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Tracking Progress Towards Sustainable Elimination of Iodine Deficiency Disorders in Selected four Districts of Bihar: An Epidemiological Study

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Abstract

Introduction: Iodine Deficiency Disorders (IDDs) remain a significant global public health challenge, with severe consequences ranging from congenital anomalies, Goitre to mental deficiency. Preventing these disorders through iodized salt consumption is cost-effective and efficient.

Aims/ objective: To assess the prevalence of goitre and the proportion of households using adequately iodized salt in selected four districts (Saran, Muzaffarpur, Samastipur, Patna) of Bihar (a state in eastern India) using WHO/ UNICEF/ICCIDD criteria.

Materials and Method: A community-based cross-sectional study was conducted among children aged 6-12 years. A multi-stage sampling method was employed, and iodine content in household salt samples were analysed.

Results: The results showed that the prevalence of goitre ranged from 0.9% to 4.63% across districts, indicating that goitre is not a public health problem. Adequate iodized salt consumption varied from 71.95% to 86.72%, falling short of the 90% USI goal. Urinary iodine excretion data were not available due to ongoing laboratory setup in PMCH, Patna.

Conclusion: The study underscores the need for strengthened monitoring and evaluation to ensure the sustainability of IDD control activities for achieving sustainable elimination of IDD in Bihar.

Keywords: Iodine Deficiency Disorders (IDDs), Goitre prevalence, Iodized salt consumption, Sustainable elimination, Universal Salt Iodization (USI)

Introduction

Iodine Deficiency Disorders (IDDs) constitute a significant global public health concern due to their diverse and severe health consequences. Iodine deficiency disorders (IDD) has emerged as among the main public health issues in India in the context of micronutrient deficits. Iodine deficiency causes a range of illnesses that impact people at every phase of life, from prenatal to childhood and maturity.

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In newborns, kids, and teenagers, it can cause hypothyroidism and negatively impact both physical and mental growth, which has long-lasting effects into later life.[1]

IDD-related complications include congenital anomalies, mental deficiency, stillbirths, goitre, and more. It is also crucial to note that amongst micronutrient deficiencies, iodine deficiency should receive the highest priority because it is the most significant risk factor to children's preventable mental retardation and damage to the brain, which in turn causes learning difficulties and psychomotor dysfunction.[2]

In comparison to children living in iodine-sufficient locations, children in iodine-deficient regions typically have inferior intelligence quotients (IQ).[3] Given the severity of the issue, it is crucial that children be checked and treated for any IDD at a young age to avoid intellectual impairment at this crucial stage. Primary care physicians, especially those working with school health initiatives, must be on the lookout for early signs and symptoms of IDD in school-aged children. Iodine deficiency disorder (IDD) is determined to be endemic in 263 districts, according to sample surveys done in 325 districts across India.[4]

Consumption of iodized salt is a cost-effective strategy to prevent IDDs. Despite this, over 1.5 billion individuals worldwide are at risk of IDDs, as highlighted by the Government of India.[4] To address this challenge, the National Goitre Control Program was launched in 1962 and subsequently renamed the National Iodine Deficiency Disorder Control Program in 1992. The program aimed to reduce IDD prevalence to below 10% in endemic districts by 2000. Compulsory iodization of table salt was introduced in 1983, and the sale of non-iodized salt for direct human consumption was banned across India in 2006.[5]

In order to deal with iodine deficiency at the national level, universal salt iodization (USI) is acknowledged as the most efficient, ecologically sound, and cost-efficient approach.[6] When a minimum of 90% of households utilize enough iodized salt (15 ppm), a nation is said to have reached USI. A significant international effort has been made to promote USI over the last twenty years; as a result, 34 nations have eliminated IDD using USI, and it is currently estimated that 70% of households globally are consuming enough iodized salt.7 IDD remains to be a public health issue in 32 countries despite severe regional and national variations in access to and use of appropriately iodized salt.[7,8]

To measure progress and ensure the sustainability of IDD elimination efforts, accurate measurement and tracking methods are essential. The WHO / UNICEF / ICCIDD criteria are widely adopted for IDD surveys, utilizing indicators such as goitre presence, urinary iodine estimation, and salt iodine content.[9] Following this methodology, the Department of Community Medicine at Patna Medical College conducted an IDD survey in selected districts of Bihar (a state in eastern India), including Saran, Samastipur, Muzaffarpur, and Patna. The study aimed to assess the current scenario of IDD and iodized salt consumption in these districts.

Materials and Methods

A community-based cross-sectional study was conducted in the districts of Saran, Muzaffarpur, Samastipur, and Patna in Bihar (a state in eastern India). A total of 1307 children aged 6 to 12 years were examined, and caregivers were interviewed regarding iodized salt consumption practices.

The sampling process encompassed randomly selecting 3 blocks from each district, with 9 villages per block. From each village, 12 households were chosen, and a child in the specified age group was selected from each household.

Parents of all the children who took part in the research were asked for their written informed consent. The investigator accurately read out the participation information sheet, which were provided in both English and the local language. Any questions about the research were appropriately answered. In addition, permission was obtained through consent forms from the school administration of each institution polled.

In cases where the target child was absent, a neighbouring household was considered. Analysis of salt samples were conducted using titration method for iodine content. The WHO/UNICEF/

ICCIDD criteria were used for assessment, grading goitre prevalence, and determining iodine content adequacy.[9]

Data on the socio-demographic factors and study parameters were gathered using a proforma. All children were checked for goitre using the normal palpation technique, and the WHO standards of grades 0, 1, and 2 were used to calculate the goitre score. The lead researcher confirmed each and every case of goitre that had been clinically reported. If the overall goitre rate among children aged 6 to 12 years was greater than 5%, the district was regarded as an endemic district.[10]

Statistical Analysis: Data collected from all the district were presented in tabular form using Microsoft Excel 365. Descriptive analysis was used to calculate percentage, prevalence or frequency of study parameters and to estimate association between variables.

Results

The study covered a total of 1307 children from the four districts, revealing goitre prevalence rates of 2.48%, 4.63%, 3.35%, and 0.9% in Saran, Muzaffarpur, Samastipur, and Patna districts, respectively. Adequate iodized salt consumption was 78%, while inadequately iodized salt consumption was 22%. Saran had 72.04% adequately iodized salt, Muzaffarpur had 86.72%, Samastipur had 71.95%, and Patna had 81.08%. Further analysis at the block level highlighted consumption disparities. Analysis of salt samples indicated that iodized salt consumption ranged from 71.95% to 86.72% in the districts.

Table 1: Districts wise distribution of consumption of iodized salt and iodine content in salt samples

Districts	Iodine Content (n =1307)			
	Adequately (>15ppm)		Inadequately (<15ppm)	
	Number	Percentage		Percentage
Saran	232	72.04%	90	27.95%
Muzaffarpur	281	86.72%	43	13.27%
Samastipur	236	71.95%	92	28.05%
Patna	270	81.08%	63	18.91%
Total	1019	77.95%	288	22.05%

Table 2: Distribution of total Goitre in Saran district (n = 322)

Age Groups (Year)	Sex	Total Examination	Grades of Goitre			Total Case Goitre	Percentage
			Grade 0	Grade 1	Grade 3		
6-12	Male	135	132	1	2	3	2.23%
	Female	187	182	2	3	5	2.67%
	Total	322	314	3	5	8	2.48%

Table 3: Distribution of total Goitre in Muzaffarpur district (n = 324)

Age Groups (Year)	Sex	Total Examination	Grades of Goitre			Total Case Goitre	Percentage
			Grade 0	Grade 1	Grade 3		
6-12	Male	166	161	3	2	5	3.01%
	Female	158	148	3	7	10	6.32%
	Total	324	309	6	9	15	4.63%

Table 4: Distribution of total Goitre in Samastipur district (n = 324)

Age Groups (Year)	Sex	Total Examination	Grades of Goitre			Total Case Goitre	Percentage
			Grade 0	Grade 1	Grade 3		
6-12	Male	165	161	1	3	4	2.42%
	Female	163	156	2	5	7	4.29%
	Total	328	317	3	8	11	3.35%

Table 5: Distribution of total Goitre in Samastipur district (n = 324)

Age Groups (Year)	Sex	Total Examination	Grades of Goitre			Total Case Goitre	Percentage
			Grade 0	Grade 1	Grade 3		
6-12	Male	156	155	0	1	1	0.60%
	Female	177	175	1	1	2	1.11%
	Total	333	330	1	2	3	0.90%

Prevalence of iodine inadequacy in salt content was positively correlated with prevalence of goitre in Patna and Samastipur. Surprisingly, Muzaffarpur district with lowest prevalence of iodine inadequacy in salt had highest prevalence of goitre.

Discussion

The study's findings indicate that goitre is not a major public health problem in the selected districts, as per WHO/UNICEF/ICCIDD criteria. However, prevalence persists, warranting continued monitoring and intervention. While iodized salt consumption falls short of the 90% USI goal in all districts, it is crucial to strengthen monitoring and evaluation efforts to ensure the sustainability of IDD control activities.

According to studies carried out in Meghalaya and by Chaudhary C et al., goitre is more common in people between the ages of 9 and 12 years.[11, 12] In the current study, females had a higher prevalence of goitre than males. The comparative prevalence of goitre was higher for girls than for males, according to a systematic study review and meta-analysis on the association between goitre status and sex [0.54 (95% CI = 0.53-0.56) versus 0.46 (95% CI = 0.44-0.47)].[13] Similar to the findings of the current study, Chaudhary C et al.'s investigation in Haryana found that females were more likely than males to have goitres ($p < 0.05$).[12]

The most important factors underlying the recent rise in the household availability of suitably iodized salt in India are the integration of the salt business and the implementation of improved manufacturing processes by many of the large manufacturers. Conversely, the non-refined iodized salt made by medium and small manufacturers and merchants is frequently insufficiently iodized and can be purchased for less than refined iodized salt in containers with identical designs, names, and logos. [14,15]

Because the end customer cannot distinguish the differences other than price, they are drawn to the cheaper product. Small producers frequently lack Salt Department registration, have little ability to iodize salt using low-cost methods, and frequently deceptively label their non-iodized salt as "iodized."[14,15] Iodized salt is bought from wholesalers in both salt-producing and salt-consuming states. Manufacturers frequently buy salt in bulk and then repackage it.[16-18]

Bulk salt is frequently non-iodized, but distributors and retailers cannot tell the difference.[16,18] Despite the fact that India produces potassium iodate, which is used to iodize salt, iodine must still be imported.[14] The cost of potassium iodate has varied and increased over the last few years as a result of the rising iodine price on a global scale.14 This has had a significant impact on the small producers and dealers, which has a bad impact on the standard of the iodized salt they manufacture.[14]

There is presently no system in place to guarantee potassium iodate's purity or steady cost. In addition, consumers, particularly the poorest, believe that iodized salt is more costly than regular salt.[17] Iodized salt has been made available to customers living

below the poverty threshold via the PDS network in some states at costs similar to common salt in an attempt to bring the costs of common salt and iodized salt closer in comparison.

The absence of urinary iodine excretion data is a limitation that underscores the need for future research. Confirmation of IDD for cases with goitre could not be done via thyroid function tests due to trouble in taking blood samples from school-going students.

Conclusion

This study highlights the importance of ongoing efforts to combat IDD in Bihar. Although the prevalence of goitre remains relatively low, sustained efforts are necessary to achieve sustainable elimination. Improving iodized salt consumption is imperative to meet USI goals. The study calls for the establishment of a urinary iodine excretion laboratory to comprehensively assess iodine nutrition status. Enhanced monitoring and evaluation are crucial to achieve and maintain the sustainable elimination of IDD in Bihar (a state in eastern India).

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Conflict of Interest: NIL

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Original Article

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The Environmental Health Risk Analysis regarding Hepatitis A Transmission among Street Food Vendor in Indonesia

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Abstract

This study aimed to conduct hazard identification and risk assessment for the transmission of hepatitis A among street food vendors (SFVs), whereas risk management was generated. This observational analytic study was conducted in Jember Regency - Indonesia. Cluster random sampling was employed, wherein five distinct locus were selected representing SFVs in campus area and local market area. A total of 100 SFVs in Jember participated in this study. Data was collected using a questionnaire. The risk assessment was measured by multiplying the likelihood and consequence. Additionally, the data was subjected to descriptive analysis. This study found the identification of hazards among SFVs was found inadequate sanitation facilities, poor food processing practice (improper handling of raw ,- cooked ingredients, and poor food serving), limited availability of clean water, substandard building and layout were observed as potential hazards for the transmission of hepatitis A. The risk assessment found inadequate sanitation facilities (18 point), negative attitude (18 point), poor quality assurance (16 point), and food contamination (14 point) have high scores. The risk management including: a) location and building: providing specific location, and maintaining cleanliness of the furniture and equipment on a regular basis, b) sanitation facility: provision of sanitary waste bin, communal toilet and wastewater drainage system; fly control measures, and using piped water supply, c) food processing: increasing food handler personal hygiene, and standard food handling process.In conclusion, the risk of Hepatitis A transmission among street vendors remains high and poses a threat in Jember, indicating the need for health education for the street vendors. Additionally, the author recommends policymakers to implement regular monitoring or inspection of the food quality and the necessity of providing clean water facilities or other fundamental facilities to SFVs.

Keyword: Hepatitis A, street food vendor, informal worker, Environmental Health Risk Assessment, ISO 3100 Risk Management

Introduction

Hepatitis A is a disease commonly found worldwide and poses a health issue for communities, leading to outbreaks in Indonesia. Hepatitis A often occurs in developing countries with poor sanitation environments and inadequate hygienic practices. Nevertheless, no one is unsusceptible for the infection.

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The World Health Organization (WHO) noted 1.4 - 1.5 million cases were reported each year, causing 7,134 deaths in 2016[1,2]. In Indonesia, Hepatitis A leads several outbreaks in the community, in which 6 outbreak (279 cases), 9 outbreak (550 cases), 4 outbreak (204 cases) were reported during 2010-2012, respectively[3]. The distribution of children infected with the hepatitis A virus (HAV) before the age of 10 is recorded high, nearly 90%, and asymptomatic[2]. The hepatitis A outbreakoccur due to the common source transmission, associated with contaminated food handled by infected food handlers and contaminated food products[4].

Hepatitis A Virus (HAV) is the agent of hepatitis A disease. Belonging to *Hepatovirus*within the *Picornaviridae*family, HAV attacks human liver cells[4,5]. Hepatitis A is intimately associated with the lack of clean water, inadequate sanitation, and poor personal hygiene. Both contained and epidemic infections were elicited by contaminated water[6]. Transmission occurs through fecal-oral transmission, primarily through the consumption of food and beverages contaminated with HAV[2].

Street food vendors/SFVs (also known as Pedagang Kaki Lima) encompass public places that provide various food and beverages. The transmission of disease in SFVs may occur due to contaminated food and water source, poor sanitation and hygiene practice, and substandard practice of food handlers. Food suppliers commonly have suboptimal food handling practices, and a significant proportion operate within unsanitary conditions[7]. Study in Indonesia,SFVs exhibit a heightened sense of confidence in vending their food products, despite their suboptimal implementation of hygiene and sanitation practices as prescribed[8].

Environmental Health Risk Analysis (EHRA) is a scientific framework for addressing environmental and health issues[9]. The US Environmental Protection Agency defines EHRA as the scientific evaluation of the potential health impacts that may occur due to exposure to specific substances or their mixtures under specific conditions[10]. EHRA is an approach used to assess health risks in the environment. Environmental hazards can generally be categorized into three criteria: physical hazards, biological hazards, and chemical hazards[11].

The risk of hepatitis A transmission in the community remains a health issue, and burdening the health system in Indonesia. As a study location, Jember Regency has been chosen for following rationals: a) third largest and densely regency in East Java Province, b) prominent economic hub in the eastern area of East Java Province, c) multiple hepatitis A outbreak during 2002-2010. This study aims: a) to identify hazards, b) to assess risks, and c) to generate risk management.

Method

This observational analytics study was conducted in Jember - Indonesia. Jember is one of the regency located in East Java Province - Indonesia. As the third largest regency in East Java Province, total population in 2022 was recorded at approximately 2.58 million[12]. Several major public and private universities/ colleges/polytechnics were located in Jember, such as The University of Jember, Jember State Polytechnic, Muhammadiyah University of Jember, and KH AchmadSiddiq State Islamic University. This study was conducted in July- October 2021

Population and Participants

The research population comprised 203 SFVs, and 100 SFVs were selected using a cluster random sampling technique tailored to the proportional distribution of SFVs in each locus. Five distinct locus inJember Regency was selected, namely: a) the The University of Jember (UNEJ) campus street vendor locus (60 SFVs), b) the Gebang Market locus (10 SFVs), c) the Kepatihan Market locus(10 SFVs), d) the Mangli Market locus(10 SFVs), and e) the Mangli market locus(10 SFVs). Information consent was taken from the participants.

Data, Variable, and Analysis

The study data was primarily collected with questionnaire and observation sheet instruments. The questionnaire was developed based on Indonesian Ministry of Health (MoH) Decree Number 1098/ Menkes/SK/VII/2003[13]. However, modifications were made to adjust to specific conditions of SFVs in the field, in which the variable related to the kitchen and dining area was not included.

Thestudyencompassedidentification,assessment, and management of environmental sanitation risks

referred to ISO 31000 - Risk Management[14]and environmental health risk analysis guidelines[9]. The variable of hazard identification among SFVs consists of: a) location and building (location and layout, stall sanitation, sanitation of food processing equipment, and food handlers hygiene), b) sanitation facility (completeness of sanitation facilities, pest and rodent control, and provision of clean water), c) food processing (food processing, condition of raw food ingredients, condition of finished food products, food presentation, food contamination, and food additives). The process of hazard identification involves identifying the specific hazard, its source and underlying causes in SFVs.

Risk assessment is derived from the multiplication of *Likelihood* and *Consequence*, where the *Likelihood* and *Consequence* value is assigned a score of 1-5, respectively. A score of 1 is given for low likelihood and low consequence, while a score of 5 is given for high probability and high consequence[14].

Risk = Likelihood x Consequences

Likelihood - the change or probability of an impact/adverse event or hazard occurrence

Consequence - the potential impacts or outcomes that may result from the occurrence of a hazard

There are three categories of risk: low risk (1-8), moderate risk (9-17), and high risk (18-25).The data was presented by Table and Figure, in which descriptive method was subjected to analysis technique in this study.

Result

a. Risk Identification

The risk identification based on environmental sanitation in SFVs that have the potential to increase hepatitis transmission in Jember Regency is assessed through three indicators: a) location and building, b) sanitation facility, c) food processing/management. The environmental risk identification among SFVs in Jember Regency is presented in Table 1 as follows.

Table 1. The Hazard Identification and Risk Management of Hepatitis A Transmission among SFVs

No	Hazard	Source of Hazard	Causative	Risk Management
location and building				
1	Unstandard location and layout	Building	located in sidewalks and semi-permanent structures	Allocated specific locations
2	Poor stall sanitation	a. Table b. Chair	a. Dull and dirty b. Dirty and unsafe	Stall are consistently cleaned
3	Poor sanitation of food processing equipment	Frying pan, pot, plate, glass, spoon, and tray.	The washing process is not performed repeatedly	Cleaning using running water and soap
4	Low food handlers hygiene	Work attire/uniform, nails, coughing, sneezing.	Worn and dirty clothing, long and dirty nails, uncovered and untied hair, coughing and sneezing while handling food	a. The food handlers wear clean and tidy clothing (uniforms); have short nails, and cap their hair b. The handlers are in good health, and do not engage in conversations while handling food, including wash their hands before or after food handling activities
Sanitation facility				
1	Inadequate completeness of sanitation facilities	a. Rubbish bin b. Toilet c. Liquid waste disposal d. Clean water supply	a. Not available and substandard b. Not available c. Disposed into the public drainage d. Utilizing well water	Provision of sanitary waste bins, communal toilets, wastewater drainage system, and utilization of clean water
2	Poor pest and rodent control	Flies, Cockroach	Pest presence and infest to food.	The presence of fly control measures (ultraviolet lamps or adhesive traps)
3	Provision of clean water	a. Tap water supply system b. Well (Ground water) c. River water d. Rain water	a. Infrequent usage b. Contaminated c. Contaminated d. Contaminated	The use of piped water supply directly from the tap (PDAM) or well water treated with disinfectant
Food processing				
1	Inadequate food processing practices	Ingredient washing and handling process	a. Not washed with clean- , running- water b. use a knives and trays with all types of food ingredients c. Incomplete cooking d. Poor serving	a. The food ingredients are washed with clean and flowing water, then cut using specific knives b. The food ingredients are cooked thoroughly at appropriate temperature and duration

Continue.....

2	Poor condition of raw food ingredients	a. Fresh food ingredients b. Dry food ingredients c. Processed food ingredients d. Oil ingredients	a. Not stored in the refrigerator, left open on the cart b. Left open c. Not covered and left open d. The oil is continuously used and not replaced until it turns dark brown	The ingredients are stored in clean and standardized containers. The cooking oil is single used
3	Poor condition of finished/cooked food product	a. Food appearance b. Unpleasant odor c. Food condition is no longer optimal	a. Viscous appearance and dull color b. Not reheated c. Not reheated	Stored at appropriate temperatures, reheated every 8 hours, and stored in covered containers
4	Poor food presentation	a. Food presentation b. Food decorative arrangement c. Health arrangement/food hygiene	a. Open and heavily infested by flies b. Lack of decorative arrangement c. Absence of health assurance	The food is covered with clean containers, and ensuring safe and covered presentation
5	food contamination	a. Physics b. Chemical c. Biology	a. Presence of hair, plate shards, glass fragments b. Presence of borax, formalin c. Presence of hepatitis A virus	Carefully protected to prevent contamination and is covered. Moreover, no chemical substances are used.
6	Food additives	a. Coloring additive b. Thickening additive c. Preservatives	a. Presence of Auramine, Alkanet, Butter Yellow, Black 7984 b. Presence of borax c. Presence of formalin	Using organic substance or those that are not prohibited

b. Risk Assessment

The highest risk is associated with the lack of sanitation facilities and negative attitudes, with a risk score of 18 (high). This is followed by poor quality assurance with a risk score of 16 (moderate), and food contamination with a risk score of 14 (moderate). The risk assessment among SFVs presented by Figure 1.

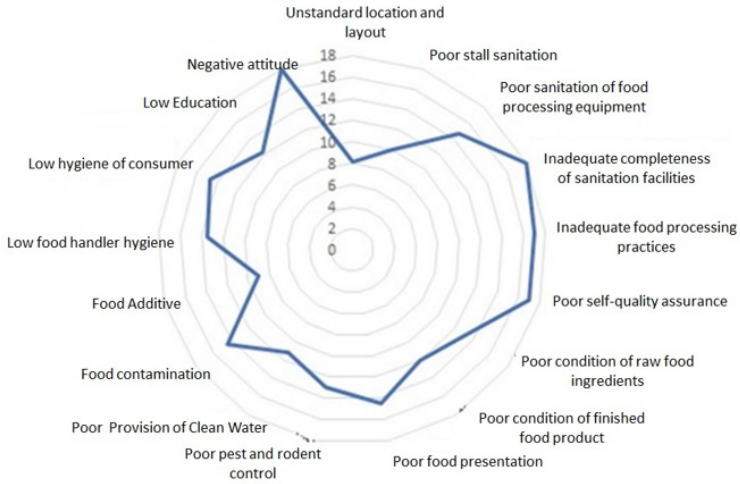

Figure 1. The assessment of risk based on environmental approach among street vendors

c Risk Management

The risk management of hepatitis A transmission among SFVs is formulated based on environmental health risk analysis and field measurements regarding the spread of hepatitis A among students and the general public. Risk management : a) location and building: providing specific location and the equipment (chair and table) is consistently cleaned, b) sanitation facility: provision of sanitary waste bin, communal toilet and wastewater drainage system, fly control measures, and using piped water supply, c) food processing: increasing food handler personal hygiene, standard food handling process. The risk management is presented by Table 1.

Discussion

As presented by Table 1, the source of hazard among SFVs are including: a) substandard location and building, b) poor sanitation facility, and c) poor food processing. The absence of following aspects result in compromised food safety, primarily through contamination of raw and prepared food by the HAV. The SFVs was built with semi-permanent structure and predominantly located on the sidewalk. The

primary source of water is derived from well water, whereas the quantity is limited to two buckets, which are allocated for cleaning food-related equipment. This condition leads to unclean equipment, and the potential for the hepatitis virus to remain on food equipment. This situation is exacerbated by the inadequate provision of sanitation facilities, such as waste bins, toilets, and waste disposal systems.

This study corroborates Ma etal[7] and Sepadi[15], in which the street food suppliers exhibit inadequate food handling practices and operate in unhygienic conditions, and this is worsened by low sanitation. SFVswith non-hygienic practices exhibited in bacterial load in food items, including *Escherichia Coli*, *Salmonella* and *Staphylococcus Aureus*[16].

Several factors have been found to be correlated with non-hygienic practices and low sanitation among SFVs, including: a) lack of knowledge regarding food safety and hygiene practice, b) limited access to clean water and sanitation facilities, c) lack of proper training and education on food safety and hygiene, d) ineffective regulatory and enforcement mechanisms for ensuring compliance with hygienic standards[17]. Unsanitary cultural and traditional practices contribute to unhygienic practices. Study in Jakarta- Indonesia found that vendors exhibit a sense of confidence in selling their food products despite inadequate implementation of hygiene and sanitation measures[8]. High levels of knowledge, attitudes, and practices regarding food safety and hygiene are correlated toward sex, monthly income, educational status, food vending experience and food safety training[18]. Therefore, despite rising vendor street awareness regarding safety food, establishing fundamental infrastructure and services, food inspection, and also ongoing training regarding safety food are necessary[19].

Substandard handling of raw- and cooked- food, as well as inadequate personal hygiene, have emerged as significant concerns among SFVs in Jember. Based on observation, raw food ingredients are not stored in a safe container or refrigerator, and the food handler wears dirty clothing with long- dirty nails. A significant proportion of SFVs also demonstrate non-compliance with the practice of reheating food every eight hours. Microbial contamination of food can occur at various stages throughout the food supply chain, and can result in the proliferation and dissemination of pathogenic microorganisms, including hepatitis viruses[20].

The inorganic chemical substances used continues as a concern among SFVs in Jember Regency. This study revealed the utilization of *Auramine*, *Alkanet, Butter Yellow*, *Black 7984*, including borax and formalin among SFVs. The occurrence of physical contamination in SFVs is evident by the presence of hair, plate shards, and glass fragments close to food. Moreover, the repetitive utilization of oil until it exhibits a darkened hue is noticed. Issa et al[21] reported that the excessive intake of inorganic food additives has been associated to an elevated risk of allergies, particularly in children, as well as interference the development of the intestinal barrier and the gut-associated immune system. Furthermore, the use of repeatedly heated cooking oils cause adverse health effects, including lung, colorectal, breast, and prostate cancer[22].

The results of the risk assessment, as visualized by Figure 1, indicate thatthe greatest risk is associated with the inadequate availability of sanitation facilities and negative attitudes, with 18 (high). This is followed by poor quality assurance (16), and food contamination (14). Based on these findings, immediate actions should be taken to improve the sanitation facilities for SFVs and provide education to enhance their knowledge and awareness regarding the importance of sanitation in mitigating the spread of hepatitis A. In addition, the risk management was shown by Table 1.

Indonesian MoH has been established Decree Number 1098/Menkes/SK/VII/2003[23], in which concerning Guidelines for Hygiene and Sanitation Requirements for Food Houses and Restaurants. Several aspects are regulated to obtain food safety, including food handlers, utensils, water, food ingredients, and food additives, serving, and vending facilities. Moreover, proper sanitation facilities are determining factors for obtaining hygiene standards among SFVs[23]. Nevertheless, lack of implementation of these regulations drives hepatitis A transmission among SFVs.

It is recommended to promptly clean eating utensils to mitigate bacterial growth. Additionally, in food management practices, it is essential to segregate utensils appropriately, ensuring that knives used for

food ingredients are kept separate from those used for cooked food, and ladles used for rice are not used for other food items. Effective cleaning of utensils utilized in food management is crucial to prevent cross-contamination. In addition, kitchen utensils used for food preparation and serving can serve as potential sources of contamination, underscoring the importance of maintaining their cleanliness.

Conclusion and Acknowledgement

The hazard identification among SFVs was found that the food processing equipment, food serving, and clean water provision is worse. The risk assessment found lack of sanitation facilities (18 point), negative attitude (18 point), poor quality assurance (16 point), and food contamination (14 point) have high potential risk. The risk management including: a) location and building: providing specific location and the equipment (chair and table) is consistently cleaned, b) sanitation facility: provision of sanitary waste bin, communal toilet and wastewater drainage system, fly control measures, and using piped water supply, c) food processing: increasing food handler personal hygiene, standard food handling process. In order to obtain and maintain food security, the author recommends policymakers to implement regular monitoring or inspection of the food quality and the necessity of providing clean water facilities or other fundamental facilities to SFVs.

Ethical clearance: Taken from The Ethical Committee of Medical Research at the University of Jember, with No. Registration: 1881/UN25.8/KEPK/DL/2023.

Source of funding:The University of Jember

Conflict of interest:Nil

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Original Research Article

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Study of Malnutrition in Children with Malignancies in Northern Garhwal Region

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Abstract

Background: Children with cancer are particularly vulnerable to malnutrition. Adequate nutrition plays a decisive role on treatment response, quality of life, and cost of care. This study aims to find out the prevalence of malnutrition in pediatric cancer patients and assess its grade and severity.

Methods: 89 patients included in this observational hospital based study. Nutritional status was assessed at the time of diagnosis then at 3rd and 6th month by different Anthropometric parameters.P < 0.05 was taken as significant.

Conclusion: Out of 89 patients, 3 died. According to IAP classification prevalence of malnutrition when weight for age taken as criteria, 22.1% lies in grade I and 16.3% lies in grade II at admission , total 38.4% malnourished at admission.

According to WHO 19.8% were moderately wasted at admission and 5.8% were severely wasted. When BMI taken as criteria, 15.1% falls under thinness and 16.3% falls under severe thinness, only 1.2% were obese. After post hoc analysis, there was significant difference between BMI of patients atadmission versus 6months and also at 3months versus 6 months. Prevalence as per WHO criteria at admission 25.6% decreased to 16.3% at six months.

Keywords: malnutrition, anthropometric parameters

Introduction

Globally it is estimated that cancer kills over 7.9 million people every year with 13% of total deaths worldwide and 14 million new cases annually. Childhood cancer is a leading cause of child mortality in developed countries as well as a recognised contributor to malnutrition and death in developing countries, in particular those of low socioeconomic status [1].

The importance of nutritional status in children with cancer is related to its possible influence on the course of the disease and survival [2]. The survival of children with cancer has substantially increased over the last decades.It is recognized that a diminished nutritional status may be a contributing factor for decreased immune function, delayed wound healing,

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and disturbed drug metabolism influencing prognosis [2,3]. Children with cancer are particularly vulnerable to malnutrition, because they exhibit elevated substrate needs due to the disease and its treatment.It has been demonstrated that adequate nutrition plays a decisive role on several clinical outcome measures such as treatment response, quality of life, and cost of care [4,5].

Weight loss in cancer patients is due to depletion of both adipose tissue and skeletal muscle mass, while the nonmuscle protein compartment is relatively preserved, thus distinguishing cachexia from simple starvation [3].

In children with cancer, body weight can be influenced by tumor mass and hydration, particularly during chemotherapy, masking loss of fat and skeletal muscle. The measurement of body compartments provides useful information about the nutritional status at the time of diagnosis [6].

Malnutrition is a negative prognostic factor that is often associated with increase morbidity and decrease survival in pediatric oncology patient.

Current information regarding the prevalence of malnutrition in childhood cancer is critically influenced by several factors like different diagnostic techniques to assess the nutritional status, the staging and histologic type of malignancy at the time of assessment and child's individual susceptibility toward malnutrition and anticancer regimen.

In a recent critical review of important aspects of nutrition in children with cancer it was found that the importance of nutrition in children and young adults with malignancies is still under estimated [7].

As our institute is the only tertiary centre in Uttarakhand providing treatment for various childhood malignancies. More studies are required to reaffirm the need for proper nutrition management in children with malignancies. This study therefore aspires to investigate the nutritional status of children with cancer and determine its prevalence and to assess its grade and severity. So that we can prevent morbidity and mortality in childhood malignancies by simply providing early intervention with proper dietary intake and support in further betterment of future of our state to be healthy and fine.

Aims and Objectives

To find out the prevalence of malnutrition in pediatric cancer patients and to assess its grade and severity.

Material and Methods

The present observational study was conducted in the Department of Paediatrics, Himalayan Institute Of Medical Sciences (HIMS), Swami Rama Himalayan University, Swami Ram Nagar, Dehradun, over a period of 12 months after obtaining approval from institutional ethics committee.

Children upto 18 years of age diagnosed to have malignancy were included in the study. Subjects taken from both outpatient and/or In patient settings betweenNovember 2017 to December 2019 at HIMS Dehradun after obtaining a written informed consent from the patients, parents or their guardian.

Total 89 patients were included .Patients beyond 18yrs of age and who were already diagnosed undergoing treatment, had associated co-morbidities were excluded. Case Recording Form were used in which data of the patients were recorded. A thorough clinical history and physical examination was performed. Nutritional status of the patients was assessed at the time of diagnosis then at 3rd and 6 months Anthropometric parameters for all subjects were recorded that include weight, height, mid upper arm circumference(MUAC) and triceps fold thickness(TFT). After this weight for age, weight for height and Body mass index (BMI) of each subject were calculated and then grading and severity of malnutrition done according to IAP(Indian Academy of Pediatrics), WHO(World Health Organization) and BMI(Body Mass Index) classification.

Results and Discussion

Table 1: Frequency of Different Malignancies

Diagnosis	<=5 Years	>5 - <= 10 Years	>11 - <=18 Years	Grand Total
Acute leukemia	1 (50%)	1 (50%)	0 (0%)	2
ALL	11 (38%)	10 (34%)	8 (28%)	29
AML	3 (25%)	4 (33%)	5 (42%)	12
CML	0 (0%)	0 (0%)	1 (100%)	1
Craniopharyngioma	0 (0%)	1 (100%)	0 (0%)	1
Ependymoma	1 (100%)	0 (0%)	0 (0%)	1
Ewing's sarcoma	1 (20%)	1 (20%)	3 (60%)	5
GCT	0 (0%)	0 (0%)	1 (100%)	1
Glioma	0 (0%)	1 (100%)	0 (0%)	1
Hepatoblastoma	0 (0%)	1 (100%)	0 (0%)	1
Hodgkins lymphoma	1 (13%)	2 (25%)	6 (63%)	9
Immature teratoma	0 (0%)	2 (100%)	0 (0%)	2
Medulloblastoma	3 (60%)	0 (0%)	2 (40%)	5
Multiple myeloma	0 (0%)	0 (0%)	1 (100%)	1
Nephroblastoma	1 (100%)	0 (0%)	0 (0%)	1
Neuroblastoma	1 (50%)	1 (50%)	0 (0%)	2
Osteosarcoma	0 (0%)	0 (0%)	3 (100%)	3
Papillary carcinoma of thyroid	0 (0%)	0 (0%)	1 (100%)	1
Retinoblastoma	1 (100%)	0 (0%)	0 (0%)	1
Rhabdomyosarcoma	2 (67%)	1 (33%)	0 (0%)	3
Sacrococygeal tumor	1 (100%)	0 (0%)	0 (0%)	1
soft tissue tumor	0 (0%)	0 (0%)	1 (100%)	1
Wilms tumor	1 (50%)	1 (50%)	0 (0%)	2
Grand Total	28 (33%)	26 (30%)	32 (37%)	86

Out of 86 patients haematological malignancies were more prevalent in children from 0-18 years 51.1% leukemia and 10.4% lymphomas, similar to study by L.Lima de Araujo et al. [8] whofoundprevalence out of 46 patients of haematological malignancies, 36.7% leukemia and10.0% lymphoma.

Table 2: Demographic characteristics of patients

AGE GROUP	No. Of cases (n =86)	Percentage
0-5	28	32.6%
6-10	26	30.2%
11-18	32	37.2%
SEX	No. Of cases (n =86)	Percentage
Male	56	65.1%
Female	30	34.9%
Socio Economic Status	No. Of cases (n =86)	Percentage
Lower middle class	26	30.2%
Upper lower class	42	48.8%
Upper middle class	18	20.9%
Total	86	100%

The ages ranged between 1 to 18 years. Majority (43%) were between 11-18 years

There were 56 boys (65.1%) and 30(34.9%) girls. The male female ratio was 1.8:1

Study of Jusawalla et al [9] Bombay gives male: female ratio of 1.4:1.

Other Studies also showed male preponderance .

Socioeconomic status assigned according to Modified Kuppuswamy's scale.

Maximum percentage lies in upper lower class 48.8%

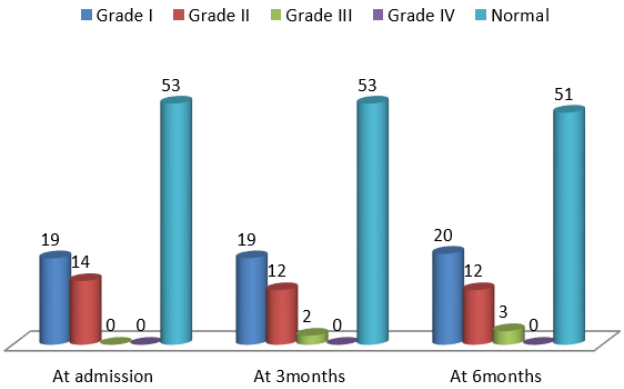

Figure 1: IAP classification of malnutrition

Percentage of patients in grade I increased from 22.1% at admission to 23.2% at 6 months, however percentage in grade II decreased over a period of 6 months from 16.3% to 14%. At admission numberof patients in grade III malnutrition were zero and increased to 2 and 3 at 3 months and 6 months respectively. None of the patients at grade IV during study.

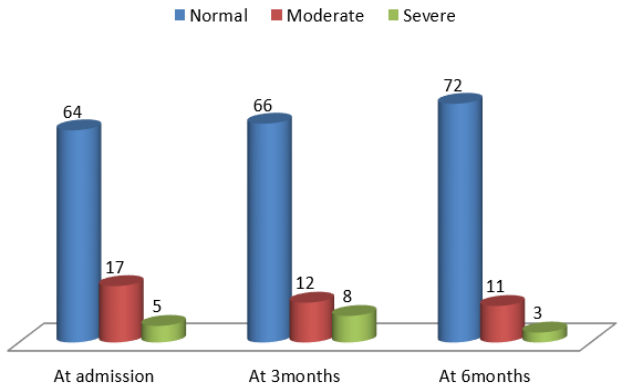

Figure 2: Wasting in patients over period of study

At admission 74.4% were not malnourished according to WHO classification and 19.8% were moderately wasted and 5.8% were severely wasted. Percentage of severely malnourished increased at 3months to 9.3% and decreased to 3.5% at 6months. However, malnutrition status improved during a period of time with more number becoming normal at 6 months on follow up that were 83.7%.

Table 3: Severity of wasting in different age groups at admission, 3 months and 6 months

Duration	Wasting	<=5 Years	>5 - <= 10 Years	>11 - <=18 Years	Grand Total
At Admission	MODERATE	4	7	6	17
	NO	23	18	23	64
	SEVERE	1	1	3	5
	Grand Total	28	26	32	86
At 3 Month	MODERATE	2	4	6	12
	NO	23	20	23	66
	SEVERE	3	2	3	8
	Grand Total	28	26	32	86
At 6 Month	MODERATE	3	4	4	11
	NO	24	21	27	72
	SEVERE	1	1	1	3
	Grand Total	28	26	32	86

Most patients were moderately wasted 17 at admission then at 3 months and at 6 months. However more number of wasting is seen in age group 11-18 years.

Chukwu et al [1] found 12.2% subjects wasted and p value was statistically significant which was comparable to our study where 23.5% of patients were wasted at 3months and 16.3% at 6months.

Table 4: Malnutrition as per Body mass index (BMI)

BMI	At admission	At 3 months	At 6 months
Normal	58(67.4%)	58(67.4%)	60(69.2%)
Thinness	13(15.1%)	13(15.1%)	12(14%)
Severe thinness	14(16.3%)	14(16.3%)	13(15.1%)
Obesity	1(1.2%)	1(1.2%)	1(1.2%)

Most patients under normal range. 15.1% and 16.3% were under thinness and severe thinness respectively at admission and decreased to 14% and 15.1% at 6 months, only 1% of patients were obese at admission and no change seen at 3 months and 6 months.

In our study 29.1% malnourished at admission and became normal at 6 months with 100% survival. This could be because of early diagnosis in our hospital with proper nutritional follow up from the beginning. At admission severe thinness was (15.1%) and thinness (16.3%) compared to study by Priscila et al in which 10.85% were below adequate BMI atadmission[10]. This data at three months remains same and decrease to 27%for severe thinness and thinness respectively. These data further decreased to 29% and 23% at six months. This decrease in malnutrition status is explained by improvement in dietary intake and regular follow-up and good compliance to treatment. However this decrease was not significant.

Table 5: Comparison of weight for height at admission, 3 months and 6 months

Weight for height		p-value	95% Confidence Interval for Difference[a]	
			Lower Bound	Upper Bound
At admission	At 3months	.054	-3.956	.026
	At 6 months	.000	-3.609	-1.693
At 3 months	At admission	.054	-.026	3.956
	At 6 months	1.000	-2.706	1.334
At 6 months	At admission	.000	1.693	3.609
	At 3 months	1.000	-1.334	2.706

Significant difference observed in weight for height at admission versus 3 and 6months both. However no significant difference observed at 3 months versus 6 months.

Table 6: Triceps fold thickness (TFT) of cases

TFT	Mean	SD	Sig.
At admission	12.8	2.2	0.000
At 3months	12.7	2.5	
At 6months	12.9	2.7	

TFT showed mean of 12.8 at admission and 12.9 at 6months and T p-value is statistically significant $p<0.05$.

TFT permit an assessment of lean body mass. These parameters should be obtained routinely to minimize inter-observer variability and compared with reference values to assess the nutritional status. Values $<5^{th}$ percentile for age are consistent with severe malnutrition. These measures are less subject to variation between racial/ethnic groups than is the case with height and weight.[11]

Nutritional support during therapy for children with ALL in Guatemela was associated with better outcome. [12]

Similarly we focussed on nutritional status from the very beginning of the chemotherapy and found better outcome at the end of the study.

Conclusion

The topic of malnutrition in children with cancer has been reviewed mostly in developed countries. The data regarding prevalence of malnutrition is very scanty for developing countries. In this study we found malnutrition prevalence as per different Criteria.Most studies investigated the prevalence of malnutrition at diagnosis, with very few exploring nutritional status during or at the end of therapy. In our study we followed these patients for 6 months.

Limitation of the study was time period for the follow up was less, so not much significant change in weight and height of the patient is expected in this period of time.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Original Research Article

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Comparison of Endotracheal Tube Cuff Pressure change between Supine-prone and Supine – Knee Chest Position in Lumbar Disc Surgery

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Abstract

Background: In rare instances, massive over inflation of the cuff may lead to acute complications such as tracheal bleeding or rupture. This may be associated with post-operative complications like sore throat hoarseness of voice. The purpose of this study was to evaluate the ETT cuff pressure changes between supine to prone and supine to knee chest position in lumber disc surgery.

Materials & Methods: Sixty patients, aged between 18 to 60 years of either sex, belonging to American Society of Anaesthesiology (ASA) physical status I to II undergoing elective lumbar disc surgery under general anaesthesia either in prone position or in knee-chest position were considered for this study. The patients were randomly allocated into two groups of 30 patients each. Group "p" was undergone operation in prone position and group "k" undergone operation in knee-chest position. The patients were connected to standard monitoring system such as non-invasive blood pressure (NIBP), electrocardiogram (ECG), pulse oxymeter, and capnometer. All patients were pre-medicated with inj. glycopyrrolate 0.2 mg and inj. fentanyl 2µg/kg iv 5-6 minutes before induction of anaesthesia and were pre-oxygenated with 100% oxygen for atleast 3 minutes. All the patients were induced with inj. propofol 2.5 mg/kg i.v. followed by inj. rocuronium at a dose of 1.2 mg/kg for facilitating tracheal intubation with reinforced ETT. The ETT size selected for men and women were 8.0-8.5 mm ID and 7.0- 7.5 mm ID (Mallinckrodt) respectively.

Results: Group k patients showed higher cuff pressure change from 25 to 39.97cm of H2O compared to group p from 25 to 30.47 cm of H2O after change of position only. There was statistically significant different found between groups Sore throat was found significantly higher in group k compared to group p (20% vs 16.67%).

Conclusion: The cuff pressure of the endotracheal tube should be monitored and managed properly after the position change from supine to prone and prone to knee chest position.

Keywords: Endotracheal tube, cuff pressure, lumbar disc surgery, supine-prone and supine – knee chest position

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Introduction

Endotracheal tube (ETT) is often necessary to achieve airway control during general anaesthesia. The cuff of the tube seals the extraluminal airway, facilitating positive-pressure ventilation and reducing chances of aspiration. Nowadays endotracheal tubes have high-volume low-pressure cuffs, generally made of polyvinylchloride or polyurethane materials. Cuff pressure is essential in endotracheal tube management.[1, 2] Cuff pressure changed with change in position of tube as tracheal diameter is not same everywhere. It is shown that flexion causes advancement of tube toward carina and extension causes withdrawal of tube cranially.[3] Below 20 cm of H_2O can cause air leakage, which lessens the effect of mechanical ventilation, produces a leakage of inhalation anaesthetics and there is chance of aspiration. Inflation of the cuff in excesses of 30 cm H_2O damages the tracheal mucosa by compromising capillary perfusion. When pressures are greater than 50 cm of H_2O, total obstruction of tracheal blood flow occurs.[4] In rare instances, massive over inflation of the cuff may lead to acute complications such as tracheal bleeding or rupture.[5] This may be associated with post-operative complications like sore throat, hoarseness of voice.[6] The purpose of this study was to evaluate the ETT cuff pressure changes between supine to prone and supine to knee chest position in lumber disc surgery.

Materials and Methods

After getting institutional ethics committee approval and written informed consent from 60 patients, aged between 18 to 60 years of either sex, belonging to American Society of Anaesthesiology (ASA) physical status I to II undergoing elective lumbar disc surgery under general anaesthesia either in prone position or in knee-chest position were considered for this study. Patients refusal, suspected difficult intubation, risk factors for perioperative aspiration, pregnancy, morbid obesity, chronic coughing, uncontrolled hypertension, uncontrolled diabetes mellitus, recent history of respiratory tract infections were excluded from this study. The patients were randomly allocated into two groups of 30 patients each. Group "p" was undergone operation in prone position and group "k" undergone operation in knee-chest position.

Pre- anaesthetic evaluation was performed in each patient including history, thorough clinical examination and airway examination. After shifting the patients to the operation theatre, they were made to lie in supine position on the trolley. A peripheral venous line was established with 18 G venous cannula and intravenous (iv) normal saline was started. The patients were connected to standard monitoring system such as non-invasive blood pressure (NIBP), electrocardiogram (ECG), pulse oxymeter, and capnometer. All patients were premedicated with inj. glycopyrrolate 0.2 mg and inj. fentanyl 2μg/kg iv 5-6 minutes before induction of anaesthesia and were preoxygenated with 100% oxygen for atleast 3 minutes. All the patients were induced with inj. propofol 2.5 mg/kg i.v. followed by inj. rocuronium at a dose of 1.2 mg/kg for facilitating tracheal intubation with reinforced ETT. The ETT size selected for men and women were 8.0-8.5 mm ID and 7.0- 7.5 mm ID (Mallinckrodt) respectively. Insertion depth of the ETT were 22-23 cm for men and 20-21 cm for women at the upper incisor and cuff was inflated with 5 cc air in pilot balloon using a disposable syringe.

Cuff pressure was adjusted to 25 cm H_2O using a hand -held cuff pressure gauge (aneroid manometer) and it was measured at the end of expiration. A three way stopcock was attached between pilot balloon and manometer, third port was attached with either 2 cc or 1 cc disposable syringe for air withdrawal or administration according to need. During the procedure, the manometer was continuously attached to the pilot balloon of the ETT, and the pressure was controlled by the pressure relief valve and bulb (manual pump) of the manometer. ETT were secured in the centre of the mouth with fixator and bite blocker. The final position of the ETT was confirmed by bilateral auscultation. During the procedure 100% oxygen at a fresh gas flow of 6 L/ min were delivered and anaesthesia was maintained with N_2O (70 volume% in oxygen) and isoflurane (0.4- 0.8 volume %). The positioning of the patients either prone or knee-chest position were performed according to the previous randomization. The supine to prone position change were made on Alpha Classic Pro (Mequet Company) operating table using a standard position, with the patients head resting on an elevated 7 cm head ring and rotated towards right,

both eyes were protected with lubricant jelly and covered with eye pad and both arms are abducted less than 90° whenever possible. Pressure points were padded with cotton to prevent nerve damage, and chest and abdomen are supported away from the bed to minimize abdominal pressure and preserve pulmonary compliance. Similarly knee-chest position was made with head elevated and neck rotated towards right. The increase in intrathoracic pressure by the increased abdominal pressure in prone and knee chest position was prevented by attempts to ensure that the abdomen of the patient was not compressed. All monitors were remaining attached and continuous monitoring was done during the change of position. Inj. atracurium at 4-12μg/kg/min and inj propofol at 50-150 μg/kg/min infusion were started. Inj. tramadol 2 mg /kg i.v. was given after positioning the patient either in supine or knee chest position and thirty minutes before end of operation infusion paracetamol 15mg/kg iv was infused. Fifteen minutes before the end of surgery all patients received inj. diclofenac 75mg intramuscularly for post-operative analgesia. Infusions were stopped 30 minutes and 15 minutes before end of surgery for inj. atracurium and inj. propofol respectively. Isoflurane was discontinued at the time of the skin closure and anaesthesia was maintained with nitrous and oxygen.

ETT cuff pressure were measured after intubation in supine position, then just after change of position to prone or to knee-chest position thereafter every 30 minutes interval during the surgery, before and after reposition to supine position. Cuff pressure was kept at 25 cm of H_20. Air withdrawn or introduced to the pilot balloon when cuff pressure became >25 cm of H_2O and <25 cm of H_2O respectively. Haemodynamic changes such as SBP, DBP, MAP, HR, EtCO2 and saturation (SPO_2) were recorded in every 30 minutes interval in concurrent with cuff pressure changes. Residual muscle paralysis was reversed with inj. neostigmine and inj. glycopyrrolate intravenously. Extubation were made in supine position on the trolley. Patients were shifted to post anaesthesia care unit (PACU) for observation.

Statistical Analysis

Data were expressed as mean ± SD or number of patients. ETT cuff pressure changes were compared between supine to prone and supine to knee chest position and how much air required to adjust the cuff pressure at 25 cm of H_2O. All numerical variables were normally distributed by Kolmogorov-Smirnoff goodness-of-fit test. There was no variation in SPO_2. Comparison of numerical variables between Groups p and k done by Student's unpaired t test. The analysis was performed with Statistica version 6 [Tulsa, Oklahoma: Stat Soft Inc., 2001]. Statistical significance was considered at $P < 0.05$.

Results

Table 1: Characteristics differences in different study groups

Characteristics	Group p (n=30)	Group k (n=30)	P value
Age	40.90±14.099	41.27±9.457	0.906
Sex (M/F)	22/8	25/5	0.532
Height(cm)	159.27±5.546	159.70±5.266	0.757
Weight(kg)	62.70±10.416	62.43±9.818	0.919
ASA(1/2)	26/4	27/3	0.070
Durationofsurgery (min)	104.57±21.762	105.67±20.583	0.841

Two groups were comparable in terms of age, sex, body weight, height, ASA status (Fisher's exact test, p = 0.797), duration of surgery (Mann-Whitney U test, p = 0.788) [Table 1].

Table 2: ETT cuff pressure change between group p and group k (study groups)

Group	Supine (cm of H_2O)	After position (cm of H_2O)	P value
P (n=30)	25	30.47 ± 4.911	0.000
K (n=30)	25	39.97 ± 4.657	0.000

Group k patients showed higher cuff pressure change from 25 to 39.97cm of H2O compared to group p from 25 to 30.47 cm of H2O after change of position only. There was statistically significant different found between groups [Table 2].

Table 3: Volume of air required to adjust pressure in group p and group k.

	Group P	Group K	P value
Volume of air (cc)	-0.41±0.361	-1.00±0.400	0.000

Group k patients required more air to withdraw to maintain target cuff pressure and found to be statistically significant (p =0.000) [Table 3]

Table 4: Incidence of hoarseness in group p and k

Hoarseness of Voice	Yes	No
Group p(n=30)	16.67%	83.33%
Group k(n=30)	20%	80%

Sore throat was found significantly higher in group k compared to group p (20% vs 16.67%). Statistical analysis was done by Fisher's exact test 2-tailed (p value < 0.001). There was statistically no significant change noticed in HR, SBP, DBP, MAP, ETCO2, and SPO2in both the groups [Table 4].

Discussion

The results of this study demonstrated that position change from supine to prone and supine to knee chest position increases the cuff pressure of ETT. Head flexion, extension or rotation is a cause of increased cuff pressure in both the positions. We kept the posture of the head and neck unchanged in both the positions to avoid movement related bias, so our study only compared the cuff pressure differences in these two positions, between groups.

Kim JT *et al* and Hartrey R *et al* showed that flexion of head and neck moves the ETT toward the carina, while extension displaces the tube cranially and an average movement of 8.5 mm on extension and 15 mm on flexion in their adult patients.[7, 8] Kako *et al* found that the cuff pressure was changed by head rotation, neck flexion and extension in a paediatric population, and the major cause of increased cuff pressure was movement of the ETT within trachea either cranially or caudally. For cases with the cuff pressure should be measured at regular interval following the head and neck turned and fixed from the neutral position.[9]

Choi *et al.*in their study found that increased ETT cuff pressure by the position change from supine to prone position is due to the anatomic structure change in the neck. The trachea is located in the anterior portion of the neck and therefore cervical spine, muscles, and major vessels can compress the trachea by the gravity in prone position.[10] The increased intrathoracic pressure leads to an increasing airway pressure, which would cause the increase in ETT cuff pressure during inspiration and in patients with mechanical ventilation. However, during expiration if the patients did not receive a positive end-expiratory pressure, the airway pressure decreased to near zero. In our study the cuff pressure was measured at the end of expiration to prevent the effect of increased airway pressure in both the positions. The factors mentioned above are only hypotheses that require further studies.

In our study, the cuff pressure was set at 25 cm of H_20. Rello *et al*. reported that cuff pressure below 20 cm of H_2O has a high risk of ventilator associated pneumonia in intensive care patients as it can causes microleak around the cuff.[11] Seegobin RD et al concluded that capillary perfusion pressure has been recorded as ranging between 22 and 32 mm Hg, and the upper limit is uncertain. They found evidence of obstruction to mucosal blood flow at a lateral wall pressure above 30 cm H_2O (22 mm of Hg) with total occlusion of flow to the mucosa over the tracheal rings and posterior tracheal wall at a lateral wall pressure of 50 cm H_2O (37 mm of Hg).[4]

In our study we found that ETT cuff pressure has increased in both supine and prone position. Pressure change was more noticed in knee chest position compared to prone position. The main result of our study was that the cuff pressure increased from 25 to 30.47± 4.911 cm of H_2O and 25 to 39.97± 4.657 cm of H_2O after change in position from supine to prone and supine to knee chest respectively. After positioning ETT cuff pressure change in every 30 minutes was found nearly equal in both the situation and 0.41 ± 0.361 cc and 1.00±0.400 cc of air was withdrawn to maintain the target pressure.

Postoperative symptoms of sore throat and hoarseness are annoying for patients. The etiology of sore throat has not been clearly understood, it may be possible that injury of tracheal mucosa following intubation can release of inflammatory cytokines that cause swelling of mucosa. This swelling can affect vocal cord and patient experiences sore throat. Yamanaka et al. found that longer duration of surgery with ETT are high risk for postoperative hoarseness.[12] We also found in our study that 16.67% and 20.00% of patient experienced hoarseness and sore throat in both the situation. Overpressure of the ETT cuff can cause ischemic injury to the tracheal mucosa; hence the cuff pressure should be monitored and managed properly. The under-inflation of the ETT cuff can lead to air leakage, which lessens the effect of mechanical ventilation and produces the leakage of inhalation anesthetics.[13]

This study had some limitations. Firstly, we did not evaluate the displacement of the ETT after position change by fiberoptic bronchoscopy. The tip of ETT in supine position is not assuredly the same as that in prone position. Also, it is not clear whether the displacement of ETT occurs in flexed or extended postures. Secondly, in our study, neutral, flexed, and extended head posture in prone and knee chest position was not exactly the same as those in supine, which may have affected our results. However, we minimized differences in flexed, extended and rotated head posture before and after changing in both the position. Thirdly, because the mode of the manometer was not digital, there may have been an error in the reading of cuff pressure by the investigator. These factors might be a possible source of bias.

Conclusion

The position change solely from supine to prone and supine to knee chest position without the movement of head and neck can cause the increase of endotracheal tube cuff pressure and related adverse effects. Therefore, the cuff pressure of the endotracheal tube should be monitored and managed properly after the position change from supine to prone and prone to knee chest position.

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Original Research Paper

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Comparison of Thoracic Analgesia with Epidural Fentanyl and Transdermal Fentanyl Patch: A Comparitive Prospective Randomized Study

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Abstract

Background: Thoracic epidural analgesia (TEA) is used for analgesia following lower abdomen or orthopaedic surgeries. The aim of study was To compare the effects of 0.125% Bupivacaine with 2mcg/ml of Fentanyl infusion (group A) and 0.125% Bupivacaine with fentanyl patch (group B).

Methods: Patients undergoing elective surgery were randomized in a non-blinded fashion to receive postoperative analgesia at a single teaching hospital. A nested qualitative study (reported elsewhere) explored the dual primary outcome of patient experience and acceptability. Secondary outcome measures included rest and movement pain scores over 72 h, functional analgesia, analgesia satisfaction, opiate consumption, functional recovery, morbidity, safety, and cost-effectiveness.

Results: A total of 40 patients were randomized. The median (interquartile range; i.q.r.) dynamic pain score at 24 h was significantly lower after TEA than RSCA (33 (11–60) *versus* 50.5 (24.50–77.25); $P = 0.018$). Resting pain score at 72 h was significantly lower (4.5 (0.25–13.75) *versus* 12.5 (2–13); $P = 0.019$). Opiate consumption on postoperative day 3 (median (i.q.r.) morphine equivalent 17 (10–30) mg *versus* 40 (13.25–88.50) mg; $P = 0.038$), hypotension, or vasopressor dependency (29.7 *versus* 49.2 per cent; $P = 0.023$) and weight gain to day 3 (median (i.q.r.) 0 (−1–2) kg *versus* 1 (0–3) kg; $P = 0.046$) were all significantly greater after TEA.

Conclusions: TEA provided superior initial postoperative analgesia but only for the first 24 h. By 72 hours and provides superior analgesia, is associated with a lower incidence of unwanted effects, and may be more cost-effective.

Keywords: fentayl, analgesia, pain, chest wall

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Introduction

Thoracic surgery pain is most common severe types of postoperative pain commonly occurring in more than 70.0% of patients. Its after effects might last for several months or even years, significantly degrading quality of life[1]. Not only is postoperative analgesia required ethically, but it is also necessary because it helps control the stress response and maintain respiratory function. Loss of pulmonary parenchyma and postoperative discomfort have a negative impact on the mechanisms of the chest wall, making it difficult for patients who are at high risk for respiratory and cardiac issues to receive the necessary postoperative physiotherapy[2]. Reduced lung function is correlated with preoperative respiratory capacity, lung resection extent, and level of pain. Cough, depth of breathing, and expectoration are improved by successful analgesia. This also reduces the occurrence and severity of hypoxia, atelectasis, pneumonia, retention of secretions and respiratory failure. These improvements affect the rate of sequelae[3].

Multiple nociceptive and descending modulatory inputs are involved in the pathophysiology of thoracotomic pain, therefore it is impossible to predict an appropriate postoperative analgesia from knowledge of the relevant components. Surgery-related traumatising events include making surgical incisions, stretching ligaments, and inserting rib retractors in intercostal gaps to facilitate pleural manipulation. A bigger inflammatory process is started when peripheral nociceptors are activated by the inflammatory response. This larger inflammatory process amplifies pain transmission and changes pain perception through central sensitization. Through the afferent branches of the vagus and phrenic nerve, which appear to be the cause of shoulder pain, manipulation of the pleura/pericardium and bronchi stimulates visceral discomfort[4].

Material and Methods

After approval from institutional ethical committee this prospective randomized study was conducted on 40 patients, of either sex, aged 18 years and older, ASA physical status I- III scheduled for thoracic surgeries through posterolateral thoracotomy.

Exclusion Criteria Included

- History of relevant drug allergy
- Opioid dependence
- Contraindication for thoracic epidural
- Morbid obesity (BMI>40)
- Bleeding disorders (Coagulopathy)
- Psychiatric Illness
- Infection at injection site
- Liver or renal impairment

Inclusion Criteria Included

- Patients of either sex
- Age group of 20-60 years
- ASA Staus I-III

Pre-operative assessment was done a day prior to surgery. This includes a detailed history regarding physical health, other co-morbidity, current medication, drug allergy and previous anesthetic and surgical experience. The clinical examination was done along with laboratory investigations which includes complete hemogram, serum electrolytes, blood urea, serum creatinine, pulmonary function test, electrocardiogram and chest roentgenogram. Study protocol was explained to the patients and written informed consent was obtained from all the participants during pre-anesthetic evaluation. Visual analogue scale (VAS) 64 was explained to the patients. It consisted of a 10-cm unmarked linear scale where 0=no pain and 10=worst imaginable pain. All the patients was kept fasting after 12 midnight for solid food. By using a computer generated randomization table all the subjects were divided into two groups (A and B) consisting of 20 patients in each group.

Following premedication was advised:

- Tab Alprazolam 0.25 mg orally at 10 pm night before surgery and 0.25 mg at 6am on day of surgery.
- Tab Rantidine 150 mg orally at 10 pm night before surgery and 150 mg at 6 amon day of surgery.

Group-A: In Group A patients, epidural analgesia was activated using 5–10 ml bolus of 0.25% of bupivacaine which were administered over a period of 10 min toward the start of the surgery, before

chest incision and infusion of 0.125% bupivacaine with 2 mcg/ml of fentanyl will be started at a rate of 5–8 ml/h through syringe pump. Placebo patch was applied 12 hours before surgery on the back of patient away from surgical field.

Group-B: In Group B patients, epidural analgesia was activated using 5–10 ml bolus of 0.25% of bupivacaine which were administered over a period of 10 min toward the start of the surgery, before chest incision and infusion of 0.125% bupivacaine was started at a rate of 5–8 ml/h through syringe pump. Fentanyl patch was applied 12 hours before surgery on the back of patient away from surgical field. All the participants and investigator providing postoperative care were blinded to the group assignment.

Intraoperative monitoring consisted of:

- 5-lead electrocardiogram (ECG)
- Invasive blood pressure (IBP)
- finger pulse oxymetry
- end tidal carbon-di-oxide (EtCO 2)
- nasopharyngeal temperature
- Central venous pressure.

Results

In our study, 40 patients were studied and were randomly divided into 2 groups of 20 patients each -

Table 1: Distribution of patients on the basis of group

Groups	Administration drug	Number of patients (%)
Group A	Bupivacaine with fentanyl + placebo patch	20 (50.0%)
Group B	Bupivacaine + Fentanyl patch	20 (50.0%)

Group A-consisting of 20 patients on the basis of drug administered consisting 0.125% Bupivacaine with 2mcg/ml of fentanyl at 6ml/hr rate + placebo patch applied 12 hours before surgery and Group B consisting 0.125% Bupivacaine to be started at 6ml/hr rate + Fentanyl patch applied 12 hours before start of surgery.

Distribution of patients on the basis of sex

Majority of patients were male. In Group A 60.0% were male and 40.0% were female whereas Group B consisted of 75.0% male and 25.0% female. Sex showed statistically non-significant association in both the groups ($p>0.05$).

Comparison of demographic details of patients of both groups:

In group A mean age of studied patients was recorded 34.80±10.75 years while in group B it was recorded 38.90±14.31 years.

In group A mean height of studied patients was recorded 154.75±5.34 cms while in group B it was recorded 156.45±4.71 cms.

In group A mean weight was recorded 56.50±10.13 kg, while in group B it was recorded 61.05±10.50 kg.

In group A mean BMI of the studied patients was recorded 23.52±3.73 kg/m^2 while in group B mean BMI of studied patient was 24.88±3.68 kg/m^2.

In group B mean age, mean height, mean weight and mean BMI of the studied patients was Demographic variables showed statistically nonsignificant association with both the groups ($p>0.05$).

Distribution of patients on the basis of ASA grading

Majority of patients, 65 % belong to ASA Grade II in both groups and rest patients belonged to ASA Grade III.ASA Grade showed statistically non-significant association between both the groups ($p>0.05$).

Comparison of Duration of surgery of patients of both groups

Mean duration of surgery in Group A was 5.95±0.83 hour and mean duration of surgery in Group B was 6.05±0.51 hour. It showed statistically non-significant association with both groups ($p>0.05$).

Comparison of HR of patients of both groups

Mean Heart rate was lower in Group A than group B and showed significant correlation in both groups ($p<0.05$).

Comparison of SBP of patients of both groups

Mean Systolic Blood Pressure (SBP) was recorded to be lower in Group A than it was recorded in Group B and showed significant correlation in both the groups ($p<0.05$).

Comparison of DBP of patients of both groups

Mean Diastolic Blood Pressure (DBP) was recorded to be lower in Group A than it was recorded in Group B and showed significant correlation in both the groups ($p<0.05$).

Comparison of RR of patients of both groups

Mean Respiratory Rate (RR) was recorded lower in Group A than it was recorded in Group B and showed significant correlation in both groups ($p<0.05$).

Comparison of VAS (at rest) of patients of both groups

At rest (VAS) was recorded lower in A Group than in B Group and showed significant correlation in both from 1 Hrs to 24 Hrs ($p<0.05$).

Comparison of VAS (at movement) of patients of both groups

Visual Analog Scale (VAS) At movement was recorded lower in A Group than in B Group and showed significant correlation in both at 24 Hrs ($p < 0.05$).

Comparison of VAS (at cough) of patients of both groups

Visual Analog Scale (VAS) At cough was lower in A Group than in B Group and showed significant correlation from 1 Hrs to 24 Hrs ($p < 0.05$).

Comparison of Sedation of patients of both group

Sedation was recorded lower in B Group than in A Group and showed significant correlation in both groups from baseline to 24 Hrs ($p < 0.05$).

Comparison of Rescue Analgesia of patients of both groups :

Mean duration in hours for patients in Group A to demand rescue analgesia was 10.10±1.47 hrs post operatively while in group B mean duration in hours to demand rescue analgesia was 18.10±3.95 hours.

This correlation was statistically significant and signified Group B has less amount of pain and lesser dosage of drug required for analgesia Similarly mean dose of tramadol required by patient in group A for rescue analgesia in first 24 hours was 58.75±12.23 mg.

On other hand mean dose of tramadol required in Group B was lower as compared to group A and was 15.50±9.72.

Mean total dose in 24 hrs in Group A (58.75±12.23) was higher than Group B (15.50±9.72) and was found to be statistically significant between both groups ($p<0.05$).

Comparison of complication of patients of both A, B groups

Nausea was reported in 3 (15.0%) patients of - Group A , 5 (25.0%) patients in B group and showed statistically non-significant association between both groups ($p>0.05$).

Discussion

Important component of anesthesia-based acute pain services is Thoracic Epidural Analgesia (TEA), and is used for treatment of the acute pain after the thoracic surgery, abdominal surgery, and rib fractures 5. When planning a moderate-to-large thoracic or upper abdominal incision it is warranted. By maximising, the pain management, reducing the surgical stress response, and enabling the early mobilization, TEA is an advantageous adjunct in fast-track surgery. The need to provide one lung ventilation in order to facilitate an acceptable operative field for surgeons as well as the potential for significant bleeding and hemodynamic changes because of surgeons operating close to the heart and its associated major vascular structures are among the clinical challenges and concerns for anesthesiologists that are associated with thoracic surgery. Thoracotomies are associated with severe postoperative pain, resulting in respiratory problems including hypoventilation, hypoxemia, atelectasis, lung infections, and respiratory failure. As a result of inadequate postoperative pain management, many patients may develop postoperative thoracotomy pain syndrome which can last for months or years [7].

Conclusion

Bupivacaine with 2mcg/ml of Fentanyl was found to be more effective than Bupivacaine with fentanyl patch in postoperative pain in thoracic surgeries**.**

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Source of funding: Self

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Original Article

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An Observational Study on Clinical Profile and Outcome of Japanese Encephalitis Patients Admitted in the Department of Medicine of a Tertiary Care Hospital of North Bank of Assam, India

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Abstract

Background: A significant public health issue in India is Japanese encephalitis (JE), which has a high fatality rate and causes residual neurological damage in survivors. The goal of the current study was to examine JE positive among patients who had been admitted with acute encephalitis syndrome (AES) and to analyse the differences in clinical profile, disease severity, neurological consequences, and mortality rate in Tezpur Medical College and Hospital.

Methods: This study is a retrospective observational study in a patients who were diagnosed as Japanese encephalitis on the basis of JEV-specific IgM antibodies in blood and cerebrospinal fluid (CSF) samples. The study included 32 Japanese Encephalitis positive patients admitted in Tezpur Medical College and Hospital (who met the clinical case definition of AES) and thus, their clinical profile and outcome were analysed.

Result: A total 32 JE cases were enrolled in the study diagnosed with CSF and Serum IgM ELISA antibody test. All of them were Serum IgM ELISA antibody positive, 9(28%) cases were both Serum and CSF IgM antibody positive. Most common age group affected was 12-20 years(31%). 59.37% cases recovered completely, 21.87% had neurological sequelae at the time of discharge and 18.75% died at ward.

Conclusion: Japanese Encephalitis is one of the leading cause of AES in India. In our study it has been seen that GCS score on presentation and CSF cell counts has positive association with mortality and disease sequale. Adequate care and treatment should be provided in order to avoid subsequent complications/sequale. Proper vaccination and vector control can prevent or mitigate this disease.

Keyword: Acute Encephalitis Syndrome, Japanese Encephalitis, Vaccination

Introduction

Acute Encephalitis Syndrome (AES) is defined as a person of any age at any time of the year presenting with acute onset fever and change in mental status such as confusion, disorientation, coma or inability to talk and/or new onset of seizure (except simple febrile seizure)[1]. Japanese encephalitis (JE) is the primary cause of Acute Encephalitic Syndrome in India[2,3]. It is caused by JE virus from flaviviridae

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family and transmitted by vector culex mosquito. Since last few decades Assam has experienced seasonal outbreak of JE specially during monsoon starting from April which peaks on July and August[4]. Every monsoon brings flood in the state providing favourable environment for mosquito breading and transmission of the disease to susceptible people. As JE has high morbidity and mortality rate, it caries a significant public health burden in India[5]. In previous study (pre covid-19 pandemic) conducted in Assam showed mortality rate of 24% and 51% were stable and discharged[6]. In another study conducted on children showed 63.9% recovered completely, 21.3% had neurological sequelae at the time of discharge and 14.7% died in hospital[7]. In 2020 and 2021 during Covid-19 pandemic most of the adult population got infected with covid-19 and during mass vaccination most of the adult population got vaccinated with covid-19 vaccine. Therefore this change in immunity profile of the adult population may change the susceptibility of JE virus, clinical profile and its outcome. In 2022 the Covid-19 pandemic wave was not severe bringing back to normalcy in day to day activity and the first monsoon brought major flood affecting almost all districts of the state followed by which numbers of JE cases start coming to hospitals of the state starting from month of May.

The present study aims to find out the clinical profile and disease outcome of the JE patients admitted in the department of Medicine of Tezpur Medical College and Hospital, Assam and try to assess the difference of clinical profile, severity of disease, neurological sequelae and mortality rate with previous (pre covid-19) outbreak data.

Aims and Objectives:

1. To study the clinical profile and outcome of the Japanese encephalitis patients
2. To assess the difference of clinical profile, severity of disease, neurological sequelae and mortality rate with pre-covid-19 pandemic data.

Inclusion Criteria:

1. All AES patients diagnosed as Japanese encephalitis by CSF IgM/Serum IgM ELISA antibody test
2. Age above 12 years

Exclusion Criteria:

1. AES cases having other etiological diagnosis
2. Age below 12 years

Materials and Methods

Source of data: This study was conducted in the department of Medicine, Tezpur Medical College and Hospital and data was collected from patients fulfilling the inclusion criteria after taking informed consent from patient/guardian.

Duration of the study: Study was conducted for 6 months duration from May2022 to October 2022

Sample Size: All the patients fulfilling the inclusion criteria during study duration determined the sample size.

Methodology

This is a retrospective observational study was conducted in the department of medicine, Tezpur Medical college and Hospital during the period from May 2022 to October 2022.

All the AES patients diagnosed as Japanese encephalitis by CSF IgM/Serum IgM ELISA antibody test and above 12 years of age were enrolled in the study after taking informed consent. A detailed clinical history, general examination and systemic examination were done as per standard protocol. Relevant laboratory investigations and radiological investigations will be conducted. A complete case performa was prepared for data collection.

Result and Observations: The results were analysed by using SPSS software. Quantitative and numerical variables were presented with measure of central latency like mean, median and measure of dispersion like standard deviation and standard error. During the analysis dichotoms variabls were compared using chi square test and descriptive statistics were used whenever required.

Ethical Justification:

Japanese Encephalitis is the primary cause of Acute Encephalitis Syndrome and every year there is a seasonal outbreak in this part of the world causing immense burden to the public health care. This study aims to understand the clinical profile and outcome

of the JE patients in this year's outbreak and try to assess the difference with previous outbreak data whether any change in its clinical profile, severity and mortality rate which will help in its clinical management and treatment.

Result and Observations

Demographic characteristics:

A total 32 JE cases were enrolled in the study diagnosed with CSF and Serum IgM ELISA antibody test. All of them were Serum IgM ELISA antibody positive, 9(28%) cases were both Serum and CSF IgM antibody positive. 17(53%) cases were male, 15(47%) were female. Most common age group affected was 12-20 years(31%) , youngest being 13years and oldest being 83 years(Figure 1). Most of the cases (94%) were from rural area and most of them belong to lower socioeconomic background (76%). Only 4(12.5%) patients can recall vaccination history with JE vaccine.

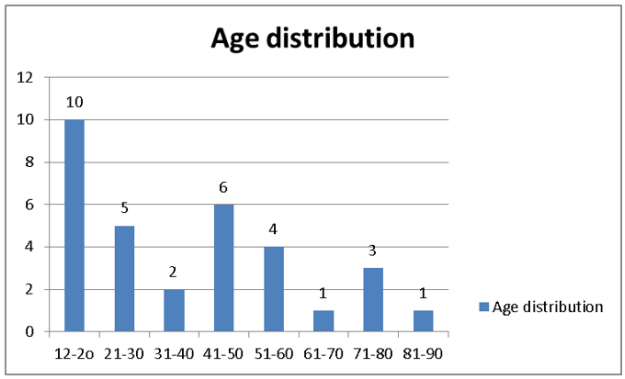

Figure 1

Clinical and laboratory profile:

Table 1 represent the clinical features of JE cases. Most common presenting symptom was fever(100%) followed by altered sensorium(90.62%) and headache(56.25%). Signs of meningeal irritation was found on 28(87.50%) cases, 17(53.12%) cases have GCS score ≤8. Seizure was present in 4(12.50%) cases and 2(6.25%) cases have focal neurological deficit in the form of hemiparesis. Duration of illness prior to hospital admission ranges from 3 to 20 days with average duration of 12days. Table 2 represent the laboratory profile of the JE patients. Mean haemoglobin level was 9.45 g/dl, mean total leukocyte count was 8341cells/mm and mean platelet count was 2.1 lakh/mm3. Mild elevation of serum AST level (mean73.56u/l) and mild hypoalbuminemia (mean serum albumin 3.4g/dl) was found. Table 3 represent CSF analysis, 43.73% patients have CSF cell count <5 and mean CSF cell count was 34.31±18.89cell/mm3, most of them have lymphocytosis with mean value 57.12±26.89%. Mean CSF glucose was 76.32±21.87 mg/dl and 71.87% patients have raised CSF protein with mean value of 67.34±27.12mg/dl.

Table 1: Clinical features of JE cases

Clinical feature	Total no. of patients	Percentage (%)
Fever	32	100
Altered Sensorium	29	90.62
Headache	18	56.25
Vomiting	13	40.62
Seizure	4	12.50
Abnormal behaviour	7	21.87
Focal neurological deficit	2	6.25
Signs of meningeal irritation	28	87.50
Glasgow Coma Scale(GCS) ≤8	17	53.12

Table 2: Laboratory parameters:

Laboratory parameters	No.(%) of patients	Mean
Haemoglobin(g/dl)		
<7	5(15.62)	9.45
7-12	20(62.5)	
>12	7(21.87)	
Total Leukocyte count(cell/mm)		
<4000	6(18.75)	8341
4000-11000	21(65.62)	
>11000	5(15.62)	
Platelet count(cell/mm3)		
<1.5Lakh	7(21.87)	2.1Lakh
>1.5 Lakh	25(78.12)	

Continue.....

Serum AST level(u/l) 40-100 101-200 >200	 25(78.12) 4(12.50) 3(9.37)	73.56
Serum ALT level(u/l) <40 40-100 >100	 16(50.0) 13(40.6) 3(9.37)	50.9
Serum Protein level(g/dl) <4 4-7 >7	 2(6.25) 26(81.25) 4(12.50)	5.9
Serum Albumin level(g/dl) <4 >4	 25(65.62) 7(21.87)	3.4
Serum Urea level(mg/dl) <40 40-100 >100	 21(65.62) 9(28.12) 2(6.25)	36.74
Serum Creatinine level(mg/dl) <1.2 >1.2	 21(65.62) 11(34.37)	1.1

Table 3: CSF analysis

CSF features	No. (% of patients)	Mean±SD
Cell count(cell/mm3) <5 5-100 >100	 14(43.73) 12(37.5) 6(18.75)	34.31±18.89

Continue.....

Polymorphs(%) <50 50-200 >200	 14(43.75) 2(6.25) 1(3.12)	13.02±11.23
Lymphocytes(%) <50 50-200 >200	 14(43.73) 10(31.25) 5(15.62)	57.12±26.89
Glucose level(mg/gl) <40 >40	 4(12.5) 28(87.5)	76.32±21.87
Protein (mg/dl) 20-40 >40	 9(28.12) 23(71.87)	67.34±27.12

MRI brain could be done on 3 patients out of those 2 reports showed T2 flair and hyper intensity in left hippocampus and 1 patient had normal MRI study.

Outcome: Table 4 shows the outcome of the patients . 59.37% cases recovered completely, 21.87% had neurological sequelae at the time of discharge and 18.75% died at ward. Table 5 shows relation of outcome with different variables.

Table 4: Outcome

Outcome	**No of patients**	**Percentage(%) of patients**
Recovered completely	19	59.37
Discharged with neurological sequelae	7	21.87
Death	6	18.75

Table 5. Relation of outcome with different variables:

Variable	Total	Fatal	Pecentage Fatality	Significance
AGE				NS
<20	6	1	16.6	
20 TO 60	21	4	19.0	
>60	5	1	20	
GENDER				NS
MALE	18	1	5.5	
FEMALE	14	5	35.7	
Duration of illness prior to admission				NS
<7 days	3	2		
>/=7 days	29	4		
GCS				S
3-8	9	5	55.5	
9-12	7	1	14.2	
13-15	14	0		
CSF CELL COUNT Cell/mm3				S
<5	14	1	7.1	
5-100	12	1	8.3	
>100	6	4	66.7	
TOTAL LEUKOCYTE CELL				NS
<4000	6	1	16.7	
4000-11000	20	3	15	
>11000	7	2	28.5	

Discussion

It is seen that Male gender and age between 12-20 from rural areas frequently have Japanese Encephalitis. In our study around 100% JE was identified in this study based on serology. Fever happens to be most common presentation followed by headache, altered sensorium, signs of meningeal irritation and seizures.Nearly all patients had leucocytosis, hyponatremia, low haemoglobin and increased transaminases were seen. 59.37% cases recovered completely, 21.87% had neurological sequelae at the time of discharge and 18.75% died at ward. shows .Only 4 out of 32 patients can recall vaccination history with JE vaccine. Significant association with fatality is seen with patients having lower GCS score and higher CSF cell counts.

In our study, we found fever, altered sensorium and headache to be the most common presesntations in JE. Almost all the studies have found that the same initial presenting complaints, both in adults and children. Of note are the studies by Shih Hao Lo et al., in Taiwan and Kakati G. et al[7]., in Assam Medical College, Dibrugarh, who studied AES in children.

In a study by Shih Hao Lo et al.[8], the Male to female ratio was found to be 1.6:1 whereas in our study we found the ratio to be 1.1:1. This shows a slight prelidiction towards males being more infected than females. However, in a rural centre like ours, it might be due to women seeking lesser medical help than males.

On studying the lab parameters, we found that mean CSF protein was towards higher side. The CSF cytology showed lymphocyte predominance.

In our study, 18.75% patients expired whereas 59.3% patients were discharged without any sequalae. These findings are similar to that of Kakoti G et al[7]., who found 14.7% mortality and 63% discharge without any sequalae.

On comparing the outcome with various variables, it was found that low GCS and higher CSF total cell counts may be predictors of mortality in the patients.

In a study by Ramli NS et al.[9], it was found that an increasing trend of JEV seropositivity in all countries as their populations reach older age cohorts, excepting India and Taiwan where it affected more of younger age group ; which is almost similar to our study where is affected people from age of 20-60.

In a study by Sarkari N et al.[10] which studied the acute clinical profile of JE patients and their neurological sequale at the time of discharge showed 667 patients out of 1199 patients had some sort of neurological sequale at the time of discharge. In our study the percentage was 21.87.

Conclusion

JE epidemics have occasionally been documented in several regions of India, and the disease is still a serious public health concern. A high index of suspicion and subsequent serological screening are essential for an early diagnosis of JE because its initial manifestations may be vague. In order to reduce subsequent consequences, doctors should also closely monitor consciousness decline, seizures, and respiratory failure during the acute phase to reduce secondary complications and adverse neurological sequale. There should be Scaling up JE vaccination coverage in India and education to common people regarding the spread of the disease, vector control and the vaccine. Assessment of the itineraries of travelers to JE-endemic places, guidance on personal protective measures to prevent vector-borne diseases, and consider recommending JE vaccine for travelers at increased risk for JE virus infection should also be done.

Ethical Clearance: Taken from Institutional Human Ethics Committee ,TMC&H,Tezpur.

Source of Funding: Self

Conflict of Interest: Nil

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Original Research Article

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A Clinico-epidemiological Study to Evaluate the Status of Iodine Deficiency Disorder in North 24 Pargana District of West Bengal

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Abstract

Background: Iodine deficiency disorders (IDD) being major public health problems in India, including West Bengal needs to be continuously monitored through recommended methods and indicators.

Present study is aiming to assess the total goiter rate, urinary iodine excretion, iodine content of salts at households' level among primary school children and to find association with the socio-demographic characteristics of the study population.

Method: A school-based, cross-sectional study was conducted during March 2019 to August 2019 among 540 schoolchildren of class three and four. Goiter was assessed by standard palpation technique, urinary iodine excretion (UIE) was analyzed by wet digestion method and salt samples were tested by spot iodine testing kits.

The total goiter rate (TGR) was 10.56 %. About 97.22 % of the salt samples tested were adequately iodized. Though consumption of iodized salt was adequate irrespective of socio demographic characteristics; goiter prevalence was significantly different with respect to mother's education level. Median urinary iodine excretion was found to be with in normal range. Lastly, a comparison is made between indicators of IDD over years which showed significant fall of TGR % of North 24 Pgs and a significant increase of adequately iodized salt consumption from 2004 to 2019.

Conclucion: 2019 resurvey of North 24 parganas indicates that the district achieved close to the goal of NIDDCP i.e. prevalence of IDD should be below 10%. It also proved that universal salt iodinization program has increased the household's iodine consumption above national goal of 91.2%. Goiter prevalence is found to be less in children whose mother attend the education upto 12th standard and beyond.

Key words: Goiter, Iodine, IDD, TGR, UIE, iodized salt, North 24 Pgs, West Bengal.

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Introduction

Iodine deficiency disorders (IDD) are widespread in India. Estimated 200 million people are at risk for IDD. Of these, 71 million have goiter, 2.2 million suffer from cretinism and 6.6 million have neurological deficits characterized by mental deficiency, hearing defects, squint and stunted growth.[1, 2] Studies suggests that IDD is not restricted to the classical Himalayan and sub Himalayan endemic goiter belt, it has also been reported from the sub- Himalayan flat lands (Terai), riverine areas and even in the coastal regions.[3] We now know that the soil of the flooded river valleys is also deprived of iodine as in the Ganges valley in India, which indicates that the problem of iodine deficiency is more widespread than previously suspected.[4]

As per recent data up to the year 2015-16, 337 districts out of 414 surveyed had been found endemic to iodine deficiency.[5] Considering the impact of IDD on the population, it may be concluded that elimination of IDD is not only a health issue, rather a critical development issue, and thus should be given the highest priority by government.[5] To deal with the problem National Goiter control Program (NGCP) was launched in 1962, primarily aiming at covering endemic population with iodized salt. The organized efforts were intensified in 1992 with change of NGCP to National Iodine Deficiency Disorders Control program (NIDDCP).

Globally, International Council for the Control of Iodine Deficiency Disorders (ICCIDD), WHO and United Nations children's Fund (UNICEF) have recommended some quantifiable indicators for monitoring the process of program.[6]India needs to follow these recommended indicators at state/ district level.

Rationale for the study: The northern part of West Bengal is hilly and located in the classical iodine deficient goiter belt of India, while its major southern part is in the Gangetic basin. North 24 Parganas is situated at the southern part of the state and extensively flood prone. Geographical characteristics of the district suggest the IDD proneness of the district. In North 24 Pgs, the last survey was done in 2004and found moderately high goiter prevalence. [3] So this study will help to assess the current status of IDD and also help to understand the progress of the NIDDCP in North 24 Pgs in comparison to last survey.

Objectives:

In this perspective, the present study was conducted to assess the total goiter rate, urinary iodine excretion levels, iodine content of salts at the households' level among primary school children of class three & four (8-12 years) and to associate them with the socio demographic characteristics of the study population.

