconomic status. Another study conducted in District Nainital of Uttaranchal also reported similar findings where hospital deliveries increased sharply with rise in socioeconomic status.¹¹ Literacy, though thought to be a crucial factor, was found to be insignificant on multivariate regression may be because it is further linked to socio-economic status. Minimum three antenatal checkups during pregnancy is another factor which emerged as significant in determining the place of delivery. Similar findings were observed by NFHS III¹² where it was revealed that women having antenatal care visits were more likely to deliver in a health facility. Unfortunately, contact with health worker has been found to be insignificant during multivariate regression. These finding may reflect the fact that health workers during their contact with mothers are not utilizing the opportunity to motivate them for institutional delivery.

CONCLUSION

Most significant factor affecting the choice for place of delivery has been found to be socioeconomic status. It reflects that overall rise of socioeconomic status can improve the delivery practices and hence can help us

to decrease the maternal as well as neonatal mortality. Considering widely prevalent traditions and beliefs and low rate of utilization of health services, every opportunity of mother's interaction with the health facility should be availed to promote institutional deliveries.

ACKNOWLEDGEMENT

We humbly acknowledge the invaluable support and guidance rendered by Late Dr R. K. Sachar, Ex Professor and Head, Department of Community Medicine, Sri Guru Ram Das Institute of Medical Sciences and Research Amritsar.

Conflict of Interest: Nil

Source of Support: No

Ethical Clearance: Taken from Research and Ethical Committee of Sri Guru Ram Das Institute of Medical Sciences and Research Amritsar, Punjab.

REFERENCES

1. Hazarika I. Women's reproductive health in slum populations in India: evidence from NFHS-3. *J Urban Health*. 2010; 87(2):264-77.
2. Census of India. Metadata and brief highlights on slum population. Government of India: 2001.
3. http://www.uhrc.in/index.php?name=CmedsDownloads&files=index&req=view_downloads&cid=1&min=10&orderby=dateD&show=10
4. World Health Organization. Making pregnancy safer. Skilled birth attendant [Cited 2012 Oct 28]. Available from: http://www.who.int/making_pregnancy_safer/topics/skilled_birth/en/index.html
5. UHRC. Key indicators for urban Poor in India from NFHS 3 and NFHS 2. Urban Health Resource Centre. Available from: <http://uhrc.in/downloads/factsheet-India.pdf>
6. International Institute for Population Sciences. District Level Household and Facility Survey 2007-08, Punjab. Ministry of Health and Family Welfare; 2010.
7. Census of India. Punjab population data at a glance. Government of India; 2011.
8. NFHS III. Health and living conditions in eight Indian cities. Ministry of health and family welfare. Government of India: 2006.
9. Das S, Bapat U, Shah N, Chordhkar L, Wasundhara J, Osrin D. Prospective study of determinants and costs of home births in Mumbai slums. *BMC Pregnancy Childbirth*. 2010 [cited 2012 Dec 23]; 10 (38). Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2928174/>.
10. UHRC. Maternal and newborn care practices among the urban poor in Indore. India: Gaps, reasons and potential program options. Urban Health Resource Centre (New Delhi); 2007.
11. Pandey S, Shankar R, Rawat C, Gupta V. Socio-economic factors and delivery practices in an urban slum of district Nainital, Uttaranchal. *Indian J Community Med* [serial online]. 2007 [cited 2013 feb 20]; 32:210-1. Available from: <http://ijcm.org.in/text.asp?2007/32/3/210/36832>
12. International Institute for Population Sciences and Macro International. National Family Health Survey (NFHS 3) 2005-06: India: Volume I. Mumbai: IIPS 2007.(Endnotes)

Total Sanitation Campaign: Human Rights Impact Assessment of a Health Program

Kapil Kumar Singh

Research Student, Master of Public Health(ID: 212109212), School of Health and Social Development, Deakin University, 221 Burwood Highway, Burwood, Victoria 3125 Australia

ABSTRACT

This article undertakes a human rights impact assessment of Total Sanitation Campaign which was launched to eliminate the practice of open defecation and block the fecal-oral transmission of diseases. Overall this program has been found to be sound from the human rights perspective; however, there are some implementation issues which can restrict the human rights of the people, especially, the right to health.

Keywords: Human Rights, Health Policy, Sanitation

INTRODUCTION

All governmental policies including health policies can preserve and promote or restrict and infringe human rights. ^{1,2} A single policy by ignorance, design or neglect may violate some rights of one group while protecting the same rights of another group. ¹ However, the human rights are supposed to be enjoyed by all the people equally without any discrimination. In this article, a human rights analysis of India's Total Sanitation Campaign (TSC) program is done by using seven-stage human rights assessment tool which was outlined by Lawrence Gostin, Jonathan M. Mann and Larry Gostin in 1994. ²

Globally, 63% of the population has access to improved sanitation, 2.5 billion people lack improved sanitation and 1.1 billion people defecate in open. ³ This practice is not only an affront to human dignity but also the root cause of fecal-oral transmission of disease. ⁴ The gravity of this problem has been recognized and articulated as a major global issue under Target: 7(c) of the Millennium Development Goals (MDGs). ⁵ Moreover, in year 2010, sanitation has been explicitly recognized as a human right which is essential to the realization of all other human rights. ⁶

In India, 626 million people practice OD which is 59% of the 1.1 billion world population who defecate in open. ³ Out of the total burden of diseases, 10% diseases are caused by faeco-orally transmitted pathogens. These diseases take an immense toll of life in the country, for instance, each year around 1000 under-five child deaths occur due to diarrhea. ⁷ Further, 14% of urban people and 67% of rural people practice OD. ³

The Government of India (GoI), in 1986, launched The Central Rural Sanitation Program (CRSP), which was a "supply-driven", "subsidy-oriented" program with narrow focus of toilet construction. ⁸ CRSP completely ignored the role of changing behavior in order to eradicate OD. ⁷ In 1999, CRSP was restructured and launched as Total Sanitation Campaign (TSC) which was "demand-driven", "people-oriented" and "Community-led" program. ⁹

GoI, in 2003, launched a post -achievement incentive scheme known as Nirmal Gram Puraskar (NGP). ¹⁰ This award accelerated the sanitation coverage efforts because a lot of prestige was attached to it as the award is given by the President of India. ¹⁰

Corresponding author:

Kapil Kumar Singh

Flat No. 38, Reading Lane, Talkatora Stadium, New Delhi-110001.

Email: drkapilteotia@gmail.com, edy@deakin.edu.au

PHONE: +61 405045877

HUMAN RIGHTS IMPACT ASSESSMENT

This assessment is based on a series of questions to ascertain the human rights benefits and burdens of a health policy. ²

Stage 1: The Specific Intended Purpose of TSC

The defined vision of TSC is to achieve “Nirmal Bharat” status by 2022 and the goal is to eradicate the open defecation practice by 2017.¹¹

Who does TSC target and who does it exclude?

The program exclusively targets rural population and excludes urban population. However, data shows that practice of open defecation is also a problem in urban areas.³

MECHANISM

TSC is a flagship program of Central Government, which is being implemented in rural areas of all States.¹² Finances for the TSC are shared between Central Government and State Governments in 80:20 ratio under different components of the program except in case of constructing individual household latrine (IHHL) where some cost is also shared by the beneficiary.⁸

INTERVENTIONS

TSC is implemented through various interventions at individual and community level.^{8,11} In order to generate demand for sanitary facilities and their use in a sustainable manner, Information, Education and Communication (IEC) strategy is used. It uses communication channels such as folk media, mass media, painting, hoarding and door to door contacts.^{8,11}

Another intervention is capacity building where training is provided to Panchayati Raj Institutions (PRIs) and Non-Governmental Organizations (NGOs) members, Accredited Social Health Activist (ASHA), teachers, and Anganwadi workers. In addition, rural people are trained in masonry, brick making, toilet pan making and plumbing to ensure supply chain.^{8,11} The construction of IHHL is aimed in each rural family; however, incentives are exclusively provided to below-poverty line (BPL) households.⁸

Rural Sanitary Marts and Production Centers are also ensured in rural areas to provide variety of materials and hardware for the construction of sanitary facilities. In addition, a Community Sanitary Complex (CSC) is constructed in villages at public places and markets where there is lack of space for IHHLs.^{8,11} In addition, hygiene education is imparted in schools through an appointed teacher who is trained in

hygiene education.⁸ Besides this, toilet facilities are constructed separately for girls and boys.

Stage 2: What are the ways and the extent to which the TSC may impact positively and negatively on health?

Evidence for the effectiveness of TSC

A comprehensive program consisting of activities, such as IEC to create awareness and generate demand for sanitary facility; Community-led total sanitation approach in which community participates in assessing the local needs, formulating, implementing and supervising the program; and Construction of IHHLs, CSC and toilets in schools with no to very low incentives only for poor and marginalized sections, has been found to be very effective.¹³

Documented health effects of this strategy

According to United Nations Children’s Fund (UNICEF),¹⁴ young children are more prone to diseases caused by poor sanitation. Therefore, use of toilets and hand washing could reduce one third of the diarrheal related mortality.¹⁴ Evidences exist which show that provision of sanitary facilities prevent infection known as tropical enteropathy, stunted growth and underweight which otherwise may cause long term consequences such as poor school performance, cognitive deficit, dropping out and poor economic productivity, or result into child mortality.¹⁵ India’s TSC intervention decreased infant mortality rate by 4 infants per 1000 live births; and children who lived in rural areas with better sanitation grew taller (on average by about 0.2 standard deviation) in comparison to those who lived in poor sanitary areas.¹⁶ Spears¹⁶ argued that height is a better indicator of child health and taller children perform better on cognitive task. Children who were born in districts with more latrines were cognitively more superior to those who were born in areas with few latrines.¹⁷

According to one study, improvement in sanitary facilities could reduce incidence of cholera by 68%.¹⁸ Similarly, latrine installation supplemented with hygiene education could reduce diarrhea episodes by 24%.¹⁹

What about informed consent?

TSC has an inbuilt informed consent because of the widespread use of IEC activities in the very beginning of the program. Creating awareness and disseminating hygiene education is an ongoing process in the TSC.⁸

The participation is voluntary and one is not coerced or forced to build IHHLs because the program is “demand-driven”.⁸

What are the opportunity costs?

According to WHO, every US\$ 1 investment in sanitation would yield an economic return of US\$ 3- US\$ 34 depending on the region and will bring an average 10% reduction in diarrhea episodes.²⁰ Benefits like reduction in health expenditure, increased school enrollment, gender empowerment, social inclusion, local employment and increased productivity lower the opportunity cost of having TSC.²⁰

Stage 3: What and whose rights are impacted positively and negatively by the TSC?

The goal and objectives of TSC also have human rights implications. All the rights mentioned below, explicitly or implicitly are enshrined in either of the components of The International Bill on Human Rights.^{21, 22} Firstly, TSC partly protects the recently recognized human right to safe and clean drinking water and sanitation, by ensuring toilet facilities in houses, public places and schools.^{6, 22} Secondly, TSC promotes right to adequate standard of living because by eliminating OD, the houses and the surrounding environment would become hygienic, clean and more livable.²² Thirdly, the provision of toilet facility ensures right to dignity and right to privacy because of the freedom from the embarrassment and shame associated with open defecation in front of neighbor and outsiders.²³ Fourthly, TSC aims to fulfill the right of children to survive and develop into a productive member of the society by creating sanitary facilities with consequent reduction in child mortality (Target 2 of MDG).¹⁴ Similarly, TSC protects the right to health by protecting from diseases resulting from poor sanitary conditions by breaking the transmission link of faeco-oral diseases.^{15, 22}

TSC also protects the right to life and safety by creating toilets within the house or in the nearby location.²² Lack of toilet forces people to defecate in open fields (at night or rainy season) or on railway tracks which is dangerous and unsafe. Instances of women being molested or raped and people losing their limbs or lives are very frequent in rural areas.²³ This program also ensures gender equality by constructing Women Sanitary Complexes in villages at a place acceptable and accessible to women; and by ensuring separate toilets for girls in schools.^{12, 22} Similarly, right to equality is also promoted by

earmarking 3% and 25% of the funds (for toilet construction) for disabled persons and socially marginalized sections respectively.¹²

In addition, right to education is ensured by creating separate toilet facilities for boys and girls.^{14, 22} According to UNICEF,¹⁴ school attendance, retention and educational performance of students, particularly, girls are contingent on the availability of sanitation facilities. TSC, hence, is instrumental in achieving Target 2 MDG which is to achieve universal primary education.

Further, by linking toilet construction with Mahatma Gandhi National Rural Employment Guarantee Scheme; and also establishing Rural Sanitary Marts/ Production Centers in rural areas, TSC ensures right to work for the unemployed skilled and unskilled workforce.²⁴

Is TSC discriminatory?

This program does not have any provision which is explicitly or implicitly discriminatory in any form. On the contrary, TSC promotes equality as mentioned in above section.

Over-and-under inclusion

In TSC only rural households (both BPL and APL) are covered. Hence, it does not include urban household where 14 % of people practice OD.³ Further, APL rural households are excluded from the incentive provision of TSC.

Stage 4: Does the TSC necessitate restriction of human rights?

The analysis and reviews have not found any provision or activity of the TSC which makes the participation compulsory or uses methods which restrict rights of the target population. There have been instances where people were fined who were practicing OD and household items were seized of those who could not pay fine.²⁵ However, this kind of punitive action is not a part of TSC.

Stage 5: If so, have the criteria/ preconditions to restrict rights been met?

Because, TSC does not restrict any right, Stage 5 of human rights analysis is not applicable.

Stage 6: Are the health and other relevant structures and services capable of effectively implementing the TSC?

There exist many factors which may hinder the effective implementation of the TSC. Some of these factors are:

- Implementing TSC as a means to achieve sanitation MDG targets, in some cases, has changed the focus of TSC from “demand-driven” to “target-driven” and from “community-led” to “state-led”.¹⁰ This led to hurried construction of latrines to meet the targets and superstructures such as plastic sheets, jute bags and tin sheets were used.⁹
- Using inappropriate technology for the toilet construction may contaminate sub-surface water, further increasing the incidence of diseases.¹⁰
- Due to NGP, there is a race among the states to get it first. Hence, TSC is being considered as a toilet construction program, similar to CRSP.¹⁰
- Because menstrual hygiene is not included in TSC, women may not be motivated to use toilets because of the lack of disposal mechanism.¹⁰
- Scarcity of water discourages the use of toilets.²³ People, therefore, prefer to defecate near a water body. In addition, construction of toilets without provision of water increases the work of women because they have to go as far as 2-3 kms to bring water to be used in toilets for the whole family.²⁵
- Poor maintenance mechanism for the toilet facilities constructed in community and schools discourages the users to use toilets and forces them to relieve in open.⁹

Stage 7: What system of monitoring, evaluation, accountability, and redress exists to ensure that the TSC is progressing towards the intended effect and that adverse effects can be acted upon?

The monitoring system of TSC is well defined which runs upward from the village level to the Central Government level.⁷ Inspection Officers are appointed from the state level and district level for frequent field inspections to check and ensure the construction of facilities, correct selection of beneficiaries and display of correct information related to TSC (under Right to Information Act) in Village Councils for the people of the village.⁸

Further, GoI sends Review Missions to states to evaluate the implementation of TSC. In addition to governmental reviews, there is a provision of social audit for which Village Sanitation Assembly would be

convened which due to involvement of representatives of NGOs, government, social activists, community and beneficiaries, ensures accountability, speedy grievance redressal, transparency, consultation and participation.⁸

CONCLUSION

The human rights analysis of TSC has clearly identified which rights are protected and which are violated by this program. Overall this report has found that TSC is well conceptualized and formulated not only to protect the right to sanitation but also to protect and promote other human rights. However, there are some barriers which might impede the success of TSC during implementation. Hence, relevant remedial actions must be thought of and implemented, and only then can the vision of Nirmal Bharat/ Clean India be realized.

Conflict of Interest: None.

Source of Support: Nil.

ACKNOWLEDGMENT

I am extremely grateful to Ann Taket, Professor of Health and Social Exclusion, Faculty of Health, Deakin University, Australia for providing guidance and support in this work.

Ethical Clearance: It was not required.

REFERENCES

1. Taket A. Health Equity, Social Justice and Human Rights. Oxfordshire: Routledge;2012. p. 102-12.
2. Gostin L, Mann JM. ‘Towards the development of a human rights impact assessment for the formulation and evaluation of public health policies’. Health and Human Rights 1994;1:58-80.
3. United Nations Children’s Fund, World Health Organization. Progress on Drinking Water and Sanitation: 2012 Update, WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, 2012 [cited 2012 Sep 12]. Available from: http://www.wssinfo.org/fileadmin/user_upload/resources/JMP-report-2012-en.pdf
4. United Nations. The Millennium Development Goals Report, 2010 [cited 2012 Sep 12]. Available from: <http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf#page=60>
5. United Nations. Official list of MDG indicators, 2008 [cited 2012 Sep 17]. Available from: <http://>

- mdgs.un.org/unsd/mdg/Resources/Attach/Indicators/OfficialList2008.pdf
6. United Nations General Assembly. Resolution adopted by the General Assembly: The human right to water and sanitation, 2010 [2012 Sep 17]. Available from: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/64/292
 7. Water and Sanitation Program. A Decade of the Total Sanitation Campaign: Rapid Assessment of Processes and Outcomes, 2011 [2012 Oct 15]. Available from: http://www.wsp.org/wsp/sites/wsp.org/files/publications/WSP_India_TSC_Report_Vol_1_Press.pdf
 8. Ministry of Drinking Water and Sanitation. Guidelines: Nirmal Bharat Abhiyan, Government of India, 2012 [cited 2012 Oct 12]. Available from: [http://ddws.gov.in/sites/upload_files/ddws/files/pdfs/Final%20Guidelines%20\(English\).pdf](http://ddws.gov.in/sites/upload_files/ddws/files/pdfs/Final%20Guidelines%20(English).pdf)
 9. Pardeshi G, Shirke A, Jagtap M. 'SWOT analysis of total sanitation campaign in Yavatmal district of Maharashtra'. *Indian J Community Med* 2008;33:255-9.
 10. WaterAid India. Feeling the Pulse: A Study of the Total Sanitation Campaign in Five States, 2008 [cited 2012 Sep 12]. Available from: http://www.wateraid.org/documents/plugin_documents/feeling_the_pulse__a_study_of_the_total_sanitation_campaign.pdf
 11. Ministry of Drinking Water and Sanitation. Nirmal Bharat Abhiyan, 2012 [cited 2012 Sep 17]. Available from: <http://tsc.gov.in/TSC/NBA/AboutNBA.aspx>
 12. United Nations. INDIA: A Case Study – Related Best Practice or Lessons Learned in Water & Sanitation, 2003 [cited 2012 Oct 3]. Available from: <http://www.un.org/esa/agenda21/natinfo/countr/india/CaseStudyIndiaws1.pdf>
 13. WaterAid. Abandoning Open Defecation, 2010 [cited 2012 Sep 18]. Available from: http://www.wateraid.org/documents/plugin_documents/social_transformation_study_briefing_note.pdf
 14. United Nations Children's Fund. Soap, Toilets and Taps: A Foundation for Healthy Children, 2009 [cited 2012 Sep 18]. Available from: http://www.unicef.org/wash/files/FINAL_Showcase_doc_for_web.pdf
 15. Humphrey JH. 'Child undernutrition, tropical enteropathy, toilets, and handwashing'. *Lancet* 2009;374:1032-5.
 16. Spears D. Effects of Rural Sanitation on Infant Mortality and Human Capital: Evidence from India's Total Sanitation Campaign, RICE working paper 2012 [cited 2012 Sep 20]. Available from: <http://riceinstitute.org/wordpress/wp-content/uploads/downloads/2012/07/tsc-summer-2012.pdf>
 17. Spears D, Lamba S. Effects of Early-Life Exposure to Rural Sanitation on Childhood Cognitive Skills: Evidence from India's Total Sanitation Campaign, RICE working paper 2012 [cited 2012 Sep 20]. Available from: <http://riceinstitute.org/wordpress/wp-content/uploads/downloads/2012/07/Spears-Lamba-TSC-cognition-May-2012.pdf>
 18. Azurin JC, Alvero M. 1974, 'Field evaluation of environmental sanitation measures against cholera'. *Bulletin of the World Health Organization* 1974;51:19-26.
 19. Daniels DL, Cousens SN, Makoe LN, Feachem RG. A case-control study of the impact of improved sanitation on diarrhoea morbidity in Lesotho. *Bulletin of the World Health Organization* 1990;68:455-63.
 20. WaterAid. Improving water and sanitation governance through citizens' action. 2008 [cited 2012 Oct 2]. Available from: http://www.wateraid.org/documents/plugin_documents/wa_nep_improving_watsan_governance_ca_dec2008.pdf
 21. Office of the United Nations High Commissioner for Human Rights. The International Bill of Human Rights. 2003 [Cited 2012 Oct 8]. Available from: <http://www.ohchr.org/Documents/Publications/Compilation1.1en.pdf>
 22. Centre on Housing Rights and Evictions, WaterAid, Swiss Agency for Development and Cooperation, United Nations-Habitat. Sanitation: A human rights imperative. 2008 [cited 2012 Oct 1]. Available from: <http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=2927>
 23. WaterAid. South Asian people's perspective on sanitation: Synthesis review. 2011 [Cited 2012 Oct 10]. Available from: http://www.wateraid.org/documents/plugin_documents/12932_lores_south_asian_peoples_perspective_on_sanitation_synthesis_paper.pdf
 24. Ministry of Rural Development. Guidelines For Taking Up Works Related To Access To Sanitation Facilities. 2012 [Cited 2012 Oct 3]. Available from: http://nrega.nic.in/Final_guidelines_for_convergence_with_TSC.pdf
 25. Mehrotra N, Patnaik S. 'Culture versus Coercion: Other Side of Nirmal Gram Yojana'. *Economic and Political Weekly* 2008;43:25-7.

Perception and Practices Regarding Menstruation in Women of Reproductive Age Group in Urban Slums

Khurshid Parveen¹, Manish Chaturvedi², Deoki Nandan³, Ved Shrotria⁴

¹Assistant Professor, Deptt.of Community Medicine, Moti Lal Nehru Medical College, Allahabad, ²Associate Professor, School of Medical Science, Noida, ³Director, National Institute of Health and Family Welfare, New Delhi, ⁴Ex Head of Deptt., Sarojini Naidu Medical College, Agra, UP, India

ABSTRACT

Background: There are various beliefs and practices which exist in the domain of reproductive health of women. Menstruation is one such area. Menstruation is a monthly cyclical change entirely of a women's body and yet it influences the quality of her life in her household, her interaction with the family, and her relation with the world outside her household. Menstruation is influenced by various beliefs & taboos. Perception and practices regarding menstruation are of considerable importance for reproductive health. Poor practices increase vulnerability to reproductive tract infection.

Objectives: To identify the gap between perception & practices during menstruation and know superstition and beliefs regarding the same.

Material and Method: This cross-sectional descriptive study was conducted amongst 300 reproductive age group 15-44 yrs group women in urban slums of Agra to determine their perceptions, problems, and practices on menstruation. Stratified simple random sampling technique was used for collecting information from the women of reproductive age group from the area attached to urban health center of Department of Social and Preventive Medicine, Agra.

Results: The correct perception regarding household work was found in about half (48%) of the women surveyed, and in practice it was 58%. Two thirds of the women had correct perception about dietary belief and taboos and only 35% women avoided certain foods. Out of 207 married women 33.3% had correct perception about intercourse during menstruation period, while in practice it was only 15.2%. Out of 31 women who were involved in this activity during menstruation 16 were using condom.

Conclusion: It was found that half of the women had adequate knowledge regarding menstruation while practice was influenced by various beliefs and taboos. It is necessary to increase IEC (information, education and communication) for better perception, for discarding unhealthy practices and for adopting healthy practices. Counseling can be initiated early for the adolescent girls. Counseling is also required for the elderly women who perpetuate the tradition and practices in the family.

Keywords: Menstruation, Household Work, Dietary Belief & Taboos, Intercourse

INTRODUCTION

The impact of reproductive health is not limited to the individual, family or society at large. It extends

across national boundaries to the world as whole.¹ The average life span has increased globally from 46.5 yrs(1950) to 69yrs(2008).² The major contributing factors are adequate nutrition, improved environmental conditions, decrease in the prevalence of various diseases as well as good medical facilities. Even though mortality and morbidity due to various diseases have decreased, women of reproductive age group continue to suffer from various ailments related to reproductive tract and this is specially true for those living in urban slums of Uttar Pradesh. According to

Corresponding author:

Khurshid Parveen

Assistant Professor

Deptt.of Community Medicine,

MLN Medical College, Allahabad

E mail Id- drkparveen@gmail.com

Mobile: 09452102609

both NFHS-2 and SRS the death rates for females in age group (15-49yrs) are higher than those for the males.³

These females of reproductive age group are having lack of knowledge about personal hygiene. They are not practicing hygienic condition of living and their standards of living are very poor¹.

Various beliefs and practices exist in the domain of women's reproductive health.⁴ Menstruation is one such area. Menstruation is monthly cyclical change entirely of a women's body and yet it influences the quality of her life in her household, her interaction with the family, and her relation with the world outside her household⁵. The meaning ascribed to menstruation and the cultural practices associated with it have a bearing on women's sexuality, on her reproductive health status and consequently on her overall health status.

Although menstrual hygiene is an issue that every girl and woman has to deal with in her life, there is lack of information on the process of menstruation, the physical and psychological changes associated with puberty and proper requirements for managing menstruation. The taboos surrounding this issue in the society prevents girls and women from articulating their needs and the problems of poor menstrual hygiene management have been ignored or misunderstood. Good menstrual hygiene is crucial for the health, education, and dignity of girls and women⁶.

Perception and practices of women regarding menstruation, a physiological process, is influenced by social rules which vary between cultures and also between social groups within a single culture. On the other hand hygiene related practices during menstruation are of considerable importance for reproductive health, poor practices increases vulnerability to reproductive tract infections⁷.

The present study was conducted to find the differences between perception and practices related to menstrual health in women of reproductive age group 15-44yrs in urban slums of Agra district.

OBJECTIVES

1. To know the gap between perception and practice in relation to menstruation.

2. To learn about the superstitions and beliefs regarding menstruation.

MATERIAL AND METHOD

A cross sectional study was carried out in 3 urban slum communities of Agra. These slum areas are a part of field practice area of Department of Social and Preventive Medicine. A stratified simple random technique was used for collecting the information from the women of reproductive age group 15-44yrs. For this study, because of multiplicity of variables and varying frequencies, incorrect perception of menstrual hygiene was chosen to determine the sample size for menstruation health. Based on 30% incorrect perception, sample size was calculated. A minimum number of 233 females were required for study purposes but considering that few women will give incorrect response and for better results and even figure of 300 was taken for the study. Data was collected on predesigned and pretested schedule. Chi square test was applied to observe the significance of the variables/ parameters.

RESULTS

Out of 300 women, majority (27%) was in age group 15-19 yrs and the least 10% were in age group of 40-45 yrs. The percentage were almost similar (17%) in age groups (20-24), (25-29), (30-34).

Three fourth of the females were Hindus and rest were Muslims. About half of the women belonged to general caste while 28.0% to schedule caste, and 21.0% to backward caste.

Table 1 illustrates the relationship between perception and practices regarding household work during menstruation and age of women. Less than half (48%) of women had correct perception about doing household work during menstruation. Among them larger number belonged to age group 15-19 yrs and smaller number in age group 35-39yrs and this percentage further went up to 58% in practice. Perception & practices regarding household work during menstruation in relation with age were found to be statistically significant. ($\chi^2=14.9$, $df=5$, $p<0.05$) and ($\chi^2=17.2$, $df=5$, $p<0.05$) respectively.

Table 1. Perception & Practices Regarding Beliefs in Carrying Out Routine Work During Menstruation in Relation to Age of Women in Reproductive Age Group (15-44 Yrs.)

Perception/ Practice	Menstruation variable	Age of Women (Yrs.)							Total	%age
		15-19	20-24	25-29	30-34	35-39	40-44			
Perception -	House hold work during Menstruation culture/taboo									
	(a) Correct	33	30	21	27	12	21	144	48	
	(b) Wrong	48	18	30	27	24	9	156	52	
Practice-	Are you doing normally									
	(a) Yes	39	33	30	30	16	26	174	58	
	(b) No	42	15	21	24	20	4	126	42	
Practice*-	What work you are not doing									
	(1) Not allowed to do worship	78	46	51	53	36	30	294	98	
	(2) Not allowed to enter into kitchen	21	7	8	22	14	15	87	29	
	(3) Not allowed to touch pickle	61	29	37	26	27	15	195	65	
	(4) Not allowed to touch water from Common source	9	9	15	9	12	12	66	22	

*Multiple Responses

($\chi^2=14.9$, $df=5$, $p<0.05$) and ($\chi^2=17.2$, $df=5$, $p<0.05$)

Majority (98%) of the women did not worship during menstruation, 29% were not allowed to enter into the kitchen, and 65% were not touching the pickles, 22% were not allowed to take water from common sources.

Table 2 shows the perception and practices of dietary beliefs & taboos according to age of women.

Table 2: Perception & Practices of Dietary Beliefs During Menstruation in Relation to Age of Women (15-44 Yrs.)

Perception/ Practice	Menstruation variable	Age of Women (Yrs.)							Total	%age
		15-19	20-24	25-29	30-34	35-39	40-44			
Perception -	Dietary belief & Taboos									
	(a) Correct	45	30	36	47	24	16	198	66	
	(b) Wrong	36	18	15	7	12	14	102	34	
Practice-	Are you avoiding such foods									
	(a) Yes	36	15	18	9	9	18	105	35	
	(b) No	45	33	33	45	27	12	195	65	
Practice*-	If yes, what type?									
	(1) Hot & Spicy	-	-	3	3	-	-	6	4.4	
	(2) Cold	24	6	6	9	8	7	60	44.4	
	(3) Sour	27	15	12	9	10	14	87	64.4	

*Multiple Responses

($\chi^2=17.48$, $df=5$, $p<0.05$) and ($\chi^2=21.28$, $df=5$, $p<0.05$)

In this study correct perception about dietary habit meant not avoiding any food items during menstruation. More than half 66% of the women were having correct perception about dietary habits. While 65% were not avoiding any food items during menstruation. Among 35% of the women who were avoiding certain food items majority (64.4%) were avoiding sour foods(lemon, tamarind & other sour items), 44.4% were avoiding cold food items(rice, curd, cold drinks) where as only 4.4% were avoiding hot & spicy foods. None of the women in age group 15-24yrs and 35-44yrs were avoiding hot & spicy food items

during menstruation. Perception & practices of dietary belief & taboo in relation to age were statistically significant. ($\chi^2=17.48$, $df=5$, $p<0.005$) and ($\chi^2=21.28$, $df=5$, $p<0.005$) respectively.

Out of the 207 married women 69 were having correct perception for having sexual contact with their husband during menstruation. Majority (138) women were having incorrect perception. In practice 31 women cohabited during menstruation. Majority of them were not practicing this because of personal reasons or religious taboos. Nine women of age group

30-34yrs were having sexually active partner/ husband during their menstruation. While there were only 3 in age group 40-45 yrs. Not a single female of younger age group 15-19 yrs was involved in intercourse during their menstruation. Out of 31 women who were involved in such practice during

menstruation either by self or by husband's wish only 16 were using condom and they belonged to age group 20-29 yrs and 40-45yrs. Perception about intercourse during menstruation in relation to age was statistically significant ($\chi^2=24.43$, $df=5$, $p<0.005$), but practice was not significant ($\chi^2=1.54$, $df=5$, $p>0.05$).Table 3

Table 3. Perception & Practices About Sexual Intercourse During Menstruation According to Age of Married Women (15-44 Yrs.)

Perception/ Practice	Menstruation variable	Age of Women (Yrs.)							Total	%age
		15-19	20-24	25-29	30-34	35-39	40-44			
Perception-	Intercourse during menstruation									
	(a) Correct	1	20	24	15	4	5	69	33.3	
	(b) Wrong	2	16	27	36	32	25	138	66.6	
Practice-	Are you doing									
	(a) Yes	-	5	8	9	6	3	31	15.2	
	(b) No	3	30	41	42	30	27	173	84.8	
Practice-	If yes									
	(1) (a) Yours will	-	2	3	9	6	-	20	64.5	
	(b) Husband's will	-	3	5	-	-	3	11	35.5	
	(2) (a) with condom	-	3	4	6	3	-	16	51.6	
	(b) without condom	-	2	4	3	3	3	15	48.4	

($\chi^2=24.43$, $df=5$, $p<0.05$) and ($\chi^2=1.54$, $df=5$, $p>0.05$)

DISCUSSION

Perception & practices during menstruation are of considerable importance as it affects the health of the women and leads to increased vulnerability to reproductive tract infection. Studies reported from India and other developing countries have highlighted the common practices prevailing among the young female^{7,8}.

In the present study less than half (48%) of the women had correct perception regarding household work during menstruation. While in practice more of them 58% were doing household work during menstruation. Majority (98%) of the women did not worship during menstruation. Half of them were not entering the kitchen. Similar findings have been reported by Drakshayani⁹ in a study on menstrual hygiene among rural adolescent girls in Andhra Pradesh. More than 50% were restricted from household work, taking part in religious activities, attending marriages, playing during menstruation. A study conducted in Bangladesh by Kathryn Seymour¹⁰ for UNICEF in 2008 also reported similar findings. Some examples from her report are being quoted "We are taught that things will be spoiled if we touch them during our periods" says 14-year old Shopra from Char Branagacha. "We can't touch food, cooking utensil,

kitchen garden" and "we can't go to temple or Mosque," 17 years old Monira adds.

In our study it was observed that the so called cold food items (rice, curd, cold drinks) and sour items (lemon products) were avoided. It was believed that by eating sour & cold items there will be swelling of uterus and by using hot & spicy food in their diet there can be excessive bleeding during menstruation. Almost similar finding were reported by Drakshayani⁹ i.e. restriction of food items during menstruation which included milk & milk product, vegetables etc.

Having sex during periods is a personal choice that the women and her partner have to be comfortable within. In fact, it may bring real health benefits. It may provide pain relief for menstrual cramps by providing feel-good endorphins that are released during orgasm. Sex during period could also help to shorten periods by a few days. "Menstrual blood actually makes a very nice lubricant and may enhance sexual satisfaction for some couples," says Kellie Flood-Shaffer, MD, Division Director of Obs & Gynae at the University Of Cincinnati College Of Medicine. "Unless personal, religious, or cultural tradition restrict sex during menstruation, it is not any more dangerous," says Dr. Flood Shaffer.¹¹ In this study perception regarding intercourse during menstruation was

discussed among 207 married women and its practice among 204 married women leaving 3 widows aside. Perception about intercourse during menstruation was correct in about 33.3% of married women. Majority 66.7% of them were having incorrect perception. Only 15.2% of women were doing this practice during their periods. Tanfer K.et.al.¹¹ reported in their study that more than one fourth usually have vaginal intercourse during menses. Sex during menses was most common in women who were more educated, young, white women.

In the present study 16 women were using condom and they belonged to age group 20-29yrs and 40-44yrs during the act. In a study conducted by Diana Rodriquez¹² it was reported that having sex during menstruation was safe but still it cannot prevent from STDs which can only be prevented by the use of condom.

CONCLUSION

In conclusion it can be stated that from this study a wide gap between perception and practice in relation to menstruation was observed. We also learned about various belief and taboos associated with menses many of which can be overcome by proper IEC (information, education and communication) which will result in better perception and help in discarding unhealthy practices while adopting healthy practices. This activity should be initiated early for the adolescent girls. Counseling is also required for the elderly women who perpetuate the traditions and practices in the family.

ACKNOWLEDGEMENT

The author is grateful to Prof. S.Dwivedi and Dr. Ajay Singh, Department of Community Medicine, M.L.N.Medical College, Allahabad for their support and valuable suggestions.

Conflict of Interest: None declared.

REFERENCES

1. Reproductive health research .The new direction. Biennial Report; 1996-97.
2. K.Park, Park's textbook of preventive and social medicine. 21st ed. Jabalpur, India: M/S Banarsidas Bhanot Publishers; 2011. p450.
3. Arvind Pandey et al. International Institute for Population Science (IIPS) and ORC Macro. 2001. National Family Health Survey (NFHS-2), India, 1998-99. p124: Uttar Pradesh. Mumbai: IIPS.
4. Swenson I, Havens B. Menarche and menstruation. Community health nurs. 1987; 4(4):199-200.
5. Kulkarni, A.V. Attitudes towards menstruation, a study of the first experience of menstruation. Bombay. 1985.
6. UNICEF. Media center, bringing the issue out of closet, adolescent girls launch a guidance booklet on Menstrual Hygiene Management, New Delhi, 8 March 2008.
7. Dasgupta, A. M. Sarkar, Menstrual Hygiene: How Hygienic is the adolescent girl? 2008.
8. El-Gilany, A., K. Badawi, and S. El-Fedawy, Menstrual hygiene among adolescent schoolgirls in Mansoura, Egypt. Reproductive Health matters, 2005. 13(26):p147-152.
9. Drakshayani Devi K, Venkata Ramaiah P. A study on menstrual hygiene among rural adolescent girls. Indian J Med Sci. 1994; 48(6):139-43.
10. Kathryn Seymour. Tackling menstruation hygiene taboos. Bangladesh, UNICEF Publication 2008.
11. Tranfer K, Aral SO. Sexual intercourse during menstruation. Available From: <http://www.ncbi.nlm.nih.gov> [Accessed on 2011 May 04]
12. Diana Rodriquez. Having Sex During Your Period. Sex and Menstruation-Sexual Health-EverydayHealth_com.mht [Accessed on 2011 July 27]

Adverse Events Following Immunisation and Global Scenario in Vaccine Pharmacovigilance

Reena Verma¹, Kingshuk Lahon²

¹Assistant Professor, Department of Pharmacology, LN Medical College, Bhopal, Madhya Pradesh, ²Associate Professor, Department of Pharmacology, Mahatma Gandhi Medical College and Research Institute, Pondicherry

ABSTRACT

The safety of vaccines is a high priority for vaccine manufacturers and drug regulatory bodies. Adverse event following immunization (AEFI) is an untoward, temporally associated event following immunization process which does not necessarily have a causal relationship with administration of vaccine. Vaccine pharmacovigilance relates to detection, assessment, understanding, prevention and communication of adverse events following immunization, or of any other vaccine - or immunization - related issues. AEFI aggravate public opposition to immunisation and jeopardize the effectiveness of immunisation campaigns. AEFI are of various types and may be due to programmatic errors, vaccine-induced or potentiated errors. Global vaccine pharmacovigilance systems focus on passive, active or hybrid systems, record linkage and rapid cycle analyses. The global advisory committee on vaccine safety also plays an important advisory role to WHO in vaccine pharmacovigilance. Majority of the population are however exposed to non-functional systems. Thus, a global vaccine safety data network can be useful in solving this problem. WHO AEFI reporting system contains a checklist and causality assessment criteria. It can be made more effective by acting on results of assessment tools. AEFI reporting in India is an elaborate process under the charge of the CDSCO, Ministry of Health and Family Welfare. However, capacity to detect and respond to AEFI needs improvement. A multi-pronged approach by WHO involving national authorities, multilateral agencies, nongovernmental and professional organizations, academia, healthcare institutions, pharmaceutical industry, lay public and media is the key to ensuring effective vaccine safety monitoring worldwide.

Keywords: AEFI, Vaccine Pharmacovigilance

INTRODUCTION

The safety of vaccines is a high priority for vaccine manufacturers and government agencies that regulate the pharmaceutical industry. Unlike medicines that are used to cure illness or to alleviate symptoms of disease, vaccines are given to large and diverse groups of people, with no perceived or immediately obvious health benefit to the person who is vaccinated.^[1]

Adverse event following immunization (AEFI) is an untoward, temporally associated event following immunization process which does not necessarily have a causal relationship with the administration of the vaccine.^[2] The adverse event may be any unfavorable and/or unintended sign, abnormal laboratory finding, symptom or disease. Vaccine pharmacovigilance is defined as the science and activities relating to the detection, assessment, understanding, prevention and communication of adverse events following immunization, or of any other vaccine - or

immunization - related issues. It is the continual evaluation and monitoring of a vaccine's safety after it has received marketing authorisation. During these large-scale vaccine effectiveness studies, vaccine safety monitoring continues, which may include reports of rare events or of events not noted during the clinical trials.^[3]

WHO estimates that 65% of the world population are covered by vaccine pharmacovigilance systems which are not fully functional. The absence of a national system for vaccine safety monitoring represents the most extreme form of such deficiencies.^[4]

Adverse events associated with vaccine administration are not accepted easily by the public as they are administered to healthy persons, mostly children. Except in some countries where immunization is compulsory, it is usually elective. AEFI perpetuate the common misconceptions about

immunization among the lay public, such as the unnecessary exposure of healthy people to vaccines in this day of better hygiene and sanitation, where vaccine-preventable diseases have been almost eliminated. Moreover, there is a wrong perception questioning the efficacy of these vaccines in being able to prevent diseases.^[5] So, fear of disease is often replaced with concerns regarding vaccine safety.

Whenever AEFI appear, it aggravates the public's opposition to immunisation, given their safety concerns. In fact, vaccine associated adverse events are more likely to be reported and communicated by the public. As AEFI especially in children is a sensitive issue with social implications, the print and electronic media play their part in spreading the extent and scale of the problem. Although vaccine safety concerns can be valid, such concerns are often based upon rumours or misrepresentation of facts. Often, while a scientific inquiry is underway to support or refute these claims, vaccine uptake may decline, resulting in increased disease risk and associated morbidity and mortality. This can significantly impact on the effectiveness of immunization programmes.^[4] AEFI also cause adverse legal and socioeconomic impact by adversely exposing the community to inappropriate vaccines, undue anxiety and financial burden.^[2] Such an impact has been seen in several cases of AEFI in India. A network of Adverse Drug Reaction (ADR) monitoring centres along with AEFI monitoring program provide the machinery for vaccine pharmacovigilance in the country.^[6] Though India has made progress towards existing guidelines, the capacity of the system to detect and respond to AEFI remains inadequate.

Appearance of AEFI in immunization programmes is thus a public health problem, with wide consequences beyond the immediate visible impact.

Our aim was to identify the types and causes of AEFI, review the current status of vaccine pharmacovigilance systems, identify gaps in the current systems and to discuss solutions to improving the global vaccine safety infrastructure.

CLASSIFICATION OF AEFI

In general, AEFI can be broadly classified into Serious and Non-serious.

A serious adverse event (SAE) is one which is fatal/ life threatening, results in persistent/significant disability or incapacity or prolongation of

hospitalization or congenital anomalies /birth defects and/or is medically important.

AEFI to be reported include all SAE irrespective of causal association, as well as non-serious adverse events that are unexpected in nature, severity, frequency or outcome, vaccine failures, and usage in pregnancy.

The working classification used divides these events into:

- **Programmatic errors:** Most common cause of serious AEFI and deaths. For example, deaths after measles vaccines causing toxic shock syndrome due to improper reconstitution and storage errors, bacterial abscess, sepsis.
- **Vaccine induced errors:** Common adverse reactions which are causally related to vaccines and may be local, systemic or allergic reactions. For example, vaccine associated paralytic poliomyelitis (VAPP) due to OPV.
- **Vaccine potentiated errors:** Reaction stimulated by vaccine-febrile seizures in sensitive or predisposed child.
- **Injection reaction:** For example, abscess at injection site, transmission of blood borne pathogens.
- **Unknown:** Here, the cause cannot be determined and so, cannot be categorized in any of the above categories.^[2]

CAUSES OF AEFI

The most common cause for AEFI is programmatic error. But coincidental events and innate properties of vaccine also constitute a considerable percentage. These can be enumerated as follows:

- Overdose of vaccine
- Improper immunization site or route
- Use of unsterilized syringes and needles
- Vaccine reconstituted with incorrect composition and/or amount of diluents
- Inadvertent substitution of drug for vaccine diluents
- Incorrect preparation of vaccine for use

- Contaminated vaccine or diluents
- Degradation on incorrect storage of vaccine
- Contraindications like history of previous serious reaction ignored during vaccination
- Reconstituted vaccine used beyond six hours after reconstitution
- Reconstituted vaccine not discarded at the end of an immunization session and re used subsequently in next session.^[2]

Management of AEFI

Global Vaccine Pharmacovigilance Systems

The different types of vaccine safety monitoring systems are^[4]:

Passive surveillance: These systems rely on voluntary reporting of AEFI by physicians, parents or other individuals into a central database. Examples of passive surveillance systems include the Vaccine Adverse Events Reporting System (VAERS) in the USA, the WHO Uppsala monitoring system and the yellow card system in the UK.

Limitations: Reporting bias, both under- and over-reporting.

Active surveillance: Here, data on specific clinical conditions or any AEFI is systematically collected by dedicated staff through sentinel centres in a time bound frame. Examples include monitoring for intussusception following rotavirus vaccine introduction in South America.

Limitations: Analysis of a new vaccine adverse event is difficult due to lack of prior data collection and, thus, the lack of a comparison rate.

Hybrid systems: These combine features of both passive and active reporting systems. In Brazil, vaccine clinics report all events for a pre-specified list of possible AEFI. Audits are performed to verify complete reporting of these events. These are recorded weekly into a national computerized vaccine safety database so that baseline rates are available for comparison when new vaccines or vaccine lots are introduced.

Record linkage analyses: Existing computer databases of medical records that contain hospital or outpatient diagnostic data are linked with exposure information in vaccine registries. Thus, identification of AEFI is part of routine medical care. Here, limited

or no reporting bias is observed, since events are identified from existing computer databases. Limitations: They are available only for select populations and in a few Western countries, where computerized medical record databases are prevalent. However, such databases are becoming increasingly popular.

Rapid cycle analyses: Here, a pre-defined list of possible outcomes is identified for a new vaccine or vaccine combination. Weekly data sets are then utilized to compare the rate of AEFI identified for each of the predetermined outcomes. Only if the rate of event is statistically outside the expected value till date in the weekly data collection, is the event regarded as being likely associated with vaccination. Most often, they detect signals which need to be verified.

Global advisory committee on vaccine safety: The Global Advisory Committee on Vaccine Safety (GACVS), established in 1999 is an independent group of experts in epidemiology, biostatistics, preclinical and clinical regulatory activities, clinical medicine, immunology, vaccine development and research, which provides independent advice to the WHO on vaccine safety issues.

Global vaccine safety networks: A global vaccine safety data network would allow evaluation of rare adverse events and studies in new populations to evaluate safety signals detected within one country, which is not currently available. Efforts are underway in Europe and Australia to develop such a network, facilitated by the work of the Brighton Collaboration, which has developed an international network of experts to develop case definitions and protocols related to vaccine safety.

Reporting of AEFI: The Who Checklist

The WHO-Uppsala AEFI reporting system is an effort to establish a global database of passively reported adverse events.^[7] It allows comparisons of possible signals between countries and vaccine regimens. A checklist^[5] has been issued by the WHO in case AEFI is reported. It has various sections:

Section A titled as 'Be prepared' gives a list of necessary actions for the preparation that is required on receiving reports of AEFIs, like development of centralized system, establishment of national advisory committee, adoption of standard case definitions (Brighton collaboration or national case definitions), defining signals, routine process, frequency of

meetings for causality assessment and process of actions to be taken.

Section B: involves receiving and processing reports at regional and national level.

Section C: uses a step by step guide to conduct the systematic standardized causality assessment. Causality assessment is the systematic review of data about an AEFI case to detect the likelihood of association between an adverse event and the vaccine received. It involves verification of the diagnosis, coding review, collation and storage. AEFI are assessed using WHO scale for categorising the adverse events as Very likely/certain, Probable, Possible, Unlikely or Unrelated.

For example

- **Reason for reporting must be verified with respect to diagnosis:** whether serious/non-serious.
- **Strength of association or consistency of findings:** known vaccine related event, frequency of occurrence, specificity of association, biological plausibility, temporal relationship, history of similar symptoms in the past, history of concomitant or preceding drug therapy or disease, other factors.
- Causality category should be determined using WHO criteria.
- A brief case summary should be prepared.
- Actions should be taken on recommendations from the review.
- The case may be considered for education purposes.
- It is necessary to communicate findings to immunization programme staff, national regulatory authority and others.

Section D: deals with systematic causality assessment process for AEFI or cluster.

Vaccine Pharmacovigilance In India

Vaccine development is regulated by Indian Council of Medical Research (ICMR) guidelines for clinical trials of vaccines. A network of Adverse Drug Reaction (ADR) monitoring centers along with the Adverse Events Following Immunization (AEFI) monitoring program makes up the machinery for vaccine pharmacovigilance.^[6]

In India, vaccine manufacturing, safety and quality control and post marketing surveillance is handled by Central Drugs Standards Control Organization (CDSCO), under Drugs Controller General of India (DCGI), Ministry of Health and Family Welfare, Government of India. Manufacturers have to furnish periodic safety update reports (PSURs) to CDSCO every 6 months for the first 2 years and then annually for the next 2 years. But serious unexpected adverse events must be reported to the licensing authority within 15 days of initial receipt of information by the manufacturer.

In urban sector, health workers and medical officers of corporations, municipalities and towns have to provide health services and report AEFI occurring in these health centres or hospitals. Private practitioners practising anywhere either rural or urban areas also should report AEFI to district health authorities.

In rural areas, AEFI reporting is the responsibility of auxiliary nursing midwife, medical officers of PHCs OR CHCs.

Reporting can be done as monthly routine. In case of serious AEFI, immediate reporting should be done. Time taken for reporting should ideally be as early as possible or at least within 7 days.

A reporting procedure based on WHO reporting checklist exists involving medical officers of rural and urban health centres, district immunisation officer, state immunisation officer, state and regional AEFI committees, Assistant Commissioner, Universal Immunisation Programme and DCGI, Ministry of Health and Family Welfare.

For vaccine reaction, state AEFI committee will immediately inform Govt of India/ DCGI/national AEFI committee along with state drug control authorities. Programme division of MoHFW can then suspend the use of suspected product, lot, vaccine or syringes.

Re-evaluation can also be taken to check the quality of vaccine with due information to manufacturer. If vaccine is found to be the cause, the lot can be withdrawn.

In case there is programme error, measures are taken to rectify these either by maintenance of basic precautions, field workers training sessions, supervision, correction of logistics for supply of vaccines.

Coincidental events should be communicated to the community and adequately clarified. All measures are taken for the referral services in case the event recurs.

If the reaction occurred is of unknown origin, experts may be required for investigation and assessment of causality and even if no reason is defined clearly, it should be indicated and communicated to the authorities.^[2]

Thus, we see that an elaborate system for AEFI management exists in India. However, in terms of performance, the capacity to detect and respond adequately to AEFIs requires further improvement.

CORRECTIVE MEASURES

In order to standardise the performance of vaccine pharmacovigilance systems, the WHO has devised an assessment tool^[4] that systematically addresses a series of indicators:

- Central/National guidelines and procedures for monitoring and management of AEFI
- Clear documentation of roles and responsibilities at all levels
- Routine training on AEFI monitoring and management for health staff
- Functional system for review of vaccine safety for regulatory action, including collaborative data sharing between key players
- System for providing feedback on AEFI from the national level to all levels
- Capacity to detect and investigate significant vaccine safety issues
- Documented process for action to be taken regarding vaccine performance
- Provision for post-marketing safety monitoring in the marketing authorization process (for vaccine-producing countries).

The following precautions^[5] can be useful in managing AEFI:

- 1) Timely review of cases based on the best case information available. Additional information on cases can be solicited soon after receipt when memory is fresh.
- 2) Timely triage & referral of serious AEFI for expert

systematic causality assessment should be ensured.

- 3) Programme expertise for credible quality review, assessment and analysis.
- 4) Action on recommendations following causality assessment to ensure programme safety and credibility.
- 5) Feedback and effective communication about the process and the outcome to stakeholders and the media to avoid misinterpretation.

Filling the lacunae in global vaccine safety will require concerted action of WHO with national authorities, multilateral agencies, nongovernmental organizations such as the Bill and Melinda Gates Foundation and Global Alliance for Vaccines and Immunization (GAVI), philanthropic and professional organizations, academic, clinical care and public health institutions, vaccine manufacturers, the lay public and last, but not the least, the print and electronic media.^[4]

CONCLUSION

AEFI have a deleterious impact on the effectiveness of national immunization campaigns. There are many causes of AEFI, but programme errors are the most common. Passive and active surveillance, hybrid systems, record linkage and rapid cycle analyses are in force worldwide for vaccine safety monitoring. Limitations of the systems include reporting bias, problems in analyses and resource deficits. The global advisory committee on vaccine safety plays an important advisory role to the WHO in vaccine pharmacovigilance. However, many countries have non-functional vaccine safety monitoring systems. Global vaccine safety networks can overcome these deficits by evaluation of rare AEFI and studies in new populations to evaluate safety signals detected in one country.

WHO has a checklist for reporting AEFI, which is adopted by India under the CDSCO, Ministry of Health and Family Welfare. However, the capacity to detect and respond to AEFI needs improvement.

WHO has devised an assessment tool to standardise the performance of vaccine pharmacovigilance systems. It also recognizes the need for a collaborative effort with multiple stakeholders at national levels, multilateral agencies, NGOs, professional organizations, academia, healthcare

institutions and pharmaceutical industry. Recognition of the importance of vaccine safety assessment capacity and development of appropriate infrastructure and expertise is essential to ensure that our vaccine programmes remain safe and effective.

Conflict of Interest: None

REFERENCES

1. European Medicines Agency (EMA). Committee for medicinal products for human use. Guideline on the conduct of pharmacovigilance for vaccines for pre- and post-exposure prophylaxis against infectious diseases. London: EMA 2009. <Available from <http://www.emea.europa.eu> . Accessed April 10, 2011>
2. Singhal T, Amdekar YK, Agarwal RK. Adverse events following immunization. IAP Guidebook on Immunisation, IAP Committee on Immunisation 2007-08. New Delhi: Jaypee Brothers Medical Publishers, 2009:118-22
3. European vaccine manufacturers. Vaccine safety. EVM 2004. <Available from www.evm-vaccines.org/pdf/brief_sheet_vaccine_safety.pdf. Accessed April 10, 2011>
4. Black S, Zuber P LF. Global trends and challenges in vaccine safety. *Paediatric health* 2009 Aug;3(4):329-35
5. World Health organisation. Adverse events following immunisation (AEFI): Causality assessment. Geneva: WHO, 2009. <Available from http://www.who.int/entity/immunization_safety/activities/en/. Accessed April 10, 2011>
6. Pharmaceutical drug manufacturers. Vaccine policy in India - All vaccines to come under DPCO. <Available from <http://www.pharmaceutical-drug-manufacturers.com/articles/nationalvaccinepolicy-india.html>. Accessed April 20, 2011>
7. The Uppsala Monitoring Center. The global intelligence network for benefits and risk in medicinal products 2008. <Available from <http://www.who-umc.org>. Accessed April 5, 2011>

Myasthenia Gravis Aggravated by Lower lobe Tuberculosis- A Case Report

Aithal KR¹, Mahabalshetti AD², Patil BS³, Rajoor UG¹

¹Associate Professor, ²Assistant Professor, ³Professor and HOD, Department of Medicine, SDM College of Medical Sciences and Hospital, Sattur, Dharwad, Karnataka, India

ABSTRACT

Myasthenia gravis (MG) is occasionally aggravated by chronic infection, of which there are many kinds. We report herein the case of a 75-year-old woman with MG aggravated by the Lower lobe Tuberculosis (LLT), diagnosed by flexible fiber optic bronchoscopy with broncho alveolar lavage (BAL). The possibility of LLT had been underdiagnosed in the differential diagnosis of aggravation of MG weakness, because LLT often misdiagnosed as other pneumonias even in endemic areas. This case suggests that chronic infections such as tuberculosis should be considered in myasthenic patients with exacerbation if definite evidence for aggravating factors of MG is not obtained.

Keywords: *Myasthenia Gravis, Lower Lobe Tuberculosis*

INTRODUCTION

Myasthenia gravis (MG) is a relatively uncommon disease, although prevalence has increased over time with recent estimates approaching 20 per 100 000 in the US population¹. Incidence varies widely from 1.7 to 10.4 per million, depending on the location of study², and has been reported to be as high as 21 per million in Barcelona, Spain³. After 50 years of age, incidence is higher in men⁴. The age peak for late-onset MG (onset after the age of 50 years) is now the same for both sexes⁵.

MG can be aggravated by various autoimmune or rheumatologic diseases, thyroid dysfunction, and infectious conditions. These conditions may not only interfere with immunosuppressive treatment, but they may also exacerbate myasthenic weakness by immune dysregulation.⁶

Tuberculous infection is common in developing countries due to an increase in overcrowding, the pandemic outbreak of HIV infection, and drug-

resistant mycobacterium tuberculosis infection⁷.

MG is known to be exacerbated during unsuspected infectious illnesses such as tuberculous infection. It has been demonstrated that corticosteroid therapy in patients with unrecognized or untreated tuberculosis can lead to the reactivation of *M. tuberculosis*⁸. We present herein a case of myasthenic weakness aggravated by Lower lobe Tuberculosis.

CASE REPORT

75 yrs old female patient, presented to our hospital with history of cough, breathlessness and drowsiness since two days. She is a known case of diabetes mellitus type2, hypertension since 5 years on regular treatment, diagnosed with MG in our hospital 2 months back.

Her initial symptoms were fluctuating ptosis, generalized weakness with diurnal variation more in the evening which responded to pyridostigmine (60mg/day). She did not complain of fever, weight loss and dysphasia. On admission to our hospital, patient was haemodynamically stable, had mild pallor. A neurological examination revealed bilateral ptosis, ophthalmoplegia, diplopia, mild dysphagia, and generalized muscle weakness in all four extremities, with respiratory distress. Chest examination revealed bilateral equal air entry with bilateral basal crepitation.

Corresponding author:

Kiran Aithal

Associate Professor

Department of Medicine, SDM College of Medical Sciences and Hospital, Manjushree Nagar, Sattur, Dharwad-09, Karnataka

Email: drkiranaithal@yahoo.com

Other system examination was unremarkable. In view of increasing respiratory distress and desaturation patient was intubated and ventilated. Complete blood count showed white blood count of 42650mm^3 , Hb-12.5 g/dl, normal renal functions, liver functions and thyroid functions. Her chest x-ray (CXR) revealed bilateral lower zone pneumonia. Computerized Tomography (CT) scan of thorax was done to rule out thymoma but it revealed large area of collapse in right lower lobe with patchy pneumonitis in bilateral lower lobe (fig A). Endotracheal secretion for acid-fast bacilli (AFB) was negative and culture grew providentia species. Diagnosis of myasthenic crisis with bilateral pneumonia with respiratory failure was made. Patient was started on intravenous antibiotics, steroids, and other supportive treatment. Dose of pyridostigmine was escalated to 180mg/day. In spite of aggressive treatment for one week, patient's condition did not improve and CXR showed persistent right basal collapse consolidation (fig B). Bronchoscopy was done to rule out intraluminal pathology which was normal and BAL was positive for AFB (2+). Post-bronchoscopy sputum smears also turned positive for AFB. Patient was started on anti tubercular treatment (ATT). Patient showed gradual improvement and weaned off the ventilator. Eventually on the 20th day she was discharged with oral pyridostigmine 60mg thrice daily, ATT and tapering prednisolone. Patient was followed up for 6 months. Her sputum AFB was negative; CXR became normal (fig C). Presently she is ambulatory with a maintenance dose of pyridostigmine, antidiabetic and anti-hypertensive medications.

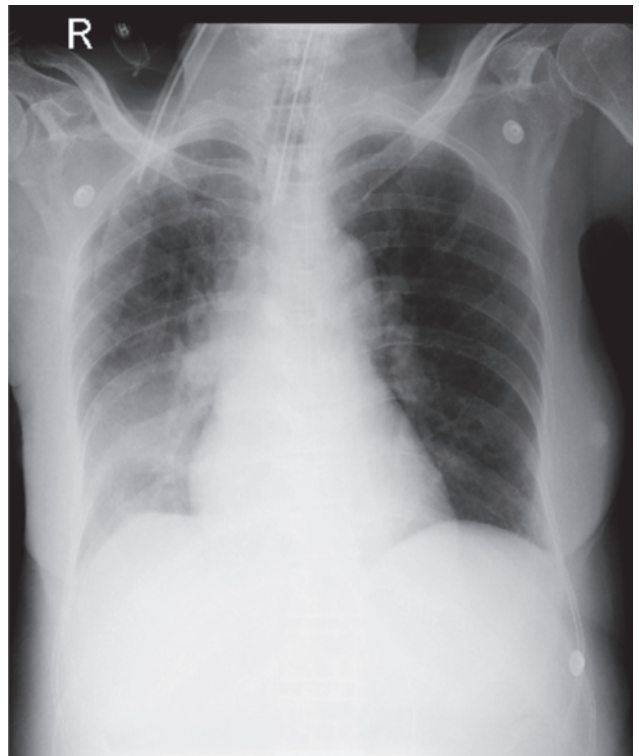


Fig. B. CXR showing persistent shadow in right lower zone after one week of antibiotics.

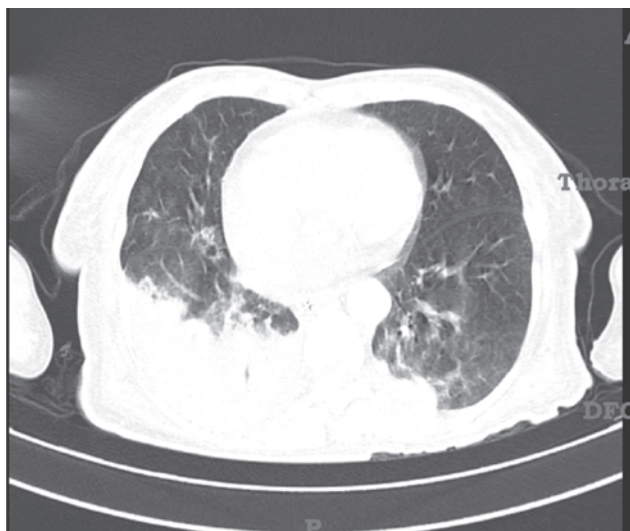


Fig. A. CT scan chest showing collapse consolidation of right lower lobe.

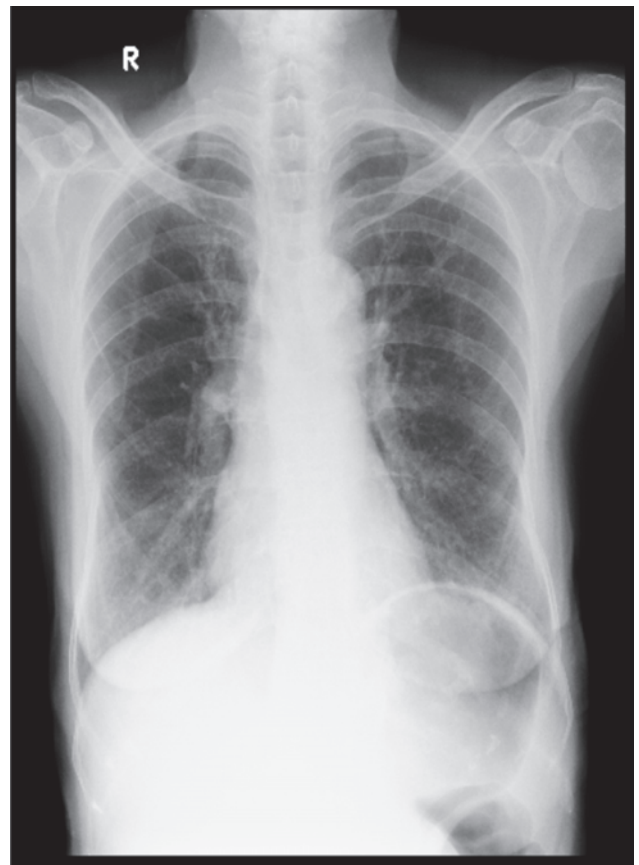


Fig. C. Post bronchoscopy CXR showing resolution of shadows after one week of ATT.

DISCUSSION

MG is a neuromuscular transmission disorder that is characterized by easy fatigability and muscle weakness. It is an autoimmune disease that is associated with antibodies such as anti-acetylcholine receptor antibody (AChR-Ab) at the neuromuscular junction. Patients with MG have an increased incidence of several associated conditions that may exacerbate the myasthenic weakness, including hyper- or hypothyroidism, occult infection, medical treatment for other disorders, emotional stress, and pregnancy⁶. In our case the MG-aggravating factor present was LLT.

LLT was first reported by Kidd⁹ in 1886. A review of literature shows a great variation in the reported frequency. It varies from 0.63% (Mathur et al 1974)⁶ to 6.4% (Vishwanathan 1936)¹⁰. Zuber Ahmad et al.¹¹ in their study observed a higher incidence – 10.5%. The discrepancies in the reported incidences may be due to confusion in the terms and definitions used, such as basal, lower lobe, or lower lung field tuberculosis¹². Lower lung field tuberculosis should be highly entertained especially when the clinical course is not characteristic of a non-tuberculous pneumonia or when the infiltrate fails to resolve in the expected fashion despite adequate antimicrobial therapy¹⁰. In our case, as the patient did not show clinical and radiological improvement despite adequate antimicrobial therapy, bronchoscopy was planned.

Flexible fiber optic bronchoscopy significantly increases the recovery rate of acid-fast bacilli from 47% to 94% in those patients suspected of having active pulmonary tuberculosis.

Microscopic examinations of bronchoscopic specimens were found positive for AFB in 48% to 67%¹³. Post-bronchoscopy sputum smears for AFB proved to be useful¹⁴⁻¹⁶. Nevertheless, bronchoscopy should be performed early to make a diagnosis of tuberculosis in patients with lower lung field lesions despite negative smear or culture for AFB¹⁴⁻¹⁶. In our case, despite of repeated sputum smear negativity for AFB, both BAL specimen and post-bronchoscopy sputum smears turned positive for AFB.

Together these findings suggest that the possibility of tuberculous infections is often ignored in patients with various types of tuberculous infections without typical pulmonary symptoms or signs. Therefore, in

MG patients with exacerbations, careful practical approaches to the screening of tuberculosis by chest radiography, tuberculin skin testing, and sputum examination are mandatory. In addition, further diagnostic tools such as CT and bronchoscopy are required because BAL yields higher chance of AFB positivity. If bronchoscopy had been performed to detect tuberculous infections sooner after the symptom aggravation in our patient, the comorbidity and treatment duration may have been reduced.

In conclusion, the possibility of chronic infections such as tuberculosis should be considered in MG patients on treatment who show progressive exacerbation of myasthenic weakness without other aggravating factors.

Acknowledgement: nil.

Conflict of interest: nil.

Source of funding: nil.

Ethical clearance: not applicable.

Previous presentation: nil.

REFERENCES

1. Phillips LH 2nd. The epidemiology of myasthenia gravis. *Ann N Y Acad Sci* 2003; 998: 407-12.
2. Phillips LH, Torner JC. Epidemiologic evidence for a changing natural history of myasthenia gravis. *Neurology* 1996; 47: 1233-8.
3. Aragonés JM, Bolibar I, Bonfill X, Bufill E, Mummány A, Alonso F, et al. Myasthenia gravis. A higher than expected incidence in the elderly. *Neurology* 2003; 60: 1024-6.
4. Grob D, Brunner N, Namba T, Pagala M. Lifetime course of myasthenia gravis. *Muscle Nerve* 2008; 37: 141-9.
5. Somnier FE, Keiding N, Paulson OB. Epidemiology of myasthenia gravis in Denmark: a longitudinal and comprehensive population survey. *Arch Neurol* 1991; 48: 733-9.
6. Drachman DB. Myasthenia gravis. *N Engl J Med*. 1994; 330:1797–1810.
7. Venkateswaran RV, Barron DJ, Brawn WJ, Clarke JR, Desai M, Samuel M, et al. A forgotten old disease: mediastinal tuberculous lymphadenitis in children. *Eur J Cardiothorac Surg*. 2005; 27: 401–404.

8. Cunba BA. Pulmonary tuberculosis and steroids. *Chest*.1995; 107:1486–1487.
9. Kidd P. Basic tuberculous phthisis. *Lancet* 1886; 2: 616.
10. Vishwanathan R. Tuberculosis of the lower lobe. *Brit Med J*.1936; 2: 1300.
11. Zuber Ahmad, M Shoaib Zaheer. Lower Lung Field Tuberculosis – A Clinical Study. *JIACM* 2003; 4(2): 116-20
12. S. Satya Sri. Textbook of pulmonary and extra pulmonary tuberculosis. 3rd ed. New Delhi. Interprint publication 1998; 120.
13. Wilfredo S. Ang, Edgardo P. Fajardo, Fernando G. Ayuyao. Lower Lung Field Tuberculosis. *Phil J Microbiol Infect Dis* 1991; 72-78.
14. Wongthim S, Limthongkul S, Udompanich J, et al. Fiberoptic bronchoscopy in diagnosis of patients with suspected active pulmonary tuberculosis. *J Med Assoc Thai* 1989; 72(3):154-159.
15. Sarkar SK, Sharma GS, Gupta PR, Sharma RK. Fiberoptic bronchoscopy in the diagnosis of pulmonary tuberculosis. *Tubercle* 1980; 61:97-99.
16. Unddenfeldt M, Lundgren R. Flexible fiberoptic bronchoscopy in the diagnosis of pulmonary tuberculosis. *Tubercle* 1981; 62:197-199.

Knowledge, Attitudes and Practices Regarding Highly Pathogenic Avian Influenza among Adult Population of Bangladesh

Mohammad Azizur Rahman¹, Rezaul Karim²

¹Faculty of Post Graduate Medicine and Research, University of Dhaka, Bangladesh, ²Department of Computer Sciences and Engineering, Chittagong University of Sciences and Technology, Chittagong, Bangladesh

ABSTRACT

This investigation explored the knowledge, attitudes, and behaviors relating to AI among an adult population in Bangladesh. From August 2009 to October 2010 a random sample of 1020 adults received a questionnaire about socio-demographic characteristics, knowledge of transmission and prevention about AI, attitudes towards AI, behaviors regarding use of preventive measures and food-handling practices, and sources of information about AI. A response rate of 67% was achieved. Those in higher socioeconomic classes were more likely to identify the modes of transmission and the animals' vehicles for AI. Those older, who knew the modes of transmission and the animals' vehicles for AI, and who still need information, were more likely to know that washing hands soap before and after touching raw poultry meat and using gloves is recommended to avoid spreading of AI through food. The risk of being infected was significantly higher in those from lower socioeconomic classes, if they did not know the definition of AI, if they knew that AI could be transmitted by eating and touching raw eggs and poultry foods, and if they did not need information. Compliance with the hygienic practices during handling of raw poultry meat was more likely in those who perceived to be at higher risk.

Keywords: Knowledge, Attitudes, Practices, Avian Influenza

INTRODUCTION

The first known direct avian to human transmission of influenza A (subtype H5N1) viruses was reported during an outbreak in Hong Kong in 1997 and exposure to infected poultry was identified as the probable route of transmission^[1-3]. The Avian influenza A has spread through 47 of Bangladesh's 64 districts. Apart from the high economic costs and the socio-economic implications of the poultry outbreak, avian influenza also poses an alarming public health risk through transmission of infection from animals to human, and the risk of a change in the virus resulting in sustained human-to-human transmission causing

a widespread human pandemic. Bangladesh reported its first human case of the H5N1 strain of avian flu. Alongside the massive avian outbreaks, the World Health Organization (WHO) reported more than 300 confirmed human cases of avian influenza A (H5N1), approximately two thirds of whom have subsequently died^[4]. Nearly all of these cases are traceable to exposure to infected poultry or birds, but there has not yet been a mutation allowing the H5N1 and H7N7 viruses to spread efficiently in human^[5]. Several public health strategic interventions are required for effective disease prevention and control of the multifaceted issues posed by avian influenza^[6]. In the past years a limited number of studies have been published investigating knowledge, attitudes, and practice about avian influenza among target groups^[7,8,9] and general population^[10-13]. This area of investigation seems to be an important one because members of the public often misinterpret their risk of health problems.

Corresponding author:

Mohammad Azizur Rahman

Faculty of Post Graduate
Medicine and Research

University of Dhaka, Bangladesh.

Address: 1/2 Block-B, Green Road, Pardigulia,
Tangail-1900, Bangladesh.

Phone Number: +88001722430208

Email: mdlabeled@gmail.com

MATERIALS AND METHOD

This cross-sectional survey was conducted from August 2011 to October 2012 in the geographic area of

Tangail (Bangladesh). A two-stage cluster sampling technique was employed to draw the required sample. In the area surveyed there were 40 schools and each school was considered a cluster. The first stage consisted of selecting four clusters through random sampling. The second stage consisted of randomly select 255 adults from the parents' files of each sampled school that contained 500 students. The data collection tool was a pretested questionnaire containing the structural and semi structural questions according to the objectives and variables of the study.

The response choices for all knowledge questions were given on a three-point Likert-type scale using "yes", "no", "do not know" options for the modes and vehicles of transmission, and risk groups and "agree", "uncertain", and "disagree" for the measures concerning the preventive measures; whereas, the response choice for the question about the knowledge of the definition was open.

Statistical analysis

Multivariate logistic and linear regression analyses investigated the independent contribution of potential predictors to the following primary outcomes of interest. Statistical significance level was defined as a two-tailed *p*-value ≤ 0.05 . Stata version 8.1 software program was used for all statistical analyses [14].

RESULTS

The sample consisted of 683 individuals for a participation rate, defined as the number of completed questionnaires divided by the number of those randomly selected, of 67%. Socio-demographic characteristics of the respondents are reported in Table 1. The average age was 40.7 years, two thirds were female, almost all were married, the majority had not reached college level education, more than half is

inactive or housewife, and one-third has three or more children. The respondents knowledge about avian influenza is reported in Table 2. Half the survey respondents correctly defined avian influenza as a contagious infection caused by a virus that can affect all species of birds, and 20.1% to 81.4% knew the different modes of transmission, although 7.5% indicated a human-to-human. Almost all (95.7%) and three-quarters (74.7%) identified poultry and birds as common vehicles for the disease. Overall, only 33.5% correctly identified the modes of transmission and the common vehicles for avian influenza. Multiple logistic regression analysis showed that those employed (OR = 1.34; 95% CI 1.05–1.7) and with higher educational level (OR = 1.31; 95% CI 1.1–1.63) were significantly more likely to correctly answer knowledge questions about transmission (Model 1 in Table 3). Respondents did not recognize the major risk groups, since a large percentage agreed that poultry workers (88%) were at risk, but lower values were reported for butchers (55.1%), hunters (30.7%), and veterinarians (23.6%). Moreover, 34.6% knew that washing their hands with soap before and after touching raw poultry meat and using gloves is a hygienic practice to avoid spreading of the avian influenza virus through food. Those older (OR = 1.03; 95% CI 1.01–1.05), who knew the modes of transmission and the common vehicles for avian influenza (OR = 1.63; 95% CI 1.11–2.39), and who still need additional information about avian influenza (OR = 1.52; 95% CI 1.09–2.12) were more likely to know this practice (Model 2 in Table 4). Respondents considered the risk for them of being infected significantly higher if they were from lower socioeconomic classes, had lower educational level, if they did not know the definition of avian influenza, if they knew that avian influenza could be transmitted by eating and touching raw eggs and poultry foods, and if they believed that they did not need additional information about the disease (Model 5 in Table 7).

Table 1. Socio-demographic characteristics of the study population.

		n	%
Gender	Female	461	67.5
	Male	222	32.5
Age group (years)		40.7 ± 6.8 (40)*	
	≤ 35	154	22.5
	36–40	213	31.2
	41–45	163	23.9
	46–50	100	14.6
	> 50	53	7.8
Marital status	Married	654	95.7
	Other	29	4.3

Table 1. Socio-demographic characteristics of the study population. (contd.)

		n	%
Educational level (years)	No formal education	28	4.1
	5-7	117	17.1
	8-12	239	35
	≥ 13	299	43.8
Employment status	Employed	309	45.2
	Unemployed/Housewife	374	54.8
Number of children	1	64	9.4
	2	372	54.4
	≥ 3	247	36.2

* Mean ± Standard deviation (Median)

Table 2: Knowledge about avian influenza of the study population

	Yes		No		Do not know	
	n	%	n	%	n	%
Definition*						
(Contagious infection caused by virus that can affect all species of birds)	351	52.5	318	47.5	0	-
Modes of transmission						
Animal-to-animal	421	61.6	0	-	262	38.4
Animal-to-human	469	68.7	0	-	214	31.3
No human-to-human	632	92.5	0	-	51	7.5
Eating uncooked poultry	551	80.7	75	11	57	8.3
Touching uncooked poultry	556	81.4	74	10.8	53	7.8
Touching uncooked eggs	353	51.7	177	25.9	153	22.4
Touching uncooked frozen poultry	137	20.1	28	4.1	518	75.8
Vehicles of transmission						
Poultry	654	95.7	0	-	29	4.3
Birds	510	74.7	0	-	173	25.3
Risk groups						
Poultry workers	601	88	0	-	82	12
Butchers	376	55.1	0	-	307	44.9
Hunters	210	30.7	0	-	473	69.3
Veterinarians	161	23.6	0	-	522	76.4

Table 3: Logistic regression 1 models results

	Agree		Uncertain		Disagree	
	n	%	n	%	n	%
Use of preventive measures						
Preparing raw poultry and other foods using different knives	482	70.6	123	18	78	11.4
Touching raw poultry with gloves	382	55.9	191	28	110	16.1
Wash hands with water and soap before and after preparing raw poultry	302	44.2	258	37.8	123	18
Cleaning cutting boards after preparing raw poultry	298	43.6	221	32.4	164	24
Using gloves and washing hands with soap before and after touching raw poultry meat	236	34.6	123	18	324	47.4

Table 4. Logistic regression 2 models results

Variable	OR	95% CI	p
Model 1. Knowledge about the main modes of transmission and the animals classified as common vehicles for avian influenza. Log likelihood = -419.33, $\chi^2 = 32.65$ (4 df), $p < 0.0001$			
Level of education	1.31	1.1–1.63	0.015
Employment status	1.34	1.05–1.7	0.023
Number of children	0.78	0.59–1.04	0.08
Age	1.02	0.99–1.04	0.12

Table 5. Logistic regression 3 models results

Variable	OR	95% CI	p
Model 2. Knowledge that wash hands with soap before and after touching raw poultry meat and use of gloves is a hygienic practices to avoid spreading of the avian influenza virus through food.			
Log likelihood = -425.15, $\chi^2 = 30.27$ (5 df), $p < 0.0001$			
Knowledge about the modes of transmission and the animals			
Classified as common vehicles for avian influenza	1.63	1.11–2.39	0.011
Reported interest in receiving further information on avian influenza	1.52	1.09–2.12	0.014
Age	1.03	1.01–1.05	0.041
Health professionals and scientific journals as sources of information	1.35	0.96–1.91	0.08
Employment status	1.24	0.97–1.58	0.08

Table 6. Logistic regression 4 models result

Variable	OR	95% CI	p
Model 3. Wash hands with soap before and after touching raw poultry meat and use of gloves.			
Log likelihood = -423.57, $\chi^2 = 68.66$ (6 df), $p < 0.00001$			
Perception of risk of contraction avian influenza	1.13	1.06–1.19	< 0.0001
Knowledge that wash hands with soap before and after touching raw poultry meat and use of gloves is a hygienic practices to avoid spreading of the avian influenza virus through food	2.42	1.73–3.4	< 0.0001
Health professionals and scientific journals as sources of information	1.65	1.17–2.34	0.004
Gender	1.53	1.08–2.17	0.015

Table 7. Linear regression 5 models results.

Variable	Coeff.	t	p
Model 4. Perception of risk of contraction avian influenza for him/her F (7,661) = 15.56, $p < 0.00001$, $R^2 = 14\%$, adjusted $R^2 = 13\%$			
Level of education	-0.66	-4.85	< 0.0001
Reported interest in receiving further information on avian influenza	-1.07	-4.85	< 0.0001
Knowledge that avian influenza could be transmitted by eating and touching uncooked poultry and eggs	1.07	3.09	0.002
Correct definition of avian influenza	-0.64	-3.06	0.002
Employment status	-0.4	-2.36	0.019
Age	-0.02	-1.09	0.28
Knowledge about the modes of transmission and the animals classified as common vehicles for avian influenza	-0.23	-1.01	0.31
Constant	11.12		

DISCUSSION

The results of the present survey explore a combination of opinions outlining the stated knowledge, attitudes, and self reported behavior patterns concerning avian influenza among a large cross-section of a random sample of an adult population in one region of Bangladesh. Guidelines and recommendations have been developed to prevent and control the spread of avian influenza at source and in responding to the pandemic threat [6,15-19]. Most respondents recognized that their knowledge on preventive measures was fair and indicated the need for increasing that knowledge. This finding is important because it has already been reported that public health education campaigns and general media reports about avian influenza appear to have been effective in reaching those who were at greatest risk of acquiring the disease through contact with backyard poultry [11]. In a study, that examined the perceived risk of avian influenza from live chicken sales involving Hong Kong households, it was documented that one third of those surveyed perceived some risks and almost 50% indicated that their friends had expressed anxieties [10]. The respondents to our questionnaire exhibited higher compliance with recommendations of the WHO to avoid spread of avian influenza through food [6], such as hand washing and using protective gloves, when compared with the findings reported in two previous surveys about food-borne diseases. In one study only 20.8% of respondents claimed that they used protective gloves, 53.9% reported washing hands before and after touching raw and unwrapped food, and 50.4% reported using soap to wash hands [20]. In the other one respectively 68.7% and 66.2% of food handlers routinely washed their hands before and after handling any food [21]. As we hypothesized, in accordance with a previous study, knowledge influences behavior [8]. Our survey indicates a significant association between those who fail to wash hands and to use gloves and the lack of knowledge that these are standard hygienic practices to avoid spreading of the virus through food.

CONCLUSION

In conclusion, the results of this study illustrates that, despite being given information, respondents had no detailed understanding of avian influenza, had a great perceived risk of experiencing avian influenza, and had a low compliance with precautions behaviors.

ACKNOWLEDGEMENTS

We would like to offer our sincere thanks to all individuals who participated in this study. The study would not have been possible without the co-operation of the Schools, and we are indebted to them for their contributions.

Conflict of interest declaration: None.

Funding: This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Ethical clearance: An ethical issue relate to the research involving human subjects was addressed accordingly following the guidelines imposed by the Bangladesh Medical and Research council (BMRC) and the ethical committee of the North South University, Dhaka, Bangladesh.

REFERENCES

1. Mounts AW, Kwong H, Izurieta HS, Ho Y, Au T, Lee M, Buxton Bridges C, Williams SW, Mak KH, Katz JM, Thompson WW, Cox NJ, Fukuda K: Case-control study of risk factors for avian influenza A (H5N1) disease, Hong Kong, 1997. *J Infect Dis* 1999, 180:505-508.
2. Katz JM, Lim W, Buxton Bridges CB, Rowe T, Hu-Primmer J, Lu X, Abernathy RA, Clarke M, Conn L, Kwong H, Lee M, Au G, Ho YY, Mak KH, Cox NJ, Fukuda K: Antibody response in individuals infected with avian influenza A (H5N1) viruses and detection of anti-H5 antibody among household and social contacts. *J Infect Dis* 1999, 180:1763-1770.
3. Buxton Bridges C, Lim W, Hu-Primmer J, Sims L, Fukuda K, Mak KH, Rowe T, Thompson WW, Conn L, Lu X, Cox NJ, Katz JM: Risk of influenza A (H5N1) infection among poultry workers, Hong Kong, 1997-1998. *J Infect Dis* 2002, 185:1005-1010.
4. World Health Organization: Cumulative number of confirmed human cases of avian influenza A/ (H5N1) reported to WHO. [http://www.who.int/csr/disease/avian_influenza/country/cases_table_2007_07_25/en/index.htm] Accessed July 30, 2011.
5. Katz JM: Preparing for the next influenza pandemic. *ASM News* 2004, 70:412-419.

6. World Health Organization: Public health interventions for prevention and control of avian influenza. A manual for improving biosecurity in the food supply chain: focusing on live animal markets. Regional Office for South-East Asia, New Delhi 2009.
7. Imai T, Takahashi K, Hoshuyama T, Hasegawa N, Lim M-K, Koh D: SARS risk perceptions in healthcare workers, Japan. *Emerg Infect Dis* 2005, 11:404-410.
8. Abbate R, Di Giuseppe G, Marinelli P, Angelillo IF: Knowledge, attitudes, and practices of avian influenza, poultry workers, Italy. *Emerg Infect Dis* 2006, 12:1762-1765.
9. Leggat PA, Mills D, Speare R: Hostellers' knowledge of transmission and prevention of avian influenza when travelling abroad. *Travel Med Infect Dis* 2007, 5:53-56.
10. Fielding R, Lam WWT, Ho EYY, Lam TH, Hedley AJ, Leung GM: Avian influenza risk perception, Hong Kong. *Emerg Infect Dis* 2005, 11:677-682.
11. Olsen SJ, Laosiritaworn Y, Pattanasin S, Prapasiri P, Dowell SF: Poultry-handling practices during avian influenza outbreak, Thailand. *Emerg Infect Dis* 2005, 11:1601-1603.
12. Lau JTF, Tsui H, Kim JH, Griffiths S: Perceptions about status and modes of H5N1 transmission and associations with immediate behavioral responses in the Hong Kong general population. *Prev Med* 2006, 43:406-410.
13. Lau JTF, Kim JM, Tsui H, Griffiths S: Perceptions related to human avian influenza and their associations with anticipated psychological and behavioral responses at the onset of outbreak in the Hong Kong Chinese general population. *Am J Infect Control* 2007, 35:38-49.
14. Stata Corporation: Stata Reference Manual Release 8.1 College Station, TX, USA; 2003.
15. World Health Organization: WHO recommendations relating to travelers coming from and going to countries experiencing outbreaks of highly pathogenic H5N1 avian influenza. [http://www.who.int/csr/disease/avian_influenza/travel2005_11_3/en/index.html]. Accessed May 5, 2009.
16. World Health Organization: WHO global influenza preparedness plans. The role of WHO and recommendations for national measures before and during pandemics. [http://www.who.int/csr/resources/publications/influenza/GIP_2005_5Eweb.pdf]. Accessed May 5, 2010.
17. World Health Organization: WHO strategic action plan for pandemic influenza 2006-2007. [http://www.who.int/csr/resources/publications/influenza/WHO_CDS_EPR_GIP_2006_2c.pdf]. Accessed May 6, 2010.
18. Occupational Safety and Health Administration: OSHA guidance update on protecting employees from avian flu (Avian influenza) viruses. [http://www.osha.gov/OshDoc/data_AvianFlu/avian_flu_guidance_english.pdf]. Accessed May 5, 2011.
19. Centers for Disease Control: Interim recommendations for infection control in health-care facilities caring for patients with known or suspected avian influenza. [<http://www.cdc.gov/flu/avian/professional/pdf/infectcontrol.pdf>]. Accessed May 7, 2010.
20. Angelillo IF, Foresta MR, Scozzafava C, Pavia M: Consumers and foodborne diseases: knowledge, attitudes and reported behavior in one region of Italy. *Int J Food Microbiol* 2001, 64:161-166.
21. Angelillo IF, Viggiani NMA, Rizzo L, Bianco A: Food handlers and foodborne diseases: knowledge, attitudes, and reported behavior in Italy. *J Food Prot* 2000, 63:381-385.

Psychological Distress Measurement among Infertile Indian Women Undergoing in-Vitro Fertilization

Lalit Kumar¹, Arvind Kumar², Suneeta Mittal³, G Sumuna⁴, A Bahadur⁵, Leema Maiti⁶

¹Research Assistant, Obg, AIIMS, ²Junior Resident, CCM, AIIMS, ³Prof.& HOD, Obg, AIIMS, ⁴Pool Officer, Obg, AIIMS, ⁵Pool Officer, Obg, AIIMS, ⁶Medical Social Worker, Obg, AIIMS, New Delhi

ABSTRACT

The treatment of infertility by assisted conception is one of the most progressive areas of modern medicine. The overall aim of the present study is to understand and assess the psychological distress among infertile women undergoing In-vitro-fertilization (IVF) cycle.

The subjects of the present study comprise 125 infertile women undergoing IVF cycle during June 2008 - Jan 2010, at ART centre, Deptt. of Obg, AIIMS New Delhi. Beck Depression Inventory and Infertility Questionnaire was used for the assessment of psychological distress. IFQ measures indicate that 24% of the total infertile women have moderate levels of distress. Scores on BDI revealed that 20% of the women face mild level of depression, 26% moderate levels and 10% face severe depression levels. On BDI scores, a positive association is found with age and BDI scores and a negative significant results with education variable was observed. Higher educated infertile women can better cope with stressful situation as compared to less educated infertile women. Psychological distress appears almost at par in case of conceived and non-conceived women. However, sexual dissatisfaction among infertile women on higher side.

Keywords: Assisted Reproductive Technologies, Beck Depression Inventory, In-Vitro-Fertilization, Infertility Questionnaire

INTRODUCTION

Desire for pro-creation is a natural desire for men and women both. Pro-creation is also a legitimate ground for marriage. Infertility so is perceived as a social problem across all the cultures and societies. Infertility though is a common phenomenon for both women are more ostracized than men in every culture. Marriage is a social institution which safeguards the upbringing and education of children. The basic unit of society is family, and family consists of man, wife and their children. Family exercises the control and also gratifies the impulses of men and women¹.

Infertility is a significant issue for women and couples and affects more than 80 million people worldwide². Infertility is an inability of a couple to achieve pregnancy. Primary infertility is inability of a couple to achieve pregnancy for at least one year of trying to do so. Secondary infertility is defined as the failure to conceive following a previous pregnancy despite co-habitation and exposure to pregnancy for at least six months. There are no detailed figures of the extent of infertility prevalence in India but a multi-national study carried out by WHO indicated that India, places the incidence of infertility between 10% and 15 %³. ICMR suggests that approximately 13-19 million couples are likely to be infertile in India at any given time⁴. The WHO's estimates of primary and secondary infertility in India is 3% and 8%, respectively⁵. According to a National Family Health surveys in India, 3.8% of women aged between 40-44 years were reported to be childless⁶. According to a study done by the International Institute for Population Sciences, childlessness among Indian couples has risen by 50% in the 20 year period from 1981-2001⁷. In India, the prevalence of STIs was found to be high among women reporting infertility and pelvic inflammatory disease⁸.

Corresponding author:

Lalit Kumar

Research Assistant, Obg

R.No.- 3076, IIIrd Floor

Department of Obstetrics & Gynaecology

All India Institute of Medical Sciences

Ansari Nagar, New Delhi, India.

Tel- 011-26593221, 26593378, 26588322

Fax No.- 011-26588449

E-mail: lalit1309@yahoo.com

Level of infertility has also increased with the age of marriage risen steadily in the last three decades⁹. Factors contributing to this rise include socio-economic change, particularly improvement in education, urbanization, and expansion of work opportunities outside agriculture¹⁰. Infertility can be an outcome of diverse etiologies exacerbated by severe social isolation, restrictions and stigma. Childbearing is a nature's gift to women but inability to conceive deprives her from motherhood, which lowers her self-esteem. Moreover, bearing a son still remains an important factor in the socio-economic well being of most Indian women¹¹

For past some time, demand for infertility treatment has been increasing because of multiple factors, including late marriages, conscious decision taken for postponement of child bearing in women, the prevalence of sexually transmitted diseases, diminishing numbers of adoptable infants, the development of new techniques for treating infertility, and increased public awareness of available services¹². The treatment of infertility by assisted conception is one of the most progressive areas of modern medicine. Over the past three decades in-vitro fertilization has moved from an experimental procedure to an accepted medical treatment. Women undergoing IVF treatment are often anxious and depressed because of their infertility and the uncertainties of the treatment with which they have to deal¹³. The success rate through IVF is below 30% under the best circumstances. Moreso, it taxes the couple's endurance physically, emotionally and monetarily. Such advanced treatment is expensive and not easily affordable by the majority of Indians. Thus, infertility, though not life threatening, continues to constantly cause intense agony and trauma to the infertile couples.

Some studies have been conducted to assess the psychological distress among infertile women undergoing IVF cycle. By and large, these studies are oriented to western countries and the social ethics do not match with the Indian culture. Moreso, even in the Indian setting such studies are limited to only those women undergoing IVF cycle in highly expensive private setting¹⁴. The present study is undertaken in a public health institution which is not- only cheap and affordable but is practical to be available for public at large.

Aim: The overall aim of the present study is to understand and assess the psychological distress in terms of self-esteem, blame/guilt, sexuality, and

depression among infertile women undergoing IVF cycle.

METHODOLOGY

Subjects: The subjects of the present prospective study comprise 125 infertile women undergoing IVF cycle during June 2008 – Jan 2010, at ART centre, OBG, AIIMS. The Centre is first ever set up in govt tertiary care facility with very nominal charges on "no loss, no profit" basis taking care of drugs & disposable related costs (₹ 60 to 70 thousand per cycle). Couples were contacted by IVF counselor and only willing subjects who were able to complete the questionnaire were recruited. Selection of sample was unbiased, before the intake interview, subjects were informed about its purpose. Informed consent was obtained from all the participants and study was reviewed by the principal investigator.

MEASURES

Beck Depression Inventory-II²²: Developed by Aaron T. Beck is a 21 -item self-rated instrument for measuring the severity of depression. The items are organized according to the severity of the content of the alternative statements, and each item is rated on a 4- point scale ranging from 0-3 in terms of severity. The reliability on coefficient alpha of the BDI-II was found 0.92.

Infertility Questionnaire²¹: Developed by Bernstein J consists of 21 questions to assess psychological dysfunction in terms of self-esteem, blame/guilt, and sexual impairment. These items are organized according to the severity of the content of the alternative statements, and each item was rated on a 5- point scale ranging from 1-5 in terms of severity. Each sub-section was scored separately, with any score greater than three represented distress. Higher score indicates higher level of distress.

RESULT

Analysis was carried out using statistical package-SPSS. The total group was compared in terms of demographic and infertility variables. Psychological measures were assessed to obtain total group scores as well as each variables comparative score. Then scores was assessed and calculated for mean, standard deviations, co-relation and *p* values in conceived and non- conceived group.

Sample Characteristics

Out of a total 125 women, 47.2% belong to the age group of 31-35 years and 0.8 % of the women are > 40 yrs. 52% of the woman possess graduate and above levels of education as shown in Table-1.

Table 1. Respondents Profile

Variables	Percentage scores
Mean age of women 32.45±0.31 yrs	
Age group	Percentage scores
20-25	0.8
26-30	32.8
31-35	47.2
36-40	18.4
Above 40	0.8
Education status	
Primary to secondary levels	25.6%
Graduate and above	74.4%
Infertility type	
Primary	73%
Secondary	26%
Infertility causes	
Tubal factor	45.6%
Male factor	19.2%
PCOD	9%
Endometriosis	8%
Unexplained	17.6%
Stimulation protocol	
Agonist	49.6%
Antagonist	50.4%
IVF Results	
Conceived	15.2%
Non-conceived	88.2%

IFQ and BDI Scores

IFQ measures indicate that 24% of the total infertile women have moderate levels of distress and 2% are

severely distressed. Considering each variable score, it is found that almost 50 % women have mild to moderate levels of distress and 4% are severely affected on self esteem domain. Same pattern exists in blame/ guilt domain, where 24% show mild to moderate level of distress and about 2% have severe level of distress. Lastly on sexuality variable, 24% of the women have mild to moderate distress levels and 3% have severe distress on an overall basis. Scores on BDI revealed that 20% of the women face mild level of depression, 26% moderate levels and 10% face severe depression levels as described in table-2.

Table-2 Total Scores: IFQ & BDI

Distress levels	Self-esteem (%)	Blame/ Guilt (%)	Sexuality (%)	Total Distress Scores (%)
No distress	45.6	88.8	73.6	74.4
Mild to moderate	50.4	9.6	24	24
Severe distress	4	1.6	2.4	1.6
Depression range	Percentage scores			
Minimal	43.2			
Mild	20			
Moderate	26.4			
Severe	10.4			

Comparative Scores between primary and secondary infertility

According to the BDI scores, in secondary-infertility, severe depression is higher i.e. 12% and in primary- infertility it is 9%. On IFQ measure it is also observed that 75% of the women with primary-infertility indicated severe distress level on self-esteem, while in case of secondary- infertility, 69% women have low level of self-esteem and 6% are severely dissatisfied on sexuality domain as shown in table-3.

Table-3 IFQ & BDI Scores (primary & secondary infertility)

Group	No distress			Mild to – moderate			Severe distress			
	Self -esteem	Blame	Sexuality	Self -esteem	Blame	Sexuality	Self -esteem	Blame	Sexuality	
Primary Infertility	43%	55%	2%	90%	8%	1%	75%	23%	1%	
Secondary Infertility	51%	29%	9%	84%	2%	3%	69%	24%	6%	
Depression range	Primary infertility					Secondary infertility				
Minimal	44%					39%				
Mild	17%					30%				
Moderate	29%					18%				
Severe	9%					12%				

Inter- comparison of scores between conceived & non-conceived groups

We have further analyzed and compared scores on psychological measures (IFQ & BDI) between

conceived and non-conceived group. Uni-variate analysis indicates that there were no clinical and

statistical significant differences observed in conceived and non- conceived groups. A Positive association of age was seen with self-esteem, blame/guilt domains and also with total IFQ scores. Further it was observed

that a negative association was found between age and IFQ sexuality and there was a negative association of age with total BDI score observed in conceived group.

Table 4: Bivariate analyses for conceived and non-conceived group

	Conceived				Non-Conceived			
	Age		Education		Age		Education	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Self esteem	0.30	0.20	0.49	0.84	-0.02	0.80	-0.17	.08
Blame/guilty	0.04	0.87	0.04	0.87	-0.63	0.52	-0.27	0.006
Sexuality	-0.065	0.79	0.25	0.31	-0.04	0.71	-0.13	0.18
Total IFQ scores	0.137	0.57	0.14	0.57	-0.05	0.63	0.05	0.61
BDI scores	-.20	0.41	-0.41	0.79	0.27	0.79	-0.28	0.04

It was observed that a positive association persists between education and IFQ domains, self-esteem, blame/guilt, and sexuality and also with total distress

score. On total BDI scores, negative association was observed with no statistical significance (Table-5) in IVF conceived group.

Table 5: Univariate analyses of IFQ & BDI Scores

Variable	Conceived	Non-conceived	P-value
	Mean (SD)		
Age	33.15(2.5)	32.42(3.62)	0.39
Self esteem	26.05(5.98)	24.94 (4.29)	0.33
Blame/guilty	9.95(4.2)	10.35(3.78)	0.67
Sexuality	22.47(4.97)	22.71(3.75)	0.81
Total IFQ scores	58.47(12.28)	58.01 (8.41)	0.84
BDI scores	17.15 (10.19)	15.49(10.84)	0.53

In non-conceived group, most of the domains on IFQ measure indicated a negative association with education and age variables. There was negative association of self esteem, blame/guilty), sexuality and total distress score with age but without statistically significant association. On BDI scores, a positive association is found with age and BDI scores.

In non-conceived group, the association within IFQ variables- self esteem, and sexuality was negative and statistically not significant but on blame/guilt domain and BDI score showed negative and statistical significant results with education variable.

DISCUSSION

The purpose of this study was to assess psychological distress in terms of self-esteem, blame/guilt, sexuality, and depression among women belonging to different socio-economic and educational backgrounds, undergoing In Vitro Fertilization (IVF) cycle. Population in developed, developing and underdeveloped countries hold different attitudes

regarding infertility. Motherhood is of great social significance and infertility is perceived as a threat to men’s procreativity and the continuity of the lineage. However the inability to conceive children is experienced as a stressful situation by individuals and couples all around the world. Past researches have indicated that the infertile women exhibited significantly higher level of psychopathology in the form of tension, hostility, anxiety, depression self blame, and suicidal ideation¹⁵. A few other studies have reported that about half of women felt that their inability to conceive had serious negative effects on their lives, particularly their sexual relations¹⁶. The findings of the present study on sexual dissatisfaction are supported by previous studies that by and large women reported greater sexual dissatisfaction. It has been observed in the study that increasing age has significant effect on depression and distress- higher the age, greater the depression and psychological distress (Tabe-4). This part of finding is also supported by several earlier research findings which have observed that older women have more depressive symptoms than younger women¹⁷.

In our study, higher education level has appeared as buffer for infertile woman. Women with high school or above education levels have statistically significant lesser scores on blame/guilt and depression scores and as such are also supported by previous studies¹⁸. Past research investigation conducted among infertile women also supports that higher education level has a significant and negative relation with depression and anxiety. Moreso, and other investigators have also revealed the fact that education and job, other than maternity is the lone gate, leading women to joyful aspects of their life¹⁹. Thus education plays a considerable role in decreasing their depression

Although ARTs provides hope to the infertile to bear a biological child, but a number of issues remain to be addressed. ART services infact are not usually available at most of the public health institutions, while these are increasingly being offered in private clinics. As services are expensive and highly commercialized, the high cost of ART treatment tends to create a situation of exploitation of childless couples and exacerbates their vulnerability. Inconsideration, though the Tenth Five year Plan (2000-07) has emphasized for providing greater access to essential examination, investigation, management and counseling services for infertility, but such service are in practice rarely available for the public at large²⁰. As part of remedial measures, the present study recommends for a higher level of psychosocial counseling among infertile women. Such a re-enforced step certainly will help the affected women to face trauma and social stigma against infertility and can act as a booster for their self-esteem.

The present study concludes that - higher educated infertile women can better cope with stressful situation as compared to less educated infertile women. Childbearing in Indian patriarchal society is synonymous to women's identity and increasing age reduces the chances of conception. Our finding supports the above societal and biological norm as we observed increased level of psychological distress in the older women respondents. Psychological distress appears almost at par in case of conceived and non-conceived women. However, sexual dissatisfaction among infertile women is on higher side it therefore necessitates special focus in counseling be given for their sexual concern/health. In order to make the present on-going ART program more effective, the study strongly suggests for adopting a much more comprehensive psychological evaluation approach in general and a far better improvised counseling for infertile women undergoing IVF cycle.

REFERENCE:

1. Family Disorganizations Social Problems (1992). Dr. Kumar
2. Daar AS, Merali Z (2002) Infertility and social suffering: The case of ART in developing countries. In: Vayens E, Rowe PJ, Griffin PD (eds). Current practices and controversies in assisted reproduction. Geneva: WHO, pp. 91-115.
3. P. Rowe and EM Vikhlyeva (1988): World Health Organization: Geneva
4. ICMR (2005) Guideline for Accreditation, Supervision and Regulation of ART Clinics in India.
5. WHO (1984) Report: Meeting on prevention of infertility at the primary health care level. Geneva: World Health Organization.
6. International Institute of Population Sciences (IIPS- 2000) National Family Health Survey 1998-99, India Mumbai.
7. Hindustan Times 8th Feb 2010. India: Infertility a growing problem.
8. Kushtsagi P, Rao K, Abraham E et al (1991) Prevalence of antibodies to Chlamydia Trachomatis among infertile couples. Journal of Obstetrics and Gynecology of India. 41: 671-3.
9. International Institute of Population Studies (IIPS) 2000, National Family Health Survey 1998-99, Mumbai.
10. Das NP, Dey D 1998 Female age at marriage in India: trends and determinants. Demography India 27: 91-115.
11. Das Gupta M et al (1998) Women's health in India, risk and vulnerability. Mumbai: Oxford University Press.
12. Hirsch MB, Moher D (1987) Characteristics of infertile women in the United state and their use of infertility service. Fertil Steril: 1987; 47:618-5.
13. Mahlstedt (1985), The psychological component of infertility. Fertil. Steril, 43: 335-346.
14. Anjali Widge & John Cleland (2009) The public sector's role in infertility management in India. Health Policy and Planning 2009, 1-8.
15. Zahid, M.A. (2004). Coping with infertility among Kuwaiti women: Cultural Perspective. International Journal of Social Psychology, 50, 294-300.
16. Van Zyl, J.A. (1987). Sex and infertility, part II: Influence of psychogenic factor and psychosexual problems. S. Afr. Med J., 72, 485-487.
17. L. Repokari et al (2005) The impact of successful assisted reproduction treatment on female and male mental health during transition to parenthood: a prospective controlled study.

- Human Reproduction vol. 20, No11 pp. 3238-3247, 2005.
18. Christopher et al (1999) The fertility problem inventory: measuring perceived infertility-related stress. *Fertility and Sterility*; 70:1; 54-62.
 19. Fatemeh Ramzanzadeh et al (2004) A survey of relationship between anxiety, depression and duration of infertility. *BMC Women's Health* 2004, 4-9
 20. Planning Commission Government of India (2002) Tenth five year plan 2002-07 New Delhi.
 21. Bernstein J, Potts N, Matlox JH (1985) Assessment of psychological dysfunction associated with infertility. *JOGNN* 1985; (suppl): 635-65.
 22. Beck AT (1996) *The Psychological Corporation*, Harcourt Brace & Company, San Antonio, USA.

Psychological Assessment of Primiparous Women During the Ante & Postnatal Period a Longitudinal Study of 3 Years

Leema¹, Rohini Sehgal², Suneeta Mittal³, Shobha⁴, VL Jindal⁵, Arvind Kumar⁶, Lalit⁷

¹Medical Social Worker, Department of OBG, AIIMS, New Delhi, ²Scientist Grade II, Department of OBG AIIMS,

³Professor and Head, Department of OBG AIIMS, ⁴Medical Social Worker, Department of OBG, AIIMS, ⁵Medical Scientist Group B, Department of OBG, AIIMS, ⁶Program Officer, Indira Gandhi National Open University, New Delhi, ⁷Counsellor

ABSTRACT

Mental health problems during the pregnancy is very common which needs to be identified and should be treated to improve the functional capacity of new mothers. 250 primiparous young women in their reproductive age group were selected for the study out of which 239 women were analysed for the first follow up schedule and 226 women at 6 weeks postpartum. Most of the study group subjects are graduate/postgraduate and belonged to the upper middle class income group (according to Kuppaswami's socioeconomic status) and non-working. Hamilton Depression Rating and Beck Anxiety Inventory measures were used for depression and anxiety measurement for the subjects. Overall anxiety and depression level of new mothers were low since the base line registration i.e.13-16 weeks of pregnancy and reduces over the time. Study shows that new mothers are anxious about the baby weight irrespective of gender of the neonates. Our study concludes that educated women are emancipated to express their emotional and mental conflicts during the important life transitions such as pregnancy and child birth. A protective environment, adequate social support and cost effective medical treatment certainly reduces the perinatal anxiety and depression. Summing up it is evident that nature and nurture both contribute to life span development of human being.

Keywords: Neonatal intensive care unit, Hamilton Depression Rating Scale, Beck Anxiety Inventory, Lost to Follow up, Primiparous Department of Obstetrics Gynaecology, Indian Council of Medical Research, All India Institute of Medical Sciences

INTRODUCTION

The process of pregnancy is the concern of biology, psychology and social science. ¹ The mother –child identification plays a great part in the whole process of pregnancy. ² Many physical and emotional changes occur to a woman during pregnancy and after delivery. ³ Mothers expecting for the first time go through a very crucial stage in their lives. Conception brings emotional, physical and environmental changes in their lives which increase the level of anxiety and can cause relatively silent depression. In pregnancy a normally pre-formed somatic phenomenon becomes the immediate expression of definite psychic contents. ⁴ Between 15&20% of all women experience some form of pregnancy related depression or anxiety. ⁵ Prenatal depression affects between 10 & 20% of woman. Symptom of prenatal depression include: sleep problems, fatigue, appetite disturbances, anxiety etc. Postpartum depression affects 10to20% of new mothers with symptoms like persistent sadness, fatigue, guilt, sleep and or appetite disturbances, irritability /mood changes lack of interest in the baby,

family activities, anxiety, palpitations, numbness and hyperventilation. ⁶

Some factors believed to contribute to perinatal depression are: the dramatic change in hormone levels occurring during pregnancy and postpartum, sleep deprivation, psychological stresses of new motherhood etc⁷ It is especially important to identify depression during their pregnancy⁸ as untreated maternal depression negatively affects an infant's overall development, and it can also negatively impact mental health and behaviour of children.⁹ There is increasing evidence that common mental health problems, including depression and anxiety, are two to three times more prevalent among pregnant women and mothers of infants in resource constrained settings than in high-income countries. Depression reduces caregivers' sensitivity and responsiveness at a time when children are entirely dependent on them. According to WHO Mental health problems are one of the most prevalent and severe but neglected complications of pregnancy . One in 3 to one in 5 pregnant women &mothers of new born in developing

countries have significant mental health problems of depression & anxiety as the most common.^{10,11} Cohort studies from both India & Pakistan provided evidence that maternal depression is an independent risk factor for poor infant growth.¹² The hypothesis of the study was that mental health problems during pregnancy is very common which needs to be identified and treated to improve their functional capacity.

AIM

Overall aim of this study is to assess & evaluate the psychological status of primiparous young Indian women during perinatal period .

METHODOLOGY

This study is a part of Indian Council of Medical Research (ICMR) Task force study. 250 healthy married primigravida women with (13-16) weeks of pregnancy attending the antenatal clinic in the department of OBG at AIIMS, willing to participate and ready to adhere the follow up schedules were enrolled during the period of December 2007-March 2010. Subject inclusion criteria for enrolment was 1st-age ranging from 20-30 years, 2nd -antenatal women in second trimester (13-16) weeks of pregnancy 3rd -primigravida with no associated physical illness and no past h/o psychological trauma and treatment. Medical officers had provided counselling, & antenatal check up to the subjects. Baseline proforma comprised of information upon demographic profile according to Kuppuswami Socioeconomic Status scale (Updating 2007), menstrual and obstetrics history and diet related queries. For psychological evaluation Hamilton- Depression Rating Scale & Beck Anxiety Inventory measures were used. There were two follow up related to the study (besides routine antenatal check-up) first after the base line visit with and second at 6 weeks postpartum. Subjects are free to communicate telephonically with the medical social workers of the study group at any point of time. Cost of medical treatment in AIIMS is affordable & subsidized globally (Wikipedia free encyclopaedia) therefore our study subjects got low- cost treatment. Personal and clinical data of the participants were kept confidential and there was no violation of protocol during and after the study.

MEASURES

Hamilton Depression Rating Scale¹³

The total Hamilton Depression (HAM-D) Rating scale provides an indication of depression and over time provides a valuable guide to progressive method. . In general the higher the total scores the more the severe the depression. (10-13 mild; 14-17 mild to moderate; >17 moderate to severe.)

Kuppuswami Socioeconomic Scale¹⁴

Kuppuswami scale is widely used to measure the socio-economic status of an individual in urban community based on three variables namely education, occupation and income.

Beck anxiety inventory¹⁵

The Beck Anxiety Inventory (BAI), created by Dr. Aaron T Beck, is a twenty-one question multiple choice self-report that is one of the most widely used instruments for measuring and severity of depression. The questionnaire is designed for adults age 17-80. A grand sum between 0-21 indicates very low anxiety, between 22-35 indicates moderate anxiety, >36 is a potential cause for concern.

RESULT

A total 250 eligible women who gave their written consent for the study were enrolled. All data were recorded in standard forms and statistical analysis performed using SPSS-15. Comparisons were made using the chi2 test for categorical data. For all comparisons pearsons- correlation was used.

Table 1: Respondents demographic profile

Age	Frequency	Percentage
20-25 yrs	175	70%
26-30 yrs	75	30%
Education		
Illiterate	4	1.6%
Primary School	5	2.0%
Middle School	26	10.4%
High School	40	16.0%
Post High School	54	21.6%
Graduate/Postgraduate	118	46.8%
Professional	3	1.2%
Occupation		
Unemployed	187	74.8%
Unskilled	1	0.4%
Semi Skilled	4	1.6%
Skilled Worker	15	6.0%
Clerical, Shop Owner	20	8.0%
Semi Profession	19	7.6%
Profession	1	0.4%
Socioeconomic status (Kuppuswami scale)		
Upper Class	6	2.4%
Upper Middle	144	57.6%
Lower Middle	91	36.4%
Upper Lower	9	3.6%

Out of total 250 eligible women eleven withdrew their participation after the baseline registration . another 24 women refused to come at 6 weeks postpartum visit.

Table 2: Obstetrics profile of respondents*

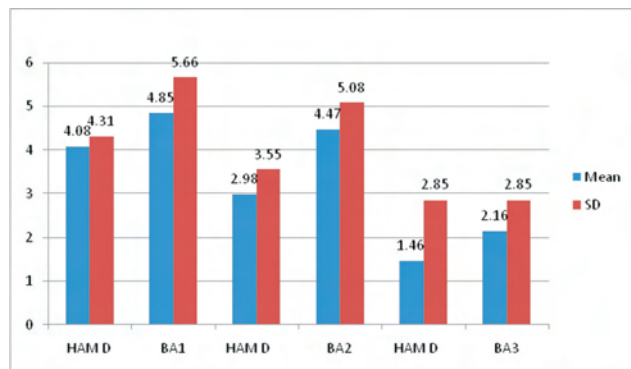
Sex of baby	Frequency	Percentage
Male	118	47.2%
Female	112	44.8%
Lost follow up	20	8%
Mode of Delivery		
Vaginal	170	68.4%
Caesarean	60	24%
Lost follow up	19	7.6%
Maternal death (pre-delivery accidental)	1	0.4%
Birth weight		
<2.5kg	77	30.8%
>2.5kg	153	61.2%
Lost follow up	20	8%

*Analysis of Obstetrics profile of 230 respondents were done as four lost to follow up women in their third visit at 6 weeks postpartum, contacted telephonically.

All 250 mothers were primigravida. Out of 250 deliveries, 230 (20 lost follow up) neonatal births were registered. Two neonatal deaths occurred, one in NICU due to septic shock another one still birth due to multiple congenital anomalies. One maternal death reported for a road accident after her baseline registration in the study.

Table 3: Comparison of Hamilton –Depression scale and Beck Anxiety Inventory score on 3 visits of participants.

	(14-16) weeks Pregnancy N=250		(28-30) weeks Pregnancy N=239		6 weeks Post Partum N=226	
	Ham-D	BAI	Ham D	BA2	Ham D	BA3
Mean	4.08	4.85	2.98	4.47	1.46	2.16
SD	4.31	5.66	3.55	5.08	2.85	2.85



Mean &SD values of participants on their base line registration for Hamilton depression scale & Beck Anxiety Inventory indicates the mild level of anxiety, a significant and steady reduction is observed over the time in the respective scores for both the measures.

Table 4: Bivariate analysis of Demographic profile of respondents Vs Hamilton Depression Rating Scale

	Base line visit n=250 (13-16) weeks		(28-30) weeks n=239		At 6 weeks post partum	
	Pearsons coefficient	P value	Pearsons coefficient	P value	Pearsons coefficient	P value
Age	10.22	.924	44.85	.99	15.98	.192
Education	52.83	.035	18.03	.958	41.058	.016
Occupation	46.22	.118	27.187	.613	28.99	.220
Socioeconomic status	44.85	.995	41.109	.970	32.69	.995

We have analysed and compared scores of Ham-D Scale measures with the demographic profile of the respondents in both trimesters & at 6 weeks postpartum, no statistical association was found among age, occupation & socioeconomic status of

respondents with Ham-D values. A positive association is observed with education in base line Ham-D value & also with the score of postpartum period .

Table-5: Bivariate analysis of Demographic Profile of Respondents Vs Beck Anxiety Inventory Scale

	Base line registration n=250(13-16) weeks		(28-30) weeks of pregnancy n=239		At 6 weeks post partum n=224	
	Pearsons coefficient	P value	Pearsons coefficient	P value	Pearsons coefficient	P value
Age	22.07	.595	16.55	.676	6.44	.892
Education	48.88	.518	52.7	.086	22.06	.576
Occupation	43.125	.744	53.35	.054	22.04	.566
Socioeconomic status	22.7	.595	66.31	.864	45.45	.578

In bivariate analysis of various demographic variables with BDI score in both trimesters and at 6 weeks postpartum period, a non significant statistical trend was observed.

Table 6: Multivariate analysis for Ham-D Score at 6 weeks postpartum & Mode of delivery, Birth weight & Sex of infants

	Mode of Delivery		Baby weight		Sex of infants	
	Pearsons coefficient	P value	Pearsons coefficient	P value	Pearsons coefficient	P value
N=226 mean=1.46	29.18	.213	24.21	.086	11.02	.526

Table 7: Multivariate analysis for BAI score at 6 weeks postpartum & Mode of delivery, Birth weight & Sex of infants

	Mode of Delivery		Baby weight		Sex of infants	
	Pearsons coefficient	P value	Pearsons coefficient	P value	Pearsons coefficient values	P value
N=226 mean=2.16	23.42	.49	85.54	.015	13.48	.335

In multivariate analysis for values of Ham-D & BAI at 6 weeks postpartum with obstetrics profiles of respondents a positive association although not significant appeared with baby birth weight. Other variables seem to have no statistical significance with the scores of any of the measures.

DISCUSSION

As the women goes through major transition of becoming a mother for the first time depression can be a distressing companion for her.¹⁶ Depression during the perinatal period has devastating consequences not only for the women experiencing it but also for the women’s children and family.¹⁷ However, our results show in the base line registration, of the participants the depression and anxiety levels are mild and it reduces over the time. There are different yet interrelated facts observed from the result. Our participant mothers are married primigravida women, to them procreation is a legitimate ground to

hold the marriage.¹⁸ Childbearing in Indian patriarchal society is synonymous to women’s identity.¹⁹ Low level of anxiety indicates the desire for normal conception in the participants post marriage as motherhood is of great significance .As infertility is stigmatised, women have a lot of pressure to produce a biological child to survive in the society.²⁰ Another significant finding in our study was that majority of our subjects are non-working women and study indicates n.s.p value in terms of age and occupation. Previous studies have showed that nonworking married women are better adjusted in their married life then working married women. ²¹ In terms of socioeconomic status no statistical significance was established . Our experiences have shown that women of lower socioeconomic status are more likely to develop depression. This makes sense, considering that the more sources of stress in women’s life the more likely she is to develop depression.²² Most participants in our study belonged to upper middle class family and at

the same time were nonworking, which had a positive impact to reduce the depressive symptoms during the antenatal period.

The stigma of having a mental illness is huge in the south Asian community and it keeps women away from getting the care they need.²³ In our study 46.8% subjects were graduate /postgraduate & it appears higher education levels are buffer to the depressive symptoms in women of the study. Reason could be that educated women are able to communicate their anxiety and depression in a better way and willing to share their depressing impulses and pre-existing emotional tensions to medical experts who can advice them properly about the psychic & somatic process of pregnancy.

Additional analysis of demographic profile in relation to the depression and anxiety quotient revealed no relative negative influence on mental health to the participants of the study. Postpartum depression is a subtype of major depression with onset & within 6 months after child birth. (American Psychiatric Association 2000) Published estimates of the postpartum period range widely from 5%to>25% of new mothers depending on the timing of the assessment and population characteristics.²⁴ In our data postpartum depression and anxiety level are significantly low then many past researches. As stress and anxiety are often regarded as normative in childbearing. This non-translatibility is reflected by the fact that while it is theoretically possible to diagnose antenatal anxiety or postnatal anxiety disorders, such diagnosis is rarely made in clinical reality.²⁵

One of the facts in our study was that a positive association of the postpartum anxiety level exist with baby birth weight without any gender bias. India has a two child norm policy since 1992(National Development Council's Committee on population) our study deals with primigravidas only which lowered the potential risk factors of postpartum depression where as previous studies with Indian women (Patel Rodrigues & De Souza, 2002) found that carrying a female baby was significantly associated with developing postpartum depression. Culture plays a significant role in post partum depression. (Bina, Rena The Impact of cultural factors upon postpartum Depression, A literature review) also adequate social support, reduces the risk of depression during pregnancy.²⁶ Cultural aspect, societal attitude & constitutional policy seems to have a positive impact on the participants of the study group .

Our study has several limitations so the recommendation should be considered with caution. Psychological measure may not be adequate and selection procedure might be biased.

The study concludes that women's education can be an effective& essential tool for psychological assessment. Educated women are emancipated to express their emotional and mental conflicts during the important life transitions such as pregnancy & child birth. A protective environment, adequate social support and cost effective medical facilities during pregnancy in primiparous women certainly reduces the perinatal anxiety and depression.

REFERENCES

1. The Psychology of woman vol. 2 Motherhood Helene Deutsch p. 127, 136 chapter6 Grune&Stratton New York 1945
2. Perinatal Depression-A Resource from the Mental Health Association of Maryland Nov. 2010
3. Perinatal and Postpartum Depression A Top Priority at Annual Conference of Obst &Gynae (ACOG)May 7 2010 p1-2
4. Report of a UNFPA/WHO International Meeting the Interface between Reproductive Health & Mental Health Hanoi Jene 21-23 2002
5. Maternal Depression and Infant Growth Review of Recent Evident printed issue 34 p. 36 IFE
6. Adapted from Hedling and Viewweg, The Hamilton Rating Scale for Depression Journal of Operational Psychiatry 1974;102:149-165
7. Kuppuswamy's socioeconomic status scale- Updating for 2007 Kumar N, Shekhar C, KunduAS. (In JP Press)
8. www.kevinglasses.com/resources/Beck Anxiety Inventory Wikipedia, the free encyclopedia
9. Perinatal Depression :A Randomized Controlled Trial of an Antenatal Education Intervention for Primiparas Barbara A Hayes RN, DNSc Reinhold Muller Phd.. Birth vol. 28 issue 1 p-28-35 March 2001
10. Perinatal Depression: Prevalance, Screening Accuracy and Screening Outcome Authors Gaynes BN, Gavin N.. AHRQ no. 119
11. Family Disorganization Social Problem(1992)Dr Kumar
12. Looking Back, Looking Forward A profile of sexual &reproductive health in India Population Council New Delhi Jan 2004

13. Conception and Indian Women Pubmed Widge A, London School of Hygiene & Tropical Medicine London U. N. Patient Education Coches 2005 Dec, 59(3) 226-33
14. Internet Journal of Medicine Update by Hina Ahmed Hashmi. . . Marital Adjustment Stress and Depression among Working and Nonworking Married Jan 2007 Women p1
15. www.helpguide.org/mental/depression_women Depression in Women: Causes; Symptoms & Treatment Melinda Smith MA & Jackline Jal Phd Reviewed Jeane Segal Phd- Nov 2010
16. Postpartum Depression Among South Asian Women posted by Sundari in Health 23/09/2008 p-2
17. Antepartum Depression Symptomatology is Associated with Adverse Obstetric and Neonatal Outcome Tony K. H. Chung. Psychosomatic medicine 63:830-834(2001)
18. Effect of a Participatory Intervention with Women's Groups on Birth Outcomes and Maternal Depression in Jharkhand and Orissa, India Dr Prasantha Tripathi Msc. . . The Lancet vol. 375 issue 9721 p118-1192.

A Study on Nutritional and Immunization Status of Under Five Children in an Urban Slum of Bhubaneswar, Odisha

Lipilekha Patnaik¹, Sumitra Pattanaik², E Venkata Rao², Sibabratta Patnaik³, Trilochan Sahu⁴

¹Assistant Professor, Department of Community Medicine, ²Associate Professor, IMS & SUM Hospital, ³Senior Resident, Dept. of Pediatrics, KIMS, Bhubaneswar, ⁴Professor, Department of Community Medicine, IMS & SUM Hospital, Bhubaneswar

ABSTRACT

Background: According to National Family Health Survey - 3 (NFHS-3, 2005-2006), in India, percentage of children (under 3 years) who are stunted are 38 percent, wasted are 19 percent, and underweight are 46 percent.

Objectives: To assess the nutritional and immunization status among under 5 children and to identify the associated factors.

Methodology: In a community based cross sectional survey conducted during May - June 2011 in an urban slum area of Bhubaneswar, a total of 124 children were included. Data on age, sex, family size, socio economic status, per capita monthly income, no. of siblings, H/O passing worms etc. were collected. Their height and weight were recorded along with assessment of immunization status.

Results: It was found that 28.2% of under 5 children were low weight for age. Stunting and wasting was found in 23.4% and 21.8% of children respectively. Under nutrition was more among girls (35.18%) and children of 3-5 years age (29.41%). Under nutrition was found significantly higher among children of illiterate mother (P=0.026), working mother (P=0.011), low social class (P=0.015), children with more no. of siblings (P=0.046) and higher birth order (P=0.023). The other co-morbidities observed were worm infestation (8.06%), anaemia (8.06%), diarrhoea (5.64%) and vitamin A deficiency (1.61%). 43.33% of under 5 children were completely immunized at one year of age and 41.11% were partially immunized.

Conclusion: Health and nutritional education and behaviour change communication activities can be undertaken in the slum for early recognition of under-nutrition.

Keywords: *Low Weight for Age, Under Nutrition, Stunting, Wasting*

INTRODUCTION

The problem of malnutrition and infection is common in the first five years of life. Prolonged malnutrition may affect the child's growth and he may not be able to reach his optimum potential.¹ In India, 20% of under-5 children suffer from wasting due to acute under-nutrition. More than 1/3rd of the world's children who are wasted live in India.² According to National Family Health Survey - 3 (NFHS-3, 2005-2006), in India percentage of children (under 3 years) who are stunted are 38 percent, wasted are 19 percent, and underweight are 46 percent.³ A child with malnutrition is at a higher risk of contracting diseases and death.⁴ Children who survive may enter the vicious cycle of recurring illness with irreversible

damage to growth, cognitive development, school performance and finally compromised productivity as an adult.

The urban population is rapidly expanding because of large-scale migration to cities for a possible better life. The cities and towns are also expanding but the sheer volume of people compromises the ability of the city to meet their basic needs.⁵ As most of the slum dwellers are illiterate, neglected and live in a comprised living condition, most of their children are malnourished and suffer from some form of morbidities. Keeping this in view, the present study was undertaken with the objectives to assess the nutritional status of under 5 children and to identify the factors underlying it.

MATERIAL AND METHOD

A community-based cross-sectional survey was conducted during May - June 2011 in an urban slum area of Bhubaneswar in the field practice area of Department of Community Medicine. As per records of Anganwadi centre and survey registers of Urban Health & Training Centre, the total no. of slum households present near Baramunda were 628 with a population of 2978 and under 5 population of 148. It was decided to consider all children under 5 years of age in the urban slum as the study subjects. By a house-to-house visit, the families having children less than 5 years were identified with the help of social worker of UHTC. Locked houses during the survey period and the children gone to their relative's house were excluded from the study. The children whose mothers were reluctant to participate were excluded from the study. Data was collected from 124 under 5 children and 115 mothers (respondents).

Data on age, sex, family size, socio economic status, per capita monthly income, no. of siblings, dietary habits and h/o passing worms etc. were collected near the house through a pre-designed and pre-tested questionnaire survey. Subsequently, they were motivated to come to the urban health centre for further examination and investigations. Necessary investigations like Hb%, stool, urine examinations were done in urban health & training centre. Immunization status of all children was assessed by verifying the history, presence of BCG scar and the immunization card. Weight was measured using SAULTER England spring balance for children who could not stand and Electronic weighing machine was used for older children. Height was measured without shoes to the nearest 0.1 cm using calibrated STADIOMETER. For children less than 2 years of age an INFANTOMETER was used to measure the height. A non-stretchable, flexible fiber tape was used to measure the mid arm circumference. Nutritional status was assessed by plotting the values in the growth chart developed by WHO i.e. Weight for age, Height for age, Weight for Height, mid arm circumference for age.⁶ Signs for nutritional deficiencies like night blindness, angular stomatitis, cheliosis, spongy bleeding gum, palmar pallor etc. were looked for in all children.

A child is said to be completely immunized if all the doses of the 6 antigens for primary immunization

has been administered by completion of one year of age. If none of these vaccines has been administered, then the child is termed as un-immunized (zero dose of OPV/ Pulse polio immunization/optional vaccines are excluded for evaluating the immunization status). Non-completion of the scheduled doses makes the child partially immunized.

Data were analyzed using SPSS software. Outcome variables were expressed as percentage and the proportions were compared using chi-square test of proportions at $p < 0.05$ significance level.

RESULTS

All the mothers (n=115) of 124 under five children of the slum were interviewed. The number of children in the age groups less than 1 year, 1-3yrs and 3-5 year were 27.4%, 31.5% and 41.1% respectively. Majorities (56.5%) were male with 43.5% of female children. Out of 124 study subjects, 44.35% were socially and educationally backward class (SEBC), 39.52% belong to general category, 11.29% were schedule caste and 4.84% were scheduled tribe. All of them were Hindus by religion.

In the present study, father of one child was dead. Out of 114 persons (fathers of 123 children), 84.21% were literate with 28.07% educated up to primary level, 51.75% up to secondary level and 4.39% had above secondary level of education. Out of 115 women (mothers of 124 under 5 children) 40% women were illiterate with 33.91% educated up to primary level, 22.61% up to secondary level and 3.48% had above secondary level of education. Majority (58.77%) of fathers of under 5 children were labourers followed by 14.03% were skilled workers. Majority (87.83%) of women (mothers of under 5 children) were house wives, 8.69% were labourers or unskilled workers.

Economic status of the family was classified as low, middle & upper social class according to Prasad's classification. Out of 115 families, 53.91% belonged to low and 46.09% belonged to middle. None of the families belonged to the upper social class.

Out of 115 families, 92.17% families were nuclear families. Out of 124 children, 46.77% children were having one sibling, 30.65% children have no sibling. 16.13% children were having 2 and 6.45% children were having more than 2 siblings.

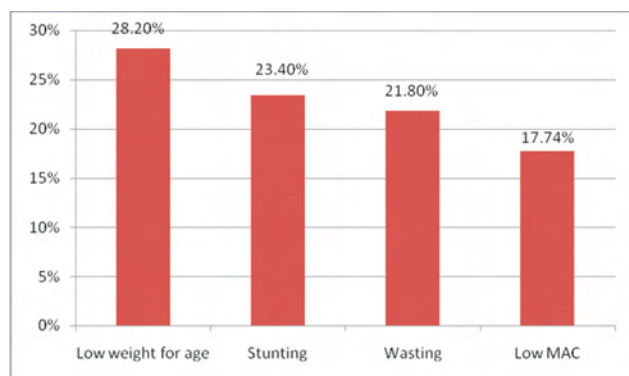


Fig 1: Nutritional status of Children

It was found that 28.2% under 5 children were low weight for age. Stunting and wasting found in 23.4% and 21.8% children respectively. Mid arm circumference was below normal in 17.74% children. No child in the slum was found higher than 97th percentiles on the WHO charts.

Table 1: Weight for age and associated factors

Factors		Total Children	Children with low wt. for age	Remarks
Age	< 1yr	34	9 (26.47%)	$\chi^2=0.087$ $P=0.957$
	1-3 yr	39	11 (28.2%)	
	3-5 yr	51	15 (29.41%)	
Sex	Male	70	16 (22.86%)	$\chi^2=2.287$ $P=0.130$
	Female	54	19 (35.18%)	
Mother's education	Illiterate	48	19 (41.3%)	$\chi^2=4.987$ $P=0.026$
	Literate	76	16 (21.05%)	
Mother' occupation	HW	110	27 (24.54%)	$\chi^2=6.514$ $P=0.011$
	Working	14	8 (57.14%)	
Social class	Low	67	25 (37.31%)	$\chi^2=5.942$ $P=0.015$
	Middle	57	10 (17.54%)	
Type of family	Nuclear	114	31 (27.19%)	$\chi^2=0.744$ $P=0.388$
	Joint	10	(40%)	
No of siblings	0	38	5 (13.16%)	$\chi^2=6.155$ $P=0.046$
	1	58	20 (34.48%)	
	>1	28	10 (35.71%)	
Birth order	First	36	5 (13.88%)	$\chi^2=5.147$ $P=0.023$
	More	88	30 (34.09%)	

Under nutrition (low weight for age) was 35.18% in girls and 22.86% in boys. Higher prevalence i.e. 29.41% was found in 3-5 years age group but no statistical difference was found between gender and age groups.

Higher prevalence of under-nutrition was found in children of illiterate mother (41.3%), working mother (57.14%), low social class (37.31%), joint family (40%) and those with one or more siblings (35.71%) and higher birth order (34.09%). Under nutrition was found significantly higher in children with illiterate mother ($P=0.026$), working mother ($P=0.011$), low social class ($P=0.015$), children with more no. of siblings ($P=0.046$) and higher birth order ($P=0.023$). The prevalence is higher in children of joint families but no significant difference was observed.

The other co-morbidities observed were worm infestation (8.06%), anaemia (8.06%) and diarrhoea (5.64%) and vitamin A deficiency signs (1.61%) of children.

Table 2: Immunization status of Children

Immunization Status	Number (Percentage)
Above 1 year children (n=90)	
Completely Immunized	39 (43.33)
Partially Immunized	37 (41.11)
Non Immunized	14 (15.56)
Less than 1 year children (n=34)	
Completed as per age	19 (55.88)
Not completed as per age	15 (44.12)

It was observed in that 43.33% of the children were completely immunized at one year of age and 41.11% were partially immunized and 15.56% were un-immunized. In children less than 1 year of age children it was found that (34) 55.58% were immunized as per their age/immunization schedule and 44.12% were not immunized as per schedule.

DISCUSSION

In the present study it was found that 28.2% under five children were low weight for age. Stunting and wasting found in 23.4% and 21.8% children respectively. Mid arm circumference was low in 17.74% of children. In a study by Mukhopadhyay DK and Biswas AB (2011), prevalence of stunting, wasting, underweight were 50.0%, 20.2%, 53.1% respectively.⁷ In a study by Bhandari D and Choudhary SK in an semi urban community of Gujarat, they observed that prevalence of underweight was 43.67%, prevalence of stunting was 50.3% and prevalence of wasting 23.2%.⁸ In contrast to the observations of the above authors, this study reveals the low prevalence of under nutrition among under five children. Under-nutrition (low wt. for age) was 35.18% in girls and 22.86% in boys. Higher prevalence i.e. 29.41% under-nutrition

was found in 3-5 years age group but no statistical difference was found in different age group and different gender. Higher prevalence of under nutrition was found in children of illiterate mother (41.3%), working mother (57.14%), low social class (37.31%), joint family (40%) and those with one or more siblings (35.71%) and higher birth order (34.09%). Under nutrition was found significantly higher in children with illiterate mother ($P=0.026$), working mother ($P=0.011$), low social class ($P=0.015$), children with more no. of siblings ($P=0.046$) and higher birth order ($P=0.023$). The prevalence is higher in children of joint families but no significant difference was observed. Bhanderi D and Choudhary SK, have observed a significant association of nutritional parameters with parental education, socio-economic status, family size. They found under-nutrition is significantly higher in children with siblings than single child ($P<0.001$), children of low socio economic status families ($P<0.001$). They showed a significant association of mother's education with nutritional status. The underweight children were significantly higher in nuclear families but in our study we found no difference with type of family.⁹In their study Ray SK, Biswas AB et al, found that prevalence of malnutrition among the children of literate mothers was comparatively lower (54.93%) than the illiterate mothers (69.55%) and the difference was also statistically significant ($p<0.05$).⁹They also observed that 56.07% children with two or less member of siblings, were malnourished. On the contrary 71.33% children were malnourished when numbers of siblings were 3 or more. The difference was statistically significant ($p<0.05$).⁹Other co-morbidities observed were worm infestation (8.06%), anaemia (8.06%) and diarrhoea (5.64%) and vitamin A deficiency signs (1.61%) of children. These morbidities may have some influence on the nutritional status of children. In this study it was observed that 43.33% of the children were completely immunized and 41.11% were partially immunized and 15.56% were un-immunized by completion of one year. In less than 1 year children ($n=34$), 55.58% were immunized as per immunization schedule and 44.12% were not immunized as per schedule. In the study by Panda P et al only 27 per cent of children were fully immunized for age and about 28 per cent had received no vaccines.¹⁰Complete immunization coverage in the study by Trakroo PL et al was higher in Sarojini Nagar block of Lucknow district (17.2%) as well as that of other slums in the country (17.0%).¹¹ Though there is difference of

findings in these studies, complete immunization status of children at the age of one year is a concern because the proportion is low.

CONCLUSION

Proportion of children having under nutrition was quite high in the study area, which requires monitoring and subsequent intervention. Health and nutritional education with Behavior change communication activities can be undertaken in the slum for early recognition of under nutrition. Mothers of under five children should be counseled for prevention of under nutrition and complete immunization.

REFERENCES

1. The feeding and care of infants & young children, Dr. Shanti Ghosh, Voluntary Health Association of India, New Delhi, 2nd edition, 1977, Page 73.
2. UNICEF INDIA: (Source NFHS, 2005-2006).
3. Trends in Children's Nutritional Status (2007). National Fact Sheet India (NFHS-3). Available from: <http://www.nfhsindia.org/factsheet.html>.
4. Students' Handbook for IMNCI. Integrated management of Neonatal and Childhood Illness, Ministry of health & family welfare, Government of India, 2007.
5. Ghosh S & Shah D, Nutritional problems in Slum children, Indian Pediatrics, 2004; 41:682-696.
6. www.who.int/childgrowth/standards/en/
7. Mukhopadhyay DK & Biswas AB, Food Security and Anthropometric Failure Among Tribal Children in Bankura, West Bengal, Indian Pediatrics, 2011; VOLUME 48__APRIL 17.
8. Bhanderi D and Choudhary SK, An epidemiological study of Health and Nutritional status of under five children in semi-urban community of Gujarat, Ind J Public Health, 2006; 50 (4):213-219.
9. Ray SK, Biswas AB, Dasgupta S and Mukherjee D, Rapid Assessment of Nutritional Status and Dietary Pattern in Municipal Area, Ind J Community Medicine, Vol. 25, No. 1 (2000-01 - 2000-03)
10. Panda P, Benjamin AI, Zachariah P, Health status of under fives in a Ludhiana slum. Health and Population - Perspectives and Issues, 1993; 16(3&4):133-141.
11. Trakroo P, Health of the Urban Poor in India, Indian Journal of Community Medicine, 1992; XVII (3):86-92.

Knowledge, Attitude and Practices (KAP) among Patients of Epilepsy Attending Tertiary Hospital in Bhubaneswar, Odisha

Sarangi Lisa¹, Parhi Laxmidhar²

¹Associate Professor, Department of Community Medicine, ²Assoc. Professor, Dept. of Neurology, Hi Tech Medical College and Hospital, Bhubaneswar, Odisha

ABSTRACT

Introduction: Persons with epilepsy are shunned and discriminated against in education, employment, and marriage in India because epilepsy is seen as a shameful disease in the eyes of the public. These observations come from many studies carried out in India and outside.

Objective: To obtain information on knowledge, attitude and practices (KAP) of epilepsy patients in Bhubaneswar

Materials & Method: Interview of 150 people with epilepsy (PWE) attending the Neurology outpatient services of Hi Tech Medical College and Hospital, Bhubaneswar was conducted. Demographic details and responses to a questionnaire assessing the knowledge, attitude and practices were recorded.

Results: A majority of the patients belonged to middle socioeconomic strata, the literacy rate was reasonably high (96%). A large majority (91%) of PWE had heard about epilepsy and 93% knew that epilepsy can be treated with modern drugs. Positive attitude was observed with respect to allowing a child with epilepsy to study (75%), play games (91%) and allow children to play with a child with epilepsy (94%). Although encouraging responses were not observed regarding marriage. It was observed that there was only one (0.7%) response to epilepsy being contagious and 21% believed it to be caused by supernatural powers.

Conclusion: These studies can dispel the myths and misconceptions about epilepsy from the minds of people and create awareness regarding modern treatment modalities available for it.

Keywords: KAP, Epilepsy, Tertiary Hospital

INTRODUCTION

Epilepsy is derived from the Greek word *epilambanein*, meaning 'to seize' or 'to attack'. It was first recorded in 716 B.C to 612 B.C. in Babylonia. Hippocrates described epilepsy as the 'sacred disease' but most cultures placed a demonic interpretation on its unique constellation of symptoms and signs. It was only in 1875 that the disease was recognised as disordered brain electricity.

Although the disease is such an old one, the stigma attached to epilepsy and the misconceptions about the disease often contribute to a greater burden than the disease itself.¹⁻³ Stigma can have significant negative influence on treatment seeking behaviour, quality of life encompassing all spheres of life including education, employment, marriage and child bearing.^{4,5} Discrimination at school, job, by friends, spouse and family members adds to the burden. Social ostracization affects not only the person with epilepsy but also the family members.

There are scarce studies on such aspects in Odisha. Therefore a study was undertaken to obtain information on the knowledge, attitude and practices of epilepsy patients presenting to Hi Tech Medical College and Hospital, Bhubaneswar.

Corresponding author:

Lisa Sarangi

Associate Professor

Department of Community Medicine

Hi Tech Medical College and Hospital, Bhubaneswar,

Odisha. Email: sarangilisa@gmail.com

MATERIALS AND METHOD

All the People with Epilepsy (PWE) attending the neurology outpatient services of Hi Tech Medical College and Hospital, Bhubaneswar, during the period October 2012 to December 2012 (3 months) were enrolled for the study. Out of 178 PWE who presented during the study period, informed consent could be obtained from 150. A predesigned and pretested questionnaire was administered comprising of 23 questions assessing the KAPs in English or Hindi or Odia whichever the patient was proficient with. The questionnaire was translated and back translated to English and checked for accurate response. The

questionnaire recorded demographic details and the responses for assessing KAP. The responses were recorded as 'yes', 'no' and 'don't know'. Statistical tests were done by calculating percentage and chi square test (p-value less than 0.05 was considered as significant). Ethical clearance from the Institutional Ethical Committee was obtained.

RESULTS

A total number of 150 PWE were interviewed during a 3-month study period including 90 males and 60 females.