Material and Methods

Study design: It was an observational, cross sectional study.

Study area: North 24 Parganas health districts, West Bengal, India.

Study population: primary school children of class three & four (aged 8-12 years) of North 24 Parganas health district of state west Bengal considered as the study population.

Exclusion criteria: children who were not present in school on the day of survey.

Time frame: March 2019 to August 2019.

Sample size: The prevalence of goiter in North 24 Pgs district was previously reported to be 20.1% (10).considering the confidence level of 95%, design effect of 2 and relative precision of 10% the calculated sample size was 512. It was established by the formula,

N= [4 p (1-p)/d2]* D (where, p- prevalence, d= relative precision, D- design effect)

Thus, the final sample size was 540 (18 school including children per cluster =30). The sampling method used to select study subject was cluster random sampling.

Sampling Procedure: Firstly, all the village and wards in the health district with their respective population according to the 2011 census was enlisted and "30 clusters" (i.e. villages/wards) was selected through multistage cluster sampling based on "probability proportion to size" (PPS). Then all the primary schools were enlisted in each identified

cluster and selected using simple random sampling from the list. In next step, from the sampling frame of all children of class three and four in the identified school in a cluster, 18 children were selected through PPS & systemic sampling.

The spot urine samples were collected by systemic random sampling (every 5th student) from the selected school children with a random start.

Thirdly, all the study children in each cluster asked to bring about 20 gm of salt in auto seal polythene pouches (supplied by the investigators beforehand), which were routinely being consumed in their respective families.

Assessment of goiter: The investigators assessed thyroid size of540 children in 30 clusters. Gradation of goiter was according to the classification laid down by WHO/ UNICEF/ ICCIDD.[6,]

Estimation of urinary iodine excretion (UIE) level: Spot urine samples were collected by systemic random sampling from the school children who were examined for goiter. Samples were collected in sterile urine container and transported to laboratory maintaining cold chain. UIE determined by wet digestion method.[7]

Assessment of the iodine content of the salt consumed: Rapid test kits used in this study (kit no. K052-1PK; lot no. 0000378696; exp. Feb.2020) were collected from HIMEDIA.

Ethical issues: The study got ethical approval from the institutional ethics committee of Institute of Public Health, Kalyani on 25th February, 2019 (Ref ID-SHDH/EC/264//5).informed written consent was obtained from each study participants.

Data analysis: Data collected arranged in graphical and tabular format and analysis done with SAS software version 9.2 and GraphPad QuickCalcs online software. Significance considered at p</= 0.05.

Result

A total of 540 school children aged 8 to 12 years were surveyed. Demographic details of the students are expressed in tabular format. (Table -1).

Table 1: Socio-demographic Characteristics of participants (n=540), North 24 Parganas health district, west Bengal, 2019.

Characteristics		Number	Percentages (%)
Age	8 years	131	24.26
	9 years	237	43.9
	10 years	159	29.44
	11 years	11	2.04
	12 years	2	0.37
Sex	Male	296	54.81
	Female	244	45.19
Area	Urban	283	52.41
	Rural	165	47.59
Type of house	Pukka	265	49.07
	Semi pukka	196	36.30
	Kachha	79	14.63
Father education	Higher education (>class 12)	59	10.93
	Higher secondary (class 11 &12)	70	12.96
	Secondary (class 5 to 12)	289	53.52
	Primary	100	18.52
	No school	22	4.07

Continue.....

Mother education	Higher education (>class 12)	34	6.30
	Higher secondary (class 11 &12)	67	12.41
	Secondary (class 5 to 12)	323	59.81
	Primary	67	12.41
	No school	23	4.26
Family income (monthly)	Rich (>/= 50000)	248	45.93
	Poor (</= 5000)	292	54.07

Goiter examination were done in 540 school students and urinary Iodine excretion test were done for 117 samples which are given in details in figure -1.

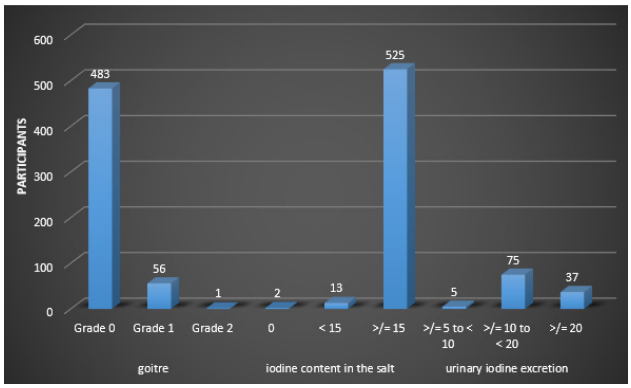

Figure 1: characteristics of Participants according to indicators of Iodine deficiency disorders (IDD).

By chi square test it was found that goiter prevalence is not significantly different in respect to age and sex. It was seen that prevalence of goiter was less in those children whose mother had attained education up to the 12th standard and beyond compared to those children whose mother could not achieve education even up to the 12th standard level (P = 0.0063). Area, type of house, father's education and monthly family income had no association with goiter prevalence. (Table -2).

Table 2: Association of other independent variables (except age, sex) according to Goiter (n-540).

TGR(%)	Categories	2 value (Table probability)	P value (Two sided Pr <= P)
10.56%	**Area**	0.0818	0.0802
	Type of house	0.0028	0.4229
	Father's education	0.0018	0.6677
	Mother's education	2.34	0.0063*
	Family income (monthly)	0.0018	0.4356

*significant at p </= 0.05.

By chi square test it was found that there was no significant association of UIE level with age and sex distribution, area, type of house, parents' education and monthly family income.

Table no 3: Association between the comparisons of indicators of IDD over years.

Indicators of IDD	North 24 Pgs (2004)	North 24 Pgs (2019)	2 value/ One sample median test value	P-value
Prevalence of Goiter (TGR%)	20.1	10.6	Chi square (DF) = 15.314(1)	<0.0001*

Continue.....

% of households consuming adequately iodized salt(>/=15 ppm)	69.7	97.2	Chi square (DF)= 135.601(1)	<0.0001*
Median urinary iodine excretion (UIE) levels(mcg/dl)	16	17	One sample median test (sign) = 5	0.3994

*significant at p </= 0.05.

There was a statistically significant difference between TGR% of North 24 Pgs in 2004 & 2019. Percentage of households consuming adequately Iodized salt (>/=15 ppm) significantly increased in 2019 from 2004. There was no statistically significant difference in median UIE value over years. (Table – 3)

Discussion

This study provided the opportunity to assess the current magnitude of iodine deficiency disorders in the North 24 Parganas health district by applying internationally accepted standard methods. It highlighted that the district is now passing through the phase of iodine deficiency to iodine sufficiency. The mild prevalence of goiter was found despite of satisfactory percentage of households consuming adequately iodized salt. It might be due to inappropriate cooking process.

Both the sexes were almost equally represented in all age groups among the study population. The urban rural division of the district was also almost same with the study population. (Table -1).

The study was conducted among school children of 8-12 years of age. It was observed that total goiter rates by sex and overall age groups were not significantly different. Although, contrary to this finding, studies in North 24 Pgs in 2004 and in Purulia district in 2005 observed increased TGR with the increasing age among females.[3]

When TGR was considered among the study population by their place of residence, type of house and monthly family income, it was seen that TGR was not significantly different among rural residents and urban residents. Though there is no statistically significant concordance between TGR and father's education; it was seen that education level of mother significantly associated with goiter prevalence (P = 0.0063) (Table-2).It was also reported from previous studies that health education to the parents significantly changed the practice of intake of iodine among their families.[8]So we can say as the cooking and food habits of children are mainly controlled by their mothers, it also may be the reason of decreasing TGR in children having educated mother.

Number of households consuming adequately iodized salt (97.2%) which was more than the recommended goal of >91.2% coverage.[6] Only 0.37% of households were consuming salt with no iodine (figure-1). This is a reflection of successful universal salt iodinization program (USI)[3][9]

Urinary iodine concentration is the most useful indicator of IDD and it has been recommended that no iodine deficiency is indicated in a population when median urinary excretion level is >/= 10 mcg/dl.[7] In the present study UIE level was with in the acceptable range (figure-1) reflecting the current iodine status, while the prevalence of goiter indicates the long-term iodine status in a population. Similar observations i.e. high TGR within median UIE level higher than the cut off value were found in a number of studies in India particularly where IDD control programs have been going on for last few years, reflecting a transition from iodine deficient to iodine sufficient state.[3, 9] Some other possibilities may be considered to understand the presence of high goiter rate and adequacy of urinary iodine excretion in North 24 Pgs health district. They are: iodine intake from the sea fish, increased intake of goitrogen by food and other sources of iodine.[10] These variable have not been addressed in this study.

In 2004, North 24 Pgs was surveyed to identify the magnitude of IDD which needed to be resurveyed after every 5th years according to NIDDCP guidelines. After 15 years in 2019 the re-survey is done in North 24 Pgs health district. 69.7 % households consumed adequately iodized salt in 2004 [3] which significantly increased in 2019 (97.2%). It also leads to significant reduction in TGR (P<0.0001) (Table-3).

All these signify that the district was in phase II of IDD elimination phase of community intervention) i.e. from iodine deficient to iodine sufficient state in 2004 [3] and still the district is passing through this phase in 2019. This process of transition needs to be augmented towards successful elimination of IDD with sustained consumption of adequately iodized salt, intensified awareness activities and an appropriate monitoring system.

Conclusion

2019 resurvey of North 24 parganas indicates that the district achieved close to the goal of NIDDCP i.e. prevalence of IDD should be below 10%. It also proved that universal salt iodinization program has increased the household's iodine consumption above national goal of 91.2% however this initial success needs sustainability by increasing national Iodinization program and generation of valid scientific data of the areas which had been surveyed already.

Another interesting finding came into the light that children whose mother were educated up to the level of higher secondary education and above found to consume more iodized salt and as a result of that decreased goiter prevalence. It proves that maternal education significantly improves the outcome so more focus should be given on girls' education.

Limitations of the study

1. The present study is a cross sectional in design. So it is limited in finding any causal association.
2. Iodine content of the salt was tested by spot iodine testing kits. This method is regarded as qualitative rather than quantitative. Titration, a better method of quantitative estimation was not done.

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Lifestyle Determinants of Hypertension among Government School Adolescents: A Cross-sectional Study

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Abstract

Background: High blood pressure in adolescents is a growing concern around the world, and is caused by various lifestyle factors like an unhealthy diet, high in sodium and fats, lack of sleep, and physical inactivity. Unchecked hypertension during adolescence can lead to stroke, cardiovascular and kidney disease later in life. This study investigated any possible correlation between lifestyle variables and adolescent hypertension.

Materials and Method: A cross-sectional analytic study was conducted with 600 school-going adolescents after obtaining permission from Ethical Committee, school administration, and parents. Data was collected for the student's sociodemographic profile, personal/family history, lifestyle habits, BMI, and systolic/diastolic blood pressure. Qualitative data were presented as percentages or proportions; quantitative data was denoted by mean and standard deviation. 'p-value' less than 0.05 was considered significant.

Results: Most of the adolescents (68%) were found to be underweight. Sleep duration had a negative correlation with blood pressure, which showed a statistically significant difference. Other lifestyle variables didn't show any significant relationship with hypertension.

Conclusion: 2/3rd of government school students studied were underweight, with a ratio of 1.2 normotensives for every hypertensive individual. Sleep duration exhibited a negative correlation with blood pressure, showing the importance of sleep.

Keywords: Adolescent, Electronic Device, Exercise, Hypertension, Lifestyle, Sleep

Introduction

Globally, hypertension is a major public health problem and a leading modifiable risk factor for cardiovascular disease (CVD) and death[1,2]. Hypertension could have its origin in childhood and go unnoticed unless specifically diagnosed during this childhood period. Adolescent hypertension is becoming more common, and its incidence is rising internationally. The prevalence of hypertension

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among Indian adolescents ranged from 2% to 20.5% among studies, with a pooled estimate of 7.6%.[3]

Multifactorial lifestyle factors can contribute to the development of adolescent hypertension. A diet high in sodium, unhealthy fats, and added sugars (mainly fructose) have been linked to the etiology of hypertension[4]. Lack of physical activity or a sedentary lifestyle is also a major cause of weight gain and an increase in blood pressure. Chronic stress & anxiety, and poor or irregular sleep can raise blood pressure and increase the risk of developing hypertension. Behavioral risk factors like addiction to smoking and excessive alcohol consumption and depression were significantly associated, with and contributed to the development of hypertension in school-going adolescents[5,6,7].

Hypertension in adolescents often remains asymptomatic, without regular blood pressure monitoring. There is strong evidence that pediatric hypertension tracks into adulthood and is associated with premature cardiovascular, stroke, and/or kidney diseases[8,9,10,11,12]. The prevention and control of hypertension among school-going adolescents have not received due attention in many developing countries, although it is one of the most modifiable risk factors for cardiovascular diseases[13]. There have been few studies on the effect of adolescent lifestyle on hypertension, despite the fact that it might give essential input into the design of policies and initiatives targeted at preventing and controlling adults' hypertension. Therefore, it is important to identify hypertension in adolescents at earlier stages for effective management. The objective of the present study was to determine the association of lifestyle factors with hypertension among school-going adolescents.

Material and Methods

A community-based, cross-sectional, analytic type of observational study was conducted on 600 healthy age-matched school-going adolescents with in the 10-19 years of age group. The present study was conducted after taking approval from the Institutional Ethical Committee and school administration and consent from parents/ guardians. Students suffering from any acute or chronic disease, secondary hypertension, taking any medications, or not willing to participate were excluded from the study.

A pre-designed working proforma was asked to be filled out by each participant that has information regarding demographic details (name, age, gender, residence), family history of chronic diseases, and details of their lifestyle like physical inactivity, sleeping hours, food habits,exercise, time spent on electronic devices. The anthropometric measurement was recorded to calculate the body mass index (BMI) for each participant. The blood pressure was measured on the left arm by using a standard mercury sphygmomanometer, after giving five minutes of rest to participants in a sitting posture and taking all the necessary precautions[14]. Three measurements of systolic blood pressure (SBP) and diastolic blood pressure (DBP) were taken at intervals of five minutes and the average was calculated. This measured average blood pressure was converted into percentile and adolescents were classified intonormotensive, pre-hypertensive, and hypertensive categories using the below percentile chart (Table-1). The percentile charts based on gender, age, and height were provided by the National High Blood Pressure Educational Programme (NHBPEP): the fourth report was used for the classification of blood pressure[15].

Table 1: Percentile Chart

Classification of Hypertension in Children and Adolescents	
Normal	<90th
Prehypertension	90th to <95th or if BP exceeds 120/80 mmHg even if below 90th percentile up to <95th percentile
Stage 1 hypertension	95th percentile to the 99th percentile plus 5 mmHg
Stage 2 hypertension	>99th percentile plus 5 mmHg

In the present study, the adolescents were further divided into 2 groups normotensive and hypertensive. The hypertensive group included both prehypertensive and hypertensive stages 1 and 2 for the lifestyle determinants.

Statistics: All the collected data was entered and compiled into an Excel sheet and statistical analyses were performed using a statistical software primer (version 6). The qualitative data was expressed in the form of percentages and proportions; the chi-square test was used to infer the significance of proportion. The regression analysis was performed for the correlation coefficient. A 'p-value' less than 0.05 is considered as significant.

Results

In the present study, most of the adolescents belong to the age group 13-15 years (53.5%) and 68% of adolescents were underweight. Whereas the other characteristics of adolescents were nearly similar. Out of 600 adolescents, 210 (1/3rd) had a family history of hypertension (Table 2).

Table 2: Sociodemographic and family history of the adolescent population

Variables	Number (N=600)	Percentage (%)
Age group		
10-12 years	165	27.5
13-15 years	321	53.5
16-18 years	114	19
Gender		
Boys	286	47.7
Girls	314	52.3
Residence		
Urban	300	50
Rural	300	50
BMI		
Underweight	407	67.8
Normal weight	170	28.3
Overweight	18	3
Obese	5	0.8
Family History		
Hypertension		
Yes	210	35
No	390	65
Heart Diseases		
Yes	28	4.7
No	507	95.3
Diabetes		
Yes	93	15.5
No	507	84.5
Obesity		
Yes	101	16.8
No	499	83.2

Normotensive and hypertensive subjects showed no significant difference in food habits with respect to fruit intake, fast food intake, and the type of food (Table-3).

Table 3: Association of blood pressure with food habits among adolescents (N=600)

Food Habits	Normotensive	Hypertensive	Total	Pearson chi-square
Fruit Intake				
Daily	76	64	140	X^2=0.950
Weekly	76	74	150	p=0.622
Occasionally	172	138	310	
Total	324	276	600	
Fast food Intake				
Daily	32	24	56	X^2=0.589
Weekly	78	73	151	p=0.745
Occasionally	214	179	393	
Total	324	276	600	
Type of food				
Vegetarian	217	175	392	X^2=0.838
Non-vegetarians	107	101	208	p=0.203
Total	324	276	600	

N= Number of subjects

The sleep duration had a significant (p=0.008) difference in normotensive and hypertensive subjects, while the exercise variable did not influence blood pressure among adolescents (Table 4).

Table 4: Association of blood pressure with the duration of sleep and exercise among adolescents

Variables	Normotensive	Hypertensive	Total number of subjects	Pearson chi-square
Sleep duration				
Normal sleep	222	176	398	X^2=9.786
Short sleep	79	92	171	***p*=0.008**
Long sleep	23	8	31	
Total	324	276	600	
Exercise				
Regular	227	187	414	X^2=0.371
Irregular	97	89	186	p=0.542
Total	324	276	600	

The normotensive adolescents (70%) were more regular in exercise than hypertensive (68%) adolescents with a nonsignificant difference (p=0.542) (Table 4, Figure 1).

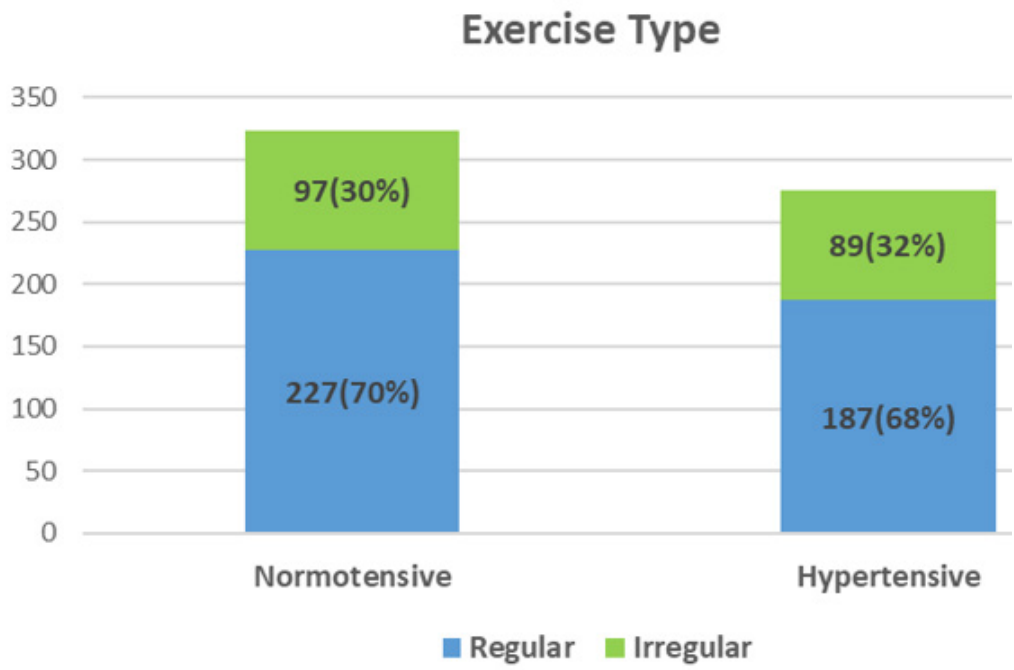
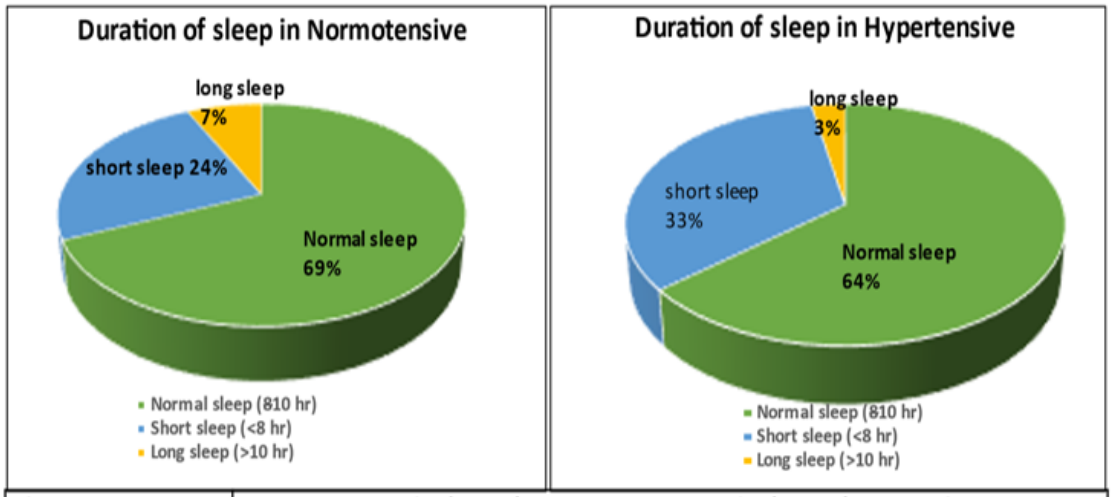


Figure 1: Proportions of exercise regularity among normotensive and hypertensive adolescents

The normotensive adolescents were having more normal sleep than the hypertensives with a significant difference (p=0.046) (Figure 2).



Sleep groups	Normotensive (N=324) Means (SD)	Hypertensive (N= 276) Means (SD)	p-value
Normal sleep	8.72 (0.79)	8.57 (0.67)	0.046
Short sleep	6.53 (0.63)	6.53 (0.57)	1.000
Long sleep	11.79 (0.93)	11.37 (0.69)	0.253

Figure 2: Distribution of sleep duration among the normotensive and hypertensive adolescents

A negative correlation was found between blood pressure (SBP, DBP) and sleep duration with significant differences (p=0.008, p=0.016), respectively. Time on electronic devices had a positive correlation (non-significant) with the blood pressure of adolescents (Table 5).

Table 5: Regression analysis of blood pressure with sleep duration and time on electronic devices

Independent variable (I)	Dependent variables (D)	Constant (A)	Unstandardized Coefficient (B)	Standardized coefficient (Beta)	Significance	R^2	Regression Line D=A+(B x I)
Sleep duration	SBP	122.641	-0.633	-0.087	0.033	0.008	SBP=122.641+ (-0.633 (Sleep hrs))
	DBP	77.04	-0.655	-0.125	0.002	0.016	DBP=77.042+ (-0.655 (Sleep hrs))
Time on electronic devices	SBP	117.03	0.228	0.027	0.501	0.001	SBP=117.037+ (0.228 (Elect hrs))
	DBP	71.50	0.078	0.013	0.749	<0.001	DBP=71.502+ (0.078 x time on Elect device))

Correlation value = Beta, D = Dependent variable, A = Constant, B = Unstandardized Coefficient, I= Independent variable

Discussion

Most of the adolescents (54%) belong to the age group 13-15 years and 2/3rd (68%) of adolescents were underweight. Out of 600 adolescents, only 1/3rd (35%) had a family history of hypertension. In the present study, only sleep duration was significantly associated with hypertension, whereas other lifestyle factors like exercise regularity, food habits, and time on electronic devices didn't influence hypertension.

In several previous studies[16,17,18,19,20] childhood obesity has been considered a major contributing factor to the increasing prevalence of hypertension in adolescents, whereas, in the present study, 68% of participants were underweight. Recently review articles publishedby Fikriana R et.al[21] and Ubaidillah et al.[22] collected 55 and 20 relevant

articles respectively to determine the risk factors for hypertension in adolescents, also suggested that most of the risk factors for hypertension in adolescents are related to obesity. However, these literature reviews included most of the lifestyle factors but the factor "sleep duration" was not considered. Whereas the present study reported a negative correlation was found between blood pressure and sleep duration with significant differences.

The National Sleep Foundation recommends <8 hours as insufficient, 8 to <9 hours as borderline, and ≥9 hours as optimal sleep for adolescents[23] In the present study, the normotensive adolescents exhibited a higher occurrence of normal sleep duration in comparison to their hypertensive counterparts, with a statistically significant difference (p=0. 046). Compared with other studies, the association of sleep duration with hypertension was like that of Javahri and associates[24] who reported that adolescents with low sleep efficiency, on average had a 4.0 ± 1.2 mmHg higher systolic BP compared to other children. Moreover, the study by Santos et.al [25] conducted in Brazil reported that sleep duration was significantly associated with blood pressure, and each increase of one hour in sleep was associated with blood pressure reduction in both sexes combined (p< 0.0001).Our findings are consistent with the findings of a Chinese cross-sectional study conducted on 4902 children and adolescents age 5 to 18 years and Kucieni[23] done on almost similar age groups(12- 15 years) of adolescents. It is suggested by these findings that the duration of sleep may have an impact on hypertension.

Possible explanation: Various potential mechanisms have been suggested in existing literature for the relationship between short sleep duration and blood pressure increase. One of them is elevated cortisol levels which can contribute to central and peripheral disturbances. People who get little sleep have higher levels of cortisol in their saliva compared to those who get a normal or long duration of sleep[24,25]. Another investigation implied that limited sleep time could elevate blood pressure by intensifying sympathetic nervous system activity, or by distorting circadian tempo and autonomic response[26].

Limitations: In this study, we were unable to gather information about the socioeconomic status of adolescents' parents. The participants were unable to give correct information regarding their total hours of exercise. Therefore, we gathered information on exercise on the basis of being regular or irregular. The various lifestyle factors like food habits, sleep duration, exercise type, etc depend on participants' memory, so there may be a recall bias.

Conclusion

In the present study, 2/3rd of adolescents were underweight. The ratio of normotensive versus hypertensive was 1.2:1 for the adolescents of the government schools of Jaipur district and only the 1/3rd adolescent had a family history of hypertension. Among the life style factors, only sleep duration was significantly associated with the tendency of hypertension. Sleep duration had a negative relationship with blood pressure, indicating an increase in sleeping hours reduces blood pressure. The exercise regularity and the time on the electronic device did not show any significant difference on hypertension.

Ethical clearance: Taken fromthe Institutional Ethics Committee of SMS Medical College & Hospital, Jaipur (3952/MC/EC)

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Infant Care Practices Adapted by Mothers Attending Medical College in Tamilnadu: A Cross –Sectional Descriptive Study

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Abstract

Context/Background: Rearing practices are a major determinant of nutritional and health status of infants. Infant Care Practices has more impact on Child Survival. Therefore these practices need to be better understood

Aims/Objectives: The objective of the study is to assess the feeding and child rearing practices among mothers in the study area.

Methodology: A cross sectional descriptive study was conducted among 110 mothers of 6 months to two year children attending Government Medical College in Thiruvannamalai using a Semi structured Questionnaire. Analysis of collected data was done using Microsoft Excel and SPSS software.

Results: Only 43.6% of mothers exclusively breastfeed their child and 33.6% of mothers had given prelacteal feeds to the newborn. Bottle feeding was practiced by 71.7% of mothers. About 68.2% of mothers applied kajal to the eyes of children.All the mothers utilised Health care services during illness of the children. Maternal education improves the weaning and immunisation practices and found statistically significant ($p < 0.05$)

Conclusions: Faulty child rearing practices need to be corrected either through health education, hands on training of mothers and counselling by healthcare professionals in order to improve the health status of infants.

Key-words: Infant, Rearing, Breast feeding, complementary foods, Child care, Colostrum

Introduction

Child rearing practices vary across communities depending on social custom, beliefs, prejudices of the community, literacy and socioeconomic status of the family especially mother[1]. These practices at times are not of any benefit to the newborn and can be harmful. Understanding these practices is important for the successful delivery of health messages and services. Various domains included in child care rearing practices includes breast feeding, cord care, Immunisation, baby care, weaning.

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Proper feeding practices during infancy are essential for attaining and maintaining proper nutrition, health and development of Infants and children[2]. Infants should receive complementary foods along with breast feeding after 6 months to meet the nutritional needs. In India according to NFHS-3 reported that 48.3% of mothers were exclusively breastfeed and only 53.8% of mothers started weaning at 6 months[5]. Vaccines are the most cost effective intervention to prevent death and infectious disease among children. The current study was conducted to assess the bad child rearing practices .It is important to understand the local practices to comprehend fully the determinants of child morbidity.

Methodology

A cross sectional descriptive study was carried out among mothers of 6 months to two year children attending the paediatric outpatient department at Government Thiruvannamalai medical college hospital in Tamil Nadu. Keeping in view prevalence of Exclusively Breast feeding in NFHS-4 in Tamil Nadu in year 2015-16 noted as 48.3%,with confidence level of 95% a sample size of 110 was calculated[10]. Using Judgement sampling method 110 mothers with children 6 months to two years were selected. Mothers with children outside the study range and children brought by caregivers other than mother were excluded in the study.

Data was collected over a period of three months from October to December 2019. Ethical clearance was obtained from Institutional ethics committee and prior permission was obtained from Hospital authority to interview Mothers. Written Informed consent and those who are willing to practice were included in the study. Data collection tools included pretested semi structured questionnaire and interviewing mothers attending OPD. Data entered in MS excel and analysed using SPSS software. Chi square test was applied and p value < 0.05 was taken as statistically significant.

Results

A total of 110 mothers were interviewed for child rearing Practices. Most of the mothers were 18 to 25 years (49.1%). It was observed that 18(16.4%) of mothers were illiterate or educated at Primary level. Majority 102(92.7%) of mothers lives in Nuclear family. It was noted that 58(52.7%) of the children were male. All the children were delivered through Institutional delivery. About 53(48.2%) of children belongs to age group 6months to 1 year followed by 57(51.8%) children between age group 1 to 2 years. Only less number 7(6.4%) of children birth weight less than 2.5kg. The mean birth weight of children was 3.1(±0.4) kg.

Table 1: Socio-Demographic Characteristics of Mother and Children (n=110)

Characteristics	N (%)
Age (Years)	
18-25	54(49.1%)
25-30	42(38.2%)
>30	14(12.7%)
Education	
Illiterate	5(4.5%)
Primary	13(11.8%)
Middle	63(57.3%)
Intermediate	29(26.4%)
Family	
Nuclear	102(92.7%)
Joint	8(7.3%)
Gender of children	
Male	58(52.7%)
Female	52(47.3%)
Age of children	
6months -1 year	53(48.2%)
1 year-2 years	57(51.8%)
Birth weight	
Less than or = 2.5 kg	7(6.4%)
> 2.5kg	103(93.6%)

In the present study it was found that about 37(33.6%) of mothers gave Prelacteal feeds to their children. All the mothers feed colostrums to their babies. Majority 88(80%) of mothers initiate breast feeding with in 4 hours after delivery while 22(20%) of mothers breast fed after 4 hours .Bottle feeding was Practised by 86(71.7%) of mothers. In this study Exclusively Breast feeding was given only by 45(40.9%) of mothers. Only 62(56.4%) started complementary foods at 6 months. Large Proportion 103(93.6%) of children were fully immunised. About

7(6.4%) of children were partially immunised. All mothers feed their children during illness. All mothers seek healthcare facility during illness. It was found that 75(68.2%) of mothers applied Kajal to eyes of their children. About 62(56.4%) of mothers oil massage their babies. 19(17.3%) of mothers apply oil and breast milk over Umbilical cord. About 58(52.7%) of mothers feed gripe water to their babies. All the mothers Utilised health Services during Illness of the children. Majority of the Mothers 79(71.8%) utilised Periodic Health Check-up for Growth Monitoring of the child. ICDS Services was utilised by 64(58.2%) of Mothers.

Table 2: Child care Practices adapted by mothers (n=110)

Child rearing Practices	N (%)
Prelacteal feeds	
Yes	37(33.6%)
No	73(66.4%)
Initiation of Breast feeding(Hours)	
<1 hour	65(59.1%)
1-4 hours	23(20.9%)
4-12 hours	19(17.3%)
>12 hours	4(3.7%)
Exclusively Breast feed	
Yes	48(43.6%)
No	62(56.4%)
Bottle feeding	
Yes	86(71.7%)
No	34(28.3%)
Complementary Foods Started	
6months	62(56.4%)
> 6 months	48(43.6%)
Immunisation	
Fully Immunised	103(93.6%)
Partially Immunised	7(6.4%)
Cultural Practices	
Application of Kajal to Eyes	75(68.2%)
Feeding Gripe water	58(52.7%)
Oil Massage	62(56.4%)
Umbilical Cord Applications	19(17.3%)
Health Services Utilisation	
Health Check-up for Growth Monitoring	79(71.8%)
ICDS	64(58.2%)
Health care Services during Illness	110(100%)

It is noted from the below analysis, Maternal education positively influence the Initiation of Breastfeeding after delivery and also Exclusive Breast feeding practice though statistically not significant. The analysis shows that maternal education improves the weaning and immunisation practices and found statistically significant ($p<0.05$).

Table 3: Maternal Education and its association with Child rearing Practices

Child rearing Practices	Illiterate & Primary N= 18	Middle & Intermediate N= 92	p value
Exclusively Breast fed			
Yes	7(38.9%)	38(41.3%)	0.848
No	11(61.1%)	54(58.7%)	
Complementary foods started			
6 months & Before	6(33.3%)	56(60.1%)	0.031*
After 6 months	12(66.7%)	36(39.9%)	
Immunisation			
Fully Immunised	13(72.2%)	90(98.2%)	0.001*
Partially Immunised	5(27.8%)	2(1.8%)	
Initiation of Breast Feeding			
Less than 1 hour	7(38.9%)	58(63%)	0.056
More than 1 hour	11(61.1%)	34(30.9%)	

Discussion

Prelacteal feeds causes diarrhea and electrolyte disturbance. Similar to our findings were noted in study by Nitin et al (South India 2013) reported that 33.5% of mothers gave prelacteal feeds to their children[7]. In contrast to our present findings, study by Mahbooba et al (Srinagar 2016) reported large proportion 40% of mothers did not give colostrum to the babies[8]. A study by Umar et al (Northern Nigeria 2017) found 67% of mothers did not give colostrums to their babies[4].

Ilamaran et al (Tamilnadu 2015) reported that majority of mothers Breast fed their child (87.5%) within one hour[13]. WHO recommends exclusive breast feeding for children up to 6 months[11]. As Per NFHS-5(Tamilnadu), the prevalence of Exclusive Breast feeding in Children under 6 months was 56%[10]. Syed et al (North India 2012) found that only 48.3% exclusively breastfed their children which is similar to our study findings[5]. A study by Nitin kumar et al (South India 2012) observed that only 57.9% of mothers exclusively breastfed their children[1].

Maninder et al (Patiala 2017) noted that 87% of mothers practised bottle feeding[3]. Similar to our study High prevalence of Bottle feeding (50%) were noted by Rathisharmila et al (Tamilnadu 2019). Nasreen et al (Bangladesh 2017) noted that 92.95% of children were fully immunised[2].Our findings are similar to NFHS-5 (Thiruvannamalai) where coverage of Fully immunised children was 97%[10]. Similar to our findings, in study by suvra et al (Orissa 2005) showed only 53% of mothers started Complementary feeding at 6 months[9]. Syed et al (North India 2012) noted 25% of mothers started complementary feeding at 6 months[5]. Similar to our study Puri S et al (Chandigarh 2008) noted that 56.6% of mothers practised oil massage to their babies. On the Contrary, Uma Rani et al (West Bengal 2022) found that only 50% of mothers fully utilised health services of the children[14].

Conclusion

Faulty child rearing practices are still prevalent especially in feeding practices among mothers. Incorrect child rearing practices need to be corrected in order to improve the health status of infants .Health education is the important cost effective intervention. Hands on training of mothers and counselling regarding various practices related to child rearing lead to low morbidity and mortality in children. Health education programmes by health care professionals to mothers need to be conducted to create awareness regarding practice of healthy habits of child rearing and correct practices of child feeding.

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Original Research

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Investigating the Impact of Psychological Interventions in Response to Depression, Stress, Anxiety, Post Traumatic Stress Disorder and Cognitive Functioning in Covid-19 Recovered Patients

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Abstract

The COVID-19 outbreak, in addition to the threat to physical health, may also negatively affect mental health. In this study, we intended to study the changes in psychological parameters in covid-19 recovered patients after they get the psychological intervention. This study conducted in three phases. In the first phase, Depression, Anxiety and Stress Scale - 21 (DASS-21), Post traumatic stress disorder (PTSD) Checklist PCL-5 and Montreal Cognitive Assessment were administered on a total of 477 covid-19 recovered patients. After a gap of 3 months, through clinical interview it was found out that 220 patients needed intervention. In the second phase of the study, psychological intervention was given to 190 patients. In the final phase, after a gap of three months from the intervention phase, all the tests were re-administered on the patients. Data were scored and analyzed using descriptive statistics. Result showed that significant difference was found in the score of depression, anxiety, stress and PTSD. Depression, anxiety, stress, PTSD scores were significantly reduced after intervention. ($p < 0.01$). No significant difference was observed between the MOCA score. These findings of the study suggest that, psychological intervention may have a beneficial effect on COVID-19 patients' mental health.

Keywords: Covid-19, psychological parameters, psychological intervention,

Introduction

Since December, 2019, an outbreak of coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has widely and rapidly spread in China and around the world [(26)]. In addition to the threat to physical health, the COVID-19 outbreak may also negatively affect mental health. Research at the onset of the COVID-19 pandemic has already indicated that symptoms of depression, anxiety, and self-reported stress have increased in the general population [(17, 22)]. Previous studies have shown that depression and anxiety are

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common and persistent mental illness in various illnesses including chronic diseases and cancer [14, 9]. Post-traumatic stress disorder (PTSD), anxiety, depression and mild cognitive impairment are possible disorders which might be expected, especially after intensive care (ICU) admittance [16, 13]. In a 2-year follow-up study of ICU patients with acute lung injury, the majority (59%) suffered from anxiety, depression and symptoms of post-traumatic stress disorder(PTSD) simultaneously during the entire follow-up [4]. In the meta-analysis by Salari in the general population during the COVID-19 pandemic, there were psychological factors such as stress (29.6%), anxiety (31.9%) and depression (33.7%) [19]. In a review study by Karim *et al*. on the prevalence of psychiatric disorders in the COVID-19 epidemic, the results showed that the most common psychiatric disorders in different segments of society are depression and anxiety [10].

It has been demonstrated that a psychological intervention can reduce emotional distress, promote positive health habits, and enhance immune responses for patients with cancer and other diseases [3,8]. As for infectious diseases, optimism and related constructs could improve the anxiety control and life quality of chronic hepatic B patients [25], as well as the pain management in people with HIV [1]. Psychological intervention may be beneficial for patients' mental health and therapeutic process. Meanwhile, breathing exercises have been reported to reduce the levels of anxiety and depression and improve pulmonary function [5].Information on the development and implementation of psychological interventions during the COVID-19 pandemic is still scarce. However, cognitive behavioral therapy (CBT) focusing on identifying and restructuring thought patterns and traps, relaxation techniques, and activity scheduling has been recommended [18, 23]. Furthermore, digital aids such as internet-based self-help interventions were found to be particularly suitable for the treatment of psychological distress under the given circumstances since they do not require direct on-site contact and are easily scalable [18, 20, 21].Internet-based self-help interventions have proven to be an effective treatment option for various psychological problems, such as depressive symptoms [3]. To date, only a few studies have addressed psychological interventions targeting COVID-19 related psychological distress.Hence, we designed a psychological program that included psychological support and breathing exercises for patients. We intend to investigate whether this kind of intervention could effectively lower anxiety and depression level of patients.

Study design and setting:

This observational study included patients with a history of COVID-19 who were admitted in the IPD of Medical College & Hospital, Kolkata, between July 2021 and March 2022. This study was conducted with the intention to find changes in psychological parameters in covid-19 recovered patients admitted in a tertiary level COVID hospital. In this study, we also intended to study the changes in psychological parameters in covid-19 recovered patients after they get the psychological intervention.This study conducted in three phases. In the first phase of the study, Depression, Anxiety and Stress Scale - 21 (DASS-21), PTSD Checklist PCL-5 and Montreal Cognitive Assessment were administered on a total of 477 covid-19 recovered patients. After 3 months from collecting the initial data, an assessment was done through clinical interview and it was found out that 257 does not required any further guidance or intervention as they have recovered from the mental health issues they were facing. Patients facing mild anxiety or depression after recovering from covid were generally overcome their mental health issues with time, the reason behind this maybe they feel secured and safe after going back home, they have overcome the fear of rejection from the society slowly with time and the presence of family members and friends gives them a sense of social support which in turn helps in reducing the loneliness they feel at time of staying in hospital. During the COVID-19 pandemic, many patients often feel helpless and alone due to lack presence of family or friends [11]. According to the stress-buffering model, social support may reduce adverse psychological effects of negative life events on individuals' mental health.

While 220 patients needed intervention. The three months-time gap was appropriate for our study, as with time patients with minimal mental issues recovered by themselves and we were able to help those who needed the intervention. In the second phase of the study, psychological intervention was given to the patients by trained counsellor. Intervention was given with the gap of three months following the first phase. A total of 190 patients agreed to take the intervention. In the third phase, which is the final phase of the study, after a gap of three months from the intervention phase, all the tests were re-administered on the patients. In the final phase a total of 172 patients were assessed.

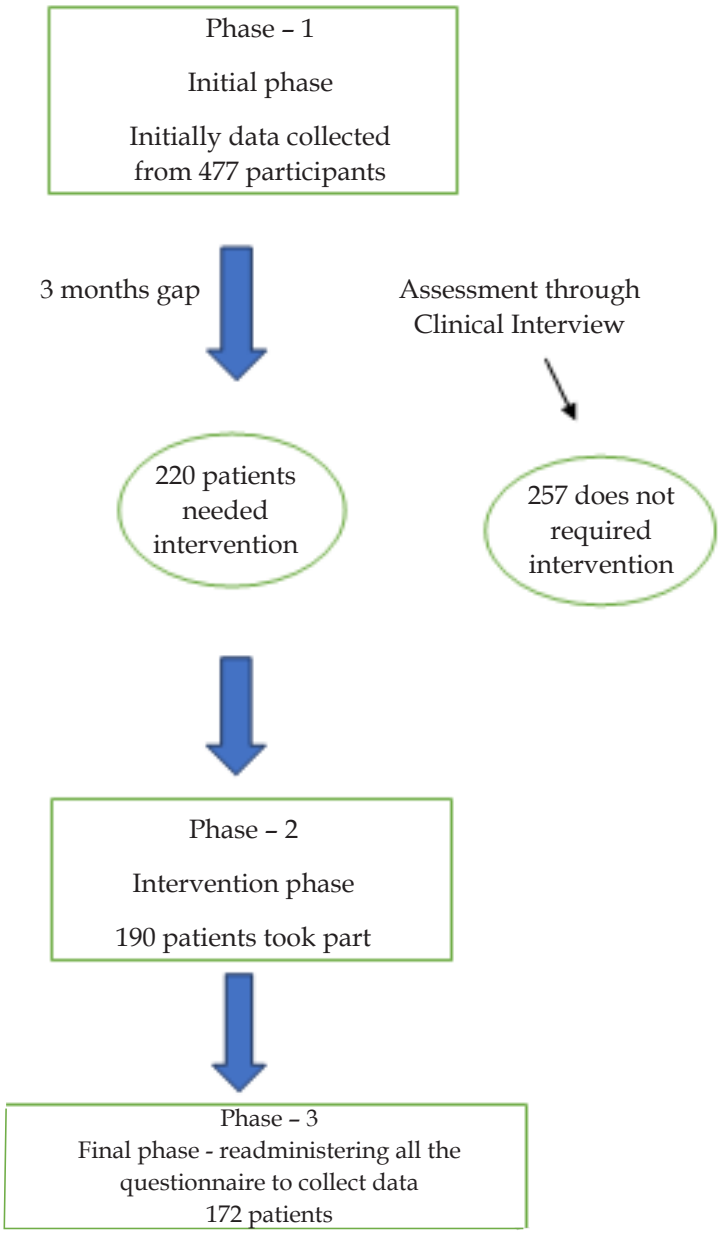

Figure 1: Phases of Data Collection

Table 1: Description of interventions

AGE-RANGE	INTERVENTION STRATEGIES		
	Behavioral Strategies	**Cognitive Strategies**	**Emotional Strategies**
20-35 year	Progressive muscle relaxation techniques Mindfulness Morning walk Cycling Structured routines	Time management, problem solving, role playing, addressing relationship issues, coping with covid related lifestyle changes, coping with covid related work changes.	Identification of emotion, journaling, help-seeking and support seeking strategies
36-60 years	Progressive muscle relaxation techniques Relaxed breathing	Thought restructuring, positive self talk, stress management, work life balance, using mnemonics for memory, interoceptive exposure, activity scheduling and behavior activation, breaking covid myths, focusing on realistic covid protocols.	Identification of emotion, journaling, peer group support, socialization with covid protocol
61-80 years	Relaxed breathing Meditation Positive engagement Using OTT platforms for entertainment.	Using mnemonics for memory Mental imagery, expectation rationalization, coping with changes in socialization platforms due to covid, focusing on realistic thinking, coping with loneliness, monitored social media activity.	Identification of emotion, positive reinterpretation, seeking social and emotional support

Participants:

Inclusion criteria for this study were adults over age 18 years who were diagnosed with COVID-19 from a RTPCR test. polymerase chain reaction (PCR) test. Exclusion criteria were major preexisting neurological conditions that can affect cognitive functioning (e.g., Parkinson's disease, traumatic brain injury, multiple sclerosis, brain tumor, stroke, epilepsy, and autoimmune disorders). Written informed consent was taken from willing eligible participants prior to interview.

Screening Measures:

All assessments were carried out online using self-report questionnaires. Participants filled out self-report questionnaires at pre-treatment, post-treatment (3 weeks) and follow-up (6 weeks after randomization).

1. Depression, Anxiety and Stress Scale - 21 (DASS-21)
2. Montreal Cognitive Assessment
3. PTSD Checklist PCL-5

Statistical Analysis:

Data was scored and analyzed using descriptive statistics. We used Student's *t*-test to compare between the scores of two phases. Statistical analysis was done using Statistical Package for Social Science software version 16 for Windows. The differences between two phases were considered significant if *p*-values were smaller than 0.05.

Result

Demographic Characteristics:

A total of 172 participants, including 108 male and 64 female, were participate in the current study. The age of the study participants ranged from 18 to 88 years. Their average age was 51.86 ± 15.38 years. Oxygen saturation is a key clinical index for

evaluating the severity of patients with COVID-19. In this study, 108 (62.8%) patients were mild type, 43 (25.0%) patients were ordinary type, 21 (12.2%) patients were severe type, but there were no critically ill patients. All the patients were cured and discharged. In addition, we examined the education status and comorbidities of patients with COVID-19, with 60 (34.9%) having a college education or above, 29 (16.9%) having a high school education, 59 (34.3%) having secondary education and 24(14%) having primary or below education, and 106 (61.6%) having comorbidities (such as diabetes and hypertension).

Table 2: Comparison of depression, anxiety, stress, PTSD and MOCA scores between pre- and post-intervention phase.

Variables	Pre- intervention	Post- Intervention	t-value	p-value
Depression	14.65	10.22	4.56 **	.000
Anxiety	9.63	4.87	8.60 **	.000
Stress	17.74	10.79	10.53 **	.000
PTSD	19.27	10.72	8.79**	.000
MOCA	24.00	24.44	2.17*	.046

When comparison was made on the basis of before and after intervention, i.e., score of depression, anxiety, stress, PTSD and MOCA were compared before and after intervention. Significant difference was found in the score of depression, anxiety, stress and PTSD. Depression, anxiety, stress, PTSD scores were significantly reduced after intervention. ($p < 0.01$). No significant difference was observed between the MOCA score.

Discussion

A considerable number of patients with COVID-19 indeed suffered from depression and anxiety, according to the above results. In this study, we conducted an intervention program to investigate its effect on patients with COVID-19. The results showed that anxiety, depression, stress and symptoms of PTSD were relieved in post-intervention phase compared with the pre-intervention phase, which suggested that interventions effectively reduced anxiety, depression, stress and PTSD in patients with COVID-19. The reasons behind this might be the fact that patients received frequent communication with trained mental health professionals, which resulted in obtaining more information about the disease and their condition, thereby alleviating the anxiety and fear caused by being blind to the disease. The patients get more opportunity to contact other people, communicate and understand their own problems through the psychological counselling process, which helps to reduce the sense of being left alone and helps to feel the support from others, which in turn reduce the anxiety, depression and stress of patients with COVID-19. This is consistent with the discovery that social support is one of the key factors linked to anxiety and depression for patients with COVID-19 [11]. As psychological interventions such as yoga, meditation, and breathing exercises can have a positive effect on the prevention and treatment of the SARS-COVID19 infection by strengthening the immune system [6], using these techniques to reduce stress and anxiety might be helpful in patients with COVID-19.

In the present study the breathing exercise, muscle relaxation techniques might have plays a major role in reducing the stress and anxiety of the patients. This is goes in line with the studies in China which found that the use of psychological interventions such as progressive muscle relaxation and Jacobson [12, 24] is effective in reducing anxiety and depression in COVID 19 patients. Of course, progressive muscle relaxation exercises allow the patients to experience different states of sensation along with muscle stretching and relaxation in a sequence that can relax the muscle and keep the whole body in a relaxed state by relieving negative emotions such as, stress and anxiety [2], which in a way confirms the results of our study.

These findings of the study suggest that, psychological intervention may have a beneficial effect on COVID-19 patients' mental health. This intervention program can also be applied to other patients with anxiety, depression and other psychological distress. Early detection and prevention

of mental health problems is of vital importance to help patients have good clinical outcomes and better quality of life. Our findings can help to develop a psychological support strategy for hospitalized patients with COVID-19 or other chronic diseases.

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General Nutrition Knowledge, and Dietary Intake among Sportsmen and Coaches: A Review Study

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Abstract

Nutrition knowledge is an important factor that influences the nutritional status and health of the individual, group or community. Research studies have been trying to develop a reliable tool which can measure nutrition-related knowledge, nutrition-related awareness and its effect on dietary behaviour. Sports nutritionists usually base their dietary interventions on a nutrition education program with dietary guidelines. There are no. of cross-sectional studies for both coaches and athletes, reporting on nutrition knowledge. Achieving optimal physical condition and maximising athletic performance both depend heavily on nutrition. Our diet provides our bodies with the energy and nutrients they need to sustain physical activity, improve muscular function, and aid in recuperation. Any physical fitness program is incomplete without nutrition as it is an integral part of physical fitness. For any sportsman, the dietary goal is to obtain adequate nutrition to improve their health and fitness or performance in sports.[4] A carefully organized nutrition program greatly improves athletic performance.

Nutritional status is a crucial factor in determining the physical fitness and training of a sports individual. For sportsmen energy requirement or nutrient requirements are high due to their game. As it is known, appropriate nutrition improves the physical performance of the sportsmen. On the other hand, inadequate intake of nutrients leads to nutrient deficiencies therefore leading to poor performance and health problems. Many studies have provided strong evidence that optimal nutrition supports physical activity, recovery and athlete performance. However Apart from less nutritional knowledge, there are several factors such as restrictive dietary intake or excessive exercise which influence healthy eating. In addition, lack of knowledge, zeal to follow a nutritious diet, lack of money and lack of time, can be a potential reason not to follow a healthy diet. Athletes generally rely on their coaches for nutrition-related guidance. So, when coaches have less knowledge about nutrition it can be a potential problem for athletes to follow a healthy diet.

In some Cross-sectional studies, it is found that Coaches Play a key role in providing nutritional-related information. However, they were not aware of the importance of nutrition on performance therefore not giving the necessary importance to their diets. Coaches have inadequate knowledge about sports nutrition and their role is critical as they are prime contact for the athletes to know about their diet to enhance their performance.

Keywords: Sportsmen, Nutritional knowledge, Dietary intakes, Coaches, Nutritional status, Physical fitness, Athlete, Dietary behaviour, Diet.

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Introduction

Nutrition knowledge is an important factor that influences the nutritional status and health of the individual, group or community. Nutrition knowledge is an important tool in assessing the nutritional status of an individual, group or community. Research studies have been trying to develop a reliable tool which can measure nutrition-related knowledge, nutrition-related awareness and its effect on dietary behaviour.[1,2] Sports nutritionists usually base their dietary interventions on a nutrition education program with dietary guidelines. There is no. of cross-sectional studies for both coaches and athletes, reporting on nutritionknowledge.[3]

Any physical fitness program is incomplete without nutrition as it is an integral part of physical fitness. For any sportsman, the dietary goal is to obtain adequate nutrition to improve their health and fitness or performance in sports.[4]A carefully organized nutrition program greatly improves athletic performance.[5]

Nutritional status is a crucial factor in determining the physical fitness and training of a sports individual. For sportsmen energy requirement or nutrient requirements are high due to their game. As it is known, appropriate nutrition improves the physical performance of the sportsmen.On the other hand, inadequate intake of nutrients leads to nutrient deficiencies therefore leading to poor performance and health problems. Many studies have provided strong evidence that optimal nutrition supports physical activity, recovery and athlete performance. However Apart from less nutritional knowledge, there are several factors such as restrictive dietary intake or excessive exercise which influence healthy eating.[6,7,8,9] In addition, lack of knowledge, zeal to follow a nutritious diet, lack of money and lack of time, can be potential reasons to not to follow a healthy diet.[10]Athletes generally rely on their coaches for nutrition-related guidance. So, when coaches have less knowledge about nutrition it can be a potential problem for athletes to follow a healthy diet.[11-14]

In some Cross-sectional studies, it is found that Coaches Play a key role in providing nutritional-related information. However, they were not aware of the importance of nutrition on performance therefore not giving the necessary importance to their diets. (Evaluation of the nutrition knowledge of sports department students of universities). Coaches have inadequate knowledge about sports nutrition and their role is critical as they are prime contact for the athletes to know about their diet to enhance theirperformance.[15,16,17] Sportsmen who have physical education as their subject major show greater nutrition knowledge.[18]

A cross-sectional study to identify the nutritional knowledge which included the192ATs, 71SCSs, 185 athletes and 131 coaches. For data analysis, descriptive statics have been used. To examine the distribution of nutrition knowledge of different populations used in the study, the chi-square test has been used. One way ANOVA test has been applied to comparing different study groups for knowledge and healthy eating habits. For the application of these tests SPSS Software. The significance level was set at 0.05 for all analyses. Studies revealed that ATs and SCSs have adequate and Athletes, and coaches have inadequate nutrition knowledge about nutrition.[15]

A study was conducted on the students of the Syrian university which aimed to find out the relationship between anthropometric measurements, socioeconomic status, type of university and nutrition knowledge. For the assessment of nutritional knowledge, a questionnaire adapted from Paramenter and Wardle has been used. Total number of the study participants was 998. Nutritional knowledge was higher in females as compared to male participants in the study. Total nutritional knowledge was higher in private university students as compared to public universities.[1]

A study that conducted on a 21 Rugby player to assess the relationship between the level of nutritional knowledge and dietary habits of the elite player. A general nutritional knowledge questionnaire was used to assess nutrition knowledge and a Food frequency questionnaire was used for the dietary habit assessment. Results showed that general nutritional knowledge was adequate in the player.

Methodology

A literature search has been done by using keywords like general nutrition knowledge, diet

knowledge, sportsmen, Coaches, athletes and diet, and dietary behaviour. Studies for the macronutrient, assessment have been excluded. All of the abstracts have undergone a rigorous screening to ensure that they are appropriate for review. From the references of the articles, further articles were also taken.

Exclusion and Inclusion criteria

Studies that include the general population as the study population have been not included in this review report. Studies on sportsmen, athletes, swimmers, or any college player have been included.

Result and Discussion

250 results were yielded in the aftermath of the search and these were then followed by the exclusion of duplicates and articles where full text was not available. For this review, 26 studies were considered, most of them had cross-sectional study designs which concentrated on the measurement of nutrition knowledge in American college athletes[19,20,21,22,23,24,25,26]. The other four papers assessed nutrition knowledge among coaches[27,28,29,30]. Masters-level athletes' nutrition knowledge was never examined in any study. In this review seventeen nutrition knowledge (NK) tools were used either in their original form or adapted versions as reflected by various authors within the included studies[31,32,20,33,16,34]. Different devices have been employed for appraising nutritional familiarity essentially making it impossible to draw a direct comparison between findings. Parmenter and Wardle developed a General Nutrition Knowledge Questionnaire which has been used in three different studies[35].In three separate tests undergraduate students showed that the lowest score was realized through- subsections: Recommendations for diet, sources of food and nutrients, the choice of foodstuffs for daily needs and diet-disease associations. These three studies had the lowest score in subsections of diet and disease relation as well as the highest in subsections for sources of foods or nutrients among the control group, test group dietary recommendation[36,37]. Sports Nutrition Knowledge Questionnaires (SNKQ) were used in six studies that underwent content validation and construct [32]. The results were different with overall scores that ranged from 48% to 54.7%[38,39,41,42] Some investigations indicated low scores on supplement sections whereas others found high performance on nutrient fluids as well as recovery[38,39,40]. Direct comparisons between adaptations and modifications impeded them. Furthermore, ULTRA-Q adaptation for ultra-endurance athletes and Torres-McGehee et al.'s tool adaptations were employed showing varied scores across sports.[15] Similarly Devlin & Belski's tool plus Nutrition for Sport Knowledge Questionnaire (NSKQ), yielded dissimilar scores as well as sub-sectional performances among athletes[16, 38,42,44] Twelve studies have assessed dietary intake using various methods including FFQs; 24-hour recalls; food diaries; and semi-quantitative food records. Macronutrient intake is implicated in grams per day or kilograms of body weight and showed variations across studies. The protein intake varied from 1.1 to 3.4 g/kg.bw/d while carbohydrate intake differed from 2.4 to 4.6 g/kg.bw/d. Daily recommended carbohydrate intake for sports nutrition ranges between 3 g and 12 g/kg.bw/d whereas the protein intake ranges from 1.2 to 2.0g/kg.bw/d[39,43,45,46,47,48,49.] In the seven studies mean fiber intakes ranged from 15 g/day to 45.8g/day (43,47,48,49,50). Fat intake was found to vary with a range of between 0.9 and 1.6 g/kg.bw/d, with saturated fat makes up about 9-13% of total energy consumed[45,43,39,48,49]. Six studies examined the relationship between dietary ingestion and nutritional knowledge (NK); these revealed some associations. Among Australian soccer players, Andrews & Itsiopoulos observed that there was a moderate positive correlation of sports NK with mean energy intake r = .31 P=.04 as well as carbohydrate intake (r = .35 P=.02)[47] Argolo et al identified a negative correlation between total NK and sodium intake(r=-0.485, P<0.05) among Brazilian adult table tennis players[49.] there was a weak but statistically significant sport NK positive correlation with both total energy expenditure and height in Australian footballers and soccer players – unrelated to total NK – energy and carbohydrate intake r 2 = 0.046, P = 0.014 and r 2 = 0.043, P = 0.039, respectively [45]. Furthermore, general and sports NK scores in elite Australian football players had a medium-large, statistically significant negative correlation unrelated to total protein intake r 2 = 0.244, P = 0.026 and r 2 = 0.382, P = 0.016, respectively.[43]

A negative correlation was found among American student-athletes between NK scores on dietary recommendations and the consumption of caffeine-based energy drinks: r = −0.48; P < .001. By contrast, a positive association was indicated for Australian football players' NK scores and the percentage of estimated energy requirements met from EA: r = 0.325; P = 0.031 and positive correlations were found for protein, fibre, and calcium intake: r = 0.348; P = 0.021; r = 0.510; P = 0.001; r = 0.428; P = 0.004, respectively.[43]

Studies indicate that several athletes fail to meet the minimum requirements to pass an NK test, suggesting their ignorance of both common and athletic-oriented dietary recommendations. For the studies selectively filtrating one passing criterion for optimum NK scores, only average NK was observed pitted against the others who had poor NK levels. The lack of benchmarking makes it challenging to assess the significance of these results, but the percentages appear low, indicating potential knowledge gaps in athletes. Nutrition factors which include coaches and trainers who undervalue their role in the field of nutrition, as well as team nutrition experts who do a weak job of passing the relevant educational information to the athletes, are some of the causes of athletes' undernutrition[20] Dietary carbohydrate intake in athletes is frequently lower or just enough in contrast to protein intake which often is greater than the recommendations, a reason for this might be that some trendy athletes mention protein intake a lot or they have specific goals that Athletes may be consuming more of certain nutrients such as protein by adhering to certain diets or working towards specific goals that may emphasize these nutrients. This association indicates players with top NK will most probably consider having natural diet tendencies. Nevertheless, there is a vast discrepancy in the outcomes of NK measurement, and many researchers use antiquated or invalid versions of measurement modalities. As those dietary assessment methods in athletes are profoundly divergent, they may neglect features specific to this particular team[35,43,45]. A systematic review of the research is very important; however, an update was required to check the validity of previous findings, especially those relating the NK and dietary habits. Overall, integrating NK in athletes could serve as a motivational factor resulting in better food choices and ultimate performance, stressing the necessity of the portfolio of performance augmenting nutrition education programs for this community.

Conclusion

A vital aspect of athletic performance is nutrition. Athletes may better feed their bodies, maximise training adaptations, and improve their overall performance by understanding the importance of macronutrients, micronutrients, hydration, and nutrition periodization. Athletes may reach their maximum potential and excel in their particular sports by giving healthy nutrition priority.Measurement tools used for assessing the nutritional knowledge were inadequately validated therefore it is difficult to be certain of the current status of nutrition knowledge. There are so many factors which influence nutrition knowledge such as traditional differences, passion to follow a nutritious diet, knowledge about the diet suitable for sportsmen and money. There is a need for large population research with the help of validated tools to investigate nutrition knowledge and its relation or impact on dietary intake.

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Original Article

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Infiltration of Appendix with Eosinophils in Acute Appendicitis

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Abstract

Background and Aim: Despite the fact that the precise origin of acute appendicitis is unknown, luminal obstruction, nutrition, and hereditary factors are likely to be involved. The intricate evolutionary history of the appendix and the broad ranges in evolutionary rates among various animals suggest that the feature is recurrent. Keeping the above points in mind, the present study aimed to study the etiology and prevalence of eosinophilic appendicitis.

Material and Methods: The present is the prospective study done in the department of pathology in the medical college associated with a hospital. A total of 250 cases were studied for one year. Tissue specimens were included from appendectomy procedure done either as an elective or emergency procedure. For light microscopy, one slide from each block was stained with H&E to arrive at a diagnosis.

Results: The most common reason for performing appendectomies was acute appendicitis in 144 instances, followed by peri-appendicitis in cases. A male predominance was also noted in cases of acute appendicitis and periappendicitis. The most frequent age range to be affected in eosinophilic appendicitis cases was 10 to 20 years. Twenty individuals were diagnosed with eosinophilic appendicitis out of the 250 cases that were received. In these cases, the muscularis propria had eosinophil infiltration, and there were a few spots where there was edema dividing the muscle fibres.

Conclusion: Rare condition known as acute eosinophilic appendicitis has hazy symptoms. In order to effectively approach and manage patients, it needs to be thoroughly investigated. The mainstay for making diagnoses continues to be histopathology.

Key Words: Acute Appendicitis, Eosinophilia, Pathology, Periappendicitis

Introduction

The diagnosis of acute appendicitis, a frequent surgical emergency, often involves a history, clinical examination, and leucocytosis. Many inflammatory and non-inflammatory conditions resemble appendicitis. Females in particular and extremes of age show this. perhaps a minor case of appendicitis has the potential to worsen and perhaps become fatal. So, instead of waiting for a certain diagnosis, doctors frequently do surgery. As a result, the incidence of negative appendicitis was rather significant

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(15–30%). Negative exploration reportedly has a 5- to 15% morbidity rate.[1,2]

Acute appendicitis has a 7% lifetime risk in Western populations. This clinical ailment is characterized by discomfort and tenderness of the right iliac fossa, vomiting, fever, and an increased white blood cell count. In cases of acute appendicitis, the muscularis propria frequently has neutrophil infiltration. It is believed that eosinophil infiltration of the musclaris, the histopathologic aetiology of acute appendicitis, is incredibly uncommon. Acute eosinophilic appendicitis has been reported in a small number of instances, and the illness is still not fully understood.[3,4]

Despite the fact that the precise origin of acute appendicitis is unknown, luminal obstruction, nutrition, and hereditary factors are likely to be involved. The early eosinophilic infiltration in the muscle layer of acute appendicitis, however, may result in type I hypersensitivity, according to multiple studies. Therefore, type I hypersensitivity results in inflammation, which is aggravated by infection. An eosinophil-edema appendicitis lesion can occasionally occur without an underlying infection when type I hypersensitivity reaction is more severe. The name for these lesions is acute eosinophilic appendicitis.[5-7]

The intricate evolutionary history of the appendix and the broad ranges in evolutionary rates among various animals suggest that the feature is recurrent. Keeping the above points in mind, the present study aimed to study the etiology and prevalence of eosinophilic appendicitis.

Materials and Methods

The present is the prospective study done in the department of pathology in the medical college associated with a hospital. The tissue specimens were included from the appendectomy procedure done either as an elective or emergency procedure in the surgical department of the hospital. The ethical committee of the college institute was informed about the study, and the ethical clearance certificate was obtained from them before the start of the study. A total of 250 cases were studied for one year. The related clinical history and the Patients' data were obtained from the surgical department of the hospital. The tissue samples of the studied cases were processed in the department of pathology.

Inclusion Criteria:

All acute appendicectomy case specimens were examined.

Also included were suspected cases of gastroenteritis-related worm presentation.

Exclusion Criteria:

Cases of gangrenous appendicectomy were not included.

Tumours of the appendix were disqualified.

For light microscopy, all specimens were fixed in neutral buffered formalin for 12 to 24 hours. The specimens treated in 10% formalin as well as the demographic information were gathered. The specimens' gross exams were looked at. The appendix's length and the point at which its thickness was at its greatest were observed. Analysis was done on the perforation and gangrenous change areas. Three cross-sections were obtained after the object had been fixed in formalin to illustrate the base, middle, and tip.

Technique of Processing:

To make a diagnosis using light microscopy, one slide from each block was stained with H&E. These staining outcomes were evaluated: Blue to black nuclei Pink cytoplasm and other materials. The entire appendix was sectioned in cases where eosinophilic appendicitis was detected in order to exclude areas of neutrophil infiltration. Additionally, a stool analysis was performed to rule out worm infestation.

Analytical statistics: By using the Chi-square test for qualitative variables, the clinical and morphological factors were compared between the groups.

Results

The study included 250 appendectomies carried out at the affiliated hospital and Medical College. A total of 250 patients who had appendectomies were examined; 146 of these patients had emergency appendectomies, and 104 patients had elective appendectomies.

A substantial portion of the patients who underwent appendectomies were between the ages of 10 and 20 years, followed by the 20 to 30 age group. Patients ranged in age from 0 to 70 years. The male gender was more frequently afflicted than the female population in the age range of 10 to 20 years. Less appendectomies were done on patients who were younger and older. The most common reason for performing appendectomies was acute appendicitis in 144 instances, followed by peri-appendicitis in cases. A male predominance was also noted in cases of acute appendicitis and periappendicitis.

The most frequent age range to be affected in eosinophilic appendicitis cases was 10 to 20 years. Additionally, eosinophilic appendicitis revealed a masculine bias. Peritonitis was found in one case of eosinophilic appendicitis that was linked to eosinophilic enteritis.

Twenty individuals were diagnosed with eosinophilic appendicitis out of the 250 cases that were received. In these cases, the muscularis propria had eosinophil infiltration, and there were a few spots where there was edoema dividing the muscle fibres. In 18 cases of eosinophilic appendices, the mucosa was normal and free of ulcers. The muscular layer was thin in all of the analyzed cases. These cases showed varied degrees of oedema penetrating the muscle layer. Lymphoid hyperplasia was present in approximately 15 cases of eosinophilic appendicitis.

Table 1: Gender wise distribution of study participants

Gender	Number of patients
Males	170
Females	80
Total	250

Discussion

Acute eosinophilic appendicitis was proposed in 1996 for the first time by Aravindan; then it was defined in 2010 by Aravindan et al. They reported that an allergic reaction type 1 hypersensitivity is a predisposing event, which triggers the acute inflammation of the appendix.[8] This inflammation involves muscularispropria eosinophilic infiltration and edema, both are considered the hallmarks of this disease entity. Type 1 hypersensitivity is not only developed in the appendix but also in other adjacent areas such as ileum and cecum, whereas the appendix considered the most affected organ by allergic reaction. Although eosinophils are normally found in submucosal layer and lamina propria of the appendix, evidence of infiltration through the muscularispropria combined with edema should raise the suspicion of acute eosinophilic appendicitis.[9,10]

Appendectomy is the most frequently practiced emergent surgical procedure accounting for 1%-2% of all surgical operations. Acute appendicitis can occur at any age; however, most commonly occurs at younger ages particularly between 10 and 20 years. Although acute appendicitis has been recognized for more than 100 years, its etiology and pathogenesis still remain to be elucidated. However, it has been considered that its etiology is multifactorial and that luminal obstruction, diet, and family factors may play a role in its pathogenesis.[11]

The AEA was created in 2010 by Aravindan et al. after Aravindan first proposed the idea in 1997. Aravindan discovered that the mural nding's ltrate is the solitary and persistent eosinophil in acute appendicitis in a study including 120 appendicectomies. Additionally, he added that the ltrate, which is eosinophilic in type and present in acute appendicitis, may be an early indicator of Type I hypersensitivity. According to his theory, the lesion is a precursor of acute appendicitis, which includes AEA.[12]

A case of AEA that occurred on a background of allergy brought on by amoebiasis was reported by Tufan Egeli et al. A thorough histopathologic analysis of the surgical specimen indicated severe eosinophilic infiltration and edoema in the serosa and muscle layer of the appendix. Since the patient lived in a region where parasitic infestation was common, direct stool inspection was done in the immediate post-operative period. Examining the stools produced trophozoites of E. histolytica, and AEA was thought to be connected to the allergic reaction brought on by this parasite. Examining the stools in our investigation revealed no parasites.[12,13]

In cases of AEA, the appendix was enlarged and hyperemic, similar to acute suppurative appendicitis, but there was no exudate. Acute eosinophilic

appendicitis's histopathologic characteristics include edoema that separates the muscle fibres and a strong eosinophilic infiltration in the muscularis propria in the absence of neutrophils. To identify acute eosinophilic appendicitis, all of these characteristics were identified in our cases.[14]

Aravindan et al. identified the eosinophil edoema lesion as a distinguishing feature of acute eosinophilic appendicitis. Additionally, he says that this is present in all cases of acute focal appendicitis and acute suppurative appendicitis in regions where neutrophils are insufficient or nonexistent. We had observed eosinophil edoema lesions in all of our instances of acute eosinophilic appendicitis. Additionally, in a few cases of acute suppurative appendicitis, we observed an eosinophil edoema lesion.

Conclusion

Rare condition known as acute eosinophilic appendicitis has hazy symptoms. In order to effectively approach and manage patients, it needs to be thoroughly investigated. The mainstay for making diagnoses continues to be histopathology. Appendicitis has a complex aetiology that includes blockage, nutrition, and infection. A recently described aetiology of inflammation is type 1 hypersensitivity allergic reaction.

Ethical approval was taken from the institutional ethical committee and written

Informed Consent was taken from all the participants.

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Original Article

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COVID-19 Vaccine Hesitancy and Associated Factors among Adults and Adolescents Attending COVID-19 Vaccination Centre of South India-A Cross-Sectional Study

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Abstract

Introduction: Challenges related to the acceptance and refusal of COVID-19 vaccination (vaccine hesitancy) emerged as a significant problem worldwide.

Objectives: 1. To study socio-demographic profile of the study participants.2.To assess association between sociodemographic characteristics and vaccine hesitancy among study participants.3. To find out the reasons for vaccination hesitancy among study participants.

Methodology: A crosssectional study was conducted at COVID-19 vaccination centre, in South India. Study participants included were subjects who were due for COVID-19 vaccine. Total sample size was 385.Data was collected by interview technique.

Results: Majority,311(80.8%) of the respondents were urban residents and were in 18-30 age group. Male respondents were higher 227, (59.0%) than female,158(41.0%). Regarding reasons for COVID-19 vaccine hesitancy, majority, 107 (27.8%) reported they were unaware of vaccination schedule followed by 97 (25.2%) not getting time to go for vaccination and 49 (12.7%) respondents reported fear of side effects of COVID-19 vaccine. We found statistically significant association between COVID-19 vaccine hesitancy and socio-demographic variables like their residence, age, gender, type of family, educational level, marital status and co-morbidity. **Conclusion:** Regardless of the source of vaccine hesitancy, interventions to encourage vaccination by simplifying messages and emphasizing benefits can be effective.

Keywords: Vaccine hesitancy, COVID-19 vaccine, Sociodemographic characteristics, side effects

Introduction

COVID-19 pandemic broke out in December 2019& spread across the world. The Government of India took proactive steps to respond to the pandemic and initiated the preparedness of the health systems to respond to all aspects of

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COVID-19 management[1] Vaccines are one of the effective public health interventions to control the spread of infections[2]COVID-19 vaccination drive, the world's largest vaccination drive, was launched by the Hon'ble Prime Minister on 16th January 2021.The Day 1 witnessed vaccination of the highest number of beneficiaries covered anywhere in the world on the first day[1] The phenomenon of vaccine hesitancy existed long before the current pandemic and has recently been considered as one of the top ten threats to health by the World Health Organization.[3]WHO defined vaccine hesitancy as delay in acceptance or refusal of vaccines despite availability of vaccination services[4]

Although the COVID-19 vaccine was considered effective to curb the virus, challenges related to the acceptance and refusal of vaccination (vaccine hesitancy) emerged as a significant problem worldwide, with more than 90% of countries experiencing vaccine hesitancy[5] Vaccine hesitancy can be the major hindrance of the control efforts to lessen the negative consequences of COVID-19 pandemic, at least in certain countries/regions."[6] Overcoming vaccine hesitancy is essential to slowing transmission of SARS-CoV-2. Hesitancy around COVID-19 vaccines is a significant challenge for public health but also a complex and multi-faceted issue[7]

Precautions need to be taken to vaccinate general public who are not accepting vaccination, which will help in the successful control of the pandemic. There is a need to study various factors related to Covid-19 vaccination hesitancy and address this issue.

Objectives:

1. To study socio-demographic profile of the study participants.
2. To assess association between sociodemographic characteristics and vaccine hesitancy among study participants.
3. To find out the reasons for vaccination hesitancy among study participants.

Materials and Methods

This study was a cross-sectional study conducted at COVID-19 vaccination centre, in SVIMS University, Tirupati of Andhra Pradesh state in South India from February to April 2023.

Sample size: Considering Rao GS et al[8] (2022) study which showed 61.8% of the study population were hesitant to receive COVID19 vaccine due to fear of side effects in their study, the calculated sample size was 363 using the formula 4pq/d2 with an alpha error of 5% at 5% margin of error. With a 6% non-response rate, the total sample size was found to be 385.

Inclusion criteria:

1. Subjects who has not taken second dose or precaution dose of COVID-19 vaccine.

Exclusion criteria:

1. Those who got vaccinated from other vaccination centres.
2. Subjects with absolute contraindication for vaccine.

A total of 6432 individuals were due for COVID-19 vaccine from the SVIMS COVID-19 Vaccination centre is the sample frame for this study. Simple random sampling method was used for the selection of required sample. Ethics approval was obtained from the Ethics Committee of the Sri Venkateswara Institute of Medical Sciences, Tirupati, AP (IEC No. 1330). Data was collected telephonically by interview technique after taking consent by investigator and research team. For this structured questionnaire was develop dusing evidence from prior studies on vaccine hesitancy and based on literature review. Study questionnaire comprised of two sections: 1. Socio-demographic details of the respondents like age, gender, religion, marital status, type of family, monthly family income, educational status, occupation and place of residence. 2. Vaccine hesitancy questionnaire.

Statistical analysis: The collected data was entered into Microsoft excel. Mean and standard deviations were calculated for continuous variables. SPSS version 26 was used to calculate statisticsand Chi-square test was used to know the association of socio-demographic variables with vaccine hesitancy. P value <0.05 was considered as significant.

Ethical Considerations: Ethics approval was obtained from the Institutional Ethics Committee. (IEC No 1330) Informed consent was taken from the study respondents.

Results

Table No 1: Socio-demographic details of study respondents(n=385)

Variable	Frequency	Percent (%)
Age		
< 18	07	1.8
18-30	178	46.2
31-45	91	23.6
46-60	61	15.8
60 and above	48	12.5
Gender		
Male	227	59.0
Female	158	41.0
Place of residence		
Urban	311	80.08
Rural	74	19.2
Educational status		
Illiterate	20	5.2
Primary	37	9.6
Secondary	107	27.8
Graduate	192	49.9
PG	29	7.5
Religion		
Hindu	372	96.6
Muslim	10	2.6
Christian	03	0.8
Marital status		
Unmarried	158	41.0
Married	216	56.1
Widow/Widower	11	2.9
Type of family		
Joint	37	9.6
Nuclear	340	88.3
extended	08	2.1

As shown in Table No 1, majority, 311(80.8%) of the respondents were from urban area. Majority of the respondents were in 18-30 age group, 178(46.2%). Male respondents were higher 227, (59.0%) than female respondents, 158(41.0%). Regarding educational status, 20(5.2%) were illiterates. Majority of them studied up to graduation,192 (49.9%). Majority of the respondents were Hindu by religion,372 (96.6%). Regarding marital status, 216 (56.1%) respondents were married and most of them belonged to nuclear type of families 340(88.3%).

Table No 2: COVID -19 Vaccination history of study respondents. (n=385).

Variable	Frequency	Percent (%)
Type of vaccine received		
Covishield	238	61.8
Covaxin	147	38.2
Past covid infection		
Yes	105	27.3
Before taking vaccine	75	19.5
After taking vaccine	30	7.8
COVID Vaccine due		
Precaution dose	316	82.1
Second dose	69	17.9
Willing to take vaccine		
Yes	306	79.5
No	58	15.1
Don't know	21	5.5

As shown in Table No 2, majority of the respondents, 238(61.8%) reported that they received Covishield vaccine and105 respondents reported that they had covid-infection during the pandemic, out of which, 75 (19.5%) had infection before receiving vaccine and 30(7.8%) had infection after receiving vaccine. 316 (82.1%) did not take precaution dose and 69 (17.9%) did not take second dose of the vaccine.

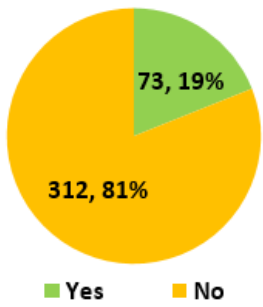

Figure 1: Co-morbidities among study respondents.

As shown in figure 1, 73 (19.0%) respondents reported co-morbidities.

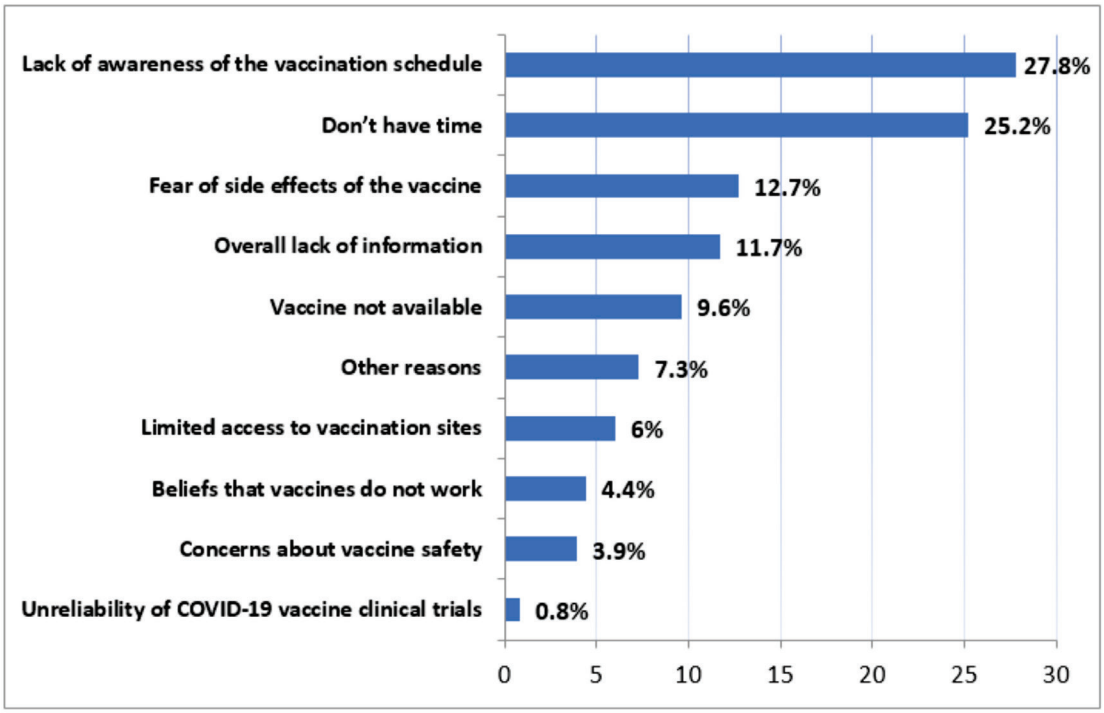

Figure 2: Reasons for vaccine hesitancy among study respondents.

As shown in figure 2, majority, 107 (27.8%) study respondents reported that they lacked awareness of vaccination schedule followed by 97 (25.2%) respondents said that they were not getting time to go for vaccination. About 49 (12.7%) respondents reported that they developed a fear of side effectsof COVID-19 vaccine. 45 (11.7%) respondents reported they were unaware and lacked information regarding vaccination. Other reasons for vaccine hesitancy were unavailability of vaccine (37, 9.6%) when they went; limited access to vaccine site (23, 6.0%); belief that vaccine do not work (17, 4.4%) and they expressed uncertainty regarding their effectiveness against infection; vaccine safety (15, 3.9%); unreliability of COVID-19 vaccine trials to prove the vaccine safety and efficacy (03, 0.8%) and other reasons reported were having co-morbid condition, being old age etc. (28, 7.3%).

Table 3: Association of reasons for vaccine hesitancy in relation to age & education

Reasons for vaccine hesitancy	**Yes (%)**					**p value**
Age group	< 18	18-30	31-45	46-59	≥60	
Don't have time	3.1	56.7	18.6	7.2	14.4	0.01
Education	Illiterate	Primary	Secondary	Graduate	PG	
Overall lack of information	8.9	20	26.7	42.2	2.2	0.04

Table 4: Association of reasons for vaccine hesitancy in relation to gender, residence and comorbidity.

Reasons for vaccine hesitancy	Yes (%)		***p* value**
Gender	Male	Female	
Beliefs that vaccine do not work	88.2	11.8	0.01
Vaccine not available	37.8	62.2	0.008
Residence	Urban	Rural	
Limited access to vaccination site	47.8	52.2	<0.0001
Comorbidity	Present	Absent	
Fear of side effects of vaccine	32.7	67.3	0.01

Table 5: Association of reasons for vaccine hesitancy in relation to type of family, marital status &category of study respondents.

Reasons for vaccine hesitancy	Yes (%)			P value
Type of family	Joint	Nuclear	Extended	
Don't have time	11.3	83.5	5.2	0.03
Marital status	Unmarried	Married	Widowed	
Unreliability of COVID-19 vaccine trials	66.7	0	33.3	0.002
Don't have time	49.5	45.4	5.2	0.02
Category	HCW	FLW	Citizen	
Beliefs that vaccine do not work	5.9	11.8	82.4	0.01
Overall lack of information	2.2	0	97.8	0.004
Vaccine not available	40.5	0	59.5	0.002
HCW- Health Care Worker, FLW- Front Line Worker				

We found statistically significant association between COVID-19 vaccine hesitancy and socio-demographic variables ($p<0.05$).

Discussion

In this study, out of all, 58 (15.1%) respondents still were not willing to take the COVID -19 vaccine. There are variety of reasons for vaccine hesitancy among study respondents. Majority of the respondents (27.8%) reported that they were unaware of vaccination schedule followed by lack of time to go for vaccination (25.2%). About 12.7% respondents reported that they developed a fear of side effects of COVID-19 vaccine and 11.7% respondents reported they were unaware and lacked information regarding vaccination. A study by Chowdhury S.R et al[9], observed that, (29%) individuals showed vaccine hesitancy. Among the hesitant individuals, the top three reasons of hesitancy were concern regarding side effects, waiting and watching to see if the vaccine is safe; and some people thought that others are more in need of the vaccine. Chandani S et al[10], observed that more than a fifth were either unaware of the vaccines (20.63%) and 10% refused to get vaccinated. Major reasons causing COVID-19 vaccine hesitancy were concerns over side effects among (58.7%) and (63%) of the individuals in a study by Nizam A et al[11] and Joshi A et al[12] respectively.

Several risk factors associated with vaccine hesitancy and rejection have been reported in studies across different countries including socio-demographic factors (e.g., age, gender, marital status, employment status, income), cost, access to services, safety, and effectiveness.[13-16]

In this study, we found statistically significant association ($p<0.05$) between COVID-19 vaccine hesitancy and socio-demographic variables like their residential area, age, gender, type of family, educational level, marital status and co-morbidity. Similarly, Marzo RR et al[17]in their study found that COVID-19 vaccine hesitancy was significantly associated with age, residential area, education levels, employment status, and family economic status. A study by Utami A et al[18]revealed that the elderly, having comorbidity, not being exposed to information, not believing in the vaccine halalness, not believing that vaccines could prevent the COVID-19 infection, and having vaccination-related mild-moderate anxiety were more likely to have vaccine hesitancy ($p<0.05$). Findings from a survey by Umakanthan S. et al[19]found that hesitancy is high among the younger cohort, female respondents, those with lower educational levels, and those from low-income families.

Respondents in the younger age group 18-30 years, were more hesitant (56.7%), as compared to other age groups and the reason reported by them was that they didn't have enough time to go for vaccination. Similarly in a study by Rao GS et al[8] done among healthcare workers revealed that younger age group was more hesitant in taking the vaccine (62.8%). Umakanthan S et al[19]revealed in their study that older respondents (>55 years) constituted a low proportion of vaccine-hesitant groups and were more

likely to be vaccinated. Also, a study by Danabal KGM[20], showed that younger individuals were more hesitant in taking the vaccine. This may be due to the fact that vaccines were offered for persons above 45 years of age as a priority and also people in older age groups are more susceptible to get COVID-19 infections therefore the fear of the disease was more in this group leading to a favourable attitude towards COVID 19 vaccines.