Table: 1 Demographic detail of 150 patients with epilepsy

Parameters	Number	%
Age in Years		
<30	103	68.7
31-45	43	28.7
46-60	4	2.6
Gender		
Males	90	60
Females	60	40
Income		
(National Council of Applied Economic Research, NCAER)	17	11.3
Low(<Rs.40,000 p.a)	105	70
Middle(Rs.41,000-1.8lakhs p.a)	28	18.7
High(>Rs.1.8lakhs p.a)		
Occupation		
Employed	56	37.3
Student	49	32.7
Housewife	29	19.3
Unemployed(Males only)	16	
Education		
Illiterate	6	4
School	15	10
Graduate	106	70.7
Professional	23	15.3
Marital Status		
Married	115	76.7
Unmarried	35	23.3

The demographic characteristics of 150 patients are shown in Table 1. Young people under age of 30 years constituted the majority (68%) and the rest (28%), except for 4 subjects, were in the middle age. Seventy percent of the patients belonged to middle income

group who had access to specialist consultation in a hospital. Out of all PWE who were interviewed, 37% were employed. There was a startling finding that 18% (16 out of 90) of males remained unemployed due to their epileptic condition.

Table 2: Knowledge, attitude and practices among 150 persons with epilepsy

Question	Yes		No		Don't Know	
	N	%	N	%	N	%
1. Have you heard about epilepsy?	137	91.3	13	8.7		-
2. Is epilepsy a brain disorder?	84	56.0	36	24.0	30	20.0
3. Is epilepsy a mental disease?	36	24.0	103	68.7	11	7.3
4. Is epilepsy a hereditary disorder?	19	12.7	131	87.3		-
5. Is epilepsy due to supernatural powers?	31	20.7	117	78.0	2	1.3
6. Is it due to sins of patient/ ancestors?	23	15.4	116	77.3	11	7.3
7. Is epilepsy contagious?	1	0.7	124	82.6	25	16.7
8. Is epilepsy treatable with modern drugs?	139	92.7	8	5.3	3	2.0
9. Is epilepsy treatable with Ayurvedic medicine?	7	4.7	74	49.3	69	46.0
10. Can faith healers treat epilepsy?	27	18.0	123	82.0		-
11. Is branding useful in treatment of epilepsy?		-	145	96.7	5	3.3
12. During an epileptic attack will you put keys in the hands of patients?	10	6.7	138	92.0	2	1.3
13. During an epileptic attack will you make the patient smell a shoe?	42	28.0	108	72.0		-
14. During an epileptic attack will you take the patient to hospital?	145	96.7	5	3.3		-
15. Can a child with epilepsy study?	113	75.3	36	24.0	1	0.7
16. Will you allow your child to play with a child with epilepsy?	141	94.0	9	6.0		-
17. Can a child with epilepsy play games?	136	90.7	12	8.0	2	1.3
18. Can a person with epilepsy take up a job?	136	90.7	14	9.3		-
19. Can a person with epilepsy marry?	98	65.4	40	26.6	12	8.0
20. Will you reveal about the epilepsy of your daughter before marriage?	60	40.0	90	60.0		-
21. Will you reveal about the epilepsy of your son before marriage?	85	56.7	65	43.3		-
22. Can a person with epilepsy have children?	138	92.0	12	8.0		-
23. Are you discriminated by spouse?	25	16.7	125	83.3		-

The responses to the questionnaire (Table 2) showed that 91% had heard about epilepsy, while 93% knew epilepsy can be treated with modern drugs and 97% mentioned that they would take a person having an epileptic attack to the hospital. While 56% considered epilepsy to be a brain disorder, 24% thought it was a mental disorder, 21% attributed the disease to supernatural powers and 15% thought that the disease is a result of sins committed by them or their parents in the present or previous birth and still 7% did not know with conviction. Certain practices during an epileptic attack such as making the afflicted person smell a shoe and putting the keys in the hand

were mentioned by 28% and 7%, respectively. Positive attitude was observed with respect to allowing a child with epilepsy to study (75%), play games (91%) and allow children to play with a child with epilepsy (94%). Although encouraging responses were not observed regarding marriage of daughters (60%). Only 40 to 55% mentioned that they will disclose the information about their son/daughter has epilepsy before marriage. Discrimination by spouse was reported in 17% cases. A significant observation was that there was only one (0.7%) response to epilepsy being contagious and 17% don't know whether epilepsy is contagious.

Table3: Association between attitude of PWE and literacy status

Variables	Positive Attitude		Negative Attitude		Chi square Total		(p value)
	No.	%	No.	%	No.	%	
Illiterate	2	33.3	4	66.7	6	100	-
School	6	40.0	9	60.0	15	100	0.08(p=0.77)
Graduate	84	79.2	22	20.8	106	100	4.38(p=0.04)
Professional	21	91.3	2	8.7	23	100	6.53(p=0.01)
Total	105	70.0	45	30.0	150	100	

Table 3 shows that there is a significant association of literacy with the positive attitude of patients with epilepsy. The graduates and those with a professional background had a significant ($p < 0.05$) positive attitude than those with school education ($p > 0.05$), when the three groups were compared to illiterates.

DISCUSSION

In this present study, attempts were made to assess the KAP of epilepsy in Bhubaneswar among patients with epilepsy. The majority of patients in our study were in the middle socioeconomic strata and were graduates. The myths and misconceptions about the disorder particularly that epilepsy is due to supernatural causes were recorded in 20.7% which was comparable with the observations (4 to 26%) of others from different parts of the country.^{6,7,8} Knowledge that epilepsy is a brain disorder was reported by 56% which was slightly less than the observation of 68% in the population of Kerala⁹ 93% of our patients were aware that epilepsy is treatable with modern drugs, while it was only 78% in the study from Kerala.⁹

Ayurveda is widely practiced and popular in Kerala and 64% felt that ayurvedic treatment is beneficial as against 5% in our study. In many of the studies in India faith healing is considered to cure epilepsy by 6 to 39% of responders.⁶⁻¹² In our study just one patient (0.7%) felt that epilepsy is contagious as against high proportion of 12% and 13% in studies on public reported by Radhakrishnan et al. and on persons with epilepsy by Khwaja *et al.*, respectively.^{9,11}

Our study showed that only 5% of our patients would not allow their children to play with a child with epilepsy compared to 11% reported by Radhakrishnan *et al.*⁹ and 43% by Gambhir *et al.*¹² A negative aspect in our study was that more than half of our patients mentioned that they would not disclose the information that their son/daughter has epilepsy because of the fear of not finding suitable partner and difficulty in marriage negotiations.

In many parts of India there is a practice to keep keys in the hands of the patient or smell a shoe to abort the epileptic attack. In our study we found that 7% and 28% respectively practised this age old method with strong belief without any scientific reasons.

The present study in Bhubaneswar showed that with increase in literacy level, there was a significant association with positive attitude.

CONCLUSION

The public attitude towards epilepsy has changed, although slowly. The data emerging from the Indian studies should provide guidance to the policy makers, planners and administrators to implement measures to improve the KAP in PWE and general public. They should incorporate awareness programs to enhance understanding of nature of the disorder, and focus on issues related to schooling, marriage, having children and eliminate negative attitudes towards people with epilepsy. This issue can be dealt efficiently from the school level where the misconceptions are erased from the young minds before the myths have a strong foothold.

Source of support: Nil

Conflict of Interest: None

ACKNOWLEDGEMENT

The authors are thankful to the staff of Dept. of Neurology of Hi Tech Medical College, Bhubaneswar and particularly to Mr Jyotiranjana Panda, Administrative Officer, for the smooth collection of data.

REFERENCES

1. de Boer HM, Mula M, Sander JW. The global burden and stigma of epilepsy. *Epilepsy Behav* 2008; 12:540-6.
2. Meinardi H, Scott RA, Reis R, Sander JW. The treatment gap in epilepsy: the current situation and ways forward. *Epilepsia* 2001; 42:136-49.
3. McLin WM, de Boer HM. Public perceptions about epilepsy. *Epilepsia* 1995; 36: 957-9.
4. Baskind R, Birbeck GL. Epilepsy-associated stigma in sub-Saharan Africa: the social landscape of a disease. *Epilepsy Behav* 2005; 7:68-73.
5. Jacoby A, Snape D, Baker GA. Epilepsy and social identity: the stigma of a chronic neurological disorder. *Lancet Neurol* 2005; 4:171-8.
6. Samant JM, Lala VM, Ravindranath S, Desai AD. Social aspects of epilepsy. *Neurol India* 1973; 21:165-74

7. Tandon PN. Epilepsy in India. Indian Council of Medical Research: New Delhi, 1989:183.
8. Surekha RK, Surekha R. Knowledge, attitude and practices with regard to epilepsy in rural north-west India. *Ann Indian Acad Neurol* 2007; 10: 160-164.
9. Radhakrishnan K, Pandian JD, Santoshkumar T, *et al.* Prevalence, knowledge, attitude and practice of epilepsy in Kerala, South India. *Epilepsia* 2000; 41:1027-35.
10. Desai P, Padma MV, Jain S, Maheswari MC. Knowledge, attitudes and practice of epilepsy: experience at a comprehensive rural health services project. *Seizure* 1998; 7:133-8.
11. Khwaja GA, Singh G, Chaudhry N. Epilepsy and religion. *Ann Indian Acad Neurol* 2007; 10:165-8.
12. Gambhir SK, Kumar V, Singhi PD, Goel RC. Public awareness, understanding and attitudes toward epilepsy. *Indian J Med Res* 1995; 102:34-8.

Analytical Study of Water Safety Parameters in Ground Water Samples of Uttarakhand in India

Sandeep Gaur¹, M C Joshi², H S Jos³, Sandeep Saxena⁴

¹Lecturer, Pharmaceutical Chemistry, Deptt. of Pharmacology, ²Assistant Professor, Deptt of Pharmacology, ³Associate Professor, Deptt of Community Medicine, Rohilkhand Medical College Hospital, Bareilly, Uttar Pradesh, ⁴Scientist, Catalysis Conversion Process Division, Indian Institute of Petroleum, Dehradun, Uttaranchal

ABSTRACT

Background: There is plenty of water available in hills, the main problem of the locality is the drinking water. These water resources are not exploited for drinking and irrigation purposes. Also, certain health problems are associated with people living in hills that are because of the presence of excess of heavy metals and other impurities.

Aims and Objectives: The present study was conducted to analyze the various parameters of ground water in uttarakhand, India and to check its fitness for drinking. It will also clarify the health hazards imposed on the population of this state.

Design & Setting: The present study was conducted in five regions of Uttarakhand, India (Haridwar, Vikasnagar, Mussoorie, Dehradun & Dakpathar) during 2006-2007. Ten samples of ground water were collected from each of the five regions during the pre-monsoon (Jan-Feb 2007) and post-monsoon (Sept-Oct 2006) seasons.

Materials & Method: The pH was estimated by pH meter and the alkalinity was determined by titration methods. The total suspended solid was calculated by the following formula: Total suspended solid (mg) / ltr = (A-B) × 1000 / sample vol. in litres. Where, A= weight of filter + dried residue, B=weight of filter paper. Total hardness was calculated by adding calcium and magnesium hardness derived by EDTA titration method. The chloride was estimated by silver nitrate titration method and sulphates were estimated by titration method. The different heavy metals (Mn, Al, Ba, Cd, Cr, Co, Cu, Fe and Pb) were determined in the ground water samples by ICP mass spectroscopy.

Results: The concentrations of heavy metals, pH, alkalinity, sulphate, chloride, TDS & Total Hardness (TH) were compared with the standards set by BIS for Drinking water (IS 10500:1991). The results show that water quality of all the five regions studied showed no remarkable variation from the BIS recommended value of pH (6.5-8.5). The alkalinity was above the BIS desirable level of 200mg/l in all the samples, but was less than the maximum permissible limit. The Drinking water of all the regions contains higher amounts of TDS than the desirable limits. The maximum TDS was detected in Haridwar (682.5 mg/L) and dehradun (610 mg/L) state. The ground water of mussoorie region shows total hardness to be above the BIS desirable level of 300mg/l. The chloride content was above the BIS desirable level of 250mg/l in dehradun only. The sulphate content was highest in haridwar (197.5mg/l) and dehradun (170mg/l) but it was below the desirable limit of 200mg/l. The cadmium (Cd), chromium (Cr), and lead (Pb) content of all the five regions of Uttarakhand showed higher the BIS permissible limits of 0.01, 0.05 and 0.05 mg/l respectively. The content of manganese (Mn), barium (Ba), Copper (Cu), cobalt (Co), iron (Fe) are within the permissible limit of BIS standards for drinking water.

Keywords: Ground Water, Hydro-Chemical Analysis, ICP Mass Spectroscopy

INTRODUCTION

Only a small fraction (about 2.5%) of earth's water is fresh and suitable for human consumption. Approximately 13% of this fraction is ground water;

an important source of drinking water for many people worldwide¹. In Kumaun hills, ground water is available in the form of natural springs and they are used by more than 50% of total population of the region to meet their daily requirements². Heavy metals are

priority toxic pollutants that severely limit the beneficial use of water for domestic or industrial application³. Nitrate has been identified as one of the major anionic pollutants of ground water leading to certain health disorders namely, methemoglobinemia, gastric cancer, goitre, birth malformation and hypertension, etc², it's high concentration in ground water is mainly because of excessive use of nitrogen fertilizers in agriculture and high amount of organic waste generated by human population³. Sixteen states in India have already been identified endemic to fluorosis⁴. Arsenic contamination of ground water in West Bengal is well documented and more cases are also reported from eastern part of Bihar, Gorakhpur, Balia, Western part of Uttar Pradesh and Chattishgarh⁵. The intensive farming belt of Western U.P., Haryana, Punjab, and parts of Rajasthan, Delhi and West Bengal have been reported to contain high NO₃ in groundwater⁶. The guideline values for chemicals in water are based on available evidence, frequent presence of the contaminant in water and international concern about particular substances. In many cases the values are much lower than those described in documented toxic effects, but in other cases the evidence is unclear and guidelines may not be available on substances not normally present in water, or where the evidence of health effects is inadequate⁷. As trace elements, some heavy metals (e.g. copper, selenium, zinc) are essential to maintain the metabolism of the human body. However, at higher concentrations they can lead to poisoning. The most pollutant heavy metals are Lead, Cadmium, Copper, Chromium, Selenium and Mercury. Another important parameter of Water quality is hardness, although water hardness has no known adverse effects; however, some evidence indicates its role in heart disease⁸. Hard water is unsuitable for domestic use.

Our country's fresh water wealth is under threat due to the excess of heavy metal pollutants. The hydro-chemical analysis study is one of the most important aspects revealing quality of water that is suitable for drinking, agriculture and industrial purposes^{9,10}.

MATERIAL & METHOD

Sampling Method and Preservation

The water samples were drawn during monsoon (July-Sept) and non-monsoon (Nov-Jan) during 2006-2007. The ground water samples were collected from Haridwar, Vikasnagar, Mussoorie, Dehradun and Dakpathar regions of Uttarakhand, India by proper

method from 10 places of each area. Water Samples from different location were collected in the plastic canes of 2.5 litre, about ½ litre water samples was taken from one hand pump in one location and these were mixed to get one sample from one location. In this way sample collected were analyzed in 2-3 days so no special preservation required. However samples in the canes were kept in the refrigerator.

Testing Methods of Different Parameter

The pH of the ground water was estimated by pH meter. The alkalinity of water is generally due to present of carbonate and hydroxide ion. The total alkalinity of ground water was calculated by titration method. The total solid (TS) present in 100ml of sample water was calculated by evaporating the water sample at 103 to 105⁰ C to dryness in drying oven, cooling it in desiccators and then weighed. The TS in mg/l = (A-B) x 100 / sample volume in liter. Where A = weight of (dried residue + dish) & B = weight of dish. The total suspended solid (TSS) was calculated by the following formula: Total suspended solid (mg) / ltr = (A-B) x 1000 / sample vol. in litre. Where, A=weight of filter + dried residue, B=weight of filter paper. The total dissolved solids (TDS) term is used to describe the inorganic salts and small amount of organic matter present in solution. It was calculated by subtracting TSS from TS. Total hardness was calculated by adding calcium and magnesium hardness derived by EDTA titration method. The chloride was estimated by silver nitrate titration method and sulphates were estimated by titration method.

After collection of water samples, these were preserved to avoid further contamination. These samples were first filtered with whatmann's filter paper to remove un-dissolved material; after filtration different elements were determined in these samples by Inductive coupled plasma microscopy method.

FINDINGS

The physico-chemical characteristics of drinking water of the study area are presented in Table 1. The results show that water quality of Haridwar, Vikasnagar, Mussoorie, Dehradun, Dakpathar shows no remarkable variation from the BIS recommended value of pH (6.5-8.5). The alkalinity was above the BIS desirable level of 200mg/l in all the samples, but was less than the maximum permissible limit. The Drinking water of all the regions contains higher amounts of TDS than the desirable limits. The maximum TDS was

detected in Haridwar (682.5 mg/L) and dehradun (610 mg/L) state. The ground water of mussoorie region shows total hardness to be above the BIS desirable level of 300mg/l. The chloride content was above the BIS

desirable level of 250mg/l in dehradun only. The sulphate content was highest in haridwar (197.5mg/l) and dehradun (170mg/l) but it was below the desirable limit of 200mg/l.

Table 1: The Physicochemical characteristics of water samples in Uttarakhand, India.

Parameter	BIS Standards (mg/l)	Haridwar	Vikasnagar	Mussoorie	Dehradun	Dakpathar
pH	6.5-9.2	7.25	7.0	7.4	7.2	7.1
ALKALINITY	Desirable : 200 mg/l , Permissible: 600 mg/l	275	328	336	288.25	322
TOTAL HARDNESS (TH)	Desirable: 300 mg/l , Permissible : 600 mg/l	252	282	329	290.5	272
T H(As Ca ⁺⁺)		206.5	212	249	290.5	208
T H(As Mg ⁺⁺)		45.5	70	80	40.5	64
TDS	Desirable : 500 mg/l , Permissible : 2000 mg/l	682.5	567.5	551	610	548
SUSPENDEDSOLID(SS)	-	16.5	22	18	22	20
CHLORIDE	Desirable : 250 mg/l , Permissible : 1000 mg/l	153.5	196.0	121.0	289.0	185.0
SULPHATE	Desirable : 200 mg/l , Permissible : 400 mg/l	197.5	153	139	170	132

Table 2 shows the heavy metals concentrations of ground water samples in all the five regions of Uttarakhand, India. These were analysed by ICP technique. The cadmium (Cd), chromium (Cr), and lead (Pb) content of all the five regions of Uttarakhand

showed higher the BIS permissible limits of 0.01, 0.05 and 0.05 mg/l respectively. The content of manganese (Mn), barium (Ba), Copper (Cu), cobalt (Co), iron (Fe) are within the permissible limit of BIS standards for drinking water.

Table 2. The Heavy metals concentrations in water samples of Uttarakhand, India

Heavy Metals	BIS Desirable Level (mg/l)	BIS Permissib-le level (mg/L)	Haridwar	Vikasnagar	Mussoorie	Dehradun	Dakpathar
Mn	0.1	0.3	0.052	0.058	0.054	0.053	0.054
Al	-	0.2	0.056	0.058	0.056	0.056	0.056
Ba	-	-	0.075	0.078	0.079	0.079	0.078
Cd	0.003	0.01	0.131	0.132	0.130	0.133	0.130
Cr	0.05	0.05	0.094	0.096	0.094	0.096	0.098
Co	-	-	0.060	0.062	0.064	0.064	0.060
Cu	0.05	1.5	0.022	0.022	0.021	0.021	0.018
Fe	1.0	1.0	0.066	0.068	0.062	0.067	0.064
Pb	0.05	0.05	0.084	0.090	0.088	0.088	0.090

DISCUSSION

Heavy or toxic metals are trace metals that are at least five times denser than water. As such, they are stable elements (they cannot be metabolized by the body) and bio-accumulative. These include mercury, nickel, lead, arsenic, cadmium, aluminum, platinum and copper. Heavy metals have on function in the body and can be highly toxic. They are taken in to the body by drinking, inhalation, ingestion and skin absorption. A gradual build up of these toxins will occur, if heavy metals enter and accumulate in body tissue faster than

the body's detoxification pathways can dispose them off.

Lead in humans on long term exposure can lead to acute or chronic damage to the nervous system on humans. It causes plumbism leading to anemia, impaired neurological and motor development, and damage to kidneys. Cadmium on long-term exposure is highly toxic; causes 'itai-itai' disease-painful rheumatic condition; cardio vascular system affected; gastro intestinal upsets and hyper tension. High exposure can lead to obstructive lung disease and has

been linked to lung cancer. Arsenic could lead to weight loss, skin and nervous system toxicity. Copper is an essential substance to human life, but in high doses it can cause anemia, liver and kidney damage. Effect of the Mercury is to cause damage to the brain and the central nervous system. Chromium is carcinogenic and causes respiratory problems, kidney and liver damage, and damage to circulatory and nerve tissue. Chromium often accumulates in aquatic life, adding to the danger of eating fish that may have been exposed to high levels of chromium.

The water quality of Haridwar, Vikasnagar, Mussoorie, Dehradun, and Dakpathar shows that the alkalinity was above the BIS desirable level of 200mg/l in all the samples, but was less than the maximum permissible limit. The drinking water of all the regions contains higher amounts of TDS than the desirable limits. In a similar study in Uttarakhand, the concentration of total dissolved solids exceeded the desirable limit of 500 mg/L in about 10% of the samples, alkalinity values exceeded the desirable limit of 200 mg/L in about 30% of the samples, and total hardness values exceed the desirable limit of 300 mg/L in 15% of the samples. However, no sample crossed the maximum permissible limit for TDS, alkalinity, hardness, calcium, magnesium, chloride, sulfate, nitrate, and fluoride. The concentration of chloride, sulfate, nitrate, and fluoride are well within the desirable limit¹¹.

For the protection of human health, guidelines for the presence of heavy metals in water have been set by different International Organisations such as WHO, USEPA, EPA, European Union Commission¹², thus, heavy metals have maximum permissible level in water as specified by these organisations. Maximum contaminant level (MCL) is an enforceable standard set at a numerical value with an adequate margin of safety to ensure no adverse effect on human health. It is the highest level of a contaminant that is allowed in a water system. The heavy metals analysis of the ground water sample in our study showed that the cadmium (Cd), chromium (Cr), and lead (Pb) content of all the five regions of Uttarakhand is higher than the BIS permissible limits of 0.01, 0.05 and 0.05 mg/l respectively. Therefore, the people living in these areas are prone to develop various ill effects of these heavy metals on long term exposure. It has been observed that due to industrial pollution, the metals like Cd, Pb & Cr are found on the higher side in Uttarakhand. These results are of concern as lead has been recognised for centuries as a cumulative general metabolic

poison¹³. It is neurotoxin and is responsible for the most common type of human metal toxicosis¹⁴. Also, studies have linked lead exposures even at low levels with an increase in blood pressure¹⁵ as well as with reduced intelligence quotient in children¹⁵ and with attention disorders¹⁶.

CONCLUSIONS

Heavy metal toxins contribute to a variety of adverse health effects. The present study gives an overview to show that how much quantity of element is present in mainly from Haridwar, Vikas-Nagar, Mussoorie, Dehradun and Dakpathar regions of Uttarakhand, India. On the basis of present study we observed that due to the excess quantity of Cd, Pb, and Cr in Uttarakhand, India, the human beings of that region are suffering with various diseases like gastrointestinal and thyroid diseases.

REFERENCES

1. Bachmat Y. Ground water contamination and control, Marcel Dekker, Inc, New York. 1994.
2. Singh AK, Rawat DS. Depletion of oak forest a threatening to springs: An exploratory survey. *The National Geographical J Env Quality*. 1985, 31(11): p. 44-48.
3. Petrus R, Warchol JK. Heavy metal removal by clinoptilolite. An equilibrium study in multicomponent system. *Water Research*. 2005, 39; p.819-830.
4. Mariappan P, Yegnaraman V, Vasudevan T. Occurrence and removal possibilities of fluoride in ground waters of India. *Poll Res*. 2000, 19(2): p. 165-177.
5. Singh AK. Chemistry of arsenic in ground water of Ganges-Brahmaputra river basin. India. *Curr Sci*. 2006, 91(5): p. 1-7.
6. Malve SP, Dhage SS. Nitrate: An environmental pollutant. *Everyman's Science*. 1996, XXXI (5): p. 158-163.
7. WHO Guidelines for drinking water quality, 2nd edition. Volume 1: recommendations. Geneva: WHO, 1993; Volume 2: Health criteria and other supporting information. Geneva: WHO, 1996.
8. Schroeder HA. Relations between hardness of water and death rates from certain chronic and degenerative diseases in the United States. *J Chron disease*. 1960, 12: p.586-591.
9. Kelley WP. Permissible composition and concentration of irrigation waters. *Proc ASCE*. 1940, 66: p. 607.

10. Wilcox LV. The quality water for irrigation use. US Dept Agric Bull. 1962, p. 40
11. Jain CK, Bandhopadhyay A, Bhadra A. Assessment of ground water quality for drinking purpose, District Nainital, Uttarakhand, India. Environmental Monitoring and Assessment. June 2009.
12. Marcovecchio, J.E., S.E. Botte and R.H. Freije, 2007. Heavy Metals, Major Metals, Trace Elements. In: Handbook of Water Analysis. L.M. Nollet, (Ed.). 2nd Edn. London: CRC Press, pp: 275-311.
13. Adepoju-Bello, A.A. and O.M. Alabi, 2005. Heavy metals: A review. The Nig. J. Pharm., 37: 41-45.
14. Berman, E., 1980. Toxic Metals and Their Analysis. Philadelphia, PA: Hayden and Sons.
15. Zietz, B.P., J. Lap and R. Suchenwirth, 2007. Assessment and management of tap water Lead contamination in Lower Saxon, Germany. Int. J. Environ. Health Res., 17(6): 407-418.
16. Needleman, H.L., 1993. The current status of childhood low-level lead toxicity. Neurotoxicology, 14: 161-166.
17. Yule, W. and M. Rutter, 1985. Effect on Children's Behavior and Cognitive performance: A Critical Review. In: Dietary and Environmental Lead (Pb): Human Health Effects. R. Mahaffey, (Ed.). New York: Elsevier, pp: 211-251.

Role of Imprint Cytology in the Diagnosis of Upper Gastrointestinal Tract Lesions

M Sanjeevreddy¹, S K Kittur², R B Jakareddy³, Sunita Y Patil⁴, B R Yelikar⁵

¹Assistant Professor, Department of Pathology, BLDEA's Shri B M Patil Medical College and Research Centre, Bijapur, Karnataka, India, ²Professor and Head, Dept. of Pathology, Belgaum Institute of Medical Sciences, Belgaum, Karnataka, India, ³Associate Professor, Dept of Gastroenterology, BLDEA's Shri B M Patil Medical College and Research Centre, Bijapur, Karnataka, India, ⁴Assistant Professor, Department of Pathology, Jawaharlal Nehru Medical College, KLE, University, Belgaum, Karnataka, ⁵Professor and Head, Department of Pathology, BLDEA's Shri B M Patil Medical, College and Research Centre, Bijapur, Karnataka

ABSTRACT

Background: Histological study of the upper gastrointestinal (GI) endoscopic biopsies provides an accurate diagnosis of the lesions occurring in these regions. But the limitation of histology is longer time required. Study of imprint smears of endoscopic biopsies enables an immediate report.

Aim: To compare the accuracy of endoscopic biopsy imprint cytology with histology in the diagnosis of upper gastrointestinal tract lesions.

Materials and Method: A total of 77 cases were studied over a period of two years. The endoscopic biopsy tissue was first taken on a clean glass slide and rolled gently with the help of a needle to make an imprint of the tissue on the slide. These imprint smears were immediately fixed with 95% alcohol and stained with H and E and PAP stain. After the imprint smears are made the same biopsy tissue was then put in 10% formalin for routine histopathological processing. Two separate staff studied the imprint smears and histopathology slides independently and later the findings were correlated.

Results: Biopsy histology results were found to be correct in 100% cases. Imprint cytology had an overall accuracy of 97.6%, 100% and 100% for the diagnosis of malignancies of the oesophagus, stomach and duodenum respectively. One false result was obtained in oesophageal lesions. The combined diagnostic accuracy of imprint cytology and histology for all upper GI lesions was 100%.

Conclusion: Imprint cytology can serve as a useful and simple tool for an immediate and accurate diagnosis of upper GI malignancies.

Keywords: *Imprint Cytology, Malignancy, Upper Gastrointestinal Tract*

INTRODUCTION

The advent of flexible fiberoptic endoscopes has made most portions of the gastrointestinal tract easily accessible to direct vision. Histological study of mucosal biopsies obtained from the upper and lower gastrointestinal tract is useful for an accurate diagnosis of inflammatory and neoplastic lesions occurring in

these regions. However, the limitation of histology is the longer time required. Most gastroenterologists and even patients would prefer to have an immediate diagnosis, at least regarding the benign or malignant nature of a lesion.^[1]

Cytology provides an accurate reflection of any pathologic process. Gastrointestinal cytology has been underused in the workup of GI diseases, because of a lack of satisfactory means for collecting sufficient numbers of well preserved cells from these digestive organs.^[2] In the past, the primary method used to obtain samples from the upper and lower GI tract have been lavage cytology. This procedure was not well tolerated by either patients or medical personnel.^[3] Endoscopic selective brushing of a lesion yields a

Corresponding author:

Sanjeevreddy M Kollur

Assistant Professor

H.No.1-1495/38 1B/3, Goduthai Nagar,

Gulbarga - 585103, Karnataka.

E-mail: drsmkollur@gmail.com

Ph: 09844776687

limited amount of cell-rich, well-preserved material that can be rapidly and accurately screened, but this procedure requires a special brush that may not be available in some hospitals.^[4,5] Study of imprint smears prepared from fresh endoscopic biopsy tissue enables an immediate report from the same tissue which is subsequently processed for histopathology. A positive report prevents undue delay in the diagnosis and can then directly lead to treatment.^[1]

The present study was conducted to compare the accuracy of endoscopic biopsy imprint cytology with histology in the diagnosis of upper gastrointestinal lesions.

MATERIALS AND METHOD

Endoscopy was performed as a diagnostic procedure in 77 patients with upper gastrointestinal tract complaints (epigastric pain, dysphasia, haematemesis, vomiting, etc). If a polypoidal or ulcerative lesion, stricture or indurated area was visualized, this was biopsied with a biopsy forceps. The fresh biopsy tissue was immediately transferred on to a clean glass slide and rolled gently with the help of a fine needle to make imprint smears. Four such imprint smears were made for each case and one smear was air dried and the other smears were immediately fixed in 95% alcohol. The fixed smears were stained with Haematoxylin and Eosin (H&E) and Papanicolaou stain and the air dried smears stained

with Geimsa stain. The same biopsy tissue was then transferred to a filter paper and put in 10% formalin for routine histopathological processing and stained with H&E stain. Special stains were used as and when necessary.

An immediate consensus diagnosis regarding whether the lesion was benign or malignant, was made based on imprint cytological findings in each case. Two separate staff studied the imprint smears and histopathology slides independently and later the findings were correlated.

RESULTS

A total of 77 endoscopic biopsies from various lesions of the upper gastrointestinal tract were studied. These patients (50 males, 27 females) ranged in age from 15-90 years. Out of 77 cases, 40 cases were of esophageal lesions, 25 gastric and 12 duodenal lesions.

The results of biopsy histology proved to be correct in all cases on clinical follow-up (in case of benign lesions) and by laparotomy and histopathology of the resected tissue (in case of malignant lesions). Hence biopsy histology was taken as the gold standard with respect to which the sensitivity, specificity and accuracy of imprint cytology were calculated. The results of imprint cytology and histology at each site have been compared in Table 1 and individually elaborated below.

Table 1. Comparison of the results of imprint cytology and histology in the diagnosis of upper gastrointestinal tract malignancies.

Site	Imprint diagnosis	Histopathological diagnosis		Sensitivity %	Specificity %	+ve PV %	-ve PV %	Diagnostic accuracy %
		Benign	Malignant					
Oesophagus (n=40)								
Benign	02	02	00	100	66.7	97.3	100	97.6
Malignant	38	01	37					
Stomach(n=25)								
Benign	12	12	00	100	100	100	100	100
Malignant	13	00	13					
Duodenum(n=12)								
Benign	11	11	00	100	100	100	100	100
Malignant	01	00	01					

+ve PV— Predictive value of positive test

-ve PV— Predictive value of negative test

Oesophagus: Oesophageal lesions comprised a total of 40 cases. Out of 38 imprint smears from oesophageal lesions where diagnosis of a malignancy was made, 35 cases were diagnosed as squamous cell carcinoma [Figure 1A, B]. Three cases were diagnosed as adenocarcinoma of oesophagus [Figure 3]. On histopathological study, 34 cases were proved to be squamous cell carcinoma [Figure 2] and three cases as adenocarcinoma of oesophagus [Figure 4]. In one case, the biopsy showed benign squamous epithelium with mild inflammation. No evidence of malignancy was noted in this case. On endoscopic examination, an ulcer was noted in the lower end of the oesophagus. Imprint cytology smears showed large suspicious squamous cells and a diagnosis of malignancy was made. Histopathological examination did not reveal any evidence of malignancy. Repeat endoscopic biopsy was performed. Histopathology showed no malignancy. Review of the imprint smears showed that the suspicious cells were actually benign and because of the drying artefact in the imprint smears, it was misinterpreted and led to the false positive diagnosis.

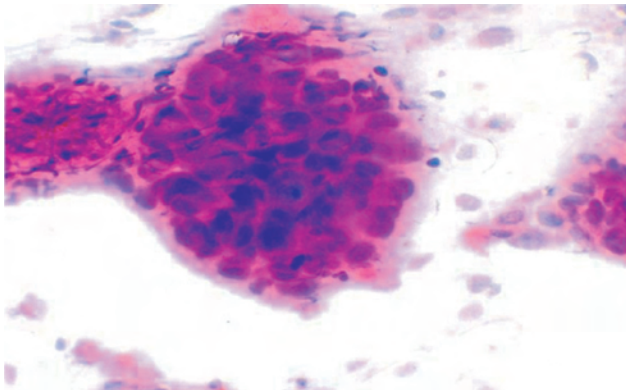


Fig. 1A. Photomicrograph showing a large cluster of poorly polarized sheets of pleomorphic cells- moderately differentiated squamous cell carcinoma of oesophagus (H&E, x200).

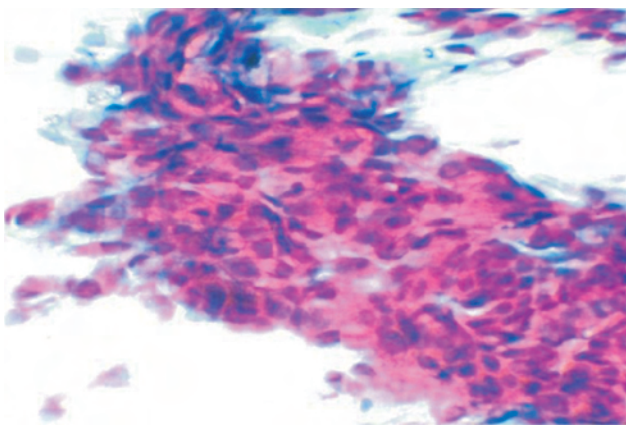


Fig. 1B. Photomicrograph showing poorly polarized sheets of large pleomorphic cells and displaying coarsely clumped nuclear chromatin— moderately differentiated squamous cell carcinoma of oesophagus (H&E, x400).

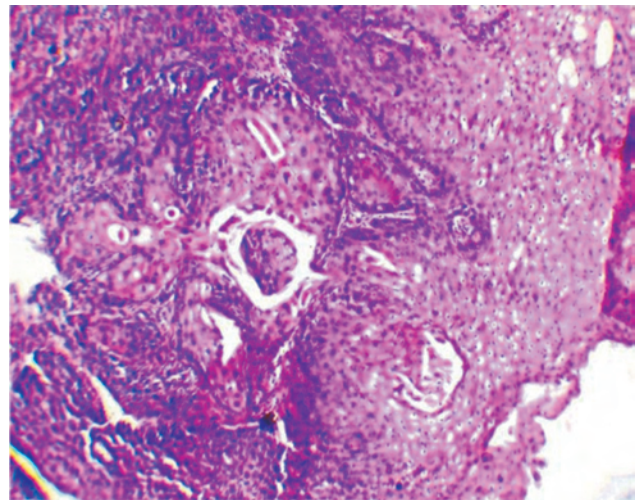


Fig. 2. Photomicrograph showing whole biopsy section of infiltrating squamous cell carcinoma of oesophagus (H&E, x40).

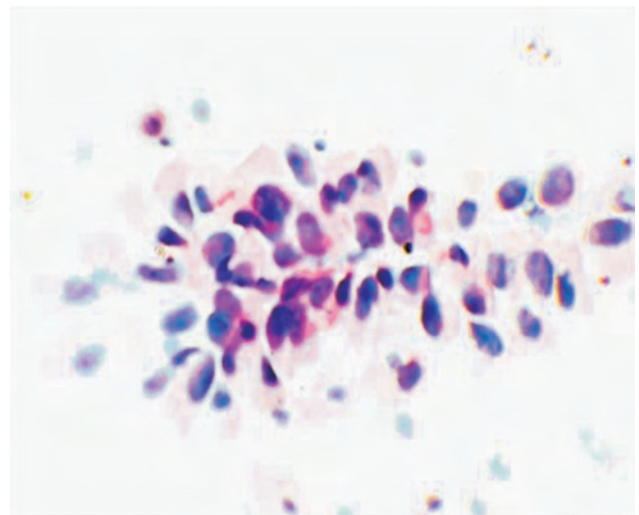


Fig. 3. Photomicrograph showing adenocarcinoma of oesophagus—clusters of pleomorphic cells arranged in vague acinar pattern (PAP, x200).

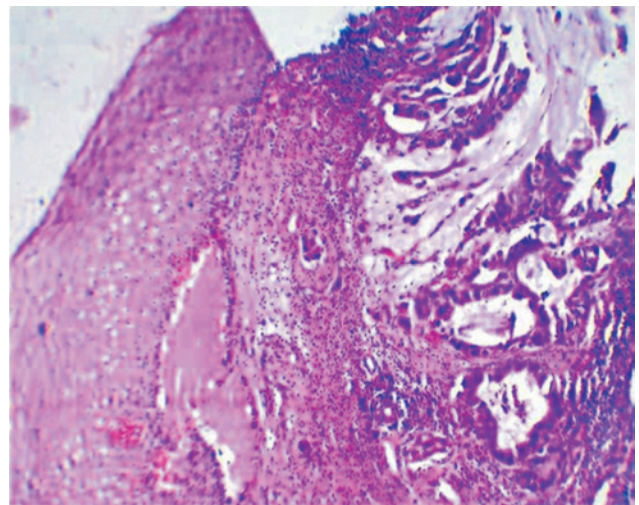


Fig. 4. Photomicrograph showing adenocarcinoma of oesophagus (H&E, x40).

Thus, one false positive diagnosis was made on imprint smear cytology of oesophageal lesions.

Stomach: Out of 25 gastric lesions, on imprint smears in 12 cases a diagnosis of benign lesion was offered, 11 were diagnosed as non-specific inflammation due to the presence of benign gastric columnar cells with mixed inflammatory cells and one case showed inflammation with few cells having mild to moderate increase in nucleo-cytoplasmic ratio, suggesting mild dysplasia which are features of regenerative activity at the ulcer edge. Identical findings were noted on histopathology, but one of the cases diagnosed as non-specific inflammation from the imprint cytology, showed gastric tubular adenoma with inflammation. In 13 imprint smears, a diagnosis of gastric adenocarcinoma [Figure 5] was made. This was confirmed on histopathology which showed adenocarcinoma [Figure 6] of varying grades of differentiation.

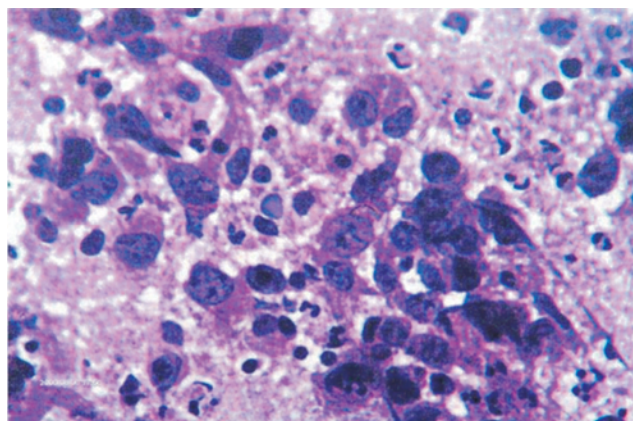


Fig. 5. Photomicrograph showing poorly differentiated adenocarcinoma of stomach—poorly cohesive large pleomorphic cells having hyperchromatic nuclei and prominent nucleoli (H&E, x400).

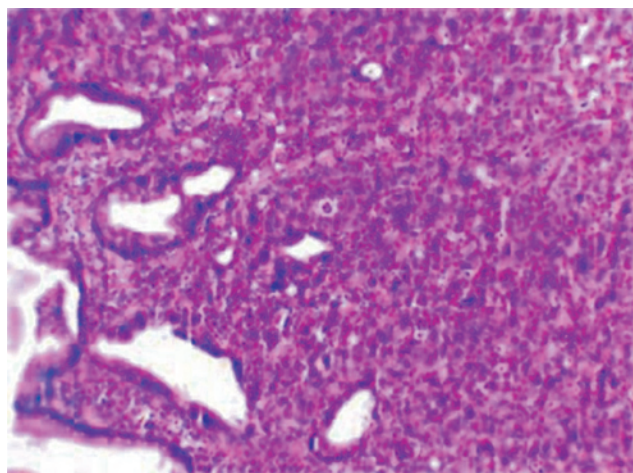


Fig. 6. Photomicrograph showing infiltrating poorly differentiated adenocarcinoma of stomach (H&E, x10)

Thus, imprint smears of gastric lesions showed no false negatives or false positives for the diagnosis of malignancy.

Duodenum: Out of 12 duodenal lesions, on imprint smears 11 cases were showing benign duodenal columnar cells in an inflammatory background and were diagnosed as benign lesions. On histopathology in two cases the features were consistent with ceeliac disease and in remaining cases non-specific inflammation noted. In one case on imprint smear, a diagnosis of adenocarcinoma was made. On histology it was confirmed as adenocarcinoma of periampullary region of the duodenum.

Thus there were no false negatives or false positives obtained for the diagnosis of duodenal lesions.

DISCUSSION

The differentiation of benign from malignant lesions of the oesophagus and stomach continues to be a frequently encountered and often difficult clinical problem. Because of the poor prognosis of gastroesophageal malignancy it is important that this separation be made with accuracy as early as possible, so that surgical resection of the malignant lesion may be undertaken without unnecessary delay.^[6] Cytological examination is rapidly gaining popularity for the early diagnosis of gastrointestinal malignancies.

Examination of matched pair of biopsies with and without preceding touch smears has shown that the quality of the biopsies for histology is not impaired by the touch smear technique. For this reason in the present study, the same biopsy which was used for making imprint smears was used for preparing histological sections.

In the present study, the diagnostic accuracy of biopsy histology was 100% for lesions of oesophagus, stomach and duodenum. Mysorekar et al^[1] also obtained a histological diagnostic accuracy of 100% for lesions of oesophagus, stomach and duodenum. Gupta et al^[7] and Sharma et al^[8] obtained a histological diagnostic accuracy of 100 and 95% for lesions of the oesophagus and 100% and 98% for lesions the stomach respectively. In the present study, the diagnostic accuracy of imprint cytology for oesophageal lesions was 97.6%. Mysorekar et al^[1] and Gupta et al^[7] have obtained a cytological diagnostic accuracy of 100% for oesophageal lesions. Kobayashi et al^[4] and Sharma et al^[8] have obtained a cytological diagnostic accuracy of 96.3% and 95% respectively for oesophageal lesions.

Young et al^[5] found imprint smear cytology with a sensitivity of 100% to be the most accurate technique for the diagnosis of malignancy of the lower end of oesophagus and cardia, as compared to biopsy histology which had a sensitivity of 89%. For gastric lesions, the imprint cytology had a diagnostic accuracy of 100% in the present study. Sharma et al^[8] also reported a diagnostic accuracy of 100%, while Mysorekar et al^[1] and Young and Hughes^[9] report a diagnostic accuracy of 96.7% and 91.8% respectively for cytology of gastric lesions. In the present study, the diagnostic accuracy of imprint cytology for duodenal lesions was 100%. Sharma et al^[8] and Mysorekar et al^[1] obtained a diagnostic accuracy of 100% and 95.8% respectively on imprint cytology for duodenal lesions.

Young et al^[5] and Gupta et al^[7] found in their studies that the biopsy touch smear cytology was superior to brush cytology and biopsy histology. Their personal experience suggests that the value of touch smear cytology comes from a combination of the advantages of two technique-tissue biopsy as a means of sampling and cytological preparations and criteria as the basis of diagnosis. Since the biopsy forceps can obtain a specimen from deeper tissue than the brush, it is able to sample tumours, which are primarily submucosal, as well as those that are superficial. In addition when there is extensive surface necrosis of a tumour, so that superficial brushings contain only large quantities of degenerate cellular debris, but the biopsy forceps can obtain well-preserved cells from the deeper layers of the lesion. Gupta et al^[7] state that imprint cytology may be superior to bioptic histology at times, as a single malignant cell or small clusters of cells in a biopsy may be insufficient to give a "tissue pattern" diagnosis of malignancy, whereas even a few viable malignant cells in a touch smear are sufficient to diagnose malignancy at a "cellular level". Moreover, by imprint cytology the diagnosis can be made in a short period of time. Even when a specimen is small or crushed which is not suitable for histology, the diagnosis still can be made at cellular level by imprint cytology. On the other hand, touch smear cytology can provide no information about the depth of invasion of malignancy and is less successful than biopsy histology in typing the tumour.

Gupta and Rogers^[10] suggested that in cases with an initial suspicious cytology, a repeat endoscopic examination of further material by cytology and biopsy is necessary. Since an initial negative biopsy with suspicious cytology cannot unequivocally rule out a

malignancy of the upper GI tract. A number of such patients were subsequently found to have a carcinoma. However, a repeated cytological suspicious of malignancy may at times result in a false positive diagnosis of a well differentiated adenocarcinoma of stomach in cases of chronic peptic ulcers due to the deceptive appearance of cells from regenerative hyperplastic epithelium at the margin of an ulcer. In the present study, one case with peptic ulcer on imprint cytology, showed cells with features of regenerative activity having nucleomegaly and mild to moderate increase in nucleocytoplasmic ratio and it was correctly diagnosed as benign inflammatory lesion.

Chun-Sheng Lan^[11] pointed out that the major sources of false negative and false positive results were technical problems and misinterpretations. In order to decrease the level of erroneous results, patients who are judged to be suspicious by cytology but negative by histology must be re-examined immediately or at intervals of one to three months and then followed for one year. In the present study, a false positive result was obtained in the case of benign oesophageal lesion because of the drying artifact in the imprint smears, it was misinterpreted as malignant lesion. While making slides of imprint smears, great care has to be taken to avoid drying artifacts. It has to be ensured that the smears are immediately transferred to fixative before they get dry up.

Mysorekar et al^[1] found the combined diagnostic accuracy of biopsy and cytology to be 100% for lesions of oesophagus, stomach and duodenum, while Sharma et al^[8] found the combined diagnostic accuracy to be 97%, 100% and 100% in the oesophagus, stomach and duodenum respectively. Other reports have also shown an increase in accuracy rate using a combination of the two methods.^[12] In the present study, although both imprint cytology and histology individually gave good results for the identification of benign and malignant upper gastrointestinal lesions, a combination of the two methods was found to be supportive for a better diagnosis.

CONCLUSIONS

Imprint smear cytology from endoscopic biopsies is a highly sensitive and specific technique for the diagnosis of malignancies of upper GI tract. It is quick, easy and cheaper technique. Imprint cytology alone can serve as a useful tool for an immediate diagnosis within an hour after endoscopy procedure and lets the gastroenterologists to plan the therapeutic strategy

approximately three to four days earlier. Histology however, is necessary to assess invasion and for tumour typing. Technical problems may be a source of false positive results on imprint cytology, so meticulous care of technique is needed. The two techniques of imprint cytology and histology are thus complimentary and both should be utilized for maximum diagnostic accuracy.

Acknowledgements: Nil

Conflicts of Interest: None

REFERENCES

1. Mysorekar VV, Dandekar CP, Satyaprakash BS, Sarkar A. Role of imprint cytology in the diagnosis of gastrointestinal tract malignancies. *Indian J Pathol Microbial* 2003;46(1):37-43.
2. Geisinger KR, Wang HH, Ducatman BS, Teot LA. Gastrointestinal cytology. *Clinics in laboratory medicine* 1991;11(2):403-40.
3. Geisinger KR, Stanley MW, Raab SS, Silverman JF, Abati A. Gastrointestinal system. In: *Modern cytopathology* 1st edn. Philadelphia: Churchill livingstone;2004. 449-50.
4. Kobayashi S, Prolla JC, Winans CS, Kirsner JB. Improved endoscopic diagnosis of gastro-oesophageal cancer. Combined use of direct vision brushing cytology and biopsy. *JAMA* 1970;212:2086-89.
5. Young JA, Hughes HE, Lee FD. Evaluation of endoscopic brush and biopsy touch smear cytology and biopsy histology in the diagnosis of carcinoma of the lower oesophagus and cardia. *J clin pathol* 1980;33:811-14.
6. Jaiswal KN, Umap PS, Jaiswal N, Shrikhande AV. Crush preparation cytology of gastrointestinal malignancies. *Journal of cytology* 2005;22(1): 35-38.
7. Gupta SC, Bisht D, Nigam DK, Sati HC, Singh PA. Fibre-optic endoscopy, endoscopic brush and biopsy imprint cytology and bioptic histology in lesions of upper gastro-intestinal tract. *Indian J Pathol Microbial* 1984;27:229-40.
8. Sharma P, Misra V, Singh PA, Misra SP, Gupta SC. A correlative study of histology and imprint cytology in the diagnosis of gastrointestinal tract malignancies. *Indian J Pathol Microbial* 1997;40:139-46.
9. Young JA, Hughes HE. Three year trial of endoscopic cytology of the stomach and duodenum. *Gut* 1980;21:241-46.
10. Gupta RK, Rogers KE. Endoscopic cytology and biopsy in the diagnosis of gastroesophageal malignancy. *Acta cytologica* 1983;27(1):17-22.
11. Chun-Sheng Lan. Critical evaluation of the cytodiagnosis of fibrogastroduoscopic samples obtained under direct vision. *Acta cytological* 1990;34(2):217-20.
12. Waldron R, Kerin M, Ali A et al. Evaluation of the role of endoscopic biopsies and cytology in the detection of gastric malignancy. *Br J Surg* 1990;77:62-63.

A Study of Research Pattern of Postgraduate Dissertations in Pathology

Manjula¹, Shashikala P², Padmamma S³

¹Librarian, Library and Information Centre, S S Institute of Medical Sciences & Research Centre, Davangere, Karnataka, ²Co-ordinator, Medical Education Unit, S S Institute of Medical Sciences & Research Centre, Davangere, Karnataka, ³Associate Professor, Department of Library and Information Science, Kuvempu University, Shankaraghatta, Karnataka, India

ABSTRACT

This is a descriptive study undertaken to analyze the pathology dissertation topics of MD pathology students. 107 dissertation topics obtained through the website of RGUHS were analyzed. Skin, Female Genital System, Gastrointestinal system and Blood were the most common systems chosen for the study and maximum sample size was from Female genital system. Studies incorporating immunohistochemistry, immunofluorescence, flow cytometry, and other newer and sophisticated techniques were very rare.

Keywords: Pathology Dissertation, Clinicopathology, Cytology, Hematology, Histopathology

INTRODUCTION

Research in the form of thesis / dissertation work is an integral part of most postgraduate curriculums. Exposure to research helps to train the mind in adopting a scientific approach to medical and clinical problems.

The goal of medical research is to improve health and the purpose is to learn how systems in human body work, why we get sick and how to get back to health and stay fit. Research is the basic foundation to improve medical care. It can also provide evidence for policies, decisions on health development and finds new ways to treat and prevent disease.

Pathology is a scientific study of the nature of disease and its causes, processes, development, and consequences. Pathology is a unique medical specialty, touches all branches of medicine, as diagnosis is the foundation of all patient care. In fact, more than 70 percent of all decisions about diagnosis and treatment, hospital admission, and discharge rest on medical test results. Thus Pathology serves as the bridge between the basic sciences and clinical medicine and is the scientific foundation for all of medicine.¹

There are 31 colleges teaching Post Graduate course in Pathology in Karnataka, out of which 26 colleges are affiliated to Rajiv Gandhi University of Health

Sciences (RGUHS), Bangalore. This paper analyses the studies which are undertaken by Post Graduates of Pathology of various medical colleges attached to RGUHS.

107 studies have been taken for analysis, as per the RGUHS web site www.rguhs.ac.in ² dissertation subject wise list on greenstone platform as on 21.12.2010. Details of 67 studies obtained are analyzed. The present study helps to know about the various studies done by the Post Graduates of pathology for their dissertation and to know thrust areas which require studies.

MATERIAL AND METHOD

This is a descriptive study undertaken to analyze the pathology dissertation topics of postgraduates of pathology doing MD, in various medical colleges attached to Rajiv Gandhi University of Health Sciences. Material for the study was obtained through the website www.rguhs.ac.in on the greenstone plot form. As on 21.12.2010, there were 107 dissertation topics uploaded in the website covering dissertations undertaken from 2005 to 2008. Out of 107 topics, proper link was obtained for 67 titles, the details of which were taken and analyzed for the type of study, sample size and the organ system to which the study was confined. There was a wrong link for 40 titles which are excluded from the study.

RESULTS

107 titles obtained initially, showed the following distribution pattern of the topics.

Histopathology 30 (28%), Cytology 12 (11.2%), Clinicopathology 9 (8.4%), Cytology / histology correlation 3 (2.8%), Hematology 12 (11.2%), Histochemistry 1 (0.9%)

Table 1. Types of study undertaken by pathology postgraduates is as follows

Type of study	No. of studies	%
Clinicopathological	9	8.4
Cytology	12	11.2
Cytology/Histology	3	2.8
Hematology	12	11.2
Histochemistry	1	0.9
Histopathology	30	28.0
Wrong link	40	37.38
Total	107	100

Table 2. The various systems to which the study was confined are as shown below.

System	No of studies	No of studies with wrong link	Sample Size
Blood	13	2	50-500
Bones	2	2	-
Breast	7	3	50-180
Cardiovascular system	1	-	50
Central Nervous System	1	-	62
Female Genital System	14	4	85-9945
Gastrointestinal	14	4	30-265
Gastrointestinal/Salivary gland	1	1	-
Head & Neck	2	1	197
Liver	3	2	56
Lungs/ Respiratory System	2	1	-
Lymph Node	7	2	50-244
Male Genital System	4	3	93
Mediastinum	1	-	71
Nerve	1	1	-
Nose	3	1	51
Renal System	1	1	-
Salivary Gland	1	1	-
Skin	16	6	28-198
Soft Tissue	3	2	138
Thyroid	7	2	82-162
Others	3	1	56-100
Total	107	40	

Sample size was obtained only in 67 studies to which a proper link was obtained. Overall sample size varied from 28 – 9945. Highest number of sample studied ie 9945 was from histopathology of female

genital system. Least number of samples for the study ie 28 was from skin.

Skin, followed by gastrointestinal system, female genital system and blood were the most frequently chosen system for the study, as shown in the above table.

DISCUSSION

Medical research and projects also have several benefits, such as improving students' ability to interpret the scientific literature critically when working as physicians or dentists, increasing the potential number of scientists who will pursue medical research and improving independent analytical problem-solving skills.³

Improving the quality of research is more a question of attitude than hard work. The amount of work required for doing mediocre research is exactly the same as that for the best of research. Research aims at the production of new knowledge and new skills that can be used in society.⁴

Both quantitative and qualitative approaches to research evaluation can be used to connect the aims of health research to its perceived value of research outcomes, whether this is tied to scientific excellence or usefulness.⁵ Pathologists play an important role in patient care and management with other doctors, as a diagnostician, consultant, experimentalist, auditor of the quality of medical practice, teacher and administrator, etc.⁶

Histopathology (28%) was the commonest study chosen for the dissertation topic and the different systems which were commonly preferred for the study were Female genital system, gastrointestinal system and Skin.

Histochemistry, respiratory system, nerve, Mediastinum was the least common topics for study. Sample size was highest for female genital system, as maximum number of specimen received for histopathology to any medical college laboratories is from female genital system, of which hysterectomy, cervical biopsy and endometrial samples are the commonest.

With advances in technology, there are new and sophisticated diagnostic methods available for disease diagnosis. Because of lack of availability of such investigation in all the medical colleges and also they are not cost effective, students opt for histopathology

and Clinicopathological studies for their dissertation work. Histopathology still remains the gold standard for confirmation of diagnosis and since the facility is available in all the medical colleges, students choose to take up histopathological studies. Postgraduate students should be encouraged to take up research activities, which adopt other types of investigations and skill. This calls for all the medical colleges to have sophisticated laboratory for such investigations and also trained personnel. This can happen when medical council of India mandates the establishment of laboratory with sophisticated methods of investigations in all medical colleges.

REFERENCES:

1. Kumar et al.,: Robbins and Cotran Pathologic Basis of Disease, Ed.8, 2010. pp 4.
2. www.rguhs.ac.in visited on 21.12.2010 on greenstone platform.
3. Weihrauch M, Strate J, Pabst R: The medical dissertation—no definitive model. Results of a survey about obtaining a doctorate contradict frequently stated opinions. *Dtsch Med Wochenschr* 2003, 128: pp2583-87.
4. Advisory Council on Health Research: Publication no. 57 - Research that matters - Responsiveness of University Medical Centers to issues in public health and health care. The Hague 2007.
5. Mostert, Sebastian P, et al.,: Societal output and use of research performed by health research groups in *Health Research Policy and Systems* 2010, 8:30 <http://www.health-policy-systems.com/content/8/1/30>.
6. Deodhare, S G: *General Pathology and Pathology of Systems*, Ed.6, 2002. pp.1.

A Study of Life Quality Factors and Fatigue in Breast Cancer Patients

Maryam Didehdar Ardebil¹, Zinatossadat Bouzari², Shahla Yazdani³, Ali Morad Heidari Gorgi⁴, Mehdi Farhanghi⁵, Mahtab Zeinal Zadeh⁶

¹ Azad Islamic University, Sarab, Iran & Phd Scholar, Psychology Department of Panjab University, India, ² Assistant Professor, Department of OB & GYN, Babol University of Medical Science, Babol, Iran & Member of Stem Cell Research Center, Babol University of Medical Science, Babol, Iran, ³ Associated Professor, Department of OB & GYN, Babol University of Medical Science, Babol, Iran, ⁴ Faculty Member of Mazandaran Medicine University, Mazandaran Iran, ⁵ Azad Islamic University of Medical Sciences, Ardebil, Iran, ⁶ Assistant Professor, Department of OB & GYN, Babol University of Medical Science, Babol, Iran

ABSTRACT

Present study aimed to explore the relative contributions of life quality in relation to fatigue among breast cancer patients. In present Cross sectional study during One year a total of 53 women who suffered from breast cancer were assessed by the Profile of inventories in Imam Hospital, Iran and also by valid and standard psychological scale for assessment these patients and analyzed by regression method.

Quality of life was positively associated with fatigue, but inversely related to age. A relationship between life quality and cancer-related fatigue was found exclusively for positive reappraisal, a combination of fatigue and life quality. The results suggest an association between life quality and fatigue. So regarding this findings and other studies results some factors which is related to quality of life should consider in treatment course to reduce patients suffering and treatment costs.

Keywords: *Quality of life; Breast Cancer; Fatigue*

INTRODUCTION

Common treatment procedures focuses on quantity and they haven't paid attention to the quality but if we consider quality of life related to wellbeing, it may help and support perfect treatment on cancer patient¹. Risk factors of breast cancers are classified as preventable and unpreventable. Unpreventable risk factors include hereditary factors, family history and not easily-attainable factors. Major preventable risk factors are associated with habits, patterns and behaviors of life.²⁻³ Life quality and life quality-related psychological factors are among second class of factors which can play a considerable role for amendment and prevention⁴. Sorrow, fear, chaos and grief are being normally observed after knowing the cancer diagnosis. Surveys show that these groups of patients are susceptible to emotional stresses.⁵ and this can lead to disturbance of life quality of women. Chronic diseases especially cancer are of those diseases that greatly influence the life quality.⁶ Impact of cancer including fatigue, psychological problems, disease denial and impairment of mental image are due to change of body organs' function and duration of disease. Many

surveys have demonstrated that 20-30% of breast cancer patients have been affected by mental problems and are feeling severe dissociation of family life.⁷ On the other hand, studies are indicative of high prevalence of fatigue and feeling of malaise among breast cancer patients.⁸⁻⁹ Under improper conditions patients experience severity pain and fatigue than calm patients.¹⁰ According to cancer prevalence increase and importance of this illness impact on all aspects of patients' life and regarding these patients are seized with several problems, this survey aims to assess the breast cancer patients' life quality in related to fatigue.

Material and method

This is a descriptive cross-sectional study in correlation type. Study population is comprised of 50 patients afflicted by breast cancer undergoing chemotherapy who were referred to Imam Khomeini Hospital of Ardabil in 2009. Sampling was done with objectives-oriented method. All patients agreed for participation in study and submit consent. Including criteria include age above 18 and having no other chronic disease. Data were collected through

questionnaire and patients self-reporting. Data collection tools were encompassed following four sections:

1. Life quality standard tool: This inventory includes two sections; first was related to demographic characteristics and second section was the SF-36 - life quality survey's questionnaire. This inventory focuses on patient's function in eight dimensions which include physical function, physical role, somatic pain, general health, social function, emotional role and mental health. Its validity has been frequently assessed either among normal population or patients with different diseases.¹¹
2. Fatigue Severity Scale of Croup et al (1989) that has 9 items. Surveys of Croup et al and Nasri's surveys in Iran are indicative of appropriate validity and reliability of this questionnaire.¹²

FINDINGS

Results of descriptive statistics showed that all mean age of patients was 46.7, 66.24% were literate and 43.76% were illiterate. 11% of patients were working and 14% were retired and rest of patients was homemaker. 24/63 %life quality lower than normal and 58/22were medico rite , only 17/15% of patient were have higher than appropriate. Relationship between life quality related fatigue was found for relationship, a combination of health mental and social function, and vitality and somatic pain (Table 1).

Table-1-Relation between life quality factors and Fatigue

V	B	SE	Beta	T	P
Vitality	1.148	0.499	-0.281	-3.100	0.002
Somatic pain	0.002	0.872	0.106	0.589	0.514
General health	0.053	0.235	-0.028	0.417	0.098
Physical role	0.239	1.056	-0.098	0.410	0.433
Social function	0.001	3.461	0.288	0.391	1.353
Emotional role	0.239	1.185	-0.098	0.614	0.728
Mental health	0.002	-3.129	0.402	0.588	1.839
physical function	0.079	1.771	0.178	0.479	0.849

CONCLUSION

Fatigue is basis and main problem between cancer patients⁸and also regarding this fact that problems like fatigue is a substantial and common problems in these patients, maladjustment with disease can affect the personal relations, clinical course and prognosis of patients disease.¹³⁻¹⁴Furthermore, many of these

patients are disappointed and hopeless in such severity that suicidal thoughts and attempts are sometimes being observed. Mental condition changes of patients influences family members too, and results in inactivation of any productive actions.¹⁵The main problem in these patients is the defect of losing the breast that is effective on their life quality. Many of patients need support because of problems like pain, body figure, sex problems and social problems.¹⁶Results were demonstrating that high percents of patients were afflicted by mild and moderate. Chronic fatigue, even in mild level, disturbs the recovery course. Also, for life quality in health items like physical, mental, social and psychological problems, results showed that 58.22% and 24.63% reported moderate and low quality of life, respectively.⁹ Sammarco in his study in 2001 has reported the moderate life quality of women less than 50 years of age. Results of Okamura et al in 2005 were indicative of this finding that improper life quality can contribute in prognosis and level of patients' problems.¹⁷ Concerning relationship of mental problems and life events to life quality and on the other hand relationship between fatigue and life quality, it generally seems that there is relationship between cancer and life quality with fatigue.^{18,19} Our findings, also was indicative of relationship between severity of chronic fatigue and quality of life and the more was fatigue the low level of quality of life. Broval's Studies also showed that women with breast cancer often showed fatigue, depression and nausea. Of our findings was that life quality decreases with aging, this finding doesn't accord with Havilland's findings in which women above 50 years of age have reported higher level of life quality comparing to younger women.²⁰This incongruity can be explained by cultural differences between Iran and Sweden. Finally, concerning effect of life quality on fatigue and inversely by improving the life quality of patients, besides prevention chance of recovery can be increased, too.

ACKNOWLEDGEMENTS

We would like to thank the Research and technology Vice Chancellor, Azad Islamic Ardebil University.

Competing interest

The authors declare that they have no competing interests.

REFERENCES

1. Vahdani nia M, Sedighi J, Montazery A. Study life quality of rage survive whit breast cancer woman. *J Payesh* 2004; 4(1):39-45.
2. Heidary S, Salahshuriyan A, Rafiyi F, Hoseiny F. Relationship between social support and rate ommunication with quality of life on cancer patients: *JFEISE* 2008;12(2):32-39.
3. Hoseiny, M.Jahany, U. Mahmoodi, M.Eshragiyan, M. Yahyapur, U. ke shtkar. A etal. Assessment prostate cancer risk factors in mazandaran : *Medicine sciences gorgan Journal* 2008;10(3): 58-64.
4. Northouse LL, Caffey M, DeichelbohrerL, Schmidt L, Guziatek-Trojniak L, West S, etal. The quality of life of African American wo men with breast cancer. *ResNurs Health*. 1999 ; 22(6): 449-460.
5. Andersen BL, Farrar WB, Golden-Kreutz D et al. Stress and immune responses after surgical treatment for regional breast cancer. *J Natl Cancer Inst* 2001;90: 30-36.
6. Shaban M, Related betwe en quality life and cancer traits on cancer patients under chemotherapy: *Journal hayatt*,2008 :10(22):63-70.
7. National Institutes of Health State-of-the-Science on ference Statement: Symptom Management in Cancer: Pain, Depression, and Fatigue 2002 : 15-17.
8. Sydney M. Dy, Steven M. Asch, Arash Naeim, Homayoon Sanati, Anne Walling, Karl A. Lorenz. Evidence. Based Standards for Cancer Pain Management- review article-*Journal of Clinical Oncology* 2008; 26(23): 3879-3885.
9. Gan Z, Julienne E , bower. Canc er related fatigue focus on breast cancer and pain hod qkings disease survivors: *acta oncologica* 2007;46(4): 474-479
10. Sims Andrew .Sign on mind (psychopathology) 2000:107
11. Neamatollahi A. Quality of life in breast cancer woman. Thesis dissertation of master of nursing. Tehran
12. Abolghasemi,A .Narimani M, Psychological tests: *Aradail ; bage rezvan ;*2005:218-228.
13. Holzner B, Kemmler G, Kopp M, Moschen R, Schweigkofler H, Dunser M, etal. style of life in breast cancer patients—not enough attent ion for long-term survivors? *Psychosomatics .* 2001; 42(2): 117-23.
14. Burgess C, Cornelius V, Love S et al. Depression and anxiety in women with early breast cancer: five year observational cohort study. *Br Med J* 2005;3: 1136-1139.
15. Golden - Kreutz DM, Thornton LM, Wells-Di Gregorio S et al. Traumatic stress, perceived global stress, and life events: prospectively predicting quality of life in breast cancer patients. *Health Psychology* 2005;24:124-131.
16. Sammarco A. Perceived social support, uncertaint y, and quality of life of younger breast cancer survivors. *Cancer Nurse*. 2001; 24(3): 212-219.
17. Macleod U, Ross S, Fallow field L, Watt GC. Anxiety and support in breast cancer: is this different for affluent and deprived women? A questionnaire study. *Br J Cancer* 2004;91: 879-883.
18. Okamura M, Yamawaki S, Akechi T, Taniguchi K, Uchitomi Y: Psychiatric disorders following first breast cancer recurrence: prevalence, associated factors and relationship to style of life. *Jpn J Clin Oncol* 2005;35: 302-309.
19. Haviland Joanna. Mils Judith. Sumo Georges. Bliss Judith .The impact of age and clinical factors on quality of life in early breast cancer. *The Breast* 2007;16(3): 241-251

Screening for Cervical Cancer in Pregnancy-Our Experience

Meena Priyadhashini V¹, Seetha Panicker²

¹Assistant Professor, Department of Obstetrics and Gynaecology, PSG Institute of Medical Sciences & Research, Coimbatore, ²Professor and Head of the Department, Department of Obstetrics and Gynaecology, PSG Institute of Medical Sciences & Research, Coimbatore

ABSTRACT

Objective:

- To diagnose Cervical intraepithelial neoplasia in pregnancy with Visual Inspection of cervix with Acetic acid and Lugol's Iodine and Papsmear as screening tool.
- To assess the difficulties of screening and colposcopy in pregnancy.

Design: Retrospective study

Materials and Method: 350 antenatal women less than 20 weeks of gestational age attending the OG OPD at PSG Hospitals, Coimbatore were subjected to visual inspection of cervix with Acetic acid and Lugol's iodine and Pap smear. A Pap smear was taken from all pregnant women following which visual inspection of cervix with Acetic acid and Lugol's iodine were done by applying 5% Acetic acid followed by Lugol's iodine. If there was an abnormality on visual inspection of cervix with Acetic acid and Lugol's iodine or cytology patients were recalled for colposcopy.

Results: 350 pregnant women both primigravidae and multigravidae were screened (n=350). Among them the screen positives for visual inspection of cervix with Acetic acid and Lugol's Iodine=30 (8.57%). Three patients had abnormal results on Pap smear (0.8%), (2 had HSIL, 1 had LSIL). Of the 30 patients who were recalled for colposcopy, 4 (13.3%) were abnormal (CIN I=2, CIN II & CIN III=2).

Conclusion: Though visual inspection of cervix with Acetic acid and Lugol's iodine has high false positivity rate because of physiological changes in pregnancy, it is still a feasible screening method in a low resource setting like ours. In our study, we had 4 positives and all of them were picked up by visual inspection of cervix with Acetic acid and Lugol's iodine. So screening for cervical cancer during pregnancy is worthwhile as antenatal clinic may be the only opportunity.

Keywords: Pregnancy, Visual Inspection of Cervix With Acetic Acid and Lugol's Iodine, Pap Smear, Colposcopy

INTRODUCTION

Cervical cancer is the most common malignancy diagnosed during pregnancy with incidence of 0.004 to 0.13%¹. One in every 100 cervical cancer patients are pregnant when diagnosed². It has been well established that organized cytology screening programs can substantially reduce the incidence of and mortality from cervical carcinoma in developed countries. Such screening programmes, based on call, recall and repeat cytology at regular intervals are difficult. On the other hand, cervical cancer continues to be a major public health problem.

High incidence and mortality rates in developing countries are due to the lack of screening programmes³. Diagnosis by simple screening methods treatment with less invasive procedures like cryo therapy, LETTZ, cervical conisation will increase the five year survival rate upto 92 %. Pregnancy produces dramatic alterations in the gross and colposcopic appearance of the cervix as well as in the cytology and the histology of cervical pathology specimens. Pregnancy and puerperium is not the ideal time for screening. However antenatal clinic may be only opportunity for screening in India.

Diagnosis is aided by screening methods like visual inspection of cervix with Acetic acid and Lugol's iodine, cytology and colposcopy. Visual inspection of Acetic acid and visual inspection of Lugol's iodine has high positivity rate. Colposcopy is difficult during pregnancy. Screening by cytology is less difficult when compared with visual inspection methods in pregnancy but is not cost effective. In some populations, upto 20% of pregnant women have an abnormal cytology during pregnancy.

When screening is part of routine antenatal care the chances of diagnosis are increased. The prevalence of intraepithelial neoplasia coincides with period of maximum child bearing. The suspected lesion can be biopsied during early pregnancy to rule out invasive cancer. It avoids detection at late pregnancy and perurperium.

The accepted standard of care is to screen all pregnant women for cervical cancer at first prenatal visit⁴. Abnormal smears or unhealthy cervix suspicious of malignancy should be subjected to colposcopic examination. Literature supports colposcopic directed biopsy in pregnancy as it is accurate and reliable.

MATERIALS AND METHOD

After obtaining informed written consent from the patients, this study was conducted on 350 antenatal women less than 20 weeks of gestational age attending the Outpatient department at PSG Hospitals, Coimbatore for a period of 6 months between June to December 2011 were subjected to visual inspection of cervix with Acetic acid and Lugol's iodine and Pap smear. Women who had a history of cytological abnormality or previously treated for CIN were excluded.

Pap smear was taken for all pregnant women in both primigravidae and multigravidae following which visual inspection of cervix with Acetic acid and Lugol's iodine were done applying 5% acetic acid followed by Lugol's iodine. If there was an abnormality on visual inspection of cervix with Acetic acid and Lugol's iodine or cytology patients were recalled for colposcopy.

OBSERVATION AND RESULTS

350 antenatal women at their first antenatal visit were screened. 30 of them were positive on visual inspection of cervix with Acetic acid and Lugol's iodine. On Pap smear 2 had HSIL and 1 had LSIL. Of

the 30 who underwent colposcopy, 2 had low grade lesions and 2 had high grade lesions.

Table 1: Screen positives

Screening method	Screen positive	%
Visual Inspection of cervix with Acetic Acid and Lugol's Iodine	30/350	8.57 %
Pap smear	3/350	0.8%
Colposcopy	4/30	13.3%

Table 2: Pap smear results

Pap smear results	n=350	%
Normal	205	58.5%
Inflammatory smear	132	37%
Unsatisfactory smear	5	1.4%
Candida cells	4	1.1%
HSIL	2	0.57%
LSIL	1	0.28%
Squamous Metaplasia	1	0.28%

Zhonghua et al observed 2.9% LSIL and 0.64% HSIL in his study⁵. In our study Pap smear showed 0.5 % HSIL and 0.28 % of LSIL.

Donders et al found 20% candida cells on Pap smear⁶ whereas in our study we had only 1.1% candida cells.

Table 3: Colposcopic findings

Colposcopic findings	n=30	%
Normal	25	83%
CIN I	2	6.6%
CIN II & III	2	6.6%
Squamous Metaplasia	1	3.3%

Wetta et al observed 3 out of 625 patients had CIN II & III on colposcopy. In our study we had two patients with CIN II & III on colposcopy⁷.

DISCUSSION

As most of CIN and cervical cancer lesions occur in child bearing age group, pregnancy presents an opportunity to screen them. Although rare, cervical cancer is the most common reproductive tract malignancy associated with pregnancy. 3 % of cases are diagnosed during pregnancy⁸. This increased incidence is because of improved surveillance compared to non-pregnant matched controls and diagnoses is made in its earlier stage during pregnancy compared to general population^{9,10,11}.

Screening during pregnancy identifies occult high grade lesions and distinguishes preinvasive lesions

from invasive lesions. Similar to non-pregnant women the incidence of abnormal Pap test is 5-8% in pregnancy^{12,13,14,15,16}. In our study about 1% of pregnant women had abnormal Pap test.

During pregnancy the cervix undergoes glandular and stromal changes similar to those occurring in the endometrium¹⁷. Cervical epithelium is highly sensitive to increased estrogen levels. The cervical stroma undergoes destruction of its collagen by collagenase and accumulation of gel-like mucopolysaccharides, as well as increased fluid content. This results in a softened and edematous cervical lip that rolls out and everts a portion of the endocervix beyond the external os.

The endocervical glands become hyperplastic, resulting in a polypoid protrusion, microglandular hyperplasia, or both. They also become hypersecretory, a state known as endocervical gland hyperplasia, contributing to a thick mucous plug. Increased vascularity and abundant mucus production are clearly evident.

The increased vascularity of the cervical epithelium and stroma produces a bluish hue (Chadwick's sign). The gross appearance of the cervix is determined largely by gestational age, especially in the primigravida^{18,19}. The extent of eversion of the endocervix varies with parity, being most marked in primipara. The eversion process begins during the early weeks of pregnancy and is usually apparent in the early second trimester. A substantial amount of immature squamous metaplasia will subsequently occur. The stroma can also undergo focal or massive decidualization and may cause vaginal spotting in pregnancy²⁰. In subsequent pregnancies, the extent of eversion of the endocervical canal is less significant, but gaping of the endocervical canal may result in a similar exposure of endocervical columnar epithelium to the acidic vaginal environment.

The positivity of visual inspection of cervix with Acetic acid and Lugol's iodine during pregnancy is more because of physiological changes like eversion of endocervix, hypertrophy of fibromuscular stroma, increased vascularity, increased nuclear cytoplasmic ratio and prominent nucleoli of the decidual cells. However, knowledge of these changes still provides an opportunity for screening because many women seek health care only when pregnant.

Cytologic appearance are more difficult to interpret in pregnancy^{21,22,23}. However, grade for grade,

intraepithelial lesions are cytometrically identical to those in non-pregnant women. Hormonal changes in pregnancy cause changes in squamous and glandular epithelial cells, including hyperplasia and reactive atypia. The Arias-Stella reaction, a hyperplastic epithelial change simulates clear cell carcinoma of cervix^{24,25}. Decidualization results in large cells with large nuclei may be mistaken for HSIL or carcinoma cervix²⁶. Endocervical gland hyperplasia may be misdiagnosed as HSIL or adenocarcinoma of cervix²⁷. Presence of viable trophoblast, abundant vacuolated cytoplasm, enlarged nuclei with prominent nucleoli, smudged chromatin may be mistaken for viral cytopathic effect or endocervical carcinoma^{28,29}. The navicular cells, low karyopyknotic and eosinophilic index and cytolysis owing to the abundance of lactobacilli that thrive in the glycogen-rich environment may all lead to diagnostic errors. Conversely, actual dysplastic changes could be incorrectly attributed to pregnancy changes, leading to false-negative cytology.

The Colposcopic examination in no different in pregnancy and the patients have to be reassured that it is not harmful to the fetus. However the examination is more demanding as gestational changes may cause suspicious colposcopic patterns.

The following are the gestational changes in the cervix:

1. Cervix becomes hypertrophied.
2. There is increased prominence of the vascular patterns.
3. The stroma becomes edematous and its cells undergo varying degrees of decidualisation.
4. Proliferation and hyperplasia of the columnar epithelium causes eversion of the endocervical mucosa.
5. Increased prominence of acetowhite areas seen in the metaplasia epithelium.
6. Immature metaplasia is difficult to distinguish from LSIL as there may be fine punctuation and mosaic pattern within the metaplastic area.

In all cases where the screening test is abnormal and the colposcopic appearance is suspicious the biopsy is taken mainly to rule out invasion.

To overcome these difficulties 5 % acetic acid are used, which acts as a mucolytic and aid in mucous

removal. If the entire T-Z is not visualised in a single field, the zone can be analysed in four separate fields. By 20th week in majority of women T-Z can be fully visualised³⁰.

Colposcopy guided biopsy should not be deferred, if it will assist in making necessary triage decision. The suspected lesions should be biopsied to rule out invasion. The disadvantages, though rare are infection and haemorrhage. Sharp biopsy forceps should be used and number of biopsies should be minimised. However a large number of reports support the use of colposcopy guided biopsy in pregnancy with little morbidity^{31,32}. Endocervical brush can be used instead of curettage^{33,34,35}.

MANAGEMENT

The principal aim in pregnant women with cytology report with LSIL/HSIL is to rule out invasive cervical cancer. A colposcopy examination is a must for the initial evaluation in these women. The colposcopy should be done by an expert colposcopist. If a lesion is detected on colposcopy a biopsy is acceptable even in the absence of colposcopic features of invasion. The American society for colposcopy and cervical pathology consensus guidelines recommend biopsy of lesions suspicious for cervical intraepithelial neoplasia (CIN) 2,3 or cancer³⁶. Spontaneous regression rate of HSIL is from 30 % to 54% in pregnancy. In all type of lesions endocervical curettage is unacceptable during pregnancy. The definitive treatment of CIN is deferred till after the puerperium. This is because CIN in pregnant women is known to regress following delivery due to change in the immune status of the patient, cervical trauma during vaginal delivery which removes the intraepithelial lesions. Biopsy of the lesion during pregnancy may also aid spontaneous regression. The ASCCP 2006 guidelines recommend deferring treatment till 6 weeks postpartum.

CONCLUSION

Though visual inspection of cervix with Acetic acid and Lugol's iodine has high positivity rate because of physiological changes in pregnancy, it is a feasible screening method in low resource settings like ours. In our study, we had 4 screen positives and all of them were picked up by visual inspection of cervix with Acetic acid and Lugol's iodine. So screening for cervical cancer during pregnancy is worthwhile as antenatal clinic may be the only opportunity to do so.

ACKNOWLEDGEMENT

The authors are thankful to the Principal Dr. Ramalingam.S, the Medical Director Dr. Vimalkumar Govindan, who constantly encouraged us for conducting our study.

Also we are thankful to our colleagues and staffs who helped us in the colposcopy clinic and in antenatal outpatient department.

Conflict of Interest : None

Source of Funding : Institution

Ethical Clearance : Obtained from Institutional Ethical Committee, PSGIMSR

REFERENCE

1. Copeland LJ, Landon MB. Malignant diseases and pregnancy. In; Gabbe SG, Neibyl JR, Simpson JL, editors obstetrics; normal and problem pregnancies Newyork curchill Livingstone 1996 P 1155-81
2. Vural E, Gonenc L, Aka N, et al (2004). Antenatal kontrollerde pap smear taramasi ve sonuclari. *Turkiye Aile Hekimligi Dergisi*, 8, 111-5.
3. Canfell K, Sitas F, Beral V (2006). Cervical cancer in Australia and United Kingdom: comparison of screening policy and uptake, and cancer incidence and mortality. *Med J Aust*, 185, 482-6.
4. Gilstrap LC, Oh W (eds). Guidelines for Perinatal Care, ed 5. Washington DC: American academy of paediatrics and the American collage of Obstetricians and Gynecologists, 2002.
5. Ma L - Zhonghua Fu Chan Ke Zhi; pregnancy related cervical cytological changes and clinical management - 01 - FEB-2011; 46(2): 84-87
6. Donders GG, Van streaten D, Hooff P, De Wet GH; Detection of candida cells from pap smear during pregnancy. *Eor J obstet Gynecol Reprod Biol* 1992 jan 9; 43(1) : 13-8
7. Wetta LA - J Low Genit Tract Dis - 01 - JUL - 2009; 13(3): 182-5. The management of cervical intraepithelial neoplasia during pregnancy: is colposcopy necessary?
8. Nguyen c, Montz FJ, Bristow RE. Management of stage 1 cevical cancer in pregnancy. *Obstet gynecol surv* 2000; 55 ; 633-643
9. Wright T C Ir, Cox JT, Massad LS, et al. consensus guidelines for the management of women with cervical cytological abnormalities. *JAM Med Assoc* 2002 ; 287 ; 2120-2129

10. Solomon D, Davey D, Kurman R et al; forum group member; Bethesda 2001 workshop. The 2001 Bethesda system; terminology for reporting results for cervical cytology. *JAM Med assoc* 2002; 287; 2114-2119
11. Zemlickis D, Lishner M, Dogendorfer P et al. maternal and fetal outcome after invasive cervical cancer in pregnancy. *J Clin oncol* 1991; 9:1; 1956-1961.
12. Champion MJ, Sedlacok TV, colposcopy in pregnancy. *Obstet Gynecol Clin NorthAm* 1993;20;153-163.
13. Economos K, Perez-Veridiano N, Delke I et al. abnormal cervical cytology in pregnancy; a 17 year experience *Obstet Gynecol* 1993; 81 ; 915-918
14. Palle c bangsbell S andreasson B. cervical intraepithelial neoplasia in pregnancy , *Acta obstet Gynecol scand* 2000;79;306-310
15. Kaminski PF, Lyon DS, Sorosky JI et al. significance of a typical cervical cytology in pregnancy. *AM J perinatal* 1992 ; 9 ; 340-343
16. Vlahos G, Rodolakis A, Diakomanolis. Eet al. conservative management of cervical intraepithelial neoplasia (CIN c2-3) in pregnant women. *Obstet Gynecol invest* 2002;54;78-81.
17. Hendrickson MR, Kempson L. Uterus and fallopian tubes. In: Sternberg SS (ed). *Histology of Pathologists*. New York: Raven press, 1992, p 809.
18. CampinMJ, Sedlacek TV. Colposcopy in pregnancy. *Obstet Gynecol Clin North Am* 1993; 20:153-163.
19. Ostergard DR. the effect of pregnancy on the cervical cytology. *AM J Obstet Gynecol* 1979; 134: 759-760.
20. Micheal CW, Esfahani FM. Pregnancy-related changes, a retrospective review of 278 cervical smears. *Diagn cytopathol* 1997, 17:99-107.
21. Morimura Y, Fujimori K, Soeda, et al. Cervical cytology during pregnancy: comparison with non-pregnant women and management of pregnant women with abnormal cytology. *Fukushima J Med sci* 2002;48(1):27-37.
22. Micheal CW, Esfahani FS. Pregnancy-related changes: a retrospective review of 278 cervical smears. *Diagn cytopathol* 1997;17:99-107.
23. Pischarodi LR, Jovanoska S. Spectrum of cytologic changes in preganacy: a review of 100 abnormal cervicovaginal smears, with emphasis on diagnostic pitfalls. *Acta cytol* 1995;39:905-8)
24. Aria-stella J. atypical endometrial changes associated with the presence of chorionic tissue. *Arch Pathol* 1954;58:112-128.
25. Arias-Stella J.a topographic study of uterine epithelial atypia associated with chorionic tissue: demonstration of alteration in the endocervix. *Cancer* 1959;12:310-313.
26. Schneider V, Barnes LA. Ectopic decidual reaction of uterine cervix, frequency and cytologic presentation. *Acta Cytol* 1981;25:616-622.
27. Valente Pt; Schantz HD, Schultz M. cytologic atypia associated with microglandular hyperplasia.
28. Shargo SS. The Aria-Stella reaction. A case report of cytologic presentation. 1977;21:310-313.
29. Mulvany Nj, Khan A, Ostor A. Aria-Stella reaction associate with cervical pregnancy; report of a case with cytologic presentation. *Acta Cytol* 1994;38:218-222)
30. Behnam K, Mariano E. the value of colposcopy in evaluating cervical intraepithelial neoplasia during pregnancy. *Diagn Gynecol Obstet* 1982;4;133-135
31. Orr JW IR, Barrett JM, orr PF et al. the efficacy and safety of the cytobrush during pregnancy. *Gyncol oncol* 1992 ; 44; 260-262.
32. Lieberman RW, Henry Mr, Laskin WB et al. colposcopy in pregnancy;directed brush cytology compared with cervical biopsy. *Obstet Gynecol* 1999; 94;198-203
33. Economas K, Perez – Verdiano N, Delke 1 et sl. Abnormal cervical cytology in pregnancy. A 17 year experience. *obstetGynecol* 1993 ; 81 ; 915-918.
34. Coppola A, Sorosky J, Casper R et al. the clinical course of cervical carcinoma in situ diagnosed during pregnancy. *Gynecol oncol* 1997 ; 67 ; 162-165
35. Baldauf JJ, DREyfus M, RitterJ et al. colposcopy and directed biopsy reliability during pregnancy; a cohort study. *Eur J obstet Gynecol Reprod Biol* 1995; 62; 31-36.
36. Wright TC, Massad LS, Dunton CJ, et al. 2006 Consensus guidelines for the management of women with abnormal cervical screening tests. *J Low Genit Tract Dis* 2007;11(4):201-22.

Visual Inspection with Acetic Acid (VIA) Vs Cervical Cytology as Cervical Cancer Screening Tools in South India

Leena MS¹, Mohd. Shafee², Kokiwar PR², Jogdand GS³

¹Associate Professor, Dept. of Pathology, CAIMS, Bommakal, Karimnagar, ²Associate Professors, ³Professor and Head, Dept. of Community Medicine, CAIMS, Bommakal, Karimnagar

ABSTRACT

Context: With a quarter of all cervical cancers occurring in India, the risk for women to contract this condition is high. The burden remains high because cervical screening programs of adequate scale are lacking.[1]

Aims: To compare the performance of visual inspection with acetic acid and cervical cytology in south India.

Setting and Design: A cross-sectional study was performed in three villages in one of the south Indian district by recruiting 668 healthy women to undergo VIA and conventional Pap smear examination.

Method and Material: Women who had a positive result from any of these tests were subjected to colposcopy and biopsies (if necessary), and women with high-grade cervical intraepithelial neoplasia (CIN) were properly treated.

Statistical Analysis: Data was analyzed using statistical software from www.OpenEpi.com

Results: Overall test positivity was 21.4% for VIA and 2.24% for Pap smear (LSIL threshold), 1.04% for Pap smear (HSIL threshold). VIA was positive in 70% of the women with CIN 1, 75% of those with CIN 2, 66.66% of women with CIN 3 and in two of two (100%) of women with cancer. Approximately 10% of women with no detectable disease had an abnormal VIA.

Conclusions: A combined use of VIA with the Pap test allowed specific detection of cervical abnormalities.

Keywords: Cervical Cancer, Screening, VIA, Pap Smear

INTRODUCTION

Severely affected by the lack of human and material resources, many economically underprivileged geographic regions fail to provide efficient screening for cervical cancer.^[2,3] The current mainstay of cervical cancer screening, cervical cytology (Pap smear), necessitates a well-organized infrastructure to achieve optimal results: health units to collect cervical material, laboratories to prepare the slides for reading, specialized personnel apt to render a diagnosis and, ultimately, physicians trained to deal with the abnormalities eventually detected.^[4] This structure is not readily available, and only a few countries have managed to consistently reduce their cervical cancer

incidence and prevalence rates by widespread use of Pap smear screening, most notably the Nordic Countries.^[5-7]

Prompted by the need for optimal strategies for cervical cancer screening, and based upon the concepts that the majority of pre-invasive and invasive cervical lesions are visible by 'naked-eye' observation, investigators have developed novel affordable diagnostic tools suitable for large-scale screening of cervical abnormalities.^[8]

Several recent studies testing VIA suggest that it closely matches the Pap smear in its performance in detecting cervical cancer precursors.^[8,9] In a recent

report on 4444 women, VILI was also shown to perform adequately,^[10] being comparable to both VIA and the Pap smear.^[11,12] However, several weaknesses of VIA and VILI have been revealed, particularly the high rate of false-positive findings, which may lead to substantial number of colposcopies.^[12-14] Importantly, more work is needed to evaluate the performance of these new tools under field conditions, and on implementing VIA and VILI in countries with different cancer incidence and in different screening settings.

The management of a rural private medical had recently designed a breast and cervical cancer screening in the 50 villages of two mandals of a district from northern Telangana, Andhra Pradesh. It was decided to screen all females from 18 – 60 years of age with VIA but in first three villages both VIA and Pap smear were used as screening methods. The results of these three villages are presented here.

MATERIALS AND METHOD

Study design

The breast and cervical cancer screening programme is an ongoing activity of Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar (AP) in two mandals (talukas) with 25 villages each in partnership with one of NGO run by a religious leader. In this study, data from first three villages where VIA and Pap smear is applied as screening test is presented. The consecutive women from the three villages namely Durshed, Velchala and Maqdumpur were recruited to undergo gynaecological consultations and examination with VIA, conventional Pap smear and screening colposcopy. In order to ensure homogeneous exam quality, all centres provided specialists in gynaecology and well-trained nurses to carry out the VIA, Pap test and Colposcopy.

The study protocol has been approved by the Institutional Ethics Committee. All enrolled women gave their agreement to participate by signing the Informed Consent Forms written in their native language.

ENROLMENT AND ELIGIBILITY

In all the villages, eligible women (see below for criteria) were informed of the study protocol by their local health units (ASHA, ANM, MPHW), local female groups, students and employees of the college and intensive campaigning was done by using audio systems inviting them to participate. A sensitization

meeting was conducted for above mentioned people to mobilize village females for enrollment in the screening programme. Women were considered eligible if they met all of the following requirements:

- Were aged 18–60 years;
- Had an intact uterus (i.e. no previous surgical procedure of the cervix or corpus);
- Had no history of abnormal Pap test in the past year;
- Were not under treatment for genital condyloma (external or in the cervix);

The women who were having following characteristics were excluded

- Hysterectomized (uterus removed)
- Menstruating
- Who refused to give consent for examination

Diagnostic setting

After signing the Informed Consent Form, women were subjected to a questionnaire addressing clinical and epidemiological risk factors of cervical disease. All women were subjected to a thorough pelvic examination, in this sequence comprising collection of the Pap smear and VIA. Women who had one or more abnormal result and five percent of normal women were referred for colposcopic examination (Fig. No. 1). The decision to take a histological specimen was based upon the Pap smear result and colposcopy. Abnormal colposcopy prompted punch biopsies of the cervix and women with high-grade cytological abnormalities were referred for conization. Women had their second visit scheduled after 14 days. Treatment was offered to all women who had high-grade lesion confirmed in the cervical biopsy.

Visual inspection with acetic acid (VIA)

After collection of the sample for the Pap test, 5% acetic acid was applied to the cervix through embedded cotton at the edge of a Cherron. After 1 min, the cervix was illuminated with a 100W bright lamp and visually examined ('naked eye' examination). Examiners have been trained to classify their visual impression according to the Atlas of Visual Inspection^[8] which has many diagnostic possibilities. For statistical purposes, these diagnosis were grouped as negative or positive, as follows:

- Negative – nulliparous, multiparous, presence of cervical mucous, squamous metaplasia, ectropium, cervicitis, Naboth cysts; polyps, vaginal discharge.
- Positive – suggestive of condyloma, cervical intraepithelial neoplasia (CIN) 1, CIN 2, CIN 3 or cancer.

Cervical cytology (Pap smear)

Conventional Pap smears were taken using the Ayre spatula and endocervical brush, fixed in 95% ethanol and stained by the modified Papanicolaou method. Final cytological diagnoses were issued using the Bethesda System (2002)^[15] and were classified as normal/inflammatory, atypical squamous cells (ASC), atypical glandular cells (AGC), low-grade squamous intraepithelial lesion (LSIL) or high-grade squamous intraepithelial cells (HSIL).

- Negative – normal/inflammatory and ASC results.
- Positive – LSIL, HSIL, and ‘suggestive of invasive carcinoma’ (two thresholds were used for positivity: LSIL or higher and HSIL or higher).

Colposcopy

Colposcopy was performed immediately after an abnormal VIA or, in case of a positive Pap smear at the second appointment. All examinations were performed by experienced and certified colposcopists. Careful examination of the cervix and transformation zone was carried out approximately 1 min after applying 5% acetic acid on the entire cervix, with up to 40 magnification. Acetowhite epithelium, punctuation, mosaic and atypical vessels prompted colposcopically targeted punch biopsies.

Cervical biopsies

Tissue samples were fixed in formalin, embedded in paraffin, and processed into 5-mm-thick haematoxylin– eosin-stained sections for light microscopy, following the routine procedures. All biopsies were examined as part of the daily routine in the Pathology Department and diagnosed using the commonly agreed CIN nomenclature.

Statistical analysis

Colposcopy and cervical biopsies (i.e. punch biopsies or cervical cones) were considered to be the reference investigations. Women with pathologically confirmed CIN 2 or worse were regarded as positive, whereas women with normal colposcopy, abnormal colposcopy with non-CIN, CIN 1, or other non-cancer diagnosis, or those who were not examined with colposcopy but had all screening tests negative, were considered to be negative. All statistical calculations were done using statistical software from www.openepi.com.

FINDINGS

The data from first three villages is furnished here. All three villages had total population 2601 of females more than 18 years. Total 939(36.10%) of these females reported to screening sites. Total 668(71.13%) women consented for VIA and Pap smear examination. The VIA and Pap smear found positive in each village were Durshed 39(18.05%) and 06(2.78%), Velchala 54(21.34%) and 12(4.74%), Maqdumpur 50(25.12%) and 04(2.01%) respectively. (Table No. 1)

Table No. 1 Summary of cervical cancer screening in three villages

Village	Pop.	Female > 18 yrs	Regd.	VIA+ve/Done	Pap+ve/Done	Hyt.	Ref
Durshed	2091	701 (33.52)	262 (37.37)	39/216 (18.05)	06/216 (2.78)	29	17
Velchala	4125	1050 (25.45)	396 (37.71)	54/253 (21.34)	12/253 (4.74)	26	117
Maqdumpur	2979	850 (28.53)	281 (33.05)	50/199 (25.12)	04/199 (2.01)	52	30
Total	9195	2601 (28.28)	939 (36.10)	143*/668 (21.40)	22/668 (3.29)	107 (11.39)	164 (17.46)

*No. of VIA positive were significantly higher than Pap positive ($\chi^2=99.57$, $df=1$, $OR=1.933$, $95\% CI=1.772-2.109$, $P < 0.001$)

Mean age was 27.9 years, with range of 19–56 years. There was no significant difference in age of women from different villages. Overall test positivity was 21.4% for VIA, 2.24% for Pap smear (LSIL threshold), 1.04% for Pap smear (HSIL threshold). The highest proportions of positive VIA 25.09% was found among

women aged 21–30 years, The highest proportions of women with abnormal Pap tests (LSIL) were encountered among those 31–40 years old (6.09%) and more than 40 years (5.26%), whereas for HSIL, the majority of abnormal tests concentrated in the group of women aged 31–40 years (1.7%). (Table No. 2).

Table No. 2 Results of the screening tests in different age groups

Age (years)	Positive / Total (% Positive)		
	VIA	Pap smear (LSIL)	Pap smear (HSIL)
< 20	05/46 (10.86)	00/46 (00)	00/46 (00)
21 – 30	126/502 (25.09)	11/502 (2.19)	02/502 (0.40)
31-40	08/82 (09.75)	05/82 (6.09)	01/82 (2.43)
>41	04/38 (10.52)	02/38 (5.26)	01/38 (2.63)
Total	143/668 (21.4)	15/668 (2.24)	07/668 (1.04)

Overall, histological specimens obtained with punch biopsies or cervical conization disclosed 20 CIN 1, 12 CIN 2, six CIN 3 and two cases of cancer, totaling 20 cases of significant (CIN 2 or worse) lesions. Normal cervical tissues, or lesions rendered as acute colpititis, condyloma or HPV-non CIN, were sampled from another 113 women. Table No. 3 displays screening test results as related to the final diagnosis. VIA was positive in 70% of the women with CIN 1, 75% of those with CIN 2, 66.66% of those with CIN 3 and in two of

two (100%) women with cancer. Approximately 10% of women with no detectable disease had an abnormal VIA. The rate of abnormalities in Pap smears (regarded as positive with an LSIL threshold) increased in parallel with the increasing grade of the histological lesions, ranging from 30% among women with CIN 1 to 100% among those diagnosed with cancer. The same occurred with an HSIL threshold, ranging from 16.66% positivity rate in women with CIN 1 to 100% in women with squamous cancer. (Table No.3).

Table No. 3 Screening test results as related to the final diagnosis

Final Diagnosis	Positive / Total (% Positive)		
	VIA	Pap Smear (LSIL)	Pap Smear (HSIL)
Negative*	113/628 (17.99)	00/628 (00)	00/628 (00)
CIN 1	14/20 (70)	06/20 (30)	00/20 (00)
CIN 2**	09/12 (75)	03/12 (25)	02/12 (16.66)
CIN 3**	04/06 (66.66)	04/06 (66.66)	03/06 (50)
Invasive**	02/02 (100)	02/02 (100)	02/02 (100)
Total	143/668 (21.40)	15/668 (2.24)	07/668 (1.04)

*all test negative; normal colposcopy; abnormal colposcopy with histological diagnosis of cervicitis, acute colpititis, condyloma.

** significant lesions

VIA, visual inspection with acetic acid, LSIL, low-grade squamous intraepithelial lesion, HSIL, high-grade squamous intraepithelial lesion.

DISCUSSION

Most of the previous reports addressing the test performance indicators of VIA and VILI have been carried out in developing countries. Investigators from India and some sub-Saharan countries have significantly contributed to our current knowledge regarding the potential of direct visual assessment of the cervix, by examining large cohorts to assess these tests in large-scale screening settings.^[4,9,13] These previous studies have been conducted in a multitude of health services and different economic backgrounds, ranging from extremely poor and unassisted regions to areas with moderately developed health care structures.^[9,10,13]

In this cohort of almost 668 women, abnormal patterns in VIA were more common among those who presented with LSIL and HSIL in their cervical Pap smears compared with those women with normal cytology. This significant association of abnormal VIA with cytological abnormalities suggests that both tests have a potential to detect cervical disease. In a series of 2754 African women, Denny et al.^[12] found that 29.4% of the women aged 35–39 years and 23.4% of those aged 50–65 years had a positive VIA, which are significantly higher figures as compared with the 21.4% overall positivity rate in the present study. Sankaranarayanan et al.,^[8] who examined 3000 Indian women, trained paramedical personnel to grade the aceto-white lesions as positive only when a distinct

pattern was noted, considering faint and doubtful aceto-whitening as a negative VIA result. We tried to adopt the same policy, but even then an unacceptable proportion of women were classified as VIA-positive in whom no cervical lesions were detected on colposcopy, Pap smear or biopsy.

Owing to the subjective visual nature of VIA should, at least in theory, correlate well with the colposcopic findings. This could not be confirmed in the present study, however. Colposcopy did not confirm almost 75% of the abnormalities in VIA. More importantly, close to 25% of the women considered as VIA and VILI as optional screening tools in Latin America having a normal cervix on VIA actually had a significant abnormality detected on colposcopy, Like all studies where less than 100% of the women are examined by the test used as the gold standard, the present study suffers from verification bias. Only those women who are referred to colposcopy on the basis of a positive screening test (Pap and VIA). Thus, some women with true cervical abnormalities who tested negative with VIA and Pap smear might still remain undisclosed, resulting in over-optimistic performance indicators of the screening tests used. In a cohort of 4444 women examined with Pap smear, VIA and VILI in Kerala, India, Sankaranarayanan R^[10] recently achieved more than 80% sensitivity and specificity with VIA, associated with 17.5% PPV.

Our study has important implications for cervical cancer screening in low resource settings. We found that screening coverage, treatment rates and even follow up rates can be high when service delivery methods are appropriate.^[1] VIA may find a place as an alternative low-technology and low-cost method of screening and case-finding. The cost considerations are important in view of the additional colposcopy sessions required as a result of somewhat high recall rates.^[16]

For screening purposes, investigators should devise strategies that provide reasonable detection rates and avoid false positives. This obvious and simple assertion represents the most important challenge in regard to cervical cancer, because either detection rates or specificity of the screening tests currently available for pre-invasive cervical neoplasia demand improvements.^[17]

ACKNOWLEDGEMENTS

To all women who came forward for cervical cancer screening.

Conflict of Interest: Nil

REFERENCES

1. Bhatla N, Gulati A, Mathur SR, Rani S, Anand K and Sankaranarayanan R et al. Evaluation of Cervical screening in rural north India. *Int J Gyn and Obst.* 2009;105:257-261.
2. Parkin DM, Pisani P, Ferlay J. Estimates of the worldwide incidence of 25 major cancers in 1990. *Int J Cancer* 1999;80:827-841.
3. Parkin DM, Bray F, Ferlay J, Pisani P. Global cancer statistics, *CA Cancer J Clin*, 2005;55: 74-108.
4. Miller AB, Nazeer S, Fonn S, et al. Report on Consensus Conference on Cervical Cancer Screening and Management. *Int J Cancer* 2000;86:440-7.
5. Ponten J, Adami H-O, Bergstro`m R, et al. Strategies for global control of cervical cancer. *Int J Cancer* 1995;60:1-26.5.
6. Sigurdsson K. The Icelandic and Nordic cervical screening programs: trends in incidence and mortality rates through 1995. *Acta Obstet Gynecol Scand* 1999;78:478-85.
7. Cronje HS, Parham GP, Cooreman BF, et al. A comparison of four screening methods for cervical neoplasia in a developing country. *Am J Obstet Gynecol* 2003;188:395-400.
8. Sankaranarayanan R, Wesley R, Somanathan T, et al. Visual inspection of the uterine cervix after the application of acetic acid in the detection of cervical carcinoma and its precursors. *Cancer* 1998;83:2150-15.
9. University of Zimbabwe/JHPIEGO Cervical Cancer Project. Visual inspection with acetic acid for cervical screening: test qualities in a primary care setting. *Lancet* 1999;353:869-73.
10. Sankaranarayanan R, Wesley R, Somanathan T, et al. Test characteristics of visual inspection with 4% acetic acid (VIA) and Lugol's Iodine (VILI) in cervical cancer screening in Kerala, India. *Int J Cancer* 2003;106:404-8.
11. Denny L, Kuhn L, Pollack A, et al. Evaluation of alternative methods of cervical cancer screening in resource poor settings. *Cancer* 2000;89:826-833.
12. Denny L, Kuhn L, Pollack A, et al. Direct visual inspection for cervical cancer screening: an analysis of factors influencing test performance. *Cancer* 2002;94:1699-707.
13. Sankaranarayanan R, Nene BM, Dinshaw K, et al. Early detection of cervical cancer with visual inspection methods: a summary of completed and on-going studies in India. *Salud Publica Mex* 2003;45:S399-407.

14. Belinson JL, Pretorius RG, Zhang ZH, et al. Cervical cancer screening by simple visual inspection after acetic acid. *Obstet Gynecol* 2001;98:441–4.
15. Solomon D, Davey D, Kurman R, et al. Forum Group Members; Bethesda 2001 Workshop. The 2001 Bethesda System: terminology for reporting results of cervical cytology. *JAMA* 2002;287: 2114–2119.
16. Sankaranarayanan R, Wesley R, Somanathan T, Dhakad N, Shyamalakumary B, Sreedevi Amma N et al. Visual inspection of the uterine cervix after the application of acetic acid in the detection of cervical carcinoma and its precursors. *Cancer* 1998;83:2150-2156.
17. Sarian LO, Derchain SF, Naud P, Roteli-Martins C, Longatto-Filho A, Tatti S et al. Evaluation of visual inspection with acetic acid (VIA), Lugol's iodine (VILI), cervical cytology and HPV testing as cervical screening tools in Latin America. *J Med Screen* 2005;12:142–149.

Activity- Specific Balance Confidence (ABC) level of Elderly Slum-dwellers of North India

Goel PK¹, Muzammil K², Kumar S¹

¹Associate Professor, Department of Community Medicine, ²Assistant Professor, Muzaffarnagar Medical College, Opposite Begrajpur Industrial Area, Muzaffarnagar, UP

ABSTRACT

Ageing is an inevitable process which begins before birth and continues throughout the life. The world health organization earmarked the theme of world health day 1999 as "Active ageing makes the difference". The Activities-specific and Balance Confidence (ABC) Scale is a questionnaire developed to measure an aspect of the psychological impact of balance impairment and/or falls. It is used to measure the perceived balancing capacity of individual doing certain functional activities. Four hundred and three elderly aged 60 years and above living an urban slum of Muzaffarnagar city were studied. Majority of them were observed having high level of confidence for activities for basic mobility as well as community mobility. This level of confidence was observed declining with increase in age irrespective of sex of elderly. Many researchers have observed decreased balance confidence followed by activity restriction that may further lead to deterioration of level of confidence to perform a particular activity. Counseling of elderly to improve their confidence will definitely help in ensuring active ageing.

Keywords: Activity Specific Balance Confidence (ABC) Scale, Fall Efficacy Scale (FES), Fear Of Fall (FOF), Elderly

INTRODUCTION

Ageing is an inevitable process which begins before birth and continues throughout the life. The elderly population aged 60 years and above contributes about 7.5% of our total population¹ that is there are about 90 million elderly living in India provisional estimates for census 2011 been 8.14%.² It is estimated that this number would escalate to more than 158 million in next decade. The world health organization responded to public health challenges of population ageing and earmarked the theme of world health day 1999 as "Active ageing makes the difference".³ Balance is the ability to maintain the center of gravity over a base of support, usually in an upright position. With good balance, a patient has the ability to sit, stand or walk safely, falling, or reaching for external items for support.⁴ Various tools have been developed by western researchers to measure the aspects of balance confidence and fear of fall to perform certain activities of daily living e.g. Activity-specific Balance Confidence scale, Falls Efficacy Scale and Modified Falls Efficacy Scale etc. The Indian researchers have seldom shown interest to apply these measurement tools in Indian population.

The Activities-specific and Balance Confidence (ABC) Scale is a questionnaire developed to measure an aspect of the psychological impact of balance impairment and/or falls. It is an assessment tool to measure balancing capacity of individual as perceived by him during functional activities. The ABC scale is based on the self efficacy theory reported by Tinetti et al (1990).⁵ Self-efficacy, a concept based in the field of psychology, refers to an individual's perceived capability within a specific domain of activities. Assessing falls-related self-efficacy in performing specific activities or tasks, rather than global fear of falling, should reveal the extent to which a person believes he or she is able to participate in specific activities without falling.⁶

MATERIAL & METHOD

A cross sectional study was carried out in Khalapar which is a slum area of city Muzaffarnagar and is also the field practice area of Urban Training Health Center (UTHC) of the Department of Community Medicine, Muzaffarnagar Medical College, District Muzaffarnagar, U.P., India. The registered families covered a population of 10628 including 856 family

members who were 60 or above 60 years of age. All the elderly belonging to the registered families were listed out and 50% of them were selected as study subjects. The first study subject was selected randomly from the list and every second elderly was interviewed alternatively with the help of predesigned proforma.⁷ Four hundred and three elderly were studied while 25 were not covered as they fall in to exclusion category.

Exclusion criteria: Home bound and wheel chair bound elderly, non cooperative attitude and non availability in the area during the study period.

Instructions for Scoring: The patient is scored on sixteen different tasks. The study subjects are asked to rate his confidence in performing each of the activities with the help of a questionnaire. The individuals must be well explained that it is the assessment of confidence in doing an activity and not the ease in performing the particular activity. The responses are recorded on a scale from 0% to 100%, i.e., from no- confidence to complete confidence or without becoming unsteady or losing confidence. An average percentage for each of the item is calculated.

The ABC is an 11-point scale and ratings should consist of whole numbers (0-100) for each item. Sum total the ratings (possible range = 0 – 1600) and divide by 16 to get each subject's ABC score. If a subject qualifies his/her response to item numbers 2, 9, 11, 14 or 15 (different ratings for "up" vs. "down" or "onto" vs. "off"), solicit separate ratings and use the lowest confidence of the two (as this will limit the entire activity, for instance the likelihood of using the stairs). The scale rating ranges represent the following-

- > 80% = high level of physical functioning
- 50-80% = moderate level of physical functioning
- < 50% = low level of physical functioning

[Myers AM (1998)⁷]

In the present study the elderly had no idea of escalators, so all responses were zero for the item number 14 asking for use of escalators holding on to a railing and item number 15 asking for use of escalators while holding on to parcels such that you can't hold railings. This resultant range was reduced to 1400 to arrive at a better assessment of confidence level in terms of accuracy. These 14 items include activities for basic mobility (9 items) and community mobility (5 items).

- A. Basic mobility (9 items): walking around the house, walk up or down stairs, bend over & pick up a slipper from the front of a closet floor, reach for a small can off a shelf at eye level, stand on your tip toes and reach for something above your head, stand on a chair and reach for something, sweep the floor, walk up or down a ramp and walk outside on a slippery floor/ surface.
- B. Community mobility (5 items): Walk outside the house to a rickshaw, get into our out of an auto-rickshaw, walk outside the house to a nearby shop/market, walk in a crowded market/ place and bearing the push/pull by the crowd in a market/place.

Study tool: The items of predesigned proforma were translated for forward and backward in Hindi language to improve the understanding of study subjects.

FINDINGS:

There were 856 (8.05%) elderly residing in the study area which has been comparable to the national estimates of 8.14% for the year of 2011. Out of the 403 elderly studied, 207 (51.36%) were males and 196 (48.64%) were females. Aged females (12) outnumbered old-old males (9) that are elderly above 80 years of age.

Table-1 shows that majority of the elderly had high level of physical functioning though this confidence range has been declined with ageing. The proportion of study population having high level of physical functioning decreased gradually with age. The sex of individuals was observed having hardly any effect on confidence range.

Table-2 depicts that ageing had psychologically negative impact on confidence of elderly for activities of basic mobility. The age had stronger impact than sex of the individual.

Table-3 revealed that the confidence range for community mobility also followed the same trend of decline with ageing. Community mobility activities were also not having any difference amongst male and female sexes.

Sharma Archana⁸ studied balance confidence with 22 items amongst Indian older adults above 65 years of age and reported mean age for high mobility being less (71.7 years) rather than low mobility older adults

(76.9 years). These two groups of elderly had mean net balance confidence 83.5% and 60.3% respectively.

Arkfen C.L., Lach H.W., Birge S, J& Miller J.P⁹ have observed low level of balance confidence or high level of fear of fall may lead to restriction of a particular activity, mobility and quality of life. Similarly Murphy S & Degnen T¹⁰ observed an estimated one third to half of elderly acknowledged afraid of falling and restricted their activity.

The ABC scale was found declining with age irrespective of the sex of individual. This might be due to reduced balance confidence followed by activity

restriction further deteriorating the confidence to perform activities setting a vicious cycle of decreased confidence and restricted mobility.

Community based large scale studies are required for further exploration of such an area of public health importance. The data base can be used for planning counseling of elderly for improving the confidence level and promotion of necessary basic mobility and community mobility physical activities.

Source of funding: None

Conflict of interest: None

Table-1: Level of physical functioning

Confidence range	60-70 yrs (n=309)		70-80 yrs (n=73)		>80yrs (n=21)	
	M (160)	F (149)	M (38)	F (35)	M (9)	F (12)
>80%	149(93.1)	139(93.3)	33(86.8)	31(88.6)	6(66.7)	9(75.0)
50-80%	7(4.4)	7(4.7)	3(7.9)	2(5.7)	2(22.2)	2(16.7)
<50%	4 (2.5)	3(2.0)	2(5.3)	2(5.7)	1(11.1)	1(8.3)

Table-2: Level of physical functioning for basic mobility (9 parameters)

Confidence range	60-70 yrs (n=309)		70-80 yrs (n=73)		>80yrs (n=21)	
	M (160)	F (149)	M (38)	M (149)	M (160)	F (149)
>80%	151(94.4)	138(92.6)	34(89.5)	32(91.4)	8(88.9)	9(75.0)
50-80%	6(3.7)	9(6.0)	4(10.5)	1(2.9)	1(11.1)	1(8.3)
<50%	3(1.9)	2(1.4)	0(0.0)	2(5.7)	0(0.0)	2(16.7)

Table-3: Level of physical functioning for community mobility (5 parameters)

Confidence range	60-70 yrs (n=309)		70-80 yrs (n=73)		>80yrs (n=21)	
	M (160)	F (149)	M (38)		M (160)	F (149)
>80%	144(90.0)	132(88.6)	29(76.3)	26(74.3)	4(44.5)	5(41.7)
50-80%	9(5.6)	12(8.0)	6(15.8)	5(14.3)	3(33.3)	4(33.3)
<50%	7(4.4)	5(3.4)	3(7.9)	4(11.4)	2(22.2)	3(25.0)

REFERENCES

- Office of the Registrar General and Census Commissioner India, Ministry of Home Affairs, Government of India. Available from: http://www.censusindia.gov.in/Census_Data_2001/India_at_glance/broad.aspx. Last accessed on 2011 November 18.
- National commission on population, appendix III demographic profile Available from: http://populationcommission.nic.in/npp_app3.htm . Last accessed on 2011 November 18
- In a society for all ages: Active ageing makes the difference WHO, Available from: http://www.who.int/ageing/publications/alc_embrace2001_en.pdf Last accessed on 2011 November 18
- Berg Balance Scale, Available from: [- \[cfm.mc.duke.edu/wysiwyg/downloads/stu_hndout_Berg_Balance_Scale_Explan_gait_7.09.pdf\]\(http://cfm.mc.duke.edu/wysiwyg/downloads/stu_hndout_Berg_Balance_Scale_Explan_gait_7.09.pdf\). Last accessed on 2011 November 18.
 - Keith Hill, Activities-specific and Balance Confidence \(ABC\) Scale, Clinometric Australian Journal of Physiotherapy 2005; Vol. 51 \(3\): 197 Available from: \[http://ajp.physiotherapy.asn.au/AJP/vol_51/3/AustJPhysiotherv51i3Clinometrics.pdf\]\(http://ajp.physiotherapy.asn.au/AJP/vol_51/3/AustJPhysiotherv51i3Clinometrics.pdf\) Last accessed on 2011 November 18.
 - Hatch J., Gill-Body K. & Portney L.G. Determinants of balance confidence in community dwelling. Physical Therapy, 2003; 83: 1072-1079.\) Available from: <http://ptjournal.apta.org/content/83/12/1072.full> Last accessed on 2011 November 18.
 - Fall prevention and risk assessment; Available from: <http://www.chfwcn.org/Tools/>](http://

</div>
<div data-bbox=)

- BroadCaster/Upload/Project13/Docs/Falls_Prevention__Risk_Assessments.pdf Last accessed on 2011 November 18.
8. Archana S Sebestina A. D'souza. Developing a scale to assess balance confidence in indian community dwelling older adults. *The Indian Journal of Occupational Therapy*: Vol. XL: No. 2 (May 2008 - August 2008) Available from: <http://medind.nic.in/iba/t08/i2/ibat08i2p33.pdf> Last accessed on 2011 November 18.
 9. Arkfen C.L., Lach H.W., Birge S, J & Miller J.P. The prevalence and correlates of fear of falling in elderly persons living in community. *Am J Pub Health*, 1994; 84:565-569. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1614787/pdf/amjph00455-0039.pdf>. Last accessed on 2011 November 18.
 10. Murphy S & Degnen T. Participation in daily living tasks among older adults with fear of falling. *The American journal of occupational therapy*, 2001; 55(5): 538-544) Available from: <http://ajot.aotapress.net/content/55/5/538.full.pdf+html>. Last accessed on 2011 November 18.

A Pilot Project to Develop in Vivo Detection of Ricin through Fluorescence Sandwich ELISA Technique

Poonam Kachhawa¹, Kamal Kachhawa², Om Kumar³

¹Demonstrator, Department of Biochemistry, Saraswathi Institute of Medical Sciences Hapur, Ghaziabad, U.P., India,

²Senior Resident, Department of Biochemistry, University College of Medical Sciences Delhi, India, ³Scientist F, Division of Pharmacology and Toxicology, Defence Research & Development Establishment, Gwalior, India

ABSTRACT

Aims & Objective: In the present study our main objective was to develop a fluorescence sandwich ELISA assay for in vivo detection of ricin from plasma of mice after intoxication. Ricin (also called RCA-II or RCA60), one of the most potent toxins and documented bioweapons, is derived from castor beans of *Ricinus communis*.

Material & Method: The assay was performed in plasma obtained from ricin treated and control mice after 30 minutes of exposure. The assay utilizes an antiricin rat polyclonal antibody to adsorb ricin from plasma of ricin treated mice. The rabbit polyclonal antiricin antibody is then used to form a sandwich, and anti-rabbit FITC-conjugate allows development of fluorescence. The developed fluorescence was read at an excitation-emission wavelength of 485/528nm. The graph was drawn by plotting the ricin concentration against the fluorescence (rf) values.

Result: We were able to detect more than 19.5ng/ml of ricin in assay buffer, 28ng/ml in diluted plasma (1:20480) at the dose of 10mg/kg and 27ng/ml of diluted Plasma (1:80) at the dose of 5mg/kg body weight. The coefficient of variation ranged from 22% for ricin in assay buffer, 9% for 5mg/kg body weight dose plasma, 14% for 10mg/kg body weight dose plasma and 4% for non treated control plasma.

Conclusions: The detection of ricin from serum/plasma of individuals exposed to ricin will be quite difficult at lethal dose, estimated for humans to be 1 to 10µg per kg body weight following inhalation or injection. Hence, more efforts are needed for the detection of ricin at its lethal exposure dose.

Keywords: Ricin, In vivo Detection, Fluorescence Sandwich ELISA

INTRODUCTION

Ricin is derived from the seeds of the castor plant *Ricinus communis*, and comprises approximately 1% approximately of the weight of the castor bean mash that remains after oil extraction¹⁻³ Ricin is considered to be a high threat biohazard due to its high toxicity and easy availability³⁻⁵. Ricin is a member of the Type II ribosome inactivating proteins, known as dimeric

or AB toxins, of which shiga and shiga-like toxins are members⁶.

The levels of toxicity vary depending on the route of ricin exposure. The mean lethal dose (LD₅₀) in mice is approximately 1000 fold lower by injection or inhalation than by oral administration⁵. The lethal dose for an adult human is about 0.35-0.7mg by inhalation, whereas the lethal oral dose has been estimated to be between 1 to 20 mg of ricin/kg body weight. The large discrepancy in oral and systemic toxicity is likely due to the harsh digestive conditions found in the stomach and epithelium and innate immune barriers present in the intestinal tract⁷.

In the past ricin has been used for the suicidal and homicidal purposes. Perhaps the most published incident in the United Kingdom was the death of

Corresponding author:

Poonam kachhawa

Demonstrator

Department of Biochemistry

Saraswathi Institute of Medical Sciences

Hapur, Panchsheel nagar, U.P., India.

Tel: 9999553960

E-mail: poonamkac@yahoo.com

Georgi Ivanov Markov in London in 1978⁸. Ricin was administered to Markov via a tiny pellet injected into the back of his thigh. The pellet was loaded in an umbrella. Use of ricin was strongly implicated, but never proven so far due to lack of availability of suitable techniques⁹. In London, on January 5th 2003, six men were arrested in a wood green flat on suspicion of manufacturing the toxin for terrorist purposes. Ricin was also detected in the mail at the white house in Washington D. C. in Nov. 2003¹⁰. Because of the high bioterrorism risk concern over ricin, more and more recent research efforts have been directed to the design of highly sensitive and fast method for the detection of this toxin in biological samples.

Several in vitro methods have been designed for ricin detection in biological samples. The most sensitive method reported to date is that described by Lubelli¹¹. With a newer technique using immuno-PCR these authors are able to detect ricin to as low as 10fg/ml in the assay buffer, as well as in serum samples. But in immuno-PCR the time required for analysis and ricin detection is longer than that of conventional ELISA techniques. Recently, a fluorescence comparative indirect ELISA was described, in which detect more than 10fg/ml of ricin in assay buffer and 20fg/ml in plasma and red blood cells (RBCs)¹². The main objective of this study was to develop an assay for in vivo detection of ricin. After exposure, ricin distributed in various organs and blood cell components. Therefore, detection of ricin from serum/plasma of individuals exposed to ricin will be quite difficult. In the present study, a novel Fluorescence Sandwich ELISA assay was developed for detection of ricin in plasma collected from mice after ricin intoxication. The assay was performed in the plasma of ricin treated and control mice after 30 minutes of ricin exposure.

MATERIALS AND METHOD

Materials

The study was conducted from July 2009 to Feb 2010 in Division of Toxicology and Pharmacology, Defence Research & Development Establishment (DRDE) Laboratories (Gwalior M.P).

Purified Ricin and Purified antiricin rabbit/rat antibody (serum IgG fraction) was provided from DRDE Laboratories (Gwalior M.P) and stored at 4°C. The anti-rabbit FITC-conjugated was purchased from Calbiochem. Animals - Swiss albino male mice

(weights of 24 to 28 gm), bred at DRDE animal facilities were used in this study. Animals were injected ricin in phosphate saline buffer at the dose of 5mg/kg and 10mg/kg body weight through intravenously (IV), via the lateral tail vein route. Mice were lightly anaesthetized with ether and blood was collected in heparinised vials from the orbital sinus after 30 minutes of post exposure. The sandwich ELISA technique was carried out for the plasma of both ricin treated mice and non treated control mice.

Determination of median lethal dose (LD₅₀)

The median lethal concentration (LD₅₀) of ricin with confidence limits for intraperitoneal routes and intravenous were determined by using method Gad and Weil¹³. For each dose 4 mice were used and 3 to 4 doses were used. After administration of ricin the animals were observed for toxicity related symptoms and mortality till 7 days of post exposure.

Fluorescence Sandwich ELISA

- Sandwich ELISA technique was standardized for the detection of ricin from plasma of treated mice using fluorescence signal. The assay was standardized in 96 well flat bottoms black polystyrene plate. Antiricin rat polyclonal IgG antibody (100µl) was coated on plate with 1:200 diluted in carbonate-bicarbonate buffer pH 9.6 and incubated at 4°C for overnight.
- The following day the plate was washed 3 times (5 minutes each wash) with 0.05% (v/v) PBS-tween-20 and was blocked with 200µl of 3% bovine serum albumin (BSA) in PBS at 37°C for 2.5 hours. After blocking and washing 100µl of ricin and plasma of ricin treated mice serially diluted in phosphate buffer was added to wells and incubated for 2 hours at 37°C.
- Plate was washed and 100µl of rabbit polyclonal antiricin antibodies 1:200 diluted in PBS were added to plate to form sandwich and kept at 37°C for 1hour.
- The plate was again washed and 100µl of revealing antibodies i.e. anti-rabbit FITC-conjugate (1:400 diluted in PBS) was added for 1hour at 37°C. After washing, the fluorescence of the plate was read at an excitation-emission wavelength of 485/528 nm and at 50, 75, 100, 125 sensitivity. In all experiments, antigen and antibody negative control were also measured.

Optimizing the conditions for sandwich ELISA

The optimal concentrations of antibodies used in sandwich ELISA were determined at which the results obtained were best. For this the varying concentration of antibody to be optimized was used while the concentration of all other antibodies was kept constant at high value.

Statistical analysis

A plot of the ricin concentration against the fluorescence (rf) values was drawn. The mean, standard error and coefficient of variation were calculated for both plasma of ricin treated mice and assay buffer.

RESULTS

In vivo ricin toxicity

Toxicity studies of ricin revealed that ricin is a highly toxic toxin. The LD₅₀ values determined for mice was 5.0µg/kg body weight through intravenous route and 7.5µg/kg body weight by intraperitoneal route with the confidence limit 3.17 – 7.84µg/kg and 4.769 – 11.78µg/kg respectively (Table-1).

Detection of ricin in plasma using Sandwich ELISA

During our studies we observed that, the detection of ricin from plasma of treated mice at 5mg/kg and 10mg/kg body weight doses through intravenous route. We were able to detect up to 19.5ng ricin/ml of assay buffer (Figure-1) and 27ng/ml of diluted Plasma (1:80) at the dose of 5mg/kg body weight and 28ng/ml of diluted Plasma (1:20480) at the dose of 10mg/kg body weight, with CVs that ranged from 22% for ricin in assay buffer, 9% for plasma of ricin treated mice with 5mg/kg body weight dose, 14% for plasma of ricin treated mice with 10mg/kg body weight and 4% for plasma of non treated control mice (Figure-2).

The fluorescence was read by calibrating the instrument at different sensitivities starting from 50 to 125. At sensitivity of 100 to 125 good results were obtained and difference between positive and negative controls increases significantly. The optimal concentration of antibodies used in sandwich ELISA was also determined by performing ELISA at different antibody concentration and the method was standardized at 1:200 dilutions (0.5µg/100ul) of anti-ricin rat polyclonal IgG used for capturing antigen. The sandwich forming anti-ricin rabbit polyclonal IgG were optimized at a concentration of 1:200 diluted

(0.5µg/100ul). The secondary antibodies used were anti-rabbit-FITC conjugated antibodies for fluorescence immunoassay. The anti-rabbit FITC conjugated antibodies were standardized at a dilution of 1:400 (0.25µg/100ul). The fluorescence was read at an excitation–emission wavelength of 485/528 nm.

Table 1: LD₅₀ Values was determined for 7 days

Animal	Route	Ld ₅₀	Confidence Limit
MICE	Intraperitoneal	7.5 µg/kg	4.76-11.78µg/kg
	Intravenous	5.0 µg/kg	3.17-7.84µg/kg

Fluorescence Sandwich ELISA

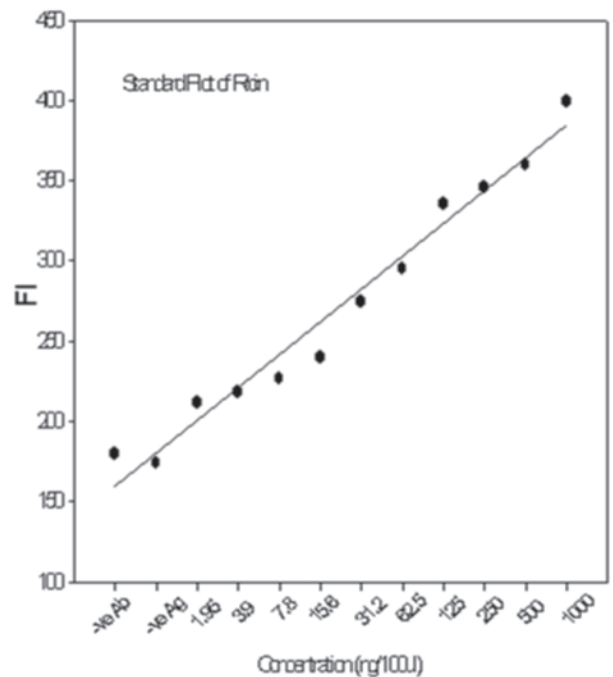


Fig. 1. Standard Plot for Ricin

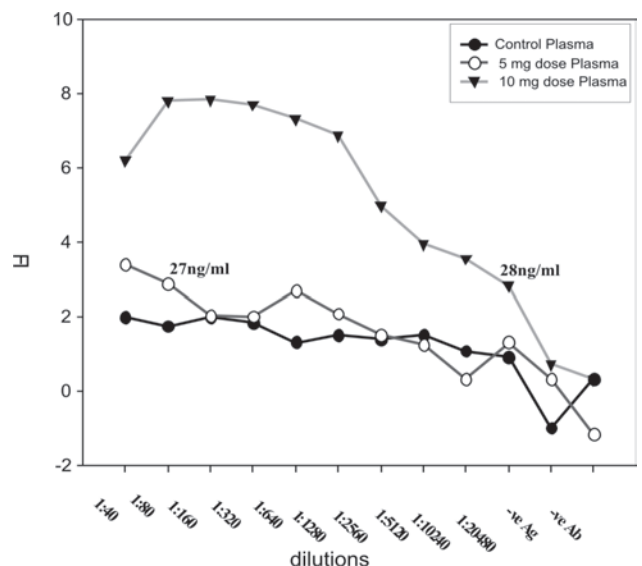


Fig. 2. Detection of Ricin in serially diluted plasma

DISCUSSION

Ricin is a highly toxic plant protein that belongs to a group of proteins called Type II ribosome-inactivating proteins (RIP-II)⁶. The two ricin polypeptide chains have molecular weights of 30 kDa (A) and 33 kDa (B), and are normally linked by a single disulfide bond. The ricin A chain is a highly active N-glycosidase that initiates depurination and cleavage of 28S ribosomal RNA at position 4324¹⁴. The cleaved RNA is no longer capable of binding Elongation Factor 2, which is needed for protein synthesis^{15,16}. Once in the target cell, a single ricin molecule can inactivate more than 1500 ribosomes per minute, ultimately resulting cell death. The ricin B chain binds to galactose-containing glycoprotein on the surface of target cells and helps facilitate toxin entry into cells via receptor-mediated endocytosis. Ricin and ricin A-chain is used in the preparation of an immunotoxin for the treatment of cancer¹⁶. Thus we need a sensitive immunoassay that can detect minute quantities of ricin in biological fluids, in case of ricin exposure, and also can monitor the toxin in biological fluids of patients undergoing immunotoxin therapy.

There are many reports about extraction of ricin by individuals for criminal or terrorist activities as the purification of ricin is not very difficult. Different assays have been described for in vitro detection of ricin by various authors including radioimmunoassay¹⁷ that detected ricin in picogram level in the blood. Poli reported a chemiluminescence ELISA that can detect ricin from diluted serum and urine samples¹⁸. A sandwich ELISA, colloidal gold based immuno-chromatographic assay and hydrogel based protein microchips has also been reported^{19,20,21}. Cook described an antigen capture sandwich ELISA, by which they have done retrospective identifications of ricin in animal's tissues following various routes of exposure²². Malcolm and Brian, detected ricin from diluted human plasma after extraction of ricin in extraction buffer containing lactose²³. Recently, fluorescence comparative indirect ELISA was described, in which detection of ricin from plasma and red blood cells and to omit the extraction step¹².

CONCLUSION

In the present study our main objective was to in vivo detection of ricin from plasma of mice after intoxication. After exposure, ricin distributed in various organs and blood cell components. Therefore, the detection of ricin from serum/plasma of

individuals exposed to ricin will be quite difficult at lethal dose, estimated for humans to be 1 to 10µg per kg body weight following inhalation or injection. Hence, more efforts are needed for the detection of ricin at its lethal exposure dose.

ACKNOWLEDGEMENTS

Authors are thankful to Dr. Yamini singh, Scientist C, Division of Pharmacology and Toxicology, Defence research and Development Establishment, Gwalior, for the guidance, and time to time valuable suggestions.

Conflict of Interest: None

REFERENCES

1. Greenfield RA, Brown BR, Hutchins JB, Iandolo JJ, Jackson R, et al. Microbiological, biological, and chemical weapons of warfare and terrorism. *Am J Med Sci.* (2002), 323:326–40.
2. Balint GA. Ricin: the toxic protein of castor oil seeds. *Toxicology* (1974), 2:77–102.
3. Franz DR, Jaax NK. Ricin Toxin. *Medical Aspects of Chemical and Biological Warfare; Chapter* (1997), 32:631–642.
4. Doan LG. Ricin: mechanism of toxicity, clinical manifestations, and vaccine development. *J Toxicol Clin Toxicol* (2004), 42:201–208.
5. Audi J, Belson M, Patel M, Schier J, Osterloh J. Ricin poisoning: a comprehensive review. *Jama* (2005), 294:2342–2351.
6. Lin TT, Li SL. Purification and physicochemical properties of ricins and agglutinins from *Ricinus communis*. *Eur J Biochem* (1980), 105:453–459.
7. Nagler-Anderson C. Man the barrier: Strategic defences in the intestinal mucosa. *Nat Rev Immunol* (2001), 1:59–67.
8. Knigh B. Ricin-A potent homicidal poison. *British Medical Journal* (1975), 1:350-351.
9. Crompton R, Gall D. Georgi Markov-Death in a pellet, *Medico-legal J* (1980), 48:48-62.
10. Shea D, Gottron F. Ricin: Technical Background and Potential Role in Terrorism, Congressional Research Service, The Library of Congress, updated February (2004), accessed on October 28, 2008.
11. Lubelli C, Chatgililoglu A, Bolognesi A, Strocchi P, Colombatti M and Stirpe F. Detection of ricin and other ribosome-inactivating proteins by an immunopolymerase chain reaction assay. *Analytical Biochemistry* (2006), 355:102-109.
12. Pradhan S, Kumar O. Detection of Ricin by Comparative Indirect ELISA Using Fluorescence

- Probe In Blood And Red Blood Cells. *J Med CBR Def* (2009), 7:508-518.
13. Weil CS. Tables for convenient calculation of median-effective dose, (LD50 or ED50) and instructions in their use. *Biometrics* (1952), 8:249–263.
 14. Endo Y, Tsurugi K. The RNA N-glycosidase activity of ricin A-chain. The characteristics of the enzymatic activity of ricin A-chain with ribosomes and with rRNA. *J Biol Chem.* (1988), 263:8735–8739.
 15. Olsnes S. The history of ricin, abrin and related toxins. *Toxicon* (2004), 44:361–370.
 16. Lord JM, Roberts LM, Robertus JD. Ricin: structure, mode of action, and some current applications. *Faseb J* (1994), 8:201–208.
 17. Godal A, Olsnes S and Pihl A. Radioimmunoassay of abrin and ricin in blood. *J. Toxicol. Environ. Health* (1981), 8:409-417.
 18. Poli MA, Rivera VR, Hewetson JF and Merrill GA. Detection of ricin by colorimetric and chemiluminescence ELISA. *Toxicon* (1994), 32:1371-1377.
 19. Shyu RH, Chiao DJ, Liu HW and Tang SS. Monoclonal antibody based enzyme immunoassay for detection of ricin. *Hybrid Hybridol* (2002a), 21:96-73.
 20. Shyu RH, Shyu HF, Liu HW and Tang SS. Colloidal gold based immunochromatographic assay for detection of ricin. *Toxicon* (2002b), 40:255-258.
 21. Rubina AY, Dyukova VI, Dementieva EI, Stomakhin AA, Nesmeyanov VA, Grishin EV and Zasedatelev AS. Quantitative immunoassay of biotoxins on hydrogel based protein microchips. *Anal. Biochem* (2005), 340:317-329.
 22. Cook DL, Jonathan D and Griffiths GD. Retrospective identification of ricin in animal tissues following administration by pulmonary and oral routes. *Toxicology* (2006), 223:61-70.
 23. Malcolm A and Brian P. A sensitive immunosorbent assay for the detection of ricin in blood, Defence Science and Technology Organisation (DSTO), (1997), Report No. DSTO-TR-0572.

Bacteriological Study of Pathogenic Staphylococci with Special Reference to Vancomycin Susceptibility

P Samatha

Associate Professor, Department of Microbiology, Katuri Medical College, Chinakondrupadu, Guntur (A.P)

ABSTRACT

Background: Staphylococci are one of the most frequently isolated organisms in microbiology laboratory from a variety of clinical specimens. Invasive Staphylococcal disease had mortality rate of about 90%, before the advent of wonder drug Penicillin in 1940. However in 1942, resistance was described and by 1960's resistance to semi synthetic penicillins like Methicillin & Oxacillin was observed. Methicillin-resistant Staphylococcus aureus resistant to all antibiotics including Vancomycin has been reported in Japan, USA, Canada and Brazil. Vancomycin has been widely used in the treatment of infections caused by Methicillin-Resistant Staphylococcus Aureus (MRSA). The emergence of Vancomycin Intermediate and Resistant Staphylococcus aureus (VISA and VRSA, respectively) in various parts of the world has been of great concern in clinical settings.

Objective: This study was performed to evaluate the possible presence of VISA and VRSA at Andhra Medical College, Visakhapatnam.

Method: The present study was conducted in the Department of Microbiology. MRSA strains were tested for Vancomycin susceptibility by standard Kirby-Bauer disc diffusion method, agar dilution method and by E-test according to standards of NCCLS

Results & Conclusions: Using disk diffusion test, most isolates were resistant to penicillin, while three of the isolates had Vancomycin MIC of 8 g/ml. All the 3 VISA strains showed multi drug resistance indicating the need to create awareness regarding these strains in the local scenario.

Keywords: MRSA, VISA, VRSA, Vancomycin

INTRODUCTION

Staphylococcus aureus is one of the most frequently isolated organisms in the microbiological laboratory from a variety of clinical specimens. It is a cause of hospital and community acquired infections.^[1, 2] Invasive Staphylococcal disease had mortality rate of about 90%, before the advent of drug Penicillin in 1940s. However in 1942, resistance was described in a few strains of Staphylococcus aureus. Today 80-90% of Staphylococcus aureus isolates are resistant to Penicillin.^[3] Semi synthetic Penicillin, Methicillin and the isoxazolyl penicillin, Oxacillins were the first agents to become available for clinical use in the early 1960s. However, resistance was recognized almost immediately and they were known as Methicillin resistant Staphylococcus aureus (MRSA).^[4]

Once recognized in a particular geographic locale, these MRSA isolates tended to persist. Ongoing

surveillance of Staphylococcus aureus isolates documented a trend of increasing prevalence of MRSA once introduced. Of greater concern was the recognition that most MRSA isolates also produced β -lactamase and seemed to be a reservoir for resistance-determinates for a variety of other anti microbials including Cephalosporins, Macrolides, Amino glycosides, and Quinolones.^[5]

The emergence of high levels of penicillin resistance followed by the development and spread of strains resistant to the semi synthetic penicillins (Methicillin, Oxacillin, and Nafcillin), Macrolides, Tetracycline, and Aminoglycosides has made the therapy of staphylococcal disease a global challenge.^[6, 7]

Studies of out breaks of MRSA infection in hospitals have shown that the principal mode of transmission of MRSA is through transiently colonized

hands of hospital personnel.^[8] Vancomycin is the drug of choice in treating documented MRSA infections as well as for empiric therapy of infections in populations where the prevalence of MRSA is high. Reports in 1990's suggested that the susceptibility in *S.aureus* was changing. But in 1996, the first clinical isolate of *Staphylococcus aureus* with reduced susceptibility to Vancomycin was reported in Japan.^[9] The present study done at Department of Microbiology, showed an increase in the rate of isolation of *Staphylococcus aureus* and Methicillin resistant *Staphylococcus aureus* from clinical specimens, as there is increase in resistance to Vancomycin, we had monitored the current status of Vancomycin susceptibility for the presence of Vancomycin resistance or intermediate strains of *Staphylococcus aureus*

MATERIALS AND METHOD

A total of 100 clinical isolates of *S.aureus* from different specimens including wound swabs, ear swabs, purulent drainage, urine, blood, vaginal swabs were selected for this study. These samples were processed & identified based upon colony morphology, positive Gram stain, DNase, catalase and coagulase tests, and fermentation of mannitol. Antibiotic susceptibility tests were performed at the microbiology laboratory

Antibiogram Testing includes

The antibiotic sensitivity pattern of all *S.aureus* isolates.

1. Detection of Methicillin (Oxacillin) Resistance by disc diffusion method.
2. Detection of Vancomycin Resistance by disc diffusion method.
3. Detection of Vancomycin Minimum Inhibitory Concentration by agar dilution method.
4. E- Test to match the results of VISA/VRSA by agar dilution method.