In the present study, vaccine hesitancy was higher among males (88.2%) as they believed that vaccine do not work to prevent COVID-19 infection and other reason reported was non-availability of vaccine which was higher in females (66.2%). Similarly, a study by Umakanthan S et al[19]found that hesitancy was high among the female respondents (25.6%) compared with men (22.3%). A study by Danabal KGM et al[20] showed that women were highly mistrusting of the vaccine. In another study by Rao GS et al[8] among healthcare workers showed that women (59.3%) were more worried about the 'safety and efficacy of the vaccine', compared to men (39.3%) ($P < 0.001$) and 66.6% of women wanted 'to wait and observe for some more time' compared to men (53.9%) ($P = 0.026$). COVID-19 vaccine hesitancy was significantly higher among respondents residing in rural areas (52.2%), they reported that they had limited access to vaccination site. Hesitancy among the rural population may be due to their lower awareness and low literacy levels. Similar results were observed in the studies done by Joshi A et al[12] (55%) and Danabal KGM et al[20], which showed that rural residents were mistrusting the vaccine.

Citizens (general public) were more hesitant for vaccination as compared with health care workers and front-line workers which was statistically significant. They believed that vaccines do not work and some reported that they lacked information about vaccination and its schedule. Respondents who belonged to nuclear families (83.5%) were more hesitant and the major reason reported for that was insufficient time to go for vaccination. This may be due to lack of encouragement in their nuclear families which people get in joint families.

We found that 42.2 % respondents who studied up to graduation were vaccine-hesitant and reported that they lacked overall information ($p=0.04$).On the contrary to this, studies by Umakanthan S. et al[19] and Joshi A et al[12] showed that respondents with higher education were not COVID-19 vaccine-hesitant while 32.7% of the respondents with co-morbidities reported that they had fear of side effects of vaccine and it was statistically significant ($P=0.01$). Similar results were observed in a study done by Abetu Mehari E et al.[21]andUtami A et al[18], which revealed that having a comorbidity is a factor associated with the acceptance of the COVID-19 vaccine.

Limitations of the study.

1. As the data collection was conducted using telephonic interview method, socio-economic information was difficult to obtain from the study participants.
2. The study was cross-sectional; hence no causal inferences could be inferred.

Conclusion

COVID-19 vaccine hesitancy still remains a public health problem in our region. As shown in this study, factors responsible for vaccine hesitancy are younger age group, females, housing type, respondents who have a higher education, with co-morbidities etc were more prone to vaccine hesitancy which is statistically significant. Regardless of the source of vaccine hesitancy, interventions to encourage vaccination by simplifying messages and emphasizing benefits can be effective.

Conflict of interest: Nil.

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Case Series

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Heterotopic Ossification at Uncommon Sites: A Case Series of 4 Rare Cases

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Abstract

Heterotopic ossification (HO) is a condition of formation of mature lamellar bone in the extra skeletal soft tissue where bone does not usually exist. It is most commonly seen in muscle tissue and central nervous system following trauma. In this case series, we have reported 4 rare cases of heterotopic bone formations at uncommon sites. One case of HO in clear cell renal cell carcinoma, one case of HO in tendoachilles, one case of HO in intramuscular vascular malformation and one case HO in abdominal incision scar. HO is a rare entity. In most of the cases exact etiology is unknown. Further studies needed for more conclusive information regarding the clinical significance of heterotopic ossification.

Keywords: Heterotopic ossification, Renal cell carcinoma, Tendo Achilles, Vascular malformation

Introduction

Heterotopic ossification (HO) is a condition of formation of mature lamellar bone in the extra skeletal soft tissue where bone does not usually exist.[1] There are two main categories of HO i.e. traumatic and neurogenic.[2] It is most commonly seen in musculoskeletal system and central nervous system.[3] Uncommon sites of HO are uterus, GIT and kidney. In this case series we have reported 4 rare cases of osseous metaplasia (HO) at uncommon sites.

Material and Methods

All the cases included in this case series we received biopsy specimens in our department. Tissue specimens were subjected to routine tissue processing and Haematoxylin and Eosin-stained slides were prepared and examined under microscope and heterotopic ossification identified incidentally.

Case Presentation

CASE 1:

A 43-year-old male presented with pain in his right lumbar area for 1 year. On clinical examination a mass was palpated on the lumbar region. On CT Scan examination it was found that a heterogenous mass measuring 6cmx4cmx3cm arising from the upper pole of right kidney. On contrast study, multiple foci of calcification were seen. He underwent nephrectomy

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and specimen was sent for histopathological study. Microscopic examination revealed features of Clear cell carcinoma along with presence of multiple foci of ossification. **(Fig 1)** The final diagnosis was given as Heterotopic ossification in Clear cell carcinoma.

CASE 2:

A 47-year-old man presented with pain and swelling of the left ankle joint and lower calf. He had no history of trauma. The pain was progressive and the patient had difficulty in walking for last 2 months. On examination, a tender mass was palpated on the lower calf region just above the ankle joint. A plain X-Ray revealed a bony mass in that region. The patient underwent excision of that mass and it was subjected to histopathological study. After decalcification of the bony hard routine tissue processing done and slides were examined under the microscope. It revealed presence of HO in fibrous tissue. **(Fig 2)** Final diagnosis was given as Heterotopic ossification involving Tendo Achilles.

CASE 3:

A 28-year-oldhealthy man presented with a firm swelling measuring 3cm in diameter over the left calf noticed for 3 months. The swelling was painless and gradually increasing in size. On MRI it was found the lesion is suggestive of vascular malformation with foci of calcification. He underwent excisional biopsy of the mass and tissue sent for histopathological examination. Under microscopic examination of the H&E-stained slides, it was found thin-walled large blood vessels in a disorganized pattern along with areas of heterotopic bone formation. (Fig 3) The final diagnosis was given as Heterotopic ossification in Vascular malformation.

CASE 4:

A 53-year-old female presented with a hard painless linear swelling on the linear midline scar mark over the anterior abdominal wall. She had a past history of gastric surgery 8 years back. USG revealed a highly echogenic linear scar extending longitudinally along midline. A plane X-Ray suggested a bone-like structure. CT Scan confirmed the presence of complete ossification. The linear swelling was excised and histological sections were prepared. On microscopic examination, there was presence of heterotopic bone formation. **(Fig 4)**

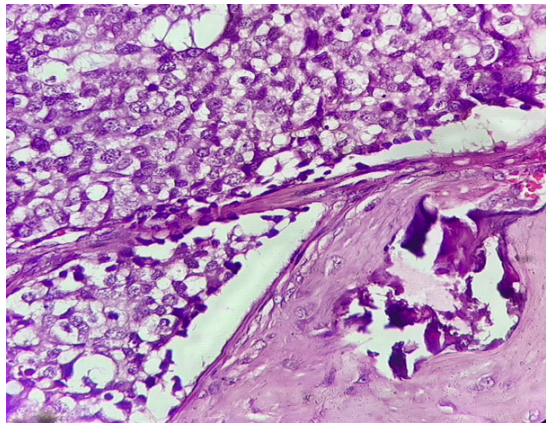

Fig 1 Showing presence of heterotopic bone in clear cell Renal cell carcinoma(H&E,400X)

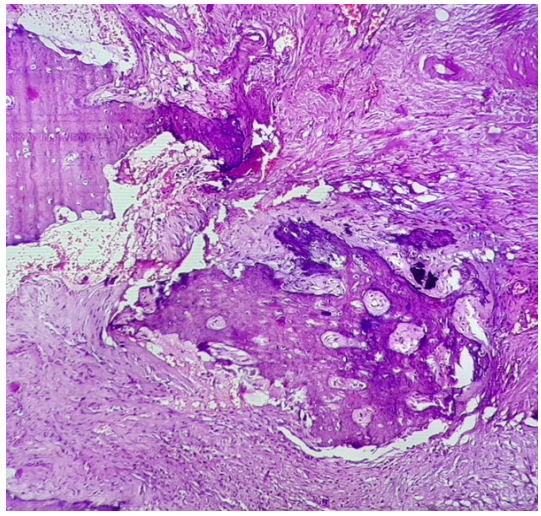

Fig 2 Showing presence of heterotopic bone in Tendo Achilles(H&E,400X)

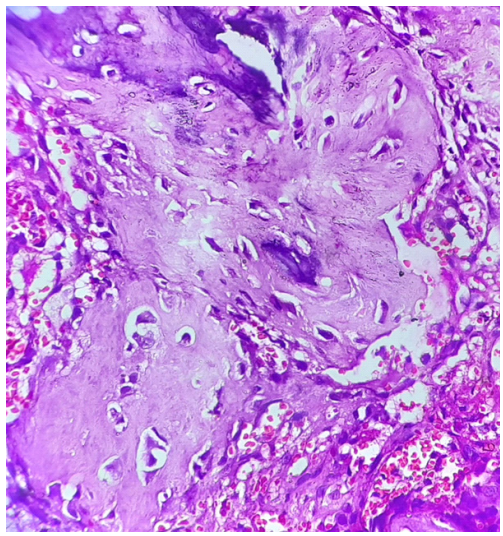

Fig 3 Showing presence of heterotopic bone inintramuscular vascularmalformation(H&E,400X)

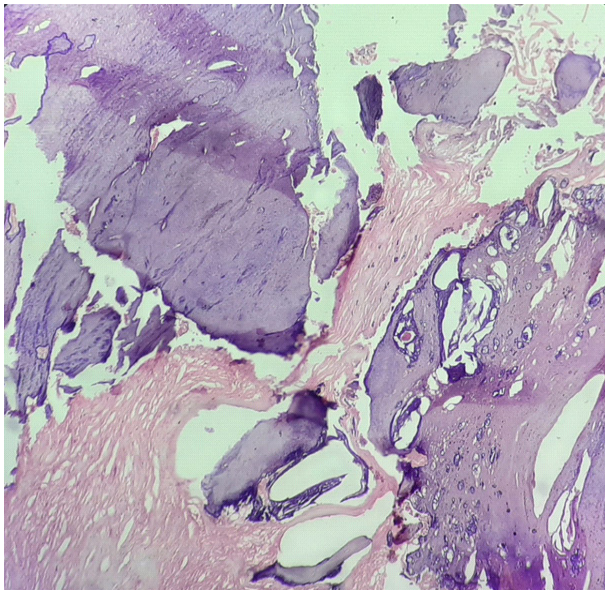

Fig 4 Showing presence of heterotopic bone in abdominal wall incision scar (H&E,400X)

Discussion

Heterotopic ossification is most commonly seen in musculoskeletal and central nervous system. In this case series, we have reported HO at rare sites.

Case 1: Though renal calcification has been reported in various vascular, infectious, cystic as well as neoplastic conditions of kidney[4], formation of heterotopic bone is a rare phenomenon.[5] Osseous metaplasia with RCC has been documented rarely with only 20 cases in the literature worldwide.[6] Patients of RCC with HO often has a mild disease with favourable prognosis. Thus, osseous metaplasia in RCC may act as a prognostic factor indicating good prognosis.[7,8] We reported this case due to its rarity and having prognostic importance in RCC patients.

Case 2: Heterotopic ossification of Tendo Achilles (HOTA) is a rare condition with male predilection.[9,10] In most of the cases, exact etiology is unknown. In some cases, trauma plays an important role for the development of HO in tendoachilles. Other conditions that predispose to HOTA include metabolic diseases (Diabetes Mellitus) and genetic predisposition.

Case 3: Intramuscular vascular lesions are uncommon entities with an incidence of 0.8%.[11] It usually occurs before the age of 30 with equal sex distribution.[12] The etiology of intravascular malformation is still unknown.[13]In addition to vascular components, it may show presence of fat, smooth muscle, calcification and fibrous tissue. But heterotopic bone formation is rare. We reported this case due to its rarity.

Case 4: Heterotopic ossification in abdominal scar is a well-recognised but a rare surgical complication with only few case reports and small case series described in the literature. It has a male predominance with reported male to female ratio of 10:1.[14,15] The exact mechanism of HO in abdominal wall incision scar is unknown but possible theories are osteoblastic metaplasia of multipotent mesenchymal cells after trauma or implantation of small particles of bone or periosteum into the soft tissues during surgery.[15]

Conclusion

Heterotopic ossification is a rare entity. In most of the cases, the exact etiology is unknown. Since only few cases has been reported in the literature, a more conclusive information regarding their clinical significance will be available when the number of cases reported will increase.

Conflict of Interest: Nil

Source of Funding: No financial support received

Ethical Clearance: Our study was approved by institutional ethics committee

Patient Consent: Written informed consent was taken from all the patients participating in this study.

Author Contribution: All are having equal contribution

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Original Article

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Smart Phone and Internet Addiction among Undergraduate Medical Students

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Abstract

Background: Smartphone is an indispensable miracle of artificial intelligence in the hands of global netizens. The internet and smartphones have a strong potential for addiction. Excessive usageof these technologies can have adverse effects on physical, social, and psychological well-being of the users.

Objective: To assess the prevalence of Smartphone and Internet addiction and the associated factors among medical students.

Methodology: Cross-sectional study was conducted among 202 undergraduate medical students. Data was collected using pre-tested and pre-designed proforma after taking informed consent on voluntary basis. Smartphone addiction scale - short version (SAS-SV) and Internet addiction test (IAT) was used to assess smartphone and internet addiction respectively. Descriptive statistics and Chi-Square test and odds ratio was applied..

Results: Among 202 undergraduate medical students 41.58% were addicted towards smartphone. 55.45% were having internet addiction, of which 39.60% and 15.35% were having mild and moderate level. 53.75% who were addicted to smartphone were having moderate and mild levels of internet addiction. This finding was found to be statistically significant ($\chi^2 = 57.609$, df = 1, p = 0.0001, OR= 13.4429)

Conclusion: Smartphone addiction and internet addiction are related proportionally. It is necessary to create awareness regarding the ill health effects and to promote physical, social, and mental well-being among students from the undergraduate level.

Keywords: Addiction, Internet, Medical student, Smartphone, Undergraduate

Introduction

A smartphone is a portable computer device that combines mobile telephone functions and computing functions into one unit, which was released in the year 1994.[1] Each and every day, most of us rely on our smartphones to communicate, research, and for entertainment. The usage of smartphone has grown over time and can be anticipated to increase further also.[2]Smartphones are considered as an essential item,

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an integral tool necessary for communicating and connecting to families, friends and work or even used for educational purposes and during emergencies.[3] They have become an become integral part of life and plays a pivotal role in the current global scenario.[4] A multitude of leisure activities drive smartphones usage, which include gaming, music, photo and video sharing on social networks like Facebook, Twitter, WhatsApp, Instagram, Snapchat and many others. Smartphone users in developing countries like India is showing auphill curve more evident among younger age group population.[5]

Worldwide, smartphones were used by 6.05 billion people in 2020 and is expected to be 6.37 billion in 2021 and will further increase to 7.33 billion in 2025.[6]With this expeditious usage of smartphones, we are into the era of new kind of health disorder called "smartphone addiction (SA)/abuse/misuse" which unfortunately has emerged as a challenging public health problem needing prompt attention, so, as to avoid untoward consequences.[7]

College students are the most rapid adopters of cell phone technology and research suggests association prevails between smartphone usage and their health and academic achievements.[8]

In the days, where mental health is as crucial as physical health, increased usage might be related to sleep disturbances and depression.[9] Internet has become one of the basic necessities of livelihood for electronic commerce, sharing of information and entertainment.[10]

Initially devised for information exchange and research purpose, internet has literally percolated every aspect of human life including social communication, education, health seeking, banking, business, administration, shopping, and entertainment. This progress has made our lives easy but overuse or misuse of internet can lead to pathological and addictive effects.[11]

Students are most vulnerable for cultivating dependency on the internet. This can be attributed to factors like availability of time, unlimited access to the Internet, limited or no parental supervision, for educational purposes and communication. Smartphone and Internet addiction can have a detrimental impact on identity formation and may negatively affect cognitive functioning, affecting academic performance, indulging in risky activities, and poor dietary habits.[12]

These addictions are associated with decline in social circle, depression, loneliness, low family function, lower self-esteem and life satisfaction.[13]Hence, this study was conducted to assess the prevalence of Smartphone and Internet addiction among undergraduate medical students.

Methodology

Study design and duration: Cross-sectional study was conducted for a period of three months from July-September 2021 after obtaining approval from the Institutional Ethics Committee.

Study area: SDM College of Medical Sciences and Hospital, Dharwad, Karnataka which is a tertiary care and teaching hospital.

Study population: Undergraduate medical students from all the professional years.

Inclusion criteria: Medical students who accepted to get enrolled in the study on voluntary basis after taking written informed consent.

Exclusion criteria: Medical students who did not agree to participate on voluntary basis and not ready to give written informed consent.

Sample size: 275 medical students from all professional years were considered for the study, of which 202 students accepted to get enrolled for the study on voluntary basis after giving consent and remaining 73 students who did not agree to participate in the study were excluded from the study population. The sample size was 202.

Sampling procedure: Convenient type of sampling was done and a total of 202 students accepted to get enrolled for the study on voluntary basis after giving consent.

Study instrument: The proforma consisted of two parts - Part I and Part II. Part I consisted of socio-demographic details, Part II consisted of Smartphone addiction scale - short version (SAS-SV)[14] and Internet addiction test (IAT)[15-17] to assess smartphone and internet addiction respectively.

Smartphone addiction scale - short version (SAS-SV):[14] The SAS-SV is a validated scale originally constructed in South Korea, but published in English (Kwon, Kim, et al., 2013). It contains ten items rated on a dimensional scale (1 "strongly disagree" to 6 "strongly agree"). The total score ranges from 10 to 60 and it provides a cut-off value for addiction, which is 31 for boys and 33 for girls.

Internet addiction test (IAT):[15-17] Developed by Dr. Kimberly S. Young. This questionnaire consists of 20 statements. The IAT total score is the sum of the ratings given by the examinee for the 20 item responses. Each item is rated on a 5-point Likert scale ranging from 0 to 5. The maximum score is 100 points. The higher the score is, the higher is the severity of your problem. Total scores that range from 0 to 30 points reflect a normal level of Internet usage; scores of 31 to 49 indicate the presence of a mild level of Internet addiction; 50 to 79 reflect the presence of a moderate level; and scores of 80 to 100 indicate a severe dependence upon the Internet.

Data collection: Data was collected after taking written informed consent from the students, who agreed to participate in the study on voluntary basis using the proforma.

Statistical analysis: Data collected was analysed using SPSS software version 27.0. Descriptive statistics was done and Chi-square (χ^2) test was applied to determine association between two categorical variables. Odds Ratio (OR) with 95% confidence interval was calculated. Statistical significance was set at 5% ($p<0.05$).

RESULTS: A total of 202 medical students participated in the study. Majority were females 103 (50.99%). Mean age of the study participants was 20.34 ± 2.34 years. Table 1 depicts gender-wise distribution usage of smartphone. Of the 202 study participants, it was found that all of them were using smartphone, of which 50.82% females were using the smartphone. Majority, 52.48% participants were using the smartphone for around 5 to 10 hours per day, of which 56.60% were females and 43.40% were males.

Table 2 depicts the details of smartphone addiction using Smartphone addiction scale - short version (SAS-SV).41.58% were addicted, of which 64.29% were males. This finding was statistically significant ($\chi^2 = 13.427$, df = 1, p = 0.00024803, OR= 2.9200; 95% CI: 1.6338 to 5.2188).

Table 3 shows the distribution of study participants in relation to Internet addiction using Internet addiction test (IAT). Of the total 202 study participants, 55.45% were having internet addiction, of which 39.60% and 15.35% were having mild and moderate levels of internet addiction. This finding was not statistically significant.($\chi^2 = 0.775$, df = 1, p = 0.37867469)

Table 4 depicts the comparison of internet addiction in relation to smartphone addiction. It was found that 93.55% and 53.75% who were addicted to smartphone were having moderate and mild levels of internet addiction. This finding was statistically significant ($\chi^2 = 57.609$, df = 1, p = 0.0001, OR= 13.4429; 95% CI: 6.4078 to 28.2019).

Table 1: Gender-wise distribution of participants in relation to smartphone usage and duration of usage (n=202):

Smartphone usage	**Male**		**Female**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**
Regular	90	49.18	93	50.82	183	90.59
Sometimes	9	47.37	10	52.63	19	9.41
Rare	0	0.00	0	0.00	0	0.00
Duration of Usage (Hours/day)	**Male**		**Female**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**
< 5 hours	44	51.76	41	48.24	85	42.07
5 to < 10 hours	46	43.40	60	56.60	106	52.48
≥ 10 hours	9	81.81	2	18.19	11	5.45

Table 2: Gender-wise distribution of participants in relation to smartphone addiction(n=202):

Addiction	Male		Female		Total	
	No.	%	No.	%	No.	%
Not-addicted (< 31: Male, < 33: Female)	45	38.14	73	61.86	118	58.42
Addicted (> 31: Male, >33: Female)	54	64.29	30	35.71	84	41.58
Total	99	49.01	103	50.99	202	100.00
$\chi^2 = 13.427$, df = 1, p = 0.00024 (significant) OR#= 2.9200 (95% CI: 1.6338 to 5.2188)						

Table 3: Distribution of study participants in relation to Internet addiction(n=202):

Internet Addiction	Male		Female		Total	
	No.	%	No.	%	No.	%
Normal (0 to 30)	41	45.56	49	54.44	90	44.55
Mild (31 to 49)	40	50.00	40	50.00	80	39.60
Moderate (50 to 79)	18	58.06	13	41.94	31	15.35
Severe (80 to 100)	0	0.00	1	100.00	1	0.50
Total	99	49.01	103	50.99	202	100.00
$\chi^2 = 0.775$, df = 1, p = 0.37867 (not significant) OR#= 1.2836(95% CI: 0.7359 to 2.2390)						

*Internet addiction - Mild, moderate, and severe levels are combined to apply chi-square test and to calculate OR.

Table 4: Distribution of study participants in relation to smartphone and internet addiction (n=202):

Internet Addiction	Smartphone Addiction					
	Not-addicted		Addicted		Addicted	
	No.	%	No.	%	No.	%
Not-addicted	79	87.78	11	12.22	90	44.55
Addicted	39	34.82	73	65.18	112	55.45
Total	118	58.42	84	41.58	202	100.00
$\chi^2 = 57.609$, df = 1, p = 0.0001 (significant) OR*= 13.4429(95% CI: 6.4078 to 28.2019)						

*Internet addiction - Mild, moderate, and severe levels are combined to apply chi-square test and to calculate OR.

Discussion

In the present study 52.48% participants were using the smartphone for 5 to < 10 hours per day and 41.58% were addicted to their smartphone. In a similar study done by Telgote S A found that the age of the participants was 18 - 25 years. They

were spending more than three hours per day on smartphone and Smartphone addiction was found to be present among 65.8% medical students.[18]

Another study done by Ghog are AS, concluded that majority 71.1% of the study participants belonged to an age group of 18–21 years, 64.10% participants were spending more than three hours per day and 45.1% were addicted to smartphone.[19]In a study done by Dharmadhikari S P found that 46.15% had smartphone addiction as per SAS-SV scale.[20] In the other study done by Gosh T found that the average time spent on smartphone was around four hours per day.[21]These study findings are in line with our study findings. Hence, duration spent on using the smartphone is an important factor for smartphone addiction.

Our study found that internet addiction among medical students was 55.45, which was in similarity to study done by Ashokan AG found that the prevalence of internet addiction among medical students was 61.4%.[22]Similar study done by Joseph J found that the overall prevalence of internet addiction in 19 states of India was 40.70% and the estimated prevalence of severe internet addiction was 4.6%.[23]

In the present study it was found that 39.60%, 15.35% and 0.50% were having mild, moderate and severe levels of internet addiction respectively. Another study done by Jaiswal A concluded that 48.2%, 42.3% and 3.3% were having mild, moderate and severe levels of internet addiction respectively.[24] A study done by Singh B revealed that 62% of them were using Internet up to a moderate level of addiction.[25] These study findings in contrast to our study shows higher prevalence of internet addiction as those studies were conducted during the lockdown period during which there was increased usage of internet among the students due to excess leisure period as they were confined at home and easy availability of internet .

In our study it was found that 93.55% and 53.75% who were addicted to smartphone were having moderate and mild levels of internet addiction. In a similar study done by GhogareA S, found that 94.1% of participants who were addicted to smartphone were overusing the internet and this association is statistically significant (p=0.0001).[19] These study findings reflected the fact that internet addiction was more prevalent among medical students who had smartphone addiction.

Conclusion

Our study concludes that duration of usage and duration of smartphone plays a major role in addiction. Efficient usage of internet must be promoted owing to the fact that the usage turns out to be disorder. Prompt monitoring and interventions, reaching out to students for interaction with caretakers and counselling are ways to have a healthy digital life.

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Original Article

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Health Profile of Working Fishermen in Coastal City: A Cross-Sectional Study

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Abstract

Introduction: Fishing community is one of the unique, traditional and endemic community. Fishing is one the major occupation of Uttara Kannada district. Fishermen are a vulnerable group with some unfavourable life styles and vulnerable for injuries, skin and respiratory allergic manifestations and certain other diseases. Local surveys need to be conducted to understand the extent of morbidity patterns among fishermen and thereby devising a policy approach to suit the local needs

Methodology: This study was done as a population based cross – sectional study among the fishing community in Karwar which is located at coastal boundary of Uttarkannada district, Karnataka. The study was conducted for a period of 6 months from June to December 2019. All the families of Fishermen community coming under field practice area of Chittakula UHC of the Govt medical college of the district were constituted as a part of our study. A total of 472 families resided in the area constituting of 1419 population of which 724 working members in the occupation of fishing.

Result: Among them Percentage of male working members 33.1% (470) and 17.9% (254) were female working members. It was seen that 79.1% of males and 23.3% of females were literates. 32.1% were below the age of 20 years, 37.6% were between 21-40 years ang 30.3% constituted above 40 years. It was found that 64.08% (464) of the working people in fishing sector had one or the other morbidity.

Conclusion: There is a high presence of musculoskeletal disorders, respiratory diseases, skin problems, non-communicable and communicable diseases in the fishermen community.

Key Words: Health, Fishermen, Coastal, city

Introduction

Fishing community is one of the unique, traditional and endemic community. Fishing is one the major occupation of Uttara Kannada district. In the recent years there has been significant development in the standard of living in all the other communities due to the advancement of technology, but the

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development in fishing community is transient[2]. The role of fisheries in Indian economy has gained momentum as a result of advanced techniques to increase the yield per unit area of water and earning foreign exchange. Coastline of Indian mainland is surrounded by Arabian Sea in the west, Bay of Bengal in the east, and Indian Ocean in the south.

Karwar which is the district headquarters of Uttarkannada is bounded by western ghats on one side and Arabian sea and Kali rive on the other. They usually live in unfavourable and challenging conditions and in the remote areas[1]. Fisherman is the one who catches fish for living as an occupation or for sport. Fisherman usually takes up this profession from their ancestors. They are prone to infections due to unhygienic living condition which is a result of low Socio-Economic status and illiteracy and lack of awareness[2].

Fishermen are a vulnerable group with some unfavourable life styles and vulnerable for injuries, skin and respiratory allergic manifestations and certain other diseases. Majority of the morbidities in them are associated with their occupation and personal lifestyles, habits and lesser utilization of health facilities. In India, there has been no much advancement in studies on fisherman's health profile. The fact that this endemic population usually reside in the remote corners of the country where the access is pretty much limited[1]

Fishing is an occupation where the occupants are exposed to both water and sunlight throughout their working hours, hence occupational diseases prevalent among the fishermen of Karwar is to be worked out. In India, the studies on fisherman are more concerned about their Socio-Economic status[1]. It has been felt as the need of the hour to carryout systematic study on fisherman population and formulation of schemes to help them to improve the overall status. Local surveys need to be conducted to understand the extent of morbidity patterns among fishermen and thereby devising a policy approach to suit the local needs. Hence the current study will concentrate on health profile of fisherman in Karwar.

Materials and Methods

This study was done as a population based cross – sectional study among the fishing community in Karwar which is located at coastal boundary of Uttarkannada district, Karnataka. Ethical clearance was obtained from institutional ethical committee. The study was conducted for a period of 6 months from June to December 2019. Fishermen population data was obtained from Central Marine Research Institute, Uttara Kannada district from the census 2007 data. All the families of Fishermen community coming under field practice area of Chittakula UHC of the Govt medical college of the district were constituted as a part of our study after taking informed consent. Universal sampling method was done. A total of 472 families resided in the area constituting of 1419 population of which 724 working members in the occupation of fishing. Thus our sample size constituted of 724 working members in fishing community.

Inclusion criteria: Only individuals working in fishing from the area for the last six months and had given the informed consent were included in the study

A written informed consent was obtained prior to the interview. Accordingly, 724 study subjects were selected. With regard to the illness if the study subject had suffered from one illness the details about that particular illness was enquired. If the study subject had suffered from more than one illness, any one illness was randomly selected using random number tables. The random selection of illness was adopted to avoid any kind of bias in selection of the illness and also would facilitate to obtain a fair mix of acute and chronic diseases.

Data entry and analysis was done using Statistical Package for Social Sciences (SPSS) version 15 software. Descriptive statistics were calculated for the various types of illness.

Findings:

A total of 472 families were interviewed.1419 was the total population. The study included 724 individuals who were selected on the basis of working in fishing sector. It was found that among the entire population 789(55.6%) were males while 630(44.4%) were females. Among them Percentage of male working members 33.1% (470) and 17.9% (254) were female working members. It was seen that 79.1% of males and 23.3% of females were literates. 32.1%

were below the age of 20 years, 37.6% were between 21-40 years ang 30.3% constituted above 40 years. It was found that 64.08% (464) of the working people in fishing sector had one or the other morbidity. The details of the morbidity patterns is mentioned in table 1.

Table 1: Morbidity patterns among fishing community

SI.NO	SYSTEM INVOLVED	SPECIFIC ILLNESS	N (Individuals With morbidity)	PERCENTAGE %
1.	Orthopaedic & Musculoskeletal Disorders	Generalised body ache	22	3.1
		Fractures & dislocations	14	1.9
		Arthritis	14	1.9
		Spine disorders	8	1.1
		Tendon injuries	10	1.4
		TOTAL	**68**	**9.4**
2.	Non communicable diseases	Diabetes type II	19	2.6
		Hypertension	18	2.5
		Dyslipidaemia	13	1.8
		Rheumatic Heart disease	1	0.14
		TOTAL	**51**	**7**
3	Communicable diseases	Dengue	6	0.8
		Viral fever	14	1.9
		Typhoid	5	0.7
		Chikungunya	1	0.14
		Malaria	2	0.3
		Diarrheal diseases	4	0.55
		TOTAL	**32**	**4.4**
4	Other Medical diseases	Anemia	23	3.2
		Hypothyroidism	6	0.8
		Hyperthyroidism	2	0.3
		TOTAL	**31**	**4.3**
5	Dermatological manifestations	Fungal lesions	25	3.5
		Impetigo	10	1.4
		Contact dermatitis	8	1.1
		Scabies	6	0.8
		Keloids	5	0.7
		Acne	7	1
		Vitiligo	1	0.14
		Herpes	2	0.3
		Psoriasis	1	0.14
		TOTAL	**65**	**9**

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6	Surgical morbidities	Cellulitis	7	1
		Acid peptic disesase	11	1.5
		Lipomas	5	0.7
		Gluteal abscess	4	0.55
		Non healing ulcer	4	0.55
		Hernias	3	0.4
		Appendicitis	1	0.14
		Haemorrhoids	3	0.4
		TOTAL	**38**	**5.2**
7.	Other morbidities	Eye diseases	31	4.2
		Gynaecological problems	18	2.4
		Dental problems	14	1.9
		Cardiac diseases	17	2.3
		Respiratory illness	56	7.7
		Casualty emergencies	33	4.5
		Psychiatric illness	10	1.4
		TOTAL	**179**	**24.7**
GRAND TOTAL			**464**	**64.08**

Discussion

This study was done on the fishermen community, the study sample included all the working population in the community. The point of interest of the study was to find out the different morbidities among the fishing working population.

In this study orthopaedic and musculoskeletal disorders (9.4%) was the highest among all the morbidities. Generalised body ache was the highest among them followed by Arthritis, Fractures and dislocation. A study conducted at Chennai had similar patterns with musculoskeletal disorders taking highest toll of 14.4%[1]. This difference in the percentage could be because in their study the study population involved only those who had one or the other illness compared to ours were, we have studied the patterns in the working community. In the study conducted among fishermen by Dr. S. B. Rotti[3], injuries following trauma were found to be 2.7% which is in concordance with our study, which shows that fractures, tendon injuries and dislocations following trauma to be 3.3% of the subjects. Toner et al in their work have also shown that subjective symptoms from the musculo-skeletal system were common among fishermen[4]. Increase in cases of musculoskeletal and orthopaedic could be because of the style of their strenuous work which demands excess uses of body strength like pulling boats, nets, rowing and many more[5,6,7].Osteoarthritis of knee may result from working and living in the vertical environment of a moving boat[8].

Skin infections like fungal infections, impetigo, contact dermatitis, scabies, herpes infections, folliculitis, psoriasis, keloids, Acne and vitiligo were found to be 9% among the working population. In the study done by Dr. S. B. Rotti[3], allergic manifestations were found to be 2.7% while other skin diseases were found to be 3.4%. Overall, 6.1% had dermatological manifestation which is in terms with our study. Similar to our study, a study conducted at Chennai among fishermen had 9.7% suffering from dermatological manifestations. Skin infections were found to be more in this community because of reasons like unclean habits, overcrowding, unhygienic practices, long hours spent in humid regions, excessive sweating and lack of utilisation of health facilities.

In this study it was seen that 2.6% of them had Diabetes type 2 and 2.5% were suffering from Hypertension. Overall NCD's was seen among 7% of the population. However, in the study done by

Dr. S. B. Rotti[3], endocrine diseases such as diabetes were found to be 0.4% and further hypertension was grouped under cardiovascular diseases. A study conducted at Chennai showed 5.3% of them affected by NCD'S. Rapid urbanisation, untimely and unhealthy food habits, excessive consumption of animal fats could be the reason for the same. In our study 4.4% of the study subjects were suffering from one or the other communicable diseases mentioned in Table 1. As the study was conducted in rainy season there were cases of dengue, malaria, diarrhoea and viral fever forming the majority. The reasons could be unhygienic environment with water collection areas leading to vector borne diseases, unsafe drinking water and improper waste and sewage disposal.

Respiratory diseases were found in 56 (7.7 %) subjects in the last six months. It is observed that upper respiratory tract infections, lower respiratory tract infections, asthmatic bronchitis, emphysema and pneumonia formed majority of the cases which is in concordance with the study done by Dr. S. B. Rotti[3]. This susceptibility to respiratory diseases among the subjects could be due to recurrent change from land to sea environment and also due to risk factor like smoking which was seen in most of these patients suffering from emphysema in this population.

Conclusion

There is a high presence of musculoskeletal disorders, respiratory diseases, skin problems, non-communicable and communicable diseases in the fishermen community. Varied weather conditions, physical stress, long and odd working hours, strain on handling the moving boat/ship, sun burns, exposure to irritants are some of the pivotal reasons for the presence of certain morbidities in this particular occupational community.

Conflict of interest: NIL

Source of Funding: self

Ethical clearance: Obtained from Institutional ethics committee, KRIMS KARWAR

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Original Article

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Association of Cytological and Biochemical Oarameters with Pleural Effusion in Patients attending a Tertiary Care Hospital of Western U.P.

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Abstract

Background: Pleural effusion is the pathological accumulation of fluid in the pleural space. This study was done to assess the association of cytological, biochemical, radiological and microbiological parameters in the evaluation of pleural effusion.

Materials and Methods: Present study was done in Saraswathi Institute of Medical Sciences- OPD/IPD of Respiratory Medicine department. As per the inclusion /exclusion criteria the study included 70 participants. Ethical clearance was taken before the commencement of study. Data was analyzed using SPSS software version 26.

Majority of participants in present study were males. Majority belongs to age group 19-29 years with mean age was found to be 34.93 ± 12.99 years. Majority of patients had exudative type of pleural effusion. Lymphocytes was found to be higher as compare to neutrophils and other cells in Tubercular cases than Non-TB cases. Similar findings were found in other studies too.

Conclusion: The present study suggest that a high fluid ADA is a vital diagnostic tool and suggest its usage as a quick diagnostic method to diagnose Tuberculous Pleural Effusion.

Keywords: Pleural effusion, ADA, Cytological, Biochemical, Lymphocytes, Neutrophils

Introduction

Pleural effusion is the pathological accumulation of fluid in the pleural space, observed to be very common. Its causes vary widely, ranging from fairly harmless effusions accompanying viral pleuritis to prognostically highly relevant ones due to congestive heart failure or cancer.[1] Patients with a Non-malignant pleural effusion has a one-year mortality in the range of 25% to 57%.

The aetiology of pleural effusions differs according to geographic location, age at diagnosis,

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and advancements in diagnostic procedures and treatment of underlying causes. Thus, the challenge in defining the aetiology of pleural effusion is demonstrated by the fact that "unknown aetiology" accounts for over 15% of cases and above. [2]

Tuberculosis (TB) today remains an important public health problem throughout much of the world. Among lung pathology, tuberculous effusion is the most prevalent morbidity in India, followed by malignant effusion and a few cases of para-pneumonic effusion, the latter being extremely rare. India has the largest prevalence of tuberculosis in the world, accounting for two-thirds of all tuberculosis cases worldwide. It is a sole cause of more than a million deaths each year, mostly in developing countries.

This study was done to assess the association of cytological, biochemical, radiological and microbiological parameters in the evaluation of pleural effusion.

Materials and Methods

The study was done in Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh. The study population were the patients coming to the OPD/ IPD of Respiratory Medicine department. This study was based on the prospective analysis of blood parameters of 70 patients who had come to the OPD/ IPD between November 2020 and October 2022. Inclusion criteria includes participants with age more than 18 years and chest X ray showing evidence of pleural effusion.

All the participants were subjected to Diagnostic Pleurocentesis under aseptic precautions where, about 10 ml of fluid was aspirated and subjected to pleural fluid analysis –Biochemical, Microbiological, Pathological analysis was done. A written Informed consent was obtained for all the invasive procedures prior to it. Ethical clearance was taken prior to the start of this study from the Institutional Ethics Committee.

Patient who had undergone repeated pleurocentesis, bleeding disorders and Pregnant women were excluded from the study. The sample size for the study was calculated as per the formula $4pq/d^2$ where prevalence was taken as 22.5 % from previous literature and standard error was taken as 10% with 95% confidence interval. The final sample size was found to be 70.

Data was entered on MS Office Excel version 2019 and analyzed using SPSS Software version 26. P value was considered significant if it was less than 0.05.

Results

Table-1: Distribution of Age Groups

Age Groups	Frequency	Percentage
19-29	29	41.4
30-40	21	30.0
41-50	11	15.7
51 and above	9	12.9
Total	70	100.0

The present study has included 70 participants with majority of them belongs to 19-29 years age group. The minimum age was 19 years and the maximum was 65 years with mean age (±S.D.) was found to be 34.93 ± 12.99 years. Majority of respondents were male (57.1%).

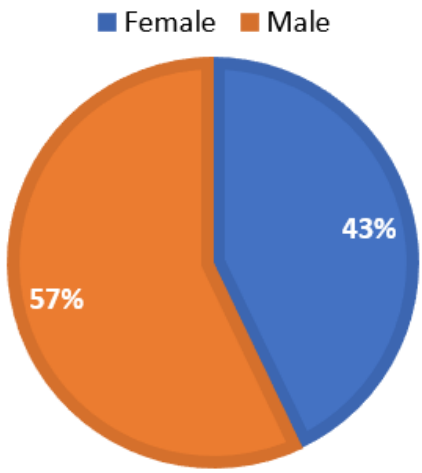

Fig 1: Gender distribution

The results showed that majority of participants has shortness of breath (85.7%), cough (58.6%) and fever (57.1%) with nearly half of them having chest pain (51.4%). Majority of the patients do not complaint of any loss in appetite or weight.

Table-2 Shows the Distribution of Fluid Colour

Fluid Colour	Frequency	Percentage
Exudate (Straw)	64	91.4
Transudate (Clear)	6	8.6
Total	70	100.0

The above table mention the distribution of pleural fluid colour where, higher proportion were observed to be exudative fluid (straw coloured) 91.4% and rest were observed to be transudative fluid (clear coloured) 8.6% cases.

According to Light's criteria, pleural fluid protein/serum protein ratio more than 0.5 was observed in exudate whereas for transudate less than 0.5 pleural fluid protein/serum protein ratio was found.

Table-3 Shows the Distribution of Fluid C/S

Fluid C/S	Frequency	Percentage
Growth	3	4.3
No Growth	67	95.7
Total	70	100.0

According to culture/sensitivity report, higher proportion of cases showed no growth. Where as only 4.3 % cases showed some growth during culture.

Table-4 Shows the Distribution of X-Ray Chest

		Conclusion		Total
		NON-TB	TB	
X-Ray Chest	B/L PE	0	1	1
	Left PE	3	27	30
	Right PE	7	32	39
Total		10	60	70

The above table show the distribution of x-ray chest where majority of case were having Right Pleural effusion with TB whereas, similar observation was found for Non-TB cases also.

Table-5 Shows the Mean Distribution of Lymphocyte, Neutrophil and Other Cells

	Conclusion	N	Mean	S.D.	Std. Error Mean	P Value
Lymphocytes	Non-TB	10	68.30	20.13	6.37	<0.001
	TB	60	85.55	11.43	1.48	
Neutrophils	Non-TB	10	25.90	17.25	5.45	0.001
	TB	60	11.95	11.09	1.43	
Other cells	Non-TB	10	5.80	3.74	1.18	0.002
	TB	60	2.92	2.35	0.30	

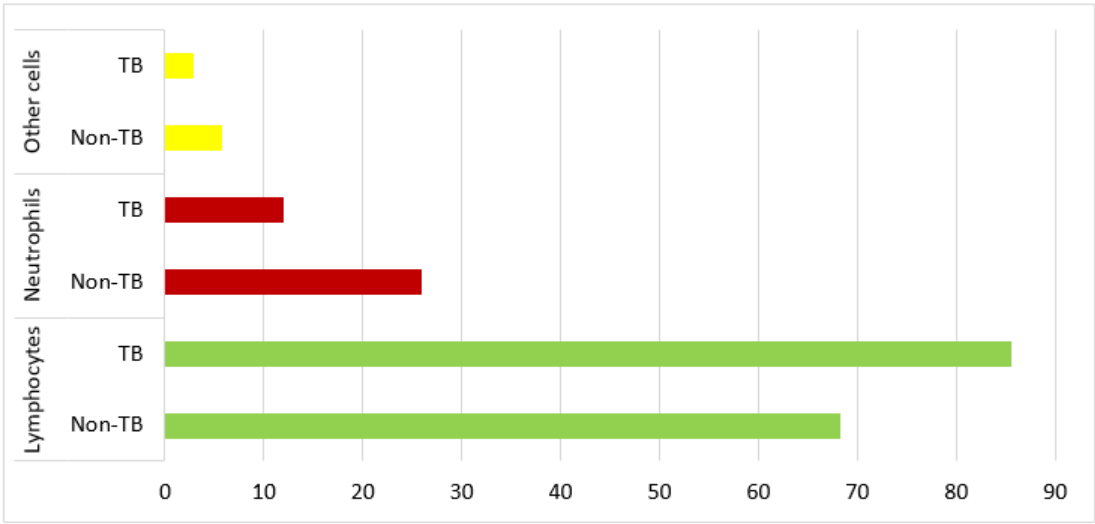

Figure-2 Shows the Mean Distribution of Lymphocyte, Neutrophil and Other Cells

The above table and figure show the mean distribution of lymphocyte, neutrophil and other cells

where significant difference have been observed to be present in TB and Non- TB cases for the lymphocyte, neutrophil and other cells category. Lymphocytes were comparatively higher in TB cases than in non TB cases.

Table-6 Shows the Mean Distribution of F-ADA, PF (S) AND PF (P)

	Conclusion	N	Mean	S.D.	Std. Error Mean	P Value
FADA	Non-TB	10	10.92	7.86	2.48	0.000
	TB	60	85.5	19.88	2.50	
PF(S)	Non-TB	10	121.88	71.46	22.60	0.000
	TB	60	81.07	39.78	5.14	
PF(P)	Non-TB	10	2.97	0.36	0.31	0.000
	TB	60	4.74	0.54	0.08	

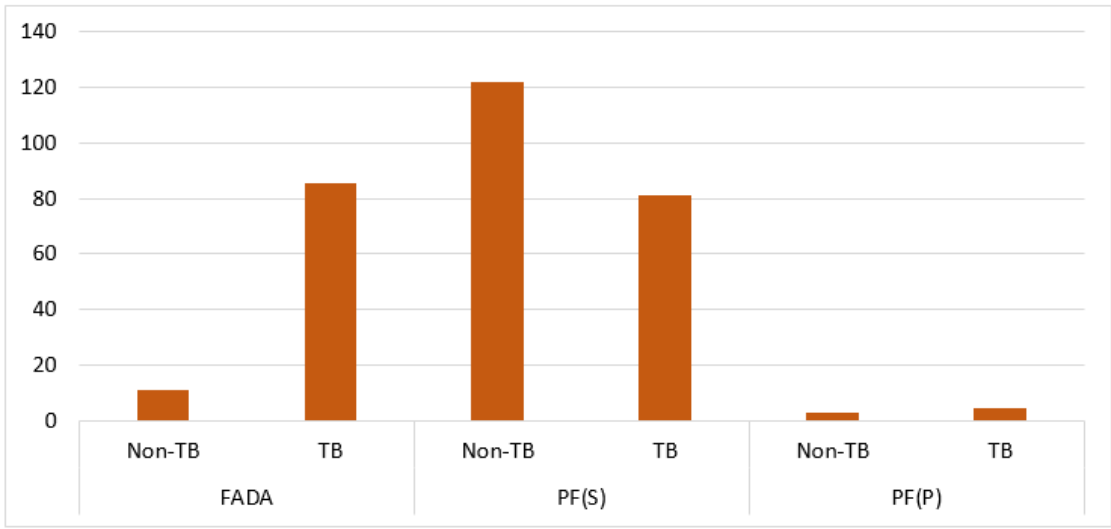

Fig-3 Shows the Mean Distribution of F-ADA, PF (S) AND PF (P)

Discussion

The present study observed that higher percentage of participants were found to be in age group 19-29 years. Ramaswamy et al.[3],study observed that the majority of participants belongs to age group 31-40 years. Qureshi et al.[4], study with similar background enrolled with age range 14-64 years. Their mean age was 30.9± 17.38 years. Whereas, in our study the mean age was 34.93 ± 12.99 years.

The commonest clinical sign was stony dullness to percussion. Pandit et al.[5]found 71.4% cases presented with pleuritic chest pain, breathlessness, dry cough and fever. Fever and cough were the commonest symptom (69.2%) followed by breathlessness and Pleuritic chest pain (61.5%). However, the present study observed the higher percentage of cases to having shortness of breath followed by cough and fever. Karkhanis et al.[6], study found that the pain is usually sharp and is exacerbated by movement of the pleural surfaces, as with deep inspiration, coughing, and sneezing.

In terms of weight loss where higher percentage of cases has been observed to have no weight loss in this present study findings however, Soe et al.[7], study observed significant weight loss (72.2%) for the cases which is not in the line of this present study.

This study observes the distribution of Diabetes mellitus where higher percentage of cases have no history of diabetes mellitus. Ezung et al.[8], study in this context showed 6% prevalence with diabetes mellitus presence.

For the case of neutrophils, and other cell category the present study also observed a decrease of mean values in TB patients. Ferreiro et al.[9], in this course discussed that presence of decrease in neutrophils is highly suggestive for TB. In this course Burgess

et al.[10], in their study overall documented that ADA, especially when combined with differential cell counts and lymphocyte/neutrophil ratios, remains a useful test in the diagnosis tuberculous pleuritis. Whereas study done by Popowicz et al.[11], documented that the proportion of neutrophils in pleural fluid was predictive of prognosis more strongly than lymphocytes.

With context to the distribution of F-Colour, higher proportion was found to be exudate (straw colour) 91.4% whereas smaller proportion (8.6%) represented transudate (clear colour). Reddy et al., also observed straw coloured fluid was more common pleural fluid in their study cases. The study further in this context mentioned that the most Tubercular pleural effusions are exudates with high adenosine deaminase (ADA), lymphocyte-rich, straw-colored and free flowing fluid, with a low yield on mycobacterial culture which is again in similar lines with present study findings.

The cases related to the cartridge based nucleic acid amplification test (F-CBNAAT) showed Tubercular bacilli was not found in higher proportion of cases. Srinidhi et al.[12] observed the role of CBNAAT in diagnosing pleural TB is limited due to its poor sensitivity which is in conformity to this study findings. Chakraborty et al.[13] also stated that for pleural fluid, CBNAAT owing to its low sensitivity, should not be included in the diagnostic protocol of pleural effusion in high prevalence areas**.**

Conclusion

In the present study it was observed that the most common cause of pleural effusion was Tuberculosis after Clinical, Radiological, Biochemical, Cytological and Microbiological correlation, although in India Tuberculous pleural effusion is very common and is the 2nd mostcommon cause of extra-pulmonary Tuberculosis after Tuberculous Lymphadenitis.

This study suggest that a high fluid ADA is a vital diagnostic tool and suggest its usage as a quick diagnostic method to diagnose Tuberculous Pleural Effusion.

Source of Funding: Self- funded.

Conflict of Interest: Nil.

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Case Study

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Atriovenous Malformation of Pinna (A Rare Case) At a Tertiary Care Hospital, Patna, Bihar

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Abstract

Introduction: Arteriovenous malformations are vascular abnormalities in which the arterial vasculature connects to the venous, leading to potentially disfiguring and life-threatening complications. Venous malformations (70 %) are the most common CVM (congenital vascular malformation), followed by lymphatic malformations (12 %), arterio-venous malformations (8 %), combined malformation syndromes (6 %) and capillary malformations (4 %). The majority of these lesions are sporadic in nature.

Case Report: A 15-year-old male came to E.N.T.OPD at PMCH with a history of swelling and skin discoloration of the right pinna (medial as well as lateral side) since last 2 years.

Physical examination

Vital signs were normal. Nopallor, no localized lymphadenopathy. A pulsatile swelling with areas of skin discoloration at the right pinna with no necrosis .Ear canal and the tympanic membrane- normal.

On palpation

Well defineds welling, circumscribed margins, soft, non-compressible, spongy, non-tender, and pulsatile with a thrill. Bruit on auscultation.

Investigations

Routine tests were within normal limits. PTA- bilateral mild S.N.H.L.

MRI-High flow vascular malformation seen in right retro auricular region with feeding vessels arising from right superficial temporal artery and branches of right maxillary artery.

Treatment- Patient underwent sclerotherapy of the lesion. Postoperatively, the patient was evaluated in the E.N.T OPD at one, two and four weeks following sclerotherapy without recurrence of a mass, pulsation or bruit.

Key words: Arterio-venous malformation, Casereport, MRI, pinna, Sclerotherapy

Introduction

Arteriovenous malformations (AVMs) of the head and neck are rare and complex vascular lesions that can be present since birth with unpredictable growth. It is a structural vascular abnormality in which the arterial vasculature connects to the venous

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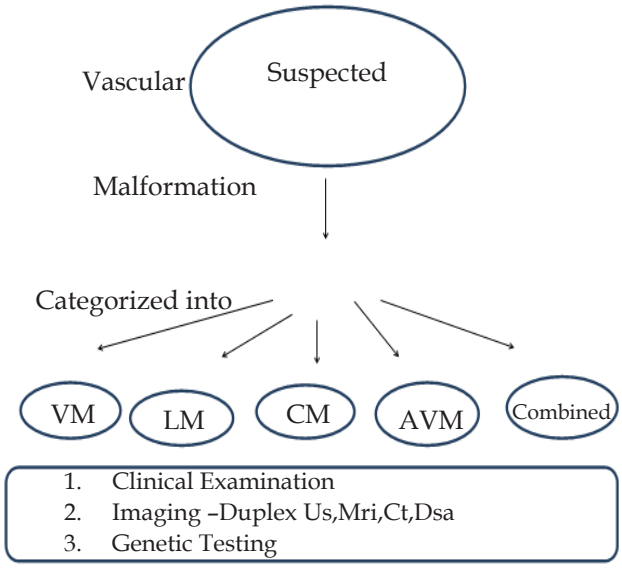
vasculature leading to potentially disfiguring and life-threatening complications [1] AVMs are usually congenital and belong to the RASopathies. The genetic transmission patterns of AVM, if any, are unknown. AVM is not generally thought to be an inherited disorder, unless in the context of a specific hereditary syndrome Arteriovenous malformations (AVMs) are lesions related to errors of vascular morphogenesis. These are almost always present at birth, manifest late in life and require treatment.[2]

Venous malformations (70 %) are the most common CVM (congenital vascular malformation), followed by lymphatic malformations (12 %), arterio-venous malformations (8 %), combined malformation syndromes (6 %) and capillary malformations (4 %). The majority of these lesions are sporadic in nature.[3]



Best Medical Therapy	Sclerotherapy	Surgical Excision
Compression Garments MLD Physiotherapy	+/- Embolization	+/-Sclerotherapy +/-Embolization

Figure 1: Diagnostic and treatment algorithm of Vascular malformations[3]

VM = Venous malformation (most common, low flow, no bruits) CM = Capillary malformation (asymptomatic birth mark, flat/raised, pink/purple) LM = Lymphatic malformation(chyle filled cyst)

AVM = Arteriovenous malformation (high flow, compressible, thrill and bruits present) MRI = Magnetic resonance imaging, US = Ultrasound

CT = Computed tomography

MLD = Manual lymphatic drainage

DSA = Digital Subtraction Angiography

NBCA= N-Butyl cyanoacry late PVA=Polyvinyl alcohol As management of AVMs is difficult, it must be multidimensional. AVM lesions have very high rates of recurrence requiring regular follow-up and repeated treatment. Our work is a single case report and has been reported in order. We report a rare and interesting case of a AVM of the right pinna.

Case Report

A 15-year-old male presented to the otorhinolaryngology out-patient department OF E.N.T. at PATNA MEDICAL COLLEGE AND HOSPITAL with a history of swelling and skin discoloration of the right pinna (medial as well as lateral side) since last 2 years. The swelling was pulsatile, warm on touch and it gradually increased in size, especially so in the past two years to attain the present size. The patient had a history of tinnitus and bilateral hearing loss. There were no episodes of bleeding/ulceration and not associated with pain.

There was no history of trauma to the ear or headaches.

No history of allergies to any drug and food.

No history of Hypertension, Diabetes Or Asthama.

No history of smoking, alcohol or substance abuse.

No past history of any chronic illness, surgery.

On physical examination

vital signs were normal. There was no pallor, no localized lymphadenopathy. A pulsatile swelling with areas of skin discoloration was seen at the right pinna with no necrosis.

(figure 1A and B). The ear canal and the tympanic membrane were normal.

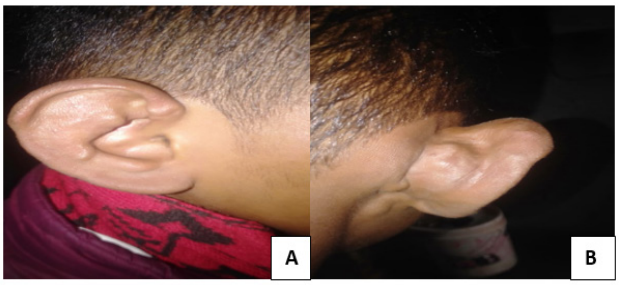


Figure 1-showing medial and lateral aspect of right pinna with AVM

On palpation

The swelling had well defined, circumscribed margins, soft, non-compressible, spongy, non-tender, and pulsatile with a thrill. A continuous bruit could be heard on auscultation.

Pretherapeutic workup or investigations

Revealed a normal hemogram, and theremaining laboratory investigations including coagulation profile, LFT, RFT, blood sugar, viral markers, ECG and chest X-ray within normal limits. PTA Showed bilateral mild S.N hearing loss. (Figure 2)

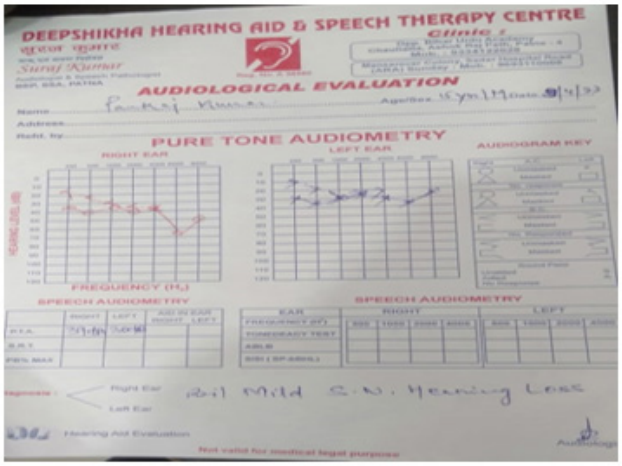


Figure 2-showing pure tone audiometry –Bilateral mild S.N hearing loss

MRI

A clinical diagnosis of AVM was made on MRI showing high flow of vascular malformation in right retro auricular region on T2 W1 and on complementary colour Doppler sonography PSV 180CM/SEC with RI 0.43. On TOF angiography the feeding vessels are seen to be arising from right superficial temporal artery branched from right maxillary artery. Multiple polyp seen in maxillary sinus. (figure 3 A,B,C and D)

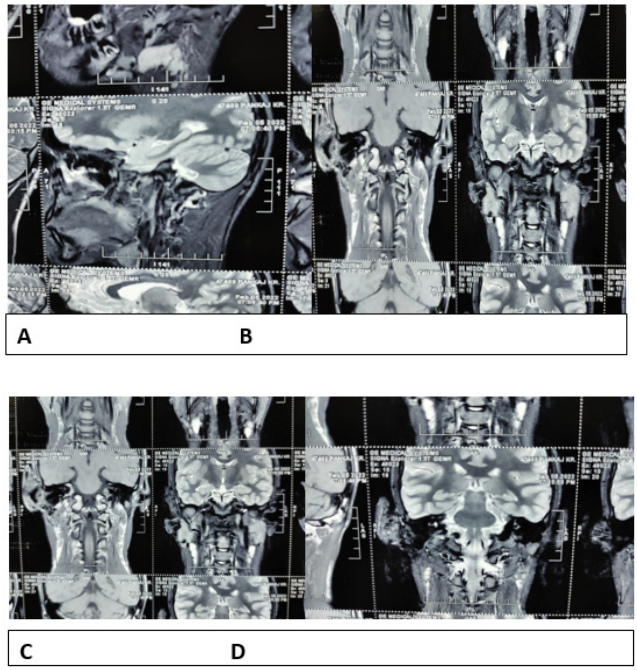


Figure 3 Impression – High flow vascular malformation seen in right retro auricular region with feeding vessels arising from right superficial temporal artery and branches of right maxillary artery

Differential Diagnosis

The following are the differential diagnosis:

1. Post-traumatichematoma—can be diagnosed by acute onset and absence of bruit.

2. Hemangioma—usually regresses by adulthood and less common in pinna.

3. Malignancy—has proliferative growth with the absence of bruit.

Treatment- Because of the high clinical suspicion of an AVM, the patient underwent sclerotherapy of the lesion (Figure 4). Postoperatively, the patient was evaluated in the E.N.T OPD at one, two and four weeks following sclerotherapy without recurrence of a mass, pulsation or bruit.

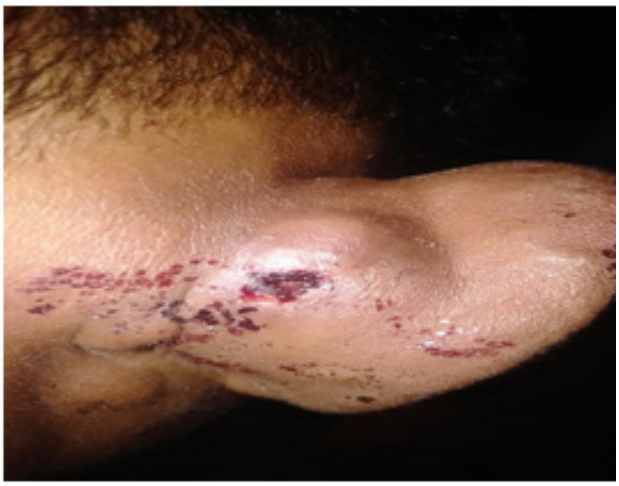


Figure 4- sclerotherapy of right pinna

Discussion

A study done on An arteriovenous malformation of the external ear in the pediatric population of USA revealed among all AV malformation of head and neck, around 16% incidence of lesions involves ear. The overall cure rate was 60%. Cure rate for small malformations was 69% with excision only and 62% for extensive malformations with combined embolization-resection.

These lesions can be classified into four stages as described by Schobinger

I: cutaneous blush/warmth

II: Bruit, audible pulsations, expanding lesion

III: Pain, ulceration, bleeding and infection

IV: Cardiac failure.[4]

Hemangiomas with limited growth in the ear are extremely rare and most are classified as cavernous hemangiomas. CASE report written BYT. Wisupagan and S. Kiatthanabumrung represents the second case of pediatric capillary hemangioma in the ear canal to be reported. Ear hemangioma may present with otorrhea, progressive hearing loss, otalgia, bleeding, tinnitus, and otitis externa, or as an accidental finding during physical examination. hemangiomas include red or dark red color and firm but malleable consistency. Audiogrammay indicate conductive hearing loss. Biopsy is not recommended in a hypervascular lesion. A variety of treatment options are available. If the tumor is small, slow-growing, and asymptomatic, observation may be considered. However, the ideal treatment is complete removal of the tumor, either by transmeatal, endaural, or postauricular approach, depending on the tumor and the surgeon's clinical judgment. CO2 laser is an alternative treatment method; however, if residual tumor remains after treatment, the patient may still need to undergo complete resection.[5]

A case study done by Das S, Than gavel S, Alexander A, et al. on Is percutaneous glue injection one of the treatments for arteriovenous malformation pinna? Showed Embolization can be done using various materials like NBCA (glue), ethyl vinyl alcohol copolymer (onyx), platinum coils and polyvinyl alcohol particles. The glue used in this study is a mode of permanent embolization and it acts by polymerizing instantaneously on coming in contact with an ionic solution in the blood. Polymerization causes occlusion of the AVM vessels via the following mechanisms.

(1) Cast and thrombus formation: polymerisation results in the formation of the cast that adjusts to the vessel shape and blocks its blood flow. This results in vessel thrombosis.

(2) Adhesion to the vascular wall: NBCA near the tip of the catheter becomes hard and adheres to the vascular wall.

(3) Damage to the vascular endothelium: results in intravascular thrombus formation and acute necrotizing vasculitis causing scarring and fibrosis. This phenomenon increases the NBCA embolizing property. This reaction develops in 40%–50% of the lesion; then being replaced by chronic granulomatous vasculitis that persists for a longer time. NBCA has been at times shown to be curative in AVM malformations.[6]

The present study conducted in PMCH, Patna on AV malformation of right pinna used sclerotherapy as a treatment with no recurrence .

Conflict of interest: None.

Ethical committee approval: Taken from Institute's ethical committee.

Funding: Done by patient side.

Informed consent: Taken.

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Original Research Article

DOI: https://doi.org/10.37506/qg6ktv49

Evaluation of the Impact of Screen Time and Parental Play on Children with an Autism Spectrum Disorder in Comparison with Normal Children

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Abstract

Background: There is a decremental trend seen in parental play in recent times, and there is a mounting trend in screen exposure in children. This changing trend in parental play and screen time exposure may affect child social and communication domains.

Objective: To assess the impact of screen time and parental play in children with autism spectrum disorder.

Methodology: This is a comparative cross sectional study with a sample of 60 children. Thirty children of age group 2-6 years diagnosed with Autism Spectrum Disorder as per DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) attending child guidance Clinic, Government Hospital for Mental care were included in the study. The Parental Play Questionnaire assessed parental play in children. The Digital Screen Exposure Questionnaire (DSEQ) evaluated child screen time exposure. The severity of ASD was assessed by using the CARS scale.

Results: Out of thirty samples with Autism spectrum disorder (ASD), 60% of children had moderate ASD, while 20% accounted for mild and severe ASD. Nearly 53.3% of ASD children had a frequency of watching smartphones more than 5 times a week with an average duration of more than 2 hours a day. In contrast, in normal children, only 6.7% have such frequency and an average time of watching smartphones less than 1 hour, significant with a p-value of <0.001. Among the ASD group, 80% of children had active physical parent-child play frequency of less than twice a week. In normal children, about 60% had a frequency of parent-child play several times daily. (p-value <0.001). About 66.7% of ASD children never had to pretend play, and 30% had pretend play once a week.

Conclusion: The result showed significantly higher screen time exposure and lack of parental play in children with ASD than in normal children. The need of this digital era is mounting concern about reducing screen time exposure and increasing parental play in childhood.

Keywords: Parental play, screen time, ASD, smartphones, childhood

Introduction

"The time spent in sedentary behaviours such as watching television, playing video games, and using computers and smartphones" defines "screen time." There has been increased penetration of smartphones and other digital screens in the Indian subcontinent over the past few years. Play is an intuitive, self-directed, enjoyable, and organically driven human

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action. Parental play is crucial for a child's growth in many areas, including physical, cognitive, social, and emotional development [1]. Children improve their fine and gross motor skills, problem-solving abilities, communication and interpersonal skills, friendships, interactions with peers and adults, executive function, and prosocial brain development through play. In recent decades, there has been a drastic change in family type, the working status of parents, urbanization, and lack of parental figures like grandparents, and digitalization in the Indian subcontinent. These changes affect parental play significantly. Autism spectrum disorder (ASD) is a type of neurodevelopment disorder characterized by persistent deficits in social communication and interaction and stereotyped or repetitive patterns of behaviour, interests, or activities. The most frequent age at diagnosis for ASD is 3.0Years [2]. According to the most recent statistics, 1 in every 54 children has autism, which is on the rise yearly. Parental play is declining, and screen time is increasing, and it is clear those children who were exposed to screens for an average of two hours per day underperformed in every category. Childhood screen use is associated with many detrimental developmental health consequences, such as obesity, behaviour issues, issues regulating emotions, speech delay, decreased executive functioning, and educational difficulties [3]. Hence the present study is aimed to assess the impact of screen time on children with ASD, the result of parental play on children with ASD, and compare the effect of screen time and parental play in ASD with normal children.

Materials and Methods

Study design: It is a comparative cross sectional study.

Study place: The study was done at a Child Guidance Clinic, a Government hospital for mental care, in Visakhapatnam

Study period: The study was conducted from May 2022 to May 2023

Study population: A convenient sample of 60 children was selected for this study

Informed consent: Informed written consent was taken from the parents of selected children.

Institutional Ethics Committee: The Institutional Ethics Committee approved the study, and all subjects provided written informed consent.

Inclusion criteria:

- Thirty children aged 2-6 years old and diagnosed with Autism Spectrum Disorder according to DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) criteria, without any co-morbid neurodevelopmental disorders attending both outpatient and inpatient, were included.
- The control group consists of children without any neurodevelopmental disorders clinically as per the treating pediatrician or psychiatrist, and they were selected from the pediatrics or psychiatry outpatient department of King George Hospital, Visakhapatnam was included.

Exclusion criteria:

- Comorbidities, such as epilepsy or a visual/hearing impairment and/or
- On medications, such as antipsychotics, anticonvulsants and stimulants

Methodology

The present study was conducted on 30 ASD children and 30 control group children without ASD. Socio-demographic information and clinical details were taken as per proforma. Child screen time exposure was assessed by a Digital screen exposure questionnaire (DSEQ) in both groups. The digital screen exposure questionnaire consists of 30 items to be rated on a 5-point Likert scale ranging from 1(Never) to 5(often), which mainly focuses on the frequency and duration of various digital screens that include television, smartphones, laptop, and computer. This scale was reliable, with kappa values ranging from 0.52 to 1.0 and an intra-class coefficient of 0.62-0.99. The severity of ASD was assessed by using the childhood autism rating scale, 15 item questionnaire, which had a validity coefficient of 0.67. A parental play questionnaire was applied in both groups to assess parental play. The parental play questionnaire consists of 30 items; the Likert scale mainly focused on frequency, the attitude of parents toward parental play, and structuring. It has a validity coefficient of 0.67. Ethical Committee clearance was taken before starting the study.

Statistical analysis

The Statistical Package for Social Sciences (SPSS) 21.0 for Windows was used to examine the data. The Chi-square test was used for the statistical analysis of the data, and the p-value was compared for the ASD and control groups.

Results

Table 1 shows the results of socioeconomic variables affecting the study population. Among the thirty samples of ASD children aged 2-6 years, 21 were male, and 9 were female. Among the normal children aged 2-6 years, 19 were male, and 11 were female. In both groups, the mother was the primary caregiver. In our study 43.3% parents of ASD children were graduates whereas 30% of normal children were graduates. Majority of the ASD test group (63%) and normal control group (66.7%) were belonging to lower middle-income socioeconomic status. 60% of ASD and 53.3% of the normal children group belong to urban domicile. The influence of socioeconomic variables on the study population was insignificant in the present study $p>0.05$. Out of thirty samples with Autism spectrum disorder (ASD), 60% of children had moderate ASD, while 20% accounted for mild and severe ASD. Table 2 show the frequency of various parental plays. Nearly 53.3% of ASD children had a frequency of watching smartphone more than 5 times a week, and 30% of ASD children had a frequency of 2-4 times a week and an average duration of more than 2 hours a day, whereas in normal children only 6.7% of have such frequency and average duration of watching smartphone less than 1hour (Figure 1). About 70% of ASD children watch television at a frequency of 3-4 times a week which is significantly higher than the recommended guideline. In a group of normal children, it was less than 20%. There is a significant difference with a $p <0.0001$. The frequency of watching laptops was almost less than 3% in both groups. About 80% of children with ASD use smartphones to watch recreational and social media videos, and 38% of normal children use screens for the same purpose. Less than 16% of children with ASD use smartphones for learning alphabets, numbers, and colors. The supervision of an adult over the children watching the media screen was higher for normal children than ASD children, with a p-value <0.001 (Figure 2). Among the ASD group, 80% of children had active physical parent-child play frequency of less than twice a week. In the case of normal children, about 60% had a frequency of parent-child play several times a day (p-value <0.001) (Figure 3). About 66.7% of ASD children never had to pretend play, and 30% had pretend play once a week. In the case of normal children, 70% of children had pretend play several times a week (p-value <0.001) (Figure 4). Parents of normal children have utilized most of the opportunities to play with the children, which were very few for parents of ASD children. (p-value <0.008). About 70% of parents of normal children provide efforts to structure parental play, like scheduling timings and providing challenging toys and methods of play, which was very less in parents with ASD, around 30% (p-value<0.001). Only 9 (30%) parents of ASD children were showed efforts to structural parental play sometimes and 43.3%, 53.3% and 3.4% of parents of normal children were showed efforts to parental play sometimes, often and always.

Table 1: socio-demographic detail and its distribution in both groups

Socio-economic Variables	Group				p-value
	ASD		Control		
	Count	Percentage (%)	Count	Percentage (%)	
Gender					
Female	9	30	11	40	0.397
Male	21	70	19	60	
Paternal status					
Father	9	30	6	20	0.371
Mother	21	70	24	80	

Continue.....

Educational status of parents					
Graduation	13	43.3	9	30	0.446
High school	7	23.3	11	36.7	
School	10	33.3	10	33.3	
Economic status					
Lower middle-income	19	63.3	20	66.7	0.787
Upper middle-income	11	36.7	10	33.3	
Religion					
Christian	0	0	1	3.3	0.355
Hindu	30	100	28	93.3	
Muslim	0	0	1	3.3	
Residence					
Rural	12	40	14	46.7	0.602
Urban	18	60	16	53.3	

Table 2: Frequency of various parental play

		SEVERITY					
		MILD		**MODERATE**		**SEVERE**	
		Count	**Column N%**	**count**	**Column N%**	**count**	**Column N%**
Active Play	Never	0	0.0%	2	11.1%	0	0.0%
	Less than once a week	3	50.0%	7	38.9%	3	50.0%
	Once or twice a week	2	33.3%	7	38.9%	3	50.0%
	Several times a week	0	0.0%	0	0.0%	0	0.0%
	Once or twice a day	1	16.7%	2	11.1%	0	0.0%
	Several times a day	0	0.0%	0	0.0%	0	0.0%
Gentle Play	Never	1	16.7%	0	0.0%	0	0.0%
	Less than once a week	1	16.7%	5	27.8%	0	0.0%
	Once or twice a week	2	33.3%	8	44.4%	5	83.3%
	Several times a week	2	33.3%	2	11.1%	1	16.7%
	Once or twice a day	0	0.0%	1	5.6%	0	0.0%
	Several times a day	0	0.0%	2	11.1%	0	0.0%
Play with toy	Never	0	0.0%	1	5.6%	0	0.0%
	Less than once a week	2	33.3%	7	38.9%	3	50.0%
	Once or twice a week	2	33.3%	2	11.1%	0	0.0%
	Several times a week	1	16.7%	6	33.3%	3	50.0%
	Once or twice a day	1	16.7%	2	11.1%	0	0.0%
	Several times a day	0	0.0%	0	0.0%	0	0.0%
Pretend play	Never	4	66.7%	11	61.1%	5	8.3%
	Less than once a week	2	33.3%	6	33.3%	1	16.7%
	Once or twice a week	0	0.0%	1	5.6%	0	0.0%
	Several times a week	0	0.0%	0	0.0%	0	0.0%
	Once or twice a day	0	0.0%	0	0.0%	0	0.0%
	Several times a day	0	0.0%	0	0.0%	0	0.0%

Continue.....

Turn taking play	Never	2	33.3%	13	72.2%	4	66.7%
	Less than once a week	4	66.7%	5	27.8%	2	33.3%
	Once or twice a week	0	0.0%	0	0.0%	0	0.0%
	Several times a week	0	0.0%	0	0.0%	0	0.0%
	Once or twice a day	0	0.0%	0	0.0%	0	0.0%
	Several times a day	0	0.0%	0	0.0%	0	0.0%
Play with book	Never	2	33.3%	7	38.9%	0	0.0%
	Less than once a week	2	33.3%	9	50.0%	6	100.0%
	Once or twice a week	2	33.3%	2	11.1%	0	0.0%
	Several times a week	0	0.0%	0	0.0%	0	0.0%
	Once or twice a day	0	0.0%	0	0.0%	0	0.0%
	Several times a day	0	0.0%	0	0.0%	0	0.0%
Noise play	Never	3	50.0%	13	72.2%	6	100.0%
	Less than once a week	3	50.0%	5	27.8%	0	0.0%
	Once or twice a week	0	0.0%	0	0.0%	0	0.0%
	Several times a week	0	0.0%	0	0.0%	0	0.0%
	Once or twice a day	0	0.0%	0	0.0%	0	0.0%
	Several times a day	0	0.0%	0	0.0%	0	0.0%

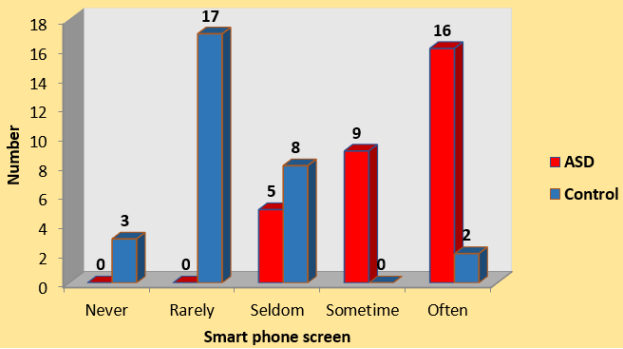

Figure 1: Evaluation of smartphone screen

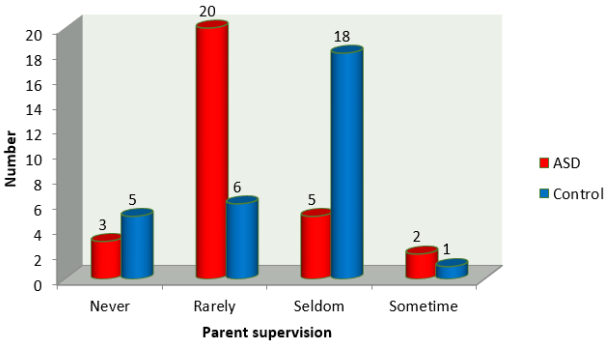

Figure 2: Comparison of ASD children and normal children with parental supervision during the screen time exposure.

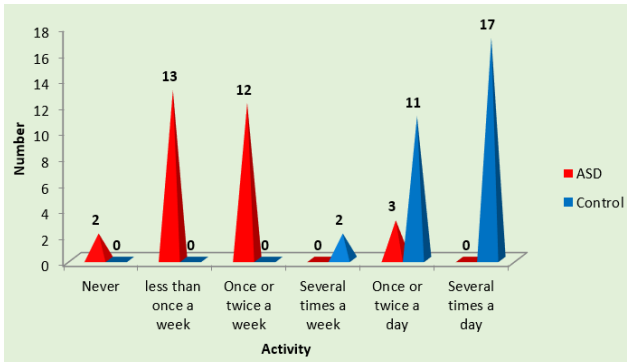

Figure 3: Represents the frequency of active games is higher in the normal group than in the ASD group

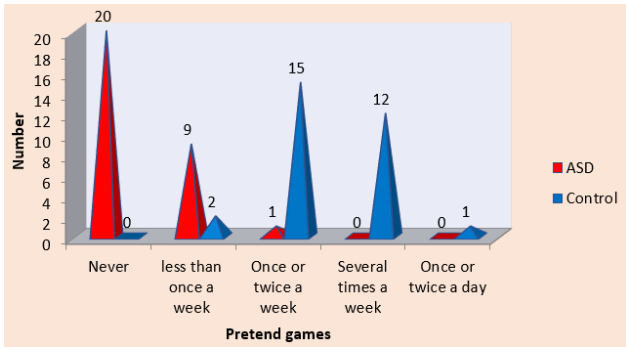

Figure 4: Pretend games

Discussion

In this study, male children had more ASD than females (21 males and 9 females), corroborating that ASD is 4 times more common in males than in females. The study was done in a government institution, so most samples were from the lower middle socioeconomic status. A significant difference in screen time exposure is observed between the children with ASD and the normal children group. Most children are exposed to smartphones more than television and laptop being the least. Regarding the frequency of adult supervision, normal children received more supervision than the ASD children group. This result mentioned above indicates the significance of screen time exposure in autism spectrum disorder compared to normal children. It could be because of the easy availability of electronic devices, lack of proper knowledge about the negative effects of screen exposure, the working status of parents, and lack of other parental figures. A study on the correlation between screen time and autistic symptoms concluded that a longer duration of screen time causes autism-related symptoms [4]. The result found in this study was corroborative with various works of literature done on screen time in ASD [1, 3, 5]. Early and increased screen exposure in children of the developmental group landed in poor executive function, impairment in neurodevelopment, and autism symptoms.

In this study, an attempt was made to assess the impact of parental play on ASD children compared to normal children. Play is essential stimulation of children's neurodevelopment and social interaction [6]. Due to the advancement in digital and technology, there is a massive decline in parental play in the Indian population. Thus it's time to assess various essential factors of parental play like frequency of different types of play, types of attitude indexing parent involvement, enjoyment, and structure. The results suggested that there is less frequency of activity (lifting, swinging), pretend games (talking on a toy telephone), and playing with a book (pointing to a picture in a book) seen in ASD than that in normal children.

Regarding parents' attitudes toward play, this study's results showed a significant lack of involvement in parental play among the parents of ASD children than that of the normal children group. There is a lack of structuring like providing challenging toys, scheduling the play, and letting the child make a decision, seen in the parents of ASD children than in normal children [7]. The above result depicted that parental play is important and the difference it makes in both groups. It could be due to changing parenting styles, increased work stress and burden, lack of knowledge about the importance of play, nuclear family, and increased usage of screens by parents.

Conclusion

Compared to normal children, children with ASD have significantly high screentime exposure to digital screens. Children with ASD also not having sufficient and efficient parental play. This incremental screen time exposure and the decrement of parental play may affect the children's neurodevelopment. Mounting concern about reducing screen time exposure and increasing parental play in childhood is much needed. This study is also corroborative with the importance of play in parental management training for the management of autism spectrum disorder.

Conflicts of Interest: Nil

Funding or Financial Support: Nil

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Assessment of Accredited Social Health Activists (ASHAs) Regarding Their Roles and Responsibilities in Selected Villages of a District in India: A Qualitative Study

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Abstract

Background: Vaccination in children against vaccine preventable diseases is an important public health intervention. ASHAs are receiving performance-based incentives for promoting universal immunisation. A recent local outbreak of Measles in two health Blocks of Rajouri district prompted us to conduct this study. The objectives of this study were to study the awareness and perception of ASHAs regarding their roles and responsibility in delivering routine immunization services to children and to study the factors affecting their performance in delivery of routine immunization services to children.

Methods: It was a qualitative study; non-probability sampling method was used for selection of subjects. Data was collected through interview and analysed using thematic framework approach.

Conclusion: The study revealed that ASHAs were aware of their roles and responsibilities except few in delivery of routine immunization services to children. Delayed and Poor incentives, Lack of proper transport and hilly area were the demotivating factors. Support from community members and Health Staff, and Supportive supervision were the motivating factors for ASHAs in delivery of routine immunization service to children. Periodic training, better and timely incentives and proper transportation for ASHAs are required to augment the immunization service delivery to the children.

Key words: Accredited Social Health Activist, Immunization, Link worker.

Introduction

Immunization is a process by which a person becomes protected against a disease through vaccination[1].Vaccination against vaccine-preventable diseases in children is an important public health intervention[2].The success of the small pox eradication programme drew attention toward immunization in India[3]. Anna Dusthall, a three-year-old child became the first child in India to receive the smallpox vaccine. The Expanded Programme on Immunization was started by World Health Organisation in 1974. India decided to launch a national immunization

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programme called the Expanded Programme of Immunisation in 1978. BCG, OPV, DPT and Typhoid-paratyphoid vaccines were introduced in this programme[4,5]. The Expanded Programme of Immunisation was rechristened by the launch of the Universal Immunization programme[6]. Later it became an integral part of the National Rural Health Mission in 2005[7].

One of the important components of the National Rural Health Mission was to provide every village in the country with an Accredited Social Health Activist (ASHA). The ASHA programme was first started in 2006 in 18 high-focus states (Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Himachal Pradesh, Jammu and Kashmir, Uttar Pradesh, Uttaranchal, Orissa, Rajasthan, Arunachal Pradesh, Manipur, Assam, Nagaland, Meghalaya, Tripura, Mizoram, Sikkim).In a span of two years, more than three lakh ASHAs were trained in the country. The population norm for ASHA is one ASHA per 1000 population[8]. There is a provision of performance-based incentive to an ASHA for promoting Universal Immunisation. ASHA is the first port of call for any health-related demands of deprived sections of society, especially women and children[9]. ASHA acts as an interface between the Health System and the Community. She is supposed to periodically visit eachfamily in the village[10]. ASHA workers were honoured with Global Health Leaders Award in 2022 for "their crucial role in linking the community with the health system, to ensure those living in rural poverty can access primary health care services, as shown throughout the COVID-19 pandemic". They worked to provide maternal care and immunization for children against vaccine-preventable diseases, community health care, treatment of hypertension and tuberculosis, sanitation and healthy living[11]. Knowledge and practice of ASHA get linked with the counselling and mobilization of parents/ caregivers of the children, which may help in the improvement of immunization coverage[7].

The number of Zero-Dose children(those who have not received a single routine vaccine shot) in India decreased from 6.8 million in 2000 to 1.6 million in 2019.However, disruption caused by the pandemic led to an increase in the number of Zero Dose children globally including in India. The government of India along with the other global partner in immunization are making efforts to reach Zero dose children and missed communities to reduce the number of Zero dose children[12]. The United Nations set childhood immunization coverage as an indicator to monitor the progress towards Millennium Development Goal (MDG-4), which aims to reduce the Under Five mortality rate. But unfortunately, India was among the list of countries that did not achieve the targeted MDG-4. Thus, the post-2015 Sustainable Development Goals continue to target under-five mortality reduction. The SDG- 3 aims to ensure health and well-being for all, including the achievement of universal immunization coverage[13].

A study conducted at a tertiary care hospital in Tamil Nadu found that vaccine hesitancy (a delay in acceptance or refusal of vaccines despite the availability of vaccination services) among parents of children in the age group of 1- 5years was 5.3%[14]. Only 65% of children in India receive full immunization during the first year of their life[15]. A study conducted in Karnataka found that the role of ASHA is mainly perceived as a link worker or as a facilitator rather than as a community health activist[16]. Another study found that there is a lack of knowledge regarding children's diseases and immunization despite the training given to ASHA workers[17]. A study conducted by Srivastava S et al found that maternal education is an important factor in immunization coverage of children and higher maternal education is associated with higher usage of health services[18].

The Government of India has set a deadline for measles elimination by 2023, but due to local outbreaks of measles in different parts of India, Scientists say the nation is set to miss the deadline. A recent local outbreak of Measles in two health blocks of the Rajouri district prompts us to study the role of ASHA and influencing factors in delivering routine immunization services to children in the Villages of Rajouri district.

Objectives

1. To study the awareness and perception of ASHAs regarding their roles and responsibility in delivering routine immunization services to children.
2. To study the factors affecting their performance in the delivery of routine immunization services to children.

Methodology

This was a qualitative study conducted in Eight selected villages of Rural Health Training Centre Manjakote, District Rajouri, Jammu and Kashmir which is under the field practice area of the Department of Community Medicine, Government Medical College Rajouri. Non- probability Sampling (Purposive sampling) method was used. The study duration was one month (March 2023).

Inclusion criteria: 1. ASHA who has been recruited >1 year.

2. Those willing to participate in the study.

Exclusion criteria: 1. Newly recruited ASHA<1 year.

2. Not willing to participate in the study.

Data Collection

Data were collected through in-depth interviews of ASHAs (n=8) until saturation of data was achieved. An open ended semi-structured questionnaire was used. Questions were asked regarding their roles and responsibility in the delivery of routine immunization to children, challenges they face in the delivery of immunization services and factors influencing their performance. ASHAs were encouraged to share their work-related experience and views. The time duration of each interview was 30-35 minutes. The purpose of the study was explained and oral consent was sought before starting the interview.