To prepare bacterial suspensions, four to five colonies of pure growth from overnight cultures of target strains were transferred into a tube containing four to five ml of peptone broth and incubated at 37 °C to match the turbidity with McFarland standard of 0.5 (usually 2-6 hours). Lawns of each bacterial suspension were made on Mueller Hinton's agar using sterile cotton swabs. Antibiotic discs (Penicillin, Gentamicin, Erythromycin, Amikacin, Ofloxacin and

Vancomycin) were positioned at appropriate distances on the bacterial lawns and incubated at 37°C for 24 hours. Oxacillin disks were placed on media with 4% NaCl & incubated at 35°C for 48 hours along with control strain ATCC 38591, then growth inhibition zones were carefully measured with Calipers and recorded according to the standard Kirby Bauer disc diffusion method and NCCLS guidelines. Vancomycin was obtained from Sigma (USA, potency 1000 µg/mg) for the determination of MIC of 100 strains with the agar dilution method according to the Procedure outlined by NCCLS.^[8]

Vancomycin base of 20mg was diluted in 0.5 ml of phosphate buffer and transferred to the flask containing 10ml of molten BHI agar at 45°C, and thoroughly mixed. Then plates were poured as described earlier with a final concentration of Vancomycin 2µg/ml. These plates were divided into 6 equal parts and the plates were inoculated with controls.

The plates were incubated at 35°C for 24 hrs and the plates showing no growth were further incubated for 48 hrs, and then discarded if negative. Agar dilutions with a concentration of 4, 8, 16, 32, 64µg/ml were prepared & tested for Vancomycin susceptibility. Resistance to Vancomycin was checked by E- test (AB biodisk, Sweden) according to CDC standards.

RESULTS

Out of 100 *Staphylococcus aureus* Isolates, 52 were from males and 48 were from females. *Staphylococcus aureus* were predominantly isolated from Pus (51%). Antibiotic Sensitivity Pattern among 100 *Staphylococcus aureus* Isolates 92 (92%) Isolates were resistant to Penicillin followed by 32 (32%) to Gentamicin, 31 (31%) to Ofloxacin, 27 (27%) to Erythromycin, 24 (24%) to Amikacin etc. Of the total 100 *Staphylococcus aureus* Isolates 45 were MRSA and 55 were MSSA. Among 45 MRSA strains Isolated 12 (26.66%) were resistant to 6 (P, Ox, E, G, Of, AK) Antibiotics and 15 (33.33%) to 5 (P, Ox, E, G, Of) Antibiotics and 37 (82.22%) to 4 (P, Ox, E, G,) Antibiotics. Hence, the MRSA isolated were multi drug resistant *Staphylococcus aureus*. All the isolates of MRSA were sensitive to Vancomycin by disc diffusion method.

DEFINITIONS: The CLSI break points for *Staphylococcus aureus* & Vancomycin were modified in January 2006.

The revised recommendation states that bacteria showing Vancomycin MICs of $\leq 2 \mu\text{g/ml}$, 4 to $8 \mu\text{g/ml}$, and $\geq 16 \mu\text{g/ml}$ are -susceptible, intermediate & resistant.^[9]

By agar dilution method 3 strains [8, 16, and 41] showed growth at concentrations of $2 \mu\text{g/ml}$, $4 \mu\text{g/ml}$ & $8 \mu\text{g/ml}$ of Vancomycin (Table 1).

Table 1. VISA among MRSA isolates by agar dilution method (n=45)

Vancomycin Concentration ($\mu\text{g/ml}$)	Growth on Vancomycin agar	
	Growth observed (No. of isolates)	No growth (No. of isolates)
2	3 (8,16,41)	42
4	3 (8,16,41)	42
8	3 (8,16,41)	42
16	—	45
32	—	45
64	—	45

At $16 \mu\text{g/ml}$, $32 \mu\text{g/ml}$, $64 \mu\text{g/ml}$ concentrations growth was not observed. According to Clinical Laboratory Standard Institute method the 3 strains were Vancomycin Intermediate Staphylococcus aureus.

E-Test was done for the 3 VISA strains observed by Agar dilution method, because it was described as "Gold standard test" according to CDC. The results coincided with the Agar dilution method (as shown in Fig 1).

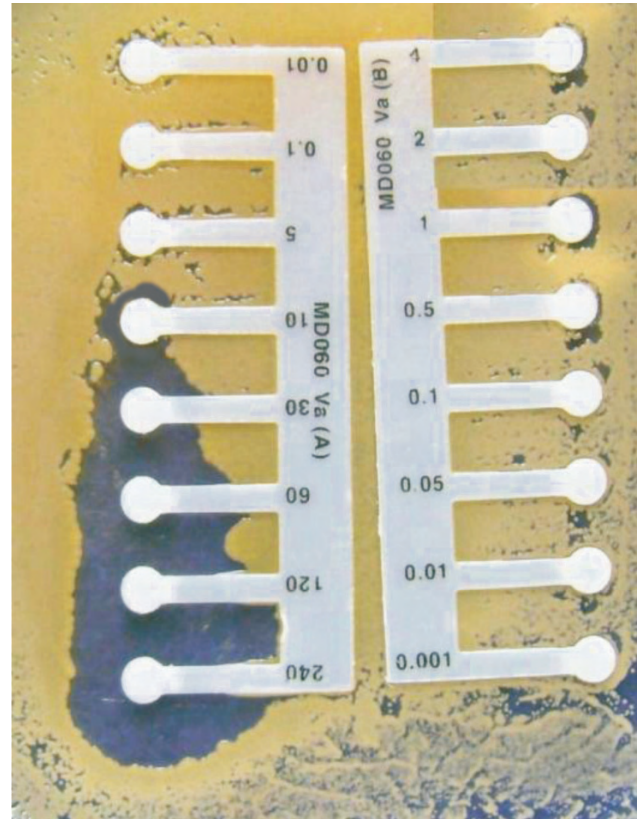
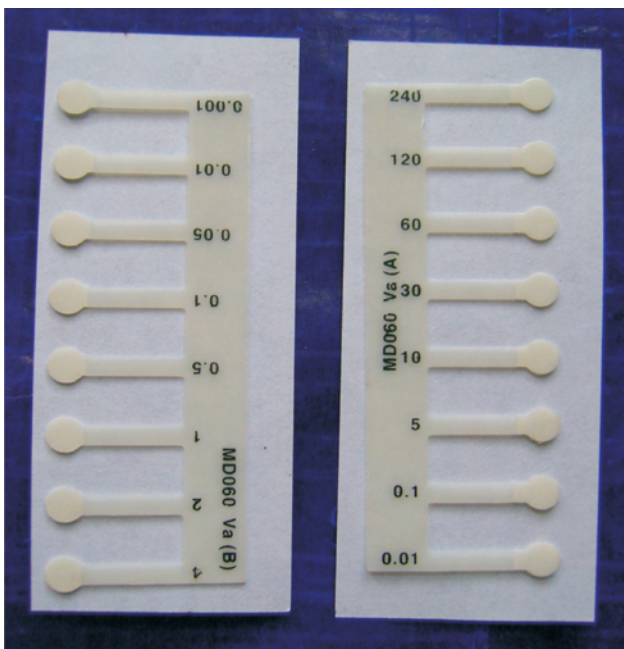


Fig. 1. E-Test Showing MIC of $8 \mu\text{g/ml}$

DISCUSSION & CONCLUSIONS

Since first being reported in 1997, the threat of Vancomycin resistance in *S. aureus* has been the topic of intensive research and discussion. Although Vancomycin resistance in *S. aureus* remains extremely rare, there is widespread concern that Vancomycin-resistant *S. aureus* poses, by far, the greatest risk to patients, given the virulence of the organism.⁽¹⁰⁾ Staphylococcus aureus isolated from various clinical samples were tested for antimicrobial susceptibility pattern with the routinely used antimicrobials. These isolates were tested for Methicillin sensitivity and MRSA strains were identified. The susceptibility pattern of these MRSA strains to Vancomycin was studied.

A study on MRSA was done by Suguneswari et al in the year 2005 in the same institute, who reported that 24% of the strains of Staphylococcus aureus were resistant to Methicillin. In the present study 45% of Staphylococcus aureus isolates were MRSA. So, there is an increase in MRSA causing infections. For life threatening Staphylococcal infections, Vancomycin is the drug of choice. Strains resistant to Vancomycin have appeared in hospitals where antibiotic use is indiscriminate.

In the present study Vancomycin susceptibility pattern among MRSA strains was studied initially by modified Kirby – Bauer disc diffusion method. All the 45 MRSA strains were sensitive to Vancomycin by this method which coincides with Orett F A et.al,^[11] Hakim et.al,^[12] and Anupurba et.al.^[13]

As some strains show the phenomenon of drug tolerance, these strains will be found susceptible in the disc diffusion sensitivity test but their Minimum Bactericidal Concentration (MBC) will be very much higher than Minimum Inhibitory Concentration (MIC).

According to the CDC recommendations susceptibility determination of Vancomycin with disc diffusion is not an acceptable method. So the same

MRSA strains were tested by the “gold standard” methods like Agar dilution and E test methods.

All the MRSA strains showed Vancomycin susceptibility by disc diffusion method. By the agar dilution method 3 of the strains were found to be VISA with MIC of 8µg/ml emphasizing the need for susceptibility testing to Vancomycin by agar dilution method.

In the present study out of 45 MRSA 6.66% (i.e. 3/45) were VISA isolates and 93.33% (42/45) MRSA strains were sensitive to Vancomycin. Bhateja P et.al,^[14] Mallaval FO et.al,^[15] Yasmin Maor et.al^[16] had reported 6.12%, 5.43%, 6.0% respectively, coincides with the present study (Table 2).

Table 2: Comparative Study of Visa/Vrsa Isolates


Year	Author	Place	VISA strains	%	VRSA strains	%
2005	Bhateja P etal	India	9	6.12	-	—
2004	Mallaval F O et al	France	48	5.43	—	—
2007	Yasmin Maor etal	Israel	16	6	—	—
2007	Present Study	India	3	6.66	—	—

The MIC for 3 VISA strains by E- test method was also 8µg/ml, which correlated with agar dilution method. All the 3 VISA strains showed multi drug resistance indicating the need to create awareness regarding these strains in the local scenario.

REFERENCES

1. CDC. National Nosocomial Infections Surveillance report, data summary from October 1986-April 1996, issued May 1996. *Am J Infect Control* 1996; 24: 380-8.
2. Harold C. N., *Anti Staphylococcal Penicillins*, the Medical Clinics of North America, Jan 1982; 66(1):51-60.
3. Barber Mary., *Methicillin resistant staphylococci*, *Journal of Clinical Pathology*, Feb 1961; 14:385-393.
4. Bary D., Cookson., *Staphylococcus aureus principles and practices of Clinical Bacteriology*, Edited by Emerson A.M., Hawkey P.M., Gillespie S.H., 1997; 109-129.
5. Lowy FD. *Staphylococcus aureus infections*. *N Engl J Med* 1998; 339: 520 – 32.
6. Milligan M. E. et.al, *Methicillin-resistant Staphylococcus aureus; A consensus review of the Microbiology, pathogenesis and epidemiology with implication for prevention and management*, *American Journal of Medicine*, March 1993;94: 313-324

7. Hiramatsu K, Hanaki H, Ino T, *Methicillin-resistant Staphylococcus aureus clinical strain with reduced Vancomycin susceptibility*. *J Anti microb*.
8. National Committee for Clinical Laboratory Standards. *Methods for dilution antimicrobial susceptibility tests for bacteria that grow aerobically*. 6th ed. Approved standard, M7-A6. Wayne, Pennsylvania; 2003.
9. CDC Hageman JC, Patel JB, Carey RC, Tenover FC. *Investigation and control of Vancomycin – intermediate and resistant Staphylococcus aureus*. A Guide for Health Departments and Infection Control Personnel. Atlanta GA 2006 pg 5.
10. Srinivasan A, Dick JD, Perl TM. *Vancomycin resistance in staphylococci*. *Clin Microbiol Rev* 2002; 15: 430–8.
11. Orrett F.A., Land M., *Methicillin resistant Staphylococcus aureus prevalence: current susceptibility patterns in Trinidad*, *BMC Infectious Diseases*, 2006 May 5; 6:83.
12. Hakim S T, Arshed S, Iqbal M, Javaid S.G., *Vancomycin sensitivity of Staphylococcus aureus isolates from hospital patients in Karachi, PAKISTAN*, *Libyan Journal of Medicine*, 18th July 2007.
13. Anupurba S., Sen M.R., Nath G., Sharma B.M., Gulati A.K., Mohapatra T. M., *Prevalence of*

- methicillin resistant *Staphylococcus aureus* in a tertiary referral hospital in eastern Uttar Pradesh. *Indian Journal of Medical Microbiology*, 2003; 21: 49-51.
14. Bhateja P, Mathur T, Pandya M, Fatma T, Rattan Ashok, detection of Vancomycin resistant *Staphylococcus aureus*, *Indian Journal of Medical Microbiology*, 2005; 23(1): 52-55.
 15. Mallaval F.O., Carricajo A, Delavenna F, Recule C, Fonsale N, Manquat G, Raffenot D, Rogeaux O, Aubert G, Tous J,  Detection of an outbreak of methicillin-resistant *Staphylococcus aureus* with reduced susceptibility to glycopeptides in a French hospital, *Clinical Microbiology Infections*, 2004 May; 10(5):459-61.
 16. Yasmin Maor, Galia Rahav, Natasha Belausov, Debby Ben-David, Gill Smollan, and Nathan Keller, Prevalence and Characteristics of heteroresistant vancomycin-intermediate *Staphylococcus aureus* Bacteremia in a Tertiary Care Center Infectious Disease Unit/ Microbiology Laboratory, Tel Aviv University, Sheba Medical Center, Tel Hashomer, Israel.

Effect of Traffic Noise on Hearing in City Bus Drivers of Bangalore

Pushpa K¹, Girija B², Shivakumar Veeraiah³

¹Final Year Post Graduate Student, Department of Physiology, Bangalore Medical College and Research Institute, Bangalore, ²Associate Professor, Department of Physiology, Bangalore Medical College and Research Institute, Bangalore, ³Professor and Head of the Department, Department of Physiology, Bangalore Medical College and Research Institute, Bangalore

ABSTRACT

Objective: To study whether the duration of exposure to noise significantly affects hearing threshold level in bus drivers.

Materials and method: Study was conducted on 30 male drivers working in Bangalore Metropolitan Transport Corporation (BMTc), Bangalore, between the age group 20 - 50 years and pure tone audiometric evaluation was done.

Results: Drivers with more no. of years of job experience had high levels of hearing threshold ($p < 0.001$) both for lower and higher frequencies but significantly more for higher frequency. This study shows that hearing loss is found in drivers at an earlier age since majority were between 30-40 years.

Conclusion: The risk of hearing loss and injury to ears increase with the sound intensity, duration of exposure to noise and individual susceptibility. Awareness has to be created in drivers by implementing education and training programs has to be conducted about the hearing protectors.

Keywords: Bus Drivers, Hearing Loss, Hearing Threshold, Traffic Noise

INTRODUCTION

Exposure to excessive noise is the major avoidable cause of permanent hearing impairment worldwide. Noise induced hearing loss (NIHL) is an important public health priority because as population live longer and industrialization spreads, NIHL will add substantially to the global burden of disability. Worldwide, 16% of the disabling hearing loss in adults is attributed to occupational noise, ranging from 7 to 21% in the various sub regions.^[1]

NIHL is generally used to denote the cumulative, permanent loss of hearing that develops gradually after months or years of exposure to high levels of noise. It has long been recognized as a problem in occupations associated with prominent noise. NIHL is the second most common form of acquired hearing loss after age-related loss (presbycusis), with studies showing that people who are exposed to noise levels higher than 85 db suffered from NIHL.^[2]

Impairment of hearing at high frequencies will initially cause a loss of clarity in perceived speech and then interfere with daily activities as hearing loss progresses. The risk of hearing loss and injury to the

ears increases with the sound intensity, the length of time an employee is exposed to noise and the individual susceptibility to NIHL. The effects of the exposure to occupational noise are higher in the developing regions.^[3]

Driving is one of the most essential parts of modern lifestyle and some choose driving as their profession and hence they are regularly exposed to noise. Deterioration in work conditions due to traffic congestion, air and noise pollution along with the pressure of maintaining a demanding schedule causes stress. Occupational noise may also contribute to accidents in the workplace; it increases communication difficulties, difficulty in maintenance of attention, concentration and memory, in addition to stress and excessive fatigue.^[4]

The purpose of this study was to assess the hearing ability of drivers in relation to their years of driving.

MATERIALS AND METHOD

30 healthy male drivers working in Bangalore Metropolitan Transport Corporation (BMTc),

Bangalore, between the age group 20 – 50 years were chosen as subjects for undergoing pure tone audiometric evaluation. Those with any past history of otorrhea, usage of ototoxic drugs, head injury or having any autoimmune disease were excluded. Subjects were explained about the study protocol and informed consent was taken.

They were asked to answer a hearing questionnaire and details were noted regarding their job history. Hearing levels for frequencies of 0.25, 0.5, 1, 2, 4 and 8 KHz were determined using ARPHI 500 MK 1 audiometer. Air conduction was measured by ear phones placed on the ears, while bone conduction was measured by placing a vibrator in contact with the skull (over mastoid process) behind the ears. Each ear was evaluated separately and test results were plotted on a graph known as an audiogram.

Statistical method^[5,6,7]

Descriptive statistical analysis was carried out. Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters. Leven1s test for

homogeneity of variance has been performed to assess the homogeneity of variance. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups. Pearson correlation between PSS and study variables is performed to assess the correlation.

Statistical software: The Statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1, Systat 12.0 and R environment ver.2.11.1 were used.

RESULTS

Out of 30 subjects, 6 subjects were between age 20-30 years, 15 subjects were between age 30-40 years and 9 subjects were between age 40-50 years. (Mean \pm SD: 35.67 \pm 7.38). 15 subjects had job experience 1-10 years, 10 subjects had job experience 11-20 years, and 5 subjects had more than 20 years of experience.

The threshold for hearing was increased for frequency levels 0.25, 0.5, 1, 2 and 8 KHz ($p < 0.001$), also for frequency 4 KHz ($p = 0.008$). Statistically there is very significant relationship between hearing threshold of drivers and their years of job experience.

Table 1: Comparison of hearing threshold for Air conduction of Left ear with respect to duration of exposure

Sound Frequency in left ear (In Hertz)	Duration of exposure				P value
	<10 years	11-20 years	>20 years	Total	
0.25	20.00 \pm 0.00	24.00 \pm 3.94	27.00 \pm 4.47	22.50 \pm 3.88	<0.001**
0.5	20.00 \pm 0.00	24.00 \pm 3.94	27.00 \pm 4.47	22.50 \pm 3.88	<0.001**
1	20.00 \pm 0.00	24.50 \pm 3.68	27.00 \pm 4.47	22.66 \pm 3.88	<0.001**
2	21.00 \pm 2.07	25.50 \pm 3.68	29.00 \pm 4.18	23.83 \pm 4.29	<0.001**
4	25.00 \pm 3.27	29.00 \pm 3.94	31.00 \pm 5.47	27.33 \pm 4.49	0.008**
8	34.00 \pm 2.07	36.50 \pm 3.37	42.00 \pm 6.70	36.16 \pm 4.48	0.001**

Table 2: Comparison of hearing threshold for Air conduction of Right ear with respect to duration of exposure

Sound Frequency in left ear (In Hertz)	Duration of exposure				P value
	<10 years	11-20 years	>20 years	Total	
0.25	20.00 \pm 0.00	24.00 \pm 3.94	27.00 \pm 4.47	22.50 \pm 3.88	<0.001**
0.5	20.00 \pm 0.00	24.00 \pm 3.94	27.00 \pm 4.47	22.50 \pm 3.88	<0.001**
1	20.00 \pm 0.00	24.50 \pm 3.68	27.00 \pm 4.47	22.66 \pm 3.88	<0.001**
2	21.00 \pm 2.07	26.00 \pm 3.94	30.00 \pm 5.00	24.16 \pm 4.74	<0.001**
4	25.00 \pm 3.27	29.00 \pm 3.94	31.00 \pm 5.47	27.33 \pm 4.49	0.008
8	34.00 \pm 2.07	37.00 \pm 2.58	42.00 \pm 6.70	36.33 \pm 4.34	<0.001**

Table 3: Comparison of hearing threshold for Bone conduction of Left ear with respect to duration of exposure

Sound Frequency in left ear (In Hertz)	Duration of exposure				P value
	<10 years	11-20 years	>20 years	Total	
0.25	25.00±0.00	29.00±3.94	32.00±4.47	27.50±3.88	<0.001**
0.5	25.00±0.00	29.00±3.94	32.00±4.47	27.50±3.88	<0.001**
1	25.00±0.00	29.50±3.68	32.00±4.47	27.66±3.88	<0.001**
2	26.00±2.07	30.50±3.68	34.00±4.18	28.83±4.29	<0.001**
4	30.00±3.27	34.00±3.94	36.00±5.47	32.33±4.49	0.008

Table 4: Comparison of hearing threshold for Bone conduction of Right ear with respect to duration of exposure

Sound Frequency in left ear (In Hertz)	Duration of exposure				P value
	<10 years	11-20 years	>20 years	Total	
0.25	25.00±0.00	29.00±3.94	32.00±4.47	27.50±3.88	<0.001**
0.5	25.00±0.00	29.00±3.94	32.00±4.47	27.50±3.88	<0.001**
1	25.00±0.00	29.50±3.68	32.00±4.47	27.66±3.88	<0.001**
2	26.00±2.07	31.00±3.94	35.00±5.00	29.16±4.74	<0.001**
4	30.00±3.27	34.00±3.94	36.00±5.47	32.33±4.49	0.008

DISCUSSION

Drivers are exposed to high levels of noise throughout their lifetime of work, but there are very few NIHL studies in India to show its prevalence. Hence, present study was undertaken to assess the hearing threshold levels of drivers. This study showed that there is a significant relationship between hearing threshold of drivers and their years of job experience. Drivers with more number of years of work experience had higher hearing threshold for all the frequencies, significantly for higher frequency.

Higher sound levels damage the outer hair cells, stereocilia, intercellular bridges and recovery takes longer. Long term exposure to high sound levels causes collapse of the stereocilia and the hair cell is eventually damaged permanently. If the outer hair cells are not functioning, a greater stimulation is required to initiate a nervous impulse; thus, the threshold sensitivity of inner hair cells is raised, which is perceived as a hearing loss. Once damaged, the auditory sensory cells cannot repair themselves nor can the medical procedures restore normal function.^[8]

Janghorbani M et al did a cross sectional study on a random sample of 4300 drivers aged around 20 years in Isfahan, Iran. Prevalence of noise induced hearing loss was found in 18.1% drivers after pure tone audiometric evaluation.^[9]

Similar study was conducted in Brazil by Correa Filho HR et al on 108 city bus drivers of Campinas,

Brazil (1991). The average age of subjects was 38.64 years. Pure tone audiometric evaluation showed that 32.7% of drivers had noise induced hearing loss.^[10]

Silva Gomes et al conducted a study on 28 drivers, pure tone audiometry of drivers showed that 50% of them had noise induced hearing loss.^[11]

In a cross-sectional study, the hearing status of tractor-driving farmers (TDFs) was compared with that of non-TDFs. Audiogram analysis showed higher prevalence of abnormalities in TDFs. TDFs more often had a higher frequency of hearing loss when compared with non-TDFs.^[12]

Similar studies done in various fields showed that there is increased prevalence of NIHL with long term exposure to noise. In a textile mill weavers study, the sound levels were around 102-104 dBA and the hearing acuity of the textile weavers was found to be poor. NIHL at 4000 Hz was as high as 30 dB in the age range 25-29 years, 40 dB in the age range 30-34 years and 45 dB in the age range 35-39 years.^[13]

A survey on the effects of noise pollution on traffic policemen in the city of Hyderabad, India, carried out by the Society to Aid the Hearing Impaired, revealed that 76% had NIHL. Among these, all those who had completed 5 years in the traffic wing had hearing loss in various degrees.^[14]

The most effective way to prevent NIHL is to protect the worker from hazardous noise at the

workplace. Hearing protectors should be used when engineering controls and work practices are not feasible for reducing noise exposure to safe levels.

Awareness should be created among drivers about the harmful effects of noise on hearing and other body systems by implementing education and training programs. Research studies are needed to know the exact prevalence of NIHL among various industries in India. A national program should be established considering the amount of damage the NIHL causes to the quality of life of workers.

ACKNOWLEDGEMENTS

I thank Dr.K.P.Suresh, Scientist (Biostatistics), National Institute of Animal Nutrition & Physiology, Bangalore, for his assistance in statistics.

Conflict of Interest: None declared.

Source of Funding: Nil

ETHICAL CLEARANCE:

Ethical clearance has been obtained from our Institutional (BMCRI) committee.

REFERENCES

1. Subroto S. Nandi, Sarang V. Dhattrak. Occupational noise-induced hearing loss in India. *IJOEM* 2008;12(2):53-6
2. Ali Karimi, Saleh Nasiri, Farshid Khodaparast Kazerooni, Mohammad Oliaei. Noise induced hearing loss risk assessment in truck drivers. *Noise Health* 2010; 12(46):49-55.
3. Geneva: WHO; Report of informal consultation on prevention of noise induced hearing loss held on 28-30 October 1997. Available from: <http://www.who.int/pbd/deafness/en/noise.pdf>.
4. Andréa Cintra Lopes, Vanessa Guioto Otowiz, Patrícia Monteiro de Barros Lopes, José Roberto Pereira Lauris, Cibele Carméllo Santos. Prevalence of noise-induced hearing loss in drivers. *Int. Arch. Otorhinolaryngol.* vol.16 no.4 São Paulo Oct./Dec. 2012.
5. Robert H Riffenburt (2005), *Statistics in Medicine*, second edition, Academic press. 85-125.
6. Sunder Rao P S S, Richard J (2006): *An Introduction to Biostatistics, A manual for students in health sciences*, New Delhi: Prentice hall of India. 4th edition, 86-160.
7. Suresh K.P. and Chandrasekhar S (2012). Sample Size estimation and Power analysis for Clinical research studies. *Journal Human Reproduction Science*, 5(1), 7-13.
8. Niland J. Occupational hearing loss, noise, and hearing conservation. In: Zenz C, Dickerson O, Horvarth E, editors. *Occupational medicine*. 3rd ed. St Louis Missouri: Mosby Publication; 1994. pp. 258-96.
9. Janghorbani M, Sheikhi A, Pourabdian S. The prevalence and correlates of hearing loss in drivers in Isfahan, Iran. *Arch Iran Med.*2009 Mar; 12(2):128-34.
10. Correa Filho HR, Costa LS, Hoehne EL, Perez MA, Nascimento LC, de Maura EC. Noise induced hearing loss and high blood pressure among city bus drivers. *Rev Saude Publica* 2002 Dec;36(6):693-701.
11. Silva GLL, Gomes MVSG, Zaher VL. Audiological profile of ambulance drivers from two hospitals in the city of São Paulo, Brazil. *Arq Int Otolaryngol.* 2006, 10(2):132-140.
12. Kumar A, Mathur NN, Varghese M, Mohan D, Singh JK, Mahajan P. Effect of tractor driving on hearing loss in farmers in India. *Am J Ind Med.* 2005;47: 341-8.
13. Bhattacharya SK, Saiyed HN, Roy A, Chatterjee SK. Hearing acuity in weavers of a textile mill. *Indian J Med Res.* 1981;74:779-85.
14. Society to Aid the Hearing Impaired (SAHI) Available from <http://www.sahiearcare.org/trafficpolice.html>.

A Retrospective Study of Cataract Surgery in Patients with Uveitis

Rahul Bhargava¹, Prachi Kumar², S K Sharma³, Anuraag Mishra⁴

¹Assistant Professor, Ophthalmology, ²Assistant Professor, Santosh Medical College and Hospital, Ghaziabad, U.P.,

³Director, Rotary Eye Hospital, Palampur, H.P., ⁴Resident, Ophthalmology, Santosh Medical College & Hospital, Ghaziabad, U.P.

ABSTRACT

Purpose: To study visual outcome of cataract surgery in patients with uveitic cataract.

Method: A retrospective study of 27 patients who underwent cataract surgery with posterior chamber intraocular lens implantation for uveitic cataract after a quiet postoperative period of minimum 3 months.

Results: The mean age was 50.88. The mean follow up period was 8.66 months. SICS with PCIOL implantation had a significantly lower postoperative inflammation when compared to ECCE group (Chi square test, $P=0.003$). When uveitis was well controlled for a minimum of three months, preoperative medications did not have a significant effect on post-operative inflammation (Chi square test, $P=0.796$). Patients in SICS with PCIOL group had slightly better visual acuity at 6 months. PCO (36.36%), persistent uveitis and macular edema (22.72%) were the most common causes of reduced vision in postoperative period.

Conclusion: Cataract surgery with IOL is safe in cataracts due to uveitis. SICS being faster, less expensive, and less technology dependent than phacoemulsification, may be more appropriate technique in such patients in developing countries like India.

Keywords: Uveitis, Small Incision Cataract Surgery (SICS), extra capsular cataract extraction (ECCE), Posterior Capsule Opacification (PCO)

INTRODUCTION

Uveitis or intraocular inflammation is often complicated by formation of Cataract. Location, severity of inflammation and use of corticosteroid therapy are the main determinants for Cataract formation¹.

Pathologically, the initial lesions are typically seen in sub-capsular and equatorial zones². Anterior sub-capsular opacities (Figure 11) are most commonly seen in uveitis secondary to atopic dermatitis or chemicals and are histopathologically, metaplastic lens epithelial cells². Similar opacities may develop in posterior sub-capsular zone in association with steroid administration³.

Cataract surgery in patients with uveitis can be challenging due to non-dilating pupil and intraoperative problems like synechia, pupillary membranes and bleeding from fragile vessels⁴.

Moreover, results of Cataract surgery are difficult to assess as eyes with different uveitis syndromes respond differently to surgery.

Duke Elder⁵ and Smith and Nozik⁶ suggested that conventional cataract surgery can be safely performed in Uveitis patients as long as inflammation has been absent for two to three months.

The etiologic cause and type of uveitis can influence not only disease course, but treatment response and rate of associated complications. A specific diagnosis can guide the clinical approach as well as surgical technique; thus a comprehensive history and appropriate laboratory analysis is essential^{7,9,10,11}.

Traditionally, conventional Extra-capsular Cataract Extraction (ECCE) with or without IOL implantation has been the preferred technique of cataract surgery in patients with uveitis.

Manual Small Incision Cataract Surgery (SICS) offers cost effective alternative to technically difficult phaco situations like miotic pupil and extensive posterior synechia where atraumatic phacoemulsification can be difficult¹.

METHOD

We retrospectively reviewed the records of patients with uveitic cataract operated between 2007-2010. Type of cataract surgery included ECCE, Manual Small Incision Cataract Surgery and Phacoemulsification with PCIOL implantation.

Preoperative work up included recording of Best Corrected Visual Acuity (BCVA), routine haematological tests, CXR (PA view), X-ray SI Joint, B-scan, and investigations like (RF, FTA ABS, ANF, Toxoplasma Gondi titres, ACE essay, ELHISA for TB & HIV (after consent), HLA typing (in clinically suspected cases due to cost factor)). Sure shot etiological diagnosis was marked when made.

Aqueous flare and cells were graded by modified Hogan's technique¹² and intraocular inflammation as per recommendations of International Uveitis Study Group¹³. Wherever indicated, oral Prednisolone, 1mg/kg OD PC, was given seven days prior to surgery, continued postoperatively and doses tapered according to inflammatory response.

Cataract extractions (ECCE/SICS/Phaco) were performed by a fellowship trained single surgeon. All IOL's were PMMA and in the bag placement was aimed in all cases. In non-dilating pupils with extensive posterior synechia, synechiolysis was performed with a viscoelastic, combined with sphincterotomy, prior to capsulorrhexis.

Postoperatively, patients were followed up on day 1, 7, 21, 30, 42 and 180. On each visit BCVA, aqueous cells and flare, red reflex¹⁴ and fundal details were recorded. Patients taking systemic steroids routinely underwent blood pressure monitoring, urine analysis, and random blood glucose testing. The visual acuity at 6 weeks, six months and final follow up day was recorded using a Snellen chart. In patients on steroids for macular edema prior to surgery, dose was increased in cases with reduction of visual acuity.

Statistical analysis was done using Chi-square tests as there was more than one variable in the study.

FINDINGS

The data was analysed retrospectively. The total number of valid cases was 27. The mean age was 50.88. The number of males were 14(51.85%) and

females 13 (48.15%). The mean follow up period was 8.66 months and standard deviation was 2.86.

15 eyes (55.55%) eyes had a final BCVA between 6/6 to 6/12. 11 eyes (40.75%) had a BCVA between 6/18 to 6/60. 1 eye (3.70%) had BCVA worse than 6/60 postoperatively. Final visual acuity was compared with preoperative visual acuity. There was improvement in vision after surgery and on application of Chi square test this was statistically significant (P=.003). Eyes receiving pre-operative steroids had a slightly better final vision (Chi square test, P= 0.564).

The frequencies of various surgeries performed are depicted in Table 1. SICS with PCIOL was the most commonly performed surgery (55.55%). On application of Chi-square test, P=0.03, this difference was statistically significant.

Table 1. Type of Surgery

Type of Surgery	No of Eyes	Percentage
ECCE with PCIOL	11	40.75
SICS with PCIOL	15	55.55
Phaco with PCIOL	01	3.70
TOTAL	27	100

The etiological diagnosis of the type of uveitis and their frequency is given in Table 3. The most common etiological diagnosis of uveitis was Idiopathic in 18 eyes (66.66%). Of 27 valid cases, 17 (62.96%) had anterior disease, 3 (11.11%) had Intermediate, 2 (7.40%) posterior disease. (Table 2)

Table 2. Anatomical Type of Uveitis

Type of Uveitis	No of Eyes	Percentage
Anterior	17	62.96
Intermediate	3	11.11
Posterior	2	7.40
Panuveitis	4	14.81
Unable to classify	1	3.70
TOTAL	27	100

TABLE 3. Etiological Type of Uveitis

Etiological Type	No of Eyes	Percentage
Idiopathic	18	66.66
FHC	3	11.11
Sarcoidosis	1	3.70
VKH	1	3.70
AS	1	3.70
Toxo. Chorioretinitis	1	3.70
RA	1	3.70
MS	1	3.70
TOTAL	27	100

Table 4. Visual Acuity prior to Surgery

Pre-Op BCVA	No of Eyes	Percentage
5/60 to HM	13	48.14
6/60 to 6/18	14	51.86
6/18 or better	0	0
TOTAL	27	100

Table 5. Visual Acuity after surgery

Post-Op BCVA	No of Eyes	Percentage
Worse than 6/60	1	3.70
6/18 to 6/60	11	40.75
6/12 to 6/6	15	55.55
TOTAL	27	100

15 of 27 eyes (55.55%) in which surgery was performed, received steroids pre-operatively. 10 eyes (66.66%) received topical corticosteroids, four times a day, one week prior to surgery. In 5 eyes (33.33%), oral corticosteroids in form of Prednisolone, 1mg/kg body weight was given 7 days prior to surgery. Topical non-steroidal anti-inflammatory drops were given in 11eyes (40.75%).

Post-operatively, all eyes received topical corticosteroid eye drops at 1 hour interval and doses tapered over 6-8 weeks. Out of 15 eyes that received pre-operative medications, eight eyes (29.62%) developed increased postoperative inflammation and received oral steroids. 2 eyes (out of eight) received additional peri-ocular triamcinolone injection for control of inflammation. Of 12 eyes that did not receive pre-operative medications, two eyes (16.66%) developed increased postoperative inflammation and needed additional medication. None of the eyes required systemic Immunosuppressive therapy. Pre-operative medications did not have a significant effect on post-operative inflammation. (Chi-square test, P= 0.796). However, post-operative inflammation was significantly lower in SICS group (Chi square test, P=0.003)

In our study, 96.30 % patients showed an improvement in vision at 6 months. In 22 eyes (81.48%), a definitive cause could be ascertained for reduced vision post operatively. Posterior capsule opacification (36.36%) and Macular edema (22.72 %) were the most commonly observed causes for reduction of vision (Table6). Of the four eyes with chronic anterior uveitis which received topical steroids preoperatively, 2 eyes developed macular edema postoperatively.

Table 6 . Complications

Complication	No of Eyes	Percentage
PCO	8	36.36
Macular Edema	5	22.72
ERM	3	13.63
ARMD	2	9.09
Recurrent Uveitis	1	4.54
Retinal Scarring	1	4.54
Posterior K.P.'s	1	4.54
Intermediate Uveitis	1	4.54
TOTAL	22	100

DISCUSSION

Cataract surgery in a patient with uveitis requires a thorough diagnostic investigation, good preoperative control of inflammation and a meticulous surgical technique.

Implantation of Intraocular lens can be safely performed in most cases of Uveitic cataract with the possible exception of Juvenile chronic arthritis^{15, 8}.

Manual small-incision cataract surgery (SICS) has emerged as a cost effective alternative to phacoemulsification in developing countries. Large burden of all types of Cataract and shortage of eye surgeons in developing countries provide manual SICS an economic advantage over Phacoemulsification as preferred surgical technique of cataract extraction¹⁶. However, there are no published randomised controlled trials comparing phacoemulsification and manual SICS for uveitic cataract (Medline search).

Overall, 37.03 % cases had increased postoperative inflammation. Our study did not find statistically significant influence of pre-operative medication on post-operative inflammation. This finding was similar to a retrospective study done by Hazari and co-workers¹⁷.

Cataract surgery in patients with uveitis results in improvement in best corrected visual acuity at 6 months in most cases (96.30 %). Okhravi et al found improvement in 96% eyes, 6 months postoperatively. Our results were comparable to this study.

In our study, manual SICS (Figure 6) was associated with a significantly lower postoperative inflammation when compared to ECCE. However, we cannot comment whether Phacoemulsification (Figure 5) is associated with less postoperative inflammation or not because of small sample size (n=1), despite most studies pointing towards this trend¹⁸.

Posterior capsule opacification (Figure 7 & 8) was the most common complication observed in our study. Visually significant PCO was defined as reduction in best corrected visual acuity by two Snellen lines¹⁹. This was comparable to the incidence reported by Schaumberg and co-workers²⁰. However, there was no statistically significant correlation between PCO and increased postoperative inflammation.

Persistent Uveitis and macular edema, (Confirmed on FFA) were the common causes of decreased vision postoperatively (Figure 1). This was similar to findings

of Okhravi and co-workers²¹. Severe uveitis was associated with an increased incidence of macular edema. There was a statistically significant reduction in the rate of macular edema in patients preoperatively treated with oral corticosteroids. This finding was similar to that of Jancevski et al⁴.

Patients with chronic anterior uveitis should be considered for systemic steroids, irrespective of active or quiescent disease. The frequency of macular edema (22.72%) observed in our study was similar to the incidence reported by other authors²².

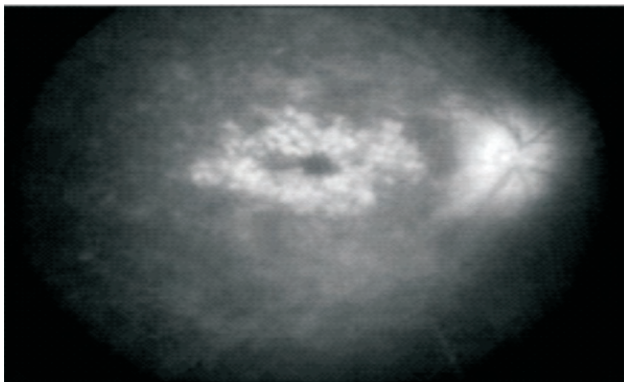


Fig. 1. Macular edema after cataract surgery in a patient with uveitis.



Fig. 2. Slit-lamp photograph showing Fuch's Heterochromic cyclitis.

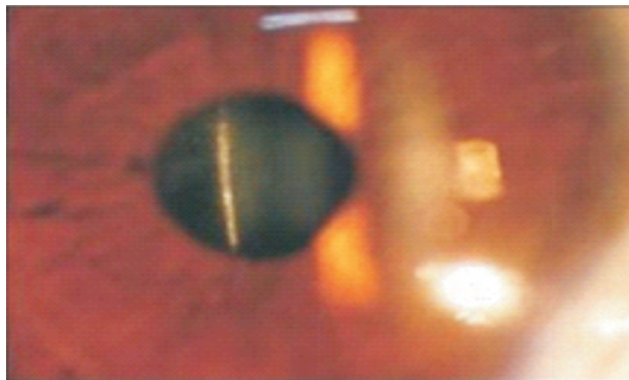


Fig. 3. Posterior subcapsular opacities in a patient with Fuch's.

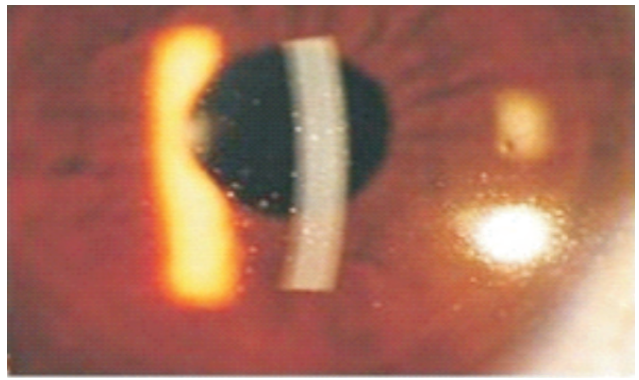


Fig. 4. Ground glass keratic precipitates.

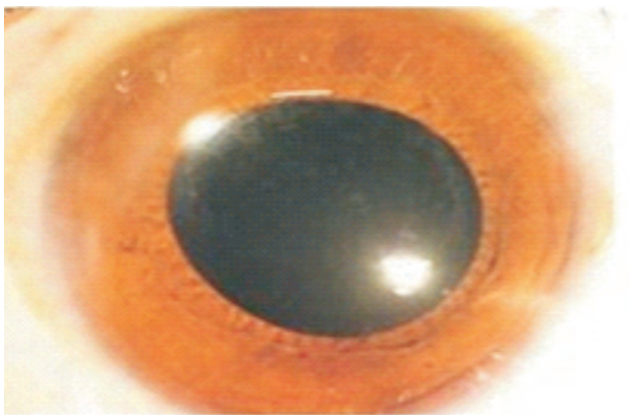


Fig. 5. Phacoemulsification in uveitic cataract.

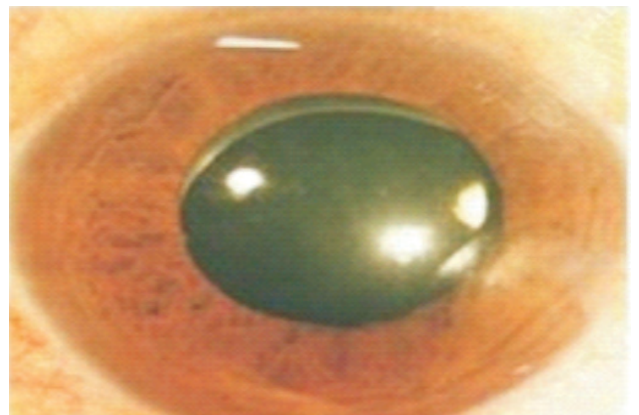


Fig. 6. Small Incision Cataract surgery in uveitic cataract.

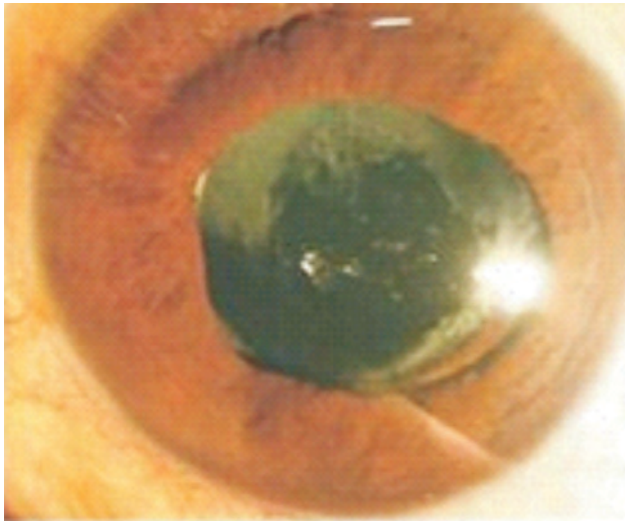


Fig. 7. Posterior capsule opacification in uveitic cataract.

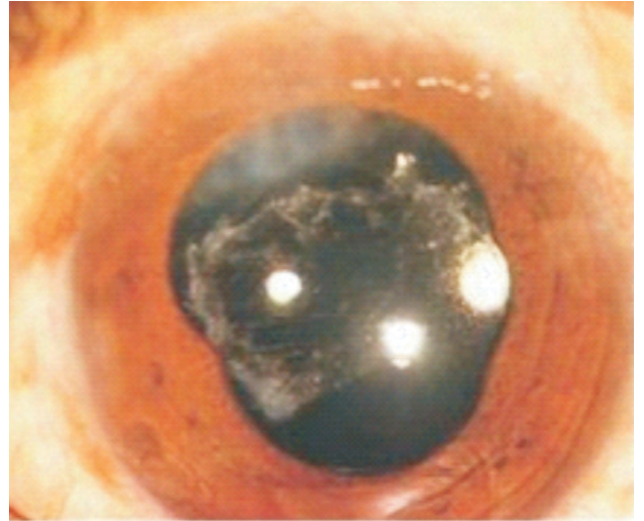


Fig. 8. Posterior capsule plaque in uveitic cataract.

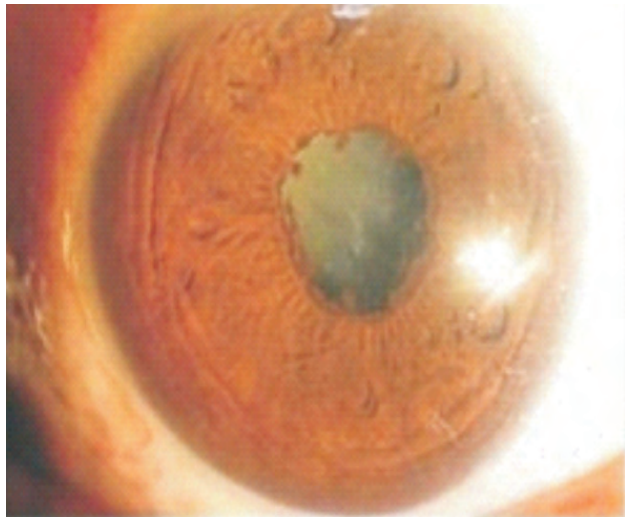


Fig. 9. Posterior synechia in uveitic cataract.

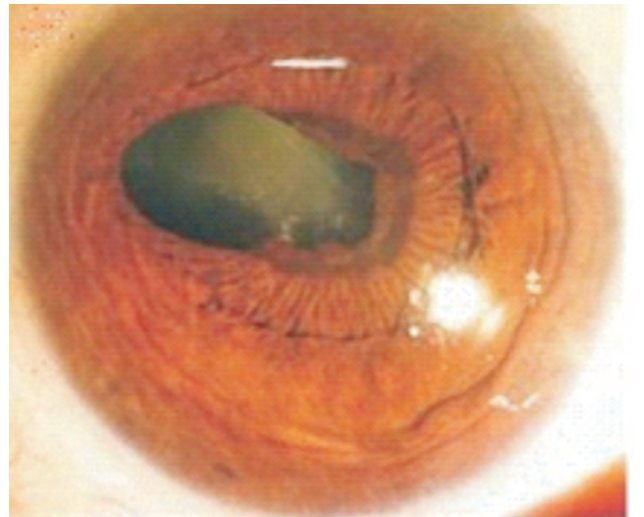


Fig. 10. Uveitic cataract



Fig. 11. Lens pigments in uveitic cataract

CONCLUSION

Cataract surgery with IOL implantation can be safely performed in most cases of uveitic cataract. The key to success lies in adequate control of inflammation preoperatively.

Manual small incision cataract surgery appears to be faster, less expensive, less technologically dependent than phacoemulsification provides an economic advantage and may be the more appropriate technique in eyes with uveitic cataract in developing countries like India.

PCO, persistent uveitis and macular edema are the most common causes of reduced vision postoperatively. All patients with chronic anterior

Table A. Master Chart

S.N	Age	Sex	Uveitis Type	Surgery	Diagnosis	Pre-Op	Final BCVA	Steroids BCVA	Follow up Pre op	Cause of ↓ Vision months	Additional Procedure
1.	60	M	Anterior	ECCE with PCIOL	Idiopathic	6/60	6/12	N	9	PCO	N
2.	70	M	Anterior	ECCE with PCIOL	Idiopathic	CF	6/18(p)	N	5	ARMD	N
3.	45	M	Anterior	SICS with PCIOL	Idiopathic	6/36 (p)	6/9(p)	N	10	Recurrent Uveitis	Y
4.	61	F	Chr. Ant.	ECCE with PCIOL	Idiopathic	CF	6/24	Y	6	Macular Edema	N
5.	42	M	Chr. Ant.	SICS with PCIOL	Idiopathic	HM	6/9	N	11	Macular Edema	Y
6.	32	F	Intermediate	SICS with PCIOL	Sarcoidosis	6/60	6/9	Y	9	-	N
7.	46	M	Anterior	SICS with PCIOL	FHC	6/36(p)	6/9	N	5	-	N
8.	32	F	Panuveitis	SICS with PCIOL	Idiopathic	HM	6/18	Y	12	PCO, Maculopathy	Y
9.	47	F	Rec. Ant.	ECCE with PCIOL	Idiopathic	HM	6/36	Y	9	Intermediate Uveitis	Y
10.	62	F	Panuveitis	ECCE with PCIOL	RA	CF	6/18	Y	7	NIIDM with CSME	N
11.	46	M	Rec. Ant	SICS with PCIOL	Idiopathic	6/36	6/6 (p)	N	5	-	N
12.	44	M	Anterior	SICS with PCIOL	FHC	6/36 (p)	6/9	N	11	PCO, Posterior K.P's	N
13.	51	F	Posterior	ECCE with PCIOL	Toxo chorioretinitis	6/24(p)	6/9	Y	7	Retinal Scarring	N
14.	64	F	Panuveitis	ECCE with PCIOL	VKH	CF	6/36	Y	9	ERM	Y
15.	61	M	Rec. Ant.	ECCE with PCIOL	Idiopathic	CF	6/18	Y	6	Persistent Uveitis	Y
16.	36	M	Rec Ant	SICS with PCIOL	AS	6/36	6/12	N	4	-	N
17.	38	M	Intermediate	SICS with PCIOL	Idiopathic	6/60	6/9	Y	7	-	N
18.	43	F	Panuveitis	SICS with PCIOL	Idiopathic	6/18 (p)	6/12(p)	N	7	PCO, ERM	N
19.	47	F	Chr. Ant.	SICS with PCIOL	Idiopathic	6/60	6/9	Y	11	Macular Edema	N
20.	60	F	Chr. Ant.	ECCE with PCIOL	MS	HM	6/60	Y	12	Macular Edema	Y
21.	36	M	Rec. Ant	ECCE with PCIOL	FHC	6/36 (p)	6/12	N	13	PCO	N
22.	68	F	Rec Ant	Phaco with PCIOL	Idiopathic	CF	6/18 (p)	N	7	ARMD, PCO	N
23.	63	M	Anterior	SICS with PCIOL	Idiopathic	CF	6/18	Y	9	-	N
24.	68	M	Anterior	SICS with PCIOL	Idiopathic	6/24	6/6(p)	N	5	-	N
25.	61	F	Panuveitis	SICS with PCIOL	Idiopathic	6/60	6/9(p)	Y	12	PCO	Y
26.	55	F	Posterior	SICS with PCIOL	Idiopathic	HM	6/12(p)	Y	14	ERM	N
27.	36	M	Intermediate	ECCE with PCIOL	Idiopathic	CF	6/9	Y	12	PCO	Y

uveitis should be considered for systemic steroids preoperatively to reduce the incidence of visually disabling macular edema.

ACKNOWLEDGEMENTS

I sincerely thank Dr. S.K. Sharma, Director Rotary Eye Hospital, Palampur, H.P for the support provided to complete the study.

Conflict of Interest: None

REFERENCES

- Hooper PL, Rao NA et al. Cataract Extraction in Uveitis Patients. *Surv Ophthalmol* 1990;35: 120-144.
- Spencer WH: *Lens in Spencer WH(ed): Ophthalmic Pathology: An Atlas and Textbook.* Philadelphia, WB Saunders 1985, ed3, pp. 423-479.
- Greiner JV, Chylack LT Jr: Posterior sub-capsular cataracts: Histopathologic study of steroid induced cataracts. *Arch Ophthalmol* 1979;97: 135-144.
- Jancevski M. Cataracts and Uveitis. *Curr. Opin Ophthalmol.* 2010 Jan; 21:10-14.
- Duke-Elder S: *Cataracta complicata*, in *System of Ophthalmology*, Vol 11, Diseases of Lens and Vitreous; Glaucoma and Hypotony. St Louis, CV Mosby, 1969, pp 210-219.
- Smith Re, Nozik RA: *Uveitis. A clinical approach to diagnosis and management.* Baltimore, William & Wilkins, 1989, ed2, pp 115-126.
- Foster FS, Rashid S. Management of coincident cataract and uveitis. *Curr Opin Ophthalmol* 2003; 14:1-6.
- Foster CS, Fong LP, Singh G. Cataract surgery and intraocular lens implantation in patients with uveitis. *Ophthalmology* 1989; 96:281-8.
- Rauz S, Stavrou P, Murray PI. Evaluation of foldable intraocular lenses in patients with uveitis. *Ophthalmology* 2000; 107:909-19.
- Alio JJ, Chipont E, Benezra D. Comparative performance of intraocular lenses in eyes with cataract and uveitis. *J Cataract Refract Surg* 2002; 28:2096-108.
- Quinones K, Cerventes-Casteneda RA, Hynes AY. Outcomes of Cataract Surgery in children with

- chronic uveitis. *J Cataract Refract Surg* 2009; 35:725-31.
12. Hogan MJ, Kimura SJ, Thygeson P. Signs and symptoms of uveitis. *Am J Ophthalmol* 1959; 47:155-170.
 13. Bloch-Michael E, Nussenblatt RB. International Uveitis Study Group recommendation for evaluation of intraocular inflammatory disease. *Am J Ophthalmol* 1987; 103: 234-35.
 14. Gholam AP, Donald RS, Morton G. Principles and practice of Ophthalmology. Vol II, Page 1560, 1987.
 15. Foster CS, Barret F. Cataract Development and cataract surgery in patients with juvenile rheumatoid arthritis-associated iridocyclitis. *Ophthalmology* 1992; 100:809-17.
 16. Natchiar G, Dabral KT. Manual Small incision suture less cataract surgery; an alternative technique to instrumental phacoemulsification. *Operative Tech Cat Surg* 2000; 3:161-170.
 17. Hazari A, Sangwan VS. Cataract Surgery in uveitis. *Indian J Ophthalmol* 2002; 50:103-107.
 18. Kawaguchi T, Mochizuki M, Miyata K. Phacoemulsification, cataract extraction and intraocular lens implantation in patients with uveitis. *J Cat Refr Surg* 2007; 33: 305-9.
 19. Sundelin K, Sjostrand J. Posterior Capsule Opacification, 5 years after ECCE. *J Cat Refr Surg* 1999; 24 1632-1635.
 20. Schaumberg DA, Dana MR. A systemic overview of incidence of PCO. *Ophthalmology* 1998; 105:1213-1221.
 21. Okhravi N, Lightman SL. Assessment of visual outcome after Cataract Surgery in patients with Uveitis. *Ophthalmology* 1999; 106:710-722.
 22. Rojas B, Zafirakis P, Foster CS. Cataract Surgery in patients with Uveitis. *Curr Opin Ophthalmol* 1997; 8:6-12.

Socio-demographic and Clinical Profile of HIV/AIDS Cases Expired in a Tertiary Care Centre in North Karnataka, India

Nayak J J¹, Viveki R G², P R Viveki³

¹Assistant Professor, Department of Skin, STD & Leprosy, Belgaum Institute of Medical Sciences, Belgaum, Karnataka, India, ²Associate Professor, Dept. of Community Medicine, Belgaum Institute of Medical Sciences, Belgaum, Karnataka, India, ³Tutor, Dept of Anatomy, Belgaum Institute of Medical Sciences, Belgaum instead of PG Student, Dept of Anatomy, J N Medical College Belgaum, Karnataka

ABSTRACT

Background: Globally, HIV/ AIDS continue to be a major public health priority as it is one of the major financial burdens on health care system worldwide.

Objectives: To explore the general clinical profile, CD4 status & frequency of opportunistic infections & non-infectious opportunistic diseases among expired HIV/AIDS cases.

Method: The present retrospective record based case study was conducted in BIMS Hospital - a tertiary care center in North Karnataka during January to February, 2011 after going through the records of all HIV/AIDS cases expired in the hospital, from January 2008 to December 2010. The collected data was analyzed using SPSS version 17.

Results: Of 361 cases expired during their hospital stay in the study period, majority (64.8%) were males and 213 (59.0%) were belonging to the age group of 26 to 40 years. Mean hemoglobin level was found to be 7.69 (\pm 2.21) gm%. Among those cases whose CD4+ T lymphocyte status was known (38.8%), more than 3/4th (77.1%) were having less than 200 cells / μ L. Common signs and symptoms recorded were weight loss (99.4%), weakness (97.2%), cough (61.5%), fever (60.4%), altered sensorium (32.4%), general wasting syndrome (67.6%), pallor (91.7%), candidiasis (38.2%), etc. Common opportunistic infections / diseases recorded were Tuberculosis (61.5%), Septicemia (13.6%), Pneumocystis carinii pneumonia (6.9 %) etc.

Conclusions: TB remains the commonest opportunistic infection among HIV positive cases. Findings in the present study might help hospital / health managers understand the major predictors of HIV related mortality.

Keywords: HIV/AIDS cases, Opportunistic infections, Antiretroviral Therapy

INTRODUCTION

HIV/AIDS is one of the major financial burdens on health care system worldwide. According to AIDS Epidemic Update, 2009¹, approximately 33.4 million people are living with HIV/AIDS (adults – 31.3 million, women 15.7 million & children below 15 years – 2.1 million) worldwide. India accounts for roughly half of Asia's HIV prevalence with proportion of

women accounting 39% of prevalence in the region in 2007 (NACO 2008). Some organizations like UNAIDS, WHO & NACO estimate national adult prevalence in India as 0.36% amounting to 2.7 million HIV positive people.²

Introduction of highly active anti retroviral therapy (HAART) has dramatically improved the prognosis of HIV infected patients in the industrialized world. In India, the national government is engaged in addressing the devastating HIV/AIDS epidemic utilizing several interventions, including free access to anti retroviral therapy (ART) launched in 2004.³ Earlier initiation of HAART along with improved strategies to diagnose and treat underlying opportunistic infections & extensive adherence to counseling may help in decreasing the mortality.⁴ Even

Corresponding author:

Viveki RG

Associate Professor
Belgaum Institute of Medical Sciences,
Belgaum - 590001, Karnataka, India
Phone number: (Mob): 09845143860

in HAART era, AIDS related deaths is still about 9.73% in India.⁸

Tuberculosis, chronic diarrhea, cryptococcal infections, toxoplasmosis & Pneumocystis carinii pneumonia continue to contribute to AIDS related mortality despite the increased access & utilization of anti retroviral therapy³. The present study was an attempt to determine the general clinical profile, CD4 + T lymphocyte status & the frequency of opportunistic infections & non-infectious opportunistic diseases among HIV/AIDS cases expired in a tertiary care centre in North Karnataka, India.

MATERIAL & METHOD

The present retrospective record based case study was conducted in BIMS Hospital - a tertiary care center in Belgaum (North Karnataka), India, during January & February 2011 by going through the recorded details of all the HIV/AIDS cases expired in the hospital, from January 2008 to December 2010.

The information like age, sex, occupation, education & marital status, religion, presenting signs & symptoms, weight, hemoglobin levels, opportunistic

infections, CD4 status, details of ART, duration of hospital stay before death etc. was recorded. HIV infection was confirmed in all subjects by 3 serial rapid HIV antibody test as per National AIDS Control Organization guidelines. Diagnoses of opportunistic infections/diseases were confirmed by appropriate laboratory tests. The collected data was compiled, tabulated & analyzed using SPSS version 16. Chi square test was applied & P value less than 0.05 was considered statistically significant.

RESULTS

Of the total 2445 HIV infected admissions during January 2008 to December 2010, 361 cases expired during their hospital stay. As shown in Table 1, majority (64.8%) of the expired cases were males and 213 (59.0%) were belonging to the age group of 26 to 40 years. Around half (49.0%) of them were illiterates, while 55.1% males were farmers by occupation. More than 3/4th (79.5%) were from rural area and 92.2 % of them were married, while 91.7% were Hindu by religion. Statistically significant difference was observed in male and female expired cases as far as their age, education & occupation was concerned.

Table 1: Socio-demographic profile of study cases

General Characteristics		Male N = 234 (%)	Female N = 127 (%)	Total N = 361 (%)	P values
Age (years):	- < 17	09 (03.8)	10 (07.9)	19 (05.3)	
	- 18-25	15 (06.4)	18 (14.1)	33 (09.1)	P < 0.02
	- 26-40	148 (63.3)	65 (51.2)	213 (59.0)	
	- > 40	62 (26.5)	34 (26.8)	96 (26.6)	
Education:	- Illiterate	94 (40.2)	83 (65.4)	177 (49.0)	
	- Primary	59 (25.2)	23 (18.1)	82 (22.7)	P < .01
	- High school	57 (24.4)	14 (11.0)	71 (19.7)	
	- ≥ Graduate	24 (10.2)	07 (05.5)	31 (08.6)	
Occupation:	- Agriculture	129 (55.1)	14 (11.0)	143 (39.6)	
	- Housewife	-	98 (77.1)	98 (27.1)	
	- Salaried worker	51 (21.8)	03 (02.4)	54 (15.0)	P < 0.01
	- Petty business	28 (12.0)	02 (01.6)	30 (08.3)	
	- Unemployed/Students	26 (11.1)	10 (07.9)	36 (10.0)	
Marital status:	- Married	216 (92.3)	117 (92.1)	333 (92.2)	P > 0.5
	- Unmarried	18 (07.7)	10 (07.9)	28 (07.8)	
Residence:	- Urban	51 (21.8)	23 (18.1)	74 (20.5)	P > 0.1
	- Rural	183 (78.2)	104 (81.9)	287 (79.5)	
Religion:	- Hindu	214 (91.5)	117 (92.1)	331 (91.7)	
	- Muslim	18 (07.7)	08 (06.3)	26 (07.2)	P > 0.9
	- Christians	02 (00.8)	02 (01.6)	04 (01.1)	

As shown in Table 2, Mean baseline weight recorded at the time of admission was 35.91 (±4.83) kgs. More than half (52.1%) of the cases expired within 3 days of their hospitalization and mean hospital stay

of all the cases recorded was 5.17 (±5.14) days. Majority of the study subjects (55.4%) were having moderate degree of anemia (Hemoglobin levels between 7.0 to 10.0 gram %), while mean hemoglobin level of all cases

was found to be 7.69 (\pm 2.21) gm%. More than a third of them were having severe anemia. Among those cases whose CD4 status was known (38.8%), 77.1% were having less than 200 cells / μ L with mean CD4

counts of 144.4 (\pm 133.7) cells / μ L. Only 82 (22.7%) were receiving anti retroviral therapy. However, the observed difference in male and female cases was statistically not significant.

Table 2: General clinical profile of study cases

General Characteristics		Male N = 234 (%)	Female N = 127 (%)	Total N = 361 (%)	P values
Mean baseline Wt. (kgs):	37.41 (\pm 5.26)	34.37 (\pm 4.38)	35.91 (\pm 4.83)		
Mean hospital stay (days):	05.34 (\pm 5.17)	04.94 (\pm 5.05)	05.17 (\pm 5.14)		
Hemoglobin levels:	>10.0 gm%	22 (9.4)	15 (11.8)	37 (10.3)	7.0
	- 10.0 gm %	133 (56.8)	67 (52.8)	200 (55.4)	P > 0.9
	< 7.0 gm%	79 (33.8)	45 (35.4)	124 (34.3)	
Mean Hemoglobin level (gm%):		08.09 (\pm 2.27)	7.31 (\pm 2.16)	7.69 (\pm 2.21)	
CD4 + Status: - Not Known:	143 (61.1)	78 (61.4)	221 (61.2)		
	- >200 Cells / μ L	24 (10.2)	08 (06.3)	32 (08.9)	
	- 50 – 200 Cells/ μ L	54 (23.1)	31 (24.4)	85 (23.5)	P > 0.1
	- < 50 Cells / μ L	13 (05.6)	10 (07.9)	23 (06.4)	
Mean CD4 Count		141.96 (\pm 108.79)	148.93 (\pm 171.88)	144.40 (\pm 133.66)	
On ART:	- for less than 6 months	27 (11.5)	19 (15.0)	46 (12.7)	
	- from 6 months to 1 year	10 (04.3)	07 (05.5)	17 (04.7)	P > 0.1
	- for more than 1year	15 (06.4)	04 (03.1)	19 (05.2)	
Not on ART:		182 (77.8)	97 (76.4)	279 (77.4)	

As in Table 3, common symptoms recorded at the time of admission were weight loss (99.4%), weakness (97.2%), cough (61.5%), fever (60.4%), breathlessness (43.8%), altered sensorium (32.4%), while common signs observed were pallor (91.7%), general wasting syndrome (67.6%), candidiasis (38.2%), dehydration

(31.3%), shock (22.4%), signs of meningitis (19.9%) and skin rash (11.1%). There was statistically significant difference in presenting symptoms of male and female expired HIV/AIDS cases at the time of admission (P<0.01).

Table 3: Presenting signs and symptoms of study cases *

Variables	Male N = 234 (%)	Female N = 127 (%)	Total N = 361 (%)	P values
Presenting symptoms:				
Weight loss	232 (99.2)	127 (100.0)	359 (99.4)	
Weakness	227 (97.0)	124 (97.6)	351 (97.2)	
Cough	146 (62.4)	76 (59.8)	222 (61.5)	
Fever	135 (57.7)	83 (65.4)	218 (60.4)	
Breathlessness	90 (38.5)	68 (53.5)	158 (43.8)	
Altered Sensorium	83 (35.5)	34 (26.8)	117 (32.4)	
Diarrhea	58 (24.8)	56 (44.1)	114 (31.6)	P < 0.01
Vomiting	49 (20.9)	56 (44.1)	105 (29.1)	
Headache	39 (16.7)	44 (34.6)	83 (23.0)	
Others	18 (07.7)	11 (08.7)	29 (08.0)	
Presenting Signs:				
Pallor	218 (93.2)	113 (89.0)	331 (91.7)	
Wasting syndrome	159 (68.0)	85 (66.9)	244 (67.6)	
Candidiasis	92 (39.3)	46 (36.2)	138 (38.2)	
Dehydration	69 (29.5)	44 (34.6)	113 (31.3)	
Shock	54 (23.1)	27 (21.3)	81 (22.4)	P > 0.95
Signs of meningitis /	48 (20.5)	24 (18.9)	72 (19.9)	
encephalopathy Rash	24 (10.3)	16 (12.6)	40 (11.1)	
Psychosis	12 (05.1)	07 (05.5)	19 (05.3)	
Hemiplegia	08 (03.4)	05 (03.9)	13 (03.6)	
Others	09 (03.9)	06 (04.7)	15 (04.2)	

* Multiple responses

A wide spectrum of diseases, including both opportunistic infections and non-infectious opportunistic diseases was seen in the present study. As shown in Table 4, common opportunistic infections / diseases recorded were Tuberculosis (61.5%), acute (16.9%) and chronic (9.4%) gastroenteritis, Pneumothorax / Pleural effusion (06.1%), Septicemia (13.6%), Cryptococcal meningitis (03.0%), while Pneumocystis carinii pneumonia was reported in only

(06.9 %) cases. Among the tuberculosis cases, pulmonary tuberculosis was seen in 62.6% cases, while TB meningitis, miliary tuberculosis, disseminated tuberculosis and abdominal tuberculosis were common conditions among the extrapulmonary tuberculosis cases. The observed difference in opportunistic infections detected in male and female cases was statistically not significant. ($P > 0.5$)

Table 4: Infections / Diseases detected *

Opportunistic Infections	Male N = 234 (%)	Female N = 127 (%)	Total N = 361 (%)	P values
Tuberculosis	147 (62.8)	75 (59.1)	222 (61.5)	
- Pulmonary	91 (38.9)	48 (37.8)	139 (38.5)	
- Extra pulmonary	56 (23.9)	27 (21.3)	83 (23.0)	
Pneumocystis carinii Pneumonia	15 (06.4)	10 (07.9)	25 (06.9)	P > 0.5
Acute Gastroenteritis	35 (15.0)	25 (03.9)	60 (16.9)	
Chronic Gastroenteritis	22 (09.4)	12 (09.4)	34 (09.4)	
Toxoplasmosis	05 (02.1)	03 (02.4)	08 (02.2)	
Cryptococcal meningitis	09 (03.8)	02 (01.6)	11 (03.0)	
Pneumothorax / Pl.effusion	13 (05.6)	09 (07.1)	22 (06.1)	
Pneumonia	14 (06.0)	07 (05.5)	21 (05.8)	
Septicemia	29 (12.4)	20 (15.7)	49 (13.6)	
Others	15 (06.4)	09 (07.1)	24 (06.6)	

* Multiple responses

DISCUSSION

The present study observed that majority (59.0%) of the HIV/AIDS cases expired in the hospital were from 26 to 40 years of age group – the most productive age group which was comparable to the findings in other similar studies.^{3,6} Majority of expired cases were males (64.8%), illiterates (49.0%) and from rural area (79.5%) whereas other similar study reported 76.0%, 14.0% and 50.0% respectively.³ More than half (52.1%) of the cases expired within 3 days of hospitalization. Social stigma and delay in seeking health care services, neglect by family members, lack of ICTC services at periphery, delay in referral and ART initiation could be the possible reasons.

Like in other studies, mean baseline weight recorded at the time of admission was 35.91(±4.83kgs).^{3,6} Mean hemoglobin level found was 7.69 (± 2.21) gm%, which was significantly lower than that in other study³. Majority (55.4%) of cases were having moderate degree of anemia.^{3,6} As anemia is an independent predictor of mortality in AIDS cases,⁶ it should be tackled in time with appropriate management. CD4 status was not known in 61.2% of the cases.⁷ Among those cases whose CD4 status was

known, majority (77.1%) were having CD4 + T lymphocyte counts less than 200 cells / μ L and 16.4% were having less than 50 cells/ μ L. Mean CD4 cell count found was 144.4 (\pm 133.7) cells/ μ L which was significantly higher than that in other studies.^{3,6,7} Only 22.7% cases were receiving ART. Majority of the cases were admitted with symptoms of weight loss (99.4%), generalized weakness (97.2%), cough (61.5%), fever (60.4%), breathlessness (43.8%) and altered sensorium (32.4%) etc. The common signs observed at the time hospitalization were pallor (91.7%), general wasting syndrome (67.6%), candidiasis (38.2%), dehydration (31.3%), shock (22.4%), signs of meningitis / encephalopathy (19.9%) and skin rash (11.1%).