Data Analysis

Data was compiled from the field notes and audio recordings and analysed using the thematic framework approach. From the data themes were identified and grouping was done as main order themes, second order themes and first order themes (Table 1).

Ethical Clearance was sought from the Institutional Ethics Committee of the Medical College.

Table 1: Thematic framework

Main theme 1: Delivery of Routine immunization service to children by ASHAs – Role and responsibility	
Secondary Theme	**Primary Theme**
As a link worker and facilitator	Home visit for House-to-House survey
	Home visit for Mobilization on the day of immunization
	Home visit for immunization
As an Educator	Knowledge and counselling on immunization
As a Service Provider	Home Visit
	Counselling
	Coordination with Health staff
As an Activist	Immunisation coverage
	Recognition
Main Theme 2: Factors affecting performance of ASHAs	
Secondary theme	**Primary theme**
Personal	Poor Incentive
	Excessive workload
	Poor transportation facility and hilly area
Professional	Training
	Cooperation from Medical staff
	Supervision

Results

Awareness and perception of ASHAs regarding their roles and responsibility in delivering routine immunization services to children

Accredited Social Health Activist as a facilitator and link worker

All the ASHAs were aware of their role as a facilitator between the community and the health care system. One ASHA said,

"Log tou hamain pochtain hain kae vaccine kahan karvane hae, aur ham unhe batate hain"

"People ask regarding vaccination sites and we inform them"

From the interview, we inferred that they were aware of their role as a facilitator. ASHAs were also acting as a sensitizer for vaccination. One ASHA said, "Jab be koi nai vaccine aate he tou ham gaon main logoon ko vaccine lagwane kae leye motivate karate hain" means "whenever there is the inclusion of new vaccine in the national immunization schedule we inform and motivate people for receiving the new vaccine".

Accredited Social Health Activist as a Health Educator

The majority of ASHAs replied that they are aware of various types of vaccines and the diseases that can be prevented by immunization. They also provide vaccine-related information during Village Health and Nutrition Day (VHND) and home visits to antenatal and postnatal women. ASHA 3 said "vaccine lagwane ke vajah sae polio khatam huva hae hamare mulak sae" means "Polio was eliminated from our country due to the vaccine usage". ASHA 2 said "BCG jitna jaldi lagwain utna acha hae, aur measles ke teen doses hote hain" means "BCG should be given as early as possible and themeasles vaccine hasa three-dose schedule". ASHA 7 said "Aab itna na tou hamare pass time hae aur na tou logoan kae pass padhne ka" means "Neither we nor people have much time for education". Although they know about vaccination but some ASHAs replied with incorrect vaccination schedules and some believed that they don't have enough time to educate people.

Accredited Social Health Activistas a Service provider

ASHA is involved in providing various types of services like Maternal and child health services, Immunisation services and detection of various diseases. For immunization-related services, ASHA is involved in maintaining records of beneficiaries and tracking missed and left-out children. ASHA 6 said "immunization card be ham sambal kae rakhtae hain aur agar koi bacha immunization kae leye na ayae tou us ka pata lagate hain" means "we save immunization record cards and track the missed children for immunization". ASHA 2 said "immunization wale din sub centre pae buhat bher hoti hae wahan pae be hamain he kaam karna parta hae" means "On immunization day we work at the Sub centre and a large number of beneficiaries gather there". It was found that ASHAs were aware of their role as service providers.

Accredited Social Health Activist as an activist

Many were unaware of their role as an activist. Some ASHAs replied that they help in the conduction of Village Health and Nutrition Day, motivating and encouraging parents for timely immunization of their children. One ASHA said "aab tou buhat faraq padh gaya hae, jab hum aaye thae tab tou logon ko manana mushkil tha" means "Now there is a good difference in the attitude of people toward vaccination, initially when we joined it was difficult to convince people for vaccination".

Factors affecting the performance of Accredited Social Health Activists in the delivery of Routine Immunisation services to children

Personal

Poor incentive: Almost all ASHAs agreed that they are receiving fewer incentives to meet their livelihood. In addition, it was found that ASHAs were more willing to do services that have better incentives. ASHA 8 said "hamain sirf dou tikae lagwane kae paisae miltae hain, baqi aap khud hi batao aaj kal kitan kharcha hae" means" We are getting money for two injections only, and you know better regarding current day to day expenditure". ASHA 7 said "Aab aap anganwadi worker ko dekho wo kitan paesa lete hae mahenae ka" means "You can assess from anganwadi worker how much she is receiving monthly".

Excessive work: All the ASHAs responded that the work load is in excess.One ASHA said "Kam tou pehlae sae he buhat hae, aur phir har kisi ka phone, panchayat wale be hamian he phones karte hain, aapne family kae leye tou buhat kam time bachta hae" means "Already we have the burden of excess work, in addition, people keep on calling, panchayat representative also ask for many things on phone, and we have very less time for family.

Poor transportation and hilly area: One ASHA mentioned the poor road network and difficult terrain as a demotivating factor to visiting patients in their own homes**.**

Professional

Training: Most of the ASHAs thought that repeated training is essential to update their knowledge and enhance their skills. ASHA 7 said "Bar bar training sae hamain yaad rehta hae kae kon se vaccine kab, kaese aur kis ko dene hae" means "Repeated training helps us to remember exactly what vaccine needs to be given, when and where it should be given".

Cooperation from others: All ASHAs agreed that cooperation from medical officers and ANMs is supportive and motivate them to work at ground level.

Supervision: ASHA 5 said "Cluster meeting wale din BMO sir sae baat ho jati hae aur hamain agar koi doubt ho tou clear ho jata hae" means "cluster meeting with the Block Medical Officer is helpful in clarification and getting our doubts cleared".

Most of the ASHAs replied that getting an adequate quantity of vaccine from cold chain points, encouragement and support from the medical officer and Sarpanchs motivates them for more work.

Discussion

Our study findings suggest that most of the ASHAs were aware of their role and responsibilities in delivering routine immunization services to children. All the ASHA were aware of their role as link workers between the community and the health care system. A similar result was found in a study conducted by Guha *et al*.(2018)in selected villages of Wardha[19]. A study conducted by Saprii *et al*. (2015) in Manipur found that the role of ASHA is mainly perceived as a link worker, however, in our study ASHAs were aware of their role as a link worker in addition to other roles[17]. In our study ASHAs were aware of their role as service providers and educators. ASHAs believed that education to the parents regarding vaccination is more important as compared to record keeping of vaccines but in actual practice, they were mostly involved in maintaining records. Lack of time and excess work was cited as inhibiting factor in playing their role as an educator. A study conducted by Garg *et al.* (2013) in Haryana found that knowledge of ASHAs workers regarding immunization was not satisfactory and most of ASHAs were involved in high-paid incentive services[20]. In our study, we also found an association between the role ASHAs are playing and the incentive they are receiving for the same. In our study, many ASHAs were unaware of their role as health activists. However, a study conducted by Mendhe *et al*. (2022) in Chattisgarh found a satisfactory result in terms of the role of ASHAs as health activists[7].

Our study findings suggest that supportive supervision and support from community members and co-workers were the positive factors in the delivery of routine immunisation services to the children by ASHAs workers. The negative factors include poor and delayed incentives, lack of proper transportation, hilly and difficult geographic terrain and excess work. The poor and delayed incentive was a factor responsible for improper immunisation in the study conducted by Mendhe *et al*[7]. In the study conducted by Guha *et al*. (2013) in Haryana, excessive work and poor transportation was acting as demotivating factor for ASHAs in delivering services[19]. A study conducted by Jain RB *et al* (2020) in Haryana found a contrary finding as compared to our study where the worsening interpersonal relation between ASHAs and the community was a factor responsible for less immunisation[20].

Conclusion

The study revealed that ASHAs were aware of their roles and responsibilities except for a few in the delivery of routine immunisation services to children. Delayed and Poor incentives, Lack of proper transport and hilly area were the demotivating factors. Support from community members and Health Staff, and Supportive supervision were the motivating factors for ASHAs in the delivery of routine immunisation services to children.

Periodic training, better and timely incentives and proper transportation for ASHAs are required to augment the immunisation service delivery to the children.

Limitation

The study includes a small number of ASHAs and is restricted to one Health Block only.

Strength

The study findings gave an in-depth understanding of motivating and inhibiting factors for service delivery and will help in taking positive action to improve vaccination coverage for children.

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Role of Renal Sonography in the Diagnosis of Chronic Kidney Disease

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Abstract

Aim: to use sonographic imaging in grading CKD and assess the serum creatinine, renal longitudinal size, parenchymal thickness and compare these parameters based upon ultrasonographic grade.

Material and Methods: Present cross-sectional; study was conducted at the Department of Radiology, Tertiary Care Teaching Institute of India for the duration of 1 year. There are 120 participants with CKD in the research. All patients received a questionnaire, and a thorough clinical examination was done. Each participant underwent sector curved array transducer of 3.5–5 MHz ultrasound images of their liver and kidneys. Low tissue harmonic and speckle reduction imaging techniques are used to measure the echogenicity of the kidney and liver while reducing interobserver bias. In all the participants, the mean values of both the kidneys renal longitudinal size and parenchymal thickness were calculated. Renal cortical echogenicity was compared and graded with the echogenicity of the liver and renal medulla.

Results: The mean age of the CKD patients was found to be 45.23 ± 06.05 years. It was found that 50 patients had Grade 1, 40 patients had Grade 2, 20 patients had Grade 3 and 10 patients had Grade 4. The results showed that, when the comparison was done, serum creatinine was found to be significant among echogenicity grades with ANOVA. when the comparison was done; the mean longitudinal size was found to be significant among echogenicity. On comparison was found to be mean Parenchymal thickness was found to be significant among echogenicity grades.

Conclusion: Renal cortical echogenicity and its grading in relation to longitudinal length, parenchymal thickness, and cortical thickness in CKD patients are the best sonographic parameters that correlate with blood creatinine. It is possible to use renal cortical echogenicity as a metric of renal function since it has the benefit of being irreversible in compared to serum creatinine levels.

Key Words: Chronic Kidney disease, cross-sectional, Renal cortical echogenicity, serum creatinine

Introduction

Kidney disease is a significant issue on a global scale. A person's health condition known as kidney disease can appear suddenly and either go away or develop into a chronic condition. CKD is a blanket term for a variety of illnesses that affect the structure and function of the kidneys and have varying clinical presentations, some of which are influenced by the aetiology, severity, and rate of progression. After it

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was realised how dysfunctional kidney structure and function affected people's health in a wide spectrum of severity, the notion of CKD began to take shape. Early kidney illness is frequently asymptomatic, is discovered when concomitant disorders are evaluated, and may be treatable.[1,2]

The prevalence of Chronic Kidney Disease (CKD) and the high cost of associated treatment make it a global public health issue. CKD is the 12th leading cause of death and the 17th leading cause of disability worldwide. This is an underestimation because end-stage renal disease (ESRD) is less likely to develop in CKD patients than cardiovascular disease.[3,4]

In India, the incidence of CKD is roughly 800 per million people (pmp) and that of ESRD is 150–200 per million people. CKD is most frequently brought on by diabetic nephropathy. While the majority of diseases develop over decades, some people do not advance during long periods of follow-up, and rapidly progressing disorders can cause kidney failure within months.[5,6]

Early detection of CKD allows for the prevention or postponement of complications from CKD, such as renal failure, cardiovascular disease, and early mortality. Only laboratory testing can diagnose CKD in its early stages. Early chronic kidney disease treatment should be successful in slowing the rate at which CKD progresses to end-stage renal disease (ESRD), as should early treatment of cardiovascular risk factors.[7,8]

By analyzing both clinical and investigative results, CKD is diagnosed. The diagnostic procedures used to identify CKD include biochemical, histological, and imaging methods. Ultrasonography is one of the imaging methods that is frequently used to diagnose and track the development of CKD. The kidneys' retroperitoneal location makes ultrasonographic examination simple and causes little bowel gas interference. Additionally, because it is free, non-invasive, and does not expose patients to ionising radiation, ultrasonographic renal evaluation is widely used. However, depending on the aetiological causes of CKD, the ultrasonographic appearance of the kidneys may change.[9,10]

The serum creatinine test is a quick and popular way to estimate GFR. However, serum creatinine-based GFR has limitations due to tubular creatinine production and variations in serum creatinine from person to person dependent on muscle mass. Additionally, any considerable increase in serum creatinine already signifies a 50% reduction in GFR. Dialysis causes a decrease in serum creatinine levels, but ultrasonography echogenicity is unaffected and is the best indicator of the severity of kidney damage.[11]

The best method for evaluating kidney disease is ultrasonography, which is the only modality used by the majority of CKD patients. Insignificant kidney injury is indicated by thin echogenic cortex or parenchyma measurements. Changes in the kidney's echogenicity are represented by ultrasonographic findings such longitudinal length, parenchymal thickness, and cortical thickness. Additionally, ultrasonography is a superior method for monitoring the development of the condition. It provides details on the severity of kidney injury, whether it may be repairable, and the choice to undergo a renal biopsy. Hence the aim of our study is to use sonographic imaging in grading CKD and assess the serum creatinine, renal longitudinal size, parenchymal thickness and compare these parameters based upon ultrasonographic grade.

Material and Methods

Present cross-sectional; study was conducted at the Department of Radiology, Tertiary Care Teaching Institute of India for the duration of 1 year. The patients who visited the radiology and nephrology departments were the subjects of the current investigation. Before the study began, the ethical committee was made aware of it and an ethical clearance certificate was obtained. Prior to being included in the study, the included patients were informed about it and required to sign a consent form. The study involved 120 patients in all. The following inclusion and exclusion criteria were used in the study:

Inclusion Criteria

The patients attending Radiology and Nephrology Department and diagnosed with CKD, were included in the study

Exclusion Criteria

Known Subjects with history of acute kidney injury, kidney transplant patients, and patients on hemodialysis, patients on peritoneal dialysis, patients with fatty liver and chronic liver disease were excluded from the study. Patients with any debilitating illness also excluded from this study. CKD patients who did not provide inform constant were excluded

There are 120 participants with CKD in the research. Both the patients and the controls provided their informed permission. Following the collection of demographic information, a history of past health conditions, prescription usage, drunkenness, and active smoking was made. All patients received a questionnaire, and a thorough clinical examination was done.

Ultrasound of kidneys

Each participant underwent sector curved array transducer of 3.5–5 MHz ultrasound images of their liver and kidneys. Low tissue harmonic and speckle reduction imaging techniques are used to measure the echogenicity of the kidney and liver while reducing interobserver bias. A visually measured portion that represented the longest longitudinal section from pole to pole was used to estimate the longitudinal length. A piece of the kidney perpendicular to its longitudinal axis was measured to determine its breadth and thickness. From the renal hilum to the convex edge of the lateral renal margin, parenchymal thickness was measured. Measurements of cortical thickness were made perpendicular to the capsule and in the sagittal plane of the medullary pyramid.

In all the participants, the mean values of both the kidneys renal longitudinal size and parenchymal thickness were calculated. Renal cortical echogenicity was compared and graded with the echogenicity of the liver and renal medulla, and graded as[12]

Grade 0: Normal echogenicity less than that of the liver, with maintained corticomedullary distinction.

Grade 1: The Echogenicity same as that of the liver, with maintained corticomedullary distinction.

Grade 2: Echogenicity greater than that of the liver, with maintained corticomedullary distinction.

Grade 3: Echogenicity greater than that of the liver, with poorly maintained corticomedullary distinction.

Grade 4: Echogenicity greater than that of the liver, with a loss of corticomedullary distinction.

In all the participants' venous blood was collected for biochemical analysis. Serum creatinine was estimated by alkaline picrate method.

Statistical analysis

Data were expressed in Mean and Standard deviation (mean ±SD). Statistical analysis was calculated by using one way analysis of variance (ANOVA). The statistical significance was determined at 5% ($p< 0.05$) level. The Pearson correlation coefficient was calculated for bivariate associations.

Results

In the present study was a total of 120 patients diagnosed with CKD were included in the study. The mean age of the CKD patients was found to be 45.23 ± 06.05 years. In relation to the sex ratio, the majority of subjects were found to be male in group A, it was found to be 60%. The diagnostic criteria for CKD were serum creatinine were higher in CKD group than the normal range.

A total of 120 patients were included in this study, with the age range of 20 to 80 years. Twenty percent of the patients were below and equal to 40 years of age, 42.5% were between 41 and 60 years, and 37.5% were above 60 years of age. The average age of the patients was 50.28 ± 09.06 years.

The results showed the renal cortical echogenicity grading based on ultrasound. It was found that 50 patients had Grade 1, 40 patients had Grade 2, 20 patients had Grade 3 and 10 patients had Grade 4. The results showed that comparison of mean serum creatinine was done with renal cortical echogenicity. The mean serum creatinine recorded in the study were as follows: 1.90 ± 1.16 mg/dl was recorded for Grade 1, for Grade 2 the level was found to be 2.45 ± 1.76 mg/dL, for Grade 3 patients the serum creatinine was found to be 3.73 ±1.33 mg/dL was recorded for and the serum creatinine for the patients in Grade 4 was found to be 5.04 ± 0.44 mg/dL. The results showed that, when the comparison was done, serum creatinine was found to be significant among echogenicity grades with ANOVA.

Table 1: Comparison of mean serum creatinine with renal cortical echogenicity

Grading of Renal Cortical echogenicity	No. of patients	Serum creatinine (mg/dL)		P value
		Mean	SD	
Grade 1	50	1.90	1.16	< 0.001
Grade 2	40	2.45	1.76	
Grade 3	20	3.73	1.33	
Grade 4	10	5.04	0.44	

On the basis of ultrasound the comparison was done for the mean of longitudinal size with renal cortical echogenicity. The mean longitudinal size was found to be 9.01 ± 1.52 Cm for Grade 1, for Grade 2 was found to be 8.56 ± 0.65 Cm, it was found to be 7.46 ± 0.64 Cm for Grade 3 and for Grade 4 the size was found to be 6.42 ± 0.62 Cm. The results showed that when the comparison was done; the mean longitudinal size was found to be significant among echogenicity.

Comparison of mean Parenchymal thickness with renal cortical echogenicity was done in the patients diagnosed with CKD. The results showed that the mean Parenchymal thickness was 4.64 ± 0.47 Cm for patients in Grade 1, for patients included in Grade 2 it was recorded as 4.14 ± 0.22 Cm, the level of thickness was found to be 3.92Cm±0.70 for the patients included in Grade 3, and the thickness was found to be 3.13 ± 0.18 Cm for Grade 4. On comparison was found to be mean Parenchymal thickness was found to be significant among echogenicity grades.

Discussion

Due to a lower glomerular filtration rate, CKD patients have higher blood urea and serum creatinine levels. Chronic renal disease is characterised by the growing dysfunction and structural abnormalities of the kidneys. The kidney damage worsens, resulting in impaired renal function, pathological abnormalities, and abnormal imaging results.[13,14]

With the ageing of the population and the rise in chronic diseases, chronic kidney disease (CKD) is on the rise. It is a significant public health issue that raises the prevalence and incidence of heart disease, stroke, and its comorbidities, including diabetes and infections, as well as the cost of medical care in many nations. The phrase "chronic kidney disease" is used broadly to describe kidney impairment lasting more than three months or a steady decline in kidney function, regardless of the underlying cause. It is a condition that comes with renal failure and a number of other consequences, as well as an increased risk of cardiocerebrovascular disease. The National Kidney Foundation (NKF) frequently uses the following definition of chronic kidney disease: "if the kidney damage, such as proteinuria, hematuria, or pathological abnormality, or glomerular filtration rate is less than 60 mL/min/1.73 m2 and lasts for more than 3 months.[15]

In the current investigation, serum creatinine levels and echogenicity scores both rose. Similar large alterations were also found by earlier research. In the current investigation, the longitudinal size greatly shrank while the echogenicity grades rose. Similar findings were observed by earlier investigations as well. Along with rising echogenicity grades, the mean parenchymal thickness is decreasing. Siddappa et al. report comparable outcomes. Decreased cortical thickness and improved echogenicity grades have also been documented. Similar results were also reported by Singh A et al. The functional capability of the kidney in chronic renal disease is assessed in this study. The best imaging method is sonography, which is widely used and offers real-time information on renal measurement and echogenicity.

It was determined from the results of the current study that there is a decreased longitudinal size, higher echogenicity grades, and increased parenchymal and cortical thickness. Utilising ultrasonography is inexpensive, noninvasive, simple, and repeatable. Early diagnosis of ultrasound abnormalities helps to lessen the harmful effects of progression.

Conclusion

Renal cortical echogenicity and its grading in relation to longitudinal length, parenchymal

thickness, and cortical thickness in CKD patients are the best sonographic parameters that correlate with blood creatinine. It is possible to use renal cortical echogenicity as a metric of renal function since it has the benefit of being irreversible in compared to serum creatinine levels.

Ethical approval was taken from the institutional ethical committee and written

Informed Consent was taken from all the participants.

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Original Article

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Prevalence of Chronic Energy Deficiency and its Socio-Demographic Correlates among Ethnic Adult Population of Punjab, India

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Abstract

Introduction: Chronic Energy Deficiency is a condition characterized by a long-term insufficient intake of calories and/or nutrients relative to a person's energy expenditure, leading to a negative energy balance. It is typically associated with inadequate nutrition and can result in various health issues.

Objectives: 1) To find out prevalence of CED in ethnic Punjabi population. 2) To determine the sociodemographic factors affecting CED the study subjects.

Materials & Methods: The study was a cross sectional study using simple random sampling technique. Taking the prevalence of CED as 30%, sample size came out to be 336, but for ease of convenience, 400 subjects were selected.

Results: The study subjects comprised of 183 males and 217 females and there were 24 cases of CED in males and 52 in females. Maximum cases of CED were found in the age group of 20-29 years, in lower castes and low-income groups and in illiterates.

Conclusion: According to this study, maximum number of CED was found in the age group of 20-29 years. Prevalence was significantly higher in females than males and its was maximum in lower castes at 35.8%. In lower income group and in the illiterate group, it was maximum and the results were statistically significant.

Key Words: Chronic Energy Deficiency (CED), Body Mass Index (BMI), Basal Energy Expenditure (BEE)

Introduction

CED is a condition characterized by a long-term insufficient intake of calories and/or nutrients relative to a person's energy expenditure, leading to a negative energy balance. This can happen due to factors such as, limited food availability. Low socioeconomic status may restrict the ability to afford nutritious foods. Cultural practices, food preferences, education and lack of nutrition knowledge can contribute to inadequate dietary intake. CED can have severe consequences on health,

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including, stunted growth and development in children, impaired immune function, increased risk of chronic diseases and impaired cognitive function. Addressing CED requires a multi-faceted approach, including improving food security, promoting education about nutrition and healthy eating habits and providing access to affordable and nutritious food options. Interventions may involve food assistance programs, nutrition education, supporting sustainable agriculture and public health policies that address the underlying socio-economic factors contributing to CED.

Globally, the prevalence of CED in Haiti is 18.7%, Central African Republic (15.2%), Nigeria (13.5%), Kenya (9.6 %), Brazil (7.3 %), South Africa (5.0 %), CED.[5]In SEARO region, CED is found to be quite high in the slums of Dhaka, Bangladesh (54%).[6] In Malaysia prevalence of CED in adult males and females were 7% and 11% in urban areas and 11% and 14% in rural areas, respectively.[7]According to NFHS-3 report, in India overall prevalence of CED was around 22% and it fell to 18% according to NFHS-4.[8] [9]According to NFHS-3, 12.75% of Punjabi population has BMI less than normal.[8] It has further reduced to 12.6% according to NFHS-5.[10]

Aims and Objectives:

1. To find out prevalence of CED in ethnic Punjabi population.
2. To determine the sociodemographic factors affecting CED the study subjects

Material and Method:

The sample size of the study was calculated using the formula as follows; [11]

$$n = \frac{Z^2 P(1-p)}{d^2}$$

Prevalence of CED in India is approximately 30% as per available literature, value of z is 4, and sample size calculated came out to be 336. However, for ease of convenience, 400 study subjects were chosen for the study. Anthropometric measurements were noted down and BMI was calculated for each individual.

BMI was calculated using height and weight of subjects and it was categorized into different grades as following;[12]

- Grade III CED <16.0
- Grade II CED 16.0–16.9
- Grade I CED 17.0–18.4
- Normal 18.5–24.99
- Overweight >25.0

The socio-economic status (SES) was calculated according to Modified Udai Pareek scale for both rural and urban population.[13]Results were analyzed using Microsoft Excel and SPSS statistical software and tests done were Chi Square and Fishers Extract test.

Exclusion criteria

- Refusal to participate
- Non-cooperative individuals
- Inability to participate due to gross physical and mental disability
- Non-Punjabi migrant population
- Subjects below 20 years of age
- Subjectsabove 60 years of age
- Pregnant women

Results

Table 1: Distribution of study subjects according to Socio-Demographic parameters

Parameters		Frequency n = 400	Percentage
Age (in years)	20-29	108	27.0
	30-39	70	17.5
	40-49	78	19.5
	50-60	144	36.0
Sex	Male	183	45.8
	Female	217	54.2
Caste	Upper Caste	210	52.5
	Scheduled Caste	142	35.5
	Scheduled Tribe	2	0.5
	Backward Class	46	11.5
Education Status	Illiterate	108	26.9
	Primary School	43	10.8
	Middle School	69	17.3
	High School	85	21.2
	Graduate	72	18.0
	Post Graduate	23	5.8

Continue.....

Income	>13500	87	21.8
	6750-13499	122	30.5
	5050-6749	64	16.0
	3375-5049	34	16.8
	2025-3374	26	15.0

Table 1 shows the distribution of study subjects according their socio demographic features. In the age group of 20-29 years, there were 108 (27%) subjects, in 30-39 years, there were 703 (17.5%), in 40-49 years, there were 78 (19.5%) and in 50-60 years there were 144 (36.0%) subjects. Out of 400 subjects, 183 (45.8%) males and 217 (54.2%) females. By parameter of caste, there were 210 (52.5%) upper caste people, 142 (35.5%) SC, 46 (11.5%) BC and 2 (0.5%) ST. Majority of subjects, 108 (26.9%) were illiterate subjects. This was followed by 85 (21.2%) high school pass outs, 72 (18.0%) graduates, 69 (17.3%) middle school pass outs, 43 (10.8%) primary school pass outs and rest, 23 (5.8%) were post graduates. Majority number of study subjects i.e., 122 (30.5%) were in the income group category of 6750-13499.

Table 2 – The distribution of study subjects according to BMI

Category	**BMI (Kg/m^2)**	**Number**	**Frequency (%age)**
CED-III	<16.0	13	3.25
CED-II	16-16.9	13	3.25
CED-I	17.0-18.4	50	12.50
NORMAL	18.5-24.9	203	50.75
OVERWEIGHT	>25	121	30.25
Total		**400**	**100**

Table 2 shows the distribution of study subjects according to their BMI status. CED was found in 76 (19%) respondents.Severe grade CED-III was found in 13 (3.25%), moderate grade CED-II was also found in 13 (3.25%) and mild grade CED-I was found in 50 (12.5%). There were 203 (50.75%) respondents showing normal BMI while 121 (30.25%) were either overweight or obese.

Table 3: Table showing association of Socio-Demographic parameters with CED

Parameter		**CED**		**Total**	**Values**
		Present	**Absent**		
Age (years)	20-29	34 (32.1%) [44.7%]	72 (67.9%) [22.2%]	106 (100%) [26.5%]	χ^2 = 38.01 df = 3 p value <0.0001
	30-39	25 (30.9%) [32.9%]	56 (69.1%) [17.3%]	81 (100%) [20.3]	
	40-49	10 (13.2%) [13.2%]	66 (86.8%) [20.4]	76 (100%) [19.0%]	
	50-60	7 (5.1%) [9.2%]	130 (94.9%) [40.1]	137 (100%) [34.2%]	
Sex	Male	24 (13.1%) [31.6%]	159 (86.9%) [49.1%]	183 (100%) [45.75%]	χ^2 = 7.6 df = 1 p value <0.005
	Female	52 (23.9%) [68.4%]	165 (76.1%) [50.9%]	217 (100%) [54.25%]	
Caste	Upper Caste	8 (3.8%) [10.5%]	202 (96.2%) [62.4%]	210 (100%) [52.5%]	χ^2 = 66.3 df = 1 p value <0.0001
	Others	68 (35.8%) [89.5%]	122 (64.2%) [37.6%]	190 (100%) [47.5%]	

Continue

Education	Illiterate	34 (32.4%) [44.7%]	71 (67.6%) [22%]	105 (100.0%) [26.3%]	***Fischer Exact Test*** $\chi^2 = 70.71$ df = 5 p value <0.0001
	Primary School	18 (62.1%) [23.7%]	11 (37.9%) [3.4%]	29 (100.0%) [7.3%]	
	Middle School	16 (20.5%) [21.1%]	62 (79.5%) [19.1]	78 (100.0%) [19.5%]	
	High School	5 (5.6%) [6.6%]	85 (94.4%) [26.2%]	90 (100.0%) [22.5%]	
	Graduate	2 (27%) [2.6%]	72 (97.3%) [22.2%]	74 (100.0%) [18.5%]	
	Post Graduate	1 (4.2%) [1.3%]	23 (95.8%) [7.1%]	24 (100.0%) [6.0%]	
Income	>13500	2 (2%) [2.6%]	85 (98%) [26.2%]	87 (100.0%) [21.8%]	***Fischer Exact Test*** $\chi^2 = 135.68$ df = 4 p value <0.0001
	6750-13499	2 (1.6%) [2.6%]	120 (98.4%) [37%]	122 (100.0%) [30.5%]	
	5050-6749	5 (7.8%) [6.6%]	59 (92.2%) [18.2%]	64 (100.0%) [16.0%]	
	3375-5049	33 (49.2%) [43.4%]	34 (50.8%) [10.5%]	67 (100.0%) [16.8%]	
	2025-3374	34 (56.7%) [44.8%]	26 (43.3%) [8.1%]	60 (100.0%) [15.0%]	

Table 3 shows association of age with CED. From the table we can see that as age increases, prevalence of CED decreases. BMI values were compared between age group 20-29 years against others and difference was found to be highly significant (p value < 0.0001.) Table also shows the relation between sex and CED. Overall prevalence of CED was significantly more in females than males (p value <0.005). Table also shows that majority of CED subjects belonged to scheduled castes. BMI values were compared between upper caste and others and difference was found to be highly significant (p value <0.0001). Also, highest number of CED was found in the illiterate group. On comparison, it shows that CED improves as the education status improves and it was found to be statistically highly significant also (p value <0.0001).

Association of Income with CED is also there in this table. Majority of CED cases were seen in lower income group. This was also found to be highly significant statistically. (p value < 0.0001)

Discussion

Table 1shows distribution of study subjects according to their BMI levels. Overall prevalence of CED in Punjabi adults came out to be 19%. Of these 13 (3.25) had severe grade CED-III. Moderate grade CED-II was also found in 13 (3.25%) while mild CED-I was found in 50 (12.5%) adults. Table also shows the association of age with CED and majority of cases, 34 (44.7%) were found in age group of 20-29 years. In 30-39 years, there were a total of 25 (32.9%) cases while in 40-49 years, there were 10 (13.2%) case. In 50-60 years, there were 5 (9.2%) cases. According to NFHS-3, CED was found to be 35.6% in 20-29 years, in 30-39 years it was 28.2% and in 40-49 years it was 26.3%[8]in India. In Punjab, CED in 20-29 years was 21.3%, 10.6% in 30-39 years and 8.4% in 40-49 years.[15]On comparing our study with state statistics as well as NFHS-3 report, results are found to be nearly similar. It raises the concerns of nutritional deprivation in youngsters which needs to be addressed at priority. The present study shows prevalence of CED in both the sexes and CED was found in 52 (23.9%) females while it was 24 (13.1%) in males. So, it is evident that that, females are found to be more susceptible. This might be due to poor eating habits contributed by family customs.

According to NFHS-3 overall CED in India is 33% among females and 28.1% in males.[8]Another

study done in Bihar (India) also shows similar results of a larger proportion of females were chronic energy deficient than their male counterparts.[15] Thus our study resembles with the above studies as higher percentage of CED has been found in females in all studies. This table also depicts association of caste with CED. Overall prevalence of CED in lower castes likes SC, BC, ST was found to be much higher as compared to upper castes. In upper castes there were only 8 cases while in other castes there were 68 CED cases. This is shown by a study which shows that, respondents belonging to other castes (mostly upper/ forward) have a higher mean BMI in comparison to those who belong to SC, ST and other BCs.[17] Another study in central Indian states shows that there is inverse relationship of CED with caste. Prevalence of CED is found to be decreasing with higher castes. This is proved by the study which shows that prevalence of CED among the general castes in lowest (43.1%) compared to SC (60.3%), ST (51.5%), and BC (51.7%) and SC are most affected of all.[16]On comparing our results with above studies, the results were similar with higher prevalence among the lower castes.

Table also shows the association of education with CED. Maximum CED was found in the illiterate group and it decreases with higher education. Maximum CED cases, 34 (44.4%) were seen in illiterate group, 18 (23.7%) were seen in primary school level, 16 (21.1%) in middle school level, 5 (6.6%) in high school, 2 (2.6%) in graduates and 1 (1.3%) in post graduates. As is evident from the results, trend of CED decreases with high education level. With higher education level, SES improves with better paying jobs and thus better availability of nutritive food and thus higher BMI. A study shows that CED is a serious problem in women who are illiterate (38.4%) and women in households of low standards of living condition (41.5%) than their counterparts.[18] Illiterate women, those working as agricultural laborer's, married women have higher rates of CED.[19] Similarly, another study shows that highly educated women have a higher mean BMI.[20] Better educated respondents are likely to be from upper economic classes with other positively contributing features to higher BMI levels.[21] Nutritional status of women goes together with the enhancement of their educational status, standard of living etc.[22] On comparing our results with above studies, the results were similar.

Table also shows association of income with CED and maximum cases are seen from lower income groups. In lowest income group of 2025-3374 there were 34 (44.7%) cases and in 3375-5049 there were 33 (43.4%) cases of CED. This improvement in nutritional dimension is very much evident with improved economic status which in turn directly improves both the quality and quantity of nutritional intake. This was confirmed by a study conducted in Indian women which shows that respondents with a higher economic status have a higher mean BMI.[20] In a study in Bihar, India, it was found that about 37% adults were suffering from CED and this proportion was larger in poor households (59.9%) than non-poor (19.7%). It was revealed that CED was two-and-a-half times more in respondents of poor than non-poor households.[15] Another study from South India shows women from low income families had CED (46%) more often than women from higher income families (34%). Similar associations were found in men.[23] On comparing our results with above studies, the results were similar with higher prevalence of CED among those with lower income.

Conclusion

According to this study, total prevalence of CED came out to be 19% and prevalence was more in females than males. Majority of CED was found in the age group of 20-29 years and its was mostly in lower castes (35.8%) followed by lower income group and in the illiterate group.

Recommendations

According to the findings of present study, CED can be prevented by making the communities aware about the importance of nutritious diet. Some government programs can be modified to improve the lives of the poor people so which will ultimately improve their nutritional status. Information, Education and Communication activity promoting awareness about proper nutrition and Behaviour Change Communication therapy should be applied for preventing the CED.

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Original Article

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Use of ABGA Parameters as predictive tool for Evaluation Of Outcomes Of Perinatal Asphyxia in Term And Preterm Newborns from central India: A Prospective Observational Study

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Abstract

Background: Perinatal asphyxia (PNA) is one of the three major cause of morbidity and mortality in India. ABG analysis may help to predict outcome of babies with Perinatal asphyxia. Aim of study was to identify Arterial blood gas analysis parameter as a predictor of outcome of newborns with perinatal asphyxia.

Methods: We included 144 newborns, with perinatal asphyxia who were born in our tertiary health care centre during March 2021 to September 2022. Extremely low birth weight babies and any baby with major congenital malformation were excluded from study. Babies were resuscitated in delivery room, then shifted immediately to NICU, stabilised and sample for arterial blood gas analysis (ABGA) was taken within first hour of life, then the babies were intervened accordingly. The outcomes were analyzed, correlated with the initial ABGA and compared among the study group.

Conclusion: We found that pH and HCO3 are better markers in predicting the outcome of perinatal asphyxia in newborns. HCO3 had the highest specificity (99.18%) followed by pH (97.54%). Discharge was higher with HCO3(mmol/L) >10 while death was significantly higher in HCO3(mmol/L)<10.This study gives an advantage over other studies conducted on cord blood sampling at birth as resuscitation of the baby is of more priority than sampling for the outcome while the amount of time taken for result and interpretation is the same. Along with the APGAR score, Arterial blood gas analysis within one hour can be used as a better predictive tool for outcome in newborns with perinatal asphyxia.

Keywords: ABGA, HCO3, newborns, Perinatal asphyxia, pH.

Introduction

Perinatal asphyxia (PNA) is a lack of blood flow or gas exchange to or from the fetus in the period immediately before, during, or after the birth process.

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It is characterized by the marked impairment of exchange of respiratory gases (oxygen and carbon dioxide) leading, if prolonged, to progressive hypoxemia, hypercapnia, and significant metabolic acidosis (pH fall below 7). Despite the important advances in perinatal care in the past decades, asphyxia remains a severe condition leading to significant mortality and morbidity.

Children face the highest risk of dying in their first month of life, at a global rate of 19 deaths per 1,000 live births.Neonatal deaths account for 46% of all deaths among children under 5.In India neonatal death is still high, accounting for more than half of all under- five deaths and more than two-thirds of infant deaths. An estimated 62,000 newborns die every year in India and 50% of them die on 1st day of life[1].

The main causes of neonatal deaths are infection (33%), perinatal asphyxia (21%), and the consequence of prematurity/Low birth weight (LBW) and its related complications (21%)[2]. Immediate assessment of PNA includes umbilical pH, 1st hour post- delivery arterial blood gas analysis (ABGA), APGAR scores, and neurological changes ranging from twitching to hypotonia and seizures[3].Hypoxic Ischaemic encephalopathy (HIE) is clinically graded by Sarnat and Sarnat, Levene and Thompson score. The clinical grading system of HIE by Sarnat criteria has been proven to be a good determinant of neurological outcome[4]. Recent studies meta-analysis have shown a good association of cord ABG abnormalities (pH<7.0) with short-term (mortality, HIE, Ventricular hemorrhage) and long-term adverse outcomes (cerebral palsy)[5]. However, APGAR scores and acidosis have low sensitivity & positive predictive value for neurological injury & morbidity as per previous studies[6]. As resuscitation of the baby is of more priority than sampling cord blood for the outcome we planned to analyse Sensitivity, Specificity, Positive Predictive Value (PPV), Negative Predictive Value (NPV) and Diagnostic accuracy of ABGA parameters to predict outcome of babies with PNA.

The primary objective was to identify Arterial blood gas analysis parameters as a predictor of mortality of perinatal asphyxia. The secondary objective was to evaluate the outcome of term and preterm newborns with perinatal asphyxia intervened through ABGA.

Material and Methods

This Prospective observational study was conducted fromMarch 2021 to September 2022 in Neonatal intensive care unit – Inborn unit, Department of Pediatrics at NSCB Medical College Jabalpur M.P. Ethical clearance was taken from Institute ethical committee (Number- IEC/2020/86) and a written informed consent was obtained from parents/guardian of all study subjects.

Inclusion criteria was newborns who have failed to initiate and sustain breathing at birth, metabolic acidosis in an early neonatal arterial blood sample (pH < 7.30) within the first hour of birth, and persistence of an APGAR score of <7 for longer than 5 minutes, All inborn newborns with PNA in whom sampling was done within one hour of birth. Exclusion criteria was Outborn babies, extremely low birth weight babies and babies with congenital anomalies.

The required sample size (N) was estimated using the formula $N = Z^2PQ / D^2$. Total 144 newborns were enrolled in the study based on sample size calculation. We obtained a detailed antenatal and perinatal history from reliable attendant of baby. Information about risk factors and any intervention done during delivery was obtained from attending obstretician. Baby was resuscitated immediately after birth and shifted to NICU.

Arterial sample was taken for Arterial blood gas analysis (ABGA) by peripheral artery catheterization within 1 hour of birth. Sample was processed in Automated Blood Gas Analyser (STAT PROFILE Prime) available in NICU, within 15 minutes of collection. Reference range for normal values for pH is 7.35-7.45, for HCO3 is 20-24 mEq/L, for PaO2is 50-70 mm Hg and for PaCO2 is 35-45 mm Hg.

Definitions

Sensitivity:

The sensitivity of a test is its ability to detect people who do have the disease.

Specificity:

The Specificity of a test is its ability to detect people who do not have the disease.

Positive Predictive value (PPV):

The PPV of a test is the proportion of positive results that are true positive, that is, the likelihood that a person with a positive test result truly has a disease.

Negative Predictive Value (NPV):

The NPV of a test is the proportion of negative results that are true negatives, that is, the likelihood that a person with a negative result truly does not have the disease.

Statistical analysis: Data was entered in Microsoft Excel sheet & analysed using statistical software SPSS- 25. Categorical variables were summarized in frequency tables with percentages, continuous variables were analyzed using Mean ± SD ormedian with the interquartile range as appropriate, and the chi-square or fisher exact test was applied. Paired t-test was applied for comparison between the two means. P-value <0.05 was considered significant.

Results and Discussion

This study included 144 newborns admitted for birth asphyxia, 84(58.33%) were males & 60 (41.67%) were females. In majority [117(81.25%)] of study subjects mode of delivery was vaginal delivery. Lower Segment Caesarean Section (LSCS) was done in 27 (18.75%) cases. Birth weight was ≥ 2.5 kg in 71 (49.31%) cases , 1.51 to 2.49 kg in 62 (43.06%) cases &< 1.5 kg in only 11 (7.64%) cases. 122 (84.72%) newborns were of term (≥37 weeks) gestation & only 22 (15.28%) were preterm (<37 weeks).

APGAR score at 5 minutes was >5 in 77 (53.47%) newborns, followed by 5 in 54 (37.50%) newborns & only 13 (9.03%) out of 144 newborns had APGAR score <5 at 5 minutes of birth.

The majority [88(61.11%)] of neonates were discharged followed by being discharged on antiepileptic [34(23.61%)], whereas 22 out of 144 study subjects (15.28%) died.

In most [72(50.00%)] of neonates, the diagnosis was HIE-I, followed by HIE-II [56(38.89%)], shock [34(23.61%)], bleed [29(20.14%)], HIE-III [16(11.11%)], Acute Kidney Injury (AKI) [9(6.25%)], and Other{Congenital Heart Disease} in 6 (4.17%).

Association of outcome with pH is shown in Table 1.

Table 1: Association of outcome with pH.

Outcome	**<7.2(n=10)**	**7.20 to7.29(n=110)**	**≥7.3(n=24)**	**Total**	**P value**
Discharge	1(10%)	69(62.73%)	18(75%)	88(61.11%)	<.0001*
Dischargeon antiepileptic	2(20%)	26(23.64%)	6(25%)	34(23.61%)	
Death	7(70%)	15(13.64%)	0(0%)	22(15.28%)	
Total	10(100%)	110(100%)	24(100%)	144(100%)	

Association of diagnosis with pH is shown in Table 2.

Table 2: Association of diagnosis with pH.

Diagnosisoutcome	**<7.2(n=10)**	**7.20 to 7.29(n=110)**	**≥7.3(n=24)**	**Total**	**P value**
HIE-I	0(0%)	57(51.82%)	15(62.50%)	72(50%)	0.003*
HIE-II	7(70%)	40(36.36%)	9(37.50%)	56(38.89%)	0.129
HIE-III	3(30%)	13(11.82%)	0(0%)	16(11.11%)	0.033*
AKI	1(10%)	8(7.27%)	0(0%)	9(6.25%)	0.276
Shock	6(60%)	28(25.45%)	0(0%)	34(23.61%)	0.0002*
Bleed	4(40%)	21(19.09%)	4(16.67%)	29(20.14%)	0.317
Other{CHD}	2(20%)	4(3.64%)	0(0%)	6(4.17%)	0.074

Association of outcome with HCO3 is shown in **Table 3.**

Table 3: Association of outcome with HCO_3(mmol/L).

Outcome	<10(n=7)	10 to15(n=87)	15 to24(n=50)	Total	P value
Discharge	0(0%)	49(56.32%)	39(78%)	88(61.11%)	<.0001*
Discharge on antiepileptic	1(14.29%)	24(27.59%)	9(18%)	34(23.61%)	
Death	(85.71%)	14(16.09%)	2(4%)	22(15.28%)	
Total	7(100%)	87(100%)	50(100%)	144(100%)	

Association of diagnosis with HCO3 is shown in **Table 4.**

Table 4: Association of diagnosis with HCO_3 (mmol/L).

Diagnosis Outcome	<10(n=7)	10 to15(n=87)	15 to24(n=50)	Total	P value
HIE-I	0(0%)	44(50.57%)	28(56%)	72(50%)	0.018*
HIE-II	3(42.86%)	33(37.93%)	20(40%)	56(38.89%)	0.958
HIE-III	4(57.14%)	10(11.49%)	2(4%)	16(11.11%)	0.002*
AKI	0(0%)	9(10.34%)	0(0%)	9(6.25%)	0.052
Shock	7(100%)	21(24.14%)	6(12%)	34(23.61%)	<.0001*
Bleed	2(28.57%)	18(20.69%)	9(18%)	29(20.14%)	0.768
Other{CHD}	(71.43%)	1(1.15%)	0(0%)	6(4.17%)	<.0001*

In majority [94(65.28%)] of neonates, PaO_2 (mmHg) was <60. PaO_2 was 60 to 70 in 25 neonates and >70 25 (17.36%) neonates. Association of outcome with PaO_2 was comparable in all groups.

In most [93(64.58%)] of neonates, $PaCO_2$ (mmHg) was <35 followed by 35 to 40 [45(31.25%)]. $PaCO_2$was >40 in only 6 out of 144 study subjects (4.17%). Shock was significantly higher in $PaCO_2$<35 (30.11%) and >40 (33.33%) as compared to 35 to 40 mmHg (8.89%). (p value=0.011).

Distribution of serum electrolytes and serum lactate was comparable in all groups.

Distribution of outcome was comparable with term/preterm birth & is shown in **Table 5.**

Table 5: Association of diagnosis outcome with term/preterm.

Diagnosisoutcome	Term(n=122)	Preterm(n=22)	Total	P value
HIE-I	57(46.72%)	15(68.18%)	72(50%)	0.064
HIE-II	54(44.26%)	2(9.09%)	56(38.89%)	0.002*
HIE-III	11(9.02%)	5(22.73%)	16(11.11%)	0.06
AKI	6(4.92%)	3(13.64%)	9(6.25%)	0.141
Shock	24(19.67%)	10(45.45%)	34(23.61%)	0.009*
Bleed	20(16.39%)	9(40.91%)	29(20.14%)	0.008*
Other{CHD}	6(4.92%)	0(0%)	6(4.17%)	0.591

PaO_2 (mmHg) had sensitivity of 77.27% followed by pH (31.82%), HCO_3(mmol/L) (27.27%) and $PaCO_2$(mmHg) (4.55%). On the other hand, HCO_3 (mmol/L) had specificity of 99.18% followed by pH (97.54%), $PaCO_2$(mmHg) (95.90%) and PaO_2(mmHg) (36.89%). As it is a dictum that increase in sensitivity will be accompanied by a decrease in specificity so we choose that variable as best in which combination of sensitivity and specificity gives the maximum predictive value. So, overall HCO_3 (mmol/L) and pH were best predictors of mortality. It is shown in **Table 6.**

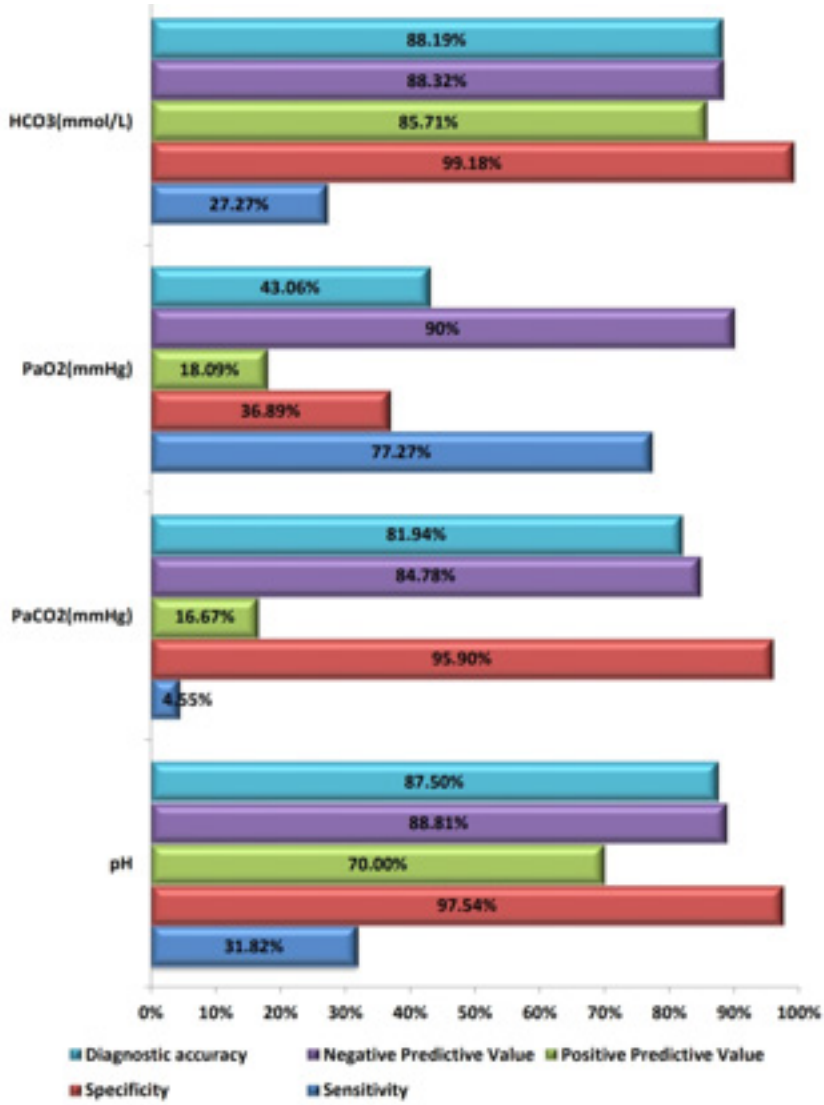

Figure 1: Sensitivity, specificity, positive predictive value and negative predictive value of pH, $PaCO_2$(mmHg), PaO_2(mmHg) and HCO_3(mmol/L) for predicting mortality.

In our study, out of 144 newborns with Perinatal asphyxia, 84 were male (58.33%) and 60 were female (41.67%) and there was no gender bias in ABG analysis. 81.25% of newborns were delivered via vaginal delivery, remaining were LSCS (18.75%). Since majority of deliveries at our centre were through vaginal, incidence of PNA was more in vaginal delivery compared to LSCS.

In our study, APGAR score at 5 minute was 5 to 7 in 53.47% of cases and 3-5 in 37.50% cases. Better outcome (survival) was reported in neonates with high APGAR score in comparison to low APGAR score similar to the study conducted by Murata et al.[7].Markedly lower rate of survival in APGAR (0-3) neonates beyond five minutes was reported by the study of Moster D et al[8].A 5-minute APGAR score of 0-3 correlates with very poor rate of neonatal survival in large populations also found in the different studies of Casey BM et al[9], Vahabi S et al[10] and Li F et al[11].

In our study, we found that majority of neonates (61.11%) were discharged followed by discharged on antiepileptic (23.61%). Only 15.28% study subjects died. Total 84.72% of neonates survived, nearly identical to Etuk SJ et al.[12], but lesser when compared to the studies done by Padayachee N et al.[13](86.7%).

(85.7%) In our study, in most of the cases (76.39%), pH was 7.20 to 7.29 followed by ≥7.3 (16.67%) while pH was <7.2 in only 6.94% study subjects. Death was significantly higher in pH <7.2

(70%) as compared to pH 7.20 to 7.29 (13.64%) and ≥7.3(0%). This is similar to study conducted by Malin GL et al.[5]and Gilstrap III LC et al[14].

We also found that, discharge was significantly higher with HCO_3(mmol/L) between 15-24, while discharge on antiepileptic was higher with HCO_3 between 10-15 and death was significantly higher in HCO_3<10 (P value 0.0001). A similar study by Saenz P et al[15],had a higher number of deaths at HCO3 <10. HIE-I was significantly higher with HCO_3(mmol/L) between 15-24 while HIE-II and HIE-III were higher with HCO_3(mmol/L) <10 similar to study conducted by Wyllie J at al[16].

In our study, complications of birth asphyxia like shock, bleeding and AKI were associated more with pH <7.2, HCO3 <10 &between 10-15, PaO2<60 mm Hg & PaCO2<35 mm Hg.HIE-I was associated more with PaCO2 <35 mmHg (52.69%) while HIE-II was more with PaCO2 >40(50%) and HIE-III were associated more with PaCO2 >40(16.66%). But the study conducted by Engle WD at al[17], hadmore incidence of HIE-II with PaCO2 >40(66%) and HIE-III (22%),as his study had cord blood samples.

Complications like shock, bleeding and AKI were higher in preterm newborns in our study(p=0.008) similar to the study conducted by Laptook AR et al[18].

Conclusion

This study indicates that ABG Analysis can be used as a mortality predictor tool in birth asphyxia in neonates within one hour of birth. pH and HCO3 are better markers in predicting the outcome of birth asphyxia in neonates. PaO2 and PaCO2 have lesser sensitivity and specificity. This study gives an advantage over other studies conducted on cord blood sampling at birth asresuscitation of the baby is of more priority than sampling for the outcome while the amount of time taken for result and interpretation is the same. Along with the APGAR score, Arterial blood gas analysis within one hour can be used as a better predictive tool for outcomes in birth asphyxia neonates.

Limitations of the study: We were not able to consider socio-demographic factors during data analysis. Our study was conducted over a limited duration and did not involve any follow up. Hence long term outcomes were not assessed.

What is already known:

APGAR scores & low cord blood pH have low sensitivity & PPV for neurological injury and morbidity in newborns with perinatal asphyxia.

What this study adds:

Along with APGAR score, ABGA within one hour can be used as a better predictive tool for outcome in newborn with perinatal asphyxia.

Competing interests: None stated; Funding: None

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Original Research Article

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Prevalence of Lifestyle Diseases in Non-Acclimatized Lowlanders at High Altitude in subdivision Darjeeling district of Eastern Himalayan Region, India

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Abstract

Background: Lifestyle diseases including overweight, obesity, hypertension and metabolic syndrome leads to heart diseases, increased risk for insulin resistance, diabetes and stroke. Obesity is one of the lifestyle diseases declared as worldwide epidemic which is a major health burden. The study determine the association of lifestyle diseases with Body Mass Indexinnon-acclimatized lowlanders at altitude of 7500 ft above sea level and to estimate effect of altitude onanthropometric and biochemical parameters.

Methods: The total of 300 male age between 20-57 years studied. The present retrospective study was doneusing Annual Medical Examination documents which were recorded at plains and at high altitude. The anthropometric indexes observed using Asia-pacific criteria fromthe World Health Organizationand biochemicalparameters observed using metabolic syndrome according to the American Heart Association.

Conclusion: The present study comprises of maximum cases of young adults at plains and middle-aged at high altitude. The maximum overweight cases were found at high altitude and general obesecases found at plains. There is a slight risk of hypertension and deranged lipid profile at this altitude but no risk of polycythaemia. The present study's indicator of abdominal obesity at high altitude is the waist-hip ratio. Increase in altitude causes changes in body mass index, blood glucose levels and lipid profile. Additionally, positive correlation found between lifestyle diseases such as central or abdominal obesity($r=0.33, P<0.05$) and diastolic blood pressure ($r=0.19, P<0.05$) with Body Mass Index at high altitude. The present study agreed with the various studies from India and abroad.

Keyword: Body Mass Index, High Altitude, Lifestyle Diseases

Introduction

The prevalence of obesity has nearly tripled since 1975, and in 2016 more than 340 million children/adolescents and 39% of adults were overweight or obese[(1)]. When compared to people who live in low-altitude areas and those who live in high-altitude areas typically have a leaner physique[(2)]. Native

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populations in high-altitude regions have been found to have a lower rate of heart disease and mortality[3]. Additionally, it has been demonstrated that residents of high altitude regions are less likely to be obese[2,4,5]. The study on immigrants those were healthier and less obese than the natives, according to the studies in the U.S. and UK[6,7] however, once they settle down, they often start to behave more like the locals and start to become less healthy and more obese as a result of getting used to the native diet and way of life[8]. Obesity in the elderly may hasten the development of chronic non-communicable diseases like diabetes, hypertension, hypertriglyceridemia, heart diseases and increases mortality[9–11]. The prevalence may be influenced by variables like individual differences in culture and altitude. The study was conducted at a 7500ft high location in the north-eastern Himalayas and the prevalence of overweight, obesity and associated metabolic diseases were examined in this study.

Materials and Methods

A retrospective study using Annual Medical Examination (AME) documents was carried out. The study was conducted in the Medical Inspection Centre at subdivision Darjeeling district of Eastern Himalayan Region, India. Necessary permission was obtained prior to the study and informed consent was taken from the individuals at the time of their AME. A total of 300 males AME documents observed in the study (150 was recorded in plains & another 150 at high altitude) between the ages of 20-57 years. Males' average ages were 30.2±6.8 years in the plains and 30.5±8.6 years at high altitude. The study used records that included the anthropometric and metabolic information. Cases with incomplete documents were not included in the analysis. A thorough proforma that includes information on age, height, weight, waist circumference (WC), hip circumference (HC), waist-hip ratio (WHR) was prepared to record the data. Weight dividing with height squared (kg/m^2) to determine BMI.WC was measured at the mid-level between the costal margins and the iliac crests. HC was measured around the pelvis at the point of maximal protrusion of gluteal region. Overweight was defined as having a BMI<=25kg/m^2 and >=23 kg/m^2. According to the WHO Asia-Pacific criteria[12], people were considered generally obese if their BMI was>=25 kg/$m^2$and BMI of <30 kg/m^2 was used to define general obesity-1. Men's WC(90cm) or men's WHR(0.9) were used to define central obesity or, abdominal obesity respectively. With the aid of as phygmomanometer, blood pressure was measured. Metabolic factors like fasting plasma glucose e(FPG), postprandial glucose (PPG), total cholesterol(TCHO),triglycerides(TG), high-density lipoprotein cholesterol(HDL-C), and low-density lipoprotein cholesterol(LDL-C) were assessed. Using the American Heart Association or National Heart, Lung and Blood Institute criteria[12], metabolic syndrome was identified as a group of lifestyle diseases, including polycythaemia(Hb>13g/dl),hypertension(SBP>140mmHg&DBP>90mmHg),prediabetes(FPG>125mg/dl),postprandialhyperglycaemia(PPG>140mg/dl),hypercholesterolemia(TCHO >93.06mg/dl),hypertriglyceridemia(TG>30.6mg/dl), Low HDL-C(HDL-C<40mg/dl), High LDL-C(LDL-C>130mg/dl).The privacy of all the data was ensured with the utmost care and the observations were thereafter statistically analysed. The study includes age & location-specific distribution, prevalence of obesity & metabolic syndrome and relationship between lifestyle illnesses with BMI at high altitude. The 0.05 significance level was used for all statistical tests using MS Excel.

Results

Out of the 300 cases, young adults <30 years were 94 cases in the plains(62.7%) and 63 cases were at high altitude(42%). Adults in their mid-thirties between the ages of 31-45 years were 44 cases on the plains(29.3%) and 65 cases at high altitudes(43.3%). Adults >45 years were 12 cases(8%) in plains and 22 cases(14.7%) in highaltitude.[***Table1].*** In the current study, young adults recorded the highest percentage of cases at plains(62.7%,n=94), while middle-aged adults had the highest percentage of cases at high altitude(43.3%,n=65), and older adults had the lowest percentage (8%,n=12) both on the plains and at high altitude (14.7%, n=22).

Table 1: Age & Location wise distribution

Age wise Distribution	Plains (n=150)	High Altitude (n=150)	Total
Young Adults(<30 year)	94(62.7)	63(42.0)	157(52.3)
Middle-aged Adults(31-45 years)	44(29.3)	65(43.3)	109(36.3)
Old-aged Adults(>45 years)	12(8.0)	22(14.7)	34(11.3)

In comparison to plains (53.8%,n=78), high altitudes had the highest percentage of overweight cases(57.8%, n=85). [***Table2].*** In contrast, more cases of general obesity were discovered inplains(14.5%,n=21) than at high altitude(10.2%,n=15). When the WC and WHR are taken into account, WC significant proportion of cases denoted central obesity were found in plains(47.8%,n=32%), whereas a WHR significant proportion of cases denoted abdominal obesity were found in highaltitude (68.9%,n=73). ***[Figure 1].*** demonstrates that large WC is a rough indicator of visceral fat mass, which is also supported by numerous other studies(11,13–15), whereas WHR is the indicator of study for abdominal obesity at high altitude. The majority of cases of elevated haemoglobin were found in the plains(52.5%,n=136), indicating that polycythaemia is not a risk at this altitude. However, cases of elevated blood pressure were also found indicating slight risk of both systolic(1.2%,n=3) and diastolic(2.4%,n=6) hypertension where the study was done. Individuals' fasting and postprandial blood glucose levels did not significantly change as a result of the elevation. When lipid profile were taken into account the highest cases of elevated TCHO(21.9%,n=55) and TG(22.3%,n=56) were discovered at this altitude, whereas the highest cases of low HDL-C(8.5%,n=22) and high LDL-C(1.2%,n=3) were discovered in plains.***[Table2].***

Table 2: Prevalence of Obesity & Metabolic syndrome

Indexes	Plains		High Altitude		P-value
	n(%)	Mean±SD	n(%)	Mean±SD	
Body Mass Index					
Underweight(<18.5kg/m^2)	0(0.0)		0(0.0)		
Normal(18.5-22.9kg/m^2)	46(31.7)		47(32.0)		
Overweight(23.0-25.9kg/m^2)	78(53.8)	23.97±2.02	85(57.8)	23.78±1.92	0.41
General obese(>26kg/m^2)	21(14.5)		15(10.2)		
General obesity-1(>30kg/m^2)	0(0.0)		0(0.0)		
Waist & Hip Circumferences					
Central obesity(WC>90 cm)	32(47.8)	84.75±5.62	33(31.1)	86.93±4.33	0.01
Abdominal obesity(WHR>0.9)	35(52.2)	0.89±0.02	73(68.9)	0.9±0.02	0.01
Biochemical Parameters					
Hb(>13.8g/dl)	136(52.5)	14.91±0.9	126(50.2)	15.4±0.78	0.01
SBP(>140mmHg)	0(0.0)	124.56±7.2	3(1.2)	128.41±6.62	0.01
DBP(>90mmHg)	1(0.4)	77.83±5.87	6(2.4)	82.49±5.2	0.01
FPG(>125mg/dl)	0(0.0)	85.82±12.17	0(0.0)	85.25±7	0.75
PPG(>140mg/dl)	0(0.0)	110.45±10.48	0(0.0)	109±9.96	0.44
TCHO(>93.06mg/dl)	48(18.5)	178.15±20.45	55(21.9)	178.09±18.2	0.99
TG(>30.6mg/dl)	49(18.9)	119.76±29.13	56(22.3)	136.73±12.17	0.01
HDL-C(<40mg/dl)	22(8.5)	45±14.52	4(1.6)	46.78±4.92	0.57
LDL-C(>130mg/dl)	3(1.2)	100.56±25.78	1(0.4)	100.64±9.74	0.99

The paired t-test between two samples of means at plains & high altitude for anthropometric and biochemical parameters was used for statistical analysis. ***[Table2].*** Therefore, the null hypothesis

that there is no discernible difference between the two groups of means is rejected in this study. A significant difference between the means(P>0.05) was found in cases of overweight, elevated blood glucose, and an abnormal lipid profile (hypercholesterolemia, low HDL-C and high LDL-C), indicating that an increase in altitude causes physiological changes in body mass index(BMI), blood glucose levels and lipid profile.Further, the correlation between lifestyle disease and BMI levels at plains and high altitude was statistically analysed. ***[Table3].*** which demonstrates that central or abdominal obesity(P<0.05) comprises a positive association & statistically significant at plains and high altitude. For prediabetes(P<0.05) is a condition with positive correlation & statistically significant at plains whereas, diastolic blood pressure(P<0.05) includes positive correlation & statistically significant at high altitude. As a result, we reject the null hypothesis that lifestyle diseases and BMI are unrelated at high altitudes. As a result, it was discovered in the current study that there is a statistically significant correlation between lifestyle diseases such as central or abdominal obesity and high diastolic blood pressure with BMI levels at high altitude.

Table 3: Association of Lifestyle Diseases with BMI of Lowlanders at High Altitude

S. no	Lifestyle Diseases	Plains	High Altitude
		r(p-value)	r(p-value)
1	Central Obesity	0.67(0.001)	0.78(0.001)
2	Abdominal Obesity	0.5(0.001)	0.33(0.001)
3	Polycythemia	0.07(0.42)	0.15(0.1)
4	Systolic Hypertension	0.01(0.92)	0.07(0.39)
5	Diastolic Hypertension	0.03(0.69)	0.19(0.02)
6	Prediabetes	0.24(0.05)	0.1(0.46)
7	Postprandial Hyperglycaemia	0.08(0.53)	0.19(0.15)
8	Hypercholesterolemia	0.12(0.41)	0.04(0.79)
9	Hypertriglyceridemia	0.004(0.98)	0.1(0.48)
10	Low high-density lipoprotein cholesterol	0.02(0.89)	0.29(0.18)
11	High low-density lipoprotein cholesterol	0.24(0.12)	0.06(0.81)

Discussion

According to the various studies, peripheral vasoconstriction and decreased exercise are caused due to cold weather and chronic hypoxia is caused by high altitude. Weather and altitude may have caused subjects to exercise less, which in turn results in a lower basal metabolic rate. Increased calorie intake and decreased energy expenditure result in positive energy gain, which raises the risk of obesity[16–18]. The study by Voss et al., found that people who live at low altitude(<500m) are less likely to become obese than people who live at high altitude(>3000m)[2]. Similarly, in our study lowlanders at high altitude had higher prevalence of overweight, hypertension and hypercholesterolemia. While the majority of studies found a positive correlation between type-2 diabetes prevalence and obesity[19]our study found positive correlation between lifestyle diseases such as central or abdominal obesity and diastolic hypertension with BMI at this altitude. Numerous studies of chronic hypoxia-induced polycythaemia in high altitude residents have revealed links between the condition and reductions in blood sugar levels, HbA1C and increase insulin sensitivity[20]. We found no correlation between BMI levels at this altitude with the prevalence of diabetes, which is one of the most significant difference between our study and other studies. Okumiya etal.'s and Woolcott et al. findings discovered an inverse relationship between diabetes and altitude in the United States[21,22]. According to numerous studies[23]that are similar to our study, high altitude individuals have significantly higher diastolic blood pressure but no difference in systolic blood pressure. This may be because hypoxia and cold temperature cause an increase in plasma catecholamines[23,24], which

are thought to play a role in the development of atherosclerosis.The measurement of TCHO levels is still regarded as the standard for calculating the risk of cardiovascular disease (CVD). A higher incidence of CVD has been linked to higher levels of TCHO and LDL-C[14].Therefore,in our study, TCHO levels were higher at high altitude than at plains. Numerous studies have already shown that high LDL-C and TG frequently increase CVD related mortality and a negative correlation between HDL-C and CVD[25]. In a manner similar to this, our study also shows a negative correlation between HDL-C levels with high-altitude BMI levels.

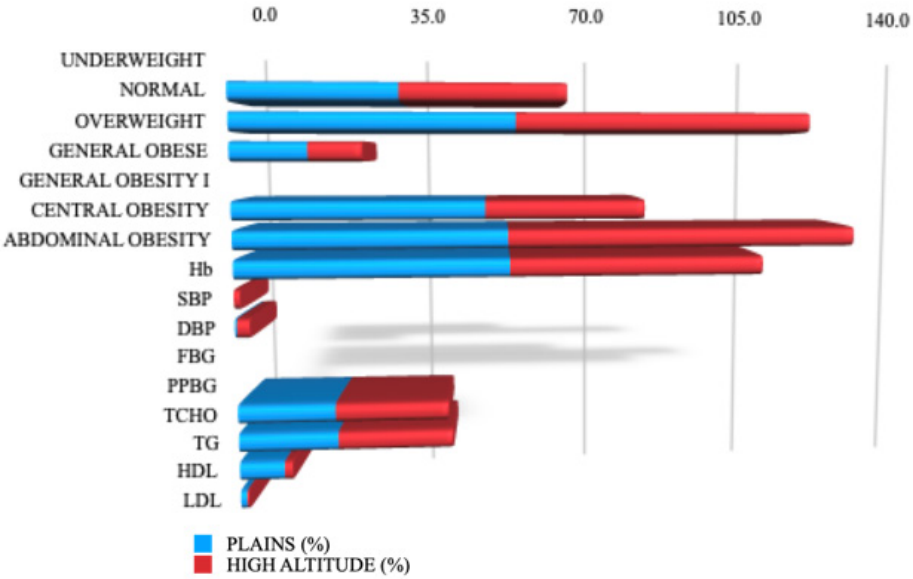

Figure 1: Prevalence of Obesity & Metabolic Syndrome

Conclusion

The study which includes a large number of middle-aged adults at high altitude reveals high prevalence of overweight, slight risk of hypertension and deranged lipid profile but no risk of polycythaemia due to increase in altitude causes changes in body mass index and lipid profile which is a cardiovascular risk factor that may result in chronic heart diseases. On the other hand, the study at the plains with the highest proportion of young adults reveals high prevalence of general obesity. The present study's indicator of abdominal obesity at high altitude is the waist-hip ratio. Association of BMI at high altitude with lifestyle diseases such ascentral or abdominal obesity and diastolic blood pressure were found to be statistically significantly correlated. Future research is therefore required to investigate the reason behind their connection to rising altitude.

Limitations

There are several limitations which includes a small sample size, an uneven age distribution and only those individuals who had AME performed at our center were included in the study and the Darjeeling district as a whole was not considered. Another drawback was that all of the AME documents in our study were male adults. In the future, more data would be included, and a study based on gender would be conducted.

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Ethical Approval: Necessary ethical approval was obtained.

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Declaration of Conflict of Interest: The authors declare that there is no conflict of interest.

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Original Research

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A Cross Sectional Study to Assess the Depression, Anxiety, and Stress among the Construction Workers of Gadag, North Karnataka

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Abstract

Background: The construction workers all over the world faces health related concerns due to high job demand, long working hours, and unrealistic deadlines. The mental health problems of construction workers cause productivity losses and also raises safety concerns and the construction industry reports higher levels of mental health issues than other industries in general. **Methods:** A Cross-Sectional study was conducted for three months from April 2022 to June 2022 among Construction workers of construction site of Gadag Institute of Medical Sciences, Gadag, Karnataka, India. **Conclusion:** The study concluded that the proportion of depression, anxiety and stress among construction workers were 49.3% (101), 73.2% (150) and 25.4% (52) respectively. It shows that depression, anxiety and stress was more common in age group between 31 to 40 years, male, laborer, completed high school education and belonging to socio-economic status Class IV.

Key Words: Anxiety; Construction workers; DASS-21 Depression; and Stress;

Introduction

The construction workers all over the world faces health related concerns due to high job demand, long working hours, and unrealistic deadlines (Beswick et al., 2007).[1] The construction industries in India is the second largest unorganized sector forming major part of the workforce.[2]

The mental health problems of construction workers cause productivity losses and also raises safety concerns[3] and the construction industry reports higher levels of mental health issues than other industries in general[4]. It is not limited to any demographic region but is a part of global trend[5]. Common mental health problems in the working population include anxiety and depression[6].

The most common psychological disorders are depression and anxiety with a prevalence of 10%–20%/year in the general population[7]. It is more in construction workers due to occupational stress and can lead to physical, psychological, and behavioral complications for the individuals and endanger their health[8,9].

Occupational stress as a common problem over the world as declared by World Health Organization (WHO), which is supported by family physicians' association report stating that approximately twothirds of cases examined at work had symptoms of stress and it the cost around 1%–3.5% of the gross

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domestic product in the countries[10]. A study about workers at the Tehran Oil Refinery reported that depression symptoms of workers are 43%[11]. Result of a study in Bangalore, stated that anxiety and stress were 36% and 18%, respectively[12]. Hence the study attempts to assess the depression, anxiety, and stress among the construction workers and to determine the association of depression, anxiety, and stress with socio-demographic factors.

Material and Methods

A Cross-Sectional study was conducted for three months from April 2022 to June 2022 among Construction workers of construction site of Gadag Institute of Medical Sciences, Gadag, Karnataka, India. Construction workers in GIMS Gadag willing to participate in the study was included and who were chronic absentees and temporary workers were excluded. Sample size was calculated using the formula

$$n = \frac{(1.96)^2 \times pq}{d^2}$$

where p is the prevalence rate 38% which was taken from the study done by K. Jayashree et.al[13].

q= 100-p = 100-38 = 62

Sampling error (d) = 7 % with 95% confidence interval.

$$n = \frac{(1.96)^2 \text{ x } 38 \text{ x } 62}{(7)^2}$$

$$n = \frac{9050.81}{49} = 184.7 \approx 185$$

After adding 10% non-response error, n= 203.5≈ 205

After obtaining the permission from the Institutional Ethics Committee and the Chief Engineer, 205 study subjects were selected using the lottery method. Written informed consent was taken in local language from the study subjects and confidentiality of information was maintained. The study participants were interviewed on pre-informed date using semi-structured questionnaire consisting of socio-demographic factors and DASS-21 which contained 21 questions(7 assessed depression, 7 assessed anxiety, and 7 assessed stress). Data was coded and entered in excel sheet and analyzed by proportion and chi-square test using Statistical Package for Social Sciences (SPSS trial version 21 Inc., Chicago, IL, USA). A p value ≤0.05 (two-tailed) was considered statistically significant.

Results

Out of 205 construction workers, majority 52.2% (107) of them belonged to the age group of 31 to 40 years, 69.8% (143) were Males, 95.1% (195) were laborers, 36.1% (74) were completed high school and 55.6% (114) were class IV according to Modified B G Prasad Socio-economic classification. (**Table 1)** Among all construction workers majority 75.1% (154) were smokers, 78.5% (161) were tobacco chewers and 56.6% (116) were alcoholics.

In our study the proportion of depression among construction workers was 49.3% (101), with 28.8% (59) mild depression, 18.5% (38) moderate depression, and 2% (4) severe depression. The proportion of anxiety was 73.2% (150), with 10.7% (22) mild, 41.5% (85) moderate, 9.8% (20) severe and 11.2% (23) extremely severe anxieties. Out of 25.4% (52) stressed study subjects, 11.7% (24) had mild, 7.3% (15) had moderate, and 6.3% (13) had severe stress. **(Table 2)**

Out of the 205 study subjects 49.3% (101) were depressed, the majority 52.2% (107) of them belong to the age group of 31 to 40 years. The majority 69.8% (143) of them belong to the male gender. The majority 55.6% (114) of them belonged to the socio-economic status Class IV.Among study subjects who consumed alcohol 15.12% (31) had mild, 3.95% (9) moderate, and 0.49% (1) had severe depression which were statistically significant (p-value <0.05). **(Table 3)**

Among the 205 construction workers 73.2% (150) were anxious, the majority 52.2% (107) belongs to the age group of 31 to 40 years. The majority of them were educated up to high school 36.1% (74). The study subjects who consumed alcohol 7.26% (16), which were statistically significant (p-value <0.05). **(Table 4)**

Among all the study subjects the majority of them belong to the age group of 31 to 40 years. Statisticallysignificant association was present between stress and history of smoking cigarettes or beedi, consuming tobacco and alcohol (p-value <0.05). **(Table 5)**

Table 1: Distribution of study subjects according to their Socio-Demographic factors.

Socio-Demographic factors	Frequency	Percentage
Age group		
<20 years	2	1%
21-30 years	70	34.1%
31-40 years	107	52.2%
41-50 years	26	12.7%
Total	205	100%
Gender		
Males	143	69.8%
Females	62	30.2%
Total	205	100%
Religion		
Hindu	188	91.7%
Muslim	17	8.3%
Total	205	100%
Marital Status		
Married	199	97.1%
Unmarried	6	2.9%
Total	205	100%
Occupation		
Engineer	7	3.4%
General Manager	3	1.5%
Labor	195	95.1%
Total	205	100%
Education		
Lower Primary	69	33.7%
Upper Primary	45	22.0%
High School	74	36.1%
Higher Secondary	5	2.4%
Graduate	10	4.9%
Post Graduate	2	1.0%
Total	205	100%
Socio-Economic Status		
Class-I	1	0.5%
Class-II	12	5.9%
Class-III	70	34.1%
Class-IV	114	55.6%
Class-V	8	3.9%
Total	205	100%

Table 2: Distribution of study subjects according to the DAS scale

DASS	Frequency	Percentage
Depression		
Not Depressed	104	50.7%
Mild	59	28.8%
Moderate	38	18.5%
Severe	4	2.0%
Total	205	100%
Stress		
Not Stressed	153	74.6%
Mild	24	11.7%
Moderate	15	7.3%
Severe	13	6.3%
Total	205	100%
Anxiety		
Not Anxious	55	26.8%
Mild	22	10.7%
Moderate	85	41.5%
Severe	20	9.8%
Extremely Severe	23	11.2%
Total	205	100%

Table 3: Distribution of study population according to the association between depression and socio-demographic factors.

Socio Demographic factors	Depression						Pearson Chi-Square Value
	Mild		Moderate		Severe		
	n	%	n	%	n	%	
Age group							$\chi2$=5.215, df = 9, p= 0.815
<20 years	1	0.49%	0	0%	0	0%	
21-30 years	16	7.80%	13	6.34%	1	0.49%	
31-40 years	35	17.07%	18	8.78%	3	1.46%	
41-50 years	7	3.41%	7	3.41%	0	0%	
Gender							$\chi2$ = 6.682, df = 3, p= 0.083
Males	42	20.49%	26	12.68%	3	1.46%	
Females	17	8.29%	12	5.85%	1	0.49%	
Occupation							$\chi2$=4.451, df = 6, p= 0.616
Engineer	2	0.98%	0	0%	0	0%	
General Manager	2	0.98%	0	0%	0	0%	
Labor	55	26.83%	38	18.54%	4	1.95%	
Education							$\chi2$=9.471, df = 15, p= 0.852
Lower Primary	22	10.73%	14	6.83%	2	0.98%	
Upper Primary	12	5.85%	6	2.93%	1	0.49%	
High School	19	9.27%	18	8.78%	1	0.49%	
Higher Secondary	1	0.49%	0	0%	0	0%	
Graduate	4	1.95%	0	0%	0	0%	
Post Graduate	1	0.49%	0	0%	0	0%	
Socio-Economic Status							$\chi2$=14.127, df = 12, p= 0. 293
Class-I	1	0.49%	0	0%	0	0%	
Class-II	5	2.44%	1	0.49%	0	0%	
Class-III	25	12.20%	15	7.32%	3	1.46%	
Class-IV	27	13.17%	21	10.24%	1	0.49%	
Class-V	1	0.49%	1	0.49%	0	0%	
Smoking							$\chi2$=8.390, df = 3, p= 0.039.
Yes	39	19.02%	25	12.20%	3	1.46%	
No	20	9.76%	13	6.34%	1	0.49%	
Tobacco							$\chi2$=8.599, df = 3, p= 0. 035
Yes	45	21.95%	24	11.56%	3	1.15%	
No	14	6.65%	14	6.65%	1	0.49%	
Alcohol							$\chi2$=28.971, df = 3, p = 0.000
Yes	31	15.12%	9	3.95%	1	0.49%	
No	28	13.25%	29	14.15%	3	1.05%	

Table 4: Distribution of study population according to the association between anxiety and socio-demographic factors.

Socio Demographic factors	Anxiety								Pearson Chi-Square Value
	Mild		Moderate		Severe		Extremely Severe		
	n	%	n	%	n	%	n	%	
Age group									$\chi2$=19.777, df = 12, p= 0. 071
<20 years	0	0%	1	0.49%	1	0.49%	0	0%	
21-30 years	12	5.65%	31	14.95%	3	1.45%	4	1.82%	
31-40 years	9	3.85%	42	20.49%	10	4.98%	16	7.18%	
41-50 years	1	0.49%	11	5.15%	6	2.75%	3	1.45%	
Gender									$\chi2$=2.414, df = 4, p= 0. 660
Males	17	8.15%	57	27.80%	15	7.35%	18	8.65%	
Females	5	2.25%	28	13.65%	5	2.25%	5	2.25%	
Occupation									$\chi2$=6.511, df = 8, p= 0. 590
Engineer	2	0.98%	3	1.35%	0	0%	0	0%	
General Manager	0	0%	1	0.49%	0	0%	0	0%	
Labor	20	9.26%	81	39.51%	20	9.26%	23	10.68%	
Education									$\chi2$=25.856, df = 20, p= 0. 171
Lower Primary	8	3.42%	27	12.76%	9	4.25%	7	3.35%	
Upper Primary	3	1.35%	20	9.38%	4	1.81%	4	1.81%	
High School	5	2.25%	32	15.16%	7	3.15%	11	5.15%	
Higher Secondary	3	1.35%	1	0.49%	0	0%	1	0.49%	
Graduate	2	0.98%	4	1.76%	0	0%	0	0%	
Post Graduate	1	0.49%	1	0.49%	0	0%	0	0%	
Socio-Economic Status									$\chi2$=8.642, df = 16, p= 0. 927
Class-I	0	0%	1	0.49%	0	0%	0	0%	
Class-II	2	0.98%	5	2.25%	0	0%	1	0.49%	
Class-III	7	3.15%	34	16.46%	8	3.64%	7	3.15%	
Class-IV	12	5.36%	41	20%	11	5.15%	15	7.25%	
Class-V	1	0.49%	4	1.80%	1	0.49%	0	0%	
Smoking									$\chi2$=6.902, df = 4, p= 0. 141
Yes	17	8.15%	64	31.22%	11	5.25%	16	7.56%	
No	5	2.25%	21	9.85%	9	4.25%	7	3.15%	
Tobacco									$\chi2$=15.663, df = 4, p= 0. 004
Yes	20	9.26%	70	34.15%	10	4.98%	15	7.15%	
No	2	0.98%	15	7.15%	10	4.98%	8	3.65%	
Alcohol									$\chi2$=25.368, df = 4, p = 0.000
Yes	16	7.26%	54	26.34%	4	1.80%	6	2.76%	
No	6	2.66%	31	14.15%	16	7.62%	17	8.45%	

Table 5: Distribution of study population according to the association between stress and socio-demographic factors.

Socio Demographic factors	Stress						Pearson Chi-Square Value
	Mild		Moderate		Severe		
	n	%	n	%	n	%	
Age group							$\chi2$=11.295, df = 9, p= 0. 256
<20 years	0	0%	0	0%	1	0.49%	
21-30 years	6	2.35%	5	2.25%	2	0.98%	
31-40 years	14	6.83%	7	3.25%	9	4.21%	
41-50 years	4	1.84%	3	1.15%	1	0.49%	
Gender							$\chi2$=6.682, df = 3, p= 0. 083
Males	17	7.48%	10	4.98%	5	2.25%	
Females	7	3.28%	5	2.35%	8	3.85%	
Occupation							$\chi2$=3.573, df = 6, p= 0. 734
Engineer	0	0%	0	0%	0	0%	
General Manager	0	0%	0	0%	0	0%	
Labor	24	11.71%	15	6.75%	13	6.25%	
Education							$\chi2$=12.268, df = 15, p= 0. 659
Lower Primary	11	4.55%	5	2.25%	8	3.40%	
Upper Primary	5	2.25%	3	1.15%	1	0.49%	
High School	7	3.15%	7	3.15%	4	1.60%	
Higher Secondary	1	0.49%	0	0%	0	0%	
Graduate	0	0%	0	0%	0	0%	
Post Graduate	0	0%	0	0%	0	0%	
Socio-Economic Status							$\chi2$=7.642, df = 12, p= 0.812
Class-1	0	0%	0	0%	0	0%	
Class-2	1	0.49%	2	0.98%	2	0.98%	
Class-3	10	4.45%	5	2.15%	4	1.80%	
Class-4	11	5.37%	8	3.56%	7	3.24%	
Class-5	2	0.98%	0	0%	0	0%	
Smoking							$\chi2$=25.735, df = 3, p = 0.000
Yes	19	9.27%	8	3.56%	3	1.40%	
No	52	52.15%	7	3.24%	10	4.98%	
Tobacco							$\chi2$=23.438, df = 3, p = 0.000
Yes	17	8.29%	8	3.25%	5	2.15%	
No	7	3.15%	7	3.15%	8	3.65%	
Alcohol							$\chi2$=31.532, df = 3, p = 0.000
Yes	11	5.37%	2	0.98%	1	0.49%	
No	13	5.85%	13	5.85%	12	5.54%	

Discussion

Out of 205 construction workers, Most of them 52.2% (107) belonged to the age group of 31 to 40 years, 69.8% (143) were Males, 95.1% (195) were laborers, 36.1% (74) were completed high school and the proportion of depression, anxiety and stress among construction workers were 49.3% (101), 73.2% (150)

and 25.4% (52) respectively whereas study done by Saberi H R et al[14] in which majority of the individuals were older than 57.2% (40), 77.3% (119) were male, 81.2% were married, 63% (97) had a diploma and the others had a university degree and symptoms of depression, anxiety, and stress were 18.83%, 33.12%, and 18.74%, respectively and according to the study conducted by Jeyapal DR et al[15] the prevalence of stress, anxiety, and depression among call handlers employed in international call centers in Delhi NCR was 46.7%, 57.1%, and 62.9% respectively

Depression symptoms more in study subjects of age group of 31 to 40 years 52.2% (107), males, completed high school education and belonging to socio-economic status Class IV.A statistically significant relationship was found between depression and substance abuse (P<0.05).

The study subjects of age group of 31 to 40 years, males, completed high school education and belonging to the socio-economic status Class IV were more prone to anxiety and stress symptoms. A statistically significant association was found between anxiety and substance abuse (p-value <0.05).

The limitations of the study were that coping strategies were not included due to time constraint and since it is a cross-sectional study the study subjects with depression, anxiety and stress were referred to psychiatry department and follow-up was not done.

Conclusions and Recommendation

The study concluded that the proportion of depression, anxiety and stress among construction workers were 49.3% (101), 73.2% (150) and 25.4% (52) respectively. It shows that depression, anxiety and stress was more common in age group between 31 to 40 years, male, laborer, completed high school education and belonging to socio-economic status Class IV. It was strongly associated with substance abuse which can be prevented by healthy coping strategies to combat above mental disorders.