Tuberculosis was observed to be the most common AIDS defining opportunistic infection among the study cases accounting for 61.5% of all opportunistic infections which is consistent with observations in other similar studies in India.^{3,8,9,10,11} Among the TB cases, extra pulmonary tuberculosis like TB Meningitis, abdominal TB, miliary TB, disseminated TB, tuberculous arterities etc. accounted for 37.4%.^{3,8,10} TB / HIV co-infection still remains a big challenge to the health care providers. However, much lower

prevalence of TB among expired AIDS cases has been reported in, New York city (1.1%),⁷ United States (0.5%)¹² and Brazil (9.0%).¹³

Other major opportunistic infections such as *Pneumocystis carinii* pneumonia (6.9%), acute and chronic gastroenteritis (26.3%), cryptococcal meningitis (3.0%), septicaemia (13.6%) along with advanced AIDS status continue to contribute to AIDS related mortality.^{3,7,12,13,14,15,16} Liver diseases (2.2%), pancreatic diseases (0.3%), presumed bacterial pneumonia (5.8%), although rare, also contributed to death in AIDS cases.^{3,12,14,15}

Non HIV related causes like drug abuse, intentional self - harm (suicide), assault (homicide), cancers, diabetes, cardiovascular diseases etc did not contribute to death in the present study. However, with introduction of highly active anti retroviral therapy (HAART), approximately 1/4th of all deaths of persons with AIDS were due to non HIV related causes in the studies conducted in the developed countries.^{7,12,16,17} As introduction of HAART has dramatically improved the prognosis of HIV infected patients in most developed countries^{7,16,17,18} prevention of AIDS defining conditions and expansion of earlier access to HAART could substantially reduce mortality in resource - poor settings.

CONCLUSION

TB remains the most common opportunistic infection and is the commonest cause of death in the study cases. Priority must be given to identify HIV infected individuals and early recognition of AIDS defining conditions and starting of appropriate treatment and prophylaxis along with expansion of earlier access to HAART in the course of their illness which collectively could reduce the mortality. Findings in the present study might help hospital managers / practitioners understand the major predictors of HIV related mortality and hospitalization behavior of HIV/AIDS cases to better allocate resources.

ACKNOWLEDGEMENT

Authors extend sincere thanks to all the staff of Department of Medical Records & Community Medicine, Belgaum Institute of Medical Sciences, Belgaum, for their help during the study period. Authors are grateful to thank the beloved Director, Dr. M.R. Chandrashekar, Belgaum Institute of Medical

Sciences, Belgaum for permitting to conduct the present study.

REFERENCES

1. WHO/UNAIDS. AIDS Epidemic Update. 2009. Available from <http://www.unaids.org/en/HIV-data>
2. NACO News, behind the numbers. News letter of National AIDS Control Organization, Ministry of Health & Family Welfare, Govt. of India. 2007; 3: 4
3. Nirmala R, Joyce BS, Anita S et al. Mortality among HIV – Infected Patients in Resource Limited Settings: A Case Controlled Analysis of Inpatients at a Community Care Centre. *American Journal of Infectious Diseases*. 2009; 5(3):226–231.
4. Isidore S, Souleymanou M, Schoneberger AM et al. Determinants of survival in AIDS patients on antiretroviral therapy in a rural centre in the Far-North Province, Cameroon. *Tropical Medicine and International Health*. 2009; 14(1):36–43.
5. Teja VD, Sudha T and Lakshmi V. Causes and pattern of mortality in HIV infected hospitalized patients in a tertiary care hospital: A fourteen year study. *Indian Journal of Medical Sciences*. 2007; 61:555-556
6. Asgeir J, Ezra N, Bernard JN et al. Predictors of mortality in HIV- infected patients starting antiretroviral therapy in a rural hospital in Tanzania. *BMC Infectious Diseases*. 2008; 8:52. Available from <http://www.biomedcentral.com/1471-2334/8/52>
7. Sackoff JE, Hanna DB, Pfeiffer MR and Torian LV. Causes of Death among Persons with AIDS in the Era of Highly Active Antiretroviral Therapy: New York City. *Annals of Internal Medicine*. 2006; 145(6): 397-406
8. Manjar JK, Kamath RR, Mandalia S, Shah K and Maniar A. HIV and Tuberculosis: Partners in crime. *Indian Journal of Dermatology, Venerology and Leprosy* 2006; 72:276-282.
9. Singh A, Bairy I and Shivanda PG. Spectrum of opportunistic infections in AIDS cases. *Indian Journal of Medical Sciences*. 2003; 57:16-21.
10. Sharma SK, Mohan A and Kadhiraivan T. HIV – TB co-infection: Epidemiology, diagnosis and management. *Indian Journal of Medical Research*. 2005; 121:550-567.
11. Kumarsamy N, Solomon S, Flanigan TP et al. Natural history of human immunodeficiency virus disease in southern India. *Clinical Journal of Infectious Diseases*. 2003; 36:79-85.
12. Susan YC, Buehler JW, Loren L et al. Causes of Death among Persons Reported with AIDS.

- American Journal of Public Health. 1993; 83(10):1429-1432.
13. Saraceni V, King BS, Cavalcante SC et al. Tuberculosis as primary cause of death among AIDS cases in Rio de Janeiro, Brazil. *International Journal of Tuberculosis and Lung Diseases*. 2008; 12 (7): 769-72
 14. Mzileni M O, Longo-Mbenza BC. Mortality and causes of death in HIV positive patients receiving antiretroviral therapy at Tshepang Clinic in Doctor George Mukhari Hospital. *Polskie Archiwum Medycyny Wewnetrznej*. 2008; 118(10): 548-554.
 15. Nissapatorn V, Lee C, Quek KF et al. Toxoplasmosis in HIV/AIDS patients: A current situation. *Japanese Journal of Infectious Diseases*. 2004; 57:160-165.
 16. Diego S, Silvia B, Antonella Z et al. Elevated risks of death for diabetes mellitus and cardiovascular diseases in Italian AIDS cases. *AIDS Research and Therapy*. 2010; 7:11
 17. University of Bristol (2010, April 29). Causes of death in AIDS patients. ScienceDaily. Retrieved on November 14, 2010 Available from: <http://www.sciencedaily.com/releases/2010/04/100428101441.htm>
 18. Sara SD, Valeska A, Martins MO and Torgal J. Predictors of Mortality in HIV associated hospitalizations in Portugal: a hierarchical Survival model. *BMC Health Services Research*. 2009; 9:125.

Follicular Ameloblastoma with Granular Changes Affecting Mandible & Maxilla - A Case Report

Rakesh Shah¹, Amit Mahajan², Rushit Patel³

¹Professor, Department of Oral and Maxillofacial Surgery, ²Reader, Department of Oral and Maxillofacial Surgery,

³Post Graduate Student, Department of Oral and Maxillofacial Surgery, K. M. Shah Dental College and Hospital, Sumandeep Vidyapeeth University, Vadodra, Gujrat

ABSTRACT

Ameloblastoma is defined as a benign but locally invasive neoplasm consisting of proliferating odontogenic epithelium lying in a fibrous stroma. Ameloblastomas are believed to have an epithelial origin, i.e. remnants of the dental lamina, remnants of Hertwig's root sheath (the epithelial remains of Malassez), epithelium of odontogenic cysts (particularly dentigerous cysts) and odontomas, the developing enamel organ and the basal cells of the surface epithelium of the jaws. Here we report a case of follicular cell ameloblastoma in a 45 years old female patient with a chief complaint of pain & swelling over the left side of face since 5 years. H & E stained sections showed stratified squamous hyperkeratotic epithelium with break in the continuity of the basement membrane. The underlying connective tissue contains numerous nests, strands, sheets & islands of dysplastic to atypical epithelial cells suggestive of malignancy in a fibro cellular stroma with little or no inflammatory cell infiltration. Hemimandibulectomy was done including condyle and coronoid process and the tumor mass. A 2.5 mm stainless steel reconstruction plate was fixed for the mandibular reconstruction. There was a marked resorption of the maxillary bone due to tumor expansion but maxilla was not involved directly into the tumor extension.

INTRODUCTION

In the World Health Organization's classification of odontogenic tumors, ameloblastoma is defined as a benign but locally invasive neoplasm consisting of proliferating odontogenic epithelium lying in a fibrous stroma. The histologic characteristics of the ameloblastoma vary greatly but no correlation, however, has yet been established between the clinical behavior of the tumor and the histologic type¹, Ameloblastomas are believed to have an epithelial origin, i.e. remnants of the dental lamina, remnants of Hertwig's root sheath (the epithelial remains of Malassez), epithelium of odontogenic cysts (particularly dentigerous cysts) and odontomas, the developing enamel organ and the basal cells of the

surface epithelium of the jaws. About 80% of these tumors occur in the mandibular molar region. The commonest age at which the tumors occur is during the 2nd and 3rd decades of life. Here we report a case of follicular cell ameloblastoma in a 45 years old female patient.

CASE REPORT

A 45 year old female patient reported to the department of oral & maxillofacial surgery, K. M. Shah dental College & Hospital with a chief complaint of pain & swelling over the left side of face since 5 years. Patient was relatively asymptomatic before 5 years. She noticed a swelling which was initially small in size which gradually increased in size which is now around 10 x 8 cm in size. Pain is present since last 1 year which is dull aching type. No H/o swelling over any other parts of the body. History of weight loss and head ache was present since the appearance of swelling. The left side submandibular lymphnodes were palpable and tender. No other significant history was noted. The clinical examination noted a solitary extraoral swelling measuring about 10 x 8 cm in size over the left side midface region with irregular shape & ill defined

Corresponding author:

Rakesh Shah

Professor

Department of Oral and Maxillofacial Surgery
K. M. Shah Dental College and Hospital

Sumandeep Vidyapeeth

Piparia Waghodia Vadodara Gujarat - 391760

E mail id dr_shahrakesh@yahoo.com

Ph no:- 9824434487

borders. Intraoral examination revealed extension of the swelling in the maxillary buccal vestibule on left side, which was 3 x 5 cm in size with bony hard consistency. The first premolar was the only tooth present in the left side maxillary region and lateral incisor, canine and both premolars present in mandibular region. Patient was operated under general anesthesia maintaining standard operative protocols. Extraoral lip switch, submandibular and retromandibular incisions were given and dissection was done to expose the tumor mass. The mandible was cut from the midline with gigli saw. Hemimandibulectomy was done including condyle and coronoid process and the tumor mass. A 2.5 mm stainless steel reconstruction plate was fixed for the mandibular reconstruction. There was a marked resorption of the maxillary bone due to tumor expansion but maxilla was not involved directly into the tumor extension.

HISTOPATHOLOGY

H & E stained sections showed stratified squamous hyperkeratotic epithelium with break in the continuity of the basement membrane. The underlying connective tissue contains numerous nests, strands, sheets & islands of dysplastic to atypical epithelial cells suggestive of malignancy in a fibro cellular stroma with little or no inflammatory cell infiltration. In few areas keratin pearls was also evident. H & E stained sections also show varying sized follicles, strands and islands resembling odontogenic epithelium. Each follicle contains peripheral columnar cells, the central cells are large polygonal with lots of eosinophilic granular cytoplasm. Thin fibrous connective tissue stroma containing collagen and fibroblasts was present between islands. In few follicles/islands the central area of degeneration with cyst formation is also noted. At the periphery of the lesion connective tissue stroma resembling a capsule was noted.

DISCUSSION

Extensive review of the literature undertaken by Small and Waldron (1955) indicates that approximately 80 % of the ameloblastomas are present in the mandible and 20 % in the maxilla. The biological behavior of this tumor is well known, in that they are slow-growing, locally invasive tumors with a high rate of recurrence if not removed adequately³. Ameloblastoma can present at any age but most cases are seen between the 3rd and 5th decades of life. Waldron and El-Mofty (1987) report that 83% of cases of ameloblastoma occur



Fig. 1. Preoperative Frontal View



Fig. 2. Preoperative Side Profile View



Fig. 3. Fluid Aspiration

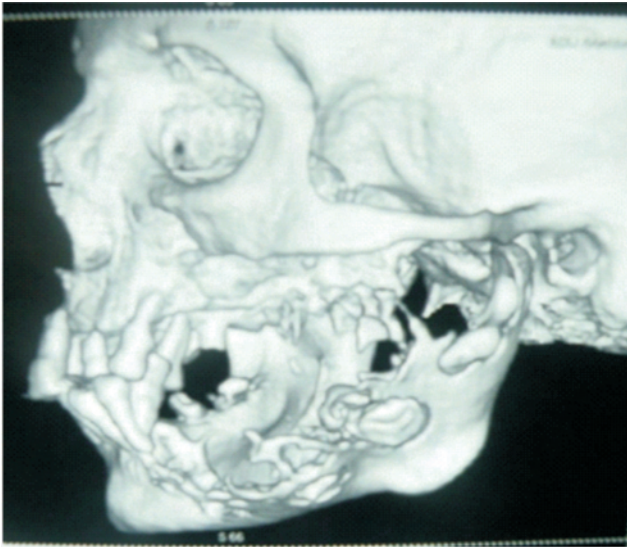


Fig. 4. 3D CT Scan



Fig. 7. Intraoperative Tumor Exposure

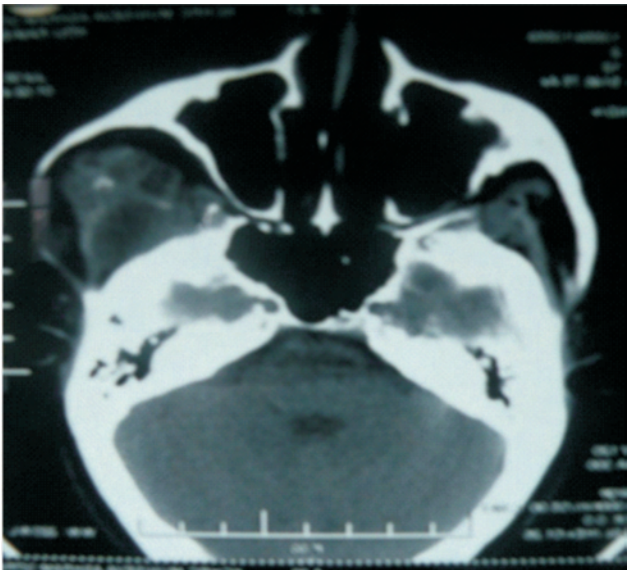


Fig. 5. CT Scan Axial View



Fig. 8. Adaptation of 2.5 Locking Titanium Reconstruction Plate



Fig. 6. 3D CT Scan



Fig. 9. Frontal View: 1 Week Follow Up



Fig. 10. Postoperative Orthopantomogram

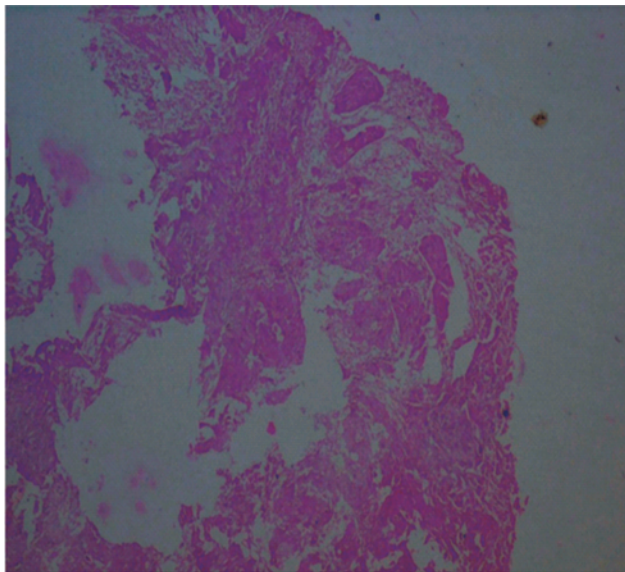


Fig. 11. 10x shows epithelial nests, sheets & islands in fibrocellular connective tissue. Suggestive of Squamous Cell Carcinoma.

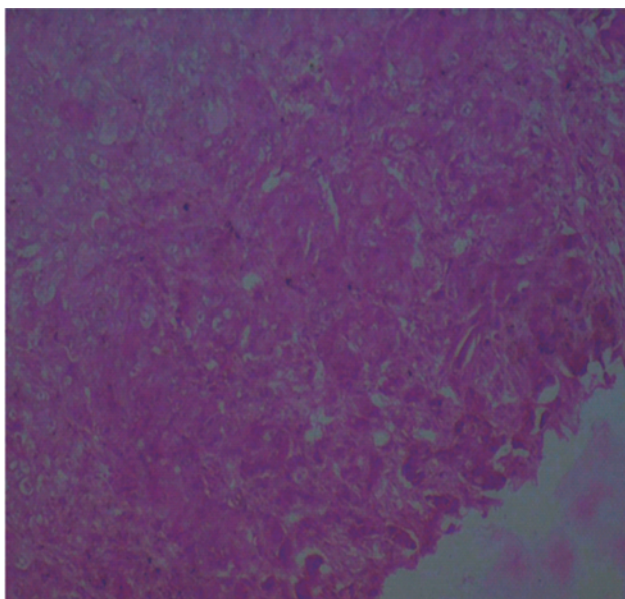


Fig. 12. 40x magnification shows dysplastic & atypical epithelial cells with very little inflammation.

in the mandible, of these, 61% are seen in the molar/ramus area. Their patient was 34 years old at his initial presentation, which is within the peak decades, and the tumor was in the incisor, canine and premolar regions of the mandible. There are various clinical, radiological and histological types of the tumor. Clinically, there are solid/multicystic, unicystic and peripheral forms Gardner (1996). While the peripheral type is rare, they can be primary or secondary soft tissue tumors. The secondary tumors appear after attempted surgical removal (Gurol and Burkes, 1995). In sub-Saharan Africa, solid/multicystic types are more frequent than the unicystic type. The reverse proportion is observed in Latin America (Ledesma-Montes et al., 2007). There are unilocular, multilocular and polycystic without clear-cut distinguishing features seen radiologically. Associating the various types with recurrence, the unicystic ameloblastoma is reported to be less aggressive than the solid/multicystic type (Gardner and Corio, 1983; Olaitan and Adekeye, 1997). In the work of Ueno et al. (1989), follicular ameloblastoma gives rise to more recurrences than the plexiform type while the unicystic is more common in the younger age group than in older patients. Gardner and Pecak (1980) found that conservative treatments such as curettage and enucleation result in up to 90% rate of recurrence. Curi et al. (1997) have suggested that they can be treated by enucleation followed by liquid nitrogen spray cryotherapy to decrease local recurrence. While unicystic ameloblastomas do well after curettage and enucleation treatment, solid/multicystic forms are treated radically by resection in our environment and in several other parts of the world. We agree with Kovács et al. (1999) that radical resection is absolutely indispensable in the proper management of these cases; discussions about its necessity are detrimental for the patient. This was recently borne out by the finding that recurrence was higher (60%) after conservative surgical treatment than after radical surgery (20%) from the work by Eckardt et al. (2009). Radical surgical treatment by resection of ameloblastoma gives better results⁴. When a diagnosis of ameloblastoma is obtained, the treatment must be aggressive and radical. This concurs with the opinion that a resection of the jaw should be approximately 1.5–2 cm beyond the radiological limit, in order to ensure that all the microcysts and daughter cysts are removed as demonstrated by OLAITAN et al. PANDYA & STUTEVILLE advocated that the excised ameloblastoma mass should include at least a 2-cm margin of uninvolved bone around the tumor⁵.

CONCLUSION

Here by we conclude that this is an interesting case of ameloblastoma which was presented to us of follicular ameloblastoma. although there was breach in the basement membrane but it could not be termed as ameloblastic carcinoma but only an aggressive variety of ameloblastoma. Although not so rare but this kind of huge lesions present still tell the story that the socio economic status plays an important role in determining the timing of reporting of case to a specialized hospital.

REFERENCES

1. AGORAN, HANDERS, W JAN. Acanthomatous ameloblastoma. *Int. J. Oral Surg.* 1980; 9: 231-236.
2. Chindia M. L., Guthua S. W., Mwaniki D. L.: Ameloblastoma after surgical removal of an impacted mandibular molar. *Int. J. Oral Maxillofac. Surg.* 1991; 20: 73-74.
3. Ueda M, Kaneda T. Combined Chemotherapy and Radiotherapy for Advanced Maxillary Ameloblastoma - A Case Report. *J. Cranio-Max.-Fac. Surg.* 19 (1991) 272-274.
4. Adebayo ET, Fomete B, Adekey EO. Delayed soft tissue recurrence after treatment of ameloblastoma in a black African: Case report and review of the literature. *Journal of Cranio-Maxillo-Facial Surgery xxx* (2010) 1 – 4.
5. Hong J, Yun P.-Y., Chung I.-H., Myoung H., Suh J.-D., Seo B.-M., Lee J.-H., Choung P.-H. Long-term follow up on recurrence of 305 ameloblastoma cases. *Int. J. Oral Maxillofac. Surg.* 2007; 36: 283–288

Household Water Treatment following Emergencies and Disasters- A Review

Ramandeep Singh Gambhir¹, Ramandeep Kaur Sohi², Amaninder Kaur Randhawa³, Vikram Bansal⁴,
Simarpreet Singh⁵

¹Sr. Lecturer, Gian Sagar Dental College, Banur, Rajpura, Punjab, ²Sr. Lecturer, M. M. College of Dental Sciences & Research, Mullana, Ambala, Haryana, ³Sr. Lecturer, Sri Guru Ram Das Dental College, Amritsar, Punjab,

⁴Sr. Lecturer, M. M. College of Dental Sciences & Research, Mullana, Ambala, Haryana, ⁵Reader, Gian Sagar Dental College, Banur, Rajpura, Punjab

ABSTRACT

Uncontaminated water does not occur in nature. Water gets contaminated by various gases, minerals, agricultural activities and urbanization. Various types of micro-organisms also contaminate water. Water has to undergo a purification process before it can be used for drinking purposes. During emergencies like floods, earthquakes and epidemics; families often lack access to safe and pure water for drinking purposes. In these situations there is a dire need to purify water at home to stop the occurrence of diseases like gastroenteritis. Treating water at the household level has been shown to be one of the most effective and cost-effective means of preventing waterborne disease in development and emergency settings. Various methods to purify household water and generate pure water are being used like chemical disinfection, filtration, solar disinfection, combined flocculation/chlorination system, boiling and safe storage. Promoting household water treatment and safe storage (HWTS) helps vulnerable populations to take charge of their own water security by providing them with the knowledge and tools to treat their own drinking water.

Keywords: Household Water, Emergency, Water Treatment, Disinfection, Disaster

INTRODUCTION

Water is that chemical substance which is essential for every living organism to survive on this planet. Water is needed by every cell of the organism's body to perform normal function. Water covers 71% of the Earth's surface, mostly in oceans and other large water bodies, with 1.6% of water below ground in aquifers and 0.001% in the air as vapor, clouds and precipitation.¹ Pure uncontaminated water does not occur in nature. It contains impurities of various kinds which can be natural or man-made. These comprise of various types of dissolved gases like nitrogen, carbon-dio-oxide, hydrogen sulphide and dissolved minerals like salts of calcium, magnesium, sodium etc. A more serious aspect of water-pollution is that which is caused by human activity, and industrialization². There are also various micro-biological agents which can also cause water pollution. The pathogenic agents involved include bacteria, viruses and protozoa which may cause diseases that vary in severity from mild gastroenteritis to severe and sometime fatal diarrhoea, dysentery, hepatitis or typhoid fever.³

Unsafe drinking water, along with poor sanitation and hygiene, are the main contributors to an estimated 4 billion cases of diarrhoeal disease annually, causing more than 1.5 million deaths, mostly among children under 5 years of age.⁴ Because diarrhoeal diseases inhibit normal ingestion of foods and adsorption of nutrients, continued high morbidity also contributes to malnutrition, a separate cause of significant mortality; it also leads to impaired physical growth and cognitive function, reduced resistance to infection, and potentially long-term gastrointestinal disorders. Contaminated drinking water is also a major source of hepatitis, typhoid and opportunistic infections that attack the immuno-compromised, especially persons living with HIV/AIDS.⁵

The earliest recorded attempts to find or generate pure water date back to 2000 B.C. Early Sanskrit writings outlined methods for purifying water. These methods ranged from boiling or placing hot metal instruments in water before drinking it to filtering that water through crude sand or charcoal filters. These writings suggest that the major motive in purifying

water was to provide better tasting drinking water. It was assumed that good tasting water was also clean. People did not yet connect impure water with disease nor did they have the technology necessary to recognize tasteless yet harmful organisms and sediments in water⁶.

Following an emergency, families frequently lack access to a safe source of drinking water. In this situation, it is critical to communicate to families the need to make water safe by themselves, at home or in shelters, to protect themselves from disease⁷.

Household water treatment is effective, simple, and inexpensive. It is especially applicable to populations recovering from a disaster situation who often lack facilities and resources. All the approaches described improve the microbial quality of water and significantly reduce episodes of diarrhoeal disease. The "best" option should be selected according to local requirements. What is most important is that households treat their water using a method or technology that is promptly available and which is most applicable and acceptable to the community in question⁷. Households should continue treating water until their supply is tested and found to be safe, or advised by local authorities.

Chemical disinfection: Chemical disinfection of water depends on the killing of bacteria, Giardia and amoeba cysts, and viruses by the chemical.⁸ Halogens (chlorine and iodine) are most commonly used. The important points are that the killing effectiveness of the chemical is dependant on concentration of the chemical, temperature of the water, and contact time.⁸ Decreased concentration (better flavor) or decreased temperature (inevitably the case in the mountains) requires a longer contact time for disinfection. Sediment (cloudy water) increases the need for halogen. Following emergencies, chlorine or iodine tablets can be distributed. If this is the case, water should be treated using the directions that come with the tablets. Alternatively, water may be disinfected by the use of existing types of chlorine compounds.⁷ At doses of a few mg/litre and contact times of about 30 minutes, free chlorine generally inactivates >99.99% of enteric bacteria and viruses, provided water is clear. Trained personnel or community members should prepare a 1% chlorine stock solution from sodium hypochlorite (liquid bleach), calcium hypochlorite or high-test hypochlorite (powdered chlorine). The amount of chlorine needed depends mainly on the concentration of organic matter in the water and

should ideally be determined for each situation. This solution should be added to water to leave a free residual chlorine concentration of 0.4 to 0.5 mg/l after 30 minutes, which can be determined using a special test kit. If this is not available, a slight smell of chlorine is a crude indicator.⁷

Solar disinfection: Solar disinfection is an effective water treatment method that is applicable to emergencies, especially when no chemical disinfectants are available. Ultra-violet rays from the sun are used to inactivate pathogens present in water.⁷ This technique involves exposing water in clear plastic bottles to sunlight for a day, for example on the roof of a house. In emergencies, empty bottles can be used that are left over from an initial shipment of drinking water. Bottles need to be cleaned, filled to three quarters full and shaken thoroughly 20 times, before being filled completely. The bottles are then exposed to sunlight for 6 hours (or for 2 days if the sun is obscured by clouds). The half of the bottle furthest from the sun should be painted with black paint to improve the heat gain from the absorption of thermal radiation.⁹ Water should be consumed directly from the bottle or transferred in a clean glass for drinking. To be effective, solar disinfection must be applied to relatively clear water.⁷ Water requires several hours of strong sunlight to obtain the advantageous energy between UV dosage and temperature rise⁹.

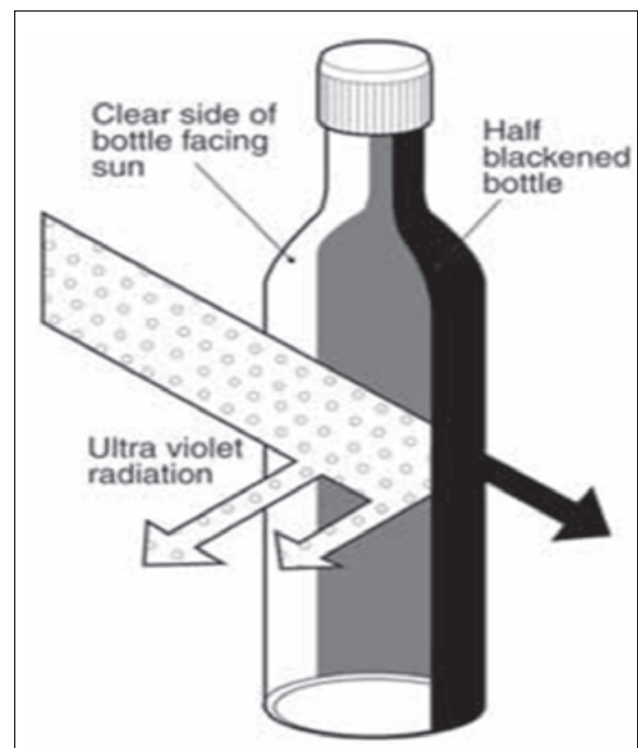


Fig. 1. Solar disinfection System

Filtration- If filters are available, then water filtration is another option to purify water. Ceramic filters with small pores, often coated with silver for bacteriostasis, have been shown to be effective at removing microbes and other suspended solids.⁷ Water can be purified by filtering through ceramic filters such as Pasteur 'Chamberland filter', 'Berkefeld' filter and 'Katadyn' filter.² The essential part of the filter is the 'candle' which is made of porcelain in the Chamberland type and of kieselgurh or infusorial earth in the Berkefeld filter. In the Katadyn Filter, the surface of the filter is coated with a silver catalyst so that the bacteria coming in contact with the surface are killed by the oligodynamic action of the silver ions which are liberated into the water. Filter candles of the fine type usually kill bacteria found in drinking water, but not the filter passing viruses. Filter candles are liable to be lodged with impurities and bacteria.² Monthly maintenance consists of scrubbing the ceramic filter element to unclog pores and washing the receptacle tank and spigot to prevent bacterial growth. If properly maintained, they have a long life. Ceramic filters can be mass-produced or manufactured locally.⁷

Combined flocculation/chlorination systems: Commercially available sachets can also dramatically improve the microbial quality of drinking water.⁷ These are formulated to coagulate and flocculate sediments in water followed by a timed release of chlorine. These typically treat 10 litres of water. The water is normally stirred for few minutes and then strained, and then allowed to stand for another half hour. Please follow the instructions on the packet.⁷ Several systems incorporate both a chemical coagulation step for particle removal and a chlorination step (or steps) for disinfection. This dual approach produces high quality finished water. The Procter & Gamble Company (P&G) has developed a Household Water Treatment and Safe storage (HWTS) option for sale at no profit to users and NGOs, called Pu-R, Purifier of Water.¹⁰ This small sachet contains powdered ferrous sulfate (a flocculant) and calcium hypochlorite (a disinfectant). To use Pu-R, users open the sachet, add the contents to an open bucket containing 10 liters of water, stir for five minutes, let the solids settle to the bottom of the bucket, strain the water through a cotton cloth into a second container, and wait 20 minutes for the hypochlorite to inactivate the microorganisms.¹⁰

Boiling: Following a disaster many families will lack the facilities and fuel to boil water. However, if practical, households can disinfect their drinking water by bringing it to a rolling boil, which will kill pathogens

effectively except at high altitudes.⁷ This is a satisfactory method for purifying water for domestic purposes. To be effective the water must be brought to a 'rolling boil' for about 5 to 10 minutes. It kills all bacteria, cysts, ova and spores and yields sterilized water.² Boiling also removes the hardness of water by driving off carbon dioxide and precipitating the calcium carbonate. The taste of water is altered but it is harmless. While boiling is an excellent method of purifying water, it offers no 'residual protection' against subsequent microbial contamination.² Boiling water is an effective method of treatment because no important water-borne diseases are caused by heatresisting organisms.¹¹

Safe storage: HWTS interventions can lead to dramatic improvements in drinking water quality and reductions in diarrhoeal disease—making an immediate difference to the lives of those who rely on water from polluted rivers, lakes and, in some cases, unsafe wells or piped water supplies.¹² Regardless of whether household water is initially of acceptable microbiological quality, it often becomes contaminated with pathogens of fecal origin during transport and storage due to unhygienic storage and handling practices.⁷ Studies show that the use of containers with narrow openings for filling, and dispensing devices such as spouts or taps/spigots, protect the collected water during storage and household use. Improved containers protect stored household water from the introduction of microbial contaminants via contact with hands, dippers, other fecally contaminated vehicles or the intrusion of vectors.⁷

Summary and Conclusion

It is very clear that water is an inseparable part of not only humans but of every organism on this planet. One cannot even think of surviving without water. We as humans, utilize water not only for drinking purposes but also to perform our daily activities like bathing, washing, cleaning etc. Water is also needed by every industry or factory as a basic raw material to manufacture any kind of product. Water intended for drinking purposes should be safe and wholesome so that it should not cause any disease or discomfort after drinking. This article summarizes five of the most common Household Water Treatment and Safe storage (HWTS) options- chemical disinfection, filtration, solar disinfection, combined flocculation/chlorination system and boiling. This particular article focuses on point-of-use drinking water treatment and safe storage options especially in emergency, which can accelerate

the health gains associated with improved water. By preventing disease, HWTS practices can contribute to poverty alleviation and development. Their widespread use, in conjunction with health and hygiene education and sanitation, could go a long way in saving millions of lives until the infrastructure to reliably deliver safe and pure water to the entire world population has been created.

REFERENCES

1. Water Wikipedia [home page on the internet]; 2009 [cited 2009 March 23]. Available from: en.wikipedia.org/wiki/Water
2. K. Park, Preventive and Social Medicine, M/S Banarsidas Bhanot Publishers, 20th Edition, 2009, Pg 617-634.
3. Water purification-Wikipedia [home page on the internet]; 2009 [cited 2009 March 23]. Available from: en.wikipedia.org/wiki/Water_purification.
4. WHO. Progress towards the Millennium Development Goals, 1990-2005 [monograph on the internet]; 2005 [cited 2011 February 2]. Available from: http://unstats.un.org/unsd/mi/goals_2005/goal_4.pdf
5. Promotion of Household Water Treatment and Safe Storage in UNICEF Wash Programmes [monograph on the internet] 2008; [cited 2011 February 11]. Available from: www.unicef.org
6. Mc Kinney and Schoch, Environmental Science Systems, Jones and Bartlett Publishers, 3rd Edition, 2003, Pg 366-372.
7. World Health Organization. Household Water Treatment and Safe Storage Following Emergencies And Disasters. Water, Sanitation and Health [monograph on the internet]; 2002 [cited 2009 March 15]. Available from: www.who.int/water_sanitation_health/hygiene/emergencies/em2002chap7.pdf;
8. Water treatment methods [monograph on the internet]; 2005 [cited 2011 February 11]. Available from: www.high-altitude-medicine.com/water.html
9. Stanfield G, Lechevallier M, Snozzi M. Treatment Efficiency, Water Treatment and Pathogen Control: Process Efficiency in Achieving Safe Drinking Water. World Health Organization [serial on the internet]; 2004 [cited 2009 March 15]. Available from: http://www.who.int/water_sanitation_health/dwq/en/watreatpath.pdf
10. Daniele S. Lantagne, Robert Quick, and Eric D. Mintz. Household Water Treatment and Safe Storage Options in Developing Countries: A review of current implementation practices [monograph on the internet]; 2005 [cited 2011 February 11]. Available from: <http://www.wilsoncenter.org/topics/pubs/WaterStoriesHousehold.pdf>
11. Water disinfection methods. Part 1 [monograph on the internet]; 2005 [cited 2011 February 11]. Available from: www.free_drinking_water.com
12. Household water treatment and safe storage [monograph on the internet]; 2011 [cited 2011 February 11]. Available from: www.who.int/household_water/en

Blood Filled Blister in the Oral Mucosa - A Diagnostic Challenge

Ranjani Shetty¹, Ashok L², Sujatha G P³

¹Assistant Professor, Dept. of Oral Medicine & Radiology, Bapuji Dental College and Hospital, Davangere, Karnataka, India, ²Prof. & HOD, Dept. of Oral Medicine & Radiology, Bapuji Dental College, Davangere, ³Professor, Dept. of Oral Medicine & Radiology, Bapuji Dental College, Davangere, Karnataka, India

ABSTRACT

Angina bullosa Hemorrhagica is characterized by the acute formation of a blood filled blister not attributable to a systemic disorder. The pathogenesis is unknown, however it is multifactorial. The most common cause is trauma prior to the appearance of the lesion. They occur mainly in the soft palate; lesions are asymptomatic and heal spontaneously without scarring. This case report discusses angina bullosa hemorrhagica which occurred due to stretching of buccal mucosa by mouth mirror during clinical examination.

Keywords: Blood filled Blister, Angina bullosa hemorrhagica, Trauma

INTRODUCTION

Angina bullosa haemorrhagica (ABH) is a benign subepithelial oral blood filled blister not attributable to any other disorder like blood dyscrasia, vesiculobullous disorders, systemic diseases or other known causes¹. The pathogenesis is unknown, although majority of the cases are associated with mild trauma, other factors such as long term use of steroids and diabetes mellitus also may be contributory². These are commonly formed on the soft palate, oropharynx and the buccal mucosa, they burst open spontaneously after a short time resulting in ragged, painless erosions that heal within a week without scarring³. It can be easily confused with other mucosal lesions. The only treatment needed is palliative.

CASE REPORT

A 63 year old male patient (Fig1) came to the department of Oral Medicine and Radiology, Bapuji Dental College and Hospital, Davangere, India with a chief complaint of missing teeth in lower front tooth region and desired to get it replaced. In the history he revealed that he got his teeth extracted 3 months back as they were mobile, he also gave a history of repeated blood filled blister formation since 20 years in the oral mucosa on the palate and buccal mucosa which occurred due to trauma, especially while having hard and crispy food like wafers and lasted for 3-4 days

and healed by itself. However he did not give any history of any blister formation in other parts of the body and also denied any history of bleeding or clotting dyscrasias. He also denied any history of hypertension or diabetes. He gave a history of smoking cigarettes occasionally. General physical examination revealed that he was moderately built and nourished and all his vital signs were within normal limits. Solitary right and left submandibular lymph nodes were enlarged 1x1cm, palpable, mobile and nontender on palpation. During intraoral examination a solitary well defined purplish red swelling developed due to trauma to the right buccal mucosa during stretching of the mucosa by the mouth mirror, initially it formed a red flat lesion which later took the form of a blood filled blister (Fig2) measuring about 1.5x1cm. On palpation it was soft in consistency. Gingival examination revealed generalized periodontal pockets, on hard issue examination 16,17,18,31,32,41,&42 were clinically missing and generalized cervical abrasion was present. Observing the formation of a blood filled blister we thought of a differential diagnosis of any bleeding and clotting disorders, bullous pemphigoid, bullous lichen planus, epidermolysis bullosa. Then the patient was subjected to investigations such as complete hemogram, investigations for bleeding and clotting disorders like bleeding time and clotting time all the values were within normal limits.



Fig. 1. Clinical photograph showing the 63 year old male patient



Fig. 3. Intraoral photograph showing painless eroded red mucosa when recalled after 4 days

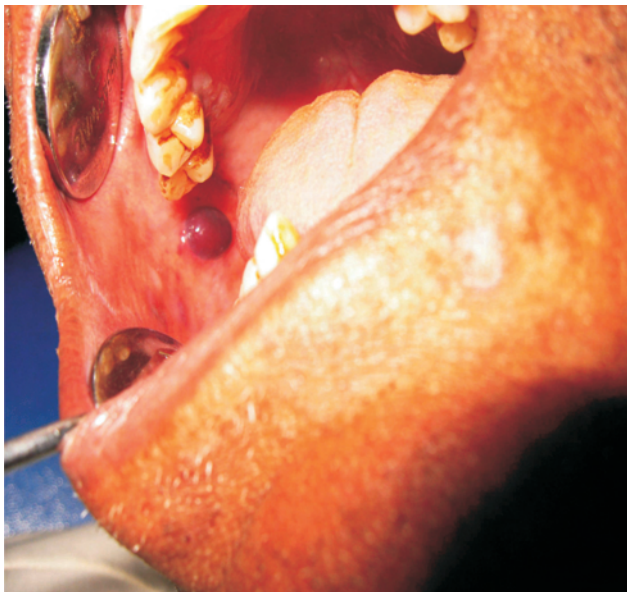


Fig. 2. Clinical photograph showing a blood filled blister after stretching of the mucosa by the mouth mirror during routine clinical examination

The clinical history of minor trauma, lack of other skin or mucosal lesions and negative history of bleeding or clotting disorders suggested a diagnosis of Angina Bullosa Hemorrhagica and the patient was recalled after 4 days. The blister had ruptured and had left a painless eroded red mucosa (Fig 3), when recalled after 6 days the lesion had healed completely without scarring. Then the patient was referred to the Department of Prosthetic Dentistry for prosthetic rehabilitation with a note of precaution to avoid trauma during fabrication of denture.

DISCUSSION

Angina bullosa hemorrhagica (ABH) is the term used to describe acute, benign, and generally subepithelial oral mucosal blisters filled with blood that are not attributable to a systemic disorder or hemostatic defect. This condition was first described in 1933 as traumatic oral hemophlyctenosis (TOH). Badham in 1967 introduced the term angina bullosa hemorrhagica⁴. It is defined as "recurrent episodes of hemorrhagic oropharyngeal bullae that appear in the absence of any identifiable systemic disorder"⁵. Synonymous terms for this disorder includes localized oral purpura stomatopompholyx haemorrhagica and recurrent oral hemophlyctenosis (ROH) (1971).^{1,6}

Majority of cases have been associated with mild trauma directed to affected area. The onset is sudden which may follow trauma caused by eating rough and crispy food, hot drinks and during dental procedures^{3,4,7}. A case of angina bullosa haemorrhagica has been reported in which blood blisters appeared during crown preparation⁸. The use of steroid inhalers in asthmatic patients is also said to be a possible aetiological factor². A case of acute upper airway obstruction caused by a rapidly expanding blood-filled bulla in the oropharynx (angina bullosa haemorrhagica), was recorded requiring tracheal intubation.⁹ Diabetes Mellitus was found to be positive or positive family history for diabetes mellitus or abnormal glucose metabolism was found in 44% of patients¹⁰. An unusual case of ABH was reported

following periodontal therapy.¹¹ In the largest published series of 30 patients, no precipitating factor was found in 47%.⁹ In another study which investigated the presence or absence of local factors as well as systemic background disease in 16 patients with ABH the 75% of them (n = 12) appeared during the ingestion of hard or crispy food. With regard to underlying systemic conditions, hypertension was the most common (n = 6) cause, and asthma, insomnia, diabetes mellitus, rheumatoid arthritis, gastrointestinal disorder and hyperuricemia were also recorded (n = 1 each). Five patients had no significant background disease.¹²

The diagnosis of ABH is largely clinical, and includes the elimination of other disease processes through histopathology. Histopathology can reveal haemorrhagic subepithelial bullae, non-specific ulceration and a chronic inflammatory cell infiltrate in the lamina propria. Direct immunostaining is usually negative, but equivocal immunostaining for IgG and C3 may be seen, as in four out of the 15 patients presented by Stephenson and colleagues.⁵

Soft palate is the commonest site, can also occur in the buccal mucosa, lip, lateral surface of the tongue, masticatory mucosa of the hard palate and gingiva. However masticatory mucosa seems not to be affected. Occurs more in middle-aged and elderly, no gender predilection is seen. The clinical course is consistent and the blister appears on the mucous membrane within seconds or minutes often preceded by a mild sharp or burning sensation.¹⁰ The lesions develop during and immediately after meals. Nikolsky's sign is negative.³ The bulla is usually dark red in color and sometimes purple in color. The blisters rupture usually during meal and releases fresh blood into the mouth and leaves eroded area on the mucosa. The erosion heals within a week without scarring or any discomfort.¹⁰ In a study of 35 patients (64.8%), the lesions predominated on the palate and in nine (16.6%) on the oral mucosa. The incidence was similar in both sexes (women, 52%; men, 48%) and the condition affected mostly the 51–70-year age group. ABH was never documented in children under 10 years of age. In 24 cases (44.4%), diabetes mellitus, hyperglycemia, and/or a family history of diabetes was found.⁶

Pathogenesis suggests that a mechanical weakness of the epithelial – connective tissue attachment may cause an increased susceptibility of non keratinized mucosa. Epithelial atrophy produced by steroids may

favour blister formation following trauma as the use of steroids can affect collagen formation resulting in epithelial and mucosal atrophy.⁴ Higgins & Duvivier 1991 suggested that decrease in elastic fibers and poor anchorage of small blood vessels followed by minor trauma may cause these lesions. A case of ABH mimicking histologically neutrophil-rich subepithelial blistering disorders was reported for the first time. Histopathology it revealed a hemorrhagic subepithelial bulla containing numerous neutrophils with a moderately dense superficial perivascular and interstitial neutrophilic infiltrate.¹³

Various differential diagnoses pertaining to angina bullosa haemorrhagica (ABH) have been reported in the dental literature; these differential diagnoses include mucous membrane pemphigoid- usually scarring and desquamation is seen in these lesions, bullous pemphigoid and bullous lichen planus may be differentiated by immunofluorescence, epidermolysis bullosa will have skin lesions, oral amyloidosis will have other features such as macroglossia and petechiae. Dermatitis Herpetiformis, linear IgA disease are the other entities which can be included in the differential diagnosis.¹⁴

In a study done to know the prevalence of oral soft tissue lesions in India in about 8.4 percent of the population studied had only one patient with angina bullosa haemorrhagica.¹⁵

The diagnosis of ABH is largely clinical⁸. However Investigations such as Histopathological examination, Direct immunofluorescence, Complete blood count, Bleeding and coagulation tests should be carried out to rule out any other disease.

It is a self limiting lesion, however symptomatic anti-inflammatory or antibiotic mouth rinses (0.25% chlorhexidine) and long term follow-up may be advisable.

CONCLUSION

Though the etiology of the formation of ABH is unclear, complete history and accurate investigations helps us to differentiate them from other skin and bleeding disorders. Thus while coming across patients with blood filled blisters we should always rule out ABH and it should be considered whenever a hemorrhagic blister occurs following minor manipulation of tissues of oral mucosa similar to the rare lesion that we have presented.

REFERENCES

1. M Giuliani,GF Favia,C Lajolo,CM Milani:Angina Bullosa haemorrhagica:presentation of eight cases and a review of the literature,Oral Diseases 2002;8:54-58.
2. M A Corson & P Sloan . Angina bullosa haemorrhagica: an unusual complication following crown preparation British Dental Journal 1996;180, 24 - 25
3. Stephenson P, Lamey P-J, Scully C, Prime SS. Angina bullosa haemorrhagica: clinical and laboratory features of 30 patients. Oral Surg Oral Med Oral Pathol 1987; 63: 560-5
4. Badham NJ:Blood blister and the oesophageal cast.J Laryngol Otol 81:791,1967.
5. Stephenson P, Scully C, Prime S S,Daly HM.Angina Bullosa Hemorrhagica:Lesional immunostaining and haematological findings.Br J Oral Maxillofacial Surg1987;25:488-491.
6. Grinspan D, Abulafia J, Lanfranchi HInt . 6 Angina bullosa hemorrhagica.J Dermatol. 1999 Jul;38(7):525-8.
7. Hopkins R, Walker DM. Oral blood blisters: angina bullosa haemorrhagica. Br J Oral Maxillofac Surg 1985; 23: 9-16.
8. High AS, Main DMG. Angina bullosa haemorrhagica: a complication of long-term steroid inhaler use. Br Dent J 1988; 165: 176-9.
9. C. Pahl, S. Yarrow¹, N. Steventon, N. R. Saeed and O. Dyar .Angina bullosa haemorrhagica presenting as acute upper airway obstruction. Br J Anaesth 2004; 92: 283-6
10. Yamamoto k,Fujimoto M, Inoue M,Maeda M, Yamakawa N, Kirita T. Angina Bullosa of the soft palate: Report of 11 cases and literature review JOAMS 2006;64:1433-1436
11. Curran AE, Rives RW. Angina bullosa haemorrhagica:An unusual problemfollowing periodontal therapy.J Periodontol 2000;71:1770-1773.
12. Horie N, Kawano R, Inaba J, Numa T, Kato T, Nasu D, Kaneko T, Kudo I, Shimoyama T. Angina bullosa hemorrhagica of the soft palate: a clinical study of 16 cases.J Oral Sci. 2008 Mar;50(1):33-6.
13. Kurban M, Kibbi AG, Ghosn S. Expanding the histologic spectrum of angina bullosa hemorrhagica: report of one case.Am J Dermatopathol. 2007 Oct;29(5):477-9.
14. Yip HK .Angina bullosa haemorrhagica: a case report and a concise review. Gen Dent. 2004 Mar-Apr;52(2):162-4.
15. Mehrotra R, Thomas S, Nair P, Pandya S, Singh M, Nigam NS, Shukla P. Prevalence of oral soft tissue lesions in Vidisha.BMC Res Notes. 2010 Jan 25;3:23.

Cytomorphological Profile of Pediatric Lymphadenopathy at Tertiary Care Centre

T R Rashmikumari¹, Isha Garg²

¹Assistant Professor, Dept of Pathology, ²Professor, Dept of Pathology, Raichur Institute of Medical Sciences, Raichur, St. Johns Medical College, Bangalore

ABSTRACT

Objective: To profile pediatric lymphadenopathy by Fine Needle Aspiration Cytology at tertiary care centre.

Method: Retrospective study of lymphnodes on which FNAC was done from June 2000 to May 2004 period. A total of 219 patients ranging from 8 months to 18 years.

Results: A total of 219 lymphnode aspirated from the pediatric group during a four year period were studied. Of these 16 were excluded as per the exclusion criteria. Therefore the final study group consisted of 203 case.

Of 203 aspirates, 100 case were reactive hyperplasia, 53 were tuberculosis, 18 were of acute necrotising inflammation. 1 is of Hodgkins disease, 5 were NHL, 2 cases of parasite and others were of 2 cases respectively. 20 cases were inadequate for diagnosis.

Conclusion: FNAC of enlarged lymphnodes is a safe, reliable adjunct diagnostic technique and obviates the need for excision biopsy especially in children. Tubercular lymphadenitis was the commonest treatable entity of significant lymphadenopathy.

Keywords: Fine Needle Aspiration Cytology, Pediatric Lymphadenopathy, Diagnosis

INTRODUCTION

Peripheral lymphadenopathy is a common clinical presentation in the pediatric practice which may need either medical management or surgical intervention. The causes of it may be numerous which may range from inflammatory to malignant conditions.

When lymph node persists after a course of antibiotics the anxiety of parents and clinicians increases which makes the clinician to take a decision on the choice of intervention.

FNAC is an initial diagnostic tool in children which is simple, cost effective, rapid and accurate diagnosis with low morbidity and obviating the need for biopsy. subsequently guiding the therapy & observation.

FNAC accuracy in many situations can approach that of histopathology in providing an unequivocal diagnosis. This motivated us to undertake this study to assess the diagnostic utility of FNAC as well as to profile pediatric lymphadenopathy.

MATERIALS AND METHOD

All pediatric patients aged 8 months to 18 years presenting with lymphadenopathy referred to St. Johns Medical college FNA clinic from June 2000 to May 2004.

The criteria to exclude the cases were lymph node measuring <1cm and deep seated highly mobile lymph nodes as it is difficult to access. As per the exclusion criteria though 22 cases did not satisfy they were included in the study because they had adequate material.

Two observers independently reviewed all the slides. The results were categorized as definitive 4+/5+, suspicious/suggestive 2+/3+, no diagnosis 0+/1+.

Hypo cellular smears were carefully reviewed to identify any cytomorphological features have been missed to make a diagnosis. This is being routinely done to convey the degree of diagnostic confidence to the clinician

RESULTS

A total of 219 lymph node aspirate of this 16 were excluded therefore in the final study group consists of 203 cases.

A summary of the cyto diagnosis is shown in table 1.

Table 1: Classification of lesions

Type of lesions	Definite diagnosis		Suggestive	Suspicious	Total
	5+	4+	3+	2+	N=183
Reactive hyperplasia	-	73	20	07	100
Tuberculosis	20	27	02	04	53
Acute necrotizing inflammation	-	16	02	-	18
Parasite-Cysticercosis Parasitic etiology	01-	—	-01	—	02
Malignancy Hodgkins Disease NHL Secondaries	01-01	-04-	-01-	01—	020501
Others(chronic sialadenitis)	-	02	-	-	02

100 cases were diagnosed as reactive hyperplasia which showed polymorphism composed of mixture of histiocytes, lymphocytes & polymorph nuclear cells. Some times reticulum cells will be hyper plastic and bi nucleated which makes diagnosis difficult.

53cases are of tuberculosis. Of which 20 cases showed Acid Fast Bacilli by ZN stain. Necrosis was seen in 30 cases and granuloma in 36 cases. One of the hypo cellular smear showed AFB by ZN stain.

Acute necrotizing inflammation are of 18cases but none of them showed AFB on ZN stain or any etiological agent.

2 were of parasitic etiology of which one showed cysticercosis & other showed only histiocytic foreign

body type of giant cells hence diagnosis of suspicious for parasitic etiology was made.

There were 8 cases of malignancy of which 2 were Hodgkin’s Disease, 5 are of NHL & 1 was metastasis in which primary was in breast.

2 cases are diagnosed as chronic sialadenitis.

Inadequate aspirates are of 20 cases which were measuring 1-2 cms.6 cases underwent excision biopsy the diagnosis of which is summarized in table 2.

Table 2: Excision biopsy diagnosis of inadequate aspirates

Biopsy diagnosis	No.of cases(n=6)
Lipoma	01
Parasitic cyst	01
Tuberculosis	03
Abscess	01
Kikuchi	01

DISCUSSION

Lymph node enlargement is a common clinical finding and in developing countries like India acute upper respiratory tract infection, suppurative skin infection, Tuberculosis¹ are the major causes for regional lymphadenopathy in pediatric age group.

In recent years FNAC has become popular as an initial diagnostic tool for the evaluation of lymphadenopathy to guide on further management.

In this study the reactive hyperplasia was the commonest lesion which is supported by other studies^{2,3} followed by Tuberculosis, acute necrotizing inflammation, lymphoma.

Summary of the comparison of the present study with other studies is listed in table 3.

Table 3: Comparison of the present study with other studies.

DIAGNOSIS IN PERCENTAGE

S.N.	Authors	Total No of cases	RH	TB	ANI	Lymphoma	Secondries	Others	Inadequate aspirates
1	John J Buchino et al (1994)	123	65.04	4.9	8.13	2.43	1.6	7.3	10.6
2	U.Handa et al (2002)	692	62.2	25.2	6.3	1.1	0.4	0.2	4.6
3	locham et al (2002)	100	74	23	-	3	-	-	-
4	Present study	203	49.3	26	09	3.2	0.5	02	20

In this study the inadequate aspirates are of 9.8% considering that doing an FNA in children is more difficult and needs co-operation from child and child

parents. Though the exclusion criteria in this study was lymph node measuring <1cms, however FNA were done on lymph node measuring <0.5cms and yielded

adequate material needed for diagnosis. Hence inadequate aspirate may be due to poor FNA technique or lack of cooperation from child.

The most common lymph node were cervical group as there is a rich lymphatic supply in the neck region⁴.

Out of 203 cases 100 were reactive hyperplasia of which 12 showed decrease in the size of lymph node following a course of antibiotics.14 underwent excision biopsy in which 11 showed reactive hyperplasia,1 was Kikuchi's disease and 2 were tuberculosis. Therefore 3 cases showed false negative and no false positive for reactive hyperplasia. This may be due to sampling error as FNA samples only a focal area.

Tuberculosis in children reflects continuing transmission in the population hence a diagnosis by a least intervention method help in preventing & treating the disease by chemoprophylaxis. Even when Mantoux test and chest x-ray have been negative does not exclude the diagnosis of Tuberculosis⁵. In such situations FNA of lymph node have helped to come to the correct diagnosis.

AFB positivity rate was particularly high when only necrotic material was seen in the back ground. This may be due to compromised immune status or inability to mount an adequate cellular immune response & it is an ideal nidus for the persistence of tubercle bacilli.

In acute necrotizing inflammation 4 out of 18 cases underwent excision biopsy due to persistence of swelling after a course of antibiotics and it was diagnosed as tuberculosis. This may be due to sampling error and hence there were 4 false negative cases & no false positive cases.

In India the malignancy contribute significantly as a cause of death in the pediatric age group. Among the malignancies NHL is the most common lymph node malignancy in children⁶. The application of FNAC in the diagnosis of lymphoma is still controversial, particularly low in NHL. But Raghuveer et al recorded 66.6% sensitivity and Gupta et al 89% accuracy in the diagnosis of primary lymphoma⁷ respectively.

Hence FNAC still has a definite place in the diagnosis of lymphoma

5 cases were diagnosed as NHL out of which 2 underwent excision biopsy & was diagnosed as high grade NHL. Hence FNAC play a role in the primary

diagnosis, staging and monitoring the recurrence of disease⁸.

There were 2 cases of Hodgkin's Disease among which one showed classic Reed-Sternberg cells and other showed RS like cells. Therefore the other case underwent excision biopsy which was diagnosed as lymphocyte rich HD. The cases of HD & NHL are few in this study to draw conclusion about diagnostic accuracy as there was no biopsy in all the cases.

There was only one case of metastasis to a lymph node, the primary being in the breast. The accuracy rate for the diagnosis of metastasis is very high and this is supported by many other studies^{7,8}.

Two were of parasitic etiology and 2 are of chronic sialadenitis. All the four cases was clinically thought of lymph node and sent for FNAC.

Therefore FNAC helps in identification of the swelling which cannot be done clinically.

20 cases were inadequate aspirate of which 6 underwent excision biopsy the diagnosis is already summarized in table 2. This may be due to lack of cooperation or poor technique.

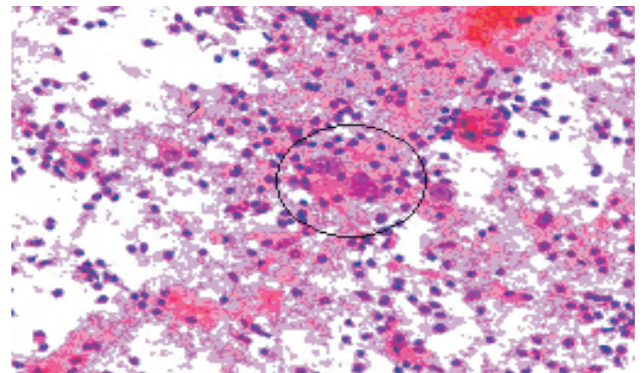


Fig. 1. Hodgkin's Disease with classic Reed-Sternberg cell H & E, 20X

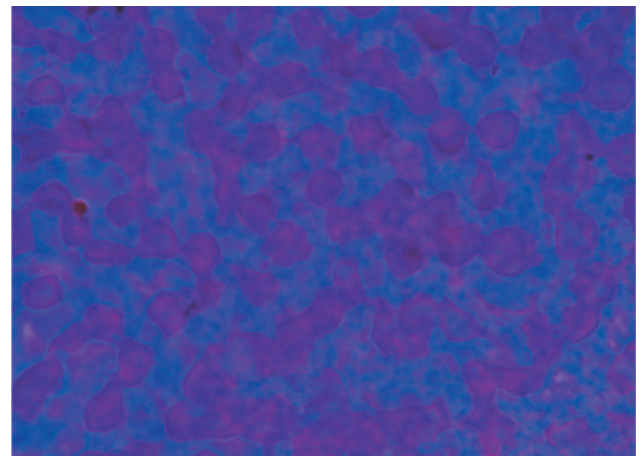


Fig.2. Cysticercus Ziehl-Neelsen, 40X

CONCLUSION

Despite the limitation of FNAC it is accepted world wide as a first diagnostic tool in the pediatric population presenting with lymphadenopathy.

Early diagnosis by FNAC triages the children with more rational planning for treatment. A definite diagnosis obviates the need for surgical excision there by FNAC beats the scalpel.

Even if lymph node measures <1cms and child is co operative it is worth while to do FNAC as it categorized the swelling in to benign and malignant.

Reactive hyperplasia(100) is the most common cause of lymphadenopathy followed by tuberculosis (53)and acute necrotizing inflammation(18) in our study respectively.

In granulomatous lymphadenopathy a careful search for abnormal cells as to be done before wrongly diagnosing it as tuberculosis as in Hodgkin's Disease¹⁰ it can be seen.

FNAC does not always substitute histopathology but may do so in some cases and it does not alter the histological characteristic of a mass .Hence subsequently the histopathological diagnosis can be made with out compromising the histology much respectively.

FNAC also aids in providing material for ancillary studies and also helps in confirmation of mass in question.

The diagnostic accuracy of FNAC in lymph node aspiration in 92% with 4% false positive⁶. Over all the specificity and sensitivity of the diagnosis by FNA compared to gold standard excision biopsy is 100% and 94% respectively in pediatric population.

REFERENCES

1. Gail B. Slap ,John S.J. Brooks. When to perform biopsies in enlarged peripheral lymph nodes in young patients. JAMA 1984;10:1321-1327.
2. J.J. Buchino,F.Jones. Fine Needle Aspiration in the evaluation of children with lymphadenopathy. Arch Pediatr Adolesc Med Dec 1994;148:1327-1330
3. Locham,Sanjiv Goyal. Lymphadenopathy in children-role of FNAC. Journal of Cytology2002;19(4):183-186.
4. M.Pradeep Reddy, NIEKHIL, Moor Chung. Clinico pathological profile of pediatric lymphadenopathy.IJP2002;69:1047-1051.
5. J.Thomas Stocker, John J. Buchino, Louis P, Dehner. Pediatric pathology,FNA,Vol-1,2nd edition:19-23.
6. Das AK, Manna AK ,Cytology in pediatric malignant solid tumors. Journal of Cytology,2004;21:171-175.
7. Linda M. Sandhaus. FNAC in diagnosis of lymphoma. Am J Clin Pathol 2000;113:623-627.
8. Rahuveer C.V., Mukta R Pai. Role of FNAC in disorders of lymph node. Journal of Cytology 1996;13:45-49.
9. Thomas F.Kardaos, James H.Vinson. Hodgkins Disease diagnosis by FNAC. AJCP 1985;36:3:286-291.
10. Geeta Singh, Vatsala Misra. Hodgkins Disease masquerading as tuberculous lymphadenitis. Journal of Cytology2004;21:106-108.

Assessment and Evaluation of Depression and Loneliness among People Living with HIV in Selected Places of Coastal Andhra Pradesh

S K Mishra¹, Usha kiran Behera², Sipra Komal Jena³

¹Professor & HOD of Dept. of Community Medicine at GSL Medical College, Rajahmundry, AP, ²Undergraduate Final Year Student of G.S.L Medical College, Rajahmundry, AP, ³Associate Professor in the Dept. of Community Medicine at GSL Medical College, Rajahmundry, AP

ABSTRACT

Back Ground: The AIDS pandemic continues to be an escalating health problem throughout the world. Mental health of PLHIVs is one of the neglected aspects in the Continuum care and most often it is under diagnosed as well as under treated. This study was proposed to assess the prevalence of depression and loneliness among PLHIV so that adequate measures could be taken to address their needs, and if required treatment of mental illness could be prioritized, which would rather be a more holistic approach.

Objectives: To review key mental health issues such as loneliness and depression in the continuum of care for people living with HIV (PLHIV) & to provide a framework for integrating mental health services into HIV/AIDS interventions.

Method: 380 PLHIV from the districts of East Godavari & Vishakhapatnam were interviewed using the SRQ-10 depression scale and R-UCLA loneliness scale for assessing the depression and loneliness respectively the responses were graded according to the standard guidelines and the mean scores for each scale were obtained. Statistical analysis was done using the student t-test and Chi square for categorical variables number and percentages were calculated.

Results: An overall 71.84% of subjects were depressed and 66.57% were found to be lonely. Loneliness & depression was significantly higher in female population. Depression as well as loneliness was found to be significantly associated with their educational status, financial status and the presence of opportunistic infections.

Conclusion: The mental health indicators depression and loneliness need more stress in the continuum of care of PLHIV.

Keywords: People living with HIV, Depression, Loneliness

INTRODUCTION

Mental disorders make a substantial independent contribution to the burden of disease worldwide, interacting with many other health conditions.

Although evidence from low income countries is limited, fairly consistent associations have been reported between HIV and poor mental health ⁽¹⁾.

Studies have shown the prevalence of mental distress in various populations like Geriatric and Adolescent populations and other health conditions like many chronic diseases ⁽²⁾. Psychological research with PLHIV has reflected a conceptual shift towards perceiving HIV and AIDS as a chronic disease ⁽³⁾.

With the advent of recent HIV epidemic, PLHIV have become a significant sector in the society.. Out of

Corresponding author:

S K Mishra

Professor & HOD

Dept. of Community Medicine.

G.S.L. Medical College, Rajahmundry, A.P.

Cell No. 09441011800

E-Mail: dr.sushant.mishra@gmail.com

23 districts, 17 districts are reporting generalized HIV epidemic. Eight of the nine coastal districts are reported to have generalized HIV epidemic ⁽⁴⁾.

Between mental health and HIV, there exists a bidirectional relationship.. 70% patients with HIV suffer from an acute psychiatric complication during the course of the illness ⁽⁵⁾ and 90% of people who have recently been diagnosed with HIV infection suffer from acute stress disorder ⁽⁶⁾. North American and European studies also suggest that people with HIV often suffer from depression and anxiety disorders as they adjust to the diagnosis ,adapt their life to such a life threatening illness, and witness the death of their friends and family. ⁽⁷⁾⁽⁸⁾⁽⁹⁾

On the other hand, with the myths associated with HIV transmission, a person affected may be isolated by friends and family, may feel lonely, alienated and develop negative attitude towards life. Alternately, one may prefer to take revenge on the society by practicing unsafe sex, or even infecting others silently. Thus, mental distress in HIV increases the risk of transmission of the disease adding to the gravity of the public health problem.

Therefore, keeping the above situation in mind, this study was proposed to assess the prevalence of depression and loneliness among PLHIV so that adequate measures could be taken to address their needs, and if required treatment of mental illness could be prioritized, which would rather be a more holistic approach.

MATERIALS AND METHOD

Study type: Community based cross sectional study

Study settings: PLHIVs registered in the ART centers of East Godavari which is a high prevalence district as well ART center of Vishakhapatnam district which is a low prevalence district of AP were selected for study.

Study period: 2 months (1st July to 31th August 2010)

Study Sample: Out of total study population comprising about 35,000 PLHIVs in both the districts, sample population was taken after taking a marginal error of 5% at confidence level of 95% and a response distribution of 50% by presuming the prevalence of depression & loneliness to be higher than that of general population which is 31.2% ⁽¹⁰⁾

Therefore, 380 study subjects were interviewed based upon the above calculation in both the districts divided equally.

Study subjects: People Living with HIV (PLHIVs), registered at the Anti Retroviral Therapy (ART) centers of East Godavari (total 12,982) & Visakhapatnam districts (total 22,000) either on pre ART or ART were selected after taking their consent and obtaining the necessary permission from the concerned authority.

Inclusion criteria: All study subjects above 18 yrs & below 70 yrs of age, willing to take part in the study.

Exclusion Criteria

- Those study subjects having history of previous mental abnormality (i.e. before sero-positivity).
- Subjects below 18 yrs and above 70 years
- Those who do not wish to participate or cooperate during the interview..

Study tool: Socio demographic profile was obtained through a pre designed and pre tested questionnaire. HIV - loneliness and depression was explored by using Revised UCLA (University of California, Los Angeles) scale three item loneliness scale ⁽¹¹⁾ and SRQ – 10 (Self Reporting Questionnaire-10) ⁽¹²⁾ respectively. SRQ is a scale developed as part of a collaborative study on strategies for extending mental health care coordinated by the WHO. In this scale, weights are assigned to the responses based on DSM (Diagnostic & Statistical Manual of Mental Disorders) IV criteria ⁽¹³⁾ for depression and a cutoff point were set at 7/20 for probable cases of depression. Similarly, Revised UCLA scale and three item loneliness scale were used to measure loneliness among PLHIVs and for both scales; the sum of all items were calculated.

The study tools were translated in to the local language and were explained in detail to the outreach workers engaged for data collection.

Data collection: Contacts established with PLHIV in pre selected ART centers. The contacted persons were interviewed after establishing rapport and trust.

Study variables: Age, sex, education, income, marital status, duration of infection, HIV prevalence

Statistical analysis: Statistical analysis was done using the SPSS software, version 16.0. The mean and standard deviation (SD) was used. Student *t*-test was used to compare between 2 means, and analysis of variance was used to compare more than 2 means. For categorical variables, the number and percentage

distribution was calculated. The level of significance was set at $p < 0.05$.

OBSERVATION & RESULTS

Table 1 shows that about 283 out of 380 study subjects (73.68%) belong to 20-40 age group. Out of 380 study subjects, 216 (56.84%) were females. Most of them were educated upto primary school i.e. 47.89% (182 out of 380) & about 28% (105 out of 380) were found to be illiterate.

Out of 380, 226 (59.47%) of respondents were married whereas about 37% of them were found to be either widow/ widower, separated or divorced.

In terms of wealth index, majority i.e. 331 out of 380 (87.1%) were found to be categorized under "Below Poverty line" (BPL) by Govt. of Andhra Pradesh. About 296 out of 380 (78%) respondents reported that their sero-positivity is > 6 months while 22% were found to be recently infected i.e. less than 6 months.

Table 2 shows Comparison of loneliness & depression between Male and Female. Females are found to be lonelier & depressed in comparison to males. There is significant difference in loneliness between male and female ($p=0.003$) but no

statistically significant difference in depression among both the sexes. Table 3 shows comparison of loneliness between Visakhapatnam and EG districts where it is seen that there is a significant difference in loneliness between Visakhapatnam district and East Godavari district ($p<0.05$) but there is no significant difference in depression between both districts ($p>0.05$)

Among those PLHIVs who are on ART, the loneliness is slightly more and depression was found to be less in comparison to those who are on pre ART. This was found to be insignificant ($p=0.599$, $p=0.563$)>0.05. (Figure 1)

Association of loneliness and Depression regarding some selected Demographic variables:

Age: There is an insignificant association in loneliness ($p=0.083>0.05$), depression ($p=0.257>0.05$) regarding age among PLHIVs.

Sex: Also there is an insignificant association in loneliness but significant association between depression and sex ($p=0.042<0.05$)

Area of Prevalence: There is a highly significant association of loneliness ($p=0.000<0.005$), depression ($p=0.000<0.005$) with the area of prevalence.

Education: There is a highly significant association of loneliness ($p=0.000<0.05$), depression ($p=0.000<0.05$) with educational status.

Marital status: There is highly significant association between loneliness and marital status. ($p=0.002<0.05$).but no significant association with depression. ($p=0.075>0.05$)

Duration of infection: There is no significant association between loneliness or depression ($p=0.064>0.05$) and duration of infection.