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Conflicts of Interest: None

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Original Article

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Assessment of Morbidity Profile and Health-Seeking Behaviour of Older Adults in a Rural Field Practice Area of a Tertiary Health Care Centre of Western Maharashtra

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Abstract

Background: The diseases prevalent in the older adults need to be identified and their early diagnosis and treatment is facilitated by a good health seeking behaviour. The present study was conducted with the objective of assessing the morbidity profile and health-seeking behaviour of older adults residing in the rural field practice area of a tertiary health care centre of Western Maharashtra.

Methods: In the present cross-sectional study, 660 older adults were selected from the study population using systematic random sampling with population proportionate to sample size and assessed using a predesigned and pretested questionnaire and clinical examination. Data entry and analysis was done in Microsoft Excel.

Conclusion: The major co-morbidities found in these older people were hypertension (49.4%), diabetes mellitus (43.3%), anaemia (26.1%) and cataract (15.6%). 13.0%study participants had symptoms like fever, cough, diarrhoea, joint pain, etc. and out of these, 26 participants were not getting treatment. Health education regarding the importance of getting treatment during times of illness is necessary to bring about a change in their health-seeking behaviour.

Keywords: Morbidity, health-seeking behaviour, older adults.

Introduction

Ageing is a process of deterioration of the functional capacity of a person that is caused as a result of the structural changes that occur with increase in age. In India, people aged 60 years and above are considered as elderly.[1] In 1950, the elderly population of the world was 7% of the global population, it increased to 11% in 2007 and it is estimated that it will rise to 22% by 2050. By the year 2050, the total population of the elderly individuals in the world will be 1.9 billion. The highest proportion of older persons is in Italy and Japan (about 24 percent and 16 percent respectively).[2] The improvement and provision of good health services and preventive care has further raised the life expectancy of the people.[3] In India, the life expectancy has steadily increased from 32 years

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at the time of Independence to over 63 in 2001.[4]The elderly individuals are very valuable to a country as their wisdom and life experience contribute to the progress of the nation. Indian elderly population is the second largest in the world, and is undergoing rapid demographic transition.

In India, the estimates for the year 2010 showed that 8 percent of the total population was above the age of 60 years. The growth of the elderly population in India is comparatively faster than the other countries and it is estimated that it will be doubled by the year 2026 (173 million) compared to the year 2006 (83.6 million). By the year 2050, the population of the elderly citizens in India will be 19 percent of the country's total population. This profound increase in India's older adults brings with it many social, economic and healthcare policy challenges.[5]

Medical problems like visual impairment, hearing loss, musculoskeletal problems, cardiovascular problems, etc. and psychosocial problems like depression, impaired memory, irritability, rigidity of thoughts, etc. are commonly present in the elderly. Aging should not be looked upon as a process of adding years to life, but as a process of adding life to years. In the year 2012, the World Health Organization (WHO) theme was "Good health adds life to years". It focused on the fact that good health throughout one's life can help the person when they grow old to lead a productive life and be self-dependent.[6]

A decision taken by an individual to maintain, attain or regain good health and to prevent any illness is called Health Seeking Behaviour.[7] This has an influence over the elderly people in choosing a particular health service. Some may do home remedies or some might not take any type of medication when they are ill mainly due to rigidity of thoughts and stubborn nature. Delay in receiving proper health care can cause worsening of their health condition.

The present study was conducted with the objective of assessing the morbidity profile and health-seeking behavior of older adults residing in the study area.

Materials and Methods

The present community-based descriptive cross-sectional study was conducted in the rural field practice area of a tertiary health care centre of Western Maharashtra from October 2020 to December 2022. The RHTC (Rural Health Training Centre) is situated at a distance of 30 km from the medical college and the headquarters of the RHTC is situated at tahshil/taluka place and provides OPD (Out-patient Department) sevices, dental OPD services, immunization services and laboratory diagnostic services to the people residing in the taluka and also to the people residing in all the villages at the periphery. The population of this headquarters is 40,700 and there are 20 wards. Hence this population is considered as urban population and for administrative purpose and for ease, the older adults above 60 years of age were selected from this population as the study population for the present study.Thus total number of older adults in this population was 3,132.

Prevalence of common morbidities in the older adults residing in the study area was assumed to be 50%as it gives maximum sample size. By considering the confidence level as 95%, and adding additional 10 percent more fornon-responses, the final sample size came out to be 660.The sample was selected from a total of 20 wards of the study area according to population proportionate to size of the ward. From the voters list, the people residing in a ward who were above 60 years of age were marked and from the list of these people, every 5th person was selected. Before conducting the study, ethical approval was obtained from the Institutional Ethics Committee. The purpose of the study was explained to the study participants and their verbal consent was obtained. Those older people who were unwilling to participate in the study due to being seriously ill or due to some other reasons and those who were not traceable even after three successive visits were excluded from the study.

Sociodemographic information was noted and clinical examination was carried out. Clinical examination of female participants was carried out in the presence of a female attendant, for example, ASHA (Accredited Social Health Activist) worker or ANM (Auxiliary Nurse Midwife).

Past history was taken and participants who were already diagnosed with diseases like diabetes mellitus, hypertension, cataract, glaucoma, osteoarthritis, bronchitis, etc. and taking medications for the same were noted based on the investigations

done before. History of any major surgery was also noted. Information regarding health services utilization[8] was also noted.

Modified Kuppuswamy scale of socioeconomic status classification for the year 2022 was used to classify the study participants according to their socioeconomic status.[9]

Statistical analysis: Data entry and analysis was done in Microsoft Excel.

Results

Table 1: Distribution of study participants according to sociodemographic variables (n=660).

	MALES		FEMALES		TOTAL	
	Number	Percent	Number	Percent	Number	Percent
AGE GROUP (YEARS)						
60 to 64	127	19.24	111	16.81	238	36.05
65 to 69	86	13.03	85	12.88	171	25.90
70 to 74	73	11.06	115	17.42	188	28.48
75 to 79	25	3.79	29	4.39	54	8.18
80 and above	4	0.60	5	0.76	9	1.36
MARITAL STATUS						
Married	299	45.30	306	46.36	605	92
Widow/Widower	16	2.42	39	5.91	55	8
EDUCATIONAL STATUS						
Illiterate	25	3.79	173	26.21	198	30
Primary school	49	7.42	105	15.91	154	23.33
Middle school	17	2.57	19	2.88	36	5.45
High school	168	25.45	48	7.27	216	32.72
Graduate	32	4.85	0	0	32	4.85
Postgraduate	24	3.63	0	0	24	3.63
SOCIOECONOMIC STATUS						
Upper class I	27	4.09	0	0	27	4.09
Upper middle class II	83	12.57	37	5.60	120	18.18
Lower middle class III	78	11.82	73	11.06	151	22.87
Upper lower class IV	127	19.24	235	35.60	362	54.84
Lower class V	0	0	0	0	0	0

Out of the total 660 study participants, there were total 315 males and 345 females. The mean age of all the participants was 67.73 5.17 years. The highest age was 84 years and lowest age was 60 years. According to the modified Kuppuswamy classification, majority of the study participants i.e., 362 (54.84%) belonged to the upper lower class IV while only 27 (4.09%) of them belonged to upper class I.

Table 2: Distribution study participants according to symptoms and comorbidities (n=660).

	MALES		FEMALES		TOTAL	
	Number	Percent	Number	Percent	Number	Percent
SYMPTOMS						
Fever	8	1.21	15	2.27	23	3.50
Cough	17	2.57	9	1.36	26	3.94
Cold	2	0.30	4	0.60	6	0.91

Continue.....

Loss of appetite	0	0	8	1.21	8	1.21
Sleep disturbance	5	0.76	7	1.06	12	1.82
Diarrhoea	5	0.76	8	1.21	13	1.97
Constipation	3	0.45	6	0.91	9	1.36
Increased micturition	2	0.30	2	0.30	4	0.60
Headache	2	0.30	6	0.91	8	1.21
Body ache	25	3.80	37	5.60	62	9.40
Generalized weakness	8	1.21	26	3.94	34	5.15
Joint pain	6	0.91	48	7.27	54	8.20
Backache	3	0.45	2	0.30	5	0.76
Knee pain	3	0.45	6	0.91	9	1.36
COMORBIDITIES						
Anaemia	8	1.21	164	24.84	172	26.06
Hypertension	197	30	129	19.54	326	49.39
Diabetes Mellitus	150	22.72	136	20.60	286	43.33
Cataract	43	6.51	60	9.10	103	15.60
Glaucoma	3	0.45	0	0	3	0.45
Hearing loss	13	1.97	14	2.12	27	4.10
Osteoarthritis	15	2.27	45	6.82	60	9.10
Rheumatoid arthritis	0	0	2	0.30	2	0.30
Past history of MI	5	0.76	0	0	5	0.76
Chronic bronchitis	6	0.91	0	0	6	0.91
Varicose veins	3	0.45	0	0	3	0.45
H/O major surgery	5	0.76	11	1.67	16	2.42

Out of the 660 study participants, there were 86 (13.03%) study participants who had some sort of signs and symptoms during the interview. The main symptoms were body ache (9.40%), joint pain (8.20%) and generalized weakness (5.15%). A higher number of females had these symptoms.

The major co-morbidities found in the study population were hypertension (49.39%), diabetes mellitus (43.33%), anaemia (26.06%) and cataract (15.60%). 197 (30%) males were hypertensive while 129 (19.54%) females were hypertensive.

Table 3: Distribution of study population according to health-seeking behaviour (n=660).

	Males		Females		Total	
	Number	Percent	Number	Percent	Number	Percent
ACTION TAKEN DURING ILLNESS						
No treatment	16	2.42	10	1.51	26	3.94
Home remedies	57	8.63	12	1.82	69	10.45
Self-medication	15	2.27	0	0	15	2.27
Govt. health services	287	43.50	315	47.73	602	91.21
Pvt. health services	298	45.15	326	49.40	624	94.54
REASON FOR SEEKING MEDICAL CARE						
Have knowledge of symptoms	302	45.76	324	49.10	626	94.85
Request by family or friends	4	0.61	11	1.67	15	2.30
Afraid of complications of disease	6	0.91	3	0.45	9	1.36

In the present study, 86 (13.03%) study participants had some form of illness and symptoms like fever, cough, diarrhoea, joint pain, etc. during the time of the interview. Out of these, 60 study participants were getting treatment for their illness, 38 of them from government health services and 22 from private practitioners. Out of those taking treatment from government health services, 16 went to a primary health centre, 8 to a subcentre and 14 to a rural hospital. There were 26 study participants who were not taking any form of treatment for their illness because 5 (19.23%) of them stayed far away from the nearest hospital, 4 (15.38%) of them did not have enough money for getting medical care, 6 (23.07%) participants did not have any person in their family to accompany them to the hospital, 8 (30.77%) were afraid of adverse effects of medicines and 3 (11.54%) were afraid of needles, invasive procedures and surgery.

Discussion

In the present study, there were about 198 (30%) participants who were illiterate and 24 (3.63%) of them had a postgraduate qualification.

Similar to the present study, there were more number of illiterate participants than literates seen by a study conducted by Ramesh D. Pawar et al. in which 192 (66.21%) participants were illiterate while 98 (33.79%) participants were literate.[3]

In the present study, the major co-morbidities found in the study population were hypertension (49.39%), diabetes mellitus (43.33%), anaemia (26.06%), cataract (15.60%) and osteoarthritis (9.10%).

Similar findings were found by the study conducted by Mohammed Ubaidulla et al., in which the major co-morbidities were visual disturbances (62%), hypertension (43%), osteoarthritis (28%) and diabetes mellitus (15.5%).[4]

In the present study, 602 (91.21%) participants got treatment from Government health services while 624 (94.54%) participants got treatment from private health services. Out of the 86 (13.03%) study participants that had illness, 60 study participants were getting treatment for their illness, 38 of them from government health services and 22 from private practitioners. There were 26 study participants who were not taking treatment for their illness because 5 (19.23%) of them stayed far away from the nearest hospital, 4 (15.38%) of them did not have enough money for getting medical care, 6 (23.07%) participants did not have any person in their family to accompany them to the hospital, 8 (30.77%) were afraid of adverse effects of medicines and 3 (11.54%) were afraid of needles, invasive procedures and surgery. These were the reasons that sometimes led them not to seek medical care during illness.

In comparison with the present study, the number of study participants that got treatment from government health services was lower in a study conducted by P Ray Karmakar et al. in which it was found that majority of the study participants (86.9%) were having chronic diseases, and out of those having chronic diseases, 71.78% sought treatment. Majority (53.37%) availed modern method of treatment and more than one fourth (28.22%) sought no treatment. Only 13.88% sought treatment from government health facility due to fixed outdoor timing.[10]

Conclusion

The major co-morbidities found in the study population were hypertension, diabetes mellitus, anaemia and cataract. Early diagnosis and treatment of the diseases that are prevalent in the older adults through periodic screening, health check-ups, proper counselling and follow up is necessary to maintain good health, improve their quality of life and prevent complications due to the disease in the future. Health education of the older adults, their family members and the community in which they live regarding self-care and home monitoring of weight, blood pressure and blood sugar levels is equally important.

Majority of the participants got treatment from government as well as private health services.Since a majority of the study participants (70%) were educated, 61.5% of them having received education from primary school to middle school, and 8.5% of them having completed their graduation and postgraduation, the health seeking behaviour was good which was indicated by the fact that they would go to a doctor for follow up visits as advised by the doctor and during times of illness. A lesser percentage of the participants did not take any treatment during illness, the most common reason for

which is the rigidity of outlook and stubborn nature that is present commonly in people as age advances. Health education regarding the importance of getting treatment during times of illness, to solve all the doubts that are there in the minds of those people regarding health care is necessary to bring about a change in their health-seeking behaviour.

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Original Article

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Assessment of Depression in Older Adults in a Rural Field Practice Area of a Tertiary Health Care Centre of Western Maharashtra

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Abstract

Background: Depression in older adults is a disease as well as a risk factor for other diseases. The objective of the present study was assessment of depression in older adults residing in a rural field practice area of a tertiary health care centre of Western Maharashtra.

Methods: In the present cross-sectional study, systematic random sampling with population proportionate to sample size was used to select a sample of 660 older adults from the study population. A predesigned questionnaire was used and clinical examination was done. Patient Health Questionnaire (PHQ) 12 after translating into the local language (Marathi) was used for the diagnosis of depression. Those who gave consent to participate were included and those who could not give consent due to serious illness were excluded from the study. Data analysis was done in Microsoft Excel. Statistical association between variables was tested using chi square test.

Conclusion: Depression was significantly associated (p value < 0.05) with the female gender, widow/widower, illiteracy, sedentary life, anaemia and osteoarthritis. The community health workers in rural areas can help to provide health services including those for depression and so their proper training is necessary.

Keywords: Assessment, depression, older adults.

Introduction

In India, two-thirds of the geriatric population resides in rural areas and half of this belongs to poor socioeconomic status.[1] The increase in the geriatric population has resulted in an increase in the economically nonproductive dependent individuals and a higher dependency ratio. Due to migration of young people from rural to urban areas because of urbanization, the elderly people living in the rural areas are left with very little economic and social support. Due to the social isolation, there is an increase in the morbidities of physical and mental health of the elderly. According to the World Health Organization (WHO), morbidity can be estimated by identifying the number of individuals who were ill, the illnesses that these individuals experienced and the period of illness.[2]

Globally, 15 percent of the older adults are

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known to be suffering from mental health disorders, of which depression and dementia are the major ones. The prevalence of depression in the elderly increases as the age advances and therefore the elderly are considered as a vulnerable population for depression.[3]Depression in the elderly is a disease as well as a risk factor for other diseases. It is the main cause of dementia, cognitive dysfunction, impaired daily routine activities and quality of life. It may also be a cause of cardiovascular diseases in the elderly. Social support and physical activity are protective against elderly depression.[4]

Depression is a very serious health problem in the elderly population all over the world, with global incidences that range from 1% to 16%.[5] Up to two thirds of suicides that occur in the elderly all over the world are because of major depression.[6] Depression is generally considered a normal part of aging and so most of the times, geriatric depression is under diagnosed and is not noticed as a serious concern. Depression itself is a risk factor for many serious diseases and so its early diagnosis and treatment is necessary to improve the quality of life of the older adults, maintain optimal levels of function and independence, which will lead to a significant reduction in mortality due to suicide and other medical illnesses.[7] It is important to identify the magnitude of depression in the elderly and their health assessment should include psychological assessment as well.

In the year 2017, due to the continuing stigma associated with mental illness, the WHO World Health Day emphasized the importance of mental health with the theme "Depression: let's talk". On 10th October every year, 'World Mental Health Day' is observed as a day for global mental health education, awareness and advocacy against social stigma.[8] Every year, "International Day for Older Persons" is also observed on 1st October and the government and societies actively take part in developing, ensuring and promoting access to comprehensive healthcare services that are oriented and better focussed towards older people.[9]

The present study was conducted with the objective of assessment of depression in older adults residing in a rural field practice area of a tertiary health care centre of Western Maharashtra.

Materials and Methods

The present community-based descriptive cross-sectional study was conducted in the rural field practice area of a tertiary health care centre of Western Maharashtra from October 2020 to December 2022. The RHTC (Rural Health Training Centre) is situated at a distance of 30 km from the medical college and the headquarters of the RHTC is situated at tahshil/taluka place and provides OPD (Out-patient Department) sevices, dental OPD services, immunization services and laboratory diagnostic services to the people residing in the taluka and also to the people residing in all the villages at the periphery. The population of this headquarters is 40,700 and there are 20 wards. Hence this population is considered as urban population and for administrative purpose and for ease, the older adults above 60 years of age were selected from this population as the study population for the present study.

Systemic random sampling with PPSS (Population proportionate to sample size) was used for selecting the sample in the present study. The total population of the study area was about 40,700. Out of this, the total number of older adults was 3,132.The prevalence of common morbidities in the older adults residing in the study area was considered as 50% as it gives maximum sample size. With the confidence level set at 95%, and adding additional 10 percent considering non responses, the final sample size came out to be 660.The sample was drawn from a total of 20 wards of the study area according to population proportionate to size of the ward. Out of the total population 40,700, about 7.7% i.e., 3,132 consists of older adults.[10] From the voters list, the people residing in a ward who were above 60 years of age were marked and from the list of these people, every 5th person was selected. Before conducting the study, ethical approval was obtained from the Institutional Ethics Committee. The purpose of the study was explained to the study participants and their verbal consent was obtained.

Inclusion criteria:

i. All the people 60 years of age and above residing in the study area for more than one year.

ii. People who were willing to give consent to participate in the study.

Exclusion criteria:

i. People who were not willing to participate in the study due to being seriously ill or due to some other reasons.

ii. People who were not traceable after three successive visits.

A predesigned and pretested questionnaire was used for collection of data. Sociodemographic information was noted and clinical examination was carried out. Clinical examination of female participants was carried out in the presence of a female attendant, for example, ASHA (Accredited Social Health Activist) worker or ANM (Auxiliary Nurse Midwife).

Past history was taken and participants who were already diagnosed with diseases like diabetes mellitus, hypertension, cataract, glaucoma, osteoarthritis, bronchitis, etc. and taking medications for the same were noted based on the investigations done before.

Patient Health Questionnaire (PHQ) 12[11] after translating into the local language (Marathi) was used for the diagnosis of depression.

Modified Kuppuswamy scale of socioeconomic status classification for the year 2022 was used in the study to classify the study participants according to their socioeconomic status.[12]

The study participants were classified as physically active or inactive based on the criteria for physical activity given by the CDC (Center for Disease Control and Prevention).[13]

Statistical analysis:

Data entry and analysis was done in Microsoft Excel. Percentages were calculated. The statistical association between variables was tested using chi square test.

Results

Out of the total 660 study participants, there were 345 females and 315 males. The mean age of all the participants was 67.73 5.17 years, the highest age was 84 years and lowest age was 60 years.

The number of married participants was 605 (92%) which included 299 (45.30%) males and 306 (46.36%) females while out of the 55 (8%) widows and widowers, there were 16 (2.42%) widowers and 39 (5.91%) widows.

There were 290 (44%) literate males and 25 (3.8%) illiterate males. 172 (26.06%) females were literate while 173 (26.21%) females were illiterate.

According to the modified Kuppuswamy classification, majority of the study participants i.e., 362 (54.84%) belonged to the upper lower class IV, 151 (22.87%) study participants belonged to lower middle class III, 120 (18.18%) study participants belonged to upper middle class II and only 27 (4.1%) study participants belonged to upper class I.

Out of the 660 study participants, 626 (94.84%) study participants were found to be physically active while 34 (5.15%) of them were leading a sedentary life.

Table 1: Distribution of study participants according to co-morbidities (n=660).

Comorbidities	Males		Females		Total	
	Number	Percent	Number	Percent	Number	Percent
Anaemia	8	1.21	164	24.84	172	26.06
Hypertension	197	30	129	19.54	326	49.39
Diabetes Mellitus	150	22.72	136	20.60	286	43.33
Cataract	43	6.51	60	9.10	103	15.60
Glaucoma	3	0.45	0	0	3	0.45
Hearing loss	13	1.97	14	2.12	27	4.10
Osteoarthritis	15	2.27	45	6.82	60	9.10
Rheumatoid arthritis	0	0	2	0.30	2	0.30
Past history of MI	5	0.76	0	0	5	0.76
Chronic bronchitis	6	0.91	0	0	6	0.91
Varicose veins	3	0.45	0	0	3	0.45
H/O major surgery	5	0.76	11	1.67	16	2.42

The major co-morbidities found in the study population were hypertension (49.39%), diabetes mellitus (43.33%), anaemia (26.06%) and cataract (15.60%).

There were 197 (30%) males and 129 (19.54%) females who had hypertension. Out of the 286 (43.33%) diabetic study participants, there were 150 (22.72%) males and 136 (20.60%) females. Out of the 172 (26.06%) participants having anaemia, most of them i.e., 164 (24.84%) were females compared to 8 (1.21%) males.

Table 2: Distribution of study participants according to PHQ (Patient Health Questionnaire) 12 item (n=660).

Grading of stress/ depression	Males		Females		Total	
	Number	Percent	Number	Percent	Number	Percent
No depression	303	46	296	44.84	599	90.75
Mild depression	12	1.82	41	6.21	53	8.03
Moderate depression	0	0	8	1.21	8	1.21
Severe depression	0	0	0	0	0	0
Total	315	47.72	345	52.27	660	100

Depression was present in 61 (9.24%) of the study participants out of which 53 (8.03%) were suffering from mild depression and 8 (1.21%) were suffering from moderate depression. There were no cases of severe depression found among the study participants.

Table 3: Association of demographic variables and sedentary lifestylewith depression.

Gender	Depression		Total
	Yes	No	
Male	12	303	315
Female	49	296	345
Total	61	599	660
Chi square value: 21.20 p value: < 0.05 df=1			
Marital Status	**Depression**		**Total**
	Yes	**No**	
Married	39	566	605
Widow/ Widower	22	33	55
Total	61	599	660
Chi square value: 67.67 p value: < 0.05 df=1			
Education	**Depression**		**Total**
	Yes	**No**	
Illiterate	29	169	198
Literate	32	430	462
Total	61	599	660
Chi square value: 9.85 p value: < 0.05 df=1			

Sedentary lifestyle	Depression		Total
	Yes	No	
Yes	8	26	34
No	53	573	626
Total	61	599	660
Chi square value: 8.72 p value: < 0.05 df=1			

The association between depression and the female gender was found to be statistically significant which meant that females were more likely to develop depression than males.

Out of the 605 study participants that were married, 39 (6.44%) participants had depression and out of the 55 participants that were widow/widower, 22 (40%) participants had depression. The association between depression and being widow/widower was statistically significant.

Out of the 198 illiterate participants, there were 29 (14.6%) participants that had depression while out of the 462 literate participants, only 32 (7%) participants had depression. Association of a participant being illiterate was significantly associated with depression.

Among the 34 study participants who were sedentary, 26 had diabetes mellitus, 24 had hypertension, 13 had anaemia and 8 had depression. Out of the 34 sedentary participants, 8 (23.53%) participants had depression while out of the 626 physically active participants, 53 (8.5%) participants had depression. The association between leading a sedentary lifestyle and depression (chi square value: 8.72) was statistically significant.

Table 4: Comparison of depression with co-morbidities of study population (n=61).

Co-morbidities	Grading of depression			Total	Chisquare value	p value
	Mild	Moderate	Severe	Number(%)		
Anaemia	33	8	0	41 (67.24)	59.07	< 0.05
Hypertension	25	8	0	33 (54.12)	0.60	> 0.05
Diabetes Mellitus	22	0	0	22 (36.08)	1.44	> 0.05
Cataract	5	2	0	7 (11.48)	0.87	> 0.05
Osteoarthritis	14	3	0	17 (27.88)	28.67	< 0.05

According to table 4, out of the 61 study participants who had depression, 41 (67.24%) participants were anaemic, 33 (54.12%) had hypertension, 22 (36.08%) had diabetes mellitus, 17 (27.88%) had osteoarthritis and 7 (11.48%) had cataract. The association of depression with anaemia and osteoarthritis was found to be statistically significant.

Discussion

In the present study, out of the total 660 study participants, there were total 345 females and 315 males. the mean age of all the participants was 67.73 5.17 years. The highest age was 84 years and lowest age was 60 years. A majority of the males and females i.e., 238 (36.05%) belonged to the age group of 60 to 64 years and those above 80 years of age were the least i.e., 9 constituting about only 1.36% of the study population.

A study done by Dasgupta A et al.[14] in 2014 in a slum of Kolkata showed that the mean age of study participants was 70 years. Majority of the study participants were females (53.1%) which was similar to our study findings.

The prevalence of depression in the present study was 9.24%. A similar prevalence of depression was found by a study conducted by Sudarshan Ramaswamy et al.[15] in which out of the 240 study participants, 23 participants (10%) had depression.

In the present study, the association between depression and the female gender was found to be statistically significant with a p value < 0.05.

Similar finding was seen in a study conducted by Ramesh D. Pawar et al.[16] in which out of the total 290 study participants, there were 146 (50.34%) females and 144 (49.66%) females. There were 107 females and 61 males that had depression and so depression was more common in females than the males with this difference being statistically significant having p value < 0.05.

In the present study, the association between depression and being widow/widower was statistically significant with a p value < 0.05.

Similar findings were reported by the study conducted by Ramesh D. Pawar et al.[16] in which it was found that out of the 178 participants who were married, 77 had depression while out of the 112 participants that were widows/widowers, 91 had depression. Depression was more among elderly who were either widowed or separated or living single (54.17%) than elderly who were married (45.83%) and living with their spouses and it was statistically significant (p < 0.05).

A study done by Armugam B et al.[17] in Chennai showed that 48% participants who had lost their spouse were having depression.

The findings of these studies were similar to the findings of the present study that showed that prevalence of depression was more in the study participants who were widows/widowers.

In the present study, depression was significantly associated with illiteracy with a p value of < 0.05. The following studies showed findings similar to the present study regarding the association of illiteracy with depression.

In a study done by Ramesh D. Pawar et al.[16] it was found that out of the 192 illiterate study participants, 118 participants had depression while out of the 98 literate study participants, 50 participants had depression.

In a study done by Manjubhashini S et al.[18] in 2013, in Vishakhapatnam, depression was found to

be more in illiterates (35%) when compared with other educated study participants.

A study done by Sharma DK et al.[19] in 2016, in Belgaum showed that 40.6% of the illiterates had depression and this was more when compared with other educated study participants.

In the present study, the association between leading a sedentary life and depression was statistically significant with a p value < 0.05.

Similar findings were found in the study conducted by Ramesh D. Pawar et al.[16], in which the elderly who were involved in physical activity were less depressed (52.11%) compared with elderly not doing regular physical activity (69.00%) and the difference was found to be statistically significant. Similar findings were seen in studies conducted by Goswami et al.[20]and Sharma R et al.[21]

In the present study, the association of depression with anaemia and osteoarthritis was found to be statistically significant with p value < 0.05.

Similar findings were found by the study done by Grover S et al.[22] in which more than three fourth of the study participants with depression had at least one physical illness with hypertension being the most common physical comorbidity followed by diabetes mellitus and osteoarthritis. The presence of a physical illness was associated with depression.

Conclusion

The findings of the present study show that depression was more prevalent in females compared to males and this was statistically significant. It was also found that being a widow/widower, illiterate or leading a sedentary lifestyle was significantly associated with depression. The older adults have many comorbidities out of which in the present study, anaemia and osteoarthritis were significantly associated with depression. Many other studies have also shown findings similar to the present study.

Early diagnosis and treatment of depression in the older adults, proper counselling and follow up is necessary. The prevalence of depression increases with increasing age of a person and so proper counselling and treatment of the patients of depression is necessary. Health education of the older adults, their family members and the community in which they live regarding ways to prevent depression like doing hobbies, doing regular exercise, getting oneself involved in cultural activities, religious activities, social gatherings, meeting relatives every once in a while, maintaining weight to prevent other diseases that also might be a cause of depression, etc. is necessary.

Depression can occur after a person retires from work but it should not be looked upon as a normal process because depression after retirement is preventable and treatable. Management of depression in older adults is related to complex interactions between various psychological, biological, and social risk factors. There are many barriers in proper diagnosis and treatment of depression and there are shortages in the geriatric mental health workforce. Therefore, intersectoral coordination between clinicians, non-clinical professionals and community health workers is necessary.

The community health workers in the rural areas can help significantly in providing all sorts of health services including those for depression and so proper training of such community health workers is equally important.

Along with health workers, community health workers and social service workers, family members can play a very important role in healthy aging of older adults by giving them the proper emotional, moral and financial support in times of need and also help to improve their compliance to their medications if they are having any chronic disease which will prevent them from getting ill and ultimately result in good physical, mental and social well-being of the older adults.

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Original Article

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A Clinico-pathological Study and Management of Fungal Rhinosinusitis

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Abstract

Background: Fungi are ubiquitous in the environment; hence we are constantly exposed to them. Objectives were to know the clinical presentation, radiological and pathological characteristics and management aspects of fungal rhinosinusitis.

Methods: 30 cases of fungal rhinosinusitis reported during study period were evaluated and data was collected through history taking, clinical examination, haematological, histopathological and radiological investigations. Management by surgical & medical modalities were evaluated.

Results: Fungal rhinosinusitis is more common in 3rd decade of life with male preponderance and more in low socio-economic status (73.3%). Nasal discharge (100%), nasal obstruction (96.7%), chronic headache (90%) and visual disturbances (23.3%) were important clinical features. Sinu-nasal polyp (66.7%) and allergic mucin (40%) were important associated factors. Orbital extension was seen in 33.3%, intracranial extension (20%) and extension to hard palate (6.7%). Computed Tomography scan had a sensitivity of 56.7% while histopathology and potassium hydroxide mount had a sensitivity of 93.33% in detecting cases. Observed mortality rate was 16.6%.

Conclusion: Fungal rhinosinusitis is an important clinical entity which must be considered in all patients presenting with unresolving rhinosinusitis.

Key word: Chronic Sinusitis; Chronic Rhinitis; Endoscopic Sinus Surgery; Aspergillus; Computed Tomography.

Introduction

Fungal rhinosinusitis (FRS) has become increasingly recognized and over the last decade. Fungi are ubiquitous in the environment, hence we are constantly exposed to them. Resident bacterial flora, probably inhibit colonization by fungi through a number of mechanisms, primarily by competition for nutrients. Bacteria might also produce antifungal

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substances, further limiting colonization. Thus antimicrobial therapy predisposes to both the overgrowth of normal fungal flora, e.g., Candida species, and growth of opportunists like Aspergillus.[1]

Fungal sinusitis should be considered in all patients with chronic sinusitis. Patients with non-invasive forms have intractable sinusitis that fails to respond to repeated courses of antibiotics before the diagnosis is recognised. Invasive fungal sinusitis usually occurs in immuno-compromised patients with fever, local pain, swelling, discharge, foul smell, cough, nasal mucosal ulceration, eschars, epistaxis and headache. More chronic forms of invasive disease may present as proptosis or orbital apex syndrome.[2] Early diagnosis, correction of any underlying cause and aggressive treatment is the key to a successful outcome. This study was conducted to know the clinical presentation, radiological and pathological characteristics and management aspects of fungal rhinosinusitis.

Materials and Methods

The study was conducted on patients presenting with features suggestive of fungal rhino-sinusitis in the department of ENT. The study was conducted over a period of two years. Data was collected in the form of detailed history taking, clinical examination, haematological & radiological investigations, histopathological examination of biopsy specimen. Management including treatment with anti-fungal drugs and surgical intervention wherever appropriate. Patients who were not willing to participate and not available for follow-up upto four weeks were excluded from study.

Data was collected and entered into excel sheet, analysed and frequency, percentage and means were used to present the data. Ethical Clearance was taken from Institutional Ethical Committee.

Results

30 cases of fungal rhinosinusitis that were diagnosed were included in the study

Table I: Demographic information

Particulars	Total Number n= 30 No. (%)
Age	
≤10 years	1 (3.3)
11-20 years	6 (20)
21-30 years	9 (30)
31-40 years	6 (20)
41-50 years	5 (16.7)
≥ 51 years	3 (10)
Sex	
Males	17 (56.7)
Females	13 (43.3)
Socio-economic status	
Low SES	22 (73.3)
Middle SES	8 (26.7)

Table I shows that the greatest burden of fungal rhinosinusitis (FRS) was in the 3rd decade of life (30%). 2nd to 4th decade accounted for 70% of the cases. FRS was more common among males than females. Sex ratio was 1.3:1. FRS was more common among people with low Socioeconomic status (73.3%), as per Kuppuswami socioeconomic classification.

Table II: Distribution of cases as per presenting complaints

Presenting Complaints (multiple responses noted)	Total Number n= 30 No. (%)	
Nasal Discharge	30	100
Nasal Obstruction (UL/BL)	29	96.7
Chronic Headache	27	90
Facial swelling	5	16.7
Visual disturbances	7	23.3

Table II shows that, the most common presenting complaints of the patients at presentation were nasal discharge (100%), nasal obstruction (96.7%), and chronic headache (90%). 23.3% of the patient complaints of visual disturbances.

Table III: Distribution as per pre-existing disease

Pre-existing systemic disorders	Total Number n= 30 No. (%)	
Diabetes Mellitus	6	20
Chronic Renal Disease	4	13.3
Retroviral Disease	1	3.3
Others	1	3.3

Table III shows that Diabetes mellitus was the most common systemic disorder associated with fungal rhinosinusitis accounting for 20% of cases, followed by chronic renal failure 13.3% and combination of these two accounts for the maximum case.

Table IV: Extension of the disease

Extension of the disease	Total Number n= 30 No. (%)	
Confined to Nose & Paranasal sinus	20	66.7
Orbital Extension	10	33.3
Intracranial involvement	6	20
Hard palate involvement	2	6.7

Table IV shows that orbital extension was seen in 33.3% of the patients followed by intracranial extension (20%) and extension to hard palate (6.7%).

Table V: Nasal endoscopic findings

Nasal endoscopic findings	Total Number n= 30 No. (%)	
Polypoid swelling/Polyp	20	66.7
Allergic Mucin	12	40
Black mucosal Eschar	6	20
Granulamatous Mass	4	13.3
Fungal tufts	3	10
Soft cheese like material	2	6.7
Brown concretions	2	6.7

Table V shows that Sinonasal Polyp (66.7%) was the most common presentation of Rhinosinusitis and makes it difficulty in differentiating fungal rhinosinusitis from other form of Rhinosinusitis

The diagnosis of fungal rhinosinusitis rests on histopathological findings, radiological features and fungal culture. No one single modality has been shown to be 100% sensitive or specific and until any such modality is devised, diagnosis will rest on clinical findings and laboratory and radiological findings. A great deal of clinical suspicion, on the part of the treating physician, is also required in order to diagnose and successfully treat the condition

Out of the 30 patients who underwent Computed Tomography (CT) scanning as a part of radiological diagnosis, 17 (56.7%) patients had features on CT suggestive of fungal rhinosinusistis. CT scan thus had a sensitivity of 56.7% of detecting cases of fungal rhinosinusitis, indicating that CT scans show non-specific findings over half the time in cases of fungal rhinosinusitis. Histopathological examination & potassium hydroxide mount together were most sensitive with result of 93.33%, followed by histopathological examination alone was positive in 90% of cases. Out of 28 cases that were positive for fungal elements by histopathological examination & potassium hydroxide mount, aspergillus species accounts to 85.7% (24), mucormycosis 10.7% (3) followed by candida species 3.6% (1)

Surgical treatment was done in all patients with functional endoscopic sinus surgery and debridement. This was found to reduce the burden of disease and speed up recovery. Followed by regular postoperative saline douching was done to reduce the crust formation. Regular steroids topical spray with nasal douching was advised for the all the patients on discharge for follow up. All patients were treated with either steroids or antifungals depending on the disease status. Treatment of the underlying predisposing factor was also given equal importance.

Antifungals were given in only 33.33% of cases (only invasive Fungal Rhinosinusitis), but steroids were given both topically & or systemically in all the patients preoperatively and six month post-operatively. 10 patients (33.33%) with invasive Fungal Rhinosinusitis were given I.V amphotericin B at a dose of 1mg/kg/day with regular monitoring of liver and renal function and antibiotic coverage to control secondary infection, with post-op topical amphotericin B lavage for 6 months. Compliance was a major factor with antifungal therapy due to the prolonged course of treatment and cost of therapy.

Orbital extension was seen in 33.3%, intracranial extension in 20% and extension to hard palate in 6.7%. 83.3% (25) patients had complete recovery

16.7% (5) patients died- (4 due to intracranial spread of the disease, 1 due to uncontrolled blood sugars and ketoacidosis and renal failure). The follow-up period was minimum 4 weeks.

Discussion

Fungal rhinosinusitis is being increasingly recognised in persons of all age groups, resulting in great socio-economic effects, including both direct and indirect costs to the society. The patients have high morbidity and even high mortality, especially those having Acute Invasive Fungal rhinosinusitis. The impact of FRS not with standing, the disease is often neglected and misdiagnosed especially in developing countries like India, where FRS is one among the neglected diseases.[3] Of the patients who visited our hospital during the study period, 30 patients were diagnosed to have fungal rhinosinusitis. Highest number of cases was found to be in the third decade of life accounting for 30% of cases. The mean age was 43.81 yrs. The male: female ratio in our study was 1.3:1. Naghibzadeh et.al. reported a mean age of 31.62 ± 12.56 years in their study [4] and Fikret Kasapoglu et. al. reported a median age as 43 years.[5] Mean age was 20 years in the study published by Zakirullah et. al.[6] Similarly, Tahimi et al. reported a male predominance in chronic fungal sinusitis.[7] The role of socio-economic status in causation of Fungal Rhinosinusitis is controversial. In our study 73.33% of the patients were of the lower socio-economic class with the remaining belonging to the Middle class as per the modified kuppuswami scale.

In our study, nasal discharge (100%), nasal obstruction (96.7%), chronic headache (90%) and visual disturbances (23.3%) were important clinical features. Ragini et. al. have also reported that the clinical presentation of most of the patients was nasal obstruction of the corresponding side, with or without headache and nasal discharge.[8] The most frequent symptoms reported by Valera FCP et.al. were fever, nasal obstruction, headache, and purulent rhinorrhea with nasal crusting.[9]

We found that 33.33% of patients had extension of disease beyond the confines of nose and paranasal sinuses. The most common site of extension was into the Orbit- 33.3%, 20% with Intra-cranial extension and 6.7% had Hard palate extension. Valera FCP et. al. reported extra-sinonasal extension in 3 out of 32 patients (9.4%), one with palatal ulcers, the second with ulcers in the nasopharynx and the third with brain extension of the disease.[9] As in our study, Zakirullah et. al. found that proptosis was predominantly present in 56.25% (18 cases out of 32) and dimness of vision in 6.25%.[6] Al-Dousary also reported similar findings with intraorbital spread of disease seen in 27.2% (16 out of 59 cases) and intracranial spread in 8.5%.[10]

In this study, CT scan was conclusive of fungal rhinosinusitis in only 56.7% of cases (17 of 30 cases). A study by Robert Todd Adelson and Bradley F. Marple states that reports of normal CT scans are seen in up to 12% of FRS patients and the poor pathologic correlation between imaging findings and surgical specimens further emphasize imaging studies as supportive, but not diagnostic, modality in the evaluation of FRS.[11] In a study conducted by Zinreich et.al. 75% of the patients were diagnosed based on CT findings and hence CT findings alone are not conclusive. [12]

In this study too, both medical and surgical treatment was provided to most cases- 10 patients received anti-fungal therapy and 30 patients underwent endoscopic sinus surgery and debridement. Of the 30 cases diagnosed and treated, 16.6% (5) died among which 13.3% (4) was due to FRS spread into intracranial cavity and one was due to ketoacidosis secondary to uncontrolled diabetes mellitus. Mortality rate was 16.6%. This rate is low probably because the study includes both invasive and non-invasive forms of the disease. Firket Kasapoglu et.al reported a mortality rate of 50%; FRS related mortality rate was 23.5%.[5]

Conclusion: Fungal rhinosinusitis is an important clinical entity which must be considered in all patients presenting with unresolving rhinosinusitis.

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Original Research Article

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Study on Alcohol Consumptions and its Impact on Academics in Medical Students of Hyderabad Telangana

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Abstract

Cross sectional and prospective study on alcohol consumption and its impact on academics in medical students of Hyderabad Telangana were conducted in a medical college Hyderabad. 100 medical students, both male and female who consumed alcohol had participated in the study. Socio demographic and academic details were collected from each participant after obtaining an informed consent. Study results revealed that majority of the students consuming alcohol were from urban area, high socio-economic background and whose family members also consume alcohol. Majority of the students were from educated and nuclear families. Social, fun and curiosity were being the top reasons for consuming alcohol. Students suffering from various psychiatric illnesses were also reported in our study. Alcohol consumption had a great impact on their academics (39%) was noticed in our study. Similar results were found in studies conducted in other states of India. Constant supervision by parents, awareness programs by their peer group and regular psychiatric counseling will help to minimize this habit among medical students.

Key words: Alcohol, Academic impact, Medical students, socio demographic profile.

Introduction

The term alcohol in common use refers to ethyl alcohol. Alcohol is produced by the fermentation of sugar by yeast. It is a CNS depressant, primarily depresses reticular activating system, it inhibits the inhibitory neuronal transmitters which result in excitement. The frequency of crimes committed by persons under the influence of alcohol is not due to failure to realize the nature and consequences of the acts but to the repression of those inhibitory influences that in sober persons prevent the commission of such acts[1].

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Alcohol consumption in adolescent age group is increasing worldwide. Alcohol is most widely and commonly used substance abuse among college students which includes professional colleges. A study conducted in US[2] on alcohol abuse among students reveals that there were 1,825 students between the age of 18 and 24 during the period from 1998 to 2005 were died from unintentional injuries due to alcohol. In another study at US[3] states that every 1 in 4 college students report different types of academic consequences like missing classes, bad academic performance due to alcohol abuse. Alcohol and substance abuse is a growing public health problem in India. Alcohol and tobacco are most frequently used substances in India. The prevalence of alcohol use among medical students[4] is high, even though they understand the dangers of its use. Factors such as increase independence, reduced parental supervision, academic stress and frequent social contact predispose the use and abuse of alcohol. Nearly 150 million adults (15 years and above) in India drink Alcohol, according to the NFHS[5] (National Family Health Survey) 2021. Alcohol consumption among 15 years & above in women is 1.3% and for men is 18.8%. In Telangana the overall prevalence was found to be 16.29% in medical students.[6]

The aim of the study is to explain alcohol consumption and its impact on academics among medical students with an objective to assess various socio demographic and psychological aspects leading to alcohol consumption. This study will be helpful to understand the reason of alcohol consumption among medical students which in turn helps to take various preventive measures.

Material and Methods

A cross sectional and prospective study on socio demographic, psychological aspects of alcohol consumption and its impact on academics among medical students was conducted in Hyderabad Telangana. 100 medical students, among 58 male and 42 female who had consumed alcohol were considered for the study. Study was conducted from 1st June 2023 to 15th July 2023, for a period of 45 days in a Medical college, Hyderabad. An informed consent was taken from each participant before commencement of the study, names of the participants kept anonymous. Ethical permission was obtained from the institution.

Students from 1st year to final year who had an experience of alcohol consumption and willing to participate in the study were included and non-alcoholic students and students unwilling to participate were excluded.

The following socio demographic and academic details was collected

1. Gender. Age of the student. Locality (urban/ rural). Religion (Hindu/Muslim/Christian)
2. Residing (Hostler/ residing outside). Year of study
3. Personal habits other than alcohol (smoking/ substance abuse)
4. Personality (lonely (no friends) / social)
5. Family history:
    - Family type: Nuclear / joint. Occupation and education of parents
    - Family income According to modified BG Prasad classification.
    - Parents consuming alcohol (F / M / both / No). Siblings consuming alcohol (Y / N)
    - Close relatives consuming alcohol (Y / N)
6. History of Alcohol consumption:
    - Age started alcohol consumption. Frequency (Regular/ occasional/ quit)
    - Duration; since how long. Time of last consumption (days/ weeks/ Months/ years)
    - Reasons: (Peer pressure / Academic stress/ Love failure/ Social gathering/ Fun/ Curiosity/ Emotional disturbance/ multiple reasons). Brand of alcohol consume regularly (Beer/ wine/ Whisky, brandy, gin, vodka)
7. Academic impact of alcohol consumption: Poor Attendance/Poor concentration in the class/Effect on reading/ poor academic performance/ Fail in the exam.
8. History of Psychiatric illness (Anxiety/ Depression/ Any other to specify….)
9. Did it affect your physical health (Yes / No). Recent Road accidents (Yes / No).
10. Did it affect your social life in anyway (Yes / No)
11. Is your family aware of your habit (Yes/No)

The above data was collected from each participant into pre structured data sheet then into an MS excel sheet and statistical analysis was done by using SPSS software.

Results and Discussion:

A Cross sectional and prospective study on alcohol consumption and its impact on academics in medical students of Hyderabad Telangana. Study results reveals that the male participants were more in number (58%) because of exposure and peer pressure. Majority of the participants (94%) were in the age group of 20 to 25 years, most of the students were in that age group during their study period. 89% of the study group belong to Hindu community, 9% Christians and 2% from Muslim community was observed, highest number in Hindu community due to their major contribution in the general population.

Table-1: Showing socio demographic details in relation to alcohol consumption in the study population.

Variables	Frequency & Percentage	Variables	Frequency & Percentage
Study population	Male – 58% Female – 42%	Age	Less than 20 - 5% 20 to 25 years – 94% >25 years – 1%
Religion	Hindu – 89% Muslim – 2% Christian – 9%	Year of study in the study group	1st MBBS – 2% 2nd MBBS -21% 3rd MBBS part 1-23% 3rd MBBS part 2-38% Internees – 16%
Residence	Hostler – 37% Residing outside – 63%	Alcohol consumption started at age	<15 years – 8% 15 to 20 years -69% 21 to 25 years – 23%
Locality	Urban – 86% Rural – 14%	Personnel habits	None – 54% Smoking – 46%
Family type	Nuclear – 85% Joint - 15%	Personality	Lonely (No friends) – 28% Social – 72%

More number of the participants (86%) from urban locality. 63% of the students consuming alcohol was residing outside the campus whereas 37% were hostlers; students who are living outside are more accessible to social life. More number of students (38%) consuming alcohol are in final MBBS, 2% observed in 1st MBBS, 21% in 2nd MBBS, 23% in 3rd MBBS, our study revealed that the number of students consuming alcohol increased year by year. In regard to personnel habits, students smoking along with alcohol were 46%, more number (54%) of students were without smoking habit. In the study group majority of the students (72%) preferred to be social and more interactive remaining 28% of students were alone and less interactive. First time alcohol consumption in relation to the age between 15 to 20 years was 69%, highest numbers were in the age group of early medical school life was noticed in our study.

Table-2: Showing Family member's education, occupation and alcohol consumption details.

Variables	Frequency & Percentage	Variables	Frequency & Percentage
Occupation of mother	Government – 10% Private – 23% Self employed – 5% Housewife - 62%	Occupation of father	Government – 23% Private – 33% Self employed – 44%
Mother's education	Up to inter mediate -19% Graduate – 62% Postgraduate – 19%	Father's education	Up to intermediate -9% Graduate – 64% Postgraduate – 27%
Parents consuming alcohol	Father – 38% Mother – 2% Both – 6%, None -54%	Family Income (BG Prasad classification)	Class-1 – 96% Class-2 – 2& Class-3 -1%, Class-4 -0 Class-5 – 1%
Close relatives consuming alcohol	Yes - 81% No - 19%	Siblings consuming alcohol	Yes - 37% No - 63%

Majority of the students consuming alcohol belong to nuclear family, self employed parents and educated family background. Family income in relation to the alcohol consumption among students according to modified BG Prasad classification was class-1 are 96%, majority of the students belongs to higher income families. In regard to parents, siblings and relatives consuming alcohol showed proportional increase in number was observed in our study. Family members consuming alcohol will definitely have an impact on students.

Table-3: Showing details of alcohol consumption pattern in study group and its impact on health and social life.

Duration of alcohol consumption	Less than 1 yr – 43% 2 to 5 Yrs - 48% >5yeras -9%	Frequency of alcohol intake	Regular -16% Occasional – 77% Quit – 7%
Brand of alcohol	Beer – 8%, Wine -6% Vodka -21%, Whiskey, Brandy, Gin, Rum -21%, Multiple brands -44%	Day of last consumption	Days – 29% Weeks -38% Months – 29% Years – 4%
History of Recent road accidents due to alcohol	Yes - 5% No – 95%	Effect on physical health	Yes – 16% No – 84%
Are family members aware of their child alcohol consumption	Yes – 29% No – 71%	Effect on social life	Yes - 8% No – 92%

Types of alcohol beverages consumed in our study group were Vodka 21%, Whisky brandy Rum and gin 21% and multiple brand beverages were 44%. Majority students consume alcohol occasionally 77%,

regularly consuming students were 16%. Duration of alcohol consumption was less than 1 year were 43%, 2 to 5 years were 48% and majority of students consumed alcohol in the past few weeks were 38%, days back were 29%. This shows how frequent they were consuming alcohol in the study population. Alcohol consumption did not effect on their physical health in 84% of study group, 5% of students met with road traffic accidents after consuming alcohol. Social life of students was disturbed in 8% of study group. 71% of student family members were not aware of alcohol consumption of their ward; this shows a serious lack of supervision and control by their parents.

Figure-1: Showing details of reasons of alcohol consumption in the study group. Majority were due to multiple reasons (33%) which include social gathering, peer pressure, curiosity, and love failure and for the sake of fun. Academic stress and emotional disturbance contributes very less.

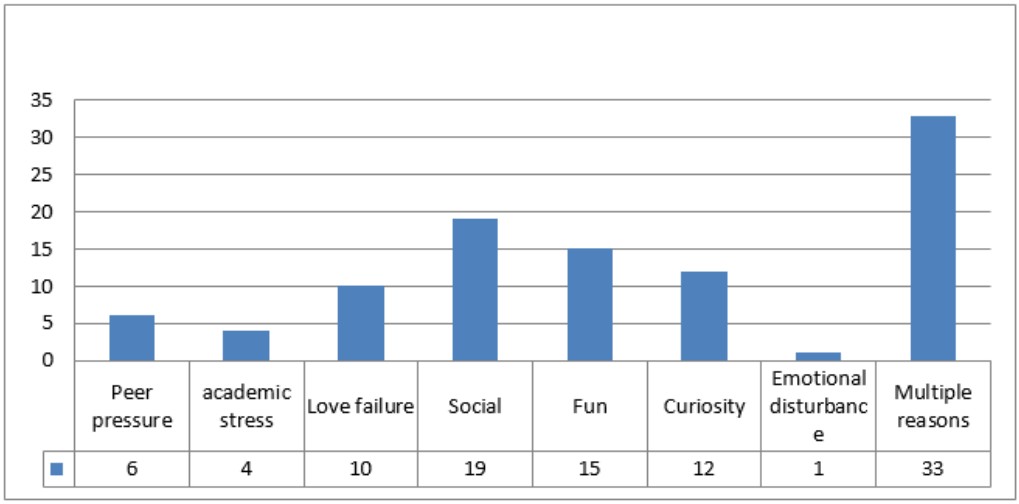


Figure-2: Showing details of History of psychiatric illness in relation to alcohol consumption was found in 44% of our study population whereas 56% of students were no history of psychiatric illness. 37% were suffering from anxiety and depression related issues and remaining 7% were suffering from other psychiatric illnesses.

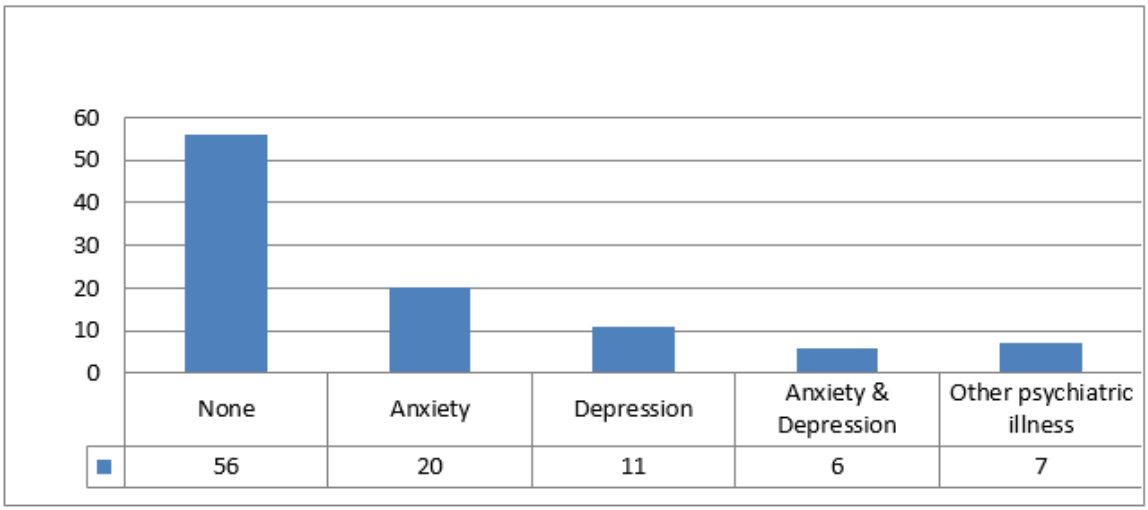
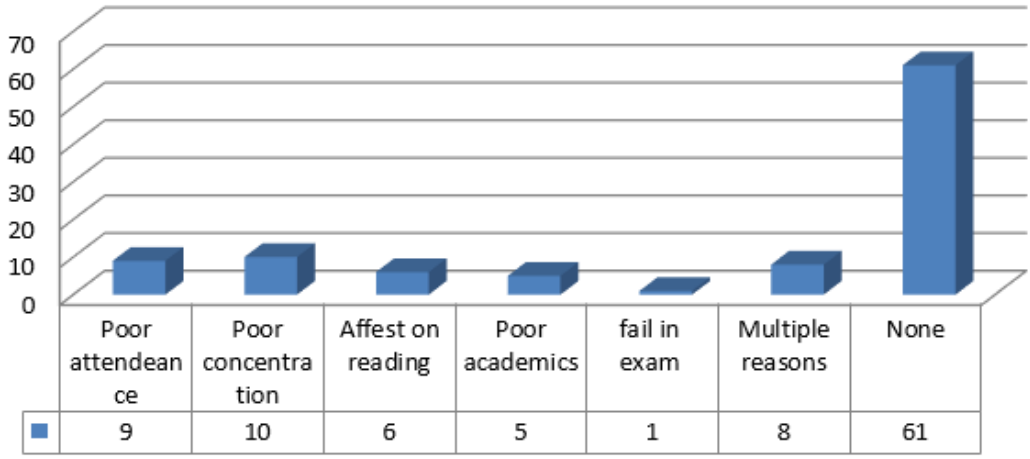


Figure-3: Showing details of academic impact due to alcohol consumption in the study group. 61% of study group had no effects whereas 39% of students had multiple academic issues like poor concentration, poor attendance and failure in examination.



Study conducted by Ningombam[7] S, Hutin Y, Murhekar MV on Prevalence and pattern of substance use among the higher secondary school students of Imphal, Manipur, India reveals that the prevalence of alcohol consumption among students was highest in student's whose family members and relatives also consume alcohol. Similar results were observed in our study. A study on illicit substance use by adolescent students in eastern India: Prevalence and associated risk factors by Dechenla[8] Tsering and Ranabir Pal shows major reason for alcohol consumption was for enjoyment and curiosity whereas in our study the most common reasons are social gathering, fun and curiosity. Alcohol use and its influencing factors among undergraduate students in Uttar Pradesh University of Medical Science in district Etawah, India. Jyoti Mehra[9], Kripashankar Nayak reveals that average age was 20 and 61% are consumed for fun, similar results were found in our study.

Conclusion

Alcohol consumption among medical students is increasing day by day. Prevalence of alcohol consumption was high among senior medical students with male preponderance and more among students of the urban area. Highest number was observed in students whose parents, siblings and relatives also consume alcohol. History of Psychiatric illness associated with alcohol consumption was observed in majority of the students. Academic impact was noticed in the study group. Majority of parents were not aware of alcohol consumption of their children, this may be the reason for increased number. Constant supervision by parents and guardians, periodical psychiatric counseling and creating knowledge and awareness on alcohol consumption and its impact on academics and health by their peer group will help in curbing this social menace.

Conflict of interest: Nil

Ethical clearance: Yes. Reference No: MRIMS/DHR-IEC-MBBS/2023/107, dated: 25-05-2023.

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Original Research Article

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Retrospective Analysis of Clinico-Epidemiological Profile of COVID 19 Associated Mucormycosis Patients: A Single Centre Experience in Southern Haryana

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Abstract

Background: A number of factors were supposed to be involved in very high rate of mucormycosis infection in COVID 19 patients like the reduced immunity because of COVID infection itself along with use of steroids, administration of supplemental oxygen, worsening glycemic control. This retrospective study has been undertaken to analyse the clinical and demographic profile of patients and various other factors that were involved in development of mucormycosis.

Material and Methods: This was retrospective observational study in which all patients admitted were either suspected but came out to be negative or which were culture or histopathological proven mucormycosis cases. The data was analysed for demographic as well as clinical profile of the patients and various risk factors involved.

Results: Total 52 patients were included in the study. All of these were rhinoorbitocerebral mucormycosis patients. The mean age of mucor positive patients was 47.3 years with male to female ratio as 5:1. The comparison of risk factors among mucor positive and mucor negative patients showed that out of 30 mucor positive patients there were 18 (60%) patients with confirmed report of COVID 19 infection, 22 (73.3%) diabetic patients, 17 (56.7%) patients with recent history of steroid treatment and 11 (36.7%) patients with history of recent oxygen therapy.

Conclusion: In this study there was no statistically significant association between specific risk factors and mucor positivity, emphasizing the multifactorial nature of mucormycosis. Further research is necessary to evaluate the complex relationship between COVID-19 infection and other factors in the development of mucormycosis.

Keywords: COVID 19, Mucormycosis, Risk factors

Introduction

With the outbreak of COVID 19 infection the whole world including our country was already struggling to manage the things and control the mortality unaware of emergence of another deadly infection the mucormycosis, popularly known as

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black fungus. It is a rare but a very serious fungal infection caused by the filamentous fungi of the order Mucorales.[1]

It primarily affects individuals with compromised immune systems. Mucormycosis has emerged as one of the most common causes of invasive mycosis in immune-compromised patients mainly diabetic patients and is known to have high mortality rates.[1, 2] Although it can attack pulmonary system, gastrointestinal tract or skin, the most common one is the rhinoorbitocerebral Mucormycosis.[3] During the pandemic of COVID 19, especially in second wave of COVID 19 this mucormycosis emerged as an opportunistic infection emerging as an epidemic within the on-going pandemic.[4] Lots of factors are involved in this very high rate of this infection in COVID 19 patients like the use of steroids, administration of supplemental oxygen, worsening glycemic control, new onset hyperglycemia and many other factors.[5] Even in cases where we deal with a suspected case of mucormycosis we need to have a rapid detection and then management particularly in cases of rhinocerebral mucormycosis as it can progress very quickly to cause the destruction of the organ involved.[6]

Many clinical centres are sharing their experiences; however in-depth analysis is needed to reach to a conclusion for the reason of this opportunistic infection which mainly attacked the COVID 19 patients. Our centre, being one of the major centres in Southern Haryana where such patients were managed, this retrospective study has been undertaken to analyse the clinical and demographic profile of patients and various factors that were involved in development of mucormycosis.

Material and methods

This was a retrospective observational study conducted at our government tertiary care teaching hospital in Southern Haryana, which was a dedicated COVID 19 care facility along with a dedicated mucormycosis ward been established, where a multi-disciplinary team of ophthalmologists, otorhinolaryngologists and physicians managed the COVID19 and later on also the mucormycosis patients.

All Patients admitted in the mucor ward or ICU of the hospital from May 2021 to November 2021 which were either suspected on the basis of clinical and radiological features but came out to be negative in culture and histopathological sample or which were culture and/or histopathological proven mucormycosis cases were included in the study. All patients who got referred or died along the course before being diagnosed either positive or negative were excluded from the study. The data of such patients was analysed for demographic as well as clinical profile of the patients and various risk factors involved in the COVID 19 associated mucormycosis. The risk factors in patients who came mucor positive were compared with those who turned out to be mucor negative on final culture and/or histopathological report. This was done by tabulating the data in Microsoft excel and analyzed by applying chi-square test with the help of Statistical Package for Social Sciences (SPSS) software, p value < .05 was considered significant.

Results

The data of total 76 patients, who were suspected of mucormycosis with either symptoms of clinical signs and were admitted either in mucor ward or ICU, was reviewed out of which 24 patients were excluded who were either readmitted or were either died or referred before confirmatory diagnosis. Total 52 patients were included in the study. All patients turned out to be with signs and symptoms of rhinoorbitocerebral mucormycosis. Out of the 52 patients included in the analysis 30 patients turned out to be mucor positive in either culture or histopathological diagnosis and 22 patients were mucor negative. The mean age of mucor positive patients was 46.73 years and the mean age of mucor negative patients was 50 years. The overall male to female ration in our study was 2.71 with slight male predominance. Among mucor positive patients the male to female ratio was 5:1 as there were 25 males and 5 females while among mucor negative patients the ratio was 1.4:1 with 13 males and 9 females.

The most common presenting symptoms were nasal blockage and facial pain followed by facial swelling and headache. Although a few patients also presented directly with signs of orbital complications

like diminished vision and periorbital swelling. The comparison of risk factors among mucor positive and mucor negative patients showed that out of 30 mucor positive patients there were 18 (60%) patients with confirmed report of COVID 19 infection, 22 (73.3%) diabetic patients, 17 (56.7%) patients with recent history of steroid treatment and 11 (36.7%) patients with history of oxygen therapy for COVID 19 management. While out of total 22 mucor negative patients 13 (59%) were with history of COVID 19 positive infection, 14 (63.6%) diabetic patients, 13 (59%) patients with recent history of steroid treatment and 8 (36.4%) with positive history of recent oxygen therapy for COVID 19 management. The comparison between confirmed mucor positive and mucor negative patients for the risk factors (as shown in Table 1) showed that although slightly more number of diabetic patients came out to be mucor positive all other risk factor were almost comparable in both the groups. And we could not find any statistically significant association between any of the risk factor and mucor positivity.

Table 1. Analysis of Major Risk Factors for Mucormycosis

	Mucor Positive	Mucor Negative	p value
COVID 19 positive	18	13	p = .95
COVID 19 negative	12	9	
Diabetes present	22	14	p = .45
Diabetes absent	8	8	
Positive History of recent steroid treatment	17	13	p = .86
Negative History of recent steroid treatment	13	9	
Positive History of recent oxygen therapy	11	8	p = .98
Negative History of recent oxygen therapy	19	14	

p value <.05 Significant

Discussion

Mucormycosis is one of the most fulminant form of Zygomycosis caused by the Mucorales species. It is a lethal infection which occurs mostly in immunocompromised individuals, particularly in those with diabetes and various malignancies.[2,7] The fungus usually enters through the respiratory tract i.e. through the nose and sinuses, from where it can progress into the orbit and can also lead to intracranial spread. The delay in diagnosis of Mucormycosis affects the outcome leading to a poor prognosis. In fact, even with early aggressive control by surgical and antifungal therapy the prognosis sometimes remains poor.[8]Therefore instead of just waiting for culture report or histopathological diagnosis the management should start as soon as possible with slightest of the suspicion even. For that a detailed knowledge of the risk factors leading to this fatal fungal infection is a must.

This study was undertaken in a view to explore the demographic profile and clinical profile including mainly the risk factors among all the suspected mucormycosis patients being admitted and managed in our hospital. Since our center was one of the major tertiary care centers in Southern region of Haryana where a large number of COVID 19 and mucormycosis patients were managed, the overall profile of our patients was presented which would add to the already existing literature related to COVID associated mucormycosis. Retrospectively we analyzed the data and other than exploring the demographic and clinical profile we compared the risk factors like history of COVID 19 infection, diabetes, recent steroid or oxygen therapy in both mucor positive and mucor negative patients. The results of our study illustrate the risk factors of mucormycosis in suspected patients. We found a higher prevalence of mucor infection among males which is similar

to many of the previous studies. A cross sectional descriptive study by Vadivel S et al. found a male predominance in mucormycosis cases with male is to female ratio of 1.6:1.[9] A study by Moorthy et al showed even more significant difference reporting 76% males and only 24% females out of 202 cases of mucormycosis suggesting a potential gender-related susceptibility to the disease.[10] Although the exact mechanisms underlying this gender disparity is not understood, the hormonal, genetic, and behavioral factors might be contributing to this male predominance.

There was a sharp rise in the cases of mucormycosis immediately after the start of and during the second wave of COVID 19 infection directly linking this deadly fungal infection with COVID 19 infection. In our study also we observed 18 (60%) COVID 19 patients developing mucormycosis which is consistent with that of other studies too like that of Chillana S et al who observed 62% of mucormycosis cases being COVID 19 positive.[11] This can be easily explained with the state of compromised immune status in COVID 19 infection both directly because of this viral infection and also because of the use of steroids and oxygen therapy among the positive COVID patients.[12, 13]

However, another thing which cannot be missed is that almost around 59% of mucor-negative patients also had a history of COVID-19 infection. This suggests that although COVID-19 infection may serve as a predisposing factor, other underlying factors also have a significant role in the development of this deadly infection. Immunological factors, such as variations in the host immune response, genetic susceptibility, and comorbidities, may influence the outcome of mucormycosis.[5]

Although we didn't find any significant statistical association between COVID 19 and development of mucormycosis (p = .95). Further research is required to verify the actual relation between COVID-19 infection and the development of mucormycosis.

All these patients who were suspected to have COVID associated mucormycosis presented with the symptoms related to nose, face and oral cavity. The most common presenting symptoms were nasal blockage and facial pain followed by facial swelling and headache although few patients also presented with nasal blockage and loose tooth. In the patients in whom nasal endoscopy and MRI paranasal sinuses showed features of necrosis in the nasal cavity underwent endoscopic debridement or maxillectomy. All the suspected patients received injectable amphotericin B initially till the results of culture or histopathology came. Only the confirmed mucor positive patients received posaconazole on discharge. Although the overall details of whole treatment protocol is beyond the objectives of this particular study.

Regarding the main risk factors, such as diabetes, recent history of steroid and oxygen therapy, in this study we could not find statistically significant association with mucor positivity. Studies have shown that even before this epidemic of mucormycosis diabetes posed as a major risk factor for mucormycosis.[14] When we compared the distribution of diabetes among patients between the mucor-positive and mucor-negative groups we found that among mucor positive patients 73.3% patients were diabetic while among mucor negative patients 14 (63%) out of 22 patients were diabetic which is quite comparable. This indicates that few other factors also contribute to mucor infection in non-diabetic individuals like iron overload has also been found to be a potential risk factor for mucormycosis.[15,16] Although no significant statistical relation could be established between diabetes and mucor infection (p = .45).

As for as the recent history of steroid therapy is concerned it is the mucor negative group which had an edge with 59 % patients giving the history of recent steroid treatment as compared to mucor positive group which showed 53% patients giving the history. The lack of a significant association between recent steroid treatment and mucor positivity in this study (p = .86) can be explained that in this study we had taken in consideration only the history of steroid treatment but didn't quantify the dose and type of steroid being given. It is quite possible that the timing, duration, or dosage of steroid treatment was different among the patients in the two groups, which could influence the risk of development of mucormycosis. Moreover the use of other immunosuppressive agents or some other comorbidities might have an interaction with

steroids leading to the development of this potentially fatal fungal infection.[17] As in a study by Bhandari S et al all the factors were studied and they showed that 84% patients had the history of steroid usage with methylprednisolone being the most common (66.8%) and the steroids were taken for an average time period of 7-14 days only.[18] In analyzing the oxygen therapy as a potential risk factor for mucormycosis we found that in both mucor positive as well as mucor negative patients it was a comparable distribution though not statistically significant (p = .98) of oxygen therapy. So as with steroid therapy same goes for this also. It is important to consider the duration of therapy, mode of delivery and other coexisting predisposing factors while analyzing the role of oxygen therapy in mucormycosis development.[19, 20]

There are few limitations in the study which cannot be ignored. The lack of significant association between risk factors and mucor positivity might have been because of small sample size. Moreover as the study was retrospective in nature it may have led to inadvertent selection bias and incompleteness of the data. Regardless of these limitations this study adds to the existing literature on demographic and clinical profile of patients including the risk factors for the development of mucormycosis.

To conclude, this study sheds light on demographic features, clinical presentation and the risk factors of rhinoorbitocerebral mucormycosis in suspected patients. The slightly higher rate of mucor infection among male patients and in patients with confirmed COVID-19 infection highlights the importance of these two main factors in mucormycosis pathogenesis. However, in this study there was no statistically significant association between specific risk factors and mucor positivity, emphasizing the multifactorial nature of mucormycosis. Further research is necessary to evaluate the complex relationship between COVID-19 infection, host immune response, and other predisposing factors in the development of mucormycosis.

Conflict of Interest: Nil

Source of Funding: None

Ethical Approval: Obtained from Institutional Ethical Committee

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Original Article

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Role of P63 in Benign and Malignant Lesions of Breast

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Abstract

Introduction: Breast carcinoma is leading cause of cancer death in women. Breast lesions constitute heterogeneous group of diseases with wide variety of etiologies ranging from inflammatory-benign- malignant lesions. There are several reported markers for immunohistochemical detection of myoepithelial cells. Smooth muscle specific proteins, such as smooth muscle actin, smooth muscle myosin heavy chain, calponin and h-caldesmon are used to highlight myoepithelium. p63 antibody is myoepithelial cell marker that selectively stains nuclei. It is negative in stromal, myofibroblastic and adipocytic cells.

Aims and Objectives: The aim of this study was to establish role of p63 expression in distinguishing benign breast lesions, premalignant lesions and malignant tumors of breast.

Materials and Methods: 30 cases were selected from core biopsy, lumpectomy and mastectomy specimens of breast received at department of Pathology, Chalmeda Anand Rao Institute of Medical Sciences during the period of January 2021 to December 2021 and were studied prospectively. All specimens were processed according to CAP protocol and reported . Immunohistochemistry was performed to determine p63 expression in those specimens. p63expression was evaluated as continuous positive/discontinuous positive/negative.

Ethical Approval: This study was reviewed and approved by institute ethics committee, CAIMS, Karimnagar.

Results: Among total 30 cases, 18 cases (60%) were benign lesions and all were positive for p63 expression. 3 cases (9.99%) were premalignant and were least positive for p63 expression. All malignant cases 9 cases (29.99%) were negative for p63 expression.

Conclusion: The Positive correlation was seen between histomorphological features and p63 scoring in all the lesions, So p63 is good Immunohistochemical marker for evaluating breast lesions.

Keywords: p63, Ductal carcinoma in situ, Fibroadenoma, Invasive ductal carcinoma, Myoepithelial cells.

Introduction

Breast lesions are heterogenous group of diseases having marked clinical and morphological diversity. [1] These are the most commonly associated lesions in women that require the prompt histopathological diagnosis and immunohistochemical analysis (IHC). [2] Breast cancer is the most common cancer in the world mainly in developed countries, it is the most

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common cancer in women, breast cancers account for the 22% of all female cancers worldwide and 12% of breast cancer occurs in women between 20-34 years.[2,3] Ductal carcinomas arising from cells of the terminal ductal lobular units are reported to be the most common among all tumors.[4]

The layer of myoepithelial cells which lie between the luminal epithelial cells invests the glandular tree and is identifiable on routine hematoxylin and eosin (H&E) stained sections.[5] Immunohistochemical methods are being used to highlight the presence of intact myoepithelial cell layer.[6] The precise identification of myoepithelial cells can give diagnostic clue to differentiate benign lesions, benign proliferative lesions with similar morphological appearance, in situ neoplasms from invasive carcinoma of breast.[7]

Myoepithelial marker p63, a member of p53 gene family is expressed in the nuclei of myoepithelial cells of normal breast [6] and also expressed in epithelial cells of stratified epithelia such as skin, esophagus, ectocervix, transitional epithelia of bladder, basal cells of glandular structures of the prostate, salivary glands and in bronchi.[5,6]

p63 is more sensitive marker as it stains exclusively the nuclei of myoepithelial cells of the breast and do not cross react with stromal myofibroblasts, vascular smooth muscles and adipose tissue unlike other myoepithelial cell markers such as smooth muscle actin (SMA), calponin, caldesmon, smooth muscle myosin heavy chain (SMMHC), cytokeratins 5/6 and CD 10.[7,8] This makes p63 a more sensitive and the superior marker over other myoepithelial markers and can be included in IHC panels to identify the myoepithelial cells in problematic breast lesions. [9]

In normal breast, p63 is demonstrated as continuous intense staining pattern.[10] In the benign non-proliferative lesions it is continuously positive, in proliferative lesions it is discontinuously positive and in situ lesions show focal positivity.[11,12] Invasive carcinomas lack the myoepithelial cell layer and hence negative for p63 staining.[13,14] Thus p63 expression is of diagnostic clue to differentiate benign lesions, benign proliferative lesions with similar morpholological appearance, in situ neoplasms and invasive carcinoma of the breast.[15,16]

Materials and Methods:

Study design : Prospective

This study was studied on total of 30 cases of breast specimens received in the histopathology unit, Department of Pathology, Chalmeda Anand Rao Institute of Medical Sciences, Bommakal, Karimnagar, irrespective of age and gender during the period from January 2021 to December 2021. Clinical history, informed consent and the examination findings of the patients were collected in all cases. All specimens were routinely processed and stained with hematoxylin and eosin (H&E) stain . The detailed histopathological examination (HPE) was done. Then the unstained sections were subjected to p63 antibody staining using Standard non-biotin polymerized horse radish peroxidase (HRP) technique to localise p63 antigen using the normal breast tissue as a positive control.

Inclusion criteria

- Patients of all age and both gender were included in the study.
- The Core needle biopsy, trucut biopsy of breast, lumpectomy and mastectomy specimens.

Exclusion criteria

- Inadequately fixed and processed specimens.

Table 1 : Distribution of different breast lesions

DIAGNOSIS	No of cases	Percentage (%)
BENIGN		
Fibroadenoma	9	30%
Fibrocystic disease	4	13.33%
Benign phyllodes tumor	1	3.33%
Tubular adenoma	1	3.33%
Usual ductal Hyperplasia	2	6.66%
Benign papilloma	1	3.33%
PREMALIGNANT		
Ductal carcinoma insitu	3	9.9%
MALIGNANT		
Infiltrating ductal carcinoma, not otherwise specified	7	23.33%
Papillary carcinoma	2	6.66%
TOTAL	30	100%

Immunohistochemical analysis/ scoring for breast lesions:

p63 expression was evaluated as continuous positive/ less continuous positive/ discontinuous positive/ Negative and scoring is done with reference to verma et.al.[10]

Results

Among total 30 cases in our study, 18 cases were benign which included 9 cases fibroadenoma (Figure 1A), 4 fibrocystic disease, 2 usual ductal hyperplasia, 1 benign phyllodes, 1 tubular adenoma and1 benign papilloma. Premalignant lesions include 3 cases of ductal carcinoma in situ (DCIS) and malignant cases include 7 cases of Infiltrating ductal carcinoma not otherwise specified (NOS) (Figure 1B) and 2 cases of papillary carcinoma (Table-1).

Age wise distribution

The age of patients ranged from 14 to 78 years and majority of cases 12 (40%) were between age group 35 - 50 years.(Table-2)

Table 2: Age wise distribution of cases

Age	<35 years	35-50 years	>50 years
No. Of cases	8	12	10

Size wise distribution

In our present study majority of cases i.e. 22 cases (73.33%) were of size 2-5 cm. The mean size of the benign tumor was 3.5 cm and malignant tumor was 7.5 cm. (Table-3).

Table 3 : Distribution of cases on the basis of size of lump (n=30)

Size (cm)	Benign	Malignant	Total
< 2cm	1(3.33%)	-	1(3.33%)
2-5 cm	16(53.33%)	5(16.66%)	21(69.99%)
> 5 cm	2(6.66%)	6(20%)	8(26.66%)
Total	19(63.33%)	11(36.66%)	30(100%)

P63 EXPRESSION:

Among total 30 cases, 18 cases (60%) were benign lesions and all were positive for p63 expression. 3 cases (9.99%) were premalignant and were least positive for p63 expression. All malignant cases 9 cases (29.99%) were negative for p63 expression. Among benign cases, the fibroadenoma was most common and showed the continuous p63 expression with score 3 (Figure-2A), Benign papilloma also showed continuous p63 expression with score 3. Other remaining benign lesions included in study like fibrocystic disease, Usual ductal hyperplasia and tubular adenoma (Figure- 2B) showed less continuous positive with score 2. Premalignant lesions like DCIS showed least positivity with score 1(Figure-3) and all the malignant lesions, invasive ductal carcinoma (Figure- 4) and the papillary carcinoma were negative for p63 expression.(Table-4)

Table 4 : Distribution of different breast lesions

DIAGNOSIS	No of cases	p63 scoring			
		Score-0	Score-1	Score-2	Score-3
BENIGN					
Fibroadenoma	9				+
Fibrocystic disease	4			+	
Benign phyllodes tumor	1		+		
Tubular adenoma	1			+	
Usual Ductal Hyperplasia	2			+	
Benign papilloma	1				+
PREMALIGNANT					
Ductal carcinoma insitu	3		+		
MALIGNANT					
Infiltrating ductal carcinoma, not otherwise specified	7	+			
Papillary carcinoma	2	+			
TOTAL	30				

Discussion

In our study, 60% cases were benign which is roughly close to the findings of Verma[1] et al with 67.6% and stefanaou [7]et.al with 52.63% and is higher than Werling [10] et. al who found percentage of benign cases to be 12.8% respectively.

In the present study, 29.99% cases were malignant which is slightly lower than the findings of Verma et al with 32.4% and much lower than Stefanaou et al[7] and Werling et al as their results were 36.09% and 41.17% respectively. Fibroadenoma accounted for 30% of all the breast lumps which was in agreement with most of the available literature on benign breast lumps, where the frequency ranged from 46.6%-67.6%. Invasive ductal carcinoma was the commonest malignant lesion in our study (23.33%), which was similar to findings of Verma et al with 27.5% cases of invasive ductal carcinoma and Stefanaou et al with 23.3% cases respectively.

Size And Age Distribution

In our study, all breast lumps were in range of 0.5-8cm and maximum of them (71.69%) had tumour size 2-5cm. Only 66 % of benign cases had tumor size more than 5cm while 20% of malignant cases had tumour size >5cm.

with a size >2cm and 10.9% with a size <2cm were malignant.

In our study, majority of cases 12 cases (40%) were in the age group of 35-50 years (39.62%) which was similar to study done by Verma et. Al[1], Stefanaou et.al[7] and Werling et.al[10]. Reibero-A[12] et.al have taken only the breast carcinoma cases in their study and the common age group in majority of cases was between 50-70 years.

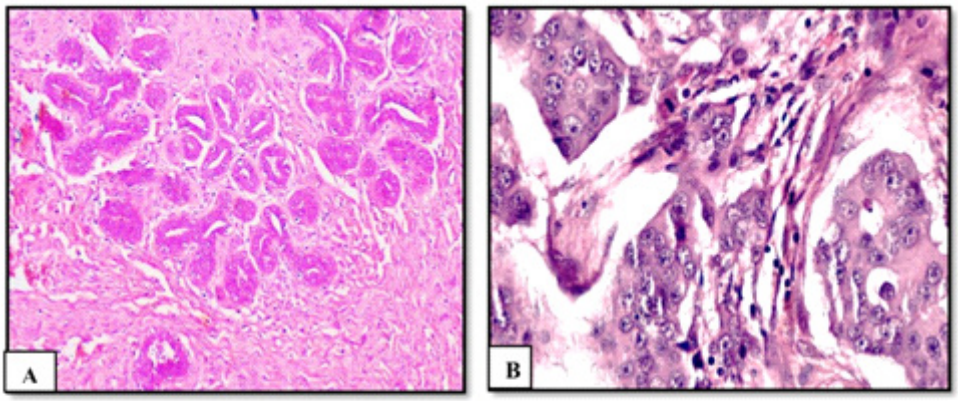

Figure-1: Microphotograph of : A) Fibroadenoma (H&E, 200x); B) Invasive papillary carcinoma (H&E, 400x)

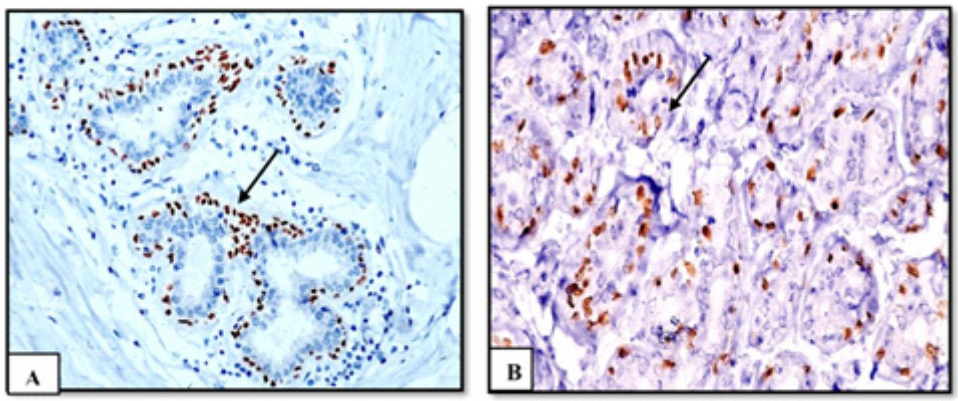

Figure-2: IHC: A- p63 expression in Fibroadenoma (Score-3) (200x)

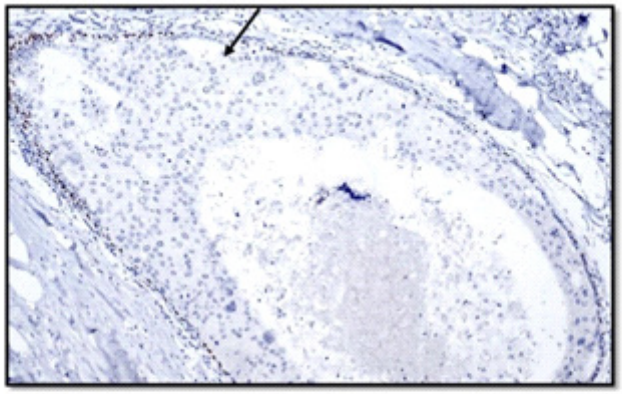

Figure-3: IHC - p63 expression in Ductal carcinoma in situ (Score – 1) (200x)

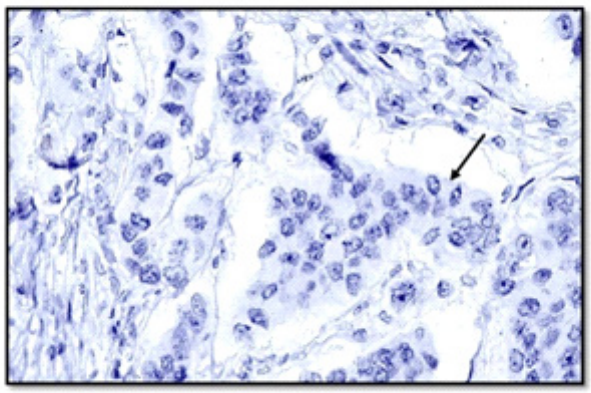

Figure-4: IHC - p63 expression in Invasive ductal carcinoma (NOS) (Score – 0) (400x)

P63 EXPRESSION

In our study, all the benign and premalignant tumors were positive for the p63 expression while 100% of the malignant tumors were devoid of p63 positivity. In 2000, Barbareschi M et al [5], investigated the 384 samples of normal and diseased human breast, including 300 invasive carcinomas, noted that p63 positivity was present in all benign lesions while invasive breast carcinomas were consistently devoid of the nuclear p63 staining. In 2002, Xiaojuan Wang[6] et al investigated 40 cases, all of which contained normal breast tissue, ductal hyperplasia, ductal carcinoma in situ and invasive ductal carcinoma; p63 was exclusively expressed in the myoepithelial cells of normal breast, partially expressed in ductal hyperplasia, rarely expressed in carcinoma in situ and not expressed in invasive carcinomas.

Conclusion

The pattern of p63 expression was studied on total of 30 cases in our study. The Positive correlation was seen between histomorphological features and p63 scoring in all the lesions. Majority of the cases were presented in age group of 35-50 yrs. Overall mean size of the tumor was 4. There was No correlation seen between age of patient, size of lesions, lymph node status, histologic grading and staging with the p63 expression in our study. Among the benign category, the non-proliferative lesions were continuous positive, the proliferative lesions showed less continuous positivity for p63, premalignant lesions showed least positivity and all the malignant lesions were devoid of p63 staining.Thus our study suggests that p63 expression has helped us to find the existence of myoepithelial cells in breast lesions as well as its pattern of expression has helped us in differentiating many complex epithelial lesions of the breast; suggesting p63 is good immunohistochemical marker for evaluating breast lesions.

Conflict of Interest: NIL

Funding : NIL

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Risk Factors of Syphilis Infection among Female Sex Workers (FSW) in Indonesia 2018/2019: A Cross Sectional Study

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Abstract

Background: *Syphilis* is one of the most common causes of curable bacterial sexually transmitted infection (STI) worldwide. Female sex workers (FSW) are the key population to be affected by STI. in Indonesia, little is known about syphilis infection in most at risk population. This study aimed to know the risk factors of syphilis among FSW in Indonesia 2018-219.

Methods: This research uses Cross Sectional study design. This study used secondary data based on the Integrated Biological and Behaviour Survey (IBBS) 2018-219. The study population was 5,816FSWs who registered in the IBBS 2018-2019 in 16Districts/Municipalities in Indonesia. The study sample was derived from an eligible population that met the inclusion criteria=5,647 respondents.

Results: The results show the prevalence of Syphilis among FSW was 1.3%. Syphilis infection is associated to condom consistent (OR=1.7 ; 95%CI=1.094– 2.853 and STI Information (OR=1.7; 95%CI=1.115–1.788).

Conclusion: FSWs who do not use condoms consistently and correctly when having sex with customers and those who do not receive health information about syphilis are at higher risk of syphilis infection. For this reason, FSWs must use condoms consistently and correctly every time they have sex with customers.

Keywords: *Syphilis, FSW, Condom Consistent, STI*

Background

STI are a major public health problem worldwide, affecting quality of life and causing serious morbidity and mortality. STIs have a direct impact on reproductive and child health through infertility, cancers and pregnancy complications, and they have an indirect impact through their role in facilitating sexual transmission of human immunodeficiency virus (HIV). In 2012, an estimated 357 million new cases of curable STIs (gonorrhoea, chlamydia, syphilis and trichomoniasis) occurred among 15–49 years-old worldwide, including 78 million cases of gonorrhoea.(1)

Four curable STI, syphilis, gonorrhoea, chlamydia and trichomoniasis, cause more than 1 million infections each day(2). Syphilis is a bacterial

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STI caused by *Treponema pallidum* which results in substantial morbidity and mortality, and it is curable. Syphilis is transmitted through sexual contact with the infectious lesions, via blood transfusion or from a pregnant woman to her foetus(3). Having a syphilis sore may make it easier for HIV to infected someone.A cross-sectional study in December 2011 targeting FSWs and their clients in Togo found if who were infected with syphilis were 3.4 times more likely to be infected with HIV(4). Study in Chongqing from 2013 to 2018, found that sex workers diagnosed with syphilis were at 4.8 times the risk of getting HIV : AOR (95%CI)= 4.88 (1.95 to 12.18)(5)

FSWs are perceived as one of the "core groups" at risk of STI, with multiple partners and low socioeconomic and cultural backgrounds strongly contributing to their vulnerability. Commercial sex workers may infect and become infected by their clients (considered a "bridging group" of men who use condoms inconsistently and do not practise safe sex with their spouses), and FSWs may subsequently transmit the infection to other partners in the general population(6).

Recent reports of increases in the incidence of syphilis raise concerns about the adequacy of the current efforts to prevent sexually transmitted infections. In 2022, the UK saw syphilis cases reach their highest level since 1948. where syphilis rates jumped 8.4% between 2020 and 2021. Canada saw an increase of 389% for infectious syphilis, significantly higher than other STIs, between 2011 and 2019(7). In Indonesia, the Ministry of Health reported an increase in syphilis cases in the last 5 years (2016-2022). From 12,000 cases to almost 21,000 cases with an average annual increase of 17,000 to 20,000 cases(8). Based on the estimation of the key population of HIV in Indonesia in 2020, the number of key population of FSW was 277.624 people with 4.688.216 people customers(9). Syphilis transmission is related to sexual behaviour, such as having multiple sex partners, unsafe sex andlack of knowledge. FSW are women who sell sex as their main or additional source of income, and receive payment in the form of money, goods or favor.(10)

The aim of this study was to determine the prevalence of Syphilis and identify factors associated with Syphilisin FSW in Indonesia 2018/2019

Materials and Methods

The design of this research was cross sectional study by using secondary data sources from the 2018/2019 IBBS. The independent variables in this study were age, marital status, chlamydial infection, vaginal douching, duration of sex work, number of customers, drugs use before sexual intercourse in the last 3 months, and STI information, while the dependent variable is the incidence of syphilis infection. The target population in this study were all FSW in 16Districts/Municipalities in Indonesia.

The sample collection method uses Time-Location Sampling (TLS). TLS is a venue-based sampling that is based on clusters. The sampling frame for FSWs was a list of FSW locations and estimates of population size at each location. Biological Specimen Collection and Testing for FWS blood sample venous blood dan using Syphilis test using RPR and rapid TP.

The inclusion criteria in this study were members of FSW who fulfill the following inclusion criteria are women who are at least 15 years old, sell sex as their main or additional source of income, and receive payment in the form of money, goods or favor. The women also had sex with at least one client in the last month, while the exclusion criteria in this study namely incomplete or missing data. Statistics data analysis using computer software (SPSS) included univariate, bivariate (simple linear regression) and multivariate (regression logistics prediction factor model)

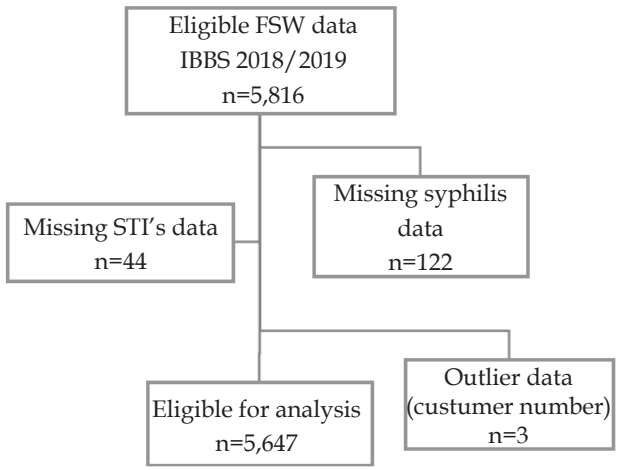

Figure 1. Sample Selection Schema

The design of this research was cross sectional study by using secondary data sources from the 2018/2019 IBBS. The independent variables in this study were Consistent Condom Use, Duration of sex work, Number of Customers (in last week), Alcohol Consumption (in 3 last mounth), Drugs (in 3 last mounth), Age, Education level, Marital status and STI information, while the dependent variable is the incidence of syphilis infection. The target population in this study were all FSW in 16Districts/Municipalities in Indonesia. Bivariate analyses were conducted to estimate the association of independent variables with syphilis prevalence simple linear regression. Logistic regression analyses were performed to determine variables associated with syphilis infection.

Results

Table. 1 Bivariate Analysis Associations of Dependent Variable with Syphilis Among FSW

Variable	Syphilis				OR	95%CI	p-value
	Positive		Negative				
	n=76	1.3%	n=5.571	98.6%			
Consistent Condom Use							
Inconsistent	50	65,8%	4332	77,8%	1,818	1,127-2,933	0,014
Consistent	26	34,2%	1239	22,2%	Ref		
Duration of sex work							
< 5 years	25	32,9%	1517	27,2%	0,763	0.471-1.236	0.272
≥ 5 years	51	67,1%	4054	72,8%	Ref		
Number of Customers							
≥ 5Person	48	63.2%	2917	52.4%	0.687	0.414-1.140	0,146
<5Person	28	36.8%	2654	47.6%	Ref		
Alcohol Consumption							
Yes	45	59.2%	2926	52.5%	0.762	0.481-1.208	0.247
No	31	40.8%	2645	47.5%	Ref		
Drugs							
Yes	2	2.6%	281	5%	1.965	0.480- 8.047	0.338
No	74	97.4%	5290	95%	Ref		
Age							
< 29 years	39	51.3%	3118	56.0%	1.206	0.767-1.897	0.418
≥ 29 years	37	48.7%	2453	44.0%	Ref		
Education level							
Low	44	57.9%	2821	50.6%	0.746	0.472- 1.180	0.210
High	32	42.1%	2750	49.4%	Ref		
Marital status							
Single	23	30.3%	1643	29.5%	1.031	0.615-1.728	0.907
Married, living with partner	7	9.2%	788	14.1%	1.625	0.725-3.642	0.238
Married, not living with partner	6	7.9%	369	6.6%	0.888	0.374-2.108	0.787
Divorce	40	52.6%	2771	49.7%	Ref		
STI information							
Unexposed	43	56.6%	3911	70.2%	1.808	1.145-2.856	0,011
Exposed	33	43.4%	1660	29.8%	Ref		

Based on table 1, it is known that the prevalence of Syphilis in FSW in 16Districts/Municipalities is 1.3%. Bivariate analysis was conducted to assess the correlation between independent variables and Syphilis infection as dependent variable. Based on simple linear regression test results, there is a significant correlation between consistent condom use (p value= 0.014 ; OR=1.818 ; 95%CI=1.127-2.933), and STI information(p value=0.011 ; OR=1.808 ; 95%CI=1.353-3.380. While the results of statistical tests on other dependent variables did not show a significant relationship with the incidence of syphilis

Bivariate analysis is also used for variable selection that enters to multivariate analysis.Variables that have p value <0.25 are included in multivariate analysis. As for the variables entered into multivariate analysis were: Consistent Condom use, Number of Customers, Alcohol Consumption, Education level, and STI information. Then multivariate analysis was carried out using logistic regression with the backward analysis method, then eliminating one by one variables that were not significant (p value <0.05) until the final model was obtained. The final model in this study can be seen in table 3 below:

Table 2 Final Fit-Model of Risk Factors for Syphilis

Variable Independent	AOR	95% CI	p-value
Consistent Condom Use	1.767	1.094– 2.853	0.020
STI Information	1.764	1.115– 2.788	0.015

From the final result of multivariate analysis using logistic regression by removing one by one the variable with p>0.05, it is known the variables that having correlation with Syphilis infection in Indonesia are Consistent Condom Use (p value=0,020 ; OR=1.767; 95%CI=1.094– 2.853) and STI Information(p value=0,015 ; OR=1.764; 95%CI=1.115–2.788).

Discussions

Based on the results of the study, it is found that Syphilis prevalence among FSW in Indonesia is 1.3%. Multivariate analysis showed a significant predictor of Syphilis infection in FSW are Consistent Condom Use and STI Information. Female sex workers who did not use condoms consistently when selling sex to customers were at 1.7 times the risk of syphilis compared to those who consistently used condoms. Likewise, the results of statistical tests showed that female sex workers who did not get information about STI were at 1.7 times higher risk of syphilis infection compared to FSW who claimed to get information about STI from health workers. The results of statistical tests it is known that the consistent condom use variable has a relationship with the incidence of Syphilis in the FSW, the results of this study are in line witha cross-sectional study, bio-behavioural survey conducted among female sex workers in six cities and ten major towns in Ethiopia. the survey was conducted in Ethiopia, from December 2019 to May 2020, found FSWs who did not consistently use condoms during sex with clients in the past 30 years had a 1.38 times higher risk of syphilis infection compared to FSWs who consistently used condoms(11).

Condoms are contraceptives or physical barriers that can reduce the risk of exposure to sexually transmitted diseases, especially those that can be transmitted through fluids that come out of the male genitals. Therefore, condoms are often the primary method of preventing sexually transmitted diseases such as syphilis because they are the easiest and most practical. Condoms cannot protect 100% against syphilis. However, when used correctly and consistently, they can effectively prevent these sexually transmitted diseases. The effectiveness of condoms can vary depending on several factors. In addition to the use of condoms for prevention, periodic health checks are needed because many people infected with syphilis are not aware that they have it because it is often asymptomatic.

Based on IBBS 2018/2019 data Proportion of FSW who had meetings with field outreach workers, received printed/audiovisual material, rreceived free condoms and were contacted by outreach workers in the last three months was still low. Similarly, few FSWs visited a health provider for treatment and few recommended STI test to their steady partner(12). This behaviour is to be expected as the lack of exposure to STI information causes FSWs not to attend health meetings or counselling and not to check themselves regularly.

In this study, more respondents have low education (50.7%) and most (70%) FSWs said they had never attended counseling on STIs or been contacted by health workers and NGO workers. This certainly affected the information on STIs obtained by FSWs. FSWs who have good knowledge about syphilis will have a better attitude to negotiate condom use and avoid risky sex when having sexual intercourse with customers.Provide health counseling on STI as a source of information on how to prevent and control STI including Syphilis. in FSWs, counseling is carried out by health workers or counselors from NGOs engaged in health/peer educator contacts, especially HIV and STI issues. in the research at the Penurunan Health Center, Bengkulu city in 2018, based on the results of statistical tests obtained p value = 0.000; OR of 2.418, it can be concluded that low knowledge is more at risk 2.418 times to suffer from the incidence of STIs in women of reproductive age who visit the Penurunan Health Center(13).

Information about STIs, including syphilis, is important to disseminate as part of efforts to prevent and control STI. Good sexual education and knowledge about how to protect yourself from STI can help reduce the spread of syphilis. Information about STIs and the importance of correct and consistent condom use should be part of good sexual education. By understanding the risks of STI and ways to prevent them, individuals can make informed and wise decisions regarding their sexual behavior.

Effective health education programs for improving the level of knowledge of STI and the promotion of correct and consistent condom use are urgently required among FSW in Indonesia. Efforts to control syphilis in FSWs can be started by providing information about syphilis including the causes, dangers, modes of transmission, signs and symptoms, and treatment of syphilis as well as how to use condoms correctly and consistently. By getting information, it will increase knowledge which will then be followed by correct syphilis prevention practice behavior such as correct and consistent condom use, being able to communicate and negotiate condom use with customers during sex. FSWs also want to check their health regularly and take treatment at health facilities until they recover if infected with syphilis. with good knowledge FSW will be able to overcome the bad stigma of STI so that they can work together with health workers in syphilis prevention and control programs.

Conclusion

STI are a global public health concern. Syphilis, can increase the risk of HIV acquisition threefold or more. Syphilis is a sexually transmitted disease that has become a public health problem, especially in vulnerable populations. Women, in particular female sex worker, face unique challenges when it comes to STI, including syphilis. Screening and treatment of Syphilis infections in FSW aims to prevent complications, spread the disease further and co-infection to HIV, especially at the FSW who don't use condom with consistently and correctly. Syphilis is a preventable disease, using condoms consistently and correctly is the best way to prevent syphilis.

In addition Good behaviour begins with enough information, so FSWs will be able to practice syphilis prevention if they have enough information.With good information about STI. By getting information, it will increase knowledge which will then be followed by correct syphilis prevention practice behavior such as correct and consistent condom use, being able to communicate and negotiate condom use with customers during sex.

Limitation of Study

This study used a cross sectional study design so that there was no clear temporal time relationship. In addition, not all variables were examined so that they were still unable to explain thoroughly about other risk factors related to the association of syphilis infection among FSW. Bias information that might occur in this study are questions that explore information that has long happened (retrospective)

Conflict of Interest: The authors declare that they have no conflict of interest.

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Spectrum of the Oral Lesions in a Rural-based Tertiary Care Teaching Hospital in Central India

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Abstract

Background: The oral cavity is a common site for pathological lesion with a wide spectrum of neoplastic and non-neoplastic lesions. They are either symptomatic or asymptomatic. Some lesions may prove to be premalignant and may be a cause of malignancy in future. Histopathological reporting is very important and essential part because the core finding we provide in reporting significantly influences the treatment part.

Material and Methods: This study was carried out in the Department of Pathology, Amaltas Institute of Medical Sciences, Dewas (Madhya Pradesh) from May 2021 to March 2023. The study included all the patients admitted in ENT, Surgery and Oncology wards of hospital presenting with oral pathology and given written informed consent. A total 80 cases were taken in to account and were studied, in relation with age, sex, site predilection. All biopsy specimens and resected tissues/organs were received in 10% formalin solution and were processed as per standard protocol and slides of standard thickness were prepared for histopathological examination. After thorough microscopic study, the diagnosis was made and categorized into major groups (non-neoplastic, benign, borderline and malignant) and subgroups according to type of lesion on histopathological examination.

Results: The site of involvement of various lesions shows maximum involvement of buccal mucosa 43(53.75%) ,followed by tongue 19(23.75%), tonsil 7(8.75%), alveolus 4(5%) , floor of mouth 3(3.75%) and least involvement of lip and palate with 2(2.5%) cases in each. Of the inflammatory lesions tonsils were the commonest site of involvement.

Conclusion: We conclude our study with the findings that lesions of buccal mucosa is commonest site and squamous cell carcinoma was the commonest entity with diversity in lesions and a wide age group of presentation. This emphasizes the role of histopathological study and diagnosis in oral lesions and provides us with valuable information of the lesion being neoplastic or non-neoplastic and timely intervention could be planned.

Keywords: Oral lesion, neoplastic, non-neoplastic, histopathology, Central India

Introduction

India ranks 2nd in the consumption of tobacco and is the 3rd largest producer of tobacco in the World as per Global Adult Tobacco Survey Report 2009-2010. The association between tobacco chewing in the form

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of gutka and cigarette smoking with pathological lesions, both pre-cancerous and cancerous has already been proven.[1] The oral cavity is a common site for pathological lesion with a wide spectrum of neoplastic and non-neoplastic lesion. They are either symptomatic or asymptomatic. Some lesions may prove to be premalignant and may be a cause of malignancy in future.[2]

Oral squamous cell carcinoma is the common oral carcinoma with varied clinical presentation. It accounts for more than 90% of all malignant lesions in the oral cavity.[3] Alveolar ridge SSC accounts for the second position, with the first being carcinoma of tongue as per site specificity. The disease burden is increasing at an alarming rate is developing South East Asian countries.[4]

One in 5 men and one in 6 women worldwide develop cancer during their lifetime.[5] The clinical manifestations of many diseases of the oral cavity can be similar to the oral manifestations of certain systemic disorders; thus often making it difficult to establish a correct clinical diagnosis. In some cases, early-stage malignant lesions can be mistaken for benign lesions. This in turn can lead to incorrect treatment, and thus to potentially fatal consequences for the patient.[6] Proper management of a patient with an oral lesion starts with an accurate diagnosis. There are lesions whose diagnosis can be made verifying on data gathered during the history and/or physical examination while there are others which need further confirmation through specialized procedures. Among the various methods available for diagnosing oral lesions, the histopathological examination of a tissue biopsy of the suspicious lesion is regarded as the 'Gold Standard'.[7] It is essential to establish an accurate diagnosis to initiate optimal therapy for oral cavity lesions. An adequate incision biopsy taken from an area representative of the lesion can provide over 98% diagnostic accuracy as to whether the lesion is malignant or not, when routine pathological techniques are used.[8] Prospective studies to assess the distribution of oro-mucosal lesions are helpful and important in estimating the prevalence of a disease in the population and thus identifying high risk subpopulation and help in preventive and curative sservices. Different sites in oral cavity show predilection for different types of lesions.[9] The majority of the cancers that occur in the oral cavity are oral squamous cell carcinomas (OSCC) arising from the squamous epithelial lining of buccal mucosa, tongue, the floor of mouth, palate, and lip.[10] The present study was planned to estimate the prevalence and pattern of oral cavity lesions in rural based tertiary teaching care hospital, Dewas, Madhya Pradesh in Central India.

Material and Methods

This study was carried out in the Department of Pathology of Amaltas Institute of Medical Sciences, Dewas (Madhya Pradesh) from May 2021 to March 2023 after taking Institutional Ethics Committee Approval and written informed consent from study participants. The study included all the patients admitted in ENT, Surgery and Oncology wards of hospital presenting with oral pathology and fulfilled the study criteria. A total 80 cases were taken in to account and were studied, in relation with all ages, sex, and sites. All biopsy specimens and resected tissues/organs were received in 10% formalin solution and were processed as per standard protocol and slides of standard thickness were prepared for histopathological examination. Staining of slides with hematoxylin and eosin (H & E) was performed. After thorough microscopic study, the diagnosis was made and categorized into major groups (non-neoplastic, benign, borderline and malignant) and subgroups according to type of lesion on histopathological examination.

Inclusion criteria: All oral cavity samples received during the study time period at Department of Pathology of Amaltas Institute of Medical Sciences, Dewas (Madhya Pradesh) from May 2021 to March 2023 at histopathology section.

Exclusion criteria: The exclusion criteria were: 1) patient with major salivary gland lesions; 2) metabolic diseases of oral cavity; 3) inadequate tissue on histopathology; 4) any repeat biopsy for residual lesion after therapy was excluded from the study.

Clinical history and physical examination were noted from biopsy specimens of oral cavity lesion were included in the study. The parameters included in the study were age, gender, site and histopathological diagnosis of the lesion. The data

was collected and analysed with suitable statistical methods.

Results

Table 1: Age wise distribution of study participants with oral lesions

Age	No.	Percentage %
<18 years	6	7.5
19-30	4	5
31-40	8	10
41-50 years	18	22.50
51-60 years	28	35
61-70	11	13.75
70 years above	5	6.25
Total	80	100

Table 2: Distribution of oral lesions

Region	Number	% Distribution
Tongue	19	23.75
Tonsil	7	8.75
Floor of mouth	3	3.75
Lip	2	2.5
Palate	2	2.5
Buccal mucosa	43	53.75
Alveolus	4	5
Total	80	100

Table 3: Types of oral lesions

Lesion	No.	%
Non-neoplastic lesions	13	16.25
Benign lesions	2	2.50
Premalignant lesions	7	8.75
Malignant lesions	58	72.50
Total	80	100

Table 4: Types of oral lesions on the basis of histopathological examination

Diagnosis	Number	% distribution
Chronic nonspecific inflammation	7	8.75
Pleomorphic Adenoma	1	1.25
Adenocarcinoma	1	1.25
Lichen Planus	1	1.25
Leukoplakia	1	1.25
Squamous Papilloma	1	1.25
Peudoepitheliomatous hyperplasia	1	1.25
Submucous Fibrosis	2	2.5
Follicular hyperplasia of Tonsil	1	1.25
Dysplastic Changes	6	7.5
Squamous cell carcinoma	57	71.25
Pyogenic granuloma	1	1.25

Table 5: Age relation of oral lesions

Type	<18yrs	19-30	31-40	41-50	51-60	61-70	>70 yrs
Non-neoplastic	6	1	1	1	3	1	-
Benign	-	1	-	1	-	-	-
Premalignant	-	-	1	1	2	2	1
Malignant	-	2	6	15	23	8	4

Table 6: Male-female distribution of oral lesion cases

Histological type Male % Female % Total %						
Non-neoplastic lesion	6	7.5	7	8.75	13	16.25
Benign	-	-	2	2.5	2	2.5
Premalignant Lesion	4	5	3	3.75	7	8.75
Malignant lesion	-	-	-	-	-	-
A. Squamous Cell Carcinoma	46	57.5	11	13.75	57	71.25
B. Adenocarcinoma	1	1.25	-	-	1	1.25
Total	57	71.25	23	28.75	80	100

A total 80 cases of oral pathology were studied from May 2021 to March 2023. Out of 80, 57(71.25%) almost three fourth were males and 23 (28.75) were females [Table 1 & 6] with male to female ratio 2.47:1. Out of total 80 cases Maximum cases were in the age group of 51-60 years, 28 (35%) , in 41-50 years there are 18(22,50%) cases with least no. cases were in the age group of 19-30, 4 (5%) . There were only 6(7.5%) cases in below 18 years and in group above 70 years there were only 5(6.25%) cases [Table 1].

The site of involvement of various lesion shows maximum involvement of buccal mucosa 43(53.75%), followed by tongue 19(23.75%), tonsil 7(8.75%), alveolus 4(5%), floor of mouth 3(3.75%) and least involvement of lip and palate with 2(2.5%) cases in each [Table 2]. Of the inflammatory lesion Tonsils were the commonest site of involvement.

Non-neoplastic lesion accounted 13(16.25%) cases and benign neoplastic lesion accounted 2(2.5%) cases, premalignant neoplastic lesion accounted 7(8.75%) cases and malignant neoplastic lesion accounted 58(72.50%) cases [Table 3]. Maximum number of non-neoplastic lesions is found in below 18 years group with youngest case was only 5 year old. 3 cases of non-neoplastic lesion were found in 51-60 year group. While in 19-30, 31-40, 41-50 and 61-70 years group only one case in each was found. Only one case of benign lesion was found in 19-30 and 41-50 year age group. Maximum number of malignant cases (squamous cell carcinoma) 23 was found in 51-60 year group followed by 15 cases in 41-50 year group with 8 cases, 6 cases and 4 cases in 61-70 years, 31-40 years and above 70 year respectively. Least number of cases (2) was found in 19-30 year age group [Table 5].

In non-neoplastic lesion highest cases 7(8.75%) were of chronic nonspecific inflammation, 1 (1.25%) was of pyogenic granuloma, 1(1.25%) was of lichen planus, 2(2.25%) were of submucous fibrosis, 1(1.25%) case was of follicular hyperplasia of tonsil and 1(1.25%) case was of pseudoepitheliomatous hyperplasia. In benign lesion 1(1.25%) case was of pleomorphic adenoma and 1(1.25%) case was of squamous papilloma. In premalignant lesion 1(1.25%) case was of leukoplakia and 6(7.5%) cases were of dysplastic changes. Out of 58 (72.50%) malignant cases 1 (1.25%) case was of adenocarcinoma of tongue in 54 year female and 57 (71.25%) cases were of squamous cell carcinoma of [Table 4].

Out of 13(16.25%) cases of non-neoplastic lesion, 6(7.5%) cases were male and 7(8.75%) cases were female. In benign category 2(2.5%) cases were females only. But in premalignant category 4(5%) cases were of males and 3(3.75%) cases were of females. Out of all 58 (72.5%) malignant cases only 1 (1.25%) case was of adenocarcinoma of tongue which was in 54 years female and out of 57(71.25%) cases of squamous cell carcinoma 46(57.5%) cases were in males and 11(13.75%) cases were in females [Table 6].

Discussion

This prospective study was done for assessment and distribution of oral cavity lesions among the biopsy specimens. The study was carried out by assessing all the slides which included a varying spectrum of pathology viz; non-neoplastic, benign, premalignant and malignant. Diagnosis of Malignant lesions in an early stage is of utmost importance for treatment with curative intent.

The importance was given for the specimens rather than the individual as the study was done on the received specimens that were sent from the Departments of General Surgery and Ear, Nose, and Throat (ENT) of this institute to Pathology Department, AIMS, Dewas, M.P. for the study period from May 2021 to March 2023. There were a total of 80 case of various oral cavity lesion received during the study period. In the present study included total 80 cases of age range was 5 year female to 82 year male, this correlates with many studies done in different part of world. In present study men with oral mucosal lesions were more frequently than in females which were similar to reported by Agarwal and Chouhan et al.[11] In contrast previous studies by Modi et al[12] reported a higher incidence of oral lesions in females probably due to more deleterious oral habits in females in their area of study. However malignant lesions were more common in males in their study as well as also reported by Lype et al.[13] Neoplastic lesions were more common in males (76.1%) than in females (23.9%) 3.6:1 which is higher than the findings of Agarwal et al[11] who observed a ratio of 3.3:1 this observation can be attributable to more unhygienic oral habits especially in males

in this region. The peak incidence of non-neoplastc lesions were seen in age group of <18 years of age in which chronic nonspecific inflammation were most common (8.75%) which is similar to Modi et al.[12] In the present study, we observed sixty-seven neoplastic cases which comprised of benign (2.50%) premalignant (8.75%) and malignant (72.50%) cases respectively. Maximum malignant lesions were seen in age group 51 to 60 years (30.1%), similar to findings of Bastokoti et al[14] but different from Agarwal et al[11]. The most common findings in this study was malignant lesions (72.50%) presented as squamous cell carcinoma (71.25%) and adenocarcinoma (1.25%).

Amongst the fifty eight malignant cases studied squamous cell carcinoma was observed in fifty seven (71.25%) cases and adenocarcinoma in one (1.25%) case; which is nearly similar to the observation in the study done by Swati Parikh et al[15] who reported (87.6%) cases of squamous cell carcinoma. It was observed in our study that benign neoplastic lesions accounts for 2 cases (2.5%) which include pleomorphic adenoma and squamous papilloma, premalignant lesions were 7 cases (8.75%) which include dysplastic chages, leucoplakia and lichen planus. It was found that oral mucosal lesions had high prevalence in age group of 30 to 69 years. Regarding for site for development of oro-mucosal lesions most common site affected was buccal mucosa followed by tongue and tonsil which was similar as that reported by Wahi et al.[16] The most common malignancy was Squamous Cell carcinoma, which is concordance with the study done by Modi D et al.[11], Patro P et al[17] and Shyam N D et al[18].

Many diagnostic tests are used to detect oral cavity malignancies like vital staining, oral cytology, light-based detection, or oral spectroscopy. But histopathology is still the gold standard and most used technique for diagnosis.[19]

Conclusion

With the results obtained in our study and with due consideration to the previous studies we conclude our study with the findings that lesions of buccal mucosa is commonest site and squamous cell carcinoma is a common entity with diversity in lesions and a wide age group of presentation emphasizes the role of histopathological study and diagnosis in oral lesions provides us with valuable information of the lesion being neoplastic or non-neoplastic and timely intervention could be planned. The oral cavity is the easily accessible site for examination and an initial awareness in the patient, to report and early diagnosis and treatment by the doctor can prevent the further progression of the inflammatory and pre-invasive lesions, thereby reducing the burden of the mutilating surgeries and helps in decreasing the morbidity and increasing the five-year survival rate .

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Original Research Article

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Novel Staging Protocol for Management of Post Covid Mucor Mycosis

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Abstract

Introduction: There is an upsurge of Mucor Mycosis infection following Covid -19 pandemic. Disordered immune system due to covid19 infection coupled with indiscriminate use of steroids is believed to be responsible for this upsurge.

Objectives: This study is aimed at analysing the preliminary epidemiological data of Mucormycosis patients admitted in a single tertiary care centre, stage them at presentation and to devise a treatment protocol according to their stage .To study the various surgical interventions , postoperative follow-up and treatment outcomes in terms of recovery rateand recurrence.

Patients and Methods: This is a prospective longitudinal study, one of the largest of its kind involving around 1841 patients diagnosed as Mucormycosis and admitted in a tertiary care hospital in India. A detailed case history, Diagnostic nasal endoscopy, CECT scan and MRI Scan were done. A novel staging was devised and patients were managed medically and surgically as per the stage. Debrided tissue was sent for microbiological and histopathological confirmation. Patients were followed-up and their recovery rates were analysed.

Results: Among 1841 patients of mucor mycosis studied, 1288 were Rhino orbital and 78 were Rhino cerebral type. 1229 patients under went surgical debridement according to the stage of disease, and rest were managed conservatively. Recovery rates fell from 90% to 26% from stage I to stage IV due to in volvement of CNS and Orbits .The mortality was as low as 17%. Re -do surgeries were done in only 12% of cases.

Conclusion: Staging of mucor at presentation helps in planning, assessing response of treatment and prognosis.

Key Words: Mucormycosis, Surgical debridement, Staging of mucor, Treatment of mucor.

Introduction

Mucormycos is is a life threatening, an gioinvasivefungus. It is a saprophytic fungus normally resides in soil , plant residue, spoiled food and upper respiratory tract as a commensal[1]. It turns infectious only in immunocompromisedindividuals .

Predisposing factors are Delta variant of Covid-19 infection, Uncontrolled Diabetes (Type-1 / Type-2 / Denovo), indiscriminate steroid use, HIV, Postsolid organ transplant, Patients on chemotherapeutic drugs and anti cancer drugs,history of O2 therapy, Ventillator / ICU management during covid infection[1].

There was paucity of literature regarding staging of the mucor cases and this resulted in lack

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of uniformity of treatment at various centres and either under treatment or over treatment of the cases. Although there was a staging system devised by Santhosh et al[1], we found that it could not be applied in our settings and we felt a need of devising a novel staging system that helped in dealing with our cases appropriately.

The present study was thus devised not only to study the epidemiological data but also to emphasise the novel staging protocol devised in our institute for mucor and applied on a large cohort of subjects that would help to fill up existing lacunae in literature on the subject and guide in similar settings.

Patients and Methods

A Total of 1841 patients of post -covid mucor mycosis were admitted in our hospital from April 2021 to November 2021.A detailed history including predisposing factors and co-morbidities gave a clinical suspicion of mucor. Diagnostic nasal endoscopy, CECT PNS scan, MRI scan was done.We devised a novel staging for Rhinoorbitalmucor mycosisand all patients were staged accordingly.

Staging: Novel staging protocol

STAGE I Involvement of nasal mucosa only with /without black eschar

Symptoms of mucor(+) withsigns of inflammation and/eschar over nasal and turbinate mucosa, sinuses not involved

STAGE II Involvement of Nasal turbinates, Septum and Para nasal Sinuses except frontal sinuswithout involving orbit

IIa Middle turbinate and Anterior ethmoid sinus involvement.

IIb Maxillary sinus medial wall and Inferior turbinate involvement.

IIc Anterior wall of maxilla necrosis with / without loss of tooth, posterior ethmoid and / sphenoid sinus involvement,

Orbital complaints with/without lamina papyracea involvement without involving the orbit. Nasal septum involvement

STAGE III Frontal sinus,roof of nasal cavity, anterior skull base and orbit involvement without loss ofvision

IIIa frontal sinus involvement, orbital complaint with periorbital swelling.

lamina papyracea necrosed.no skullbase involvement.

IIIb inflammation in periorbita,mild proptosis with orbital apex syndrome with normal or blurred vision ,posterior wall of maxillary sinus necrosis.

IIIc anterior skull base necrosis, Bilateral orbital involvement with blurring of vision ,bilateral palate/maxilla involvement.

STAGE IV Skin, Middle skull base , CNS and orbital involvement with loss of vision and cranial nerve involvement

Iva Middle skull base necrosis with pterygopalatine and infratemporal fossa necrosis , cranial nerve involvement ,with /without skin necrosis.

IVb Uni/ Bilateral orbital involvement + /- abscess with loss of vision, cavernous sinus involvement

Ivc CNS involvement with or without abscessin frontal/ temporal lobe/cerebellum, central venous sinuses thrombosis.

Treatment was started empirically on admission with Injection Liposomal amphotericin B at 5-10 mg/kg body weight, along with other symptomaticmedications.

We worked as a team formed by ENT surgeon, general physician, maxillo-facial surgeon, ophthalmologist, plastic surgeon, neurosurgeon and anaesthesiologists. Surgical debridement of involved areas in nose , sinuses, maxilla, skin and orbit was done. Tissue was sent for KOH mount, fungalculture and histopathology for confirmation .Those positive for mucorales were given definitive anti fungal treatment, those negative on histopathology were treated as bacterial sinusitis and excluded from the study.

Treatment is advocated according to the stage of disease. Stage I was treated medically only which included adequatehydration, Inj. Liposomal

Amphotericin B, along with antibiotics ,blood thinners (low mol wt Heparin) to prevent thromboembolic events, anti glycemics, correction of electrolytes and other symptomatic medication .Stage II to IV were treated with surgical debridement of involved tissues along with medical treatment. (Table 1)

Table -1-Treatment protocol as per stage

S.No	Stage of the disease	Treatment followed
1	STAGE I	Medical treatment only
2	STAGE II	FESS with/without intra orbital inj.liposomal Amphotericin B, Partial maxillectomy(Medial/Infrastructure)
3	STAGE III	FESS+/-Orbital decompression, Subtotal/Total Maxillectomy
4	STAGE IV	Full house FESS with Total /Extended Total maxillectomy with debridement of involved areas(Pterygopalatine fossa and infra temporal fossa) Drainage of cerebral abscess and orbital exenteration

Patients at discharge were given oral antifungal treatment with T.Posaconazole300 mg /day twice a day on day 1 followed by 300mg /day in divided doses and alkaline nasal douching .Patients were followed up once in 15 days for 2 months and then once in a month .In each follow up ,patients were evaluated with symptomatic assessment, LFT ,Diagnostic nasal endoscopy to clear all crusts , and repeat CECT PNS scan or MRI on suspicion of progression of disease. Patients were re-admitted and injection liposomal Amphotericin B was started on detection of disease progression or recurrence and surgical re -exploration and debridement was done wherever required.

Response to treatment was measured in terms of recovery rates according to the stage of disease and recurrence detected in the follow up of patients.

Statistical analysis

The statistical analyses were performed using SPSS version 27. The continuously measured variables were described with the means and standard deviations. Relevance between-group comparisons were performed using the independent sample's *t*-test.

Ethical statements:

Institutional ethics committee approval has been obtained for the study from Institutional Ethics committee, Gandhi medical college secunderabad with DCGI regd no .EC/180/Inst/AP/2013/RR-19 dated 26-08-2019.The present study has been given approval on 18/04/2022 with RC no-IEC/ GMC/2022/04/13.

Informed consent was obtained prior to the study and all the procedures were adhered to as per the ethical guidelines of Declaration of Helsinki

Results and Discussion

Mucor was showing male predilection(70%) and commonly seen among 40-60yr age group(**Figure 1).**

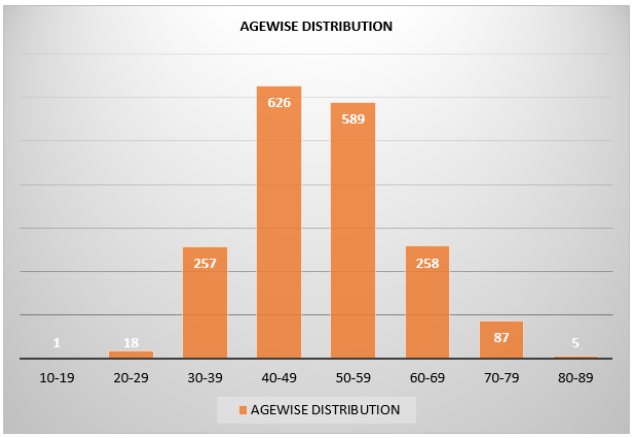

Figure 1: Age wise distribution (n=1841)

Out of 1841 patients, 1288 were Rhino orbital and 78 were Rhinocerebral and the others were Pulmonary (64), Cutaneous(2), Disseminated(401), Miscellaneous(8).

Among 1366 patients of Rhino orbital and Rhinocerebral mucor cases put together ,middle turbinate was most common area affected followed by inferior turbinate and septum **(Table- 2)**.

Table 2-Area wise distribution among Rhino orbital and Rhino cerebral types

S.NO	AREA OF INVOLVEMENT	NO.OF PATIENTS(1366)
1	NOSE	middle turbinates (1021) inferior turbinate (259) septum (86)
2	SKULL BASE	anterior (18) middle (33) Facial nerve (12) Pterygopalatine fossa (42)
3	BRAIN	frontal lobe abscess (16) cavernous sinus thrombosis(6)
4	ORBIT	1288
5	MAXILLA	248
6	FACIAL SKIN	9

Maxillary sinus was commonly affected sinus followed by sphenoid, ethmoids, and frontal **(Figure 2).**

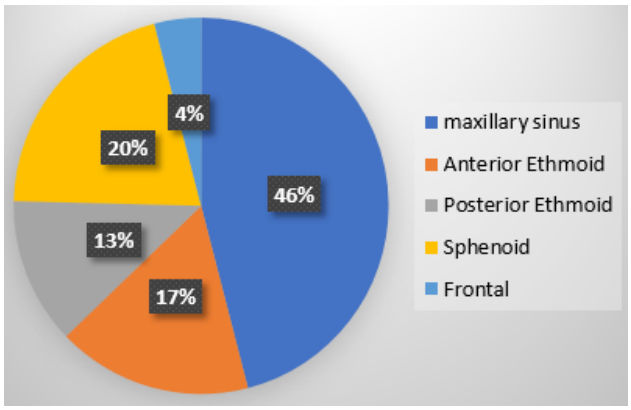

Figure 2-Paranasal sinuses involvement (n=1366)

Patients presented to hospital at stage II and III commonly, followed by stage IV and I (**Table -3).**

Table -3: Stage wise distribution of Rhino orbito cerebral mucor patients

Stage of ROMM		No. of patients(1366)	Percentage distribution %
Stage I		137	10
Stage II	Stage IIa	50	33
	Stage IIb	118	
	Stage IIc	287	
Stage III	Stage IIIa	194	46
	Stage IIIb	311	
	Stage IIIc	122	
Stage IV	Stage IVa	30	11
	Stage IVb	91	
	Stage IVc	26	

Only 1229 patients underwent surgical intervention,rest were Conservatively managed. 32 patients left against medical advice and they were excluded from the study. FESS(623) was the most commonly performed surgery,followed by partial or total maxillectomies , orbital exenterations(OE) and orbital decompressions (OD)**(Table 4)**.

Table 4- Procedure wise distribution

Stage	Procedure	Total (1229)
II	FESS	623
	FESS + PM	345
III	FESS + OD	44
	FESS + PM + OD	11
	FESS + TM	163
IV	FESS + OE	22
	FESS + TM + OE	21
	FESS + ETM + OE	32

Patients presenting as minimal orbital involvement with vision sparing like limited disease in orbital apex or medial orbit underwent orbital decompressions with or without intra orbital injections of liposomal amphotericin B . 295 patients (24 %) presented with recurrence during follow-up .They were re-admitted and stepped up to injection liposomal amphotericin B and underwent surgical debridement of involved area**.(Table 5)**

Table 5- Revision surgeries

Procedure	Total =295 (24%)
R F	55
RF+PM	74
RF+PM+OD	42
RF+TM	65
TM	54
RF+OE	5

90% recovery rate was observed in stage I in 3-6 months of medical therapy .rest progressed to stage II who underwent surgical debridement in their follow up. Stage II patients recovered by 75% on an average and rest progressed to stage III and IV in follow up over period of 6-9 months. Stage -III recovered by 57% on average in 9months to 1 year followup and rest progressed to stage IV. Stage IV patients required 12 to 18 months of treatment and followup and only 35% responded to treatment **(Table 6**).

Table 6- Recovery rates

Stage of ROMM at presentation		Recovery rates (%)	minimumFollow-up time required (months)
I		90	3-6
II	IIa	85	6-9
	IIb	78	
	IIc	64	
III	IIIa	62	9-12
	IIIb	58	
	IIIc	51	
IV	IVa	42	12-18
	IVb	38	
	IVc	26	

Rhino cerebral patients presenting with frontal lobe abscess (16 patients) underwent craniotomy and burr hole aspiration of abscess and rest were conservatively managed .

Cosmetic and functional reconstruction of thedefects was done after disease clearance by plastic surgeons and prosthodontics in patients who underwent extensive debridement .

Varying degrees of Morbidity was seen in patients with extensive and disseminated mucor who were not fit for surgery .Mortality rate in the present study was only 17 %**(Figure 3),**

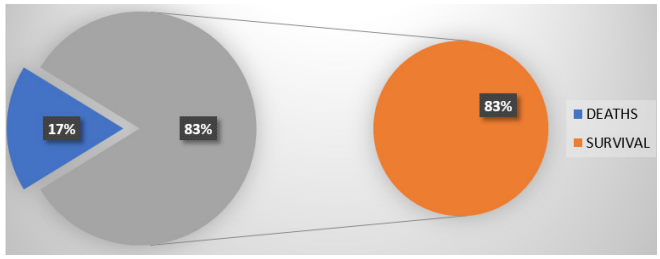

Figure 3-Mortality in Mucor

most of them were preoperative deaths (84%) seen among those with extensive disease and medically unfit for surgery.

Covid 19 pandemic was responsible in unprecedented surge in mucor mycosis cases. At our centre, we had an opportunity to study and manage huge number of cases and the present article stands as an effort to project these findings on international platform. The present study aimed at studying the epidemiology and attempted at devising and applying a novel staging system for management of mucor patients and tested it on a large cohort of 1366 patients of rhino-orbito-cerebral mucor cases.

In the present study male predilection was observed, similar results were observed in other studies on Mucor[2,3]. The common age group was 40-60 yr which also was similar to that reported in other studies[3].

In the present study, sevenclinical presentations of mucor mycosis were identified. Theywere Rhino orbital, Rhino cerebral, Disseminated, Pulmonary, Gastro intestinal, Cutaneous, Miscellaneous type[4]. Out of them Rhino orbital type which was seen in 1288 patients (69.9%), was the commonest presentation followed by Rhinocerebral type in 78 patients (4.2%), which was similar to other studies by Rimesh Paletal [5], A. Patel etal[6],and W.Jeong et al[7] that indicated an incidence of 40-60% of Rhino orbital mucor mycosis and 10-15% of Rhinocerebral mucor mycosis.

Mucor mycosis is known to stay as commensal in nose and paranasal sinuses , so middle turbinate was the first area to be involved [8] when triggered by immunosupression as detected in (74.7%) of our cases followed by inferior turbinate (18.9%) and septum (6.2%). As per previous studies in literature, maxillary sinus was the commonest sinus involved[5,8,9], which was similar to that detected in

our study (45.9%), followed by sphenoid, ethmoid and frontal . Among ethmoids usually posterior were more commonly involved than anterior, this signifies need for exploration of all sinuses even though anterior ethmoids appear normal.

Orbital involvement was seen in 74.19% of cases by direct spread of mucor through ethmoid sinuses and lamina papyracea, as seen in studies by Jacob et al[9] and Raid et al[10]. Early orbital involvement including those of medial orbital involvement and orbital apex syndromes was seen in those found to have isolated posterior ethmoid and sphenoid sinus involvement. They remain undetected in diagnostic nasal endoscopy done during follow-up. High index of suspicion based on history and CECT PNS scan helped in detecting early orbital involvement. Revision FESS with or without orbital decompressions were done to clear disease from posterior group of sinuses that prevented visual impairment in them .

Facial skin(0.6%) and facial nerve(0.8 %) involvement indicating loco-regional spread was low as compared to higher degree of involvement in other studies[6,7,8,9] Involvement of skullbasewas as low as 3.7% cases as compared to study by Jacob etal[9] (12%). Skull base, cranial nerves and brain when involved carried a grave prognosis. These lower values indicated early diagnosis and effective management of mucor that prevented disease spread in our set up.

Among Rhino cerebral type, Frontal lobe is commonest area involved (1.1%) ,followed by cavernous sinus (0.4%) as compared to study by Kapil Sonia et al [11]which showed temporal lobe infection as the commonest (3.44%) area .

A staging[1] put forth by Santhosh G Hanovar et al was not applicable to our patients as mucor infection in anterior and posterior paranasal sinuses grouped in a single stage behaved differently. we have seen that frontal sinus is very rarely involved (4%) and when involved carried a bad prognosis so we in our novel system staged it as stage III, rest all sinus involvement is staged as stage II. All mucor with Orbital involvement in Santhosh Hanovar staging was stage III, but in our study periorbital involvement without orbital involvement, orbital involvement without and with loss of vision, all three categories behaved differently and so we staged them as II,III and IV respectively. Anterior and middle skull base involvement also behaved differently so we staged them as II and III respectively.

Disseminated mucormycosis is seen in 22.3% of cases in our study. Pulmonary mucor was seen in 3.4% of cases only in our study when compared to other studies it varied between 7-10%[5,6,7,11].

Principal management protocol includes control of hyperglycemia and surgical debridement along with liposomal amphotericin B therapy. Poor drug penetration in devitalised tissue mandates the need for surgical debridement which was initiated early in course of treatment .Among 1366 patients, 1229(89%) patients underwent surgical debridement as compared to studies by Rimesh pal et al[5]and Raid et al [10]where it was 81% and 77% respectively indicating slightly higher rate of debridement in our study probably because of more number of cases coming in an advanced stage to our referral institute.137(10%) cases were managed conservatively. Surgery was not feasible in all patients due to poor general condition of patients and disseminated mucor.

As ours wasa tertiary care centre, most of the cases were managed surgically in one sitting involving multidisciplinary team. Even though preoperative CTPNS and MRI findings were taken 24-48hours before the day of surgery, on- table findings varied significantly due to rapid progression of disease. So based on the on-table findings, surgical plan was changed accordingly. FESS was the most common surgery performed (Table -III) and it was combined with various procedures like partial or total maxillectomies, orbital decompressions ,orbital exenterations as part of debridement.

In our study few patients in whom diagnostic nasal endoscopy ,maxillary sinuses and anterior ethmoids were appearing normal were discharged with tab Posaconazole treatment , later during followup visits they came back with eye swelling indicating posterior group of sinuses and medial orbital involvement. They were re -admitted and re-exploration was done to remove disease from sphenoid and posterior ethmoids and orbital decompression was done as and when required. Hence it was learnt that always our surgical debridement should be one step ahead than the disease extension depicted on radiology.

Revision surgeries were done in (24%) cases. These included revision FESS with or without orbital decompressions, Partial or Total maxillectomies with or without orbital exenterations .

Mortality rate varied depending on site of infection , immune status, various comorbidities of host and the treatment initiated. Mortality in our study is (17%) i.e., 322 deaths as compared to studies by Raid et al[10](46.3%) and Kapil sonia etal[11](18%) indicating lower mortality facilitated by proper staging and appropriate management. Deaths were due to uncontrolled diabetes leading to diabetic ketoacidosis and those with other comorbidities like cardiac and renal diseases and those with CNS extension and disseminated mucor. Mortality rate was low in patients treated with combination of amphotericin B and surgical debridement when compared with amphotericin B alone. Delay in initiation of treatment and associated complications were major predictors of survival outcomes.

Conclusion

High index of suspicion based on history and contrast imaging studies can detect early signs of mucor. Identifying them early in the course of disease can prevent orbital and CNS complications .A novel staging and treatment protocol devised at our institute helped in appropriate management of mucor patients and in predicting their prognosis.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for the clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Limitation of the study: Further follow up of the patients beyond one year would throw light on long term implications of the patient management

Ethical statements: Institutional ethics committee approval has been obtained for the study from Institutional Ethics committee, Gandhi medical college secunderabad with DCGI regd no .EC/180/ Inst/AP/2013/RR-19 dated 26-08-2019.The present study has been given approval on 18/04/2022 with RC no-IEC/GMC/2022/04/13.

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Conflict of interest Statement: There are no conflicts of interest

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Original Article

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Comparison of Umbilical Cord Milking Versus Delayed Cordclamping in Term Neonates: Randomised Control Study

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Abstract

Background: *Objectives*: To study the effect of delayed cord clamping and milking of umbilical cord on Clinico-hematological parameters in term infants.

Materials and method: The study was conducted in Muzaffarnagar medical college, muzaffarnagar. Total sample size was determined to be 100 patients fulfilling the inclusion criteria. All neonates born via normal vaginal or caesarean section in Department of Obstetrics and Gynaecology fulfilling the inclusion criteria were included in this study. A detailed history, complete physical examination & required investigations as per protocol were done for all patients.

Results: No significant differences in baseline characteristic and clinical-hemato parameters of both the groups were noticed except high bilirubin and Low APGAR score @ 1 minute in delayed cord clamping

Conclusion: Umbilical cord Milking suggested to be as non- inferior to delayed cord clamping in Term Neonates, however further study need to be done

Keywords: Umbilical cord milking (UCM), delayed cord clamping (DCC), Term neonate

Introduction

Placental transfusion provides sufficient iron reserves for first 3-6 months of life, thus preventing or delaying development of iron deficiency until use of iron-fortified food is implemented[1]. After delivery, a large volume of blood remains in the placenta and umbilical cord that could be the source for an antilogous "Placental transfusion"[2]. A newborn who receives a placental perfusion at birth either from cord milking or delayed cord clamping, obtains about 30% more blood volume than the newborn whose cord is cut immediately[3]. Receiving an adequate blood volume from placental transfusion at birth may be protective for the distressed neonate.[4] Early cord clamping and cutting of the umbilical cord is widely practiced as part of the management of labour, but recent studies suggest that it may be harmful to the baby.[5] Early cord clamping could deprive the neonate of about a quarter of its blood volume and iron.[6]

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There appears to be concerns about practicing delayed cord clamping especially in neonates needing resuscitation. In such situations, an alternative that could provide the newborn with the desired additional blood is Umbilical Cord Milking (UCM).[7] Cord milking may offer a substantial advantage over DCC in hypoxic newborns, who cannot wait for DCC as they would be at high risk of severe intraventricular hemorrhage and death.[8] UCM is the procedure defined as of "stripping" the blood from the umbilical cord to the newborn in a rapid timeframe, usually within 20 seconds.[9,10] The term is used interchangeably for intact umbilical cord milking (I-UCM)(the cord is milked when it is still connected to the placenta)and cut-umbilical cord milking (C-UCM) (the cord is milked when it is cut and separated from the placenta)

Materials and Method

Study design: prospective randomized control study

Study setting: conducted in the Department of Pediatrics & Obstetrics and Gynaecology, Muzaffarnagar Medical College, Muzaffarnagar (U.P.)

Study population: A total of 100 neonates fulfilling the inclusion criteria and born at muzaffarnagar medical college were included.

Inclusion criteria were Single Term neonates (37+0 weeks to 41+6 weeks)and availability of written informed consent from parents.

Exclusion criteria were preterm <37 weeks and post term >= 42 weeks, ABO and Rh incompatibility, Neonates requiring oxygen or any other respiratory support, Congenital malformed babies or suspected in Antenatal USG, HIV, HCV and HBsAg positive mother, Foetal distress suspected in Non Stress Test, Twins or multiple pregnancy, Abruption placenta or Placenta Previa and Short cord length(<25cm) or cord prolapse were excluded from study

Study duration: 1st January 2020 to 30th June 2021

Study methodology:

All neonates born via normal vaginal or caesarean section in Department of Obstetrics and Gynaecology fulfilling the inclusion criteria were included in this study. A detailed history, complete physical examination & required investigations as per protocol were done for all patients.

We used manually generated random number list, and assigned odd numbers to Delayed cord clamping (G1) and even number to umbilical cord milking group(G2).The numbers were written on small slips and placed in serially numbered opaque sealed envelopes. Sealed envelope was opened by a delivery room staff nurse just before delivery.

In group 1, Delayed cord clamping (DCC) was done after 60 seconds. (When cord pulsation stopped) In group 2 Umbilical cord milking (UCM), umbilical cord was clamped and cut immediately within 30 seconds at placental end, leaving cord length of at least 25cms from umbilicus of the baby. Attending Doctor placed the infant under radiant warmer where cord was held upright and milked the thrice at speed of 10cm/sec and then clamped at 2-3cm from the umbilicus.

Method of collection of data:

Data collection was composed of Clinico-hematological parameters at birth and at 48 hours after birth and length of stay in the hospital

Parameters

Clinical	**Haematological**
Apgar Score	Haemoglobin via cell Counter machine
Intraventricular haemorrhage	Serum Ferritin via Ferritin Turbidometric kit
Necrotizing Enterocolitis	Serum Bilirubin via semi-auto analyzer

Statistical analysis

The data was entered into the Microsoft excel and the statistical analysis was performed by statistical software SPSS version 21.0. The Quantitative (Numerical variables) were present in the form of mean and SD and the Qualitative (Categorical variables) were present in the form of frequency and percentage. Normal distribution of data was evaluated by Kolmogorov-Smirnov test. The student t-test was used for comparing the mean values

between the 2 groups whereas chi-square test was applied for comparing the frequency. The p-value was considered to be significant when less than 0.05

Results

Table 1: Baseline demographic parameters

	groups	Mean	Standard deviation	Mean difference	t-Test value	p-value
Maternal age (yrs)	DCC	30.2	3.21	-0.86	-1.430	0.156
	UCM	30.88	2.79			
Gestational age(weeks)	DCC	35.56	2.91	-0.16	-0.280	0.780
	UCM	35.72	2.79			
Weight of neonate(grams)	DCC	2604.28	198.56	-58.74	-1.478	0.143
	UCM	2663.02	198.81			

*DCC delayed cord clamping, *UCM Umbilical cord milking,pvalue>0.05 not significant

Table 2: Gender distribution in 2 groups

Gender	Groups		Total
	DCC	UCM	
	No. (%)	No. (%)	No.(%)
Male	23(46%)	21(42%)	44(44%)
Female	27(54%)	29(58%)	56(56%)
P value=0.687,chi-square test=0.162			

Table 3: Comparison of Haematological parameters

	groups	Mean	Standard deviation	Mean difference	t-test	p-value
haemoglobin	DCC	16.34	1.67	0.58	1.615	0.110
	UCM	15.76	1.91			
Serum ferritin	DCC	264.3	86.1	1.6	Unpaired t-Test	0.932
	UCM	262.7	90.1			
Serum bilirubin	DCC	121.16	6.31	2.98	2.037	0.044
	UCM	118.18	8.20			

Unpaired t-test, p- value <0.05 significant

Table 4: Comparison of APGAR score @1 and 5 minutes

Apgar score	groups	mean	Standard deviation	Mean difference	t test	p value
@ 1 minute	DCC	7.88	0.92	-0.18	-1.021	0.3010
	UCM	8.06	0.84			
@ 5 minute	DCC	8.88	0.92	-0.18	-1.044	0.289
	UCM	9.06	0.84			

Unpaired t-test, ,p value- >0.05 non-significant

Table 5: Birth Asphyxia incidence

Apgar score @1 minute	Groups	
	Delay cord clamping	Umbilical cord milking
	No.(%)	No.(%)
<7	3(6%)	1(2.0%)
>=7	47(94%)	49(98%)
Pvalue=0.046(significant),chi-square=5.444		

Table 6: APGAR Score @5 minute

Apgar score@5 minute	GROUPS	
	Delayed cord clamping	Umbilical cord milking
	No.(%)	No.(%)
<7	1(2%)	1(2%)
>=7	49(98%)	49(98%)
p value-1.000(non-significant),chi square=0.000		

Table 7: NICU admission of neonates

NICU Admission	GROUPS	
	Delayed cord clamping	Umbilical cord milking
	No.(%)	No.(%)
No	42(84%)	39(78%)
Yes	8(16%)	11(22%)
P value=0.044(significant), chi square=0.585		

Discussion

This study was done to compare epidemiological parameters (Maternal age, Gestational age, Gender of neonates and Weight of baby), clinical parameters (Interventricular Hemorrhage and Necrotizing Entercolitis and Apgar Score) and different hematological parameters (S. bilirubin, serum Ferritin and Hemoglobin) in delayed cord clamping (DCC) vs milking of umbilical cord (UCM) in term infants.

In this study, no significant difference in mean maternal age, mean Weight, gender of baby and Gestational age between Delayed cord clamping and Umbilical Cord Milking groups was noted.

This study has also shown that, milking the extra amount of placental blood, achieved haemoglobin level within the non-inferiority margin (mean difference 0.58 and p value – 0.110) when compared to delayed cord clamping term infants which implies that milking is non-inferior to delayed cord clamping in achieving the haemoglobinlevel

Rabe et al 2011 also compared these two techniques of delayed cord clamping and umbilical cord milking and concluded milking the cord four times achieved a similar amount of placento-fetal blood transfusion compared with delaying clamping the cord for 30 seconds. But the study was conducted in pre-term infants.[11]

In this study, there was no significant difference in Mean serum ferritin level (Mean difference 1.6 and p- value 0.932) among delayed cord clamping and umbilical cord milking Group. Agarwal et al. also showed that the mean serum ferritin in the DCC group (16.44 µg/L) was comparable to that of the UCM group (18.2 µg/L) at one year of age.[12]

Upadhayay et al 2013 found that Serum ferritin at 6 weeks was significantly higher in milking group (355.9µg/L) than in Immediate clamping group (177.5 µg/L).[13]

The mean Bilirubin level (mmol/l) was significantly more among Delayed cord clamping group (121.16±6.31) compared to Umbilical Cord Milking group (118.18±8.20). De Bernardo et al suggested that DCC was associated with an increase in haematocrit and bilirubin estimated at 72 hours after birth.[14] De Bernardo et al found that the capillary bilirubin values were higher in the DCC group compared to the ICC group but without the need for phototherapy. The difference between the two groups was not significant in regard with the level of bilirubin 6 hours after birth. [15] Shirk et al found that Peak bilirubin levels and need for phototherapy were similar between groups.[16]Kivlahan C et al found the proportion of babies requiring phototherapy in both group of our study was similar.[17]

APGAR score at 1 minute < 7 was significantly more among Delayed cord clamping group compared to Umbilical Cord Milking group. There was no significant difference in distribution of APGAR score at 5 minutes between Delayed cord clamping and Umbilical Cord Milking groups.

In present study, incidence of Hypoxic Ischaemic Encephalopathy (HIE) i.e. APGAR score at 1 minute

< 7 was significantly more among Delayed cord clamping (6.0%) group compared to Umbilical Cord Milking (2.0%) group. p value = 0.046. However, no difference was seen among both groups in Apgar score at 5 minutes. Girish et al. suggested that no significant difference was found in the number of infants with HIE in the UCM group (25 out of 50, 50%) and in the control group (26 out of 51, 51%).[18] On the other hand, in Katheria"s retrospective analysis, fewer infants who received UCM showed evidence of HIE on magnetic resonance imaging post-rewarming (5 days of life) when compared to the ICC group (8% versus 10%, p = 0.99), even if this rate was not statistically significant[19]Kumar et al,study had shown moderate to severe HIE were less in umbilical cord milking group (46.9 %)than control group(55.1%) and less neonates (44.7%) had Mild HIE in control group compared to umbilical cord milking group (53.1%) even though result was statistically not significant .Eight neonates (21.6%) in control group had Apgar at 5 min score 0-3, whereas only 4 (12.5%) neonates in cord milking group[20]

NICU admission was significantly more among Umbilical Cord Milking group compared to Delayed cord clamping group. However, no mortality occurred among both groups.

During this study, no evidence of interventricular haemorrhage and Neonatal enterocolitis were Noticed.

Limitations of study:

In this Study, we did not measure circulating blood volume, available method was beyond the scope of our infrastructure. Because of nature of the study, blinding could not be done. • This is a time bound single hospital study. To overcome these limitations, a further multicentric study with prolonged follow-up should be done.

Conclusion

Delayed umbilical cord clamping should be implemented as part of an integrated programme for childbirth and postnatal care. Alternatively, Umbilical cord milking may be considered where delayed cord clamping is not feasible as it is found to be non-inferior to DCC in this study.

Conflict of interest: Nil

source of funding: Nil

Ethical review: Informed consent was gained after fully explaining the study purpose and process to neonate attendant (parents/guardian). Ethical approval for the study was taken from Institute ethical committee

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original Research Article

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Assessment of Cobalt Binding Activity of Albumin in COVID-19 Patients and its Correlation with CRP

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Abstract

Background: Covid 19 pandemic has thrown a big challenge in terms of available manpower, space and financial recourses at all levels of healthcare facilities. The disease manifestation ranges from asymptomatic to severe but a pro-inflammatory milieu is the underlying ongoing event. Detection of pro- inflammatory markers in early stages of the disease is instrumental to avert future complications.

Method: For the present study 35 RT-PCR positive Covid patients were chosen from indoor admissions along with 35 age and sex matched controls. C Reactive Protein (CRP) and cobalt binding activity of albumin measured in both groups and compared statistically.

The values of CRP is elevated in cases (153.92± 87.56) as compared to controls (3.71± 3.07) which is statistically significant (p value= 0.001).Elevation of Cobalt binding activity of albumin is statistically significant (p value= 0.0001) in cases (151.04± 37.38) when compared to controls (81.96± 29.49). Moreover elevation of cobalt binding activity of albumin bears moderate positive correlation (r=0.609) with the elevation of CRP levels.

Conclusion: As laboratory assay of cobalt binding albumin has manifold advantages, when compared to assay of CRP, the former may emerge as a promising marker if similar result are obtained with a larger study population.

Key words: C reactive protein, Covid 19, Cobalt Binding activity

Introduction

Covid 19 pandemic has thrown a big challenge to the medical fraternity in ways more than one. The health care facilities had to strain their limited resources to deal with large number of patients within a short span of time. The hurdle that loomed large was the diagnosis, triage and prognostication of cases within available manpower, space and financial resources at all levels of healthcare facility.

This study is an attempt to remove some of these hurdles to plan a "pandemic preparedness in a humble way." Inside the human body, viral

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spike protein and human Angiotensin Converting Enzyme 2(hACE 2) receptor interaction stimulate innate and adaptive immune system resulting in cytokine release and macrophage interaction leading to increase in levels of IL 6, TNF α and IL 15[1]. The virus and host interaction creates a proinflammatory milieu characterized by increased levels of C Reactive Protein (CRP).

Albumin being a nonspecific acute phase reactant, its level decreases in any kind of systemic inflammatory condition including SARS-CoV-2[2]. Albumin is the most abundantly present plasma protein and plays an important role in maintaining plasma oncotic pressure. It also helps in transporting many drugs and other substances. The N terminal end of normal serum albumin has the ability to bind to the transition metals like nickel, copper and cobalt. This binding is important for the physiological function of albumin. In systemic inflammation, oxidative stress or ischemia induces a series of chemical reactions resulting in the alteration of the amino acid sequence in the N terminal end of albumin. This modified form of albumin is unable to bind to those metals. Due to this structural alteration in modified albumin its physiological function is also altered.

The cobalt binding activity of the modified albumin in SARS-CoV-2 is decreased and thus it differs from that of the healthy population. Thus this cobalt binding activity of modified albumin in any systemic inflammatory condition like SARS can be considered as a marker for infection. No such work has been done till now to understand this perspective clearly in our population.

C reactive protein is a non specific acute phase reactant produced by the liver.

It started secretion within 4 to 10 hrs within inflammatory exposure and continues with a half life of 19 hrs. The ease of measurement and the profile of the biomarker have made CRP useful and routinely available in clinical medicine for diagnosis.

Materials and Method

The present study was ahospital based Non-interventional, Cross-sectional Case-control study. This work was undertaken in the Department of Biochemistry, College of Medicine &Sagore Dutta Hospital, Kolkata during the period of 2021-22 after approval of Institutional ethical clearance (CMSDH/IEC/297/04-2021)

35 cases (mean age 50.15 ± 17.14 years including 11 females)selected from RTPCR Positive COVID Cases admitted in IPD, HDU & ICCU of Sagore Dutta Hospital as per the following inclusion and exclusion criteria:-

Inclusion criteria-Those that were COVID positive by RT-PCR test and agreed to take part in the study through informed consent.

Exclusion criteria- Those patients that were COVID positive with established previous history of inflammatory disorder, Myocardial Infarction or other causes of elevated CRPwere excluded from the study.

Clinical History and relevant data were collected from the patient's file/BHT with prior permission of the attending physician.

The age and sex matched 35 Controls (mean age 50.25 ±17.14 including 13 females)were randomly selected from apparently healthy individuals

Serum CRP level of the samples were measured by immunoturbidimetric method using standardized kit in autoanalyzer (ERBA XL 640)[3].A rapid colorimetric method was used to assay cobalt binding activity of albumin as designed by Bar-Or et al[4].

1 g/L cobalt chloride solution was prepared. 50 µL cobalt chloride added with 200 µL serum, mixed vigorously and incubated in dark for 10 minutes. 1.5 g/L Dithiothreitol(DTT) solution was prepared. 50 µLof this DTT solution was added in the next step and incubated for 2 minutes. Finally 1 ml of 9 g/L NaCl solution was added. Absorbances of the assay mixture were taken at 470 nm in spectrophotometer. A blank solution was prepared with all the above reagents except DTT. The values are expressed in U/ml.

Results and Discussion

Table I

Parameter	Cases (n=35)	Controls (n= 35)	t value	p value
CRP	153.92±87.56	3.71± 3.07	12.12	0.001
Co binding Activity of Albumin	151.04± 37.38	81.96± 29.49	10.25	0.0001

Table I: Denotes the Mean +- SD values of CRP and Cobalt binding activity of albumin in cases and controls. p<0.05 was considered as statistically significant.

Table I denotes the Mean +- SD values of CRP and Cobalt binding activity of albumin in cases as compared to age and sex matched controls. The increase of CRP and ACB (Albumin Cobalt Binding) values in cases is statistically significant (p=0.001)

Table II

Parameter	Pearson correlation coefficient (r)	P value
Correlation between CRPand Co binding Activity of Albumin	0.609	<0.05

Table II: Denotes the correlation between cobalt binding activity and CRP in cases. p<0.05 was considered as statistically significant

The correlation between elevated CRP and Elevated ACB in cases compared to controls shows a moderate positive correlation bearing an r value of 0.609and a p=<.0.5.

The Covid 19 disease is characterized by a wide spectrum of clinical presentation. On one end of the spectrum the presentation may be asymptomatic or mild. On the other end patients with severe disease may lead to respiratory complications requiring ICCU admissions and ventilation support. In patients where the disease features take an adverse turn factors that are responsible is not known with surety. Certain factors have been implicated e.g. pre-existing co-morbidities & a pro-inflammatory milieu inside the body characterized by Cytokine storm. Early detection of pro-inflammatory condition assists with triage, diagnostics and prognostication [5, 6]. The use ofCRP, asa biomarker in COVID-19 may present a quick and accessible tool in clinical management, provide information around likely disease progression and assist with early therapeutic ventilation.

At present CRP is measured routinely in many higher centers. However the facilities of this assay may not be available as a part of the basic health care set up. However when huge number of cases floods the healthcare facilities during the waves of pandemic, selection of serious cases may put a financial strain on the laboratory resources.

Ischemia modified albumin or Albumin cobalt binding test has come a long way from its discovery in 1990. An emergency doctor came across this test initially for recognition of ischemia. Now it is one of the United States FDA approved markers for myocardial ischemia [7, 8, 9, 10]. However ACB (Albumin Cobalt Binding) was also found to be raised in various inflammatory conditions and also needs to be assessed for its applicability as a prognostic marker in various inflammatory and auto inflammatorycondition [11]. As a significant correlation has been obtained between serum CRP levels and cobalt binding activity of albumin it will help to develop the latter as a possible pro-inflammatory marker in COVID positive patients. The cost of single quantitative estimation of serum CRP by the immunoturbidimetric method amount to no less than Rs 300 approximately along with the installation of semi-autoanalyzer or autoanalyzer in the clinical chemistry laboratories run by skilled manpower. On the contrary, a single estimation of the cobalt binding activity of albumin requires around less than Rs 10 and a simple colorimeter is sufficient for the estimation of this serum parameter [12] and can even beperformed in the bedside laboratory of a basic health care set up.

Whereas the half life of CRP is only 19 hours [13] the half life of albumin is nearly three weeks, which gives ACB test a wider diagnostic window period

that imparts an added advantage in favor of this parameter.

The limitation of this study is that it has been undertaken with a limited number of samples. If this pilot study could be generalized with increased number of samples, an economically and logistically favorable blueprint of pandemic preparedness may emerge if agreeable results are obtained. This shall equip us in a better way to deal with any future onslaughts from the COVID 19 virus.

Conclusion

Laboratory assay of cobalt binding albumin has manifold advantages, when compared to assay of CRP. The cost per test for measurement of cobalt binding activity is much less compared to CRP, requires a colorimeter which can be used even in a basic healthcare setup. This in turn will enable better screening of complicated cases at the primary level of healthcare leading to appropriate referral to higher centers.

In view of the above facts, the former may emerge as a promising inflammatory marker if similar results are obtained with a larger study population.

Ethical clearance taken from Institutional Ethical Committee, College of Medicine & Sagore Dutta Hospital, Kolkata, India (Registration No ECR/1210/Inst/WB/2019). Memo no: CMSDH/IEC/297/04-2022 Dated: 2/4/2022

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A Descriptive Survey to Assess and Compare the Breastfeeding Practices among Working and Non-Working Mothers of Infants (6-12 Months) Attending Well Baby Clinic of Selected Hospitals and MCH Centre

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Abstract

The findings of the study revealed that majority of the mothers 98 mothers (49%) had LSCS, 88 mothers (44%) had normal vaginal delivery and 14 mothers (7%) had abnormal delivery,180 mothers (90%) mothers delivered at full term whereas 13(6.5%) mothers delivered at preterm. 52(26%) mothers were giving water in between feeds to their infant who were less than 6 months and on exclusive breastfeeding. 108(74%) mothers used bottle for top feeding. 135(67.5%) mothers clean the utensils used for feeding by boiling. 16(32%) working mothers gave honey/ghutti immediately to their infants after birth whereas the number was 60(40%) for the non-working mothers. 20(40%) working mothers started complementary feeding within 4-6 months of their delivery whereas it was 95(63.3%) for non- working mothers. 18(36%) working mothers gave mashed food as complementary feed to their infants in the age group of 6-9 months whereas 32(21.3%) non-working mothers gave above items. Working mothers were giving better complementary feed to their infants but were having difficulty continuing breast feeding. The study findings revealed that there is need to impart knowledge on practice of mothers on infant feeding.

Keywords: Complementary feed, Mother, Infant, Working mothers, Non-working mothers

Introduction

Proper feeding practices from early childhood are important for normal physical and mental growth, development, optimum immunity, reducing atopic conditions and training the mothers to correct feeding habits. It is well established that under nutrition as well as obesity in early childhood is associated with increased morbidity and mortality in later life [1.]

Children are our future and the most precious resource. After birth, the health of the baby depends upon the nurturing practices adopted by their families [2.]

Traditionally, it has been believed that exclusive breastfeeding is the best form of infant and young child feeding which ensures optimum growth, enhances intellectual and emotional development and improves protection against infections, diseases and malnutrition for infant [3.]

Today's children are tomorrow's citizens. Healthy children make a healthy nation hence it is important to

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feed Infant and young child feeding practices include exclusive breastfeeding for six months, timely and appropriate complementary feeding after six months with continued breastfeeding [4].

Breastfeeding is an important public health strategy for improving maternal morbidity rates and helping to control health care costs. Just as there is no substitute for mother's love, there is no substitute for mother's milk [5].

This suggests that nurses can play an important role in the initiation of breastfeeding and for the promotion of colostrum feeding.

Due to inadequate knowledge and ill practices of mothers, many of them discard colostrum. Prelacteal feeds and early formula feeding increase the risk of infections such as lower respiratory tract infection and diarrhoea which may lead to hospitalization contributing to neonatal mortality and morbidity [13].

Indian Govt. Policies for Working Mothers

1. Government of India initiated "National Crèche Scheme" for the children of working mothers which provides day care facilities to the children.
2. Working women hostel
3. Provision of 6 months Maternity leave for mothers.

Welfare Schemes for Women in India to Promote Breast Feeding:

1. Mother and child tracking system (MCTS)
2. Pradhan Mantri Matru Vandana Yojna (PMMVY) in 2017
3. National action plan for Children
4. ICDS programme

Material and Methods

Research Design

In the present study the research design was descriptive survey to assess and compare the breastfeeding practices among working and non-working mothers of infants attending well baby clinic of selected hospitals and MCH centre, New Delhi.

Statement of the Problem

A descriptive survey to assess and compare the breastfeeding practices among working and non-working mothers of infants (6-12 months) attending well baby clinic of selected hospitals and MCH centres, New Delhi**.**

Objectives of the Study

1. To assess the breast-feeding practices of mothers attending well baby clinic of selected hospitals and MCH centre of New Delhi.
2. To assess the supplementary feeding practices of mothers attending well baby clinic of selected hospitals and MCH centre of New Delhi.
3. To compare the breastfeeding practices of working and non-working mothers.

OPERATIONAL DEFINITIONS

- **Practice**: The exclusive breast feeding of the baby for 6 months and complementary feeding after 6 months.
- **Well baby clinic**: A health service clinic for preventive monitoring, health education and advice for parents of babies from birth to 5 years of age.
- **Complementary feed**: The feed which is given after 6 months of age for additional requirements of the infant.
- **Mother:** A woman having child in the age group of 6 months to 12 months of age.
- **Infant**: A child in the age group of 6 - 12 months.
- **Working mothers**: The mother of an infant who is earning her income from being employed in a business/profession or some organization
- **Non-working mothers**: Those mothers who are not employed in profession or business and are home-makers.

Variables under the study

Age, educational status, type of family, sex of child, order of birth, type of delivery, any postnatal complication, maturity of child, major illness, ANC visit, congenital anomaly, the first part also contained additional information for working mothers regarding type of job, job site, resumption of duties after delivery, maternity leave, shift duties, information regarding the individual who is taking care of the infant in her absence, breastfeeding facilities like crèche.

Assumptions

- Mothers have the knowledge about the exclusive breastfeeding practice.
- Working Mothers have difficulty in practicing exclusive breast feeding.

Conceptual Framework of the Study

The conceptual framework used for the study was based on Orem's Self Care Theory.

Setting

The physical location and conditions in which data collection has taken place in a study is setting of the study. The present study was conducted in selected hospitals of Delhi

Sample and Sampling Technique

Population

The population was mothers of infant of age group 6 months-12month attending well baby clinic

Sample

Samples were selected mothers of infant in the age group of 6 months-12 months attending well baby clinic selected hospital and MCH centre of Delhi.

Sampling Technique

The purposive sampling technique was used for the present study.

Inclusion Criteria

- Mothers of infant who were willing to participate in the study
- Mothers of infant within the age group of 6months – 12 months
- Mothers who were available during data collection time.

Exclusion Criteria

- Those mothers who had never breastfed their child.
- Mother having child with any physical or mental sickness.
- Mother suffering from any major physical or mental illness.

Sampling Size

The sample of the present study consisted of 200 mothers who fulfilled the criteria (50 working mothers and 150 non-working mothers in a group).

Ethical consideration

Ethical clearance was obtained from the Ethical Committee of Holy Family Hospital, New Delhi. The investigator explained the purpose of the study to mothers and their written consent was obtained after explaining them about the study.

Data Collection Tools and Techniques

The data was collected using a structured Interview Schedule and practice checklist. The tool was organized in 2 parts i.e; Demographic characteristics (working mothers and non-working mothers) and Practice questionnaires on Infant Feeding. Data analysis and interpretation was done by using descriptive statistics

Validity of the tools

The Content Validity of the tool was established by submitting the tools to 11 experts. Out of them 4 were gynaecologist and 7 were Nursing faculty from Obstetrical and Gynaecological nursing

Reliability of the tools

It was administered to 20 mothers. Reliability of practice checklist was established by Cronbach alpha formula. The value of 'r' was found to be 0.82. Thus the tool was found to be reliable.

Procedure for final data collection

Data was collected from 20th December 2019 – 15th February 2020 from well-baby clinic of Holy family Hospital, Okhla, well-baby clinic at Dilshad Garden after obtaining formal administrative approval.

1. Informed consent was taken and the purpose of the study was explained to the mothers of infants (6-12 months) and an average time of 10-15 minutes was given to each participant.

Results and Discussion

Table 1: Practice Checklist and Questionnaires Regarding Initiation of Breastfeeding Practices of Mothers of Infant in the Age Group of 6-12 Months

n=200

Breastfeeding practices	Working (50)		Nonworking (150)	
	f	%	f	%
Did you breast fed your child	50	100%	150	100%
Are you still breastfeeding?	32	64%	150	100%
Did you feed the first milk (colostrum) to your baby?	50	100%	128	85.3%
Did you give honey/ ghutti immediately after birth?	16	32%	60	40%
When did you initiate the breastfeeding (hours)?				
(a) Within 1 hour	12	24%	44	29.3%
(b) 1-6	12	24%	33	22%
(c) 6-12	6	12%	6	4%
(d) 12-24	6	12%	23	15.3%
(e) 24-48	6	12%	16	10.6%
(f) 48-72	4	8%	2	1.3%
(g) After 72 hours	4	8%	26	17.3%
(h) Never fed the baby	0	0%	0	0%

- All 100% working and non-working mothers breastfed their child.
- 36% working mothers had stopped breast feeding whereas 100% non-working mothers were still breastfeeding their infant.
- 50(100%) working mothers fed the first milk (colostrum) to their baby whereas 128(85.3%) non-working mothers fed the first milk(colostrum) to their baby
- 16(32%) working mothers gave honey/ ghutti immediately after birth whereas 60(40%) non-working mothers gave honey/ ghutti immediately after birth.
- 14(28%) working mothers were giving water to the infant in between feeds when the infant was less than 6 months of age and on exclusive breastfeeding whereas 38(25.3%) non-working mothers gave water to their infant in between feeds when the infant was less than 6 months of age and on exclusive breastfeeding.
- The percentage of non-working mothers 44(29.33%) who initiated breastfeeding within 1 hour of delivery was higher than that of working mothers 12(24%). It was found that the percentage 4(8%) of working mothers who initiated breastfeeding during 48-72 hour was higher than that of 2(1.3%) of non-working mothers.

Table 2: Practice Checklist and Questionnaires Regarding Supplementary Feeding Practices of Mothers of Infant with the Age Group of 6-12 Months

n=200

Breastfeeding practices	**Working (50)**		**Nonworking (150)**	
	f	%	**f**	%
Are you giving the top feed (milk)				
Yes	30	60%	130	86.7%
No	20	40%	20	13.3%
If yes, which of the following?				
Natural milk (cow/buffalo/goat)	11	16%	49	32.6%
Forms milk (Lactogen)	15	16%	43	28.6%
Mother dairy/DMS/AMUL/NESTLE	4	8%	38	2.6%
Pasteurized milk	0	0%	0	0%
None of the above	0	0%	0	0%
How do you give top feed?				
Bottle	30	60%	78	52%
Katori and spoon	16	32%	59	39.3%
Glass	2	4%	0	0%
Cup	0	0%	0	0%
Paladay	0	0%	0	0%
Not giving	2	4%	13	8.67%
When did you start with bottle/katori/glass feeding to the baby?				
1-2 months	2	4%	11	7.33%
2-3 months	11	22%	2	1.33%
3-4 months	6	12%	1	0.67%
4-6 months	20	40%	20	13.33%
After 6 months	10	20%	95	63.33%
Not yet	1	2%	21	14%
Did you introduce complementary feed?				
Yes	22	44%	136	90.67%
No	28	56%	14	9.33%

What type of complementary feed you are giving age group (6-9 months)?				
Mashed food	18	36%	19	12.6%
Thick vegetable soup	17	34%	25	16.6%
Above items with breast milk	16	32%	32	21.3%
Sooji, Kheechri	8	16%	6	4%
Chapatti	1	2%	6	4%
biscuits	2	4%	4	2.6%
Only breast milk	0	0%	0	0%
Others, Or	0	0%	0	0%
what type of food complementary feed you are giving to the age group (10 – 12 months)				
Breast milk alone	0	0%	0	0%
Semisolid diet	3	6%	3	2%
Family diet along with breast milk	19	38%	42	28%
Liquid diet	0	0%	0	0%
How do you clean the utensils used for feed?				
Disinfectant solution	9	18%	0	0%
Only with Tap water	0	0%	15	10%
Hot water	7	14%	8	5.33%
Soap and water	10	20%	35	23.33%
Boiling	39	78%	96	64%

- There is a slight difference in the practice of giving pre-lacteal feeds. 32% working mothers had given honey and ghutti to the infant whereas it was 40% in case of non-working mothers.
- There were 28% working mothers who had given water to the infant in between feeds when the infant was less than 6 months of age & on exclusive breastfeeding whereas it was 60% for the non-working mothers.
- Top feeds were started early i.e. before 6 months of infant's age by 88% of working mothers, whereas 22.66% of non- working mothers started top feeds before 6 months of infant's age.
- There were 18(36%) working mothers who gave mashed food type of complementary feed to their infant of age group (6-9 months) whereas 32(21.3%) non-working mothers gave above items with breast milk type of complementary feed to their infant of the age group (6-9 months).

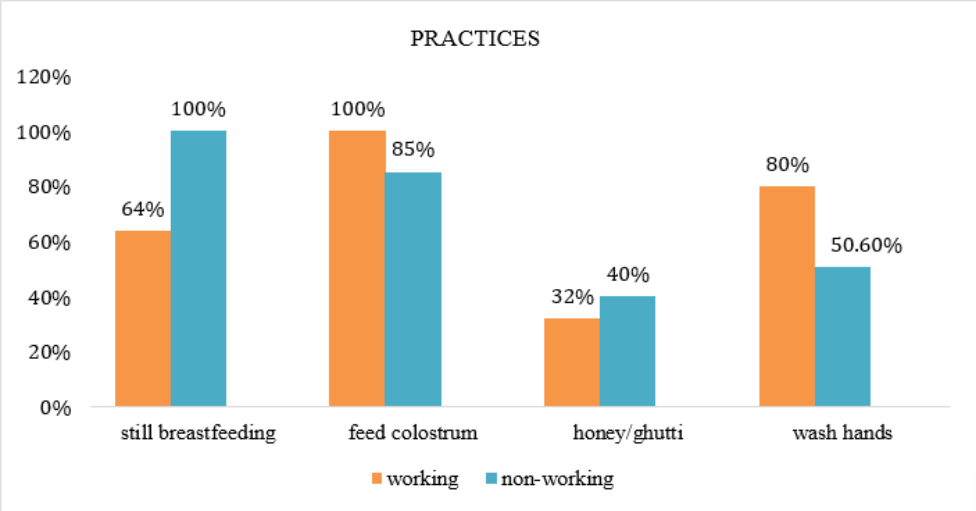

Figure 1: Bar diagram showing distribution of the study subjects based on their breastfeeding practices.

Data presented Figure 1 represents that 64% working mothers were still breast feeding whereas 100% of non-working mothers did this. 50(100%) working mothers fed the first milk (colostrum) to their baby whereas it was 128(85.3%) for non-working mothers. 16(32%) working mothers gave honey/ghutti immediately after birth whereas it was 60(40%) for non-working mothers. 40(80%) working mothers washed their hands before breast feeding whereas 76(50.6%) non-working mothers followed this practice.

Discussion

The discussion has been presented in context to the objectives and findings of the study conducted in relation with the findings revealed by the other researchers.

In the present study the sample size was 200, out of which 50 were working and 150 were non-working mothers. The findings revealed that 32% of working women practiced pre-lacteal feed and none of the working mother practiced formula milk. The findings of subjects as revealed in the study conducted by Thenisha.A in which the sample size was 172, out of which 60 were working mothers and 112 were non-working mothers. This study shows that nearly 65% of working women practice pre-lacteal feed and 70% of working women practice formula milk.

In the present study, the findings revealed that 54% of mothers used bottle for feeding. The findings of subjects in the study conducted by Asif revealed that (66.9%) mothers breastfed their youngest child and 320(77.9%) mothers used bottle for feeding.

In the present study, the findings revealed that out of 200 sample 56(28%) mothers had started breastfeeding within 1 hour after their deliveries. Colostrum was given by 89% of mothers. The findings of subjects in the study conducted by Bagul AS, Supare MS et al, revealed that out of the 384 enrolled mothers, 125(32.56%) mothers had started breastfeeding within 1 hour of their deliveries. Colostrum was given by 82 (21.38%) working mothers.

In the present study, the findings revealed that 24% of the non-working mothers and 29.3% of the working mothers had initiated breastfeeding within one hour of birth. 100% working and 85.3% non-working mothers fed the colostrum to their infant. The findings of subjects in the study conducted by Vindhya Polineni1, Prakash Boralingiah2, Praveen Kulkarni3, Renuka Manjunath revealed that 53.3% of the non-working women and 42.1% of the working women had initiated breastfeeding within one hour of birth. 95.3% of non-working women and 97.2% of the working women had fed their children with colostrum.

In the present study, the findings revealed that 38% mothers gave pre-lacteal feed to their infant. 52.5% mothers initiated complimentary feed within 4-6 months of infant's age. The findings of subjects in

the study conducted by Senthilvel V. et al., revealed that 19% mothers fed pre-lacteal feed to their infant. Only 28% mothers initiated complimentary food within 4-6 months of infant's age.

Conclusion

There is need to impart knowledge on practice of mothers on infant feeding.