Opportunistic infection: There is a highly significant association of loneliness as well as depression with Opportunistic Infection, which is highly significant($p=0.000<0.05$)

Wealth index: There is no significant association between loneliness and wealth index. ($p=0.068>0.05$) but there is a significant association with depression($p=0.035<0.05$)

Table I. (Frequency & percentage distribution of demographic variables of PLHIVs)

Sl. No	Demographic Variable	Frequency	%
1	Age		
	20-40	283	73.684
	40-60	94	24.73
	>60	3	0.7894
2	Sex		
	Males	164	43.157
	Females	216	56.842
3	Education		
	Primary	182	47.89
	Secondary	72	18.94
	Higher	16	4.210
	Professional	5	1.315
	Illiterate	105	27.631
4	Marital status		
	Married	226	59.473
	Unmarried	17	4.473
	Widow	110	28.947
	Widower	7	1.842
	Divorced	12	3.157
	Separated	8	2.105
5	Wealth index		
	BPL (below poverty line)	331	87.10
	APL (above poverty line)	49	12.89
6	Duration of infection		
	<=6 months	84	22.10
	>6 months	296	77.89

Table 2. Comparison of loneliness & depression between Male and Female

Sex	Loneliness	Mean	SD	Depression	Mean	SD
Male	104	51.45	3.98	109	12.72	2.673
Female	149	53.09	4.425	164	12.81	2.898

p=0.003 (<0.005)

p=0.804 (>0.05)

Table 3. Comparison of loneliness between Visakhapatnam and EG districts

Districts	Loneliness	Mean	SD	Depression	Mean	SD
Visakhapatnam (low prevalence)	110	53.05	4.477	114	12.68	3.113
East Godavari (high prevalence)	143	51.93	4.183	159	12.84	2.572

p=0.041<0.05

p=0.656>0.05

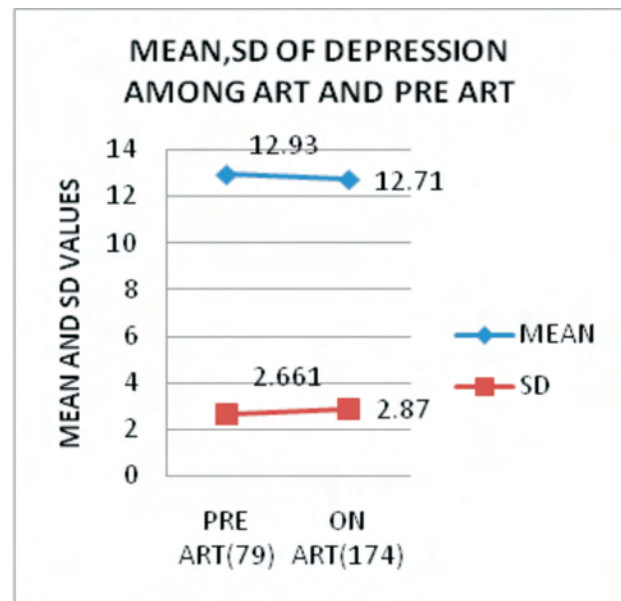
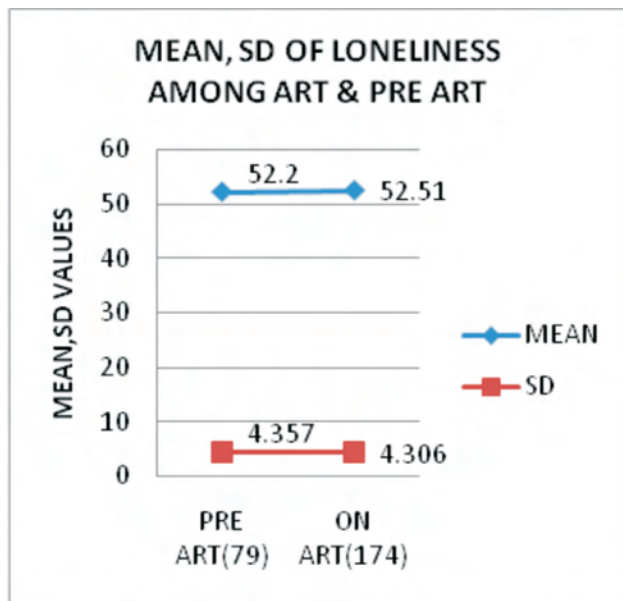


Fig. 1. Comparison of loneliness between ART and pre ART

DISCUSSION

Among the total study sample, 73.68% of people belonged to the age group of 20-40. This distribution of age supports the national data (4) of a higher prevalence among 15-49 yrs of age (89%).

Out of the 380 subjects, there were 216 (57%) female and 164 (43%) male. This observed gender distribution is as par the national data of People Living with HIV sex ratio of 60:40. About 37% of them were found to be either widow/ widower, separated or divorced. Out of 216 female respondents, 50.9% of the females were widows and widowers were only 4.16%. A greater percentage of widows reflect the social and economic damage caused by the disease and the vulnerability of the female population to the scourge of mental illness like depression and loneliness. The mean values of the scores on both depression and loneliness scales in table 2 also showed a greater

occurrence of depression and loneliness in the female population.

About 76% of subjects are either illiterate or have attained primary education in the study population. However, I.A. Kabbash, M. El-Gueneidy et.al.(14) In their study at Egypt found that 48% of respondents to be illiterate & primary educated. An educated person can easily gain information about the prevention and treatment of the illness. Education indirectly reveals the occupation and thus economic status of the person.

In our study also educational status showed a highly significant association with both loneliness and depression.

As the study was conducted in the ART centers and CCCs in NGO setups, majority of the participants were below poverty line classified under Govt. of Andhra Pradesh. Loneliness was independent to their financial

index whereas PLHIVs are depressed irrespective of their financial index.

As per the study, in a low prevalent district; even though people feel lonely they are not depressed. The role of other contributing factors such as strong networking among PLHIVs, quality counseling, NGO support etc. can at times act as strong buffer.

Loneliness & depression also influence adversely on Prevention, Treatment and Care Outcomes. In preventive aspect, the focus is to control high risk behavior, higher rates of infections and higher rates of transmission. On treatment and care there will be limited access, low uptake and adherence to ART, high failure rate to routine checks. Clinical outcome can be HIV dementia, rapid AIDS progression and higher mortality. Stone V, et al⁽¹⁵⁾. in their study on depression & ART adherence found 69.2% non adherence to ART. Several other studies on the relationship between psychological factors and adherence to ART suggested significant association and low adherence^{(16) (17)(18)(19)}

Comparison of loneliness between pre ART and on ART showed that, among those PLHIVs who are on pre-ART, the loneliness is less and depression was found to be more. This may be due to the fact that once they are registered for ART they attend the "Community care centers" where they interact more with other PLHIVs who are on ART, NGOs and counselors. On the other hand, free access to ART & a hope for quality life gives them some relief

Similarly in our study we also found that, loneliness & depression are independent of the duration (> 6 months) of seropositivity which implies that those who feel lonely or depressed, the situation does not change over the time.

The present study also showed that those who suffer from one or more opportunistic infections, the loneliness & depression among them are present.

Conclusions and Recommendations

On the basis of results, the most vulnerable section among the PLHIVs i.e. the women can be given special attention and the gender issues, social issues, insecurities which contributes to loneliness & depression can be prioritized and addressed during the counseling sessions.

In the continuum care component, the counseling and networking can be focused more and the mental health issues can be addressed by making the services

more approachable and user friendly & Policy makers can incorporate the mental health components in it. The WHO recommends that attention to the psychosocial needs of people with AIDS should be an integral part of HIV care⁽²⁰⁾.

REFERENCES

1. Vosvick M et al. "Relationship of functional quality of life to strategies for coping with the stress of living with HIV/AIDS". Psychosomatics, 2003, 44(1):51-8.
2. Barua A, Kar N et al. "Screening for depression in elderly Indian population. Indian journal of Psychiatry 2010: 52, 150-3.
3. Geetanjali , C., Seth, H., and Richmond D. Substance Abuse and Psychiatric Disorders in HIV -Positive Patients: Epidemiology and Impact on Antiretroviral Therapy. Drugs 2006;66 (6):769-789
4. HIV sentinel surveillance and HIV estimation in India, 2007-2008
5. Aceijas C, Stimson, GV., Hickman, M. Global Overview of Injection Drug Use and HIV infection among injection drug users. AIDS 2004, 19;18 (17):2295-3303
6. Adewuya, A.O. Afolabi, B.A, Ogundele, A O. Ajibare, and B.F Oladipo, "Psychiatric Disorders among the HIV-Positive Population in Nigeria: A control Study." J, Psychosom Res 63, no (2007): 203-6.
7. WHO. World Health Organization Psychosocial Support, 2005. [Accessed on 5 May 2005].<http://www.who.int/hiv/topics/psychosocial/support/en/print.html>.
8. Green G, Smith R. The psychosocial and healthcare needs of HIV positive people in the United Kingdom: a review. HIV Med. 2004;5:5-46.(Pubmed)
9. Anon. Practice guideline for the treatment of patients with HIV/AIDS. Work group on HIV/AIDS. Am J Psychiatry. 2000;157:1-62.
10. Madhav SM. Indian Journal of Community Medicine. 2001 Oct-Dec; 26(4): 198-200
11. Mary Elizabeth Hughes et al. - "A Short Scale for Measuring Loneliness in Large Surveys Results from two Population-Based Studies" DOI: 10.1177/0164027504268574 © 2004 Sage Publications
12. A User's guide to the self reporting questionnaire (SRQ); WHO/Mental health division/PSF/94.8-1994
13. "Diagnostic & Statistical Manual of Mental Disorder"; American Psychiatric Association publication 1994 - Fourth Edition
14. I.A. Kabbash,1 M. El-Gueneidy,2 A.Y. Sharaf,2

- N.M. Hassan¹ and A.N. Al-Nawawy³ - *La Revue de Santé de la Méditerranée orientale*, Vol. 14, No 6, 2008, - 1308
15. Stone V, et al. *Curr HIV/AIDS Rep.* 2005;2: 189-193
 16. Byakika-Tusiime J, Oyugi JH, Tumwikirize WA, Katabira ET, Mugenyi PN, Bangsberg DR. Adherence to HIV antiretroviral therapy in HIV+ Ugandan patients purchasing therapy. *Int J STD AIDS.* 2005;16:38–41.(Pubmed)
 17. Jelsma J, Maclean E, Hughes J, Tinise X, Darder M. An investigation into the health-related quality of life of individuals living with HIV who are receiving HAART. *AIDS Care.* 2005;17:579–588(Pubmed)
 18. Pinheiro CA, de-Carvalho-Leite JC, Drachler ML, Silveira VL. Factors associated with adherence to antiretroviral therapy in HIV/AIDS patients: a cross-sectional study in Southern Brazil. *Brazil J Med Biol Res.* 2002;35:1173–1181.
 19. Stout BD, Leon MP, Niccolai LM. Nonadherence to antiretroviral therapy in HIV-positive patients in Costa Rica. *AIDS Patient Care STDS.* 2004;18:297–304(Pubmed)
 20. Williams P, Narciso L, Browne G, Roberts J, Weir R, Gafni A. The prevalence, correlates, and costs of depression in people living with HIV/AIDS in Ontario: Implications for service directions. *AIDS Educ Prev.* 2005;17:119–130 (Pubmed)

Presence of Candida in Oral Dysplastic Lesions - A Casual Involvement or a Causal Role?

Sima Odedra¹, Jyoti Chawda², Rahul Rupapara³, Pratik Rupakar⁴

¹Assistant Professor, Oral & Maxillofacial Pathology department, ²Professor and Head of Department, Oral & Maxillofacial Pathology department, Government Dental College and Hospital, Ahmedabad, Gujarat, India, ³Tutor, Department of Dentistry, P. D. U. Medical College and Hospital, Rajkot, ⁴Post Graduate Student, Oral & Maxillofacial Pathology Department, Government Dental College and Hospital, Ahmedabad, Gujarat, India

ABSTRACT

Previous evidences have suggested a strong association between the presence of *Candida albicans* and the development of oral epithelial dysplasia/neoplasia. The aim of the present study was to determine the role of *C. albicans* in the development of oral dysplastic lesions on the basis of quantifying the level of colonization and correlating it with the degree of epithelial dysplasia present. The present study comprised of 50 patients who had different oral dysplastic lesions and showed epithelial dysplasia histopathologically. For the isolation of *Candida* saliva samples were obtained by oral rinse technique while for the detection of fungal hyphae in the tissue sections biopsy specimens were collected from each patient. Significantly ($P=0.002$) more number of patients with moderate or severe epithelial dysplasia showed higher level of colonization (over 1000 CFU/ml) than patients with mild epithelial dysplasia. In PAS stained tissue sections hyphae were detected in 33% of the patients with moderate or severe epithelial dysplasia whilst there were no hyphae detected in any of the patients with mild epithelial dysplasia. The difference being statistically highly significant ($P=0.001$). Thus, the present study reveals a significant correlation between *Candida* infection and the severity of epithelial dysplasia by showing a statistically significant association between high amount of *Candida* and moderate or severe epithelial dysplasia.

Keywords: *Candida Albicans*, Oral Epithelial Dysplasia, Oral Dysplastic Lesions, Potentially Malignant Lesions

INTRODUCTION

Yeasts constitute normal commensals of the oral cavity and they are the main cause of fungal infections, the predominant species being *Candida albicans*. Recently, the study of oral candidal infection has been the subject of intense research mainly because of its association with human immunodeficiency as well as its relation with potentially malignant and malignant lesions of oral mucosa¹. The presence of *Candida* in mouth together with epithelial changes may

predispose to candidal infection which together with other cofactors may also induce epithelial dysplasia leading to malignant changes². The role of *Candida* is defined in carcinogenesis by endogenous nitrosation potential³. Of note *C. albicans* with very high potential to nitrosylate N-benzylmethylamine are most likely to be isolated from advanced, potentially malignant, oral mucosal lesions than early potential lesions or normal oral mucosa⁴.

It is well known that the epithelium of potentially malignant lesions, mainly leukoplakia, is often invaded by yeasts, predominantly of the *Candida* genus, but whether the yeasts are casually involved in the development of leukoplakia and in the transformation of leukoplakia into carcinoma are matters still being debated⁴. Histologically such leukoplakia may show marked epithelial atypia, or the features of carcinoma in situ and they have a higher tendency to malignant

Corresponding author:

Sima Odedra

Assistant Professor

P/501, Abhishek apartments,

Opp. Ganesh Vidhyalaya, New wadaj

Ahmedabad, Gujarat - India.

Telephone No. : +91-9825771456

Email ID : drseemaodedra@gmail.com

change^{5,6}). Non-homogenous types of oral leukoplakia have a higher probability for malignant transformation and their invasion by yeasts suggests a causal role of yeasts in malignant transformation of oral precancer⁴). *C. albicans* is by far the most commonly isolated fungal species from oral leukoplakia⁷.

Oral lichen planus (OLP) and oral submucous fibrosis (OSMF) are other potentially malignant lesions where yeasts have been identified and development of malignant changes has been reported^{2,8,9}). The exact association of *Candida* with OLP and OSMF cannot be established yet though it is hypothesized that the oral yeast carriage in patients with these conditions may be different from those who are healthy. However, yeasts may be involved in the malignant transformation in some cases of OLP and OSMF^{2,10,11}.

A study has shown that there is a statistically significant association between fungal infection and moderate and severe epithelial dysplasia. Moreover, analysis of subsequent biopsies showed that epithelial dysplasia associated with fungal infection significantly worsened over time in comparison with non-infected epithelial dysplasias¹²). A significant correlation between epithelial dysplasia and the degree of oral yeast carriage has also been reported¹³.

Thus, there is a good deal of evidences that suggest association between oral infection with *Candida*, predominantly *C. albicans*, and the development of oral epithelial dysplasia. Hence the present study was undertaken to determine the role of *C. albicans* in the development of oral dysplastic lesions on the basis of quantifying the level of colonization and correlating it with the degree of epithelial dysplasia present.

MATERIALS AND METHOD

The patients in this study were selected from those visiting the Outpatients' Department of Oral Medicine, Radiology and Diagnosis, Government Dental College and Hospital, Ahmedabad. Only those patients were selected who had different oral dysplastic lesions which showed epithelial dysplasia histopathologically. Patients having immunodeficiency, diabetes mellitus and nutritional deficiency were excluded. Based on these criteria the study group comprised of 50 patients (40 males, 10 females) with the mean age was 46.5 years (range 21-72 years). From them 30 patients had oral leukoplakia (26 non-homogenous leukoplakia, 4 homogenous leukoplakia), 10 patients had oral lichen planus and 10 patients had oral submucous fibrosis. Based on the degree of epithelial dysplasia present they

were further grouped as 17 cases of mild epithelial dysplasia and 22 cases of moderate epithelial dysplasia and 11 cases of severe epithelial dysplasia.

For the isolation of *Candida* from saliva, samples were obtained by oral rinse technique while for the detection of fungal hyphae in the tissue sections biopsy specimens were collected.

Isolation of *Candida* by oral rinse technique

For *Candida* isolation patients were requested to rinse the mouth thoroughly with 10 ml of sterile saline for at least 60s prior to expectorating this mouth rinse into a sterile container. This was undertaken before the biopsy procedure commenced. The mouth rinse sample was centrifuged at 1700g for 10 min, the pellet resuspended in 1 ml of phosphate buffered saline, plated onto Sabouraud's dextrose agar (SDA) containing chloramphenicol and incubated for 48 hrs at 37°C¹⁴). Growth appeared as creamy white smooth pasty colonies. The number of colony forming units (CFU) of yeast present within this pellet and therefore present within the 10ml mouth rinse was assessed. Results were expressed in terms of the presence or absence of yeast in the oral mouth swill, and the level of colonization expressed in terms of above and below 1000 CFU/ml¹³.

To identify the *Candida* species, standard Germ Tube test and sugar fermentation tests were carried out. For that the growth was subcultured on new plate of SDA to obtain pure growth and the growth from a single pure colony was further subjected to Germ Tube test and Carbohydrate Fermentation test.

Histopathological examination

The incisional biopsy was performed in all the patients under 2% lignocaine. The biopsy specimens were subjected to routine histopathological procedures. Sections of 5 µm were stained with routine Hematoxylin and Eosin stains to diagnose the lesion and to identify the grade of epithelial dysplasia present.

Identification of fungal hyphae in tissue sections by PAS-staining

To assess the infiltration of *candidal* hyphae in the specimen, 5 µm sections were stained with periodic acid Schiff (PAS) stain. The observation of hyphae in the PAS-stained sections was expressed in terms of presence or absence.

Statistical analysis

Statistical analyses was done utilizing the Chi squared test by SPSS software 12 and differences among or between groups were assumed to be significant when the probability (*P*) was less than or equal to 0.05

RESULTS

Study group consisted of 50 patients of which 40 were males and 10 were female and more of the patients (40/50, 80%) had age range between 31-60years which showed that oral dysplastic lesions were predominant in male patients in the age group of 31-60years. Moderate or severe epithelial dysplasia was more pronounced in patients with non-homogenous

leukoplakia (23/26, 88.46%) as compared to other three oral dysplastic lesions whereas all the patients with OSMF (10/10, 100%) showed mild epithelial dysplasia (Table 1).

Out of 50 patients 38 (76%) had *Candida* isolated from their oral cavity; of these in 9/17 (52.94%) patients with mild epithelial dysplasia *Candida* was isolated whilst in 29/33 (87.87%) patients with moderate (18/29) or severe (11/29) epithelial dysplasia *Candida* was isolated (Table 2). Of note, only 2/9 (22.22%) patients of mild epithelial dysplasia with *Candida* isolation had over 1000 CFU/ml whereas 23/29 (79.31%) patients with moderate or severe epithelial dysplasia had over 1000 CFU/ml (Table 2). The difference was statistically significant (*P*=0.002).

Table 1 Correlation of type of oral dysplastic lesion & grade of epithelial dysplasia

Type of oral dysplastic lesion	Grade			
	Total number of patients	Mild epithelial dysplasia	Moderate epithelial dysplasia	Severe epithelial dysplasia
	Number (%)	Number (%)	Number (%)	Number (%)
Speckled leukoplakia	26 (52.0)	2 (7.69)	15 (57.69)	9 (34.60)
Homogenous leukoplakia	4 (8.0)	1 (25.0)	2 (50.0)	1 (25.0)
Oral lichen planus	10 (20.0)	4 (40.0)	5 (50.0)	1 (10.0)
Oral submucous fibrosis	10 (20.0)	10 (100)	0	0
Total	50 (100)	17 (34.0)	22 (44.0)	11 (22.0)

Table 2 Correlation of grade of epithelial dysplasia & *Candida* infection.

Grade of epithelial dysplasia	Total number of patients	Candida in isolate			Candida in biopsy (PAS - stained)	
		No growth	< 1000 CFU/ml	> 1000 CFU/ml	Present	Absent
	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)
Mild epithelial dysplasia	17 (34.0)	8 (47.06)	7 (41.17)	2 (11.77)	0	17 (100)
Moderate epithelial dysplasia	22 (44.0)	4 (18.2)	5 (22.7)	13 (59.1)	7 (31.8)	15 (68.2)
Severe epithelial dysplasia	11 (22.0)	0	1 (9.1)	10 (90.9)	8 (72.7)	3 (27.3)
Total	50 (100)	12 (24.0)	13 (26.0)	25 (50.0)	15 (30.0)	35 (70.0)

On observation, 13/18 (72.22%) patients with moderate epithelial dysplasia had over 1000 CFU/ml whilst 10/11 (90.90%) patients with severe epithelial dysplasia had over 1000 CFU/ml (Table 2).

Amongst 50 patients, 15 (30%) patients with moderate or severe epithelial dysplasia showed PAS-positive hyphae in their biopsies whilst there were no hyphae present in any of the patients with mild epithelial dysplasia (Table 2). The difference being statistically highly significant (*P*=0.001). Moreover, 8/11 (72.7%) patients with severe epithelial dysplasia had

hyphae detected in their biopsies as compared to 7/22 (31.8%) patients with moderate epithelial dysplasia (Table 2) which was statistically significant (*P*=0.026).

When we compare between isolation and penetration of *Candida*, out of 9 patients with mild epithelial dysplasia who had yeast isolated from their oral cavity, none of the patient had hyphae detected in biopsy whilst hyphae were identified in the biopsy of all the 15 patients with moderate or severe epithelial dysplasia who had yeast isolated from their oral cavity.

Out of 15 patients in which hyphae were found invading the epithelium in the biopsies, 13 patients had *Candida* isolation over 1000 CFU/ml which was statistically significant ($P=0.005$).

DISCUSSION

The strong association between *Candida* and oral epithelial dysplasia/neoplasia has already been established and it has been suggested that degree of epithelial dysplasia has an influence on the amount of yeast isolated in the patients' oral cavity^{6,12,13,15}. The present study supports these previous evidences by showing a strong statistical association between significant amounts of *Candida* in patients with moderate or severe epithelial dysplasia than in patients with mild epithelial dysplasia.

In the present study 76% patients with oral epithelial dysplasia had *Candida* isolated from their oral cavity which is similar to the finding noted by McCullogh et al (2002) in which 74.7% patients with oral epithelial dysplasia had *Candida* isolated from their oral cavity. Moreover, we found that 22.22% (2/9) patients with mild epithelial dysplasia showed more than 1000 CFU/ml which is contradictory from the finding noted by McCullogh et al (2002) in which 58.6% patients with mild epithelial dysplasia showed more than 1000 CFU/ml but when we consider patients with moderate or severe epithelial dysplasia, 79.31% patients had over 1000 CFU/ml which is almost similar to the finding noted by McCullogh et al (2002) in which 83.3% patients with moderate or severe dysplasia showed over 1000 CFU/ml. This difference in the findings can be explained by the fact that collection and handling of the sample used to detect fungi significantly affects the findings¹².

In PAS stained biopsies we observed hyphae in 30% (15/50) patients with oral epithelial dysplasia which is somewhat contradictory from the findings noted by McCullogh et al (2002) and Barrett et al (1998) who observed PAS positive hyphae in 16% and 12.3% patients with oral epithelial dysplasia respectively. There was absence of *Candida* infection in all the biopsy specimens of patients with mild epithelial dysplasia while 31.81% patients with moderate epithelial dysplasia and 72.7% patients with severe epithelial dysplasia showed presence of *Candida* infection in biopsy specimens. These findings are correlated with those of Barrett et al (1998) who noted *Candida* infection in biopsy specimen of 21.90% patients with mild epithelial dysplasia, 49.30% patients with moderate

epithelial dysplasia and 28.80% patients with severe epithelial dysplasia. *Candida* infection was present in biopsy specimens of 72.7% of patients with severe epithelial dysplasia which suggests a strong association between *Candida* infection and severity of oral epithelial dysplasia.

In the present study we observed that 52% (13/25) patients who had *Candida* isolated in significantly high amount (over 1000CFU/ml) had PAS positive hyphae detected histologically which is somewhat different from the finding noted by McCullogh et al who observed 84.21% (16/19) patients who had significantly high amount of *Candida* with PAS positive hyphae in histological sections. This finding supports the previous findings that suggest non invasive hyphae and fungi could be found in the culture but could be lost during the laboratory handling of biopsy specimen producing a negative result on staining the section with PAS^{1,5,12}. However, when PAS positive hyphae were detected histopathologically on the biopsy there was significantly concurrent high amount of *Candida* isolated from the patients' oral cavity.

CONCLUSION

Though the present study cannot resolve the question whether *Candida* causes epithelial dysplasia, or merely infect the altered tissue, it does confirm a significant correlation between *Candida* infection and the severity of epithelial dysplasia by showing a statistically significant association between high amount of *Candida* and moderate or severe epithelial dysplasia. Further research is required to elucidate the exact role of *Candida* in the development of oral dysplastic lesions/oral neoplastic lesions.

ACKNOWLEDGEMENT

Authors would like to acknowledge the staff members of the Department of Microbiology, B. J. Medical College and Hospital, Ahmedabad.

Funding source

None (Everything was done at our department only, using departmental material and equipments)

Conflict of Interest

This research work is not published anywhere and it was carried out by us at Govt. Dental College and Hospital, Ahmedabad.

Ethical clearance: It was taken.

REFERENCES

1. Vuckovic N, Bratic MB, Vuckovic D, Picuric I. Presence of *Candida albicans* in potentially malignant oral mucosal lesions. *Arch Oncol.* 12: 51-54, 2004.
2. Ariyawardana A, Panagoda GJ, Fernando HN, Ellepola AN, Tilakaratne WM, Samaranyake LP. Oral submucous fibrosis and oral yeast carriage – a case control study in Sri Lankan patients. *Mycoses.* 50:116-20, 2007.
3. Krogh P. The role of yeasts in oral cancer by means of endogenous nitrosation. *Acta Odontol. Scand.* 48:85-88, 1990.
4. Krogh P, Hald B, Holmstrup P. Possible mycological etiology of oral mucosal cancer: catalytic potential of infecting *Candida albicans* and other yeasts in production of N-nitrosobenzylmethylamine. *Carcinogenesis.* 8:1543-1548, 1987.
5. Cawson RA. Chronic oral candidiasis and leukoplakia. *Oral Surg Oral Med Oral Pathol.* 22:582-591, 1966.
6. Field EA, Field JK, Martin MV. Does *Candida* have a role in oral epithelial neoplasia? *J Medical and Veterinary Mycology.* 27:277-294, 1989.
7. Jepsen A, Winther JE. Mycotic infection in oral leukoplakia. *Acta Odontol. Scand.* 23:239-256, 1965.
8. Lundstrom IMC, Anneroth GB, Holmberg K. *Candida* in patients with oral lichen planus. *Int J. Oral Surg.* 13:226-238, 1984.
9. Hatchuel DA, Lemmer J, McGaw W. Candidal infection in oral lichen planus. *Oral Surg Oral Med Oral Pathol.* 70:172-5, 1990.
10. Krogh P, Thorn JJ, Vedtiffe P, Pindborg JJ. Yeast species and biotypes associated with oral leukoplakia and lichen planus. *Oral Surg. Oral Med. Oral Pathol.* 63:48-54, 1987.
11. Saigal S, Bhargava A, Mehra SK, Dakwala F. Identification of *Candida albicans* by using different culture medias and its association in potentially malignant and malignant lesions. *Contemp Clin Dent.* 2:188-193, 2011 Jul-Sep.
12. Barrett AW, Kingsmill VJ, Speight PM. The frequency of fungal infection in biopsies of oral mucosal lesions. *Oral Diseases.* 4:26-31, 1998.
13. McCollough M, Jaber M, Barrett AW, Bain L, Speight PM, Porter SR. Oral yeast carriage correlates with presence of oral epithelial dysplasia. *Oral oncology.* 38: 391-393, 2002.
14. Samaranyake LP, Macfarlane TW, Lamey PJ, Ferguson MM. A comparison of oral rinse and imprint sampling techniques for the detection of yeast, coliforms and *Staphylococcus aureus* carriage in the oral cavity. *J Oral Pathol.* 15:386-388, 1986.
15. Sitheequ MAM, Samaranyake LP. Chronic Hyperplastic Candidiasis/Candidosis (Candidial Leukoplakia) *Crit Rev Oral Biol Med.* 14:253-26, 2003.

The Study of Arthroscopic Reduction of Tibial Spine Avulsion Fractures in Adults

Anirudh C Kulkarni¹, Vishalakshi A Kulkarni², Chetan G³, Pavan Belehali⁴, Sreekantha⁵, Remya⁶

¹Sr, Department of Orthopedics, NMC, Raichur, ²SR, Department of Anaesthesia, RIMS, Raichur, ³Consultant Orthopedic Surgeon, Fortis, Hospital, Nagarbhavi, Bangalore, ⁴Registrar Orthopedics, Hosmat Hospital, Bangalore, ⁵Associate Professor, Department of Biochemistry, NMC, Raichur, ⁶Lecturer/Assistant Professor, Department of Anatomy, Nitte University, KSHEMA, Mangalore

ABSTRACT

Tibial spine fracture is relatively rare variety of fracture in the orthopedic practice. They present with unusual etiology, mode of presentation and complications. The methodology of treatment of these fractures may be conservative, surgery or arthroscopic reduction. Patients who were diagnosed with tibial spine avulsion were analyzed; 22 patients diagnosed clinically were evaluated in detail for etiology, presentation and treatment setup. The knowledge of early detection of tibial spine fracture and accuracy treatment yields best outcome.

Keywords: Tibial Spine Fracture, Presentation, Treatment

INTRODUCTION

Fractures of the intercondylar eminence of the tibia were first described by Poncet in 1875.² Tibial spine fracture is a relatively rare injury.⁶ The most widely used classification system for tibial spine fracture was published in 1959 by Meyers and McKeever⁵. Three fracture patterns were identified—type I fracture shows minimal displacement of the anterior margin; type II fracture shows displacement of the anterior margin with hinging of the posterior margin; and type III fracture is completely displaced from its bony bed.

The types of fractures are shown in the below diagrammatic representation:



Apart from case reports of unusual presentations and complications, little has been published about the fracture in adults and it is generally accepted that it rarely occurs as an isolated injury, usually being associated with soft-tissue injuries around the knee.²

Treatment for types I and II fractures is generally straightforward.¹⁰ Closed management with casting in extension has been shown to be effective.^{2,3} However, type III fractures often require surgical management. Early reports of open reduction described long-term sequel including instability, extension loss, and functional disability.^{4,7} Furthermore, use and type of internal fixation and position of postoperative immobilization have been debated.^{4,7} More recent reports have shown the value of arthroscopy in the treatment of these fractures.

This study analysed the outcome of patients with tibial spine avulsion fractures treated by arthroscopic reduction technique.

MATERIALS AND METHOD

All patients who were diagnosed with tibial spine avulsion since 2001 at the Hospital for Orthopedics, Sports medicine, Arthritis and Accident trauma, Bangalore were analyzed. The patients' ages, mechanisms of injury, clinical presentation and the fracture type as per Meyer's and McKeever's⁵ classification were recorded. Those of them, amongst this group who underwent Arthroscopic reduction were included in the study.

All patients with displaced fractures, types II and III, were operated on as soon as possible. In supine position, with a tourniquet, which is mounted high on the thigh, rests on a support with the lower leg hanging down. Arthroscopy was performed through anteromedial and anterolateral portals. Hemarthrosis was first evacuated and thorough lavaging done. Entrapment of the meniscal tissue into the fracture site

Corresponding author:

Sreekantha

Associate Professor

Department of Biochemistry, Navodaya Medical College, Raichur-584103, Karnataka

E-mail:grsreekantha@yahoo.com

Mobile:09481389119

was avoided. The bed of the fracture was identified accurately and the fracture fragment was placed into the bed using an arthroscopic probe with simultaneous extension of the knee. Radiographs were taken intra-operatively to confirm the reduction. Once the reduction was acceptable, an above knee cast was applied in complete extension. The cast was maintained for a period of 3 weeks and non weight bearing gait prescribed.

At 3 weeks cast was removed, range of movement and hamstring strengthening exercises were started. Partial weight bearing gait begun at 3rd week and gradually progressed to full weight bearing by the end of 6 weeks. Patients were put on rehabilitation programme for atleast 3 weeks.

Clinical examinations were performed to assess the range of movement, Lachman’s test , Pivot shift and varus/valgus instability at 6 weeks. At the same time follow up antero posterior and lateral radiographs were taken and fracture union analyzed.

In order to eliminate the inter observer bias, all the patients were operated upon and evaluated by a single surgeon.

OBSERVATIONS AND RESULTS

22 patients with follow up evaluation at 6 weeks were studied from 2001 to 2009. Among them, 15 were men and 7 were women. The age ranged between 19-52 years with a mean age of 29.77 years. The most

common mechanism of injury was road traffic accident, accounting for 18 cases (81.8%), followed by Sports (9.1%) and domestic fall (9.1%) accounting for 2 cases each. Right sided involvement was predominant amounting to 67.8%. Follow up ranged from 6 to 24 weeks with a mean follow up of 11.4 weeks. Meyers and McKeever’s⁵ Type 2 was the most common type of fracture pattern seen in 14 cases (63.6%) followed by Type 3 seen in 8 cases (36.4 %). Meniscal tears were encountered in 2 cases accounting for 9.1% of associated injuries. Medial collateral ligament sprains were noted in 2 cases and contusion of the medial tibial plateau was seen in 1 case.

At 6 weeks follow up the flexion ranged between 35 degrees to 140 degrees with a mean flexion of 102.3 degrees. Extensor lag was seen in 6 patients ranging from 5 degrees to 20 degrees, with a mean lag of 9.2 degrees. At the time of follow up laxity by Lachman’s test and Pivot shift test was not demonstrable in any of the patients. In 18 cases (82%) the fracture had consolidated at the time of follow up.

Overall results based on the above observed parameters, excellent results were seen in 8 cases accounting for 36.4%, good results were seen in 12 cases accounting for 54.5% . Fair result was seen in 1 case and poor result in 1 case.

Table showing the tabulation of age,sex,type of tibial spine fracture with orthopedic treatment evaluation details:

Table 1

Case	Age	Sex	M.O.I	# type	Associated Injuries	ROM*	Laxity*	# union*	Result
1	36	M	RTA	2	Lateral meniscus tear	0- 35 deg	None	UIP	Poor
2	19	F	RTA	2	None	5-100 deg	None	United	Good
3	22	F	Sports	3	None	0-120 deg	None	United	Excellent
4	22	M	RTA	3	None	0-90 deg	None	United	Good
5	42	M	Domestic	2	None	0-110 deg	None	UIP	Good
6	36	M	RTA	2	MCL sprain	5-100 deg	None	United	Good
7	29	M	RTA	2	None	20-90 deg	None	UIP	Fair
8	32	M	RTA	3	None	5-90 deg	None	United	Good
9	52	F	Domestic	2	None	0-125 deg	None	United	Excellent
10	27	F	RTA	3	None	0-100 deg	None	United	Good
11	23	F	RTA	2	Medial meniscus tear	0-100 deg	None	United	Good
12	31	M	RTA	2	None	0-100 deg	None	United	Good
13	29	M	RTA	3	None	0-130 deg	None	United	Excellent
14	40	F	RTA	2	None	0-135 deg	None	United	Excellent
15	31	F	RTA	2	None	0-100 deg	None	United	Good
16	29	M	RTA	3	None	10-125 deg	None	United	Good
17	22	M	RTA	3	MCL sprain	10-110 deg	None	UIP	Good
18	36	M	RTA	2	None	0-90 deg	None	United	Good
19	20	M	Sports	2	None	0-140 deg	None	United	Excellent
20	23	M	RTA	2	Medial plateau contusion	0-120 deg	None	United	Excellent
21	25	M	RTA	2	None	0-140 deg	None	United	Excellent
22	29	M	RTA	3	None	0-120 deg	None	United	Excellent

Abbreviations

M-Male; F- Female; MOI- Mechanism of injury; RTA- Road traffic accident; #- Fracture; MCL- Medial collateral ligament; ROM- Range of movement; deg- Degrees; UIP- Union in progress

*- At follow up

DISCUSSION

Successful treatment of tibial spine fractures allows patients to resume their pre injury activities. To accomplish this, knee range of motion and stability must be normalized. Past reports of closed treatment or open reduction of these fractures have shown difficulty in regaining extension⁴ and stability.^{4,7} More recent reports have shown the value of arthroscopy in the treatment of these injuries. McLennan⁴ found that arthroscopic reduction of these fractures resulted in improved stability when compared with closed treatment.

In past series, recession of the tibial spine fragment has been suggested as a means of compensating for potential plastic deformation of the ACL.⁴ In this study, an anatomic reduction was the goal with no effort made to recess the fracture fragments. The satisfactory stability results found in this and other series suggest that recession is not necessary in all cases. Perhaps preoperative magnetic resonance imaging, paying special attention to the status of the ACL fibers, would be helpful in deciding whether to recess the tibial spine fragment.^{4,7}

The current study is one of very few reported studies on tibial spine avulsion fractures in adults. Kendall et al² found a reversed ratio when they compared tibial spine avulsions in children and adults. They consider that adult fractures may be more common than previously believed.

Conservative treatment for all type I injuries is effective. In adults, type II and III injuries require arthroscopy for lavage and accurate classification, to allow the selection of the best treatment.⁷

Male preponderance, Right knee predominance, road traffic accident as the commonest mechanism of injury and the mean age of 29.7 years are well comparable with Kendall et al² study. The associated injuries were comparatively less, accounting for 22.7% as against 58.3% in Kendall et al² study. Meyers and McKeever's⁵ Type 2 was the common type of fracture pattern in the current study but Type 3 was common in Kendall et al² study. 91% of the patients in the present study had good to excellent outcomes as compared to 62% to 74% in most other studies. However long term follow up is required to substantiate the results obtained.

CONCLUSION

Our results suggest that tibial spine fractures are more common in adults than was previously thought. Tibial spine avulsions should be considered in the differential diagnosis of acute traumatic hemarthrosis. Early diagnosis, accurate reduction and compliant rehabilitation are essential for a good outcome.

Acknowledgement: Nil

Source of Funding: Nil

Conflict of Interest: Nil

Consent: Taken.

REFERENCES

1. Gronkvist H, Hirsch G, Johansson L. Fracture of the anterior tibial spine in children. *J Pediatr Orthop*. 1984; 4:465-468
2. Kendall NS., Hsu YC, Chan KM : Fracture of the tibial spine in adults and children a review of 31 cases : *J Bone Joint Surg [Br]* 1992; 74-B :848-52.
3. Mah JY, Adili A, Otsuka NY, Ogilvie R. Follow-up study of arthroscopic reduction and fixation of type III tibial-eminence fractures. *J Pediatr Orthop*. 1998; 18:475-477
4. McLennan JG. Lessons learned after second look arthroscopy in type III fractures of the tibial spine. *J Pediatr Orthop*. 1995; 15:59-62
5. Meyers MH, McKeever FM. Fracture of the intercondylar eminence of the tibia. *J Bone Joint Surg Am*. 1959; 41:209-222.
6. Rockwood CA, Green DP, eds. *Fractures in adults*. Philadelphia, etc : JB Lippincott Co. 2001
7. Shepley RW. Arthroscopic Treatment of Type III Tibial Spine Fractures Using Absorbable Fixation: *Orthopedics* 2004; 27, 7: 767-769
8. Wiley JJ, Baxter MP. Tibial spine fracture in children. *Clin Orthop*. 1990; 255:54-60.
9. Willis RB, Blokker C, Stoll TM, Paterson DC, Galpin RD. Long-term follow-up of anterior tibial eminence fractures. *J Pediatr Orthop*. 1993; 13: 361-364
10. Zaricznyj B. Avulsion fracture of the tibial eminence : treatment by open reduction and pinning. *J Bone Joint Surg [Am]* 1977 ; 59- A : 1111-1114.

Dental Caries Risk Assessment- A Review

K Jayaprakash¹, Gupta Neha², R Thanuja³, Khurana Suchi⁴

¹Professor & Head, Department of Public Health Dentistry, ²Assistant Professor, Department of Public Health Dentistry, ³Associate Professor, Department of Oral Pathology, ITS Dental College, Hospital & Research Center, Greater Noida, ⁴Senior Lecturer, Department of Public Health Dentistry, SGT Dental College, Hospital and Research Institute, Gurgaon, Haryana

ABSTRACT

Caries is a disease of multifactorial etiology and a risk assessment should evaluate all factors involved with the disease. Individual risk factors studied separately from the pool of risk factors tend to be poor predictors of caries onset. The assessment of all risk factors not only allows for a more accurate caries risk assessment, but also identifies the etiologic factors responsible for the occurrence of caries in a particular patient. This approach encourages management strategies developed specifically for the patient.

Identifying factors that determine those individuals at highest risk-either prior to or very shortly after teeth begin to erupt-is imperative to allow for possible preventive intervention. Once identified, these factors should be assessed using a reliable and valid tool that is useable by both dental practitioners and trained nondental health professionals.

Furthermore, the risk assessment, any proposed management strategy and outcomes should be recorded formally over time to monitor and measure treatment efficacy. Patients should be given an opportunity to formally acknowledge the outcomes of a complete risk assessment evaluation so that empowered patients can become true partners and contributors to their oral care.

Keywords: Caries, Risk Factors, Risk Assessment

INTRODUCTION

Dental caries does not have a single etiology as a factor. It is usual a dynamic interplay of four principal factors: the host (saliva and teeth), the microflora (plaque), the substrate (diet) and time. Until now, no single test has been devised that takes into consideration all these factors and can accurately predict an individual's susceptibility to caries. The risk of dental caries can, however, be evaluated by analysing and integrating several causative factors. In daily practice, the caries-risk is determined in order to assess the individual patient's risk, to identify the main causative factors and to recommend specific preventive measures for that individual's needs¹.

Traditionally, multifactorial caries-risk studies have focused on evaluation of biological, demographic and dietary factors and have used cavitation of a carious lesion or other caries disease indicators as the outcome variable². Caries risk is measured in terms of caries risk factors that either cause the disease directly (eg, microflora) or have been shown useful in predicting it (eg, socioeconomic status)³. These risk factors may vary with race, culture, ethnicity and may be useful in the clinical management of caries by helping to determine if additional diagnostic procedures are required, identify subjects who require caries control measures, assess the impact of caries control measures, guide in treatment planning decisions and determine the timing of recall appointments⁴. Since the etiology of caries is

multi-factorial, it has been suggested that risk assessment should be directed at the evaluation of all factors involved with the disease⁵.

Caries Disease Indicators

Caries disease indicators (Table 1) are clinical observations that tell about the past caries history and activity. They are indicators or clinical signs that there is disease present or that there has been recent disease. These indicators say nothing about what caused the disease or how to treat it. They only describe a clinical observation which is suggestive of the presence of disease. They are simply physical observations (holes, white spots, radiolucencies) that are strong indicators of the disease continuing unless therapeutic intervention follows.

The four caries disease indicators are

- (1) frank cavitations or lesions that radiographically show penetration into dentin;
- (2) ap-proximal radiographic lesions confined to the enamel only;
- (3) visual white spots on smooth surfaces; and
- (4) any restorations placed in the last three years.

These four categories are strong indicators for future caries activity and unless there is nonsurgical therapeutic intervention the likelihood of future cavities or the progression of existing lesions is very high⁶.

Caries Risk Factors

Caries risk factors (Table 1) are biological factors that contribute to the level of risk for the patient of having new carious lesions in the future or having the

existing lesions progress⁷. The various risk factors identified in outcomes measures of caries risk assessment are: 1) medium or high MS and LB counts 2) visible heavy plaque on teeth 3) frequent (> three times daily) snacking between meals 4) deep pits and fissures 5) recreational drug use 6) inadequate saliva flow by observation or measurement 7) saliva reducing factors (medications/radiation/systemic) 8) exposed roots and 9) orthodontic appliances⁸. If there are no positive caries disease indicators, these nine factors in sum become the determinants of caries activity, unless they are offset by the caries protective factors⁷.

Caries Protective Factors

Caries protective factors (Table 1) are biological or therapeutic factors or measures that can collectively offset the challenge presented by the caries risk factors. Protective factors should be kept high in a patient with high caries risk in order to keep the patient in balance or to reverse the caries process. Currently, the protective factors are: 1) lives/work/school located in a fluoridated community 2) fluoride toothpaste at least once daily 3) fluoride toothpaste at least two times daily 4) fluoride mouthrinse (0.05 percent sodium fluoride) daily 5) 5,000 ppm fluoride toothpaste daily 6) fluoride varnish applied in last six months 7) professionally applied topical fluoride in last six months 8) use of chlorhexidine daily for one week each of last six months 9) xylitol gum/lozenges four times daily in the last six months 10) calcium and phosphate supplement paste during last six months and 11) adequate saliva flow (> 1 ml/min stimulated). Any or all of these protective factors can contribute to keep the patient "in balance" or even better to enhance remineralization, which is the natural repair process of the early carious lesion⁷.

Table 1: Caries Risk Assessment – Children Age 6 years and over/Adults

Caries Risk Assessment Form- Children Age 6 and Over Adults			

Patient Name ----- Chart ----- Date -----			
Assessment Date: Is this (please circle) base line or recall			
Disease Indicators (Any one "YES" signifies likely "High Risk" and to do a bacteria test**)	YES-CIRCLE	YES-CIRCLE	YES-CIRCLE
Visible cavities or radiographic penetration of the dentin	YES		
Radiographic approximal enamel lesions (not in dentin)	YES		
White spots on smooth surfaces	YES		
Restorations last 3 years	YES		
Risk Factors (Biological predisposing factors)		YES	
MS and LB both medium or high (by culture**)		YES	
Visible heavy plaque on teeth		YES	
Frquent snack (>3x daily between meals)		YES	
Deep pits and fissures		YES	
Recreational drug use		YES	
Inadequate saliva flow by observation or measurement (**If measured, note the flow rate below)		YES	
Saliva reducing factors (medications/radiation/systemic)		YES	
Exposed roots		YES	
Orthodontic appliances		YES	
Protective factors			
Lives/work/school fluoridated community			YES
Fluoride toothpaste at least once daily			YES
Fluoride toothpaste at least 2x daily			YES
Fluoride mouthrinse (0.05% NaF daily)			YES
5.000ppmF fluoride toothpaste daily			YES
Fluoride varnish in last 6 months			YES
Office F topical in last 6 months			YES
Chlorhexidine prescribed/used one week each of last 6 months			YES
Xylitol gum/lozenges 4x daily last 6 months			YES
Calcium and phosphate paste during last 6 months			YES
Adequate saliva flow (>1ml/min stimulated)			YES
**Bacteria/Saliva Test Results:MS:LB:Flow rate:ml/min			

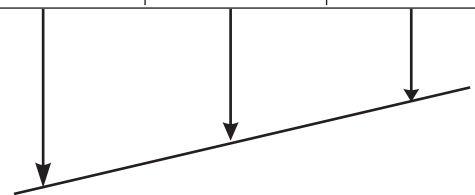
Visualize Caries Balance

(Use circled Indicators/ factors above)

(Extreme Risk= High Risk+ Severe Salivary Gland

Hypofunction)

Caries Risk Assessment(circle) Extreme High Moderate Low



Source: Featherstone JB, Domejean-Orliaguet S, Jenson L, Wolff M, Young DA. Caries risk assessment in practice for age 6 through adult. CDA Journal 2007;35(10):703-713.

The caries balance concept (Figure 1) states that the progression or reversal of dental caries is determined

by the balance between pathological factors and protective factors⁹.

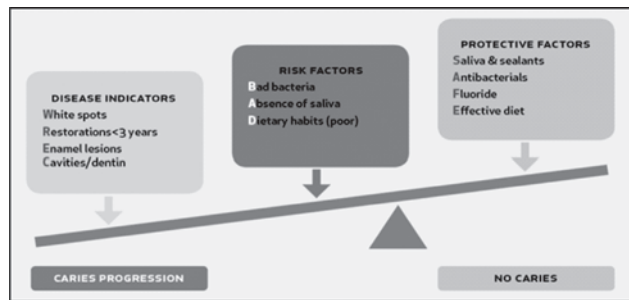


Fig. 1. The Caries Balance Concept

Source: Featherstone JB, Domejean-Orliaguet S, Jenson L, Wolff M, Young DA. Caries risk assessment in practice for age 6 through adult. CDA Journal 2007;35(10): 703-713.

Caries risk assessment

Caries risk assessment refers to the determination of the likelihood of the incidence of caries (i.e., the number of new cavitated or incipient lesions) during a certain time period. Caries risk assessment is an absolutely essential process in the clinical decision making and also a key component in caries preventive programs¹. The goals of caries risk assessment can be summarized as follows:

- (a) screen out low risk patients (to allow safe recommendation of long recall intervals)
- (b) identify high risk patients before they become caries-active and
- (c) monitor changes in disease status in caries-active patients¹⁰.

Caries risk can vary from one point of time in an individual to another. Such variation requires regular monitoring by the oral health care professional, as the changes in health status, use of medications and other lifetime events can increase caries risk. Thus, it is suggested that a risk profile be performed on a number of levels: community, individual, tooth and tooth surface¹¹.

Assessment of a person’s risk for dental caries relies on a number of factors. These factors include caries history, preventive practices, nutritional habits and medical conditions. In addition, inadequately restored surfaces, poor oral hygiene, exposed root surfaces, orthodontic treatment and elevated Streptococcus mutans levels can also act as additional factors¹¹. Based on the clinical evaluation and information derived from a patient’s medical and dental history, he or she can be classified as being at low, moderate or high risk (Table 2)¹².

Table 2: Factors in low, moderate and high caries risk assessment

FACTORS IN LOW, MODERATE AND HIGH CARIES RISK ASSESSMENT	
CHILDREN	ADULTS
<p>Low risk</p> <ul style="list-style-type: none"> - No new or incipient carious lesions in the past year <p>Moderate risk (any of the following)</p> <ul style="list-style-type: none"> - one new, incipient or recurrent carious lesion in the past year - deep or noncoalesced pits and fissures - high caries experience in siblings or parents - history of pit and fissure caries - early childhood caries - frequent sugar exposures - decreased salivary flow - compromised oral hygiene - irregular dental visits - Inadequate fluoride exposure - Proximal radiolucency 	<p>Low risk</p> <ul style="list-style-type: none"> - No new or incipient carious lesions <p>Moderate risk (any one of the following)</p> <ul style="list-style-type: none"> - One to two new, incipient or recurrent carious lesions during the past three years - History of numerous or severe caries - Deep or noncoalesced pits and fissures - Frequent sugar exposures - Decreased salivary flow - Irregular dental visits - Inadequate fluoride exposure
<p>High risk</p> <p>Two or more new, incipient or recurrent carious lesions in the past year, or two or more of the following:</p> <ul style="list-style-type: none"> - Deep or noncoalesced pits and fissures - Siblings or parents with high caries rate - History of pit and fissure caries - Early childhood caries - Frequent sugar exposures - Decreased salivary flow - Compromised oral hygiene - Irregular dental visits - Inadequate fluoride exposure - Proximal radiolucency 	<p>High risk</p> <p>Three or more carious lesions in the past three years, or two or more of the following:</p> <ul style="list-style-type: none"> - History of numerous or severe caries - Deep or noncoalesced pits and fissures - Frequent sugar exposures - Decreased salivary flow - Irregular dental visits - Inadequate fluoride exposure - Compromised oral hygiene

Tooth assessment: Studies have indicated that the teeth most susceptible to pit and fissure caries are the first and second permanent molars¹³. Even though the life expectancy of primary teeth is limited, their role in the proper development of permanent dentition cannot be underestimated. Therefore, it is advisable to initiate preventive treatment for primary molars and premolars when at risk. An evaluation of individual tooth morphology, the level of caries activity and the pattern of caries can help determine if individual teeth are at risk. Evidence also suggests that caries in the primary dentition increases a child's risk of caries in his or her permanent dentition¹¹.

Tooth surface assessment: It is well-documented that pit and fissure configuration can be a significant risk factor for occlusal caries. Pits and fissures compose only 12.5 percent of tooth surfaces, yet they account for 88 percent of caries in children¹⁴. Deep pits and fissures that are not easily cleaned can harbor bacteria that break down the enamel surface. Permanent molars are most susceptible to pit and fissure caries followed by premolars. However, in some patients, maxillary incisors with fissured or pitted surfaces may also be at risk¹¹.

The American Academy of Pediatric Dentistry (AAPD) recognizes that caries-risk assessment is an essential element of contemporary clinical care for infants, children and adolescents. Most young children appear to acquire some cariogenic microbes. A systematic review of literature concerning caries risk indicators concluded that, for caries prediction in primary teeth, previous caries experience was the best predictor followed by level of parental education and socioeconomic status. Another important risk factor in young children is the age of MS colonization. It has been found that the earlier in infancy that high levels of MS colonization occur, the more severe the caries in the primary dentition³. An individualized risk assessment of an infant or toddler will help both health care providers and parents/ caregivers identify and understand the factors associated with early childhood caries, so that a cooperative and proactive caries management plan based on caries risk assessment (CAMBRA) can be developed. Caries risk assessment and subsequent management of the disease in children is crucial due to the known fact that caries in the primary dentition is a strong predictor of caries in the permanent dentition¹⁵.

Additionally, parents should be given information and anticipatory guidance about oral disease

prevention that is specific to the needs of their child. This information should include oral hygiene recommendations, growth and development issues (that is, teething, digit or pacifier habits), oral habits, diet and nutrition guidelines and injury prevention tips. A family-centered approach and customized recommendations have been shown to be more successful in engaging parents to change specific parenting practices than such generic recommendations such as "brush your teeth twice a day" and "don't eat candy"¹⁵.

Caries risk assessment may be useful in the clinical management of caries by helping dental professionals do the following:

1. Evaluate the degree of the patient's risk of developing caries to determine the intensity of the treatment (for example, a 226 parts per million sodium fluoride [NaF] rinse versus a 5,000 ppm NaF brush-on gel) and frequency of recall appointments or treatments (for example, every three months, every six months, every year)
2. Help identify the main etiologic agents that contribute to the disease or that, because of their recent onset, may contribute to future disease
3. Determine the type of treatment (for example, plaque control, diet control, increased fluoride exposure, antimicrobial agents)
4. Determine if additional diagnostic procedures are required (for example, salivary flow rate analysis, diet analysis)
5. Aid in restorative treatment decisions (for example, cavity designs, choice of dental materials)
6. Improve the reliability of the prognosis of the planned treatment; assess the efficacy of the proposed management and preventive treatment plan at recall visits¹⁶.

Identifying factors that determine those individuals at highest risk—either prior to or very shortly after teeth begin to erupt—is imperative to allow for possible preventive intervention. Once identified, these factors should be assessed using a reliable and valid tool that is useable by both dental practitioners and trained nondental health professionals³.

Furthermore, the risk assessment, any proposed management strategy and outcomes should be recorded formally over time to monitor and measure

treatment efficacy. Patients should be given an opportunity to formally acknowledge the outcomes of a complete risk assessment evaluation so that empowered patients can become true partners and contributors to their oral care¹⁶.

ACKNOWLEDGEMENT:

We thank management of ITS Dental College, Greater Noida for their contribution and encouragement in preparation of manuscript.

Conflict of interest: None

Source of funding: None

Ethical clearance: Not applicable

REFERENCES

1. Reich E, Lussi A, Newbrun E. Caries- Risk Assessment. *Int Dent J* 1999;49:15–26.
2. Pitts NB, Stamm JW. International consensus workshop on caries clinical trials (ICW-CCT)—final /consensus statements: Agreeing where the evidence leads. *J Dent Res* 2004;83(spec no c):c125-8.
3. American Academy of Pediatric Dentistry (Council on Clinical Affairs). Policy on use of a caries-risk assessment tool (CAT) for infants, children, and adolescents. Adopted 2002, Revised 2006. Reference manual v 30/no7;08/09.
4. American academy of pediatric dentistry. Guideline on periodicity of examination, preventive dental services, anticipatory guidance, and oral treatment for children. *Pediatr Dent* 2005;27(suppl):84-86.
5. Brambilla E, Garcia-Godoy F, Strohmenger L. Principles of diagnosis and treatment of high-caries-risk subjects. *Dent Clin North Am* 2000;44(3):507-40.
6. Featherstone JB, Gansky SA et al. A randomized clinical trial of caries management by risk assessment. *Caries Res* 2005;39(4):295.
7. Featherstone JB, Domejean-Orliaguet S, Jenson L, Wolff M, Young DA. Caries risk assessment in practice for age 6 through adult. *CDA Journal* 2007;35(10):703-713.
8. Domejean-Orliaguet S, Gansky SA, Featherstone JD. Caries risk assessment in an educational environment. *J Dent Educ* 2006;70(12):1346-54.
9. Featherstone JD. The caries balance: The basis for caries management by risk assessment. *Oral Health Prev Dent* 2000;2(suppl 1):259-264.
10. Messer LB. Assessing caries risk in children. *Aus Dent J* 2000;45(1):10-16.
11. Rethman J. Trends in preventive care: Caries risk assessment and indications for sealants *JADA* 2000;131:8s-12s.
12. American Dental Association Council on access, prevention and international relations. Caries diagnosis and risk assessment: A review of preventive strategies and management. *JADA* 1995;126(supple):1-24s.
13. Brown LJ, Selwitz RH. The impact of recent changes in the epidemiology of dental caries on guidelines for the use of dental sealants. *J Public Health Dent* 1995;55:274-91.
14. Brown L, Kaste L, Selwitz R, Furman L. Dental caries and sealant usage in U.S. children, 1988-1991: Selected findings from the third national health and nutrition examination survey. *JADA* 1996;127:335-43.
15. Francisco Ramos-Gomez, Crystal M, Waing M, Tinanoff N, Featherstone JD. Caries risk assessment, prevention, and management in pediatric dental care. *Pediatr Dent Nov/Dec* 2010;505- 517.
16. Fontana M, Zero D. Assessing patients' caries risk. *JADA Sep* 2006;137:1231-1239.

A Qualitative Study Investigating the Concerns, Awareness and Behaviour of HIV Sero-Discordant Heterosexual Couples in South India

S Soni¹, Naveen R², D Richardson¹, GD Ravindran³

¹Consultants in HIV Medicine, Department of HIV Medicine, Brighton and Sussex University Hospitals NHS Trust, Brighton, UK, ²Assistant Professor, Department of Community Health, St. John's College Hospital, Bangalore, India,

³Professor of Ethics and Consultant in Infectious Diseases, Department of Medicine, St. John's College Hospital, Bangalore, India

ABSTRACT

Negative partners within HIV sero-discordant represent an important at risk group for HIV acquisition. In India, risk reduction strategies target high risk groups but often overlook these individuals. We sought to discover from sero-discordant couples: issues around their awareness and understanding of HIV, changes in their behaviour within the relationship and coping mechanisms following HIV diagnosis and their main concerns for the future, in order to help inform the development of specific counselling strategies. Semi-structured interviews were conducted with discordant couples attending an urban treatment centre in South India. A widespread lack of awareness and heavy presence of stigma around HIV prevailed. Issues such as modes of transmission and prognosis were largely misunderstood and the prevalence of inter-marital difficulties and reduced sexual desire was high. Effective post test counselling is crucial but where ongoing counselling has previously focussed on the positive partner, emphasis should move to couple based strategies which would ensure that both partners receive the same information in a controlled environment and from experienced personnel. Health care professionals should look carefully at their patient's marital circumstances and educate couples about the risks of onward HIV transmission, condom use, issues around family planning and child-wish and most importantly ensure that their emotional needs are addressed.

Keywords: Sero-Discordant, HIV Prevention, HIV Transmission

INTRODUCTION

The World Health Organisation estimates that 2.5 million people in India are infected with HIV, the epidemic predominantly affecting the heterosexual population in both urban and rural areas^{1,2} The incidence of HIV among uninfected partners of HIV-positive persons has been reported as lower than that seen in high HIV prevalence African countries³. Nevertheless, these negative partners still represent a significant risk group for HIV acquisition, monogamous female partners of infected men being particularly important given the potential for onward vertical transmission of HIV to infants. Risk reduction efforts are currently in place that target specific high risk groups⁴ but as yet there are few, if any, designated couple-based counselling services for those in HIV sero-discordant relationships.

We sought to discover from sero-discordant couples: issues around their awareness and

understanding of HIV, changes in their behaviour within the relationship and coping mechanisms following HIV diagnosis and their main concerns for the future, in order to help inform the development of specific counselling strategies that respond to both partners needs whilst also protecting negative partners.

MATERIALS AND METHOD

The participants: HIV discordant married couples were identified through clinic attendance at the antiretroviral treatment (ART) centre and general outpatient department. HIV negative partners were not specifically invited beforehand to attend so only couples who attended together were recruited. This was so as to avoid an extra journey for the HIV negative partner who would not normally have attended.

Couples were included only if both partners were aware of the other's HIV status and the HIV positive

diagnosis had been made more than 3 months prior to interview. Couples were excluded if: one partner declined to participate, partners refused to be interviewed alone, either partner was deemed to have concurrent neuro-cognitive disturbance, speech or hearing impediment or any condition that would affect judgement and ability to understand or answer questions. Suitable couples were approached to consider study participation by the physician they were seeing and if in agreement, were introduced to a researcher (SS) who gave more detailed information about the study. Consent was obtained in the written form and only if both partners agreed to being interviewed and recorded.

Occasionally couples expressed concern that the recordings would be made public allowing for breach of confidentiality. In all cases, we assured subjects that this was not the case and that all recordings were anonymised, kept confidential, only for use by research personnel and would be destroyed after the study was complete.

The interviews: Interviews were semi-structured conversations with open questions and the researcher used closed questions where necessary to gain more information but as infrequently as possible. Interviewees were encouraged to speak as freely as they wanted to. A pre-defined scope of enquiry was used to cover broad themes and to briefly collect demographic data.

Both HIV positive and negative partners were interviewed separately by a medical researcher with trained counsellor who also acted as an interpreter. Subjects were interviewed in the language of their choice, in all but one case this was Kannada. Interviews were conducted in a quiet, closed and private consulting room located within the ART centre. Conversations were recorded using a digital recorder

and transcripts were translated into English by an independent worker who was not part of the research team.

Data analysis: Framework analysis was used. Emersion and re-emersion technique of the transcripts allowed the identification of patterns and sub-themes from pre-defined broad categories. Transcripts were re-read carefully until theoretical saturation had been reached.

Table 1 summarises the broad themes addressed during interviews and the sub-themes derived from these.

Table 1. Themes addressed and sub-themes derived

Relationship with spouse	Sexual Relationship	Male dominance
Knowledge and Awareness	Knowledge	HIV transmission prevention
Coping and counselling	Initial Reaction	Emotional support

Future Concerns Financial Completion of Family

FINDINGS

20 interviews were conducted with 10 discordant couples. Although not planned, in 5/10 couples the HIV positive partner was female and in the other 5/10 was male. Mode of transmission remained unconfirmed in 4/5 male index patients; these men denied any sexual risk taking and equally there was no clear history of receipt of blood products. One man described an incident involving exposure to an unclean blade. 4/5 female index patients had documented histories of blood transfusion prior to diagnosis and 1/5 did not know. In no cases was sexual transmission disclosed as the route of transmission.

Table 2 summarises their demographic and HIV data.

Table 2. Demographic and HIV data of participants

	Couple 1		Couple 2		Couple 3		Couple 4		Couple 5	
	HIV+ Female	HIV- Male	HIV+ Female	HIV- Male	HIV+ Female	HIV- Male	HIV+ Female	HIV- Male	HIV+ Female	HIV- Male
Age (years)	39	45	24	31	37	43	26	27	24	34
Occupation	Tailor	Tailor	Garment factory	Labourer	House wife	Labourer	House wife	Driver	House wife	Builder
Poverty line	Below		Below		Above		Above		Above	
Distance study centre (km)	500		0		40		0		0	
Time since last test	9 months	4 months	10 months	3 months	6 months	3 months	3 years	3 months	2 years	13 months

Table 2. Demographic and HIV data of participants (contd.)

	Couple 1		Couple 2		Couple 3		Couple 4		Couple 5	
Sex	HIV+ Female	HIV- Male	HIV+ Female	HIV- Male	HIV+ Female	HIV- Male	HIV+ Female	HIV- Male	HIV+ Female	HIV- Male
VCT/symptoms/Pregnant	Symptoms		Pregnant		Symptoms		Pregnant		Pregnant	
ART	Yes		Yes		Yes		Yes		No	
Mode of transmission	Blood		Blood		Blood		Unknown		Blood	
Language	Kannada	Kannada	Kannada	Kannada	Tamil	Tamil	Kannada	Kannada	Kannada	Kannada
	Couple 6		Couple 7		Couple 8		Couple 9		Couple 10	
Sex	HIV+ Male	HIV- Female	HIV+ Male	HIV- Female	HIV+ Male	HIV- Female	HIV+ Male	HIV- Female	HIV+ Male	HIV- Female
Age (years)	32	25	43	41	40	35	47	42	36	28
Occupation	Driver	House wife	Mechanic	House wife	Security guard	Garment factory	Own business	House wife	Driver	Garment factory
Poverty line	Below		Above		Above		Above		Below	
Distance study centre (km)	75		500		0		130		50	
Time since last test	5 months	5 months	5 months	5 months	7 months	3 months	9 years	8 years	12 months	9 months
VCT/symptoms/Pregnant	VCT		Symptoms		Symptoms		Symptoms		Symptoms	
ART	No		Yes		Yes		Yes		Yes	
Mode of transmission	Unknown		Unknown		Unknown		Blood		Unknown	
Language	Kannada	Kannada	Kannada	Kannada	Kannada	Kannada	Kannada	Kannada	Kannada	Kannada

Relationship with spouse

Sexual Relationship: All couples described a significant change in their sexual relationship post diagnosis in that sexual activity had decreased or stopped altogether either due to fear of transmission to the negative partner:

“...the children are small, their future is more important. I am facing the disease, why should my wife and children face the same problems in the future?...Why should I transmit to people who are not suffering and destroy their life?” (Couple 6 HIV positive male)

or because of loss of interest and libido:

“Because of the fear I don’t have free mind during sexual activity, I get tensed up during the act, so I have reduced the sexual activity. I also don’t get the pleasure by using condoms.” (Couple 5 HIV negative male)

Male dominance: It was apparent throughout interviewing that the male partner, whether the index case or not, was the dominant partner in the relationship. He was in most situations solely responsible for decision making particularly with regard to sexual activity, disclosure and financial matters.

Knowledge and Awareness

Knowledge: All participants were aware of HIV and its ability to be transmitted sexually and most understood that it could also be transmitted through blood products and possibly infected needles. However, of concern, other routes of transmission were suggested during interviews which appeared to be having an adverse impact on daily life and family dynamics.

“My husband is afraid that the disease can be transmitted by touching, [sharing] use of bedclothes, mosquito bite and will also infect the children.” (Couple 1 HIV positive female)

“My husband has advised me to use different soap, sleep in different bed, he has told me also not to touch my daughter.” (Couple 3 HIV positive female)

Sources of information consisted of media coverage – television and radio broadcasts, billboard posters and healthcare personnel. But worryingly some details were confusing and suggestive of the wrong message being given.

“....message on TV radio inform us that the disease can be transmitted if we use condoms. My husband says he saw this and he believes it....” (Couple 1 HIV positive female)

"...a private doctor... who advised abortion...but I got to know through advertisement that baby of HIV mother can survive....after counselling [at study centre] I was more relaxed" (Couple 5 HIV positive female)

HIV Transmission Prevention: Despite condom use being commonly acknowledged during interview as an effective HIV prevention method when used correctly, some couples stated that it was "better not [to] take any risk", implying that they preferred to abstain from sexual intercourse altogether probably because of concerns about condom accidents and the potential risk of HIV transmission. Questions around post exposure prophylaxis following sexual exposure (PEPSE) were posed only to HIV negative partners and it was made explicitly clear at this time that post exposure prophylaxis is only available in India following occupational exposure and not sexual exposure. All were unaware of the concept of PEPSE. 7/10 partners agreed with the theoretical idea of PEPSE when the question as to whether they would seek help following sexual exposure was put to them.

"I think this [PEP] is a very good idea. I would take if it were available, if to stop the transmission. I will await the services..." (Couple 3 HIV negative male)

Of the 3/10 who did not agree with the concept of PEPSE, 2 declined to comment further as they felt it an irrelevant question if they were not sexually active (male); the other HIV negative partner disliked taking medication (female).

Coping and counselling

Initial Reaction: There were mixed responses in terms of reaction to the initial diagnosis of HIV from both HIV negative and HIV positive partners. Whilst some regarded the news as likely to have a profoundly negative impact on their livelihood, others took a more pragmatic approach by accepting that treatment is available and beneficial to them. There were no apparent differences in the observations made between male and female subjects.

"I was afraid and depressed and couldn't sleep for 1 week. I was very angry with the hospital staff for their negligence." (Couple 5 HIV positive female)

"...felt like life was shattered to pieces and it changed my life....I came to know that medicine was available ...so I came to hospital, I was counselled.....so I came out of my fear and have come to take medicine.....Yes, I am feeling better now." (Couple 7 HIV positive male)

"...I feel sad, life is on a down slide...nothing more to life....[it is] coming to an end....*crying*.." (Couple 6 HIV negative female)

Emotional support: Many subjects, especially women both HIV positive and negative, expressed the desire for more support or some means by which to communicate their feelings and frustrations.

"I worry a lot about my husband....I am also feeling bad because I am not able to express my feelings to others. In the village there is no-one who will understand so I keep it all inside." (Couple 8 HIV negative female)

".....if I can share my sadness with others I will feel better and also get good guidance and solutions to problems." (Couple 1 HIV positive female)

Only 6/10 HIV positive and 4/10 HIV negative partners claimed to have received counselling after being given the results of their HIV test. In the majority of these cases, the HIV positive person was symptomatic and couples were simultaneously faced with the burden of acute illness, sometimes necessitating hospital admission, and a new HIV diagnosis.

"He was with me when we collected the result, actually the report was handed directly to my husband...then they told us to leave without even explaining anything..." (Couple 4 HIV positive female)

All participants were subsequently attending the study centre for care and follow up. Whilst 10/10 HIV positive subjects said that post diagnosis they had received adequate education and counselling at their appointments, only 4/10 HIV negative partners had ever received any information from the clinic regarding modes of HIV transmission, and only 3/10 had received any emotional support.

Future Concerns

Financial: Financial difficulty was a frequently occurring theme. Most participants expressed concerns about managing money both now and in the future in the context of their HIV infection. They discussed current loss of earnings through frequent hospital visits, inpatient stays and days off sick through side effects from medication. They spoke with candid concern for future stability, should either the positive partner become unwell or the negative partner seroconvert. In all couples, the breadwinner was male and financial strife was most apparent among those

with a male HIV positive partner. Describing a vicious circle of loans and increasing debts, some sought help from family but feared the repercussions of having to disclose HIV status.