- All working and non-working mothers breastfed their child. Working mothers had stopped breastfeeding whereas all the non-working mothers were still breastfeeding their infant.
- Working mothers started giving top feed to their babies early as compared to non-working mothers.
- Mothers started to give mashed food type of complementary feed to their infant of age group (6-9 months) whereas non-working mothers gave above items with breast milk type of complementary feed to their infant of the age group (6-9 months).
- None of the (working and non-working) mothers gave 'breast milk alone and liquid diet' type of complementary feed to the age group (10 – 12 months).

Ethical clearance- Taken from. Holy family hospital committee

Source of funding- Self

Conflict of interest- Nil

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Clinical Characteristics of COVID-19 Patients and Risk Factors for Shortness of Breath: A Cross-Sectional Study in Bangladesh

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Abstract

Background: Exploring the clinical characteristics, and risk factors for severe complications among COVID-19-positive patients has been helpful in identifying the most vulnerable communities to which public health practitioners should pay special attention. This study aimed to evaluate the clinical characteristics of COVID-19 patients, and risk factors for shortness of breath among COVID-19-positive patients in Chattogram, Bangladesh.

Materials and Methods: Data were collected using a structured and facilitator-administered questionnaire among the COVID-19-positive patients (N = 408). Multivariate logistic regression analysis was performed to explore the predictors of outcome variables. Data were analyzed using IBM SPSS version 24.0.

Results: It was revealed that at least one comorbidity was found among about half of the study participants, while the most prevalent symptoms of COVID-19 patients consisted of fever, cough, loss of taste, loss of smell, fatigue, and sore pain. In addition, Azithromycin is a more common treatment in our country. The multivariate logistic regression displays the COVID-19 patients aged more than 50 years (AOR = 2.05, 95% CI: 1.13-3.71) and respondents with cardiovascular disease (AOR = 4.60, 95% CI: 1.51-8.58) and the second wave of the corona pandemic (AOR = 1.78, 95% CI: 1.06-2.99) were reported as a risk factor for having shortness of breath among the virus-infected people.

Conclusion: The findings explored an empirical and practical basis for exploring the risk factors for severe complications of COVID-19 patients. Furthermore, evidence from this study might play a key role in providing policymakers with research-based evidence in their continuous effort to prevent the COVID-19 pandemic.

Keywords: COVID-19, coronavirus, clinical characteristics, risk factor, shortness of breath

Introduction

Many unexplained pneumonia cases have been reported in Wuhan, Hubei Province, China, since December 2019.[1] On January 7, 2020, a novel coronavirus from a patient's throat swab was identified by the Chinese Center for Disease Control and Prevention (CCDC),[2] which the World Health Organization (WHO) designated as 2019-nCoV on January 12, 2020.[3] Subsequently, novel coronavirus-

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infected pneumonia (NCIP) spread to the world quickly, and on January 30, 2020, the WHO declared NCIP a public health emergency of international concern.[4] Then, on February 11, 2020, they renamed it Coronavirus Disease 2019 (COVID-19).[5] The COVID-19 pandemic has spread to the entire world over the past two months. When the COVID-19 pandemic accelerates, WHO's Director-General said on March 11 that COVID-19 could be identified as a pandemic.[6] According to data released by WHO, there were 650 million confirmed cases of COVID-19, including 6.64 million deaths reported to WHO globally at 6 am GMT +6, December 20, 2022.[7] The first case in Bangladesh was reported on 8 March 2020.[8] In Bangladesh, there have been 2,036,987 confirmed cases of COVID-19 with 29,438 deaths, reported to WHO.[9]

This research study will allow the scientific community and policymakers to provide a rundown of the country's scenario at a glance, which can help raise awareness of this pandemic. To encourage the pandemic control of COVID-19 in Bangladesh, it is important to understand the clinical characteristics, and risk factors for hospitalization among COVID-19 positive patients have proven useful in identifying the most vulnerable communities to which health promoters should pay special attention. Our objective was to explore vulnerable social groups to apprise policymakers in Bangladesh, and thus contribute to the design of appropriate health strategies that consider population-specific needs.

Materials and Methods

Study design

This study used the quantitative research approach designed with a cross-sectional online survey. It attempted to address the descriptive functions by addressing clinical profiles among the patients with COVID-19 in Chattogram, Bangladesh. The cross-sectional online survey was conducted between August and December 2020, during the first wave of the pandemic, and April and October 2021, during the second wave.

Sample size and data collection

The sample size was determined using single population proportion formula considering the following assumption: p = 50%, significance level 5% (α = 0.05), Z = 1.96, margin of error 5% (d = 0.05) and 5% nonresponse rate. The sample size was 422, while 14 respondents were excluded due to inadequate data. Finally, a total of 408 patients were included as the study participants. Google Forms were used to administer the questionnaire. COVID-19 patient lists with mobile numbers were collected from the hospitals and clinics where the patients took the treatment. Then, the data collection facilitator reached outto the patients and sent them the Google form link via the social media app. Informed consent was taken from the study participants.

Statistical analysis

Chi-square ($\chi 2$) analysis was used to examine the relationship between independent and main outcome variables. Then, variables with a $p < .05$ in the chi-square test were included in the multivariate logistic regression model to assess the contribution of each of these predictor variables. Model fits for predicting risk factors for suffering the shortness of breath of COVID-19 patients was $\chi 2$ (5) = 64.23 ($p< 0.001$) and Nagelkerke $R^2 = 0.21$. Variables having a p-value<.05 in the multivariate analysis were taken as significant predictors.

Results

Descriptive characteristics of the participants

Table 1 shows the socio-demographic characteristics of the study participants. A total of 408 COVID-19 patients were included in the survey. Of the participants, 126 (30.9%) were female, while the mean age of the respondents was 38.72 (SD ±14.20) years. About one-third (133, 32.6) attained undergraduate. Of the study participants, 196 (48%) had a normal BMI and 61 (15%) had a smoking behavior. Of the participants, 193 (47.8%) had at least one chronic disease, while 16% had diabetes and 6% were suffering from cardiovascular disease.

Routes of transmission

Figure 1 depicts the routes of transmission according to the response of the study participants. Of the respondents, 25% were not sure about the specific route of COVID-19 transmission, while 23.5% reported that they were infected with the

virus through workplace contact, while 21.1% were from family members. Besides, 8.6% believed that they were infected with coronavirus by contact with risky people, 8.1% were by living in an infected area and 3.9% were by traveling to an infected area. In addition to these, 4.2% were COVID-19 positive due to the contact in the marketplace, while 3.9% were from hospital contact.

Clinical profile of COVID-19 patients

Table 2 displays that 244 (59.8%) had severe COVID-19 symptoms, while 30% had a shortness of breath, and 85 (21%) had post-COVID complications.

As illustrated in Figure 2, cough (64.1%), loss of food taste (51.1), loss of smell (47.2%), extreme physical weakness (48.4%) and fatigue (43.9%) were the most common symptoms. Among others included sore pain (39.3%), moderate fever (39.2%), headache (34.9%), high fever (32%), shortness of breath (30%), sore throat (29.6%), anorexia (25.5%), sleep disturbance (25.3%), chest tightness (19.4%), nausea/vomiting (19%), chest pain (16.6%), decreasing oxygen saturation (14.9%), etc.

Figure 3 shows that, of the study participants, 56.5% reported that they were given Azithromycin. In order to treat the patients with shortness of breath and low oxygen saturation, 27.4% were provided oxygen.

As regards post-COVID complications, Figure 4 displays that 18% had a lung infection, while 11.2% suffered from other infections. Other post-COVID complications were asthma (8.9%), psychological problem (8.8%), hair fall (7.8%), diabetes (6.7%), cardiovascular disease (5.6%), hematology (5.6%), dementia (5.5%), kidney (4.5%), etc.

Logistic regression analyses exploring the risk factors of shortness of breath

The multivariate logistic regression demonstrates that the odds of respondents getting breathing difficulty is 0.57 time slower among the male patients relative to female respondents (95% CI: 0.35-0.95). Table 11 also depicts that the aging more than 50 years had higher odds of suffering from shortness of breath (AOR = 2.05, 95% CI: 1.13-3.71). The respondents who reported having normal BMI had a lower association with experiencing odds of 0.41 compared with those who had not (95% CI: 0.25-0.67). Besides, respondents with cardiovascular disease had a significantly higher chance of getting the symptom of breathing problems (AOR = 4.60, 95% CI: 1.51-8.58). Moreover, the second wave of the corona pandemic was reported as a risk factor for having shortness of breath among the virus-infected people (AOR = 1.78, 95% CI: 1.06-2.99).

Table 1: Descriptive characteristics of the study participants

Characteristics (N = 408)	Categories	Number	Percentage
Gender	Female	126	30.9
	Male	282	69.1
Age (Mean 38.72 years, SD ±14.20)	>18-25 years	82	20.1
	>25-35 years	127	31.1
	>35-50 years	109	26.7
	>50 years	90	22.1
Educational status	Up to SSC	77	18.9
	HSC	77	18.9
	Undergraduate	133	32.6
	Graduate	121	29.7
BMI	Not normal	212	52.0
	Normal	196	48.0
Smoking habit	No	347	85.0
	Yes	61	15.0
Suffering from chronic disease	No	213	52.2
	Yes	193	47.8

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Having diabetes	No	342	83.8
	Yes	66	16.2
Having heart disease	No	384	94.1
	Yes	24	5.9
Perceived fitness	Not fit	240	58.8
	Fit	168	41.2
Perceived mental strength	Not strong	205	50.2
	Strong	203	49.8

Table 2: Overall clinical profile of the study participants

Characteristics (N = 408)	**Categories**	**Number**	**Percentage**
Level of symptoms	Low	164	40.2
	Mild/Severe	244	59.8
Short of breathing	Yes	123	30.1
	No	285	69.9
Post-COVID complications	No	323	79.2
	Yes	85	20.8

Table 3: Socio-demographic and other risk factors for severe complications of COVID-19 patients

Risk factors	Categories	Shortness of Breath		COR (95% CI)	AOR (95% CI)
		No	Yes		
Gender	Female†	78 (61.9)	48 (38.1)	1	1
	Male	207 (73.4)	75 (26.6)	0.59 (0.38-0.92)*	0.57 (0.35-0.95)*
Age	Up to 50†	241 (75.8)	77 (24.2)	1	1
	> 50	44 (48.9)	46 (51.1)	3.27 (2.01-5.32)***	2.05 (1.13-3.71)*
BMI	Not normal†	134 (63.2)	78 (36.8)	1	1
	Normal	151 (77.0)	45 (23.0)	0.51 (0.33-0.79)**	0.41 (0.25-0.67)***
Smoking habit	No†	243 (70.0)	104 (30.0)	1	
	Yes	42 (68.9)	19 (31.1)	1.06 (0.59-1.90)	
Having diabetes	No†	250 (73.1)	92 (26.9)	1	1
	Yes	35 (53.0)	31 (47.0)	2.41 (1.04-4.13)**	1.27 (0.65-2.49)
Having heart disease	No†	275 (71.6)	109 (28.4)	1	1
	Yes	10 (41.7)	14 (58.3)	3.53 (1.52-8.19)**	3.60 (1.51-8.58)**
Perceived physical fitness	Not fit†	155 (64.6)	85 (35.4)	1	1
	Fit	130 (77.4)	38 (22.6)	0.53 (0.34-0.83)**	0.61 (0.36-1.02)
Pandemic wave	First†	219 (73.2)	80 (26.8)	1	1
	Second	66 (60.6)	43 (39.4)	1.78 (1.12-2.83)*	1.78 (1.06-2.99)*

† = Reference; COR = Crude Odds Ratio; AOR = Adjusted Odds Ratio; CI = Confidence Interval;

* = p <.05; ** = p <.01; *** = p <.001

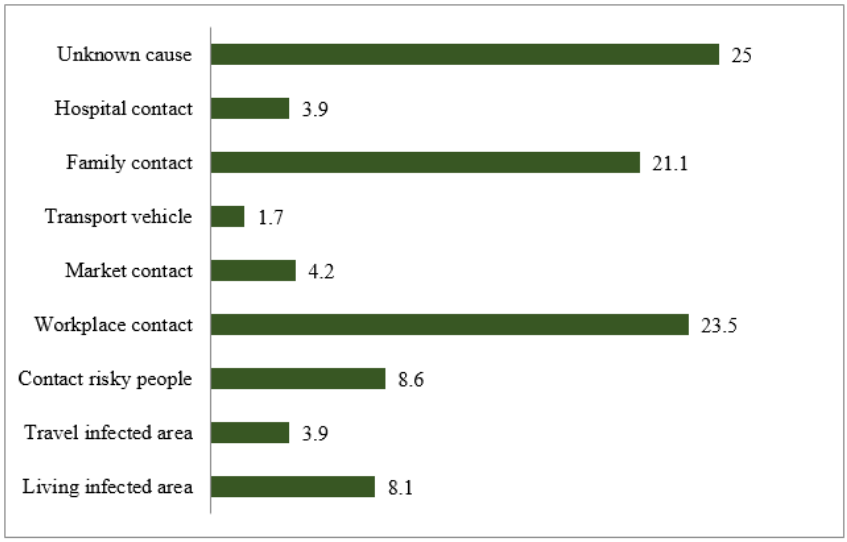

Figure 1: The study participants' route of transmission of COVID-19

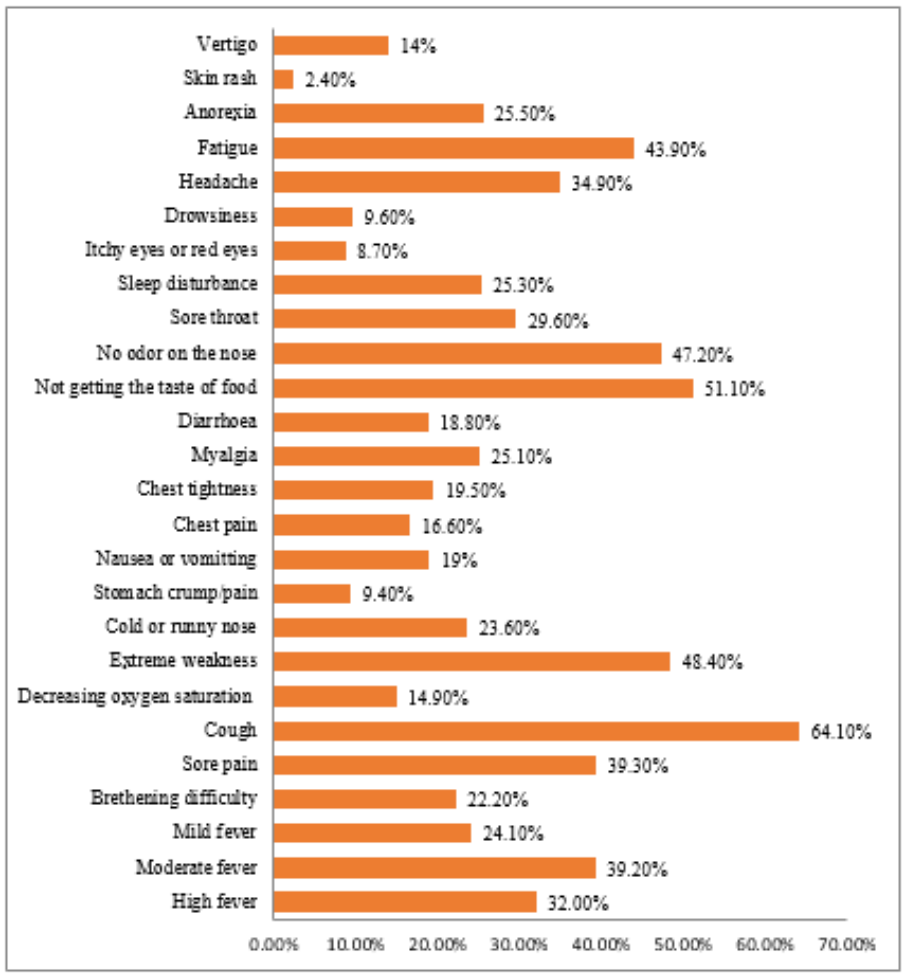

Figure 2: The study participants' COVID-19 symptoms

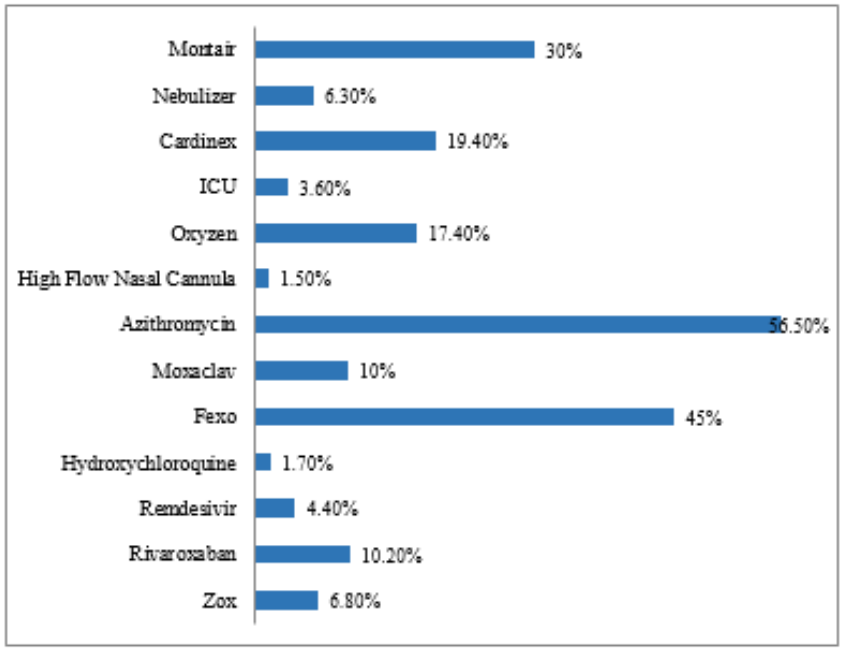

Figure 3: The study participants' receiving treatment for COVID-19

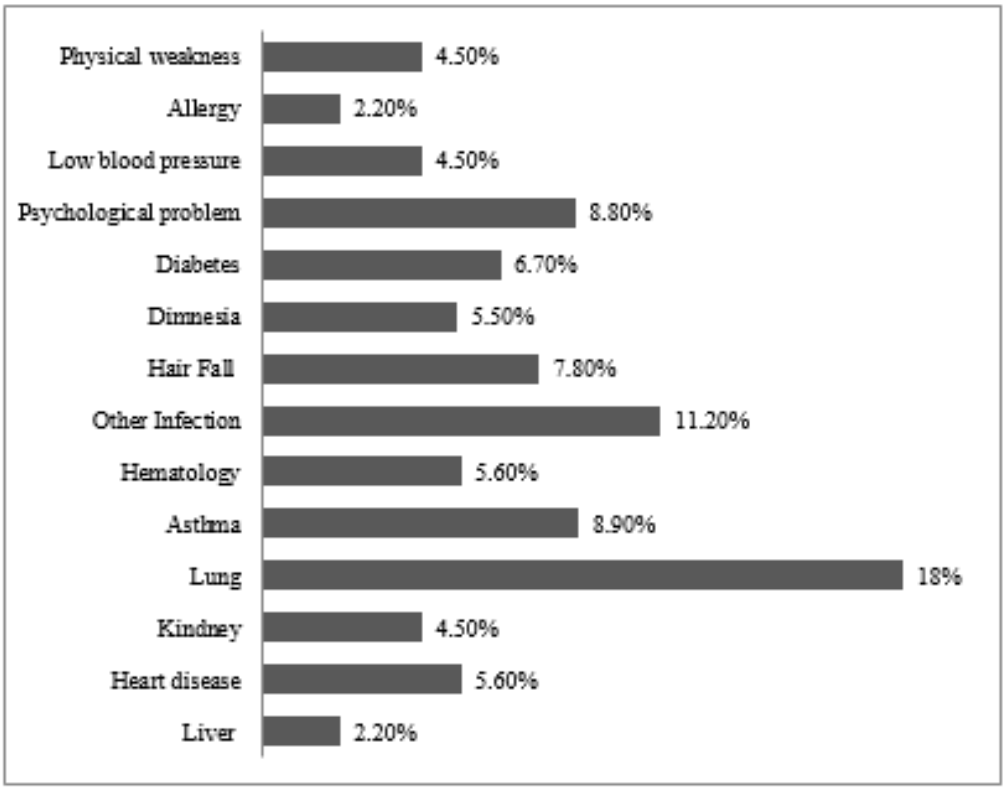

Figure 4: The study participants' different types of post-COVID complications

Discussion

In our study, the mean age of the respondents was 38.72 (SD ±14.20) years which is almost consistent with the findings of other studies conducted in Bangladesh[10-12] and lower than other studies done in China[13-16] and Oman.[17] The possible explanation for the observed difference might be due to variation in the study setting. Besides, among the study

participants more than two-thirds were male, which is nearly similar to a previous study.[11] The possible explanation for the observed difference might be that male dominance in COVID-19 cases could be related to gender differences in patients' giving a sample for test, women's shyness, and a more active male population in our country than the female population, especially in terms of work outside the home.[18] However, our finding is higher than that of other studies conducted both at home and overseas[12,15,18,19] and also lower than a previous study.[10]

As regards comorbidities among the study participants, our study findings reported that at least one comorbidity was found among about half of the study participants which is similar to a previous study[17] and lower than others.[18] Among them, diabetes mellitus, high blood pressure and allergy, cardiovascular disease and bronchial asthma were the more frequent comorbidities among the study participants. The prevalence of comorbid diabetes is similar to Mowla et al.[12] and cardiovascular disease is with Wan et al.[15] However, variations regarding the most frequent comorbidities in different previous studies conducted in Bangladesh were observed, for instance, cardiovascular diseases, respiratory diseases, liver disease and cancer;[20] hypertension, diabetes mellitus, heart diseases and renal diseases;[12] hypertension, diabetes mellitus, heart diseases.[11] The possible explanation for the observed difference might be due to variation in study setting and period since the studies were completely conducted in different regions at different times since the advent of the pandemic.

As to the routes of transmission, about half of the study participants reported that they were infected with the virus through positive contact which is lower than other Bangladeshi studies which found 73%[10] and 60%.[12] Likewise, many studies were conducted in-home[18,20] and abroad[13,15-17,19,21] we also found the most prevalent symptoms of COVID-19 patients consisted of fever, cough, loss of taste, no odor on the nose, fatigue, sore pain, headache, shortness of breath, decreasing oxygen saturation, sore throat, etc. Our findings regarding the frequency of more common medicine (antibiotics, oxygen, and ICU) differ from a previous study conducted in Bangladesh.[18] The study has a limitation that it might over-or-under assessment of the clinical characteristics of the COVID-19 patients.

Conclusion

At least one comorbid was found among about half of the study participants. About half of the patients reported that they were infected with the virus through positive contact. Azithromycin was a more common treatment in Bangladesh like many other countries. In order to treat the patients with shortness of breath and low oxygen saturation, more than one-fourth were provided oxygen. Older age, having cardiovascular disease, having diabetes, perception of physical and mental fitness and shortness of breath were reported as the risk factors for hospitalization of the COVID-19 positive persons.

Conflict of interest: There are no conflicts of interest.

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Ethical Clearance: Ethical approval for the study was provided by the Ethical Review Board of the Universityof Chittagong (No. CU SOC-21-0005). Informed consent was taken from the study participants.

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Original Research Article

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A Cross-Sectional Study to Assess the Physical Activity, Eating Behaviour and Correlation of Overweight and Obesity among College Students of Various Colleges in Indore District

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Abstract

Background: Overweight and obesity are the fifth greatest risk of global deaths. Over 1.9 billion persons aged 18 and older were overweight in 2016. Over 650 million of these men and women were obese. Instead of changes in dietary intake or other causes, it has been suggested that the increase in body weight in industrialized nations is mostly the result of decreased levels of physical activity.

Aim and Objectives: To assess the eating behaviour/pattern and type of physical activity/duration of physical activity among college students in Indore city, and to determine correlation of eating behaviour & physical activity with overweight /obesity.

Materials and Methods: A cross–sectional study conducted between January to June 2023 among 200 randomly selected students of age 17 to 25 years of various colleges of Central India in Indore district who gave consent, using a pre-designed, semi-structured, pre-tested questionnaire. Data entered in Microsoft excel was analysed using SPSS software25.0 (trial version).

Results: 46% had Body Mass Index (BMI) in normal range and 42.5% were overweight. 60% male participants had their BMI in normal range and 30.4% were overweight whereas 58.8% female participants were overweight. Majority (75.3%) of female participants had low Metabolic Equivalent of Task(MET) score whereas only 48.7% of male participants had low MET score. Both the Three Factor Eating Questionnaire (TFEQ) Scores and International Physical Activity Questionnaire(IPAQ) Scores were found to be statistically significant (p-value <0.05) among BMI categories.100% of obese participants, 91.8% of overweight participants and 32.6% of participants with BMI in normal range had low MET score, found to be statistically significant (p-value<0.001).

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Conclusion: TFEQ and MET scores were found to be statistically significant (p-value<0.001) among BMI categories suggesting that, both eating behaviour and physical activity were associated with overweight and obesity.

Keywords: Eating behaviour, Physical activity, Overweight, Obesity.

Introduction

Obesity and overweight are the fifth greatest risk factor for death worldwide. Over 1.9 billion persons aged 18 and older were overweight in 2016. Over 650 million of these men and women were obese.[1] Instead of changes in dietary intake or other causes, it has been suggested that the increase in body weight in industrialized nations is mostly the result of decreased levels of physical activity. Planning for public health should take into account the normal time sequence of the appearance of chronic diseases following the rise in obesity, as obesity is a major risk factor in the natural history of other chronic and non-communicable diseases.[2]

NFHS-5 (2019-2021) revealed that 19% women aged 15-49 are thin, 24% are overweight or obese, and 57% have BMI in normal range. Whereas, 16% of men aged 15-49 are thin, 23% are overweight or obese, and 61% have BMI in normal range. Overweight and obesity are linked to more deaths globally than underweight. 44% of the diabetes burden, 23% of IHD burden and between 7-41% of certain cancer burdens are attributable to overweight and obesity.[3]

Physical activity or physical fitness and eating habits are important modifiers of mortality and morbidity related to overweight and obesity. In some people, major reduction in activity without compensatory decrease in habitual energy intake may be the paramount cause of increased obesity. Eating habits, diet composition, eating frequency and amount of energy derived from it are all relevant to the aetiology of obesity. A diet containing more energy than required may cause prolonged post-prandial hyperlipidaemia and deposition of triglycerides in adipose tissue resulting in obesity.[2]

Recent WHO projections indicate that at least 1 in 3 of the world's adult population is overweight and almost 1 in 10 is obese. Also, over 40 million children under age five are overweight. Being overweight or obese can have a significant impact on health. Extra fat deposition causes serious health sequelae like cardiovascular disease (mainly heart disease and stroke), type 2 diabetes, musculoskeletal disorders (osteoarthritis), and some cancers (endometrial, breast and colon), thus causing premature death and substantial disability.[4]

Adolescents and young adults become bound by their habits. Therefore, the current study aims to assess the physical activity, eating behaviour and correlation of overweight and obesity among college students and to make them aware of the importance of physical activity and eating habits for leading a healthy life.

Aim and Objectives

This study aims to assess the eating behaviour/ pattern and type of physical activity/duration of physical activity among college students in Indore city, and to determine correlation of eating behaviour & physical activity with overweight /obesity.

Materials and Methods

Study population

A cross–sectional study was conducted between January to June 2023 among 200 randomly selected students of age 17-25 years, of various colleges of Central India in Indore district.

Sample size calculation

Sample size was calculated based on an estimated prevalence of overweight of 11.7% according to WHO guidelines[5], 95% confidence interval with an allowable error of 5% to obtain representative sample of students.

Using Cochran's Formula,

$4pq/d^2 = (4 * 11.7 * 88.3) / 5^2 = 165$, taking 10% non-respondents

Total sample size =182, was rounded to 200 samples.

Study instruments and data processing

The study population was administered with google form containing The Three Factor Eating

Questionnaire (TFEQ)[6] and International Physical Activity Questionnaire (IPAQ)[7] (pre-designed, pre-tested, semi-structured questionnaires).

The Three Factor Eating Questionnaire (TFEQ-R18) was used to determine eating behaviour of the participants. It consists of 18 items on a4-point response scale (definitely true/mostly true/ mostly false/definitely false).The questionnaire refers to current dietary practice and measures 3 different aspects of eating behaviour: restrained eating (conscious restriction of food intake in order to control body weight or to promote weight loss), uncontrolled eating (tendency to eat more than usual due to a loss of control over intake accompanied by subjective feelings of hunger), and emotional eating (inability to resist emotional cues). Conscious restriction (CR) consists of 6 questions, emotional eating (EE) has 3 questions and uncontrolled eating (UE) has 9 questions.

The instrument used for surveying of the physical activity level was the modified version of International Physical Activity Questionnaire(IPAQ). This version of IPAQ contained questions in detail about walking, moderate intensity and vigorous intensity physical activity which elicit the responses in four domains viz. work domain, transportation domain, domestic & garden domain and Recreation, Sport, and Leisure-time domain. Energy cost was measured in METs (Metabolic equivalents of task). Compendium of physical activity was consulted to estimate the energy expenditure of specific activities. The following criterion was applied to classify the levels of physical activity:

- Inactive - < 600 MET-min/week
- Moderately Active - 600 to 3000MET-min/ week
- Highly Active - > 3000MET-min/week

BMI is categorized into four groups according to the Asian-Pacific cut-off points[8].

- Underweight - BMI < 18.5Kg/m^2
- Normal BMI 18.5Kg/m^2 to 22.9Kg/m^2
- Overweight– BMI 23.0Kg/m^2 to 24.9Kg/m^2
- Obese – BMI 25Kg/m^2 to 29.9Kg/m^2

Data was entered into Microsoft excel spread sheet and analysed using SPSS 25.0 (trial version). Normality of the data was tested by applying Kolmogorov-Smirnov test. Appropriate test of significance like Chi-square, Mann-Whitney U and Kruskal-Wallis test were applied.

Results

Table-1 Socio-demographic characteristics, Frequencies and Percentage of categorical variables.

Gender	**Frequency**	**Percentage(%)**
Male	115	57.5
Female	85	42.5
Total	200	100
Age	**Frequency**	**Percentage(%)**
17-19	56	28.0
20-22	131	65.5
23-25	13	6.5
Total	200	100.0
Mean±SD	20.37±1.49	
Education	**Frequency**	**Percentage(%)**
Higher secondary	9	4.5
Graduation	177	88.5
Post-graduation	9	4.5
Diploma	5	2.5
Total	200	100.0
BMI	**Frequency**	**Percentage(%)**
Underweight	11	5.5
Normal	92	46.0
Overweight	85	42.5
Obese	12	6.0
Total	200	100.0

Out of 200 participants in the study 57.5% participants were males and 42.5% participants were females. Among them 65.5% belong to 20-22 years of age, 28% belong to 17-19 years of age and6.5% belong to 23-25 years of age. Mean age of participants (in years) is 20.37 with Standard Deviation (SD) of 1.49. From those 88.5% were graduated, 4.5% done post-graduation, 4.5% completed higher secondary and 2.5% done diploma. 46% have BMI in normal range, 42.5% were overweight, 6.0% were obese and 5.5% were underweight.

Table-2 Association of BMI & MET Scores with Gender.

BMI	Gender		Total	p-value
	Male	**Female**		
Underweight	6(5.2%)	5(5.9%)	11(5.5%)	<0.0001
Normal	69(60.0%)	23(27.1%)	92(46.0%)	
Overweight	35(30.4%)	50(58.8%)	85(42.5%)	
Obese	5(4.3%)	7(8.2%)	12(6.0%)	
Total	115(100.0%)	85(100.0%)	200(100.0%)	
MET score	**Gender**		**Total**	**p-value**
	Male	**Female**		
Low	56(48.7%)	64(75.3%)	120(60.0%)	<0.0001
Moderate	50(43.5%)	20(23.5%)	70(35.0%)	
High	9(7.8%)	1(1.2%)	10(5.0%)	
Total	115(100.0%)	85(100.0%)	200(100.0%)	
Parameter	**Gender**	**Mean**	**SD**	**Median(IQR)**
BMI	Male	21.73	2.29	21.22(19.72-23.83)
	Female	22.95	2.19	23.72(21.56-24.24)
	Gender	**Mean**	**SD**	**Median(IQR)**
MET score	Male	878.35	812.33	615(315-1125)
	Female	493.06	565.02	375(165-607.5)

60% male participants have their BMI in normal range, 30.4% were overweight, 5.2% were underweight and 4.3% were obese. 58.8% female participants were overweight, 27.1% had their BMI in normal range, 8.2% were obese and 5.9% were underweight. Both parameters were found to be statistically significant (p-value<0.001). Mean BMI of male participants was 21.73±2.29 and that of female participants was 22.95±2.19.

48.7% male participants had low MET score, 43.5% had moderate MET score and only 7.8% had high MET score. Whereas among female participants 75.3% had low MET score, 23.5% had moderate MET score and only 1.2% had high MET score. Mean MET score of male participants was 878.35±812.33 and that of female participants was 493.06±565.02.

Table-3 Association of UE, CR & EE Scores among both genders.

Parameter	Gender	Mean±SD	Median(IQR)	p-value
Uncontrolled Eating(UE)	Male	15.01±3.60	14(13-17)	<0.0001
	Female	12.68±3.49	13(10-14)	
Cognitive Restraint (CR)	Male	9.23±2.01	10(8-10)	<0.0001
	Female	5.94±2.11	5(5-8)	
Emotional Eating (EE)	Male	3.76±1.24	3(3-4)	<0.0001
	Female	5.39±1.19	6(4.5-6)	

Mean UE score of male participants was 15.01±3.60 and of female participants was 12.68±3.49. Mean CR score of male participants was 9.23±2.01 and of female participants was 5.94±2.11. Mean EE score of male participants was 3.76±1.24 and of female participants was5.39±1.19. All these parameters were found to be statistically significant (p-value<0.001).

Table 4: Association of UE, CR, EE &MET Scores among BMI categories.

Parameter	BMI	Mean±SD	Median(IQR)	p-value
UE	Underweight	7.09±2.21	7(5-9)	<0.0001
	Normal	12.29±1.82	13(11-14)	
	Overweight	15.69±2.66	15(13-17)	
	Obese	21.75±2.34	21.5(20-23.75)	
CR	Underweight	12.36±1.63	13(11-14)	<0.0001
	Normal	9.53±1.15	10(9-10)	
	Overweight	6.05±1.50	6(5-7)	
	Obese	3.33±1.50	3.5(2-5)	
EE	Underweight	2.36±0.92	2(2-3)	<0.0001
	Normal	3.50±0.64	3(3-4)	
	Overweight	5.39±1.00	5(5-6)	
	Obese	7.00±0.95	7(6-7.75)	
Parameter	**BMI**	**Mean±SD**	**Median(IQR)**	**p-value**
MET score	Underweight	1231.36±768.80	945(765-1470)	<0.0001
	Normal	1017.39±889.77	750(427.5-1293.8)	
	Overweight	376.94±308.95	345(165-495)	
	Obese	311.25±168.03	292.5(165-480)	

Mean UE scores of underweight, normal, overweight and obese participants were 7.09±2.21, 12.29±1.82, 15.69±2.66 and 21.75±2.34 respectively. And mean CR scores ofunderweight, normal, overweight and obese participants were 12.36±1.63, 9.53±1.15, 6.05±1.50 and 3.33±1.50 respectively. Whereas mean EE scores of underweight, normal, overweight and obese participants were2.36±0.92, 3.50±0.64, 5.39±1.00 and 7.00±0.95respectively.

Mean MET scores of underweight, normal, overweight and obese participants were 1231.36±768.80, 1017.39±889.77, 376.94±308.95 and 311.25±168.03 respectively. All these parameters were found to be statistically significant (p-value<0.001).

Both TFEQ Scores and IPAQ Scores were found to be statistically significant (p-value <0.001) among BMI categories.

Table-5 Association between BMI and MET score.

	BMI				
MET score	**Underweight**	**Normal**	**Overweight**	**Obese**	**p-value**
Low	0	30(32.6%)	78(91.8%)	12(100.0%)	<0.0001
Moderate	10(90.9%)	53(57.6%)	7(8.2%)	0	
High	1(9.1%)	9(9.8%)	0	0	
Total	11(100.0%)	92(100.0%)	85(100.0%)	12(100.0%)	

100% of obese participants, 91.8% of overweight participants and 32.6% of participants with BMI in normal range had low MET score. 90.9% of underweight participants, 57.6% of participants with BMI in normal range and 8.2% of overweight participants had moderate MET score. 9.8% of participants with BMI in normal range and 9.1% of underweight participants had high MET score. All these parameters were found to be statistically significant (p-value<0.001).

Discussion

The aim of the present study was to find if there was any correlation between eating behaviour and physical activity on overweight/obesity. The target population was college students of 17-25 years from Indore district.

The result came out as 42.5% were overweight and 6.0% were obese, in total 48.5% of students were either overweight/obese. It is consistent with the study done by Suita Devi et al.,[9]total 44.9% students were overweight (15.9%) or obese (29%) with higher prevalence among males as compared to females (46.7% vs. 43.6%).Similarly in a study done by Supa Pengpid et al.,[10] where 37.5% were overweight (26.8%) or obese (10.7%). In our study females (67%) were more overweight/obese compared to males (34.7%). Whereas in a study on medical students done by Suryanarayana Behera et al.,[11]27.5% were found to be overweight and 9.5% were found to be obese. Out of the obese students, 68% were found to be males and the rest 32% were females. Similarly, in a study on medical students done by Kishore S. Gudegowda et al.,[12]prevalence of overweight and obesity were 14.6% and 11.3%. Where overweight and obesity were more observed in boys (9.7%, 6.8%) than girls (5%, 4.5%). In a study done by Geeta Yadav et al.,[13]prevalence of overweight and obesity(on the basis of BMI) was 55% among males as compared to 37% among females and mean BMI of males was also higher than females (23.7±3.7 vs. 22.3±2.9). In contrast, in our study mean BMI of females was higher than males (22.95±2.19 vs 21.73±2.29).

In our study majority of males (51.3%) were moderate to high physically active whereas less (24.7%) females were moderate to high physically active. Similarly, in a study done by Joy V et al.,[14] 87.1% males and 60.9% females were moderate to high physically active. Whereas in a study done by Krishnakumar Padmapriya et al.,[15]males (86.2%) and females (83.2%) were equally moderate to high physically active. Whereas in a study done by Praveen Kumar et al.,[16] males (57.4%) were more active than females (42.6%) and were moderate to high physically active. In a study done by Goje Mohammed et al.,[17] 81.2% males and 52.0% females were moderate to highly physically active. In consistent with our study, a study done by Roshini Rajappan et al.,[18]greater percentage of males (56%) showed high physical activity level than females (24%). Whereas in a study done by Harmandeep Singh et al.,[19] males (91.47%) and females (85.71%) were almost equally moderate to high physically active. In our study, majority of students (60.0%) had low activity level, 35.0% had moderate activity level and 5.0% had highphysical activity level. Whereas in a study done by Marwa Mohammed Yousif et al.,[20]less than half of students (44.9%) had low activity level,32.0% had moderate activity level and 23.1% had high physical activity level.

In our study 67.4% participants having BMI in normal rangewere doing moderate to high physical activity, 91.8% of overweight participants and 100% of obese participants were doing very low physicalactivity. Similarly, in a study done by K. Shankar et al.,[21] 46.28% participants having BMI in normal range were doing moderate to high physical activity, 54.9% of obese participants were doing very low physical activity. In contrary, study done by Harmandeep Singh et al.,[19]46.28% of overweight participants and majority of obese participants (69.5% obese I & 100% obese II)were doing moderate to high physical activity. Whereas, in a study done by Ramya M. R. et al.,[22]among those who do vigorous physical activity, 78.12% were non-obese and 21.88% were obese whereas among those who do moderate intense activity, 75.16% were non-obese and 24.84% were obese. This gives an impression that those who do vigorous and moderate intense activity were more likely to be non-obese. In a study done by Quratul Ain Arifa et al.,[23] among those who do moderate to vigorous physical activity, 93.78% were not-overweight or non-obese and only 6.22% were overweight orobese, whereas 71.4% of low physically active participants were overweight or obese and 28.57% were not-overweight or non-obese.

Conclusion and Recommendations

As perNFHS-5 data, 23% of women and 22.1% of men were overweight based on BMI criterion. Health consequences of overweight/obesity are challenging to manage in late adolescence/young adults as their symptoms may be minimal, they are less likely to engage with health check-ups due to other life priorities and their career developmental stage makes

therapy adherence difficult. Low physical activity level and unhealthy eating behaviour among college students from this study encourages implementation of health education programs about obesity and risk factors among college students. Extracurricular physical activities and sports should be implemented bythe administrations to encourage students to be more physically active, particularly among female students. Further studies are needed to detect determinants of obesity in school going students and in general population, to compare and to explore the possible mechanisms behind obesity among students and young adults.

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Original Article

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Usefulness of Umbilical Cord Nucleated RBC as a Prognostic Marker of Neonate Born to Pregnancy Induced Hypertension Mother in Resource Limiting Settings

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Abstract

Background: Pregnancy induced hypertension are multi-system disorders of the mother that affect the fetus because of utero-placental insufficiency. These neonates may also have a spectrum of hematological changes which may add to the existing morbidity in them**.** *objectives*: To correlate cord Nucleated red blood cells and neonatal outcome in Pregnancyinduced hypertension.

Materials and method: The study was conducted in the Mata Chanan Devi Hospital, Janakpuri, New Delhi. A total of 55 cases and 55 controls of newborns fulfilling the inclusion criteria. The mother's antenatal records were examined to rule out the Pre-Existingmaternal medical illness. History of drug intake and compliance of treatment was recorded. *Results:* Cord blood nucleated red blood cells was significantly raised in neonates born to PIH mothers (>13 NRBC/100 WBC) compared to normotensive mothers and also had significantly higher incidence of Low birth weight, Hypoglycemia, Respiratory distress and Asphyxia.

Conclusion: NRBC count can be used as a simple tool where expertise not availableand accordingly can plan the interventions. It is a special boon in a rural care center, where advanced diagnostic modalities are unaffordable or inaccessible. Umbilical cord NRBC count it correlates well with neonatal outcome.

Keywords: Asphyxia, Pregnancy induced hypertension, Hypoglycemia, Respiratory distress

Introduction

When compared to children and adults, critically ill neonates make up a vulnerable population that possesses very unique characteristics. As a result, the early diagnosis and management of critical illness are of utmost importance for the short-term outcome as well as the lifelong prognosis of these neonates.

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Score for Neonatal Acute Physiology (SNAP), SNAP-Perinatal Extension (SNAPPE) and SNAPPE-II, Neonatal Multiple Organ Dysfunction (NEOMOD) score, and Clinical Risk Index for Babies scoring system (CRIB II) are some of the scoring systems that have been developed to estimate the severity of an illness in neonates.[1-4] These scoring systems are used to rank the severity of a neonate's condition. These technologies hope to accomplish early detection of sick newborns who are at an elevated risk of morbidity and death, and they might lead to enhanced patient care.

Recent developments in neonatal medicine have concentrated their attention on a number of clinical and laboratory characteristics as diagnostic and prognostic indicators. It is possible that the management of critically ill newborns, such as septic newborns and those with perinatal hypoxia, could be improved and more targeted using novel biomarkers, which could help for the detection of the disease within the critical time window. According to reports from earlier studies, hematological and serum biochemical variables such as leukocyte and neutrophil count, nucleated red blood cells (NRBCs), C-reactive protein (CRP), procalcitonin (PCT), arterial blood gas analysis, lactate, hepatic enzymes, plasma creatinine (Cr), and troponin high sensitivity (hsTn) have been used for this purpose. [5-9]

In typical circumstances, NRBCs, which are early erythrocyte precursors, are not identifiable in the peripheral blood of people who are healthy. On the other hand, the presence of NRBCs in the circulation of the fetus and the neonates during the first week of life is considered to be a typical finding.[10] This finding is dependent on the gestational age of the baby as well as their current state of health. The count of non-red blood cells (NRBCs) is an indicator of a high production of erythropoietin, which may be caused by a reduction in the arterial oxygen partial tension or an increase in the concentration of inflammatory cytokines. NRBCs are a very reliable indicator of death in individuals who are seriously unwell.[11]

Menk et al. [12] conducted research not too long ago in which they showed that the presence of NRBCs in the circulation may be regarded as a marker of illness severity suggesting a higher risk of mortality in an intensive care unit (ICU). Notwithstanding this, a number of studies [6,7,13] have found that a higher NRBC count corresponds with fetal hypoxia and the severity of inflammation (sepsis). Neonates with a higher NRBC count at birth showed the beginning of hypoxia at least 28-29 hours before delivery, according to the findings of Christensen et al. [14] At present, meaningful data addressing NRBCs diagnostic and prognostic utility in critically sick newborns are scarce.

Asphyxia is one of the primary factors that contributes to newborn death as well as long- term neurologic impairments in neonates who survive. This disease can occur anywhere from 1% to 10% of the time.[15,] In developing countries, three percent of newborns, or 6.3 million people, suffer from moderate or severe asphyxia, according to the reports of the World HealthOrganization (WHO). Of these newborns, 23 percent (840,000 people) die, and approximatelythe same number of subjects deal with the complications of asphyxia.[16]

Recent research has proposed that an increase in the number of non-red blood cells (NRBC) found in the umbilical vein of neonates might be interpreted as a possible indicator of birth asphyxia.[17] Throughout the first 12 hours after delivery, the number of NRBCs in healthy neonates drops by half, and within the first 48 hours after birth, there are only 20-30 NRBCs per m3. Although while NRBCs are not observed in the blood circulation on the third or fourth day after delivery, they may be found in preterm babies in very tiny levels during the first weekof life.[18]

When the NRBC count is high, it indicates that erythropoietin production is high. This indicates that erythropoietin stimulates the foetal hematopoietic system, primarily in the bone marrow, which results in an increase in the production of RBCs.[21-23] An increase in the number of NRBCs is frequently brought on by premature birth, blood incompatibility caused by ABO or RH antigens, an increase in hematopoiesis that is then followed by chronic disease, maternal diabetes, preeclampsia, foetal anaemia, intrauterine infections, chorioamnionitis, and acute or chronic asphyxia.[19,20]

Materials and Method

Study design: Case Control study

Study setting: Study was conducted at Mata Chanan Devi Hospital, Janakpuri, New Delhi.

Study population: A total of 55 cases and 55 controls of newborns fulfilling the inclusion criteria and born were included.

The study included Neonates born to women with Pregnancy induced hypertension as cases and neonates born to normotensive women as controls and availability of written informed consent from parents.

The study excluded Mothers with Prolonged rupture of membrane (>18 hrs.), Multiple gestation, Diabetic mellitus, Maternal anemia, Rh isoimmunization, Maternal smoking, Maternal alcoholism and Pre-existing maternal medical illness. The study excluded Newborns with Congenital anomalies, Twins, Out born delivery and Stillbirth.

Study duration: one and half year (February 2015-july2016)Study methodology

Detailed information was obtained from the mothers. The mother's antenatal records were examined to rule out the pre-existing maternal medical illness. History of drug intake andcompliance of treatment was recorded.

Pregnancy Induced Hypertension Especially Preeclampsia was diagnosed when the blood pressure was ≥140/90 mmHg and there was associated proteinuria of at least 30 mg/L (1+ on dipstick) in tworandom urine samples or 300 mg in 24 hours at ≥20 weeks of gestation. In the absence of proteinuria, preeclampsia was diagnosed when blood pressure was ≥140/90mmHg in association with persistent cerebral symptoms, epigastric or right upper quadrant pain plus nausea or vomiting, fetal growth restriction or withthrombocytopenia, and elevated liver enzymes.

Gestational age was calculated from the first day of the last menstrual period. The gestation was again confirmed postnatally by classifying the new born by New Ballard scoringsystem.

Method of collection of data

Newborns were selected into two groups based on inclusion criteria. Cases- Neonates born to mothers with Pregnancy induced hypertension. Controls were Neonates born to a normotensive mother.

Sample was collected from cut end of umbilical cord of neonate. By using automated cell counter total leucocyte count obtained and peripheral smear preparation by using leishman stain to count Nucleated RBC.

Statistical analysis

SPSS version 25.0 analyzed the Excel data when it was loaded. Quantitative (numericalvariables) data was given as mean and standard deviation, whereas qualitative (categorical variables) data was provided as frequency and percentage. The student t-test was used to compare the two groups' mean values, while the chi-square test analyzed their frequency differences. If p0.05, it was statistically significant.

Results

Table 1 showing the baseline data

		Frequency	%
Gender	Male	65	59.1%
	Female	45	40.9%
Mode of delivery	LSCS	81	73.6%
	NVD	29	26.4%
Birth Weight (Kg)	<2	17	15.5%
	2-3	50	45.5%
	>3	43	39.1%
Maternal age	<20 yrs	2	1.8%
	21-25 yrs	21	19.1%
	26-30 yrs	61	55.5%
	31-35 yrs	21	19.1%
	36-40 yrs	4	3.6%
	>40 yrs	1	0.9%
Para	Multi	52	47.3%
	Primi	58	52.7%

Table 1 shows that majority of the babies born were males (59.1%), the mode of delivery was LSCS (73.6%), birth weight 2-3 kgs (45.5%), maternal age of 26-30 years (55.5%) andPrimipara (52.7%).

Table 2 showing Birth weight, Hypoglycemia, Respiratory distress and Asphyxia (APGARscore @ 1 minute)

	Neonatal Outcome	Group 1 (>13NRBC)	Group 2 (≤13 NRBC)	p-value
Birth weight	<2.5 kgs	9 (56.3%)	8(20.5%)	0.009*
	>2.5 kgs	7(43.8%)	31(79.5%)	
Hypoglycemia	Present	6(37.5%)	0(0.0%)	0.001*
	Absent	10(62.5%)	39(100%)	
Respiratory Distress	Present	10(62.5%)	12(30.8%)	0.029*
	Absent	6(37.5%)	27(69.8%)	
Asphyxia (APGAR score @ 1 minute)	>7	7(43.8%)	29(74.4%)	0.030*
	<7	9(56.3%)	10(25.6%)	
Outcome	expired	1(6.3%)	0(0.0%)	0.291
	Discharged	15(93.8%)	39(100.0%)	

Neonates with elevated cord blood NRBC counts (>13 NRBC/100 WBC) are more likely to have low birth weight, asphyxia, respiratory distress, and hypoglycemia.

Discussion

In our study, in group 1, 9 out of 16(56.3%) and 8 out of 39(20.5%) in group 2, had birthweight <2.5 kgs, p-value was 0.009 which was statistically significant. It may be due to the effect of preeclampsia in inducing chronic hypoxia which in turn leads to low birth weight and elevated NRBC. A study done by *Bayati et al*.[21] showed that birth weight < 2500 gm showed a significant relationship with an elevated NRBC count in the preeclamptic group (p value 0.003).

In our study, in group 1, 6 out of 16(37.5%) and no neonates in group 2 had hypoglycemia, P value 0.003, which was statistically significant. In a study done by *Gasparovic et al*.[22] incidence of hypoglycemia was compared among two groups, Group 1:

<40 NRBC/100 WBC; Group 2 : >40 NRBC/100 WBC. It was found that the number of newborns who developed hypoglycemia were 20 out of 56 in group 1 and 15 out of 21 in group 2 with a p value of 0.001 which was statistically significant. Group 2 had significantly lower Apgar scores, birth weight and gestational age, had longer stay in intensive care units and significantly higher rates of infection which possibly resulted in higher incidence of hypoglycemia in group 2.

Out of 55 cases,10 out of 16(62.5%) in group1 and 12 out of 39(30.8%)in group2 neonates had increased NRBC out of which 10 had respiratory distress, p value was 0.029 which was statistically significant. This may be due to chronic intrauterine hypoxia or stress which is frequently seen in neonates born to PIH mother, which can increase pulmonary vascular resistance, pulmonary hemorrhage, and pulmonary edema secondary to cardiac failure or secondary hyaline membrane disease (ARDS) in newborns and may lead torespiratory distress.

Krishna et al.[23] also demonstrated significant correlation between NRBC and RDS in babies born to PIH mother (p value 0.002). Study done by *Leikin et al*.[56] reported significant correlation between NRBC count and respiratory distress in his study of 359 neonates with chorioamnionitis.

Out of 55 cases, in group 1, 9 out of 16 (56.3%) and in group 2 ,10 out of 39(25.6%) had asphyxia, p-value was 0.038, which was statistically significant. Hypoxia induced by preeclampsia in newborns leads to activation of a compensatory mechanism which leads to release of erythrocytes into the peripheral circulation resulting in increased NRBCs.

A study done by *Ghosh et al*.[24] showed that a statistically significant negative correlation (P<0.001) existed between NRBC level and markers of acute intrapartum asphyxia and Apgarscore.

Boska Badi et al.[13] did a study that showed NRBC/100 WBC count increased with progressive

decrease in first minute Apgar scores (P<0.001). A statistically significant negative correlation existed between nucleated red blood cell level and indicators of the severity of perinatal asphyxia.

In our study, 1 out of 16 (6.3%) in group1 and no neonates in group 2 expired,p value was 0.291, which was clinically insignificant.

Conclusion

NRBC count in cord blood at birth can be used as a prognostic marker in baby born to PIH. This is a simple, cheap, rapid and non-invasive test from the cord blood, which provides valuable information about the well-being of the newborn baby at birth and it correlates well with neonatal outcome.

Conflict of interest: Nil

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Ethical review: informed consent was gained after fully explaining the study purpose and process to neonate attendant (parents/guardian). Ethical approval for the study was taken from institute ethical committee.

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Original Research Article

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A Cross-sectional Sectional Study to Assess Knowledge, Attitude and Practice towards Cervical Cancer, Human Papilloma Virus (HPV) Infection and HPV Vaccine among 9th to 12th Grade School Girls in Indore

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Abstract

Background: Human Papilloma Virus (HPV) is most common viral infection among women between 15 to 44 age group. When administered before girls or women are exposed to the virus, HPV vaccine can prevent majority of cervical cancer occurrences. Therefore to evaluate knowledge, attitudes and practices regarding cervical cancer, HPV infection and HPV vaccine among girls in grades 9 to 12 the current study was conducted.

Materials and Methods: A cross-sectional study conducted between July-December 2022 in Indore government schools. Total 120 girls in grades 9 to 12 after receiving informed consent involved in the study. Data regarding knowledge, attitude and practice about cervical cancer, HPV infection and HPV vaccination collected using pretested semi-structured questionnaire. SPSS version 25.0 (Trial version) was used for data analysis.

Conclusion: Among 120 students (34.16%) and (20.83%) had heard about cervical cancer and HPV vaccine respectively, where majority were from class 11th and 12th. The association was significant between knowledge of students and their grades ($p<0.05$). (3.33%) received HPV vaccine. Among unvaccinated, (68.96%) were willing to take vaccine. Hence the study found that knowledge and uptake of HPV vaccination among school girls is poor. The government needs to strengthen the various aspects of HPV education supplied in schools and HPV vaccination awareness campaigns.

Keywords: Adolescent school girls, Attitude, Cervical cancer, Human papilloma virus, HPV vaccine, Knowledge, Uptake.

Introduction

With an anticipated 6,04,000 new occurrences in 2020, cervical cancer is the fourth most common malignancy in women worldwide. In every part of the world, younger women are disproportionately affected by cervical cancer[1]

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The most frequent viral infection of the reproductive system is Human papilloma virus. More than 95% of cases of cervical cancer are caused by HPV.

For prevention of cervical cancer, vaccination is emerging as the most effective option. HPV vaccine is not currently included in India's national immunization program (NIS). However, the vaccine has been available in private sectors since 2008. In 2016, the State Governments of Delhi and Punjab began implementing HPV vaccine[2,3] Two types of HPV vaccines are available in India– quadrivalent vaccine (GardasilTM, Merck, USA, HPV4 targeting HPV types 6, 11, 16 and 18) and bivalent vaccine (CervarixTM, GSK Biologicals, Belgium, HPV2 targeting HPV types 16 and 18)[4]. The Indian Academy of Pediatrics Advisory Committee on Vaccination and Immunization Practices (IAP COVI) recommends offering HPV vaccine to all females aged 9–26 years who can afford the vaccine.[5] For girls aged 9–14 years, two intramuscular doses of either of the two HPV vaccines (HPV4 or HPV2) at 6-months interval is recommended. For girls aged 15 years and older, and for immunocompromised girls and women, three doses of the vaccine over a 6-month period is recommended.[6, 5]

Knowledge of Cervical cancer, HPV infection and HPV vaccine have been identified as key predictive factors in increasing its uptake[7].To date studies have shown that awareness of HPV across all populations is poor. Therefore, this study investigated the knowledge regarding cervical cancer and HPV infection and knowledge, attitude and practices towards HPV vaccination among 9th to 12th Grade School girls.

Materials and Methods

Study design: The study was a cross sectional study.

Study setting: The study was conducted in Government Girl's School of Indore district, India.

Study period: Data was collected over a period of six months from July to December 2022.

Study subjects: The school going girls from 9th to 12th Grade were included in the study.

Inclusion criteria: Girls from grade 9th to 12th of 14 and above years who have given consent are included.

Exclusion criteria: School Girls below 14 years are excluded from the study.

Sample size- Considering the prevalence of HPV infection in India 19.60% (Source: (Department of Biotechnology, Govt. of India https://prescriptec.org/countries/india).The sample size was calculated using the given formula $\mathbf{n=4pq/d^2}$ with assumptions, that confidence interval was taken at 95%, the level of uptake of HPV vaccine taken (p) was *19.60%*, (q) was *80.40%*, a margin of error (d) was 7.5. Therefore, the calculated sample came out to be *112*≅120 participants.

Sampling method: All the eligible participants present at the time of data collection and who have given consent are taken in the study.

Contents of the questionnaire: The questionnaire was constructed based on the review of previous studies on knowledge, attitude and practice about cervical cancer, HPV infection and HPV vaccination uptake.

Data collection tool: Data regarding cervical cancer, HPV infection and HPV vaccine were collected by using pretested semi structured questionnaire by interview technique.

Data Analysis: Data was entered into Microsoft excel spread sheet and analyzed using SPSS version 25.0(Trial version). Appropriate test of significance like chi-square were applied whenever necessary. The p-value of less than 0.05 was considered significant. Multivariate analysis was done using variable to identify key variable regarding cervical cancer, HPV infection and HPV vaccine.

Ethical approval- The study was approved by the Institutional Ethics Committee

Result

The study sample consisted of 120 school going girls students aged 14 and above years with a mean age of 16.13 (±1.48) years. All the participants were females from 9th to 12th standard and were unmarried.

Table 1: Descriptive analysis of Socio Demographic variables (N=120)

Parameter	Frequency	Percentage (%)
Age (Years)		
14-15	45	37.5
16-17	52	43.3
18 or above	23	19.2
Class		
9th Standard	34	28.33
10th Standard	31	25.83
11th Standard	20	16.66
12th Standard	35	29.16
Father's Education		
Uneducated	28	23.33
Primary	35	29.16
Middle	30	25
High School	20	16.66
Higher Secondary	6	5
Graduate	1	0.83
Post Graduate	0	0.00
Mother's Education		
Uneducated	56	46.66
Primary	33	27.5
Middle	19	15.83
High School	9	7.5
Higher Secondary	3	2.5
Graduate	0	0.00
Post Graduate	0	0.00

Table 1 represents proportion of study participants from 9th, 10th, 11th and 12th standard was (28.33%), (25.83%), (16.66%) and (29.16%) respectively. The evaluation of father's education status showed, (23.33%) were illiterate and (16.66%) done high schooling. Among mothers almost half of them (46.66%) were uneducated, only (7.5%) done high schooling.

Table 2: Knowledge about Cervical cancer among study population (N=120)

Knowledge	9th Class Students (n=34)	10th Class students (n=31)	11th Class students (n=20)	12th Class students (n=35)	Total (n=120)	P-value
Most prevalent cancer among Women's of India						
Breast Cancer	4(11.76%)	5(16.12%)	6(30%)	9(25.71%)	24(20%)	0.04
Cervical Cancer	3(8.82%)	4(12.9%)	5(25%)	8(22.85%)	20(16.66%)	
Lung Cancer	2(5.88%)	2(6.45%)	4(20%)	5(14.28%)	13(10.83%)	
Other	25(73.52%)	20(64.51%)	5(25%)	13(37.14%)	63(52.50%)	
Heard about cervical cancer						
Yes	5(14.7%)	8(25.80)	11(55%)	17(48.57%)	41(34.16%)	0.003
No	29(85.29%)	23(74.19%)	9(45%)	18(51.42%)	79(65.83)	
Further Knowledge about Cervical cancer among those who have heard about it (N=41)						
Cervical cancer is more prevalent in which age group						
5-15years	1(20%)	2(25%)	4(36.36%)	5(29.41%)	12(29.26%)	0.24
15-45years	2(40%)	3(37.50%)	5(45.45%)	8(47.05%)	18(43.90%)	
45-60years	0(0.00%)	2(25%)	2(18.18%)	4(23.52%)	8(19.51%)	
>60years	2(40%)	1(12.50%)	0	0(0.00%)	3(7.31%)	
Risk factor for cervical cancer						
Smoking	2(40%)	0(0.00%)	1(9.09%)	2(11.76%)	5(12.19%)	0.50
Weak immunity	0(0.00%)	1(12.50%)	2(18.18%)	3(17.64%)	6(14.63%)	
HPV infection	1(20%)	2(25%)	4(36.36%)	6(35.29%)	13(31.71%)	
Family history of Cervical cancer	0(0.00%)	0(0.00%)	2(18.18%)	2(11.76%)	4(9.75%)	
All of the above	2(40%)	5(62.50%)	2(18.18%)	4(23.52%)	13(31.71%)	

Continue.....

Ways to prevent cervical cancer						
Screening of HPV	0(0.00%)	0(0.00%)	2(18.18%)	3(17.64%)	5(12.19%)	0.48
Do not Smoke	3(60%)	2(25%)	2(18.18%)	3(17.64%)	10(24.39%)	
HPV Vaccination	0(0.00%)	1(12.50%)	3(27.27%)	5(29.41%)	9(21.95%)	
All of the above	2(40%)	5(62.50%)	4(36.36%)	6(35.29%)	17(41.46%)	

Among total 120 girls, about most prevalent cancer among women's in India majority of them (20%) answered breast cancer and maximum was from 12th class as compared to other. 16.66% answered cervical cancer and majorly was from 11th followed by 12th class students.10.83% and 52.50% answered lung cancer and other cancer respectively. The association between different grades and their knowledge about most prevalent cancer among women's in India is significant ($p<0.05$). **(Table-2)**

41(34.16%) students had heard about cervical cancer before, among which majority was of 11th followed by 12th class as compared to other. This value comes Significant. ($p<0.05$). **(Table-2)**

Among above n=41 students, 43.90% know that cervical cancer is more prevalent in 15-45 years of age group where majority was from class 11th followed by 12th class student as compared to other class. According to (35.29%) among class 12th, (36.36%) from class 11th followed by (25%) and (20%) from 9th and 10th class respectively HPV infection is risk factor for cervical cancer. As stated by (12.19%) students, screening of HPV; (24.39%) students, stop smoking; (21.95%) students, HPV vaccine and (41.46%) students all of the above are ways to prevent cervical cancer. **(Table-2)**

Table 3: Knowledge about HPV infection and HPV Vaccine among study population (N=120)

Knowledge	9th Class students (n=34)	10th Class students (n=31)	11th Class students (n=20)	12thClass students (n=35)	Total (n=120)	P-value
Heard about HPV (Human Papilloma Virus) infection						
Yes	4(11.76%)	4(12.90%)	7(35%)	15(42.85%)	30(25%)	0.005
No	30(88.23%)	27(87.09%)	13(65%)	20(57.14%)	90(75%)	
Know about Vaccination						
Yes	19(55.88%)	24(77.41%)	16(80%)	31(88.57%)	90(75%)	0.015
No	15(44.11%)	7(22.58%)	4(20%)	4(11.42%)	30(25%)	
Heard about HPV Vaccine						
Yes	2(5.88%)	5(16.12%)	7(35%)	11(31.42%)	25(20.83%)	0.01
No	32(94.11%)	26(83.87%)	13(65%)	24(68.57%)	95(79.16%)	
Further Knowledge about HPV Vaccine among those who have heard about it (N=25): HPV Vaccine administered at 9-26years of age group						
True	0(0.00%)	2(40%)	6(85.71%)	9(81.81%)	17(68%)	0.045
False	2(100%)	3(60%)	1(14.28%)	2(18.18%)	8(32%)	
Two or more doses are required for protection						
True	0(0.00%)	1(20%)	3(42.85%)	8(72.72%)	12(48%)	0.10
False	2(100%)	4(80%)	4(57.14%)	3(27.27%)	13(52%)	
HPV Vaccine is for both male and female						
True	0(0.00%)	4(80%)	6(85.71%)	11(100%)	21(84%)	0.005
False	2(100%)	1(20%)	1(14.28%)	0(0.00%)	4(16%)	

Among total 120 girls, 25% had heard about HPV infection, in which most of them were from 12th followed by 11th class. There is significant association among various grades and knowledge of HPV infection (p<0.05). **(Table-3)**

75% aware about vaccine in general, in which most of them were from 12th followed by 11th class. There is significant association (p<0.05). **(Table-3)**

25(20.83%) heard about the HPV vaccine where most of them in 11th followed by 12th grades. Shows strong correlation between various grades and HPV vaccine knowledge. (p<0.05). **(Table-3)**

Among above n=25 students, 68% stated that HPV Vaccine administered at 9-26years of age group where most of them were from 11th and 12th class. There was significant correlation (p<0.05). Regarding doses of HPV vaccine correct answer was given by 48% students in which maximum was from 12th class. Vaccine is available for both male and female was known by 84% students where maximum was from class 12th. There was significant (p<0.05). **(Table-3)**

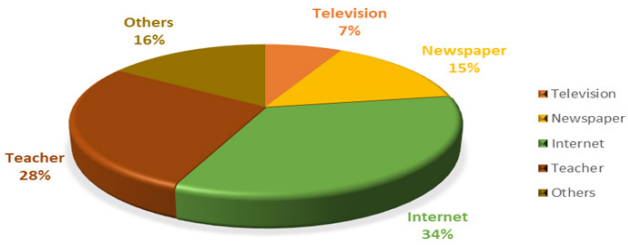

Fig 1: Source of Information about Cervical cancer and HPV Vaccine among study population (N=120)

The internet was cited as the most frequent source of information on HPV by (34.16%) of the participants. teachers (27.5%), Television (7.5%), newspapers (15%), and other sources (15.83%) were the other sources of knowledge that were mentioned. **(Fig 1)**

Table 4: Practice and attitude towards HPV Vaccine among study population (N=120)

Parameter	9th Class students (n=34)	10th Class students (n=31)	11th Class students (n=20)	12th Class students (n=35)	Total (n=120)	P-value
HPV immunization status						
Immunized	1(2.94%)	0(0.00%)	1(5%)	2(5.17%)	4(3.33%)	0.59
Not Immunized	33(97.05%)	31(100%)	19(95%)	33(94.28%)	116(96.66%)	
Willingness of HPV Vaccination among those who are not immunized (N=116)						
Yes	20(60.60%)	16(51.61%)	16(84.21%)	28(84.84%)	80(68.96%)	0.009
No	13(39.39%)	15(48.38%)	3(15.78%)	5(15.15%)	36(31.03%)	

In our study we found that, only 4(3.33%) among n=120 students had received the HPV vaccine where 2 were from class 12th, 1 from both 11th and 10th class. **(Table-4)**

Among remaining n=114 unvaccinated students 68.96% were willing for HPV vaccination, where maximum were from 12th standard. There was significant association (p<0.05). **(Table-4)**

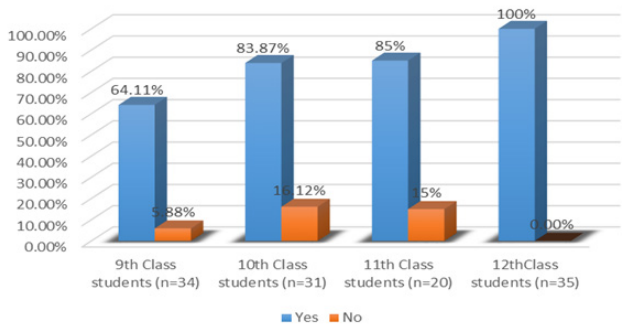

Fig 2: Willingness to know more about HPV infection and HPV Vaccine among study population (N=120)

Overall 110(91.66%) students were willing to know more about HPV infection and HPV Vaccine among study population (N=120) **(Fig 2)**:

Discussion

One of the most significant cervical cancer causes that can be avoided is HPV infection. Cervical cancer risk factors can be addressed in a variety of ways. With the introduction of the HPV vaccine, we can successfully avoid HPV infection and the resulting cervical cancer. Therefore this study aims to assess knowledge, attitude and practice towards cervical cancer, HPV infection and HPV Vaccine among school going girls.

In the current study 34.16% had heard about cervical cancer whereas in contrast 80% of the participants had heard about cervical cancer in a study done by Nasar A et al.[8].

Smoking was recognized as a risk factor for cervical cancer by 29% of the students in the study done by Saha et al in Kolkata as compared to 12.19% in the present study.[9]

On the other hand 31.71% students answered HPV infection as risk factor for cervical cancer almost similar result were found in other studies .[10]

Regarding the awareness of HPV infection, among the participants only 15.8% in the study conducted in Oman and 34.5% in another study conducted in Saudi Arabia had heard about HPV infection, whereas in our study it was found to be 25%.[11,12]

In a study conducted in the State of Andhra Pradesh, 54% of participants were aware of the HPV vaccine for cervical cancer prevention.[13] whereas in present study it was found to be 20.83%, which is almost similar to the result found in a study done by Hussain AN et al.[12] In contrast, majority of students surveyed in South Indian States of Karnataka (75.6%) were aware of the availability of HPV vaccine for cervical cancer prevention.[14]

48% of students answered correct about the number of dose of HPV vaccine in present study, similar result found in study done by Mithun M Sanghavi1[15]

The level of awareness regarding various aspects of HPV vaccine was found to be poor among students in the present study. Similar findings was seen in the study by S Mehta et al in Delhi.[16]

The main source of information for the participants in the present study was social media (34.16%) this observation is consistent with the findings of studies from Asian countries including India.[17]These findings are contrary to those of a study conducted in Italy among young adolescent girls, which found healthcare providers to be the primary and most trusted source of information.[18]

In the current study only 3.33% students were HPV vaccinated which is almost similar to the result found in another study done by Bruni L et al.[19]. But it contrasted with finding in another study done by Petra Stöcker,1,2,3,* et al. where 41% students were found to be completely HPV vaccinated.[20]

51% of respondents from a study done by Blackman E et al indicated they had a favorable attitude about receiving the vaccination[21], almost similar (68.96%) was found in present study. Contrary was found in another study, which was 80% [22]

Out of the unvaccinated people 31.03% students don't want to be vaccinated. Almost similar result was found in the studies conducted by K Swarnapriya1 et al. [23]

Conclusion

By the study it is concluded that there is lack of adequate knowledge about cervical cancer, HPV infection and HPV vaccine among school going girls. 11th and 12th class students demonstrated superior knowledge in contrast to other students. Concerns about vaccine's efficacy and safety can be main reason for low HPV vaccination uptake. This indicates need to step up efforts to develop more integrated and focused teaching strategies for a variety of features of HPV vaccination. The academic curriculum at medical colleges needs to place greater emphasis on such impending, crucial issues.

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Humanizing Pandemics by Spatio-Temporal Analysis of Societal Response to Pandemics: The case of Bengal (aka West Bengal)

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Abstract

This study is interdisciplinary in nature and brings in its fold dissemination of social science research on health. In the light of the recent Covid 19 crisis, there has been an increasing interest towards epidemiology and to understand the concept of epidemics or pandemics. Intermittent outbreaks of infectious diseases have had profound effect on societies throughout history. Historical perspective helps in understanding the extent to which panic, connected with social stigma, threat, prejudice, frustrated public health efforts can control the spread of disease. The intensity of the spread of a pandemic and the number of people affected in country and specific regions depend a lot on the measures of state control at the local and centre-level. However, the severity of an epidemic which slowly pervades into a pandemic depends on the spatio-temporal frame of a region. The research poses a basic question, how do members of the society respond to the threat of pandemic and to the hygiene, social isolation and other measures proposed by public health, over time and selects the case of Bengal which has witnessed three pandemics since the 18thcentury.. The study follows a mixed-method approach and the discussion provided a few general observations which however are not exhaustive to pandemic reaction, for the study area like threat Perception, emergence of leadership, science communication etc.

Key words: Pandemics, Epidemics, Societal Response, Spatio-Temporal Analysis

Introduction

Contexualising Covid 19 crisis, there has been an increasing interest in epidemiology and to understand the concept of epidemics or pandemics. Centres for Disease Control and Prevention (CDC) defined epidemic as an unexpected increase in the number of disease cases in a specific geographical area (2008). Amongst the worst pandemics which have affected civilizations, if we focus our attention on the last 300 years (1720-2020), mention may be made of The Great Plague of Marseille (1720-1723),

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the first cholera pandemic (1817–1824) also known as first Asiatic cholera pandemic or Asiatic cholera, Spanish Flu (1918-1920) and Coronavirus Pandemic (2019-20).

The intensity of the spread of a pandemic and the number of people affected in any specific regions depend on the state control policies. However, the severity of an epidemic slowly pervading into a pandemic depends on Spatio-temporal frame of a region. Its environment, governance, and technological advancement all are guiding forces in combating the disease spread. The research poses a basic question, how do members of the society respond to the threat of pandemic and to the hygiene, social isolation and other measures proposed by public health, over time. Hence, the study adopts a case study approach and selects the case of Bengal and the recurrent pandemics in the region in the last 200 years-Cholera of 1817, Spanish Flu of 1918 and Covid of 2019.The study adopts a mixed-method approach combining the elements of quantitative and qualitative elements. This study, therefore, uses inductive, qualitative research methods to develop new knowledge on how members of the general population respond to pandemics, at a particular spatiotemporal frame set against the backdrop of the assumed resistance on the part of the general public including, health risk fatigue, the risk communication dilemma etc.

Literature Review

According to Morens et. Al (2009), in the 17th and 18th centuries the term pandemic and epidemic were used interchangeably. The earliest known use of the term pandemic was in 1666 and it was referred to as "a *Pandemick*, or *Endemick*. However, in the 19th century the use of the term epidemic became more common while the word pandemic was hardly used. However, with evolution of society, a scientific understanding of the disease emerged. While between 1831the -32, cholera pandemic represented for the first time the global spread of pandemic disease, the 1889 influenza pandemic gave a concrete shape to the concept. Though the 1889 and 1918 influenza pandemics may have temporarily codified the pandem but it soon drifted into obscurity with the emergence of other infections and chronic and lifestyle-associated diseases.

For better understanding, the term pandemic refers to diseases that extend over a large geographic area. An example may be the Plague (the Black Death) in 14th century, cholera, influenza, and human immunodeficiency virus (HIV)/AIDS. The authors also categorized pandemics as transregional (more than two adjacent regions of the world), interregional (less than two nonadjacent regions), and global (Taunberger et. al,2009).

According to Bavel et. al(2020), any advent of a pandemic comes with large-scale behaviour changes like threat perception of the pandemic, emotions driving risk perceptions, prejudice and discriminations, disaster perception and panic responses like 'panic buying etc. The information environment around the pandemic underscores the scientific environment giving rise to conspiracy theories (like vaccine resistance), fake news etc. The authors also pointed out that crisis-like pandemics have created situation for leadership at different levels: families, employing organization, local neighbourhood communities and nations. Another societal response to slowing down of pandemic is social isolation while awaiting vaccines. This has created conflict with the human instinct to connect with fellow humans.

Thus, societal response to pandemics is a complex phenomenon and both space and time are important determinants. However, according to Patterson et. al(2021), whatever had been the public response to Black Death, has remain unchanged. Responses like disregard for governmental proclamations or poor personal risk assessment, are still common. However, a historical perspective helps in understanding the extent to which panic, connected with social stigma, threat, prejudice, and frustrated public health efforts can control the spread of disease.

Focussing on space, Guha (2020) discussed that the New World and the Old began intensive interaction from 1500 and this had made pandemics possible. There have been varied responses historically in different countries of the world. He gave an overall world view citing examples of smallpox, a disease less lethal in European children ravaged the American indigenous populations or how the trading Mediterranean cities were swayed by the Bubonic plague brought in by caravan traders of the silk route.

Pandemics have historically affected the population or economy. However, the loss has always been greater in the lower and middle income countries because of the barrier they face in combating such crisis.

Researching societal response to pandemic needs to fit into a specific space and time frame. Globally various countries at various stages of economic and societal evolution have responded in different manner to pandemic. Unless this is studied within a fixed spatial frame, the responses cannot be understood.

However, there is a substantial challenge on the accuracy of data or holistically understanding how a specific society responds to pandemics in general. Response to pandemic depends on how far the society is equipped to face it, in terms of its policy on closure, health related infrastructure or in general the behaviour of its citizens. Hence, the study focusses on a particular area in global south which have experienced pandemics over a wide temporal frame. Considering the global south, this study intends to fix the study at a spatial frame and compare across the major disease events in that area, the rates of infection, the historical impact of these largely unchecked pathogens upon populations and economies and how culture and society's collective memory have affected the response to pandemics.

Sweta et.al (2019) pointed out that India had encountered several epidemics and pandemics throughout history. The period from the beginning of the 1870s to the end of the 1910s can be called 'the age of famines and epidemics' in British India. Considering the case of India, it has witnessed almost six outbreaks of cholera(1817 to 1899),plague epidemic (1896),Influenza epidemic(1918) to name a few.

However, how literature reveal that a specific society, as a unit in general response to pandemic has not been focussed on. In order to fill this gap, the study focussed a specific spatial unit and its holistic response to the pandemic.

Material and Methodology

Objectives

The objectives of the research are to understand the following

- To comprehend the societal response to pandemics, in general
- Understand the temporal pattern of pandemics, in Bengal
- Compare the societal response to pandemics over time
- Identify the factors responsible for variable response to pandemics over time

Data Collection

While the history of pandemics in Bengal has been endeavoured to be studied from literary texts (books, government reports, news paper articles, archival letter) as most of the stakeholders were not there any more, the recent Covid 19 is studied through questionnaire survey, in addition through secondary sources. A group of 404 respondents were selected from all over West Bengal, who consented to participate in the survey, after a pilot survey. These respondents were identified by snowball sampling as one respondent identified the next set of respondents. These respondents either had the infection or were in touch with infected patients immediately after the second wave of Covid in Bengal. The survey included a mixture of open-ended and closed-ended questions. The survey results were summarized using descriptive statistics and the qualitative data obtained from free-text responses were analyzed using framework analysis performed in Excel.

Data Analysis

Societal response to pandemic, over time is assessed through the following dimensions

- Training to medical professionals and disaster preparedness
- The role of citizens in times of Pandemic
- Social network in times of public health emergency
- Democracy and Human right under Public health emergency threat
- Relationship between science and society in times of public health emergency(reaction to treatments, sanitization or vaccination)

Case Study -Profile of the Study Area

The study selects the state of West Bengal as the spatial entity and the temporal frame includes the outbreaks of pandemics, beginning from cholera (1817) to Covid 19(2021). The area being a typical global south spatial unit which has undergone rapid transformation from a feudal and colonial society to a agro-industrial and representative democratic one (Bannerji,2021).The population of Bengal in 1881 was 69,536,861(Census of India) with an area of 246231 square miles. As per details from Census 2011, West Bengal has population of 9.13 Crores, an increase from figure of 8.02 Crore in 2001 census.

Results and Discussion

The study selects three major disease events -Cholera in 19th century Bengal, Influenza (1919),Covid 19(2020-21).

Cholera

About the Disease-The pandemic is believed to have originated in the town of Jessore (near Calcutta) in August 1817(Centre for Disease Control and Prevention, 2021)

Origin and spread:

A cholera outbreak occurred in Jessore (which was then a part of India) India, midway between Calcutta (Kolkata) and Dhaka (now in Bangladesh).

Theories of Origin:

A gradual change in the course of river beds affecting decomposition processes in the soil, the famines in Bengal, eruption of Mount Tambora in the Dutch East Indies (Indonesia) in 1815 have also attracted attention in this context.

Societal response to pandemic is assessed through the following dimensions

As literature observed, series of global pandemics began when the world was united by sea in 1500. Societal response to the selected pandemic was analysed through the following dimensions.

- Training to medical professionals and disaster preparedness-

  According to Mushtaq (2009), officers of the British East India Company were not familiar with cholera. Before 1817, cholera was confined to Bengal but the 1817–1821 cholera epidemics in India had taken aback, the company.

- The role of citizens in times of Pandemic

  According to Harrison (2020), following the Rebellion of 1857, cholera called for a powerful reaction from the British, who imposed quarantine to protect troops and European enclaves. It was also pointed out that residents of *Calcutta* (now Kolkata recognized the existence of an epidemic and associated it with a local deity known as *Ola Bibi* or the *'lady of the flux'*

- Democracy and Human right under Public health emergency threat

  Medical relief took the form of distribution of European remedies (preparations of alcohol and opium, or calomel).Later it included native or "bazaar" medicines.

Spanish Flu

The Spanish Flu of 1918 was a tragedy of gigantic proportion where roughly 50 million people died. It was called the Bombay Influenza or Bombay Fever, with roughly 6% death of the Indian population (Chandra and Noor, 2020).

About the disease

The Spanish Flu virus was of the H1N1 strain with genes of avian origin but like Covid-19, it was transmitted via respiratory droplets.

Theories of Origin and Spread

According to Chandra et.al (2020), this pandemic is believed to have originated from influenza-infected World War I troops who came back home. In case of India, the Sanitary Commissioner in his report noted that: "The railway played a prominent part as was inevitable."

Societal response to pandemic is assessed through the following dimensions

After analysing the Cholera pandemic, the next section will focus on how the same spatial unit reacted to another pandemic, after a gap of 100 years.

- Training to medical professionals and disaster preparedness:

  But the flu pandemic of 1918 assumed gigantic proportion and unnerved the British Crown and passed a special law in 1920-21 known as Municipality and Local Board Acts

- Social network in times of public health emergency-According to Chandra et. Al (2014), firstly, there had been a scarcity of doctors due to war duty. NGOs like the Social Service League, raised money for nutritious food, clothing (pneumonia jackets), nursing and isolation in makeshift hospitals.

Covid 19

About the disease

COVID-19 appeared as an infectious disease of global health emergency in 2019. Arnold et.al (2020) pointed out how Wuhan, China was the first epicentre of this pandemic. Later it started spreading to other Asian countries, middle east (Iran- the epicenter), Europe (Italy -the epicenter) and Spain (western Europe epicenter) and then to USA (NY the epicenter).

Theories of Origin and Spread

The first COVID-19 case in India was identified in Thrissur, Kerala, on January 30, 2020.The first case was an infected person who returned from Wuhan, China

Government of India had been implementing lockdown rules and had enacted social distancing norms since March 24, 2020 to manage the rapid outbreak of COVID-19 pandemic during the global emergency.

Societal response to pandemic is assessed through the following dimensions

- Training to medical professionals and disaster preparedness

  According to Mondal et.al (2021), on March 26, 2020, various monitoring committees were also constituted for managing clinical care, isolation wards. For a ground level study, the respondents were also asked if they received help from trained professionals during Covid treatment.31.4 percent responded positively.

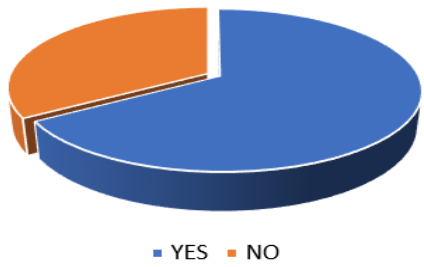

Fig 1. Medical Help from Trained Professionals During Covid

For a ground level study ,the respondents were also asked if they always verify the information received on social media, 52 percent responded positively while 33.2 percent were not sure.

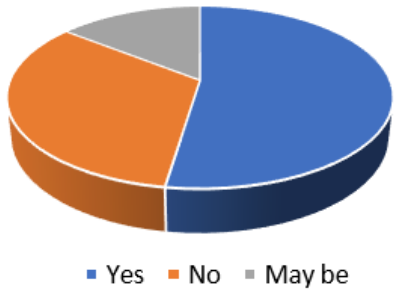

Fig 2. Verification of Covid relation information Received from Social Media

- **The role of citizens in times of Pandemic**

  According to Mondal et.al (2020) the insufficient or inappropriate information and rumours had affected the mental well-being of people during this pandemic.

For a ground level study, the respondents were also asked if their reaction when the pandemic began to spread. The maximum percentage of respondents said that they started collecting basic information from newspapers while an equal number researched or attended meeting for greater and more first hand information.

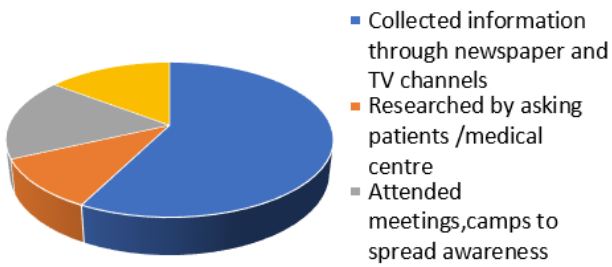

Fig 3. Source of Covid Related Information by Respondents

- **Social network in times of public health emergency**

  Covid challenges have been taken up and boosted by civil societies to deliver services like-organizing free kitchens and health camps. Many Non-Government Organizations, Clubs, Religious Organizations, Political Parties, Persons and NRIs take part in COVID-19 Pandemic control besides Government Efforts like Red Volunteers, West Bengal Doctors Forum etc.

  For a ground level study, the respondents were also asked their reaction when their relatives, neighbours or friends were covid positive. The maximum percentage of respondents said that they isolated themselves (58 percent) while others managed to stay in touch by physically distancing themselves. However,26.8 percent reported that they were proactive and arranged help.

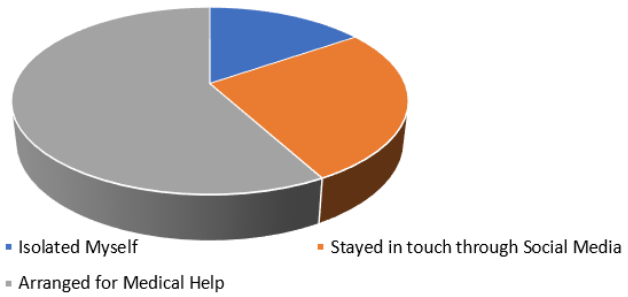

Fig 4. Reaction of Respondents when in touch with Covid Patients

Democracy and Human right under Public health emergency threat

According to Ghosh et.al (2020), both urban and rural areas got impacted by COVID-19. To control the COVID- 19 transmission, locked down and social distancing measure were taken.