"I have no support and [if] anything happens to my husband, I have no-one to support me....my husband's relatives give us some money but if they come to know of the disease they will also not support us.....cost of medical bills is increasing...I may have to disclose to my nephew to raise some funds...but I will not tell my husband about this [disclosure]..." (Couple 7 HIV negative female)

"My daughter is 17 years old. She wants to be an engineer. She will go to college next year. I have been saving money all my life for my children's education. Now I have been so long in hospital, all my money is gone....spent on hospital bills. How will I tell her?" (Couple 8 HIV positive male)

Completion of Family: Half of the couples had not completed their families prior to HIV diagnosis; they discussed in the interviews their wish to have more children: however they would not consider further pregnancies because they felt that the difficulties and risks posed to the negative partner and unborn child were too great. Although one couple did not plan for a second child, they were keen to proceed with the pregnancy when it occurred:

"No, it happened by chance...we did not use protection, he was drunk and he could not help his emotions." (Couple 4 HIV positive female)

"I was worried [when wife became pregnant] but I wanted another child so I was mentally prepared for it [if the HIV test was positive]." (Couple 4 HIV negative male)

CONCLUSION

Sex-related subjects are seldom openly discussed in India, stigma and cultural barriers to understanding and the widespread confusion and lack of knowledge about HIV are still heavily present especially within rural communities. The results of this study shed some light on the thoughts, opinions and concerns of sero-discordant couples in Southern India and provide us with important information to consider when planning effective care programmes for this group.

Discordant couples represent an important but often overlooked target for HIV prevention strategies.

Supporting previous work, our study has shown that sexual activity in couples after HIV diagnosis in South India decreases as couples try to maximally reduce the chances of a negative partner becoming infected⁵. Along with this, reduced sexual desire and the possibility of not being able to have children, couples also face drastic emotional upheaval. Whilst promoting condom use in a sexual relationship is crucial, it is also equally important to encourage a healthy sex life as part of positive living, in such circumstances where intimacy and closeness in a relationship may be compromised.

Encouragingly, most negative partners understood and agreed with the concept of PEPSE (despite this not being available locally). However, only 5/10 couples had resumed sexual activity, all of whom were using condoms and none had had a condom accident thus far. In this way, it is difficult to infer that their opinions on PEPSE may actually translate into them accessing PEPSE following exposure. Clearly the issue of PEPSE availability in India is more complex and controversial; largely financial constraints and the widespread but unfounded belief that its use may promote unsafe sex⁶ ensure that the availability of PEPSE remains restricted. Post exposure prophylaxis is given to healthcare workers post occupational exposure and we feel that negative partners in discordant couples may represent a suitable at risk group who could benefit. Further studies on cost effectiveness and acceptability of PEPSE are needed to define whether such an intervention would be worthwhile in India.

Recruiting couples where the index partners are male and female allows us to draw comparisons in attitudes to and knowledge of HIV between the sexes post diagnosis. In this study, male participants both HIV-positive and negative displayed more power and control in the relationship, being instrumental to decisions regarding sexual activity and what constituted risk, healthcare seeking practices, disclosure and child-wish. In a minority of cases, there were also reports of psychological abuse from male partners. Several studies in India have reported women's relative lack of autonomy and sexual decision making power⁷, but whilst our study reflects these findings, our female participants did not report any history of coercion or non-consensual protected or unprotected sexual intercourse, as has been extensively described previously and in other resource poor countries⁸.

One of the limitations of this study is that it took place in a hospital rather than community setting and HIV-negative partners voluntarily attended with their infected spouses. This biases our study sample towards couples who were already supportive of their partner's HIV diagnosis and we may have missed sero-negative partners who are dismissive of and who possibly abuse and stigmatize their HIV-positive spouse. In this way, our sample may not be representative of other sero-discordant couples in this region and further study in a less clinical environment may be warranted.

In conclusion, counselling programmes and emotional support services need to have strong presence in both urban and rural areas where HIV testing is taking place. Where these have previously focussed on the positive partner, emphasis should move to couple based strategies which would ensure that both partners receive the same information in a controlled environment and from experienced personnel. Health care professionals should look carefully at their patient's marital circumstances and educate couples about the risks of onward HIV transmission, condom use, issues around family planning and child-wish and most importantly ensure that their emotional needs are addressed.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the staff at the ART Centre in St. John's Hospital, Bangalore.

Conflict of Interest: None

REFERENCES

1. 2.5 million people living with AIDS in India, UNAIDS (2007) http://data.unaids.org/pub/PressRelease/2007/070706_india_pressrelease_en.pdf
2. HIV Fact sheets 2006, NACO. http://www.nacoonline.org/upload/NACO%20PDF/HIV_Fact_Sheets_2006.pdf
3. Mehendale SM, Ghate MV, Kishore Kumar B, Gamble TR et al. (2006) Low HIV-1 incidence among married sero-discordant couples in Pune, India. *JAIDS* 41(3)2006;371-373 doi: 10.1097/01.qai.0000209905.35620.48
4. Priorities and Thrust areas, NACO (2007) http://www.nacoonline.org/National_AIDS_Control_Program/Programme_Priorities_and_Thrust_Areas/
5. Rogers MC, Gopalakrishnan G, Kumarasamy N et al.(2005) HIV in couples in South India; implications for prevention. *Int J STD & AIDS*; 16: 442-445 doi: 10.1258/095646205409412
6. Dhanure SS, Shankpal PD, Rao SN, Deshmukh (2002, July) YA Post exposure prophylaxis policy in India. Poster session presented at International Conference on AIDS, Barcelona, Spain
7. Jejeebhoy SJ, Sathar ZA. (2001) Womens autonomy in India and Pakistan: the influence of region and religion. *Population and development review.*; 27 :687-712 doi: 10.1111/j.1728-4457.2001.00687.x
8. Garcia-Moreno C, Jansen HA, Ellsberg M, Heise L, Watts CH (2006) Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *Lancet*, 368; 1260-1269 doi:10.1016/S0140-6736(06)69523-8

The Study of Sensorineural Hearing Loss in Pseudoexfoliation Syndrome

Sameena Kokab¹, Jyothi Chavadaki², Neelkant S³, Sreekantha⁴

¹Assistant Professor, Department of Ophthalmology, ²Associate Professor, Department of Otorhinolaryngology, ³Associate Professor, Department of Orthopaedics, ⁴Associate Professor, Department of Biochemistry, Navodaya Medical College, Hospital and Research Centre, Raichur, Karnataka

ABSTRACT

Purpose: Determine hearing thresholds at sound frequencies important for speech comprehension in subject with ocular pseudoexfoliation (PXF) and to compare them with that of control without PXF.

Method: 60 subjects with ocular PXF and 60 age and sex matched controls without PXF were enrolled in this case-control study. Pure tone audiometry (bone conduction) was performed at 1,2 and 3 kilohertz (KHz) in all subjects. Thresholds were compared to an age and sex stratified standard (ISO7029) and between study groups. Hearing loss was defined as sum of tested hearing thresholds (HTL-1,2,3) lower than the ISO7029 standard median.

Results: The study included 35 males and 25 females subject in each group. Hearing loss was present in 97 of 120 (80.83%) of examined ears in the case group Vs 52 of 120 (43.3%) in the control group [$P < 0.001$; odds ratio(OR) = 5.51; 95% confidence interval (CI)]. overall 54 subjects (90%) in the case group Vs 37 subjects 61.6 % in the control group had hearing loss in one or both ears ($P < 0.001$; odds ratio(OR) = 5.5;

95% confidence interval. Hearing thresholds at each of the examined frequencies and the HTL- 1,2,3 were also significantly higher in individuals with PXF.

Conclusions: Hearing thresholds at frequencies which are important for speech comprehension are significantly worse in individuals with ocular PXF as compared to matched controls. This finding may support the multi-organ nature of PXF syndrome.

Keywords: PXF syndrome and Hearing loss

INTRODUCTION

Pseudoexfoliation syndrome [PXF] was first reported by Lindberg in 1917 in a Finnish population.¹ PXF is characterised by grey-white fibrillogranular extracellular deposits in ocular structures such as anterior capsule, iris, anterior chamber angle, zonules, ciliary body, anterior vitreous fare and conjunctiva.²

PXF is usually formed in eyes of individuals over 50 years of age with a prevalence ranging from 0.4 to 24% in different studies.³ Histopathologically, PXF deposits are composed of periodic acid Schiff positive and congored positive material resembling amyloid. Ultrastructurally, these deposits contain microfibrils measuring 8-10 nm in diameter composed of laminin, fibrillin, alpha-elastin, fibronectin, heparin and chondroitin sulphate.⁴ In addition to intraocular deposits, PXF material is formed in the heart, lung, liver, gall bladder and arteries, which cause systemic vascular disorders including systemic hypertension, abdominal aortic aneurysms, Ischaemic heart disease, Alzheimer's disease , retinal vascular disorders and age related macular degeneration. ⁵

Corresponding author:

Sreekantha

Associate Professor,
Department of Biochemistry,
Navodaya Medical College,
Raichur-584103, Karnataka
Contact Number- 09481389119.
Email ID- grsreekantha@yahoo.com

The organ of Corti is a complex structure in the inner ear which contains hair cells that are located on

the basilar membrane and are overlaid by the tectorial membrane. There are 2 types of hair cells in the cochlea: the inner and outer hair cells. One row of inner cells spirals up the cochlea near the central axis, while 3-4 rows of adjacent outer hair cells spiral up the cochlea further from the central axis. The tectorial and basilar membranes are connected centrally. Sound moves these structures differentially and produces a sheer force that bends the stereocilia. The tectorial membrane covers the stereocilia. The conversion of the mechanical energy produced by a sound wave to electrical energy requires deflection of stereocilia, induced by a shearing motion between the reticular lamina and the tectorial membrane. This shearing motion is produced by the basilar membrane moving as a result of the travelling sound wave.^{6,7,8}

Embryologically, the anterior structure segment of the eye as well as the tectorial and basilar membranes in the inner ear are all derived from neural ectoderm. Fibrils of PXF material that accumulate on lens, pupillary margin and other anterior segment structures can also accumulate on the tectorial and basilar membranes as well as stria vascularis in the inner ear.⁹

Sensory neural hearing loss [SNHL] and presbycusis maybe attributed to various etiologies such as toxic agents, acoustic trauma or the aging process; however the exact mechanism is unknown.¹⁰

The goal of our study is to evaluate correlation between PXF and SNHL [and to assess the possible systemic nature of this syndrome]

MATERIALS AND METHOD

Period of study: June 2011 to June 2012.

Study place: Navodaya Medical College and Hospital, Raichur.

This case control study included patients with evidence of ocular PXF and equal number of age and sex matched controls. This study was approved by the institutional ethical committee and an informed consent was filled in by all patients prior to enrollment. All 60 individuals of other ophthalmologic problems who had been ophthalmologically proven to have no Pseudoexfoliative disorder were categorised into the control group. All 60 subjects aged between 55-80 years underwent a complete

ophthalmologic examination including determination of Best Corrected Snellen Visual Acuity. Slit lamp examination, Goldmann appplanation tonometry, gonioscopy and dilated ophthalmoscopy using a +90 D lens. The presence of PXF material on the iris, lens capsule, angle, corneal endothelium was confirmed. Patients were excluded if there was head trauma, acute/chronic ear disorders, regular noisy environment, ototoxic drug intake such as gentamycin or streptomycin.

All patients were referred to ENT department at NMCH, Raichur for audiological assessment and cases with evidence of Upper respiratory tract infection, history of otic surgery, past/recent history of tympanic membrane perforation excluded.

One masked operator performed bilateral pure tone audiometry using same device for both case and controls. Hearing thresholds were determined using pure tone audiometry in bone conduction at 1, 2 and 3 kHz frequency which are thought to be important for speech comprehension. Testing was started 40db above the expected thresholds and repeated at 10db decrements. Thresholds were determined when subjects could hear atleast 2 of 3 stimuli. The sum of the thresholds was compared with ISO 7029 standard. ISO 7029 standard is the result of a meta analysis of large community based studies to determine the normal distribution of hearing thresholds at different frequencies in ontologically normal white subjects.

Hearing loss was defined if HTL- 1, 2, 3 was higher than the sum of corresponding normal median thresholds as determined by the ISO 7029 standard. The rate of hearing loss in one or both ears was compared between cases and controls, furthermore average hearing thresholds at each frequency was compared between cases and controls.

Data was analysed using unpaired student t-test for continuous variables chi-square test for categorical variables. P-value of <0.05 was considered statistically significant.

RESULTS

Overall, 120 subjects were enrolled in this case control study which included 60 patients with PXF syndrome and 60 age and sex matched controls [35 male and 25 females in either study group]

Table 1: Distribution of PXF among the study group

	Single eye	Both eyes	Total
Male	12	23	35
Female	10	15	25
Total	22(36.6%)	38(63.33%)	60

Table 1 shows that PXF is more frequent in males and both eyes are more frequently affected in both genders.

Table 2: Demographic characteristics

Age group (years)	Male		Female	
	Case	Control	Case	Control
50-54	2	3	0	0
55-59	4	3	1	1
60-64	11	12	7	5
65-69	7	6	7	8
70-74	6	6	6	6
75-79	5	5	2	3
80-84	0	0	2	2
85	0	0	0	0
Total	35	35	25	25

Mean age of male participants in case group: 65.71 years

Mean age of male participants in control group: 65.43 years

Mean age of female participants in case group: 68.4 years

Mean age of female participants in control group: 69.2 years

Table 3. Mean hearing thresholds

Frequency (Khz)	Mean Hearing Threshold	
	Cases (db)	Controls (db)
1	30.5+/-15.5	15.5+/-12.5
2	36.5+/-18.5	20.5+/-15.5
3	48+/-15.5	30.5+/-20.5

Hearing loss was present in 97 of 120 (80.83%) of examined ears in the case group Vs 52 of 120 (43.3%) in the control group [P<0.001; odds ratio(OR) = 5.51; 95% confidence interval (CI)]. overall 54 subjects (90%) in the case group Vs 37 subjects 61.6 % in the control group had hearing loss in one or both ears (P<0.001; odds ratio(OR) = 5.5;

95% confidence interval. Hearing thresholds at each of the examined frequencies and the HTL- 1,2,3 were also significantly higher in individuals with PXF.

DISCUSSION

Sensorineural hearing loss and presbycusis maybe due to various reasons such as toxin agents, acoustic trauma or the aging process; however the exact mechanism is unknown^{11,12} Accumulation of pseudoexfoliation material in the basilar or tectorial membrane of the organ of Corti in the inner ear explain the association of ocular PXF and hearing loss.

Basilar and tectorial membrane in the inner ear and anterior segment structures of the eye originate embryologically from the neural ectoderm. Type IV collagen, present in crystalline lens has also been demonstrated in tectorial and basilar membrane in addition to type II collagen and proteoglycan glycoproteins.^{13,14}

The existence of pseudoexfoliative material in the organ of Corti may result in increase in the hearing threshold. The structural changes in the organ of Corti due to deposition of fibrillar PXF in the basilar and the tectorial membranes may affect conversion of the mechanical energy produced by sound wave to bioelectrical energy resulting in SNHL. Another mechanism is due to deposition of fibrillar PXF in the vessel walls of vascular structures supplying the inner ear causes a decrease in nourishment of the inner ear and worsening in the metabolism of striae vascularis.^{15,16} However the exact mechanism explaining hearing loss in patients with PXF are not known and remain to be clarified.

Correlation and association of PXF syndrome and SNHL have been demonstrated in several studies. This study was undertaken as it was easy and cheap way to evaluate the systemic nature of this syndrome. More studies like biopsy and specific staining are needed to evaluate other organs such as ears etc. The disability caused by hearing impairment, even in one ear leading to loss of stereoacousis may have a major impact on the functional capacity of aging individuals. By considering hearing loss as one abnormality in PXF syndrome, ophthalmologist may have a chance to promote rehabilitation for patients beyond their field.

Source of funding: Nil

Ethical clearance: Taken

Conflict of interest: Nil

ACKNOWLEDGEMENT

Authors are extremely thankful to Dr.S.R.Hegde, Medical Director of NMC,Raichur.

REFERENCES

1. Ritch R, Schlotzer-Schtchardt U. Exfoliation syndrome. *Sure Ophthalmol* 2001; 45:265-315. Review .
2. Skuta GL, Morgan RK. Exfoliation syndrome, pigment dispersion syndrome and the associated glaucomas. In: Tasman W, Jaeger EA eds. *Duanes clinical ophthalmology. On CD-ROM, New York: Lippincot; 2005: Vol 3, Chap 54B.*
3. Young AL, Tang WW, Lam DS. The prevalence of pseudoexfoliation syndrome in Chinese people. *Br J Ophthalmol* 2004; 88: 193-195.
4. Streeten BW, Li ZY, Wallace RN, Eagle RC, Keshgegian AA. Pseudoexfoliative fibrillopathy in visceral organs of patient with pseudoexfoliation syndrome. *Arch Ophthalmol* 1992; 110; 1757-1762.
5. Yazdani Sh, Tousi A, Pakravan M, Faghihi AR. Sensorineural Hearing loss in Pseudoexfoliation Syndrome. *Ophthalmology* 2008; 115(3): 425-429.
6. Jafek BW, Stark AK 1st ed. Philadelphia: Hanley and Belfus Inc;1996. ENT secrets; pp. 11-26.
7. Lim DJ. Functional structure of the organ of corti: a review. *Hear Res.* 1986;22(1-3);117-146.
8. Tsuprun V, Santi P. Ultrastructural organization of proteoglycans and fibrillar matrix of the tectorial membrane. *Hear Res.* 1986;110(1-2): 107-118.
9. Shaban RI, Asfour WM. Ocular pseudoexfoliation associated with hearing loss. *Saudi Medical Journal* 2004; Vol 25 (9): 1254-1257.
10. Davis A. Epidemiology of hearing and balance disorder: Adult audiology. In: Kerr AG, Stephens D, editors. *Scott – Brown’s Otolaryngology. 6th ed. Oxford. United Kingdom: Butterworth-Heinemann; 1997.pp 231-238.*
11. Kerr AG ed. Epidemiology. In : *Scott-Brown’s Otolaryngology. 6th ed. Oxford : Butterworth-Heinemann;1997: Vol 2, Chap 3*
12. Goodwin WJ, Balkany T, Casiano RR. Special considerations in managing geriatric patients. In: Cummings CW ed. *Otolaryngology & head & neck surgery. 3rd ed. St Louis: Mosby; 1998: 314-326.*
13. Thalman I. Collagen of accessory structures of the organ of the corti. *Connect Tissue Res* 1993; 29: 191-201.
14. Kalluri R, Gattone VH 2nd, Hudson BG. Identification and localisation of type IV collagen chains in the inner ear cochlea. *Connect Tissue Res* 1998;37: 143-150.
15. Mitchell P, Wang JJ, Smith W. Association of pseudoexfoliation syndrome with increased vascular risk. *Am J Ophthalmol* 1997; 124: 685-687.
16. Saatci OA, Ferliel ST , Ferliel M, Kaynak S, Ergin MH. Pseudoexfoliation and glaucoma in eyes with retinal vein occlusion. *Int Ophthalmol*1999;23: 75-78.(Footnotes)

A Comprehensive Review on Breast Cancer

Arjun Patidar¹, S C Shivhare², Umesh Ateneriya³, Sonu Choudhary⁴

¹Asst Prof., Department of Pharmacology, BM College of Pharmacy Education and Research, Indore, MP, India,

²Department of Pharmaceutical Biotechnology, MJRP Health and Allied Science College, MJRP University Jaipur,

³Asst Prof., Department of Pharmaceutics BM College of Pharmacy Education and Research, Indore, MP, India, ⁴BM College of Pharmacy Education and Research, Indore(MP)India

ABSTRACT

The incidence of Breast Cancer is increasing, particularly in previously low incidence area such as Asian developing country like India. In the Present article Authors tried to review the Breast cancer statistics with the help of Graphical data. The comprehensive study also review with special account on causes, cancer types, different stages sign and symptoms, methods of detecting with their treatments as Radio therapy, Chemotherapy, Surgery and also have shown the various food and nutraceuticals which can be used as a preventive food for cancer.

Keywords: Breast Cancer, Statistics, Causes, Stages, Diagnosis, Treatment

INTRODUCTION

The incidence of breast cancer is rising in every country of the world especially in developing country such as India. There has been no improvement in breast cancer presentation over the past 5–10 years, in spite of breast awareness programmers. Much of the increase of breast cancer in India has been associated with greater urbanization and changing life styles. Breast cancer continues to affect a young population and patients still present late with advanced disease. Breast Cancer is cancer originating from breast tissue, most commonly from the inner lining of milk ducts or the lobules that supply the ducts with milk. Cancers originating from ducts are known as Ductal carcinomas, those originating from lobules are known as lobular carcinomas. Breast cancer is a disease of humans and other mammals. Breast Cancer occurs when a mutation takes place in the cells that line the lobules that manufacture milk or more.

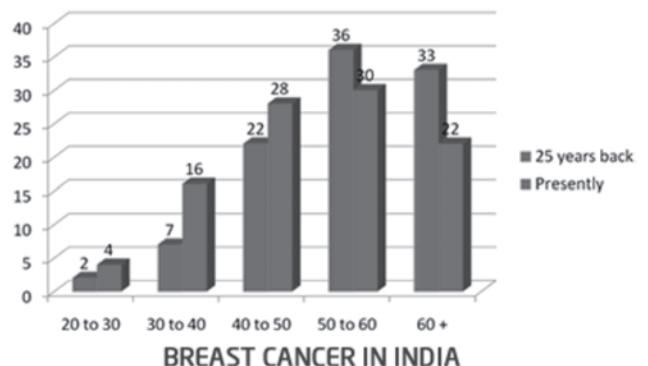
Breast Cancer Statistics^[1-3]

- Every three minutes, a woman in the United States is diagnosed with breast cancer.
- Every twelve minutes a woman dies from breast cancer.
- This year, approximately 182,800 women in the United States will be diagnosed with invasive breast cancer.
- Approximately 40,800 women will die from breast cancer.

- The most common form of cancer among women
- The second most common cause of cancer related mortality
- 1 of 8 women (12.2%)
- One third of women with breast cancer die from breast cancer, no one dies of cancer in the breast, only of cancer that has spread to other parts of the body.

Graphical representation of breast cancer in India

In India, the average age of developing a breast cancer (shown in graph 1.) has undergone a significant.



- a) The horizontal line lower down represents the age groups: 20 to 30 years, 30 to 40 yrs and so on. And the vertical line represents the percentage of cases.

- b) The blue color represents the incidence 25 years back, and maroon color represents the situation today.
- c) 25 years back, out of every 100 breast cancer patients, 2% were in 20 to 30 years age group, 7% were in 30 to 40 and so on.
- d) 69% of the patients were above 50 years of age. Presently, 4% are in 20 to 30 yrs age group, 16% are in 30 to 40, 28% are in 40 to 50 age group. So, almost 48% patients are below 50. An increasing numbers of patients are in the 25 to 40 years of age, and this definitely is a very disturbing trend.

Causes and Risk Factors For Breast Cancer ^[4-8]

Some of the causes that have been collectively associated with breast cancer are:

1. **Hormone therapy:** to reduce symptoms menopause
2. **Exogenous Estrogen:**
 - Hormonal replacement therapy(HRT)
 - 30% increased risk with long term use
 - Oral Contraceptives(OC)
3. **Pregnancy:** an early first pregnancy reduces the risk of breast cancer
4. **Genetic factors:** play a big rule in the type of breast cancer affecting young women
5. **Breast cancer virus:** Since the 1930s researchers have been looking for a virus analogous to the mamma-tumor-virus causing benign cancer in mice
6. **Birth control pills:** The adverse effect of these drugs hasn't been completely discovered; however there is a moderate risk increase if the medication has been taken for longer than 5 years.
7. **Age:** The chance of breast cancer depends on age, as the person gets older the chances of it are more.
8. **Inheritance:** Family history of close relative like mother, sister and daughter who has been diagnosed with breast cancer increases the risk factor.
9. **Early menses or menopause:** Early start onset of menses and early menopause are also associated

with breast cancer.

10. **Radioactivity:** Exposure to radioactive rays is carcinogenic and increases the chances of breast cancer.
11. **Hormone Replacement Therapy:** Using hormone replacement therapy might also cause it.
12. **Exposure to harmful chemicals:** Working in a chemical factory that uses harmful chemicals like Organ chlorines.

Abnormal Signs and Symptoms ^[4-8]

Lump formation: A lump in the breast, is often the first apparent symptom of breast cancer, breast lumps are usually painless, although some may cause a prickly sensation. Lumps are usually visible on a mammogram long before they can be seen or felt.

Pain or tenderness: Pain & tenderness occur in the breast

Redness: reddish, pitted surface like the skin of an orange is symptomatic of advanced breast cancer.

Change in nipple position: A change in the nipple, such as an indrawn or dimpling look,

Itching or burning sensation, or ulceration, scaling of the nipple is symptomatic of Paget's disease, a localized cancer.

Scaling around nipples:-Any change in the contour, texture or temperature of the breast, reddish, pitted surface like the skin of an orange symptomatic of advanced breast cancer.

Sore on breast that does not heal:-The sore or wound on breast that cannot be heal early.

Dimpling: An indrawn or dimpling look, itching or burning sensation, or ulceration,

Retraction: A noticeable flattening or indentation on the breast which may indicate a tumor that cannot be seen or felt.

Nipple discharge: Unusual discharge from the nipple that may be clear, bloody or of another color, usually caused by benign conditions but possibly due to cancer.

Stages of Breast Cancer ^[22-24]

The stages of breast cancer has designated as TNM.

T= tumor size

N = lymph node involvement

M = metastasis

Stage -I

- Tumor < 2.0 cm in greatest dimension
 - No nodal involvement
 - No metastases
1. The first stage is stage 0 this stage is sometimes referred to as a 'non-invasive carcinoma'
 2. In this stage there are abnormal cells present that might suggest that one is at higher risk for cancer.
 3. Some women chose to have a double mastectomy to avoid the potential of cancer, while others take tamoxifen.
 4. Either way it's important to have regular checkups with your doctor.

Stage II

- Tumor > 2.0 < 5 cm
 - Ipsilateral axillary lymph node (N1)
 - No Metastasis
1. Stage II is when the cancer is anywhere from 1-2 cm across, and has spread into the surrounding areas including the lymph nodes (which must also be removed to prevent the further spread of the cancer)

Stage-III

- Tumor > 5 cm (T3)
 - or ipsilateral axillary lymph nodes fixed to each other or other structures (N2)
 - Involvement of ipsilateral internal mammary nodes (N3)
- v Inflammatory carcinoma (T4d)
 2. This is the stage for cancer in the advanced stages. Its more than 2 cm across and has spread to the lymph nodes.
 3. A type of cancer most associated with this is called inflammatory breast cancer, because the breast is

inflamed because the cancer is blocking the lymph nodes.

Stage IV (Metastatic breast cancer)

- Any T
 - Any N
 - Metastasis (M1)
1. The last stage of cancer is stage IV. In stage IV, the cancer has spread past the breast and the lymph nodes and needs immediate treatment of chemotherapy and hormonal therapy to keep it under control.
 2. Then there is remission. If you are in remission you have an extremely high risk of reoccurrence within the first 5 years after the last known cancer is killed.

Types of Breast Cancer^[24]

A) In Situ Breast Cancer

- a. In Situ Breast Cancer remains within the ducts or lobules of the breasts.
 - b. This type of cancer is only detected by mammograms – not by a physical examination.
- **Intraductal:** If the cancer is in the duct it is called Ductal Carcinoma.
 - **Intralobular:** If the cancer is in the lobule of the breast, it is called Lobular Carcinoma (Intralobular) *in situ*.
- a. This type of cancer is most common among premenopausal women.
 - b. There is also a slight chance that if a woman has this type of cancer she is at risk that it would occur in the other.

B) Invasive Breast cancer

Infiltrating Breast Cancer

- Breast cancer is considered infiltrating or invasive if the cancer cells have penetrated the membrane that surrounds a duct or lobule.
- This type of cancer forms a lump that can eventually be felt by a physical examination.

Infiltrating ductal carcinoma

- Called "Infiltrating Ductal Carcinoma"
- It is the most common type of breast cancer.
- Cancer cells that are invading the fatty tissue around the duct, they stimulate the growth of non-cancerous scar like tissue that surrounds the cancer making it easier to spot.

Infiltrating Lobular carcinoma

- Called "Infiltrating Lobular Carcinoma"
- Occurs when cells stream out in a single file into the surrounding breast tissue. This type of cancer is harder to detect on a mammogram because there is no fibrous growth.

Methods Of Detection Of Breast Cancer. ^[6-9]

A) Clinical examination

- Performed by doctor or trained nurse practitioner
- Annually for women over 40
- At least every 3 years for women between 20 and 40
- More frequent examination for high risk patients

B) Mammography

- Is an x-ray examination with a special apparatus.
- The breast is compressed between two plates of plexiglass to keep the breast in position
- The applied x-rays are rather soft (26-30 keV) to increase the contrast à small neoplastic tissue formations can be seen
- Has been shown to save lives in patients 50-69
- Data mixed on usefulness for patients 40-49
- Normal mammogram does not rule out possibility of cancer completely
- American Cancer Society recommends that Women (asymptomatic) 40 years of age and older should have a mammogram every year.

C) Breast Self Examination

- Opportunity for woman to become familiar with her breasts

- Monthly exam of the breasts and underarm area
- May discover any changes early
- Begin at age 20, continue monthly

Other Forms of Detection

- Sonogram
- Thermography
- Transillumination
- Xeromammography
- CT Scan
- MRI

Treatment of Breast Cancer ^[9-21, 24]

Treatment of breast cancer is performed with the help of various methods like:-

- Chemotherapy
- Radiation Therapy
- Drugs
- Surgery

A) Chemotherapy of breast cancer

Chemotherapy works by destroying cells that are dividing and multiplying all the time.

- Chemotherapy is used for treatment of breast cancer because there is a possibility of the cancer to spread to other parts of the body.
- Chemotherapy works better for premenopausal women.
- Systemic chemotherapy can prevent the spread of cancer.
- Chemotherapy drugs are administered intravenously.
- Chemotherapy affects the whole body even if the cancer has not spread.
- Chemotherapy is often administered prior to surgery to reduce the size of the tumor to leave clear margins.
- Chemotherapy also reduces your leukocytes (white blood cells that is also our immune system), making you more susceptible to every day bugs.

- The side effects include nausea and, losing all your hair.
- It's administered through and IV or its also available in pill, and liquid form.
- As always it's your choice and should not be taken lightly.

Chemotherapy Agents

- Cyclophosphamide (Cytosan)
- Doxorubicin (Adriamycin)
- Paclitaxel (Taxol)
- Tamoxifen (Nolvadex)
- Trastuzumab (Herceptin)

Alkylating Agents

Example: Cytosan, Cyclophosphamide, Thiotepea

- These types of drugs usually damage the programs that control the growth in tumor cells.

Antimetabolites

Example: Methotrexate, 5-fluorouracil, 6-Mercaptopurine

- This type of drug interferes with the making of nucleotides, which are the substances that make up DNA.

Natural Products

Example:- Vincristine, vinblastine, Bleomycin, Dactinomycin

- These drugs interfere with cell structure as well as cell division.

Hormones

Example: Prednisone, Testosteronepropionate, Tomoxifen

- Ø Hormones affect the growth of hormones and usually enhances the effects of other cytotoxic drugs.

B) Radiation Therapy

- Radiation, at high energy levels, has the ability to destroy what is in its path, including normal and abnormal cells.
- Fortunately new technologies have found a way to battle cancer with radiation.

- Radiation usually destroys rapidly dividing cancerous cells.
- Normal cells have the ability to repair themselves.
- Radiation kills the cancer cells left after surgery.
- Radiation therapy doesn't make you radioactive.
- Radiation is painless when it's delivered, but it will become more painful over time.
- Treatments will be given up to 5-7 weeks, 5 days a week.
- Treatments only take ½ hour so you can keep your routine.
- Your hair won't fall out unless you are also taking chemotherapy.
- Your skin in the area may become red and easily irritated.
- Radiation after surgery reduces the chances of the cancer reoccurring.

C) .Surgery

- Oldest treatment
- Lots of advancement have taken place over last few years
- Surgery has role in prevention of cancer – removal of non-vital organ.

Mastectomy:

- A mastectomy is the surgical removal of the breast, non-protruding breast tissue, the lymph nodes in the armpits and some pectoral muscle.
- Breast reconstruction surgery may be conducted after the removal of the breast.

Lumpectomy:

- In this surgical procedure, the breast is conserved and the tumor is removed.
- Radiation commonly follows a lumpectomy to try to rid the body of any other cancerous cells.

Prevention of Breast Cancer

Various substance or factor that can help an individual to prevent breast cancer which are as follows:

Fat

- Research shows that dietary fat should be 20% or less in order to gain meaningful protection against cancer.
- Fat cells make estrogen, which promotes breast cancer.
- Diets high in fat are associated with the increasing breast density in mammograms, which makes interpretation more difficult.

Fiber

- Fiber provides protection against breast cancer because it has a mechanism that decreases the amount of estrogen in the body.
- The amount of fiber in the diet affects the activities of intestinal bacteria, which affects the amount of reabsorbed estrogens

Antioxidant nutrient

- Antioxidants are important in fighting breast cancer because they can disarm cancer-causing substances called free radicals.
- Vitamin C
- Vitamin E
- Beta-carotene
- Vitamin A
- Selenium

Other Preventative Measures

- Early Detection
- Exercise
- No Smoking
- Good Diet

CONCLUSIONS

There are two important aspects in breast cancer prevention: early detection and risk reduction. Screening may identify early noninvasive cancers and allow treatment before they become invasive or identify invasive cancers at an early treatable stage. Treatments are constantly evaluated in randomized, controlled trials, to evaluate and compare individual drugs, combinations of drugs, and surgical and

radiation techniques. Education needs to be intensified, in addition to the usual lifestyle recommendations, may also be considered. Further research is needed to address these issues and change the trend.

ACKNOWLEDGEMENT

Authors are very much Thankful to BM college of Pharmaceutical Education and Research, Indore and MJRP Health and Allied Science college, MJRP University Jaipur for providing the necessary facilities of library, internet to design this review work.

REFERENCES

1. Ries L, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Edwards BK. (eds) *Seer Cancer Statistics Review, National Cancer Institute. Bethesda;1973-1998; MD. 2001*
2. Henderson IC. Breast cancer. In: Murphy GP, Lawrence, Jr. WL, Lenhard, Jr. RE (eds). *American Cancer Society Textbook of Clinical Oncology, 2nd ed. American Cancer Society. Atlanta, GA; 1995.*
3. International Agency for cancer research. *IARC Handbook for cancer prevention. Volume6; 2002.*
4. *Managing side effects of chemotherapy and radiation therapy. By Marylin J. Dodd (1 and 29); 1987.*
5. Chau B, Olivottoia, Weir L, Kwin W, Truong P, Ragas J. *Increased use of adjuvant regional therapy for node positive breast cancer in British Columbia Breast J; 2004*
6. Hortobagyi GN. *Treatment of breast cancer. NEJM. 1998; 339: 974-984*
7. Osteen R, Breast cancer. In Lenhard RE, OSTEEEN RT, Glansler T. *Ads, clinical Oncology Atlanta. GA, a MWRICAN Cancer Society. 2001. 251-268.*
8. Greenlee RT, Hill-Harmon MB, Murray T, Thun M. *Cancer statistics, 2001. CA-A Cancer Journal for Clinicians. 2001.*
9. Hulka BS, Stark AT. *Breast cancer: cause and prevention. Lancet. 1995; 346:883-887.*
10. Kerlikowske K, Barclay J. *Outcomes of modern screening mammography. Monogr Natl Cancer Inst. 1997; 22:105-111.*
11. Badoe EA, Baako BN. *The Breast. In: Badoe EA, Archampong EQ, da Rocha-Afodu, editors. Principles and Practice of Surgery including pathology in the tropics. Accra: Department of Surgery, University of Ghana Medical School; 2000; 449-477.*

12. Biritwum RB, Gulaid J, Amaning A O. Pattern of diseases or conditions leading to hospitalisation at the Korle Bu Teaching hospital. *Ghana Med J.* 2000; 34:197–205.
13. Archampong EQ. Breast Cancer. *Ghana Med J.* 1977; 16(2):63.
14. Asumanu E, Vowotor R, Naaeder SB. Pattern of breast diseases in Ghana. *Ghana Med J.* 2000; 34:206–209.
15. Greene FL, Page DL, Fleming ID, Fritz AG, Balch CM, Haller DG, Morrow M, editors. *AJCC Cancer Staging Manual.* Springer The Breast. 2002; 6: 221–245.
16. Anim JT. Breast Cancer in Accra. *Ghana Med J.* 1979; 18:161–167.
17. Hecht J, Winchester D. Male breast cancer. *Am J ClinPathol.* 1994;102: 25–30.
18. Akosa AB, Ampadu FO, Tettey Y. Male Breast Cancers in Ghana. *Ghana Med J.* 1999; 33: 3–8.
19. Kidmas AT, Ugwu BT, Manasseh AN, Iya D, Opaluwa AS. Male breast malignancy in Jos university teaching hospital. *West Afr J Med.* 2005 Jan-Mar; 24(1): 36–40
20. Dixon JM, Mansel RE. Symptoms, Assessment and guidelines for referral. In: Dixon JM, editor. *ABC of Breast Diseases.* BMJ Publishing Group; 1995; 1–6.
21. Seralini G, Moslemi S: Aromatase inhibitors: past, present and future. *Mol Cell Endocrinol* 2001 Jun 10;178: 117-131.
22. Early Breast Cancer Trialists Collaborative Group. Tamoxifen for early breast cancer: an overview of the randomized trials. *Lancet.* Breast cancer that has progressed after chemotherapy for metastatic disease. *J ClinOncol* 1999 Sep;17(9):26
23. Qaseem A, Snow V, Sherif K, Aronson M, Weiss KB, Owens DK. Screening mammography for women 40 to 49 years of age: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* Apr 3 2007; 146(7): 511-515.
24. Saslow D, Boetes C, Burke W, et al. American Cancer Society guidelines for breast screening with MRI as an adjunct to mammography. *CA Cancer J Clin.* Mar-Apr 2007;57(2):75-89.

Comparison of I-gel and LMA-Supreme Laryngeal Mask Airway in Laparoscopic Surgery: A Prospective Randomized Study

Arati Srivastava¹, Pradeep Tyagi²

¹Professor, ²Assistant Professor, Department of Anesthesiology, School of Medical Sciences & Research, Greater Noida, Sharda University, India

ABSTRACT

Background: The LMA Supreme (LMA) and the i-gel are two supra-glottic airway devices, which offer potential benefits in general anaesthesia.

Aims: The aim of this study was to observe benefits of LMA Supreme over i-gel for ventilation in patients undergoing laparoscopic surgery.

Settings and Design: We performed a prospective randomized study on 100 consecutive patients undergoing laparoscopic surgery in our hospital.

Patients and Method: Hundred selected patients, who underwent laparoscopic surgery, of age ranging from 20-55 years, were randomized into two equal groups. In the group I (n=50) LMA SUPREME (No.3 & 4) and group II (n=50) i-gel (No. 3 & 4) were introduced for ventilation during general anaesthesia. In this study, we compared the insertion success rate and ventilation profile between the LMA Supreme and the i-gel groups undergoing laparoscopic surgery. The first-time success rate, insertion time, ease of insertion of gastric tube and complications were analysed.

Statistical analysis: Unpaired 't' test & 'Z' test were used for statistical analysis.

Results: We found better first time success rate, and fewer failures with the LMA Supreme compared with the i-gel, indicating that the LMA Supreme may be preferable for mechanical ventilation in laparoscopic surgeries.

Conclusion: LMA Supreme has an edge over the i-gel with respect to ease of insertion of device and gastric tube with minimal complication in mechanical ventilation for routine laparoscopic surgery.

Keywords: LMA Supreme, i-gel, Laparoscopic Surgery, Mechanical Ventilation

INTRODUCTION

Airway management is the first priority in a variety of emergency care and operative scenarios¹. Although tracheal intubation remains the gold standard in securing the airway², it is a difficult skill to acquire³ and misplaced tracheal tubes inserted can result in iatrogenic harm and patient death. In contrast, supra-

glottic airway devices have proved to be relatively safe and easy to use by operators⁴. Supra-glottic airway devices are routinely used for short-term elective surgery, and have shown to be safe and effective in spontaneously breathing patients and in patients undergoing pressure-controlled ventilation^{5,6}. The LMA Supreme is a single-use, inflatable device with an oesophageal drainage tube for suctioning gastric contents⁷, whereas the i-gel is a single-use supra-glottic device featuring an additional tube for fitting a gastric suction catheter, but no inflatable cuff as its constituent thermoplastic elastomer provides an airway seal⁸. This enables easier positioning and insertion and a better seal compared with laryngeal mask airways (LMAs) with inflatable cuffs^{5, 9-10}. The i-gel incorporates a

Corresponding author:

Arati Srivastava

Professor & Head

Department of Anaesthesiology

School of Medical Sciences & Research, Sharda

Hospital, Greater Noida, India

Mobile: +91 9811966766

drainage tube to prevent gastric inflation that allows insertion of a gastric tube. The aim of our study was to compare the ease and failure of insertion of i-gel and LMA-Supreme laryngeal mask airway, difficulty of nasogastric tube insertion and their complications in patients undergoing laparoscopic surgery.

PATIENTS AND METHOD

This is a prospective randomized study, conducted in S.M.S. & R, Sharda hospital, Greater Noida, where all the selected consecutive patients undergoing laparoscopic surgery were included. The study cohort included 100 ASA I & II patients, divided into two equal groups, admitted from June 2012 to December 2012, who ranged in age from 20 to 55 years. This study was started only after obtaining approval from institutional ethical committee and written informed consent was taken from the patients after full explanations of the procedure. The inclusion criteria were patients of category ASA I & II ranging in age from 20 to 55 years with normal coagulation profile. Patients with anticipated difficulty in intubation were excluded from this study. After necessary investigations were carried out, all 100 selected patients were randomly divided into two equal groups. In the group I (n=50) LMA SUPREME (No.3 & 4) and group II (n=50) I GEL (No. 3 & 4) were used for anaesthesia. Informed consent was taken from all the patients in the pre-operative night and they were pre-medicated with tablet Alprazolam 0.25 mg and tablet Ranitidine 150 mg. All the patents were kept nil per orally after 10 P.M. An intravenous access was achieved in the pre-operative room.

In the operation theater, patients were positioned in the supine position, noninvasive monitors were attached and base line readings of heart rate, non-invasive blood pressure, SpO₂ and end tidal CO₂ were recorded. Injection Midazolam 1mg, Glycopyrrolate 0.2 mg given through intravenous route. All the patients were pre-oxygenated with 100 % oxygen for three minutes and Fentanyl 1.5 mcg/ kg and Propofol 2.5 mg/ kg was given through intra venous route. Neuromuscular blockade was achieved by vecuronium 0.1mg per kg and volatile anaesthetic Isoflurane 1% was started to achieve the adequate depth of anaesthesia. Once adequate depth of anaesthesia was achieved each device was inserted after lubrication with water soluble jelly in both groups. After confirming the correct placement of the device by proper chest expansion, absence of audible leak, absence of gastric insufflation and a square wave pattern in capnography, the device was fixed with an

adhesive tape. A nasogastric tube of 12 Fr was placed into the stomach through the gastric channel. Maintenance was achieved by isoflurane 1%, 35% oxygen with 65% nitrous oxide and intermittent doses of muscle relaxant vecuronium in the doses of 0.015mg/kg. The electrocardiogram, heart rate, oxygen saturation, noninvasive blood pressure and respiratory rate, end tidal CO₂ were continuously monitored and recorded till the completion of surgery.

During insertion of tube, ease of insertion, insertion time and ease of insertion of naso-gastric tube were noted. Ease of insertion was divided into three grades i.e. easy, difficult and failure. If the insertion within the pharynx is without resistance and in single manoeuvre, it was graded easy. If there was resistance during insertion of the device into the pharynx and more than one manoeuvre like chin lift or jaw thrust was used it was graded as difficult insertion. If after three attempts the effective airway was not achieved then it was failure. The insertion time for the device placement, means the time taken (seconds) from the lifting the device in hand to obtaining an effective airway, was also recorded. Ease of insertion of gastric tube was also recorded. The correct placement of the gastric tube was confirmed by aspiration of gastric contents, insufflation of air through the gastric tube and listening the audible noise by auscultating the epigastrium with stethoscope. Failure was recorded if the gastric tube was not placed correctly into the stomach within two attempts.

At the end of surgery, after the return of the spontaneous respiratory efforts residual neuromuscular blockade was reversed with 50 mcg/ kg of neostigmine and 10 mcg/kg of Glycopyrrolate. The device was removed when the reflexes were restored; patient was able to open the mouth on command. Any blood staining of device, lip and dental trauma were also recorded. Any regurgitation and aspiration of gastric contents were also assessed.

The relevant clinical data were analyzed statistically using SPSS (Statistical Package for Social Sciences) Version 15.0 statistical Analysis Software. The values were represented in Number (%) and Mean±SD. The 'p' value <0.05 was considered as Significant, <0.001 as very significant, whereas >0.05 as non-significant.

RESULTS

There were no significant statistical differences among the two groups with respect to age and weight, baseline heart rate, blood pressure, respiratory rate and oxygen saturation as shown in table1.

Table 1: Comparison of Demographic profile (Mean \pm S.D.)

	Group A	Group B	P-value
No. of Patients	50	50	
Age	32.72 \pm 9.94	33.21 \pm 10.06	P>.001(n.s.)
Base Line H. R.	73.43 \pm 3.94	74.97 \pm 5.57	P>.001(n.s.)
Base Line Systolic B.p.	120.6 \pm 9.35	120.33 \pm 9.79	P>.001(n.s.)
Base Line Diastolic B.p.	76.23 \pm 7.22	77.46 \pm 7.28	P>.001(n.s.)
Base Line R.r.	16.33 \pm 1.89	16.33 \pm 2.29	P>.001(n.s.)
BASELINE SpO ₂	99.3 \pm 0.75	99.3 \pm 0.83	p>.001(N.S.)

P>.001 shows no significant difference b/w groups at α =.001 level of significance.

Significant difference was observed in mean time of insertion, difficulty in insertion of the supra-glottic devices as well as difficulty in gastric tube insertion. Mean insertion time was observed to be significantly lower in Group A as compared to Group B (p <0.001). The group B had higher incidence of delay and

difficulty in insertion of supra-glottic device and NG tube as compared to group A (p <0.05). The patients in either group had not suffered from trauma to teeth, lip, bronchospasm & laryngospasm, dysphagia & dysphonia, regurgitation and aspiration.

Table 2: Comparison of Insertion time, Difficulty in insertion of device & nasogastric tube & other complications

	Group A	Group B	'P' value
Insertion time (Mean) in seconds	17.2 \pm 1.1	24.85 \pm 1.88	
Difficulty in insertion	4(08%)	12(24%)	0.029
>1attempts for insertion	3(06%)	11(22%)	0.021
Difficulty in NG tube insertion	0	6(12%)	0.011
Trauma to teeth	0	0	-
Bronchospasm/ Laryngospasm	0	0	-
Aspiration	0	0	-

DISCUSSION:

In our study, we found that the insertion of LMA Supreme was easy and quick as compared to the i-gel, with a high successful insertion rate in the first attempt. The gastric tubes were successfully inserted on the first attempt in LMA Supreme group: however, it was, more difficult to insert a well-lubricated 12-FG gastric tube into the i-gel group might be due to the smaller aperture of the gastric access port, and therefore this took longer. Being a single-center investigation, our study has several limitations. In our study complications arising from the insertion of either supra-glottic devices were negligible. Although, some patients complained of transient pharyngo-laryngeal pain with the LMA Supreme compared with the i-gel, probably related to the inflatable cuff compressing micro-vascular structures and terminal nerve endings in these tissues⁸. In a study of 80 patient undergoing breast surgery, Ragazzi R et al¹¹ found that first-time insertion success rate was significantly higher for the LMA Supreme than the i-gel(30/39 (77%) versus 22/41 (54%); p = 0.029). Howes BW et al¹² suggested use

of LMA Supreme in emergency situations by medical personnel with no experience in endotracheal intubation. They evaluated the LMA Supreme when inserted by non-anaesthetists, firstly in a manikin and then in patients. The first time insertion success rate was 86%, with successful mechanical ventilation in all cases and no important complications. Timmermenn A et al¹³ had recommended LMA-Supreme, a device suitable for use in routine anaesthesia and which can be safely used by medical personnel with limited clinical experience. Teoh WH et al¹⁴ had compared the efficacy of the inflatable cuff of the LMA Supreme against the non-inflatable cuff in i-gel providing an adequate seal for laparoscopic surgery in 100 female patients. In our study forty-seven (94%) LMA Supreme and 39 (78%) i-gels were successfully inserted in the first attempt, with similar ease, and comparable times to the first capnograph trace 14.3 \pm 4.7 sec for the LMA Supreme versus 15.4 \pm 8.2 sec for the i-gel; p = 0.4). Gastric tube insertion was easier and achieved more quickly with the LMA Supreme versus the i-gel (9.0 \pm 2.5) sec. versus 15.1 \pm 7.3) sec, respectively; p <

0.001). After creation of the pneumo-peritoneum, there was a smaller difference between expired and inspired tidal volumes with the LMA Supreme (21.5 ±15.2 ml) than with the i-gel (31.2 ±23.5 ml; p = 0.009).

Gastric tube placement was easier with LMA-Supreme (50/50, single attempt) than i-gel(44/50,>1 attempts in 6 cases). Teoh WH et al found that Gastric Tube insertion was easier and more quickly with LMA-Supreme versus i-gel¹⁴.

CONCLUSION

In conclusion, we found that the LMA Supreme had a higher rate of successful insertion in the first attempt, with significantly fewer (no) insertion failures than the i-gel supra-glottic airways. After comparing the different parameters we came to conclude that LMA -Supreme is an effective supra-glottic airway device during general anaesthesia. Further studies should compare the insertion success rates, benefits of gastric tube insertion and other complications, so that advantage of LMA Supreme over i-gel can be ascertained.

ACKNOWLEDGEMENT

The authors acknowledge the cooperation of the patients who had given consent for the anaesthesia and study. There was no conflict of interest and no funding was required.

REFERENCES

1. Sise MJ, Shackford SR, Sise CB, et al. Early intubation in the management of trauma patients: indications and outcomes in 1000 patients. *Journal of Trauma* 2009; 66: 32–9.
2. Nolan JP, Deakin CD, Soar J, Böttiger BW, Smith G, European Resuscitation Council. European Resuscitation Council guidelines for resuscitation 2005. Section 4. Adult advanced life support. *Resuscitation* 2005; 67: S39–86.
3. Wang HE, Seitz SR, Hostler D, Yealy DM. Defining the learning curve for paramedic student tracheal intubation. *Pre-hospital Emergency Care* 2005; 9: 156–62.
4. Nolan JP, Soar J, Zideman DA, et al. European Resuscitation Council Guidelines for Resuscitation 2010 Section 1. Executive summary. *Resuscitation* 2010; 81: 1219–76.
5. Francksen H, Renner J, Hanss R, Scholz J, Doerges V, Bein B. A comparison of the i-gel with the LMA Unique in non-paralysed anaesthetised adult patients. *Anaesthesia* 2009; 64: 1118–24.
6. Uppal V, Fletcher G, Kinsella J. Comparison of the i-gel with the cuffed tracheal tube during pressure-controlled ventilation. *British Journal of Anaesthesia* 2009; 102: 264–8.
7. Van Zundert A, Brimacombe J. The LMA Supreme—a pilot study. *Anaesthesia* 2008; 63: 209–10.
8. Levitan RM, Kinkle WC. Initial anatomic investigations of the i-gel™ airway: a novel supra-glottic airway without inflatable cuff. *Anaesthesia* 2005; 60: 1022–6.
9. Bamgbade OA, Macnab W, Khalaf WM. Evaluation of the i-gel airway in 300 patients. *European Journal of Anaesthesiology* 2008; 25: 865–6.
10. Jackson KM, Cook T. Evaluation of four airway training manikins as patient simulators for the insertion of eight types of supra-glottic airway devices. *Anaesthesia* 2007; 62: 388–93.
11. Ragazzi R, Finessi L, Farinelli I, Alvisi R, Volta CA. LMA Supreme™ vs i-gel™—a comparison of insertion success in novices. *Anaesthesia*. 2012 Apr; 67(4): 384–8
12. Howes BW, Wharton NM, Gibbison B, Cook TM. LMA Supreme insertion by novices in manikins and patients. *Anaesthesia*. 2010 Apr; 65(4): 343–7
13. Timmermann A, Cremer S, Heuer J, Braun U, Graf BM, Russo SG. Laryngeal mask LMA Supreme. Application by medical personnel 89
14. Teoh WH, Lee KM, Suhitharan T, Yahaya Z, Teo MM, Sia AT. Comparison of the LMA Supreme vs the i-gel in paralysed patients undergoing gynaecological laparoscopic surgery with controlled ventilation. *Anaesthesia*. 2010 Dec; 65(12): 1173–9.

Giant Cell Tumour of Tendon Sheath: A Clinicopathological Study

Sarita Devdhar¹, Roopak Aggarwal¹, P P Bhadami², Geeta Deshmukh³

¹Asst. Professor, Pathology, ²Addl. Professor, A.I.I.M.S Patna, ³Professor, Pathology, SMS & R GR, Noida Uttar Pradesh, India

ABSTRACT

Giant cell tumour of tendon sheath is second most common tumour of hand with high incidence of recurrence. It is slowly progressing benign tumour arising from synovial cells of tendon sheath. It occurs at any age with peak incidence in third to fourth decade. Trauma, inflammation, metabolic diseases and a neoplastic etiology are considered as etiological factors.

Aim of study: This study was conducted to share our experience of Clinicopathological aspects of Giant cell tumours of tendon sheath including their relative frequencies as per age and sex distributions, anatomical Sites of occurrence, Fine needle aspiration cytology findings & histopathology features in School of Medical Science Greater Noida

Material & Methods: This is a retrospective study of Giant cell tumour of tendon sheath which was done at School of Medical sciences & Research Gr. Noida U.P India during four years from 2008 to 2012. Patients were examined clinically, FNAC & Biopsy were done and FNAC and histopathological features were studied.

Results: There were total 5 cases of giant cell tumour of tendon sheath. Most common site was fingers of hand. Age of patients varied from 25 yrs to 60 yrs. Duration of swelling were from 1 year to 3 years. Most of the swelling were approximately 2cms in diameter, firm and painless.

FNAC of the swellings revealed sheets and clusters of oval to spindle cells intermixed with mononuclear cells and osteoclast type of giant cells, suggestive of Giant cell tumour of tendon sheath.

Histopathological findings were characteristic of GCT-TS showing foamy histiocytes, multinucleate giant cells, fibroblast like cells and foamy histiocytes. Hemosiderin laden macrophages were seen in two cases, one case revealed diffuse fibro histiocytic proliferation

Conclusion: Giant Cell tumour is a relatively rare soft tissue tumour of uncertain histogenesis. Clinical and pathological features identified were same as those of previous studies. The basic aim of management should be early diagnosis with meticulous and complete excision to prevent recurrence.

Keywords: GCTTS (Giant Cell Tumour of Tendon Sheath), Multinucleate Giant Cells, Foamy Histiocytes, FNAC (Fine Needle Aspiration Cytology)

INTRODUCTION

Giant cell tumour of the tendon sheath (GCT-TS) is a slowly progressing benign tumour arising from synovial cells of tendon sheath. It occurs most commonly in the flexor tendon of the hands, followed by ankles, toes and knees^[1]. The age distribution is 6-

65 years but is more common between 30 – 50 years. Female to male ratio is 3:2^[2]. It was first described by Chassaignac in 1852 as fibrous xanthoma and has since been referred to by multiple names, including localised nodular tenosynovitis, pigmented villonodular proliferative synovitis, sclerosing hemangioma, benign synovioma, proliferative synovitis, fibrohemorrhagic sarcoma, giant cell fibrohemangioma and fibrous histiocytoma^[3,4]. The large range of nomenclature indicates disagreement as to the etiology of this pathological condition. Trauma, inflammation, metabolic disease and a neoplastic etiology are considered as etiological factors^[4,5]

Corresponding author:

Sarita Devdhar

Asst. Professor

A-109, Ashiana Orchids Gamma-2, Greater noida

Mobile-9718390901

Email-saritadevdhar2003@gmail.com

MATERIAL & METHOD

All patients were examined clinically and data e.g. Age, duration, site of clinical swelling, Size, shape, association with pain, mobility of adjacent joints, neurovascular deficits were recorded. FNAC of swelling and biopsy of swelling were done. FNAC findings and histopathology findings were noted.

RESULTS

There were total 5 cases of giant cell tumour of tendon sheath. Age of patients varied from 25 yrs .to 60 yrs. Duration of swelling were from 1year to 3 years. Most of the swellings were solitary, slow growing, approximately 2 cm in diameter, firm and painless. One case had slight tenderness .Most common site was Rt. index finger.

Table 1. Clinical profile of Patients

	Case-1	Case-2	Case-3	Case-4	Case-5
Age	35 yrs	42 yrs	60 years	25 yrs	50 yrs
Duration	2 yrs	3 yrs	2yrs &6months	2 years	1year
Site	3 rd toe	Rt. Index	Lt .wrist	Rt. indexfinger	Lt middle finger
Size	1.5X1.5 cms	2x1.5 cms.	2x2 cms.	2x1.5 cms.	2x2.5 cms
ClinicalFeatures	Painless, firm swelling	Non tender, Firm to hard	Painless, Nodular, soft to firm	Pain less	Slightly painful, firm swelling
Clinical Diagnosis	sebaceous cyst	Soft tissue Swelling	Ganglion	Soft tissue Swelling	Soft tissue Swelling

X- Ray revealed a soft tissue mass in all the cases.

FNAC of the mass revealed sheets and clusters of oval to spindle cells intermixed with mononuclear cells and osteoclast type of giant cells, suggestive of GCT-TS fig.1-3

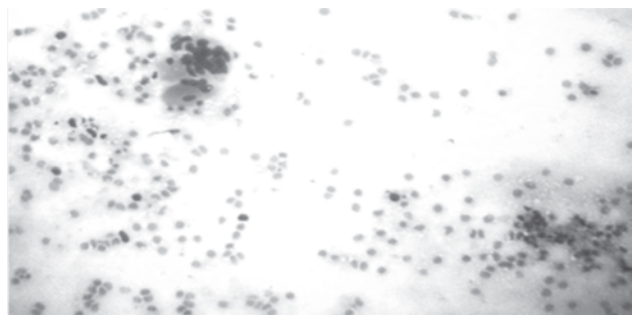


Fig. 1. multinucleated giant cell, histiocytes and spindle shaped stromal cells. (10 X)

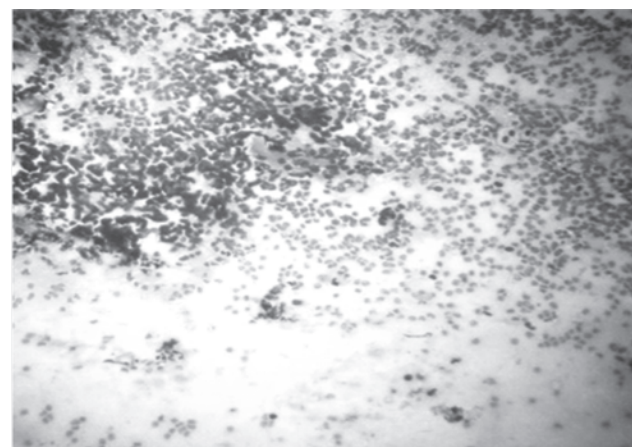


Fig. 2. cytology smear depicting multinucleated giant cells and mononuclear stromal cells. (10 X)

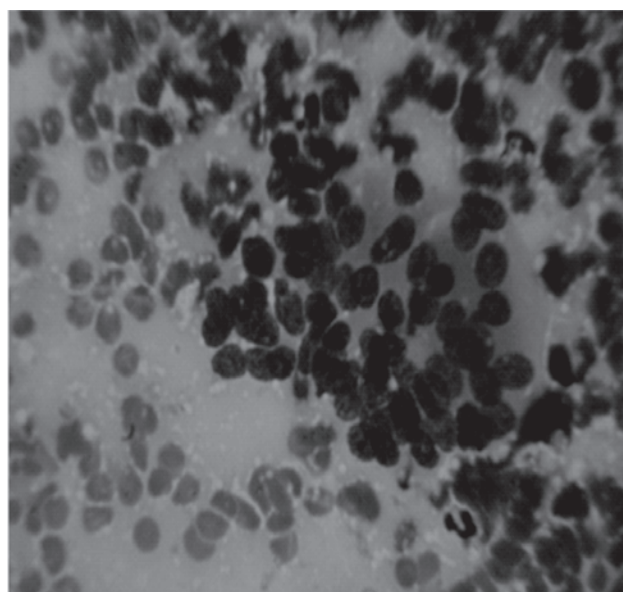


Fig. 3. osteoclast type of giant cell and histiocytes. (40 X)

Histopathology and gross examination of most of the cases revealed well circumscribed and partially encapsulated ,firm to hard masses. Cut surface was greyish-yellow in appearance. In two cases, cut surface was greyish brown.

Histopathology - microscopic findings were characteristic of a GCT-TS showing foamy histiocytes, multinucleate giant cells, fibroblast like cells and foamy histiocytes. Hemosiderin laden macrophages were seen in two cases. One case revealed diffuse fibrohistiocytic proliferation Fig-4-6

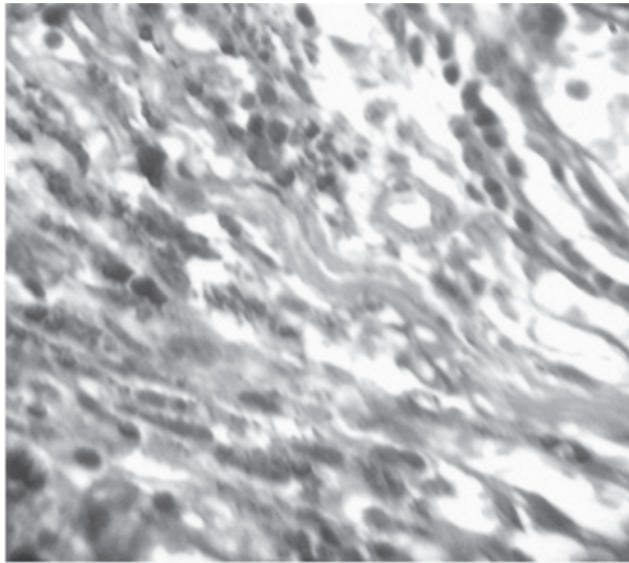


Fig. 4. A collection of spindle cells, histiocytes and hemosiderin laden macrophages. (40 X)

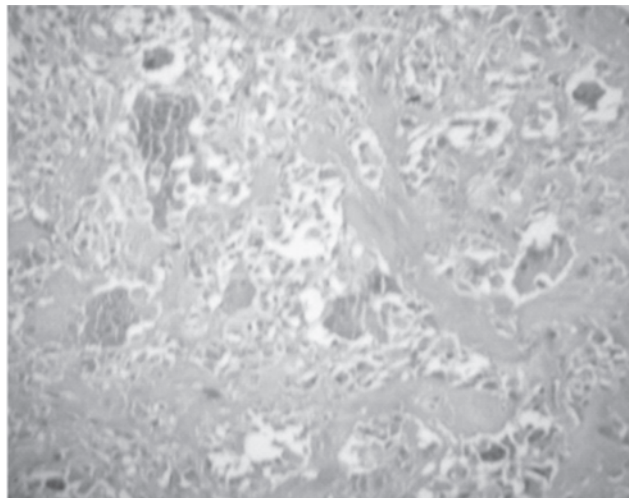


Fig. 5. Mononuclear stromal cells, histiocytes and hemosiderin laden macrophages. (40 X)

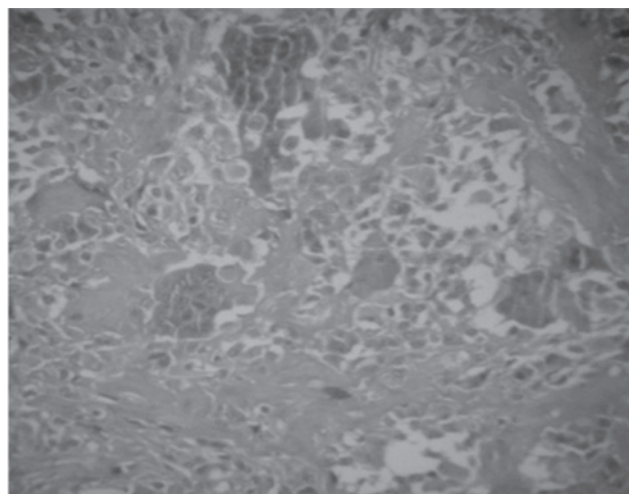


Fig. 6. Collagenized stroma, spindle shaped stromal cells and

Scattered multinucleated osteoclast type of giant cells. (40 X)

DISCUSSION

Giant cell tumour of the tendon sheath is a benign tumour, presenting as the second most common mass of the hand after ganglion cyst^[7]. It occurs at any age, with peak incidence in the third to fourth decade. Three fourth of these tumour occur in the digits, especially the fingers, usually on the volar aspect^[8].

Etiology is unknown. Many pathogenetic theories have been proposed. The most widely accepted theory as proposed by Jaffe et al. in 1941 is that of reactive or regenerative hyperplasia associated with an inflammatory process^[9].

In 2001 AI-Qubtan presented the most popular classification of the GCTTS. He classified this tumour into two types, determined by the presence of a pseudocapsule surrounding it. Each type was also subclassified depending on the thickness of the capsule, location of the tumour, the presence of satellite lesions and the diffuse or multicentric growth of the tumour^[6].

Usually, patients have no particular symptoms or present with a palpable, often painless, soft tissue mass that gradually increases in size over a long period of time^[1,2,6]. The tumour mass may vary from solitary to multiple discrete soft tissue nodules^[1]. Usually GCTTS are tendon based, well circumscribed and localised.

On plain radiographs there may be a visible soft tissue swelling, sometimes completely encasing the bony elements of the involved digits. The tumour may invade the adjacent bone and cause cystic lesion that are clearly visible on X ray.

Grossly, GCT-TS is a multilobular and generally well-circumscribed tumour. It may be partially or completely encapsulated and may have extensions and/or satellite lesions connected by as little as few strands of fibrous tissue^[1,10]. Coloration varies from gray to yellow-orange with some brownish areas, depending on the amounts of hemosiderin, collagen and histiocytes present in the tumour^[1].

Histologically, giant cell tumour is composed of four main cell types, namely the principal synovial cell, multinucleated giant cell, foam cell and histiocyte like cell^[11]. These cells are contained within a fibrocollagenous stroma, form synovial lined spaces

and are often surrounded by a thin, fibrous capsule^[10,11]. The differential diagnosis of GCT-TS includes giant cell tumour of soft tissue and giant cell tumour of bone. These lesions may be differentiated microscopically from GCT-TS by the presence of necrosis, metaplastic bone formation and aneurysmal bone cyst like areas and their typical location of back, thigh and shoulder^[12]. Fibroma of tendon sheath and extra skeletal osteosarcoma should also be considered. .

Treatment of GCTTS remains controversial. Marginal excision of the tumour is the treatment of choice, complete excision is difficult as the mass is associated with the tendon sheath or synovial joint. The incidence of local recurrence is high, ranging from 9-44%^[13].

CONCLUSION

GCT-TS is a relatively rare soft tissue tumour of uncertain histogenesis. Clinical and pathological features identified were same as those of previous studies. The basic aim of management should be early diagnosis with meticulous and complete excision to prevent recurrence.

ACKNOWLEDGEMENT

We thank Principal of S.M.S & R Gr. Noida and Head of Pathology Department for their kind support and advice..

Conflict of Interest: None

Ethical Clearance: taken

Source of funding: Self

REFERENCES

1. Glowacki KA, Weiss AP. Giant cell tumours of tendon sheath. *Hand clin.* 1995; 11:245-53.
2. Darwish FM, Haddad WH. Giant cell tumour of tendon sheath: Experience with 52 cases. *Singapore Med J.* 2008;49(11):879-82.

3. Walsh EF, Merchreffe A, Akelman E, Schiller AI. Giant cell tumour of tendon sheath. *Am J Orthop (belle Mead NJ).* 2005;34(3):116-21.
4. Reilly KE, Stern PJ, Dale A. Recurrent giant cell tumour of the tendon sheath. *J Hand Surg Am.* 1999;24:1298-302.
5. Kotwal PP, Gupta V, Malhotra R. Giant cell tumour of tendon sheath-is radiotherapy indicated to prevent recurrence after surgery? *J Bone Joint Surg.* 2000;82B:571- 573.
6. AI-Qattan MM. Giant cell tumour of tendon sheath: classification and recurrence rate. *J Hand Surg Br.*2001;26(1):72-5.
7. Phalen GS, Mc Cormack LG, Gazale WJ. Giant cell tumour of tendon sheath (benign synovioma) in the hand: evaluation of 56 cases. *Clin Orthop.*1959;15: 140-51.
8. David R, Lucas MD. Tenosynovial giant cell tumor. Case report and review. *Arch Pathol Lab MED.* 2012;136-901-906
9. Jaffe HL, Lichtenstien HL, Elsutro CJ. Pigmented villonodularsynovitis, bursitis and tenosynovitis. *Arch Pathol* 1941; 31:731-65.
10. Wright CJE. Benign Giant Cell Synovioma. An investigation of 85 cases. *Br J Surg.*1951; 38(151):257-71.
11. Monaghan H, Salter DM, AI – Naffusi A. Giant cell tumour of tendon sheath (localised nodular tenosynovitis: Clinicopathological features of 71 cases. *J ClinPathol.* 2001;54 (5):404-7.
12. O' Connell JX, Wehrli BM, Nielsen GP et al. Giant cell tumours of soft tissue: a clinicopathologic study of 18 benign and malignant tumours. *Am J Surg Pathol* 2000; 24:386-95.
13. Rodrigues C, Dasai S, Chinoy R. Giant cell tumour of the tendon sheath: a retrospective study of 28 cases. *J SurgOncol* 1998; 68:100-3.

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 specialties. 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

Our Contact Info:

Indian Journal of Public Health Research & Development Institute of Medico-Legal Publications

4th Floor, Statesman House Building, Barakhamba Road,
Connaught Place, New Delhi-110 001

Mobile: 91-9971888542, Fax No: +91 11 3044 6500

Email: 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:** Quaterly

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 (ISSN) serial number and is indexed with Index Copernicus (Poland). It is also brought to notice that the journal is being covered by many international databases.

Subscription Information

Journal Title	Pricing of Journals		
IJPHRD	Print Only	Print+Online	Online Only
Indian	INR 7000	INR 9000	INR 5500
Foreign	USD 450	USD 550	USD 350

Note for Subscribers

Advance payment required by cheque/demand draft in the name of " **Institute of Medico-Legal Publications Indian Journal of Public Health Research & Development** " 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.

**Send all payment to:
Prof. (Dr.) R.K. Sharma, Editor**

Indian Journal of Public Health Research & Development

Institute of Medico-Legal Publications

4th Floor, Statesman House Building, Barakhamba Road,
Connaught Place, New Delhi-110 001

Mobile: 91-9971888542, Fax No: +91 11 3044 6500

E-mail: editor.ijphrd@gmail.com • www.ijphrd.com