For a ground level study, the respondents were also asked their reaction if the government restrictions were justified. The maximum percentage of respondents said it was not justified (48 percent). However, 23.4 percent reported it was justified.

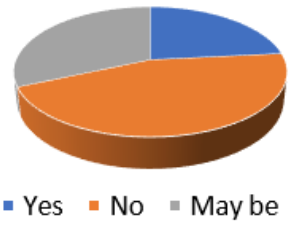

Fig 5. Respondents' perception on Covid Related Government Restriction

- Relationship between science and society in times of public healthemergency(reaction to treatments,sanitization or vaccination)

On the other hand, Vaccine hesitancy is a complex behaviour and context-specific.Tamysetty et.al(2022), pointed out that Mumbai had the greatest number of respondents stating lack of faith in immunization (20%), followed by Delhi (7.4%) and Kolkata (6%).

For a ground level study, the respondents were also asked their reaction if they feel that their society lacks proper knowledge of public health or vaccine,72 percent reported, yes.

Role of social mediaand Digital technology on the lifestyle during Covid Restriction

Digital technologies are being harnessed to support the public-health response to COVID-19 worldwide, including population surveillance, case identification, contact tracing and evaluation of interventions on the basis of mobility data and communication with the public.

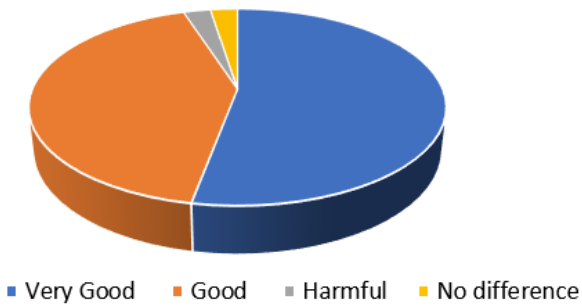

Fig 6. Role of social media and Digital technology on the lifestyle during Covid Restriction

Summarising the responses both at individual as well as societal level, related to the pandemic:

Looking at a variety of responses, a few common responses to all three pandemicswere observed in the study area.

- Threat Perception, risk, prejudice etc.
- Emergence of leadership
- Science communication
- Social norms, culture, polarization,social inequality
- Stress and coping

Of these responses ,some were common in all the pandemics,while some varied from one pandemic to other.It is illustrated in Table 1.

Table 1: Patterning Societal Outcomes to Pandemics, over Time.

Common Societal Outcomes within a spatial frame which remained constant over time	Specific Societal Outcomes within a spatial frame which varied over time
Threat Perception, risk, discrimination etc- Negative emotions resulting from threat was contagious. Even for the latest covid 19 pandemics, it was found that as negative emotions increased, people relied on negative information about COVID-19 more than other information to make decisions.	**Prejudice**-Both cholera and Spanish flu pandemic created opportunities to the increase of religious and ethnic prejudice which was not so for Covid 19.
Panic-This was observed in all three pandemics.	**Social norms**-Changing behaviours by correcting misperceptions was achieved by public messages,in case of Covid 19.This was not observed in previous pandemics.
Social Inequality- While for the first two pandemics,the Europeans of Bengal were better equipped to handle.For the recent pandemic,the economically disadvantaged people faced the greater risk,unable to afford mask or handwash or santiser or unaffordability to avail private transport.	Leadership-What was not observed in the previous two pandemics in Bengal but emerged in the third one was leadership.
Science Communication-. Like the previous pandemics, COVID-19 pandemic had already seen a rise in conspiracy theories, fake news and misinformation.	

Source :Author,2022

Comparing the Societal Change against each pandemic.

Societal evolution with pandemics:

In the late 1890s and early 1900s, at the height of the colonial era, Bengal was affected by famine and serial epidemics of cholera and malaria; famine and food shortages. However,Bengal was not in that vulnerable position today. In the 1890s and 1900s, India's pharmacological industry was in its infancy. Thiswas not so,now.withCOVID-19 vaccine mass-produced in India.

Pandemic "Blame ' game:

It is important to mention however that in each of these pandemics, India,in general and Bengal in particular played a different role. In the cholera pandemic of the nineteenth century, Bengalwas the originator, incubator, and disseminator. With influenza in 1918, Bengal was a recipient with the pandemic marching from west to east.In case of Covid -19 it has directed renewed attention to India's armies of informal labour and the migrant poor.

Conclusion

When one studies pandemic responses in a particular area over time,one has to keep in mind that the society has also evolved over time. Though there remain many similarities in patterns of disease spread and response from the first pandemic in the study area, the major risks posed by COVID-19 arose not only from the pathogen, but from indirect effects of control measures on health and core societal activities. Policymakers should use lessons from previous pandemics to develop appropriate risk assessments and control plans forand for future pandemics.

Ethical clearance- For this study, ethical clearance was not required as most of the bibliographic material was accessed from Creative Commons and the respondents identity was never disclosed.

Source of funding: Self

Conflict of Interest: Nil

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Original Article

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Risk Factors for Febrile Seizures in Children Under 5 at a Tertiary Care Teaching Hospital

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Abstract

Introduction: Convulsion is most common neurological disorder finding in children having high grade fever. Factors affecting convulsions and prevention of febrile seizures are therefore of utmost importance. The aim of study was to study the risk factors associated with febrile seizures among under 5 children.

Methods: A cross sectional study was conducted in the department of Pediatrics GS Medical College and Hospital Pilakhuwa, a tertiary care teaching hospital in North India. All children under 5years of age who had febrile convulsions from March2022 to March2023 were included in the study.

Results: In a total of 100 children in the study, 59 were boys (59%) and 41 were girls (41%). 59% of children were in the age group of 6months to 3 years. Mean age was 2.23 years (+_1.19years). 32% of children had positive family history. 80% children had simple and 20% children had complex seizures.

Conclusions: Respiratory tract infection and acute gastroenteritis were two most common comorbidity. It was seen more in boys than in girls.

Keywords: Febrile seizure, Partial seizure, Acute gastroenteritis, Respiratory tract infection, Vaccination.

Introduction

Febrile convulsion is one of the most frequently occurring seizure disorders in children[1]. It occurs in 3-5% of children at least once before 5yrs of age[2]. Febrile seizure affects 2-5% of all children across the world, 30% of children have a second episode and 15% have more recurrences.

International League Against Epilepsy has defined febrile seizure in children as temperature above 38.C without evidence of acute electrolyte imbalances and CNS infection or history of febrile convulsion[3]. It is characterized by loss of consciousness, involuntary movement of limbs on both sides of the body.

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Febrile seizure is classified as simple and complex seizures. Simple seizure is characterized by an episode of generalized tonic colonic seizure lasting less than 15 minutes in 24 hours while the complex type seizures are multiple, lasting more than 15 minutes[4].

The important causes are fever, hypoglycemia, head injury, gastroenteritis, respiratory infections, drug overdose, poisoning, prematurity, mother disease during pregnancy[5]. Positive family history of febrile seizures is seen in 25-40% of cases[4]. Maternal risk factors like stress, smoking also play significant role in first episode of febrile seizures.

Vaccinating children at recommended age may prevent some febrile seizure by protecting children against measles, mumps, rubella, chickenpox, pneumococcal infection and other diseases that can cause fever and febrile seizures[6].

The condition is more common in children belonging to a lower socioeconomic status, presumably because of inadequate access to medical care[13]. Seasonal and diurnal variations in the occurrence of febrile seizures have been observed by investigators in the United States, Finland, and Japan[14, 15].The purpose of this study was to determine the prevalence of febrile seizure among under 5 children and to explore the impact of socio-cultural and economic factors on this prevalence.

Materials and Methods

The current study was conducted using the cross-sectional approach. The study was conducted at GS Medical College and Hospital, Pilakhuwa, Hapur, Uttar Pradesh over the period of 12 months from March 2022 to March 2023 and approved by the Ethical committee. The researcher has followed the guidelines proposed by the committee to maintain the standards of the study. The data was collected from predesigned proforma that had the information related to demographic, seizure episode and complete history of the clinical examination. A written informed consent was obtained from parents based on the tenets of the declaration of Helsinki.

Inclusion Criteria: All the Children above 6 months and under 5 year of age who had first episode of febrile convulsions during March 2022 to March 2023 were included in the study.

Exclusion Criteria: All other seizure disorder patients were excluded from this study also patients age less than 6 months and above 5 years were not included.

Data was analyzed using SPSS version 27.0 software for Windows software (SPSS, Inc., Chicago, IL). The results are reported in means and standard Deviation (SD) for quantitative data and qualitative data along with number (n) and percentage (%), where appropriate. In analyses Chi-square and t-test was used, $p < 0.05$ was taken to indicate statistical significance.

Results

Total 100 children were enrolled out of which male were 59% and female were 41%. Male were more prone for febrile seizure. In age group 6months to 1 year, 18 children had febrile seizure. Age group between 2-3 years had 38 cases of febrile seizures which were maximum. The mean age of male was 2.25±1.13 and female was 2.23±1.25. The Mean age of the children combining male and female was 2.23±1.19.

In our study 80% children had simple while 20% had complex seizures. The mean body temperature was 38.65±0.7 in which boys had mean body temperature of 38.8±0.5 and girls had 38.5±0.9.P value of mean temperature was 0.0354 which was significant.

Respiratory tract infection (20%) and acute gastroenteritis (23%) were the two most common co morbidity. P value was 0.702 which wasn't significant.

32% children had positive family history of febrile seizure while 68% did not have same history. P value was 0.88 which was not significant

40% children which had febrile seizure were from urban households while 60% children belonged to rural areas. P Value 0.015 which was significant.

54% were fully vaccinated for their age while 46% were not fully vaccinated. P value 0.591 which wasn't significant.

Table 1: Frequency and percentage distribution of Age gender wise(n=100)

Age (Years)	Age (Years)	Male	Female	Total	P Value
Mean Age	6 months- 1 yr	10(55.5)%	8(44.4)%	18	
2.25±1.13	1- 2 yrs	12(54.5)%	10(45.4)%	22	
2.23±1.25	2-3 yrs	25(65.7)%	13(34.21)%	38	0.856
	3-4 yrs	7(58.311)%	5(41.6)%	12	
	4-5 yrs	5(50%)	5(50%)	10	

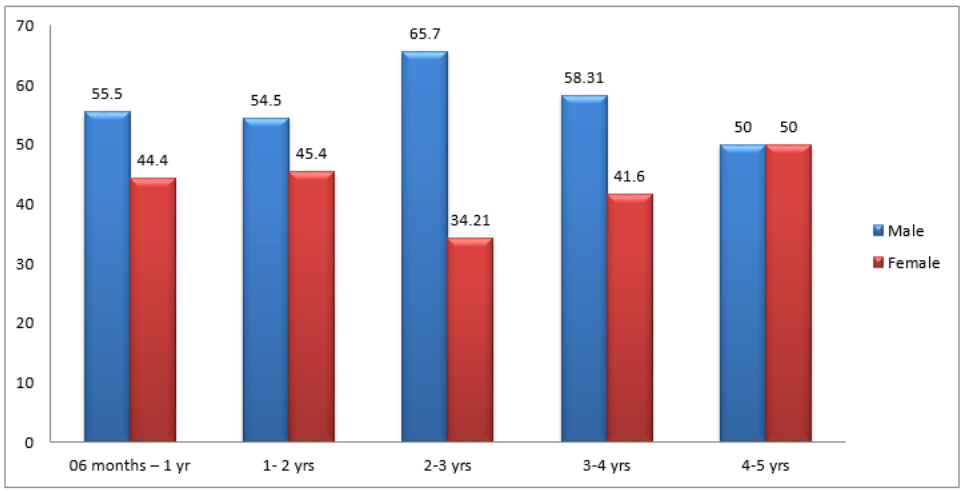

Figure 1: Age distribution gender wise

Table 2: Characteristics of the study population (n=100)

		Male	Female	Total	P Value
Temperature		38.8±0.5	38.5±0.9	38.65±0.7	0.0354
Type of Seizure	Simple	51(63.7)%	29 (36.2)%	80	0.75
	Complex	12 (60)%	8(40)%	20	
Infection	Respiratory Tract	13(65) %	7(35)%	20	
	Infection AGE	16(69.5)%	7(30.4)%	23	
	Malaria	4(57.1)%	3(42.8)%	7	0.702
	NO infection	28(56) %	22(44)%	50	
Family History	Yes	40(55.5)%	32 (44.4)%	72	0.88
	No	16(57.14)%	12 (12.85)%	28	
Residence	Urban	23(57.5)%	17(42.5)%	40	0.015
	Rural	48(80)%	12(20)%	60	
Vaccination	No	30(55.5)%	24 (44.4)%	54	0.591
	Yes	28(60.8)%	18 (39.13)%	46	

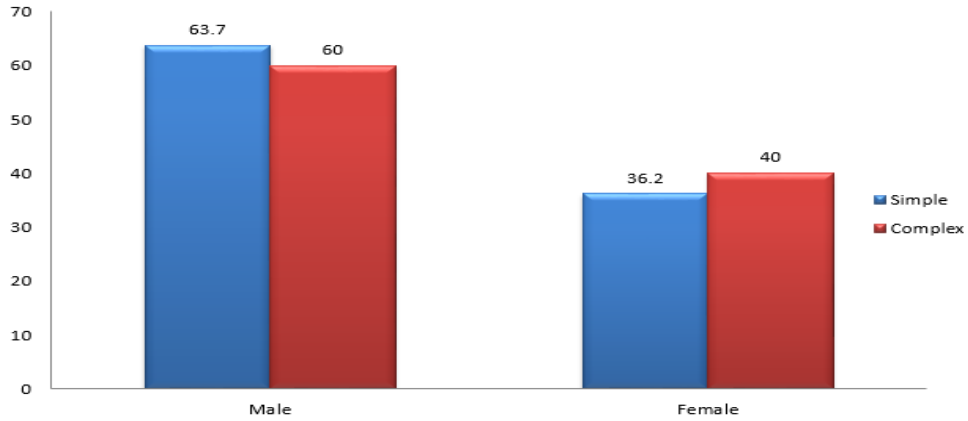

Figure 2: Types of Seizure distribution gender wise (in percentage)

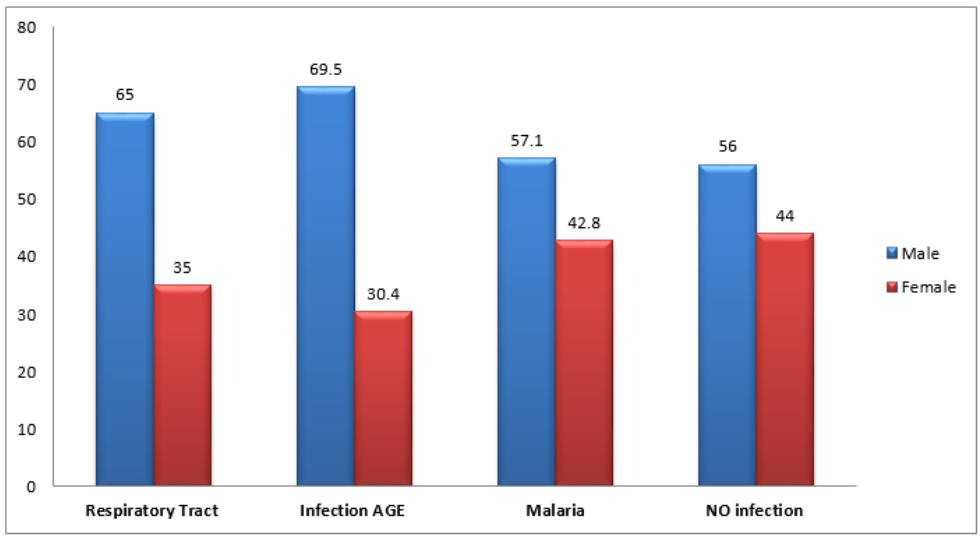

Figure 3: Types of Infection Distribution (in percentage)

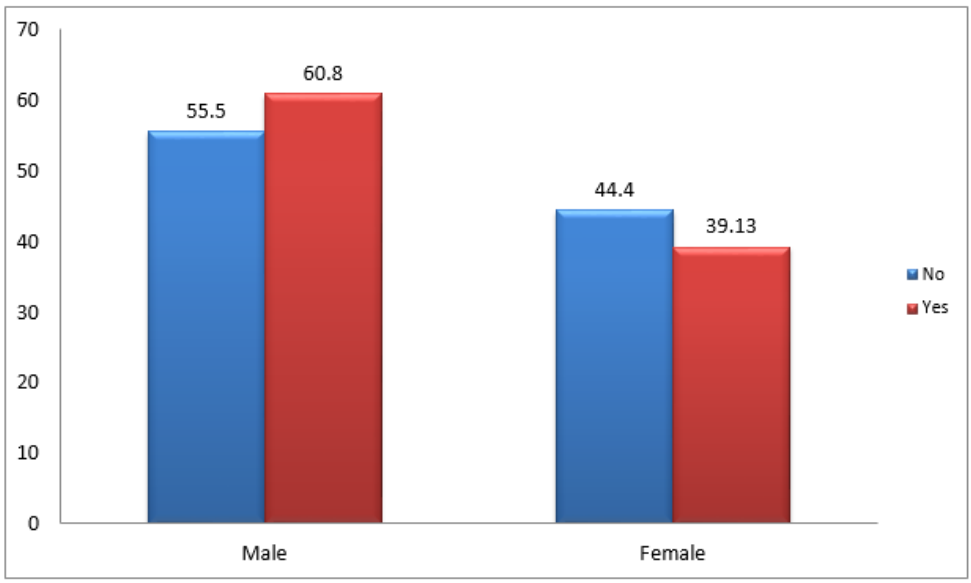

Figure 4: Vaccination Distribution gender wise (in percentage)

Discussion

Febrile seizure is one of the most common childhood seizure, occurring in about 2-5% of children between 6 months to 5 years age. Febrile seizure is an age-dependent response of the immature brain to fever. The etiology of febrile seizure is unknown but genetic factors or electrolyte disturbances may have a role in its occurrence or recurrence[14]. According to reports, febrile seizures exhibit a large hereditary tendency.

In this study it was seen that male children were more prone to develop seizures Mahyar et al did a study in 2010 and found that gender is an important factor[5].Male predominance was also reported from the study done by Chung B et al in 2006 in southern china[7.]

In this study 80% children had simple and 20% children had complex seizures .In the study by Eskandarifaret al[8] and Shrestha D et al reported the same findings[9.]

In the study by Al-Zwainiet al.[10], the most common cause of fever in children with fever and convulsions was respiratory infection and in the study by Eskandarifar et al.[8], Khazaei et al.[11], Respiratory infection and then gastroenteritis were the most common causes of fever with convulsions in the children. In our study respiratory tract infection (20%) and acute gastroenteritis (23%) were two important causes for febrile seizures.

In this study we found that children having febrile seizures belonged to rural households (60%).[12]An annual incidence rate of 0.42 per 1,000 per year was reported for rural population by Mani et al[18] as compared to 0.27 per 100,000 per year for urban population by Banerjee et al.[19]

In this study only 32% children had positive family history of febrile seizures. Vaccination had no impact on the occurrence of febrile seizure in our study but a study done by Mcintosh in 2010 found direct relation between vaccination and febrile seizure[17]. Accidently on routine blood investigations we found that febrile seizure children had low haemoglobin level.

Limitations

Firstly caution should be taken when assessing the dependent and independent variables since these data originated from a cross-sectional survey. Secondly, this study only recalls bias to assess past history regarding Ages, Temperature, Type of Seizure, Infection, Family History, Residence and Vaccination. Therefore, the contribution of theparents must be guided to take extra care of infants with family history of febrile seizure.

Conclusion

The common clinical and epidemiological factors associated with febrile convulsions were infections, family history of febrile seizure and anaemia. Parents must be guided to take extra care of infants with family history of febrile seizure. It is of utmost importance to prevent and treat infections, anaemia and malnutritionin children prone to febrile seizures.

Ethical considerations: Ethical issues have been completely observed by the authors.

Conflict of interest: The authors declare that there is no conflict of interest.

Source of funding: None

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Original Research Article

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Comparison of Recovery Characteristics between Fentanyl-Propofol & Dexmedetomidine: Propofol based Anaesthesia in Supratentorial Brain Tumor Surgery

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Abstract

Background: The aim of the present study is to compare the recovery profiles, perioperative hemodynamic changes and undesirable side-effects such as postoperative nausea and vomiting (PONV) and shivering of patients undergoing anaesthesia with fentanyl-propofol or dexmedetomidine–propofol in supratentorial brain tumour surgery.

Materials and Methods: In a prospective randomized double-blind study 70 ASA I-II patients aged 18-65 yrs of either sex, scheduled for supratentorial craniotomy with a maximum anticipated duration of 300 minutes, was allocated into two equal groups. One group received dexmedetomidine-propofol and other group received fentanyl-propofol as induction and maintenance of anaesthesia along with other drugs. Both the groups (n=35) received either i.v. dexmedetomidine or i.v. fentanyl 1 µg/kg 15mins prior to induction as loading dose followed by 0.5 µg/kg/ hr by continuous i.v. infusion peroperatively. At the end of surgery, recovery characteristics were assessed and recorded.

Results: Patients in Group 1 recovered early compared to Group 2 in terms of response to verbal command (6.99±0.77 vs 8.79±0.88), extubation time (9.14±0.91 vs 10.83±1.06) and orientation time (11.14±0.703 vs12.76±1.10) which were found to be statistically significant. Induction dose of propofol and infusion dose of atracurium were significantly less in dexmedetomidine group in comparison to fentanyl group. Though in both the groups adverse effects were seen, but it was very less (less than 9%).

Conclusion: Propofol-fentanyl and propofol-dexmedetomidine are both suitable for elective supratentorial craniotomy and provide similar intraoperative hemodynamic responses. Propofol-dexmedetomidine allows earlier cognitive recovery.

Keywords: Dexmedetomidine, fentanyl, propofol, recovery characteristics, supratentorial brain tumor.

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Introduction

The goals of neuroanaesthesia are to provide good operating conditions and to ensure stable cerebral haemodynamics without sudden increases in intracranial pressure or acute brain swelling. Furthermore, fast recovery from anaesthesia is often preferred to allow immediate neurological evaluation.[1] During recovery, abrupt increase in arterial blood pressure can pose a risk for postoperative haematoma.[2] Opioid analgesia prevents haemodynamic responses to awakening and extubation but may result in respiratory depression and high carbon dioxide tension with subsequent increase in the intracranial pressure. Alpha2 adrenergic agonists have been introduced to clinical anaesthesia for their sympatholytic, sedative, anaesthetic sparing and haemodynamic stabilizing properties. Dexmedetomidine has shown analgesic effects without significant respiratory depression.[3,4.] Dexmedetomidine provides good peri-operative haemodynamic stability with decreased intra-operative opioid requirement. Studies in animals suggest that it might have been a suitable anaesthetic adjuvant to neuroanaesthesia as it has beneficial effects in terms of neural protection. On the other hand, fentanyl is an opioid analgesic which cause respiratory depression and delay in postoperative recovery.[5]

The aims of present study were to compare recovery profiles of patients undergoing anaesthesia either with dexmedetomidine–propofol or with fentanyl-propofol in supratentorial brain tumor surgery and to compare perioperative hemodynamic changes in both set of patients.

Materials and Methods

After obtaining approval from institutional ethics committee and written informed consent from each of the patients, this randomized prospective, double blind, parallel group; study was conducted in the Department of IPGMER and SSKM Hospital, Kolkata & Bangur Institute of Neurosciences from March 2014 to March 2015. In the above study 70 patients of either sex, aged between 18 to 65 years, ASA (American Society of Anaesthesiologists) physical status I &II were assigned for supratentorial brain tumour surgery. The patients were randomly allocated into two groups comprising of 35 patients in each group. The allocation was done by a computer-generated code based on a two-way randomization and which was kept in sequentially numbered envelops and was opened 3 hours before operation. Pre-anaesthetic check-up and investigations were done, and the procedure was explained to the patients. On arrival at the operation theatre baseline hemodynamic parameters like heart rate, invasive BP and SpO2 were recorded and an i.v. line was established. Intra arterial line was established with local anaesthetic before induction.

Group 1(n=35) received dexmedetomidine and Group 2(n=35) received fentanyl in a dose of 1µg /kg15 mins prior to induction as loading dose and 0.5µg/ kg/ hr as maintenance. During the infusion SBP, DBP, HR and SpO2 were recorded at 5 mins interval. After pre-oxygenation for at least 3 min, patients received 2 µg/kg fentanyl and inj glycopyrrolate 3µg/kg before induction. Anesthesia was induced with propofol 1-2.5 mg/ kg in increments of 20 mg every 15s until the BIS reached a predetermined value of 50 and loss of verbal commands..Neuromuscular blockade was induced using atracurium in a bolus dose of 0.5mg/kgto facilitate endotracheal intubation when 95% neuromuscular block was achieved as indicated by train of four monitor (TOF count=0). Adequate oxygenation and normothermia was maintained throughout the procedure and the EtCO2 was kept in between 30-35 mm of Hg. Anesthesia was maintained with N2O:O2 (1:1), and propofol 50-150 µg /kg/ min. Depth of anaesthesia was monitored by using a BIS within a range of 40 and 50.Mannitol 1gm/kg was administered i.v. over approximately 30mins.A urinary catheter was inserted for monitoring of urinary output. Muscle relaxation was maintained by continuous intravenous infusion to maintain 90% suppression of the single twitch response. Signs of inadequate analgesia defined as an increase in mean arterial pressure 20% above baseline value and tachycardia HR>100 beats/min was treated by inj fentanyl 0.5-1µg/kg i.v., provided the BIS score is in the recommended range. Hypotension (SBP<90 mm Hg) was treated with mephentermine 6 mg i.v. and bradycardia (HR<40 beats /min) was treated with 0.6 mg boluses of i.v. atropine.

Approximately 30 mins before the expected end

of surgery, atracurium infusion was discontinued and the infusion of dexmedetomidine or fentanyl was also stopped, propofol infusion however been continued till the start of skin closure. The patients were allowed to recover spontaneously until the return of T1=25%.Then inj neostigmine 0.05mg/kg and inj glycopyrrolate 0.01mg/kg was administered to reverse the neuromuscular blockade. The time needed to return of T1 to 25% and returns of the TOF ratio (T1/T4) to 70% were recorded. The patients were extubated when BIS reached 80. Each patient was observed continuously after the termination of anaesthesia and total doses of fentanyl, propofol, dexmedetomidine and atracurium were recorded. Any adverse events or side effects were recorded during perioperative period. Hemodynamics of the patients was monitored before and after (a) during study drugs administered (b) induction of anaesthesia (c) endotracheal intubation (d) skin incision (d) opening of duramater and (e) extubation.

At the end of surgery, recovery characteristics were assessed by time to response to verbal commands (starting from the time of discontinuation of anaesthetic, a blinded investigator asked each patient at 1-min intervals, to open his or her eyes, squeeze the investigator's hand). Time to extubation (spontaneous breathing with a minimum of 8 mL / kg body weight, ability to sustain a 5-sechead lift, and adequate negative inspiratory force [-40 cmH_2O], sustained hand grip and sustained arm lift) and orientation time.

Data was summarised by routine descriptive statistics namely mean & standard deviation for numerical variables and count & percentage for categorical variables. Numerical data was compared between groups by student's unpaired't' test if normally distributed or by Mann-Whitney 'U' test if otherwise. Chi-square test or fisher's exact test was employed for inter-group comparison of categorical variables. All analyses were two tailed and $p<0.05$ was considered statistically significant.

Results

The present study was undertaken in 70 patients with ASA I and II in both male and female patients between 18-65 yrs for supratentorial brain tumor surgery.

Table 1: Demographic and clinical characteristics among study participants

	Group 1 (Mean ±SD [n=35]	Group 2 (Mean ±SD) [n=35]	p-Value
Age	30.54	33.97	0.150 (Mann-Whitney U test)
Weight	55.23±6.96	54.29±11.13	0.672
Hb%	12±1.26	11.94±1.23	0.833
Baseline heart rate	76.37±8.32	75.8±11.48	0.812
Baseline SBP	121.83±8.28	122.49±9.95	0.765
Baseline DBP	76.54±5.92	74.26±8.47	0.195
Duration of surgery (hrs)	2.2±0.529	2.35±0.708	

The demographic data for age, sex, hemoglobin % in both groups were comparable. There was no significant difference in baseline heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP). The following shows the trend of heart rate (HR), SBP and DBP during preoperative infusion and intraoperative period [Table 1]. There was no difference between groups. Decrease in respiratory rate was observed in Group 2 at 15 mins time of infusion which was found to be significant [Figure 1].

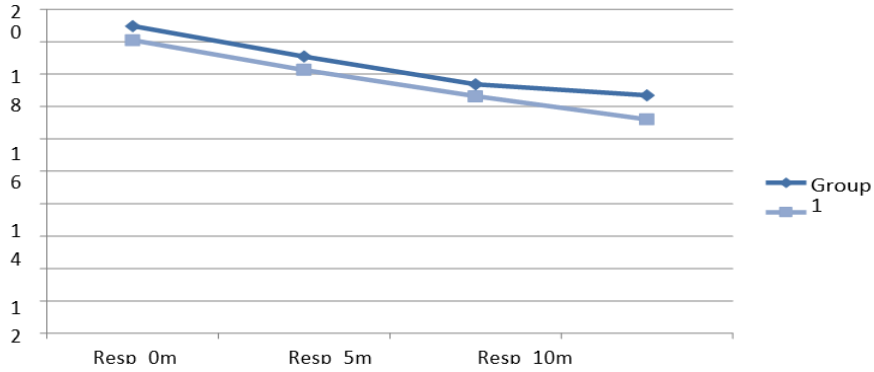

Figure 1: Changes in respiratory rate (RR/min) during preoperative infusion of study drugs.

Decrease in respiratory rate was observed in Group 2 at 15 mins time of infusion which was found to be significant [Figure 1].

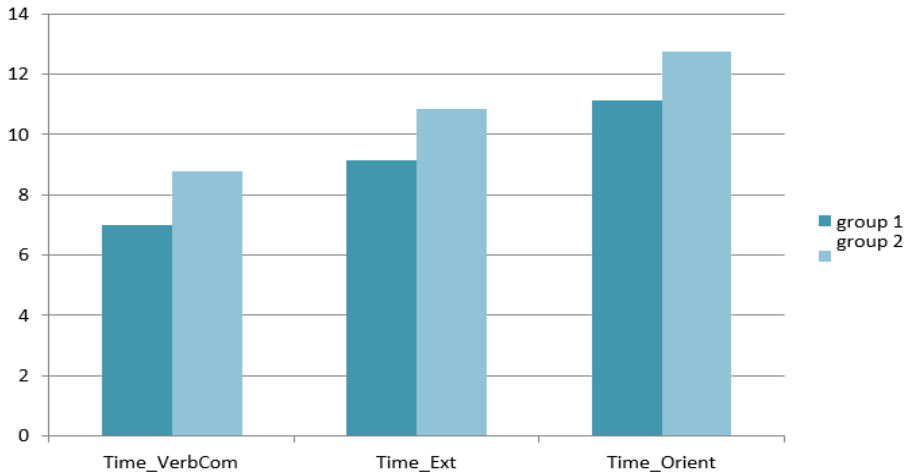

Figure 2: Time (in minutes) to verbal command, extubation and orientation after stoppage of anesthesia.

Patients in Group 1 recovered early compared to Group 2 in terms of response to verbal command (6.99±0.77 vs8.79±0.88), extubation time (9.14±0.91vs10.83±1.06) and orientation time (11.14±0.703 vs 12.76±1.10) which were found to be statistically significant [Figure 2].

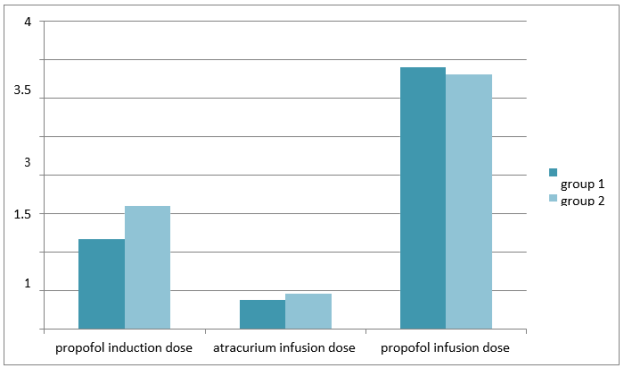

Figure 3: Induction dose (mg/kg) of propofol and infusion dose (mg/kg/hr) of atracurium and propofol

Induction dose of propofol and infusion dose of atracurium were significantly less in dexmedetomidine group in comparison to fentanyl group [Figure 3]. Though in both the groups adverse effects were seen, but it was very less(less than 9%) [Table 2].

Table 2: Adverse drug effects in the study groups

	Group 1	Group 2
No of patients	35	35
Nausea	1(2.86%)	2(5.71%)
Vomiting	0	1(2.86%)
Shivering	2(5.71%)	3(8.57%)
Bradycardia	0	0
Total	3	6

Discussion

In elective intracranial surgery, faster recovery from anesthesia is especially important for detecting early complications and for performing the neurological examination. Neurosurgical patients are at higher risk of postoperative cerebral bleeding and detection of procedural complications is easier if patients recover early. The results of the present study demonstrates that dexmedetomidine and fentanyl both can be used in patients undergoing supratentorial brain tumor surgery, as this allows prompt neurological assessment and determination of the need for urgent intervention. In our study patients of group 1 recovered early (orientation time11.14±.70 min) from anesthesia compared to group 2. Turgut et al[6] compared dexmedetomidine–propofol and remifentanil-propofol in supratentorial brain tumor surgery and showed similar recovery profile in dexmedetomidine group though timing was slightly different (orientation time 12.52±3.01 min).

Tanskanen et al[1] studied 54 patients undergoing supratentorial brain tumor surgery with continuous infusion of dexmedetomidine (plasma target concentration 0.2 or 0.4 ng/ ml) or placebo. Patients receiving dexmedetomidine had their tracheal tubes removed faster than placebo group, indicating preserved respiratory function.

He XY et al[7] included 5 trials, consisting of 482 patients in total. There were no significant differences in the number of patients who required rescue analgesics in the postanesthesia care unit, the number of patients with emergence agitation, the number of patients with postoperative nausea and vomiting, or the time to extubation between patients who received dexmedetomidine and those who received opioids. Compared with opioids, dexmedetomidine was associated with a significantly decreased time to eye- opening in response to verbal stimuli. 'The golden standard' of neuroanaesthesia includes maintenance of anaesthesia with propofol or isoflurane and fentanyl[8]. Recently, new alternatives, such as sevoflurane, desflurane and remifentanil, have been introduced to this paradigm. High concentrations of volatile anaesthetics can blunt the carbon dioxide response and render CBF pressure passively. In present study, we used fentanyl or dexmedetomidine for intraoperative analgesia because it has little effect on CBF regulation.

In dexmedetomidine group, there was significant reduction of induction dose of propofol and infusion dose of atracurium. Keniya, et al[9] concluded that dexmedetomidine ,as a pre-anesthetic medication and intraoperative infusion , decreased intraoperative anesthetic requirement. But in our study, maintenance dose of propofol was similar in both the groups.

Ali AR et al[10] showed in 3-8 yr old children undergoing ESWL (extracorporeal shock wave lithotripsy) , that both propofol/fentanyl and propofol/dexmedetomidine combinations were effective and well tolerated. However, propofol/ dexmedetomidine combination was accompanied with less propofol consumption, prolonged analgesia and lower incidence of intraprocedural and postprocedural complications.

In our study, fentanyl and dexmedetomidine were similar in overall efficacy. In both the groups, no hemodynamic and cardiovascular side effects were noted perioperatively. Similarly, Tanskenen PE et al[1] reported that dexmedetomidine provided good perioperative hemodynamic stability in patients undergoing brain tumor surgery and that it also reduced intraoperative opioid requirements. Dexmedetomidine could be convenient as an adjuvant anesthetic in neurosurgical anesthesia. But llhan et al[11] found that dexmedetomidine controlled the hemodynamic changes better than fentanyl perioperatively, after extubation and during early postoperative period.

Because of the ventilatory depressing effects of fentanyl, Feld JM et al[12] studied various alternative methods for analgesia in bariatric surgery. In their study comparing dexmedetomidine to fentanyl, they reported that dexmedetomidine provided both stable perioperative hemodynamics and postoperative analgesia, thus reducing the use of supplementary morphine. Dexmedetomidine, the highly selective alpha2 adreno-receptor agonist, has sedative and analgesic effects without causing postoperative respiratory depression.[13, 14] Dexmedetomidine 0.5 to 1.0 μg kg^{-1} over 20 minutes followed by an infusion at rates of 0.01 to 1.0 μg kg-1 h-1 was used in awake

craniotomy and enabled the performance of the neurological examination. [15, 16]

The major reported problem associated with dexmedetomidine is its hemodynamic effects such as hypotension, hypertension, and Bradycardia.[13, 14] In our study, bradycardia (HR-60/min) was seen more in dexmedetomidine group similar to other studies, however it never caused hemodynamic instability or there was no need of inj atropine. Hypotension or hypertension was also not observed in our groups. Commonly encountered complications in the early postoperative period in the recovery room in both the groups were shivering and nausea, vomiting, which were not statistically significant.

The analgesic profile of dexmedetomidine has not been fully characterized in humans.[17] However, the anxiolysis, blood pressure stabilization, analgesia, anesthetic sparing effects and sedation without respiratory depression or significant cognitive impairment effects of dexmedetomidine, are known. In our study, requirement of additional dose of analgesic was seen in fentanyl group without statistically significant difference. Cormack et al.[18] suggested that alpha2-agonists are useful adjuncts for the management of the neurosurgical patient during surgery and in the intensive care unit.

This study protocol does not allow us to make any conclusions about possible neuroprotective or cerebral vasoconstrictive effects of dexmedetomidine in elective supratentorial tumor patients. We have, however, demonstrated the safety and feasibility of dexmedetomidine in these patients in terms of early extubation of trachea and stable cardiorespiratory profile. Larger outcome studies on neural protection are warranted in clinical settings.

Conclusion

Propofol-dexmedetomidine and propofol-fentanyl are both suitable for elective supratentorial craniotomy and provide similar intraoperative hemodynamic responses and postoperative adverse events. Propofol-dexmedetomidine allows earlier cognitive recovery.

Conflict of Interest: None declared

Funding source: Self financed

Ethical Clearance: Approved by the Institutional Ethics Committee, IPGMER and SSKM Hospital, Kolkata, West Bengal

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Original Article

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Demographic and Health Profile of Tribal Population at Udaipur, Rajasthan: A Cross Sectional Study

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Abstract

Background: India is the second largest home for tribal communities, and they are distributed all over the country. One of the main public health concerns in our nation, which has a vast forest belt and numerous tribes living there, is tribal health and the problems encountered by tribal people.

Objective: 1. To determine the Socio - Demographic profile of the tribal population.

2. To estimate the health problems of the tribal population.

Materials and Methods: The present study was a community based, cross-sectional, multicentric study carried out among tribal populations residing in Iswal, Gogunda, and Losing village from 1st November 2022 to 1st January 2023. House-to-house visits were done to collect socio-demographic data and health check-ups of all family members were done to identify the health problems among them.

Results: A total of 906 tribal people (160 families) were interviewed. Age ranged between 1 month to 95 years with a mean age of 30.05 ± 19.22 years, the majority were in the age group of 11-30 years. About 51.32% were males and 48.68% were females, and literacy rates were low. About 60.63% of family's socioeconomic status was class IV and V, Hindu religion (82.45%) was most followed among them, and nuclear family types (45.63%) were more common. Overall housing conditions were good. Most of them had pucca houses (64.3%), consumed purified drinking water (73.1%), had separate kitchens (78.7%), used LPG as the major fuel for cooking (63.1%). While some practiced open-air defecation, and most of them dumped the house-generated waste (garbage) indiscriminately or on the streets 54.3). out of 906 individuals 714 individuals were apparently healthy whereas 192 individuals had certain health problems. Among them respiratory illness was the major problem affecting 52 (28.08 %) individuals followed by sexually transmitted infections 46 (19.86 %). Whereas injuries by wild animals / RTA were the least common health problem encountered among tribals 2(1.04%).

Keywords: Health problems, housing conditions, socio-demography, tribal community.

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Introduction

"Adivasi" refers to Indian tribes, indigenous people, and ethnic minorities. Sons of the soil, the tribal are forestland cultivators, minor forest product collectors, and hunters who lived in isolation near nature. 476 million indigenous people live in 90 countries, making up 6.2% of the global population.[1] 8.6% of India's population is tribal. [2] The Government of India has designated 75 of the 705 Scheduled Tribes (STs) in the country as particularly vulnerable tribal groups (PVTGs) due to pre-agriculture technology, subsistence economy, low literacy, and declining or stagnant population. [3]

Most states have tribes except Punjab, Haryana, Chandigarh, Delhi, and Pondicherry. [4] Rajasthan is the largest state in India, covering 10.4% of its total area with 3,42,239 sq. km. 56.51 million people, or 5.5% of the nation, live in this state, according to the 2001 Census. The state's scheduled tribe population is 12.4%. The scheduled tribes' population in Rajasthan is concentrated in five southern districts: Udaipur, Banswara, Dungarpur, Jaipur, and Chittorgarh. Bhil, Meena, Damor, Patelias, Saharaiyas, and Gharasia are the main tribes.[5]

Tribal agriculture is still based on small landholdings and irrigation. Industrialization, irrigation, productive land, and skill development are lacking. [5] Tribes are the poorest and most vulnerable in the nation. Poor health worsens their backwardness. [4] Human development requires health. Due to isolation, remoteness, and being largely unaffected by India's development, tribal populations have the worst health. Despite India's recent economic growth, ST or Adivasi health and human development indicators lag behind national averages. [1]

Tribal people have poorer health than non-tribal people. Low awareness, religious and cultural beliefs, inaccessible housing, and financial constraints exacerbate poor health. Health and sanitation vary among tribal communities. Poor infrastructure and inaccessible landscapes make their lives miserable and backward. They have developed differently from the rest of the country. [4] Addressing vulnerable population issues helps India meet its commitment for Indian tribes, indigenous peoples, and ethnic minorities make up 6.2% of the global population. India has the second-largest tribal population and concentration. 75 Scheduled Tribes (STs) are government designated PVTGs. Most states have tribes except Punjab, Haryana, Chandigarh, Delhi, and Pondicherry. Rajasthan, India's largest state, has 5.5% tribal people, mostly in five southern districts. Agriculture dominates the tribal community's economy, with limited productive land, irrigation, industrialization, and skill building.

Due to isolation, remoteness, and resource scarcity, tribal populations have poor health. Despite recent economic growth, ST/Adivasi health and human development indicators lag behind national averages. India's SDGs and universal health coverage depend on addressing these issues (UHC). SDGs and universal healthcare (UHC). [3] Thus, this study assessed health status and sociodemographic factors in the Rajasthan Bhil tribe in Udaipur.

Aim & Objectives:

1. To determine the Socio - Demographic profile of the study population.
2. To estimate the health problems of the tribal population of Study area.

Materials and Methods

Study area:

A total of 150 families residing in Gogunda, Iswal and Losing villages were studied based on the inclusion criteria and exclusion criteria.

Study Population:

Tribal people residing in Gogunda, Iswal and Losing village are included in the study.

Study design:

Inter-departmental, observational, Cross-Sectional, community-based Prospective type of study.

Sample size:

No sample size is calculated as the whole population is included in the study.

Sampling method:

No sampling was done; the entire universe was included in the study.

Study duration: Study carried out during 1st November 2022 to 1st January 2023.

Study tool:

A pre-tested, pre-structured and standardized questionnaire was used to collect information.

Inclusion criteria:

All the families who gave consent and residing in Gogunda, Iswal and Losing (three villages) of Badagaon taluk, Udaipur district was included in the study.

Exclusion criteria:

- Families whose houses are locked at the time of visit.
- Families who do not give consent.

Informed consent and ethical approval:

Institutional approval for the study was sought from, and granted by the Institutional Ethics Committee of Pacific Medical College and Hospital, Udaipur. All patients were briefed about the study; background, aim, risks, benefits and expectations for participation before being consented to participate. Written informed consent (in English or Hindi) were sought from each of the prospective participants in the study prior to enrolment and data collection.

Data collection

- In order to visit the hamlets, a road map was developed. Assistance was sought by the local PHC staff to schedule the visits.
- House-to-house visits were made in all hamlets. Families who did not reply and locked houses were not included. For the collection of data, a pre-tested, pre-structured and standardized questionnaire was created.
- A responsible family member from each family was interrogated to gather the relevant information. After obtaining oral consent, the entire family was subjected to clinical examination. The assistance of a female health worker, Anganwadi worker or adult female member of that family was obtained wherever possible and followed on mandatory basis when a male doctor was examining a female study participant. There was no laboratory investigation done.
- Health awareness camps were conducted at Losing, Iswal and Gogunda villages to create awareness about health, the causation of disease, preventive and control measures for the common ailments in that area as well as the free health care services available in Government and private health sector.

Statistical analysis:

The collected data was entered systematically in MS Excel software. The statistical software Epi – info 7.2.5.0 by CDC was used for data analysis. Descriptive statistics was presented in terms of tables and figures and frequency, percentage, mean, and standard deviation were calculated for the variables.

Results

Table 1: Distribution of tribal families based on their village of residence.

Name of village	Number	Percentage (%)
Iswal	27	16.87
Gogunda	89	55.63
Losing	44	27.5
Total	160	100

Table 2: Distribution of tribal population based on socioeconomic details.

Variables	Number	Percentage (%)
Age (n= 906)		
<5	73	8.05
6-10	100	11.04
11-20	172	18.98
21-30	201	22.19
31-40	131	14.46
41-50	95	10.48
51-60	80	8.83
61-70	30	3.32
>70	24	2.65
Gender (n= 906)		
Male	465	51.32
Female	441	48.68
Religion (n= 906)		
Hindu	747	82.45
Muslim	130	14.35
Others*	29	3.20
Educational Status (n= 906)		

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Illiterate	256	28.26
Primary School	293	32.34
High School	204	22.52
Intermediate	90	9.94
Graduate or above	63	6.94
Current employment status* (n= 906)		
Unemployed	145	16
Unskilled	397	43.82
Skilled	142	15.67
Professional	16	1.77
Housewife	206	22.74
Type of family (n= 160)		
Nuclear	73	45.63
Joint	43	26.87
Three generation	44	27.5
Socioeconomic class (B.J. Prasad classification) (n= 160 families)		
Class I	18	11.25
Class II	29	18.12
Class III	48	30
Class IV	49	30.63
Class V	16	10

*Unskilled, skilled, employees of government & private sector, housewives are included in employed category.

Table 3. Available Facilities among tribal Families.

Facilities (n=160)	Number	Percentage (%)
Type of house		
Kachha	18	11.2%
Pakka	103	64.3%
Semi-Pakka	39	24.3%
Drinking water source		
Piped water	69	43.1%
Ground water	83	51.8%
Both*	8	5%
Drinking water storage		
Closed container	131	81.8%
Open container	29	18.1%
Drinking water purification*		
Yes	117	73.1%
No	43	26.8%
Kitchen		
Separate	126	78.7%
Not- separate	34	21.2%
Fuel for cooking		
LPG	101	63.1%
Wood/Kerosene	32	20%
Both	27	16.8%
Bathroom facility		
Present	129	80.6%
Absent	31	19.3%
Drainage system		
Open type	47	29.3%
Close type	113	70.6%
Place of defecation		
Open field	61	38.1%
Latrine type	99	61.8%
Collection of refuse		
Bins	73	45.6%
Street dump / Indiscriminate dumping	87	54.3%

Table 4. Distribution of tribal population based on health problems.

Health problems (n = 192)	Number	Percentage
Non communicable diseases (DM, HTN, Stroke)	31	16.15 %
GIT problems*	20	10.42%
Respiratory illness*	52	27.08 %
Sexually transmitted diseases	46	23.96 %
Skin problems*	23	11.98 %
Eye problems*	18	9.37 %
Injuries*	2	1.04 %

*GIT problems: All subjects complained of vomiting, diarrhea, heart burns, indigestion, constipation were included in this category.

*Respiratory illness: All subjects complained of cough, cold, sneeze, difficulty in breathing, shortness of breath, asthma, allergic respiratory diseases were included in this category.

*Sexually transmitted diseases: Genital warts, Genito-urinary tract infection, candidiasis, gonorrhea, syphilis, HPV infection, herpes infection.

*Skin problems: acne, eczema, leukoderma, itching, hyperkeratosis, rashes.

Results and Discussion

This study examined the socio-demographic and health profile of Meena tribes in three Udaipur hamlets. The mean age was 30.05 ± 19.22 years. Young adults dominated (21 - 30 years) 201 (22.19%), 172 (18.98%) in 11–20 years, 60.26 % under 30, 5.96% elderly. Our findings match Yadav AK et al. [6], who found that over 50% of the population is under 30. According to Gutta SK et al. [7] and Sathiyanarayanan S et al. [8], Hindus made up 82.45% of the tribes and Muslims 14.35%. Gutta SK et al. [7] found that Hinduism dominated their tribes (92.86%). 71.74% were literate, 28.26% illiterate. 6.94% of tribals graduated or higher. ST literacy is 59% in India and 52.8% in Rajasthan, according to census data. The above shows higher literacy rates than tribal literacy. NGO activity, free primary education, and mid-day meal programmes may explain high literacy.[9] Despite improving literacy, most tribals (43.82%) worked unskilled jobs like daily wage work, forest hunting, wood cutting, and honey gathering. Only 1.77% were professionals. Our findings match a south Indian study by Siddalingappa H et al. [10] in tribal hamlets, where most were unskilled and unemployed. According to the modified B.J. Prasad classification, most tribes had nuclear families (45.63%) and three-generation families (27.5%). Gutta SK et al. [7] and Sujith et al. [11] found that most tribes were nuclear families. In a Maharashtra study, most tribes lived in pakka houses, followed by semi-pakka and kachha houses. [6]

Half of tribal families (51.8%) drank ground water (bore well) followed by piped water. 43.1% and 5% families used both sources when available. 81.8% of families stored drinking water in closed containers. Siddalingappa H et al. [10] found that most tribal hamlet families used borewells or hand pumps for drinking water. 73.1% of families had purified water. Most tribal families had separate kitchens and cooked with LPG. Due to state and central government efforts (Pradhan Mantri Ujwala Yojana), LPG use increased from previous years. Haq J et al. [12] reported 91.53% of tribal families used LPG for cooking. 80.6% of tribal hamlets had bathrooms and 70% had open drainage systems. 61.8% of tribal hamlets defecated in latrines. This shows community hygiene awareness and practise. Saleem SM et al. [13] found that all northern Indian rural households used sanitary latrines for defecation. In our study, 54.3% of families used street dumping and 38.1% of hamlets defecated outside. Illiteracy, ignorance, and lack of awareness about the health risks of improper household waste disposal and open-air defecation may be the cause.

714 of 906 study participants were healthy, while 192 were not. 52 (27.08%) had respiratory illness. Tapas Chakma et al.[4] studied seven primitive tribal groups in Madhya Pradesh and Chhattisgarh and found that acute respiratory infections were common in all tribes and regions. Sexually transmitted diseases (STD) 46 (23.96%) followed by RTA and/or any other cause 2 (1.04%) were the least common health issues among tribals. Salil Basu et al.[4] also believes sexually transmitted diseases, particularly female genital tract infections, are common among Indian tribes. Veena Bhasin et al. [4] found that Rajasthani tribes were unaware of sexual infection and disease transmission. Poor personal hygiene, poverty, low literacy, undernutrition, improper household-garbage disposal, open-air defecation, poor STD knowledge, and cultural factors contributed to health and disease in Meena tribe. Traditional health practitioners (Bhopa, Devala) and herbalists (Jaankar/Jaangar) treat them. This study shows that long health care system distances and poor transportation facilities drove people to local traditional treatment.

Limitation: This study identifies health issues based on the patient's history and doctors' general physical examination, but due to financial and time constraints, detailed laboratory evaluation is not done.

Recommendation:

- Long-term, broad-coverage studies are ideal for health planners to improve strategy.
- Government development programmes should be explained to tribal people.
- All stakeholders must work to improve tribal education, socioeconomic status, and sanitation.

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Conflict of interest: None.

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Original Study

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Comparison of Clinical and Angiographic Profile between Men and Women with Coronary Artery Disease

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Abstract

Aim of the Study: To study the clinical and angiographic profile of coronary artery disease (CAD) among women & men to compare the difference in these profiles CAD.

Materials and Methods: 1000 consecutive patients undergoing coronary angiography (CAG) for coronary artery disease were taken for this study. Patients were divided into two groups on the basis of gender. The risk factors, clinical presentation, echo cardiographic features, angiographic profile and treatment modalities were analyzed and compared between both groups.

Results: 300 patients were female and 700 patients were male with a mean age group of 57.2 years & 53.2 years respectively. On comparing the angiographic data CAD was higher among men. Significantly men received greater thrombolytic therapy than women & any intervention in form of PCI/CABG at admission or within 3 months of follow up was significantly greater in men than in women.

Conclusion: There has been a shift with respect to onset of risk factors and clinical presentation for coronary artery disease in the women. It is necessary to identify atherosclerotic risk factors in women and treat them appropriately to prevent further cardiovascular events. Interventional options PCI & CABG are done more often in men as compared to women.

Keywords Coronary Artery Disease, Women, Risk Factors

Introduction

Coronary artery disease (CAD) is one of the leading cause of morbidity and mortality in both developed and developing nations. We believed that CAD was primarily seen in males. But with the fact that the leading cause of death in women is CAD, this belief is gradually changing among the physicians. Although women suffer 7-10 years later than men, Centres for Disease Control (CDC) states that 38% of mortality in females are attributed to coronary artery disease which is highest amongst all causes including cancer which attributes to 22% of all cause deaths. Notably, women with CAD are more adversely affected than men.[1].

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Lack of self-awareness and poor identification of the cardiovascular risk factors, underrepresentation in clinical trials and different clinical presentations in women has led to improper diagnosis ,under treatment and inappropriate progression of the disease. A greater percentage of females (52%) than males (42%) with CAD die of cardiac arrest before reaching the hospital. The INTERHEART Study states that females have their first presentation of CAD nearly 10 years later than males, most commonly after menopause. However, in contrary, mortality from CAD is increasing more rapidly among females than males.[2].

Material and Methods

This was a prospective observational analytical study conducted in a tertiary care hospital in India. The patients who underwent coronary angiography for CAD, after obtaining written informed consent were included in the study. Data were collected using a standard questionnaire and answers were recorded. Any personal history of hypertension, dyslipidemia, diabetes mellitus and CAD were noted. Tobacco consumption in any form was asked about. Coronary risk factors, stroke & family history of premature CAD in first degree relatives (age <55 years in men and <65 years in women**),** were recorded. Questions related to history of documented prior myocardial infarction (MI), unstable angina, coronary artery bypass graft (CABG) surgery, non-invasive investigations for CAD, coronary angiography, coronary angioplasty, documented use of drugs for CAD and hospital admission for CAD. All patients underwent detailed evaluation including clinical, biochemical (including troponin levels), electrocardiography echocardiography evaluation and coronary angiography.

Inclusion Criteria

All patients who were admitted to undergo coronary angiography for Coronary Artery Disease after obtaining written informed consent were included in the study .

Exclusion Criteria

Patients with contraindications for angiography

- Patient's with renal dysfunction
- Patients who are too unstable to undergo coronary angiography

Result

1000 consecutive patients who fulfilled the inclusion criteria were included in the study. Out of 1000 patients 700 (70%) were males and 300 (30%) were females.

31.3% females and 30.3% males were in 51-60 years age group. 22.3% females and 21.3% males were in 61-70 years age group. 14% females and 5.7% males were in >70 years age group.28.4% males and 20.7% females were in 41-50 years age group, 12.1% males and 11.3% females were in 31-40 years, and 2.3% males and 0.3% female were < 30 years. Pattern of age distribution among females and males was statistically significant (Table 1).

Table 1. Age distribution in females & males

Age	MALE	FEMALE	p-value
<30 Yrs.	16(2.3%)	1 (0.3%)	<0.001
31-40 Yrs.	84(12.1%)	34 (11.3%)	
41-50 Yrs.	199(28.4%)	62 (20.7%)	
51-60 Yrs.	212(30.3%)	94 (31.3%)	
61-70 Yrs.	149(21.3%)	67 (22.3%)	
71-80 Yrs.	40(5.7%)	42 (14 %)	
Total	700(100%)	300 (100.00%)	

On comparing the risk factors 46.1% females were hypertensive and 38.3% females were diabetic. However only 27.3% males were hypertensive and 22.7% males were diabetic. Family history of premature CAD was 2.3% among females and 0.6% among males. These differences among both the groups were statistically significant.

Smoking and obesity were found in 67.9% and 55.6% among males and 14.3% and 48.7% among females respectively. These differences among both the groups were statistically significant.

53% females and 51.1% males were dyslipidemic, 61.9% females and 65.9% males had sedentary lifestyle, 3.7% females and 5.6% males had a prior history of CAD and 16.4% males and none of the females were alcoholic. None of these differences among both the groups were statistically significant (Table 2).

Table 2. Risk factors in male and female patients

RISK FACTORS	FEMALE	MALE	p value
HYPERTENSION	138(46.1%)	191(27.3%)	<0.001
DIABETES	115(38.3%)	159(22.7%)	<0.001
SMOKING	43(14.3%)	475(67.9%)	<0.001
DYSLIPIDEMIA	159(53%)	358(51.1%)	0.59
ALCOHOL	0(0%)	115(16.4%)	
OBESITY	146(48.7%)	389(55.6%)	0.045
SEDENTARY LIFESTYLE	185(61.9%)	457(65.9%)	0.218
FAMILY HISTORY	7(2.3%)	4(0.6%)	0.014
PRIOR CAD	11(3.7%)	39(5.6%)	0.205

33.3% females and 21.6% males presented with chronic stable angina, 33.7% females and 52.6% males presented with STEMI, 26.3% females and 20.3% males presented with NSTEMI and 6.7% females and 5.6% males presented with unstable angina. These differences between both the groups were statistically significant. On comparing the angiographic profile, 69.4% women and 78.5% men had Obstructive CAD whereas 21.6% women and 8.6% men had Normal Coronaries. These differences between both the groups were statistically significant. Only 4.7% women and 5.8% men had Insignificant CAD and 4.3% women and 7.1% men had Intermediate CAD. However these differences between both the groups were not statistically significant (Table 3 and 4).

Table 3. Presentation in male and female patients

PRESENTATION	FEMALE	MALE	p value
STABLE ANGINA	100(33.3%)	151(21.6%)	<0.001
STEMI	101(33.7%)	368(52.6%)	
NSTEMI	79(26.3%)	142(20.3%)	
UNSTABLE ANGINA	20(6.7%)	39(5.6%)	
Total	300	700	

Table 4: Coronary Angiographic profile in male and female patients

PATTERN OF CAD	FEMALE(n =300)	MALE (n = 700)	p Value
OBSTRUCTIVE	208(69.4%)	550(78.5%)	<0.001
INTERMEDIATE	13(4.3%)	50(7.1%)	0.094
INSIGNIFICANT	14(4.7%)	40(5.8%)	0.307
NORMAL CORONARIES	65(21.6%)	60(8.6%)	<0.001

30.7% females and 45.1% males had Single Vessel Disease (SVD), 23.1% females and 17.3% males had Double Vessel Disease (DVD) and 15.7% females and 16,1% males had Triple Vessel Disease (TVD). These differences between both the groups were statistically significant (Table 5).

Table 5. Pattern of Obstructive CAD in male and Female patients

PATTERN OF VESSEL INVOLVEMENT	FEMALE N=300	MALE N=700	p value
SVD	92(30.7%)	316(45.1%)	< 0.001
DVD	69(23.1%)	121(17.3%)	
TVD	47(15.7%)	113(16.1%)	

49.7% females and 37.7% males had normal LV function. Mild LV dysfunction was found in 25.7% females and31.6% males. Moderate LV dysfunction was found in 24.3% females and 28% males. Severe LV dysfunction was found in 0.3% females and in 2.7% males. These differences between both the groups were statistically significant (Table 6 and 7).

Table 6. Left ventricular dysfunction in male and female patients

LV DYSFUNCTION	FEMALE	MALE	p Value
NONE	149(49.7%)	264(37.7%)	0.001
MILD	77(25.7%)	221(31.6%)	
MODERATE	73(24.3%)	196(28.0%)	
SEVERE	1(0.3%)	19(2.7%)	

Table 7: Thrombolytic therapy in males and females

	FEMALE	MALE	p Value
THROMBOLYTIC THERAPY ADMINISTERED	29(9.6%)	147(21%)	<0.001

Thrombolytic therapy was given in 21% males and 9.6% females and this difference was statistically significant.

Among females 71.7% received medical therapy alone and 28.3% received intervention in form of PCI/CABG at admission or within 3 months of follow up. However, among males 60% received medical therapy alone and 40% received intervention in form of PCI/CABG at admission or within 3 months of follow up. This difference between both the groups was statistically significant (Table 8).

Table 8. Coronary intervention in female and male

	INTERVENTION PLUS MEDICAL THERAPY			MEDICAL THERAPY ALONE	p Value
	CABG	PCI	TOTAL		
FEMALE	03	82	85(28.3%)	215(71.7%)	<0.001
MALE	26	254	280(40%)	420(60%)	

Discussion

1000 consecutive patients who underwent coronary angiography for CAD were included in our study. The risk factors, clinical presentation, echo cardiographic features and angiographic profile were analyzed and compared between various groups.

Of these, 300 patients (30%) were females and 700 patients (70%) were males with a mean age group of 57.2 years & 53.2 years respectively. The INTERHEART study which was conducted in 52 countries, including India, had nearly 76% male patients amongst all the enrolled subjects [3]. On comparing the age distribution among females and males, the younger age group showed a significantly greater number of male patients. Although the peak incidence at around 51-60 years was found in both the groups, older age showed significant female preponderance. This observation is very similar to the previous studies. This difference in the age of presentation among males and females varies between 5-10 years in all the similar studies. The later age of presentation in women can be attributed to endogenous protection by estrogens before menopause. Estrogens promote HDL-C levels and reduce LDL-C levels, reduce endothelial dysfunction and up regulate the release of nitric oxide leading to vasodilatation & delay in the manifestation of atherosclerotic disease in premenopausal women.[4].

Hypertension & Diabetes were significantly more prevalent among women than men. 46.1% of female patients were hypertensive as compared to just 27.3% of male patients. Similarly, 38.3% of our female patients were found to be diabetic as compared to

22.7% of male patients. Studies conducted by Gupta and Anand respectively have reported similar distribution of risk factors among males and females [4]. However, our data shows higher prevalence of diabetes and hypertension in women which is similar to the from the WestS Bajaj et al. in a similar study in North India also found higher prevalence of diabetes and hypertension in women as compared to men.[5,6].

On comparing the BMI, Obesity was more prevalent in females. Similar to our findings, S Bajaj et al found higher BMI in males whereas Butala NM et alfound a higher BMI in females.[6,7].

Smoking was the most common risk factor among the males in our study and was significantly less in the female patients. This is consistent with various studies due to the social and cultural belief.[4,8].

2.3% of women and 0.6% of men had a family history of premature CAD (p=0.014). In a population based study by Sekhri et al., 6% of female patients & 4.4% of male patients had a first degree relative with a history of premature CAD (p<0.05), consistent with our result.[9].

On comparing females with males, the incidence of acute coronary syndrome was higher in males (77.4% vs 66.7%) and the incidence of angina pectoris was higher in females (33.3% vs 22.6%). STEMI and NSTEMI were commonest form of ACS in males and females respectively. Similar to our findings, in a 3-year follow-up study in Delhi by Chadha. S. L. et al.the proportions of all coronary events represented by myocardial infarction and angina pectoris were 21% and 79%, for men, and 11% and 89%, for women, respectively [9]. In a recent meta-analysis of 74 international studies, the prevalence of typical angina was 11–27% greater for women <65 years than men & women ≥75 years of age.[10].

On comparing the angiographic data of women and men, more women had normal coronary arteries (21.6% vs 8.6% p<0.001) whereas prevalence of obstructive CAD was higher among men (78.5% vs 69.4% p<0.001). Similar to our findings, in the CASS (Coronary Artery Surgery Study), normal coronaries were seen in 30% of women with typical angina and 64% with atypical angina, but in contrary was observed in only 7% of men with typical angina and 34% of men with atypical angina.[11]

In our study significantly greater subset of men received thrombolytic therapy than women (21% vs 9.6% p<0.001). Several studies have shown that women in compared to men with STEMI present at the hospital after the window period for thrombolysis [8]. This may explain women being less commonly treated with thrombolysis than men with STEMI as time from symptom to treatment is crucial for successful thrombolysis.

In addition, our study showed, any intervention in form of PCI or CABG at admission or within 3 months of follow up was significantly greater in men than in women (40% vs 28.3% p<0.001). Many studies show higher rates of coronary interventions for males in comparison to females suggesting more aggressive approach for males. However, others have reported no significant gender differences, thereby resulting in uncertainty if really a true gender bias exists in coronary intervention.[12].

Conclusions

Cardiovascular disease is under-recognized, undertreated & major cause of death in women. Our study highlights an alarming increase in the proportion of women diagnosed to have significant coronary artery disease. There has been a shift with respect to onset of risk factors and clinical presentation for coronary artery disease in the women. It is necessary to identify atherosclerotic risk factors in women and treat them appropriately to prevent further cardiovascular events. Gender related differences with regard to involvement of coronaries, clinical presentation and further treatment options prevail in our country. Interventional options PCI & CABG are done more often in men as compared to women.

Greater awareness of the gender based differences in risk factors, presentation of coronary artery & interpretation of diagnostic tests, is necessary for medical professionals to improve treatment strategies and overall outcomes in women. Cardiology guidelines should focus on gender-related differences wherever necessary. Further, women need to be more aware of their own risk factors and clinical signs of the disease. There is an increasing need to educate the general population that CAD is not only a disease of males & women can be affected as well.

Limitations of Our Study

The results presented involve a single centre. Hence, the results are a representation of a segment of population and not the country as a whole. Patients that were too unstable for coronary angiography were excluded. Hence our study could not comment accurately on in-hospital mortality. Our study didn't perform FFR (fractional flow reserve), IVUS (intravascular ultrasound) & OCT (optical coherence tomography). Hence we were not able to analyse further on the intermediate lesions seen on coronary angiography.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Ethical Clearance was obtained from the Institutional Ethics Committee prior to the commencement of the study

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Case Series

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Osseous Metaplasia of the Breast: A Series of Rare Cases

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Abstract

Osseous metaplasia is a reversible condition in which non-osseous soft tissue is replaced by bone. This is most commonly seen in musculoskeletal system and central nervous system. Osseous metaplasia in breast is a rare event. In this case series, we have reported 4 cases of osseous metaplasia of breast. 1 case of Osseous metaplasia in benign phyllodes tumor, 1 case of Osseous metaplasia in fibroadenoma, 1 case of Osseous metaplasia in invasive breast carcinoma and 1 extremely rare case of Osseous metaplasia of breast presenting as breast lump without any other associated pathology. Since osseous metaplasia of breast is a rare phenomenon, this entity specially in association with benign breast disease conditions pose a great challenge for accurate diagnosis.

Keywords: Benign breast disease, Breast lump, Osseous metaplasia, Phyllodes tumor

Introduction

Osseous metaplasia (OM) is a non-neoplastic reversible condition in which non-osseous soft tissue is replaced by bone. It is commonly seen in musculoskeletal system and central nervous system.[8] Osseous metaplasia of the breast is rare; only few cases being reported in the literature.[1]

Osseous metaplasia of the breast most commonly seen in cases of matrix producing breast carcinomas, a rare type of breast neoplasm accounting upto only 0.1% of all breast malignancies.[6] However, benign osseous metaplasia of breast is a rare entity with only few cases being reported in the literature.[3]

In this case series, we have reported 4 rare cases of osseous metaplasia of breast

Materials and Methods

In this case series, Surgical specimen of the breast lump (core needle biopsy/lumpectomy/wide local excision) and specimen of modified radical mastectomy)were received in our department of pathology and were processed by routine tissue processing method.

Histopathology sections were then stained with H&E and were examined under light microscope

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Case Findings

CASE 1: A 38-year-old female presented clinically with a firm mobile lump measuring 3cmx2cm in size in the upper outer quadrant of the left breast. USG of the breast showed hypoechoic lesion with a BIRADS II score. She underwent tru-cut biopsy and histopathological findings were suggestive of a benign stromal neoplasm. Lumpectomy was done and histopathological examination showed features of **Benign phyllodes tumor with multiple foci of osseous metaplasia** within it. **(Fig 1)**

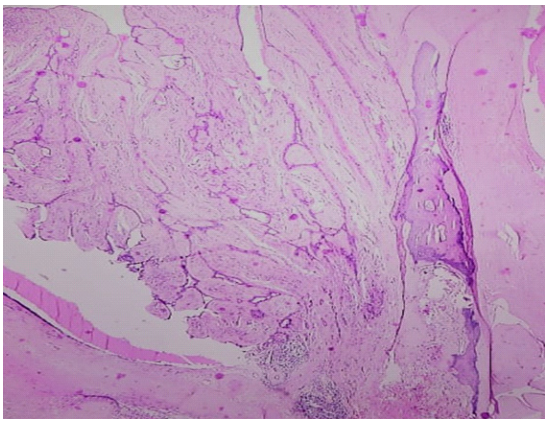

Fig 1 Showing osseous metaplasia in benign phyllodes tumor of breast (H&E,100x)

CASE 2: A 24-year-old female presented with a firm highly mobile lump measuring 2.5cmx2cm in size in right breast upper outer quadrant. FNAC of the lump showed features suggestive of fibroadenoma. She underwent lumpectomy and histopathological examination showed features of **Fibroadenoma with areas of heterotopic bone formation** within it. **(Fig 2)**

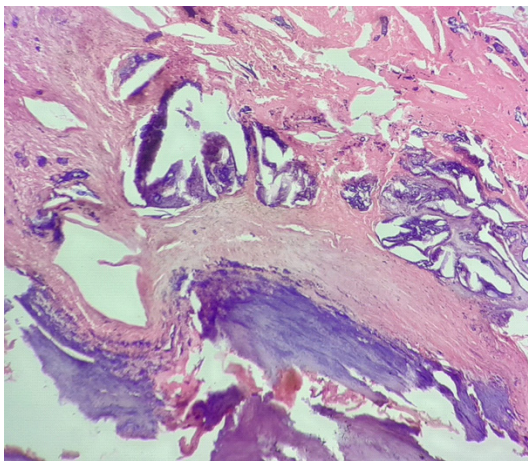

Fig 2 Showing features osseous metaplasia in fibroadenoma of breast (H&E,400X)

CASE 3: A 68-year-old female with a prior diagnosis of invasive carcinoma of right breast on tru-cut biopsy underwent modified radical mastectomy and the specimen received in our department for histopathological examination. Grossing done according to the CAP protocol and histopathology showed features of **Invasive carcinoma of breast – no special type (IC-NST) with areas of benign osseous metaplasia** within it. **(Fig 3)**

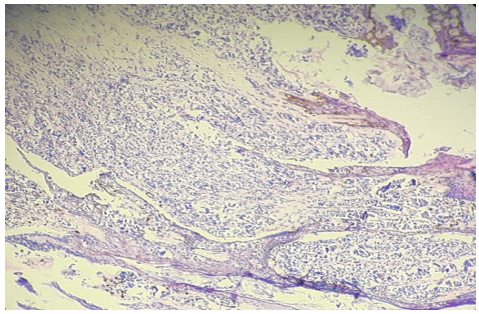

Fig 3 Showing osseus metaplasia in invasive carcinoma of breast (H&E,100X)

CASE 4: This is an extremely rare case, a 22-year-old female complaining of mastalgia in both breasts. On clinical examination one hard lump measuring 3.5cmx3cm with restricted mobility involving upper outer quadrant of left breast. On USG, a heavily calcified hypoechoic mass seen. FNAC showed only calcium granules and fragments on repeated attempts. **(Fig 5)**She underwent excisional biopsy of the lump and histopathological examination revealed heterotopic bone fragments and calcium deposits only without any other pathology. Diagnosis was given as **Heterotopic bone matrix producing breast lump**. **(Fig 4)**

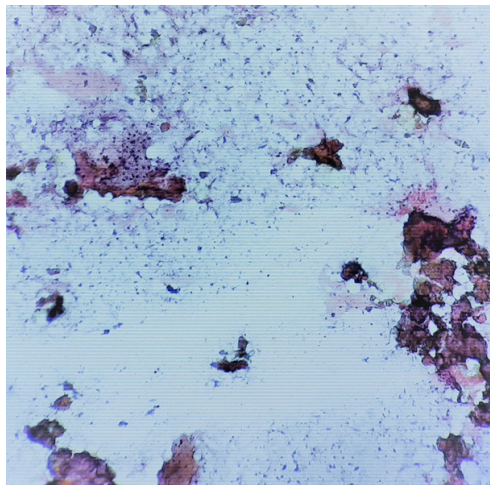

Fig 4 Showing presence of calcium granules and fragments in cytology smear of the breast lump(PAP stain,100X)

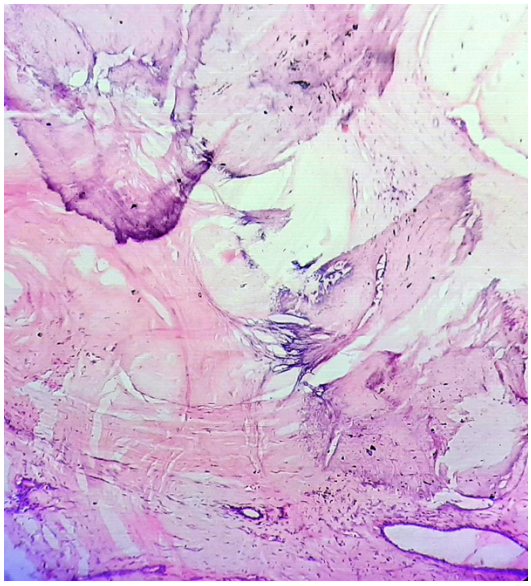

Fig 5 Showing extensive areas of ossification & few normal benign breast glands(H&E,100X)

Discussion

Osseous metaplasia of breast though rare has been reported in association with benign[2,9] and malignant breast lesions.[5]

Our first case was osseous metaplasia in a benign phyllodes tumor. Christian L G *et al*.[4] reported a case of benign heterologous osseous component in phyllodes tumor of breast. Benign osseous metaplasia of breast in the setting of non-neoplastic inflammatory lesion of breast was reported by Thushara K *et al*.[9] Osseous metaplasia in the setting of malignant lesions of breast usually seen in case of metaplastic carcinomas, a rare malignancy. In our third case, the benign osseous metaplasia seen in a case of invasive carcinoma breast of no special type (IC-NST). H A Evans *et al*.[5] reported a case of osseous metaplasia in infiltrating ductal carcinoma of breast.

Our fourth case was an extremely rare case of osseous metaplasia of breast presenting as lump in the absence of any other breast pathology. Only 1 to 2 cases were reported previously.[7] Meera Joshi *et al*.[7] reported a case of osseous metaplasia presenting as breast lump without any other pathology.

Conclusion

Osseous metaplasia of breast is a rare condition. Osseous metaplasia of breast in benign conditions poses a diagnostic challenge and most of them mimics breast malignancy by presenting clinically as a breast lump with high BIRADS score.

Conflict of Interest: Nil

Source of Funding - No financial support received

Ethical Clearance: Our study was approved by institutional ethics committee.

Patient Consent: Written informed consent was taken from all the patients participating in this study.

Author Contribution: All are having equal contribution

Acknowledgement: We like to acknowledge the Department of Surgery for contribution of the specimens of this study.

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Case Series

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Breastfeeding Practices among Lactating Mothers in a City of South India

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Abstract

Introduction: Breast feeding is the first fundamental right of the child. It provides a unique biological and emotional basis for the health and development of the children. The world health organization recommends that breastfeeding be initiated within one hour of birth. Early initiation of breastfeeding provides benefits for both mother and the baby.

Objectives: To assess the knowledge and attitude and practices about breast-feeding and complimentary feeding practices among lactating mothers attending Outpatient department (OPD) of tertiary care centre in a city of South India.

Materials and Methods: It was a cross-sectional observational study done amongst post-natal mothers attending OPD in Sri Siddhartha Medical College, Tumkur between October to November 2022. Data collected was entered on Microsoft Excel spread sheet. Descriptive statistics and Chi –square test as test of significance were used. P value less than 0.05 was taken as statistically significant. Statistical software Epi Info software version 7.2.5 was used for the statistical analysis.

Results: Data was collected from 104 post-natal mothers attending the OPD. All of them knew about importance of exclusive breast-feeding, colostrum feeding (100%). 99% of them knew breast feeding improves immunity. 95 (91%) of the participants were willing to continue breastfeeding up to two years and beyond. Only 16 (15.4%) mothers fed the baby on demand, others followed scheduled feeding like once in 1-2 hours, once in 2 to 3 hours. In our study 78.8% women started complimentary feeding at 6 months.

Conclusion: Healthy breastfeeding practices have significant effect on mothers and infants. The breastfeeding knowledge and positive practices are optimal among mothers. Focused breastfeeding counselling and advice by the health workers with emphasis on correct technique can improve the positive breastfeeding practices.

Keywords Breastfeeding; Lactating Mothers; Complimentary Feeding; Colostrum

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Introduction

Breast feeding is the first fundamental right of the child. It provides a unique biological and emotional basis for the health and development of the children.[1] The world health organization recommends that breastfeeding be initiated within one hour of birth. Early initiation of breastfeeding provides benefits for both mother and the baby.[1,2] Breastfeeding has a number of benefits to both mother and baby. An adequate supply of human breast milk is known to satisfy virtually all the nutritional needs of an infant at least for the first six months of life.[3] Exclusive breastfeeding for the first 6 months of life and timely introduction of weaning food is important for laying down proper foundations of growth in later childhood.[3] The current recommendation by World Health Organization (WHO) is exclusive breastfeeding for six months duration, and further to initiate complementary foods at six months of age while the mother continues to concurrently breastfeed her baby up to 24 months of age.[4]

According to WHO about 44% of infants 0–6 months old are exclusively breastfed.[5] National Family Health Survey-4 (NHFS) has reported improvement in the share of children less than six months who have been exclusively breastfed, in comparison with NFHS-4. The data shows that 14 out of 17 states and two out of five Union Territories have increased exclusive breastfeeding.[6]

Though it shows improvement Neonatal and infant mortality have not changed much.[6] Early initiation of breast feeding is seen in only 41.8% of neonates. Very low levels (11.3%) of the children between 6-23 months are receiving adequate nutrition which is an important reason for under5 malnutrition. So, through this study we wanted to study prevailing breastfeeding and complementary practices in this area. This can provide an overview of the scenario in this area which can act as basis for further strategies and interventions.

Objectives

1) To assess the knowledge and attitude about breast-feeding and complimentary feeding practices among lactating mothers attending Outpatient department of tertiary care centre in a city of South India.

2) To assess practices of breast-feeding and complimentary feeding practices among lactating mothers attending Outpatient department of tertiary care centre in a city of South India.

Materials and Methods

It was a cross-sectional observational study done amongst post-natal mothers attending OPD in Sri Siddhartha Medical College, Tumkur between October to November 2022. Institutional ethical clearance was taken prior to the study. Written informed consent was taken from all the participants in this study. Post natal mothers with Infants who had chronic illness, mental disorders and those who didn't give informed consent were excluded from the study. Purposive sampling was done. Sample size calculation: The sample size was calculated by taking the exclusive breast-feeding practice of 63.4% from a published article.[1]

Sample size has been estimated using the following formula.

$n = Z_{(1-\alpha/2)}^2 \, pq/d^2$ Where in, Z (1-α/2) value for 95% level of significance = 1.96

p = 63.4 %, q =100-p = 36.6 %, d = Absolute precision of 10.

Substituting the above values in the above formula n = 90, to this 10% non-response rate is added: 90 + 9 = 99. Therefore, the required sample size is 99.

Semi structured questionnaire was used to collect the data through interview method in regional language. The data was collected regarding exclusive breastfeeding, early initiation of breastfeeding, prevalent methods of infants feeding practices. The variables included were demographic details, obstetric score, breast feeding practices, dietary intake of mothers and complimentary feeding practices. Complimentary feeding practices data was collected from women who have more than one children. Data collected was entered on Microsoft Excel spread sheet. Descriptive statistics and Chi –square test as test of significance were used. P value less than 0.05 was taken as statistically significant. Statistical software Epi Info software version 7.2.5 was used for the statistical analysis.

Results

Data was collected from 104 post-natal mothers attending the OPD. Socio-demographic details of the participants under the study are given in Table 1.

Table 1: Socio-demographic details of the participants under the study

Sl no.	Socio demographic variables		Frequency	Percentage
1	Type of Family	Joint	34	32.7
		Nuclear	70	67.3
2	Education	>Degree	37	35.6
		Diploma	39	37.3
		High school	18	17.3
		Middle school	9	8.7
		Primary school	1	1
3	Family Income	>10,000	29	27.9
		5,000-10,000	10	9.6
		1,000-5,000	65	62.5
4	No. of Children	1	67	64.4
		2	34	32.7
		3	3	2.9
5	Religion	Christian	7	6.7
		Hindu	90	86.5
		Muslim	7	6.7
6	Child age	</= 1 month	16	15.4
		1-6 months	36	34.6
		6-12 months	34	32.7
		12-18 months	12	11.5
		18-24 months	6	5.8
7	Type of Delivery	C-section	60	57.7
		Normal	44	42.3

Most of the women belonged to nuclear family (67.3%). More than 50% of them (57.7%) were delivered by Lower segment caesarean section (LSCS). All women were literate with more than 70% of them with diploma and degree level of education, majority of the women were Hindu (86.5%) by religion. About 65% of the women (64.4%) had single children. Out of 104, 65 women had monthly family income between 1000 and 5000 rupees.

Knowledge and attitude regarding breast feeding practice:

All of them knew about importance of exclusive breast-feeding, colostrum feeding (100%). 99% of them knew breast feeding improves immunity. Importance of early initiation was not known to 2 of the participants (1.8%). 80% of them were aware that breast feeding will prevent diarrhoea in child. 60% believed that consuming galactagogues like almond and fenugreek can improve the secretion. 94% of them knew exclusive breastfeeding is for the duration of 6 months. Among the participants 84 (80.8%) had adequate levels of knowledge and details are shown in table 2.

Table 2: Knowledge and Attitude about Breastfeeding among study participants

Sl no.			Frequency	Percentage
1	Whether exclusive breastfeeding is important?	Yes	104	100
		No	-	-
2	Whether you have known colostrum nutritionally beneficial to the child?	Yes	104	100
		No	-	-
3	Does exclusive breastfeeding improve immunity?	Yes	103	99.0
		No	-	-
		Maybe	1	1.0
4	Whether you think it's important to breastfeed within 1hr. after birth	Yes	102	98.1
		No	2	1.9
5	Do you think consuming exclusive breastfeeding prevent child from diarrhoea?	Yes	84	80.8
		No	-	-
		Maybe	20	19.2
6	Whether you think patterns of breastfed infants differ from formula feed?	Yes	87	83.7
		No	2	1.9
		Maybe	15	14.4
7	Do you think consuming galactogogues like almonds and fenugreek can improve the secretion?	Yes	63	60.6
		No	9	8.7
		Maybe	32	30.8
8	How long do you think exclusive breastfeeding should be continued?	<6months	6	5.8
		6months	98	94.2
9	Knowledge Level	<75%	20	19.2
		>75%	84	80.8
Attitude towards breast feeding practice				
1	Are you willing to continue breastfeeding up to 2 years or above?	Agree	95	91.3
		Disagree	5	4.8
		Unsure	4	3.8
2	Will you stop breastfeeding when the child has diarrheal episode or not feeling well?	Agree	16	15.4
		Disagree	80	76.9
		Unsure	8	7.7
3	Do you think formula feeding is better than breastfeeding?	Agree	21	20.3
		Disagree	66	63.5
		Unsure	17	16.3
4	Do you think health and hygiene are more important for breastfeeding?	Agree	103	99.0
		Disagree	-	-
		Unsure	1	1.0
5	Do you believe that breastfeeding causes changes in breast shape and body shape?	Agree	84	80.8
		Disagree	1	1.0
		Unsure	19	18.3

Attitude:

95 (91%) of the participants were willing to continue breastfeeding up to two years and beyond. 80 (76.9%) disagree to discontinue breast feeding the child during diarrhoea. Only 66 (63%) disagree that formula feeding is better than breast feeding. 103 (99%) feel health and hygiene are more important for breastfeeding. 84 (80%) believe breastfeeding causes changes in breast shape and body shape and details are shown in table 2.

Practice of breast feeding:

Only 16 (15.4%) mothers fed the baby on demand, others followed scheduled feeding like once in 1-2 hours, once in 2 to 3 hours. Nearly 20% of the mothers gave prelacteal feeds to the babies. 96% of the women expressed breast milk during emergency situation (Table 3).

Table 3: Breastfeeding practices among the participants under the study (n=104)

Sl no.			Frequency	Percentage
1	How often do you feed your baby?	Every1-2	26	25.0
		Every 2-3	53	51.0
		Every time	16	15.4
		More than	9	8.7
2	Do you give prelacteal feeds to an infant?	Yes	19	18.3
		No	85	81.7
3	If yes to above question, what do you give?		85	81.7
		Honey	3	2.9
		Infant formula	3	2.9
		Water	13	12.5
		Total	104	100.0
4	When do you start breastfeeding after delivery of child?	1-2 hours	35	33.7
		2-12 hours	25	24.0
		Within an hour	44	42.3
5	Are you consuming galactogogues for improving milk production?	Yes	55	52.9
		No	49	47.1
6	Do you practice expressing milk during emergency situation?	Yes	100	96.2
		No	4	3.8

Complimentary feeding practices:

In our study 78.8% women started complimentary feeding at 6 months. Only 23% of the women fed the children with complimentary food 2 to 3 times up to 9 months and less than 20% of them fed > 3 times for children above 9 months as shown in Table 4.

Table 4: Practices about Complimentary feeding among the participants under the study

Sl no.	Complimentary feeding practices		Frequency (total=52)	Percentage (%)
1	When did you start complimentary feeding?	At 6months	41	78.8
		>6months	11	21.2
2	How many times did you feed the child up to 9 months?	1-2times	38	73.1
		2-3times	12	23.1
		>3times	1	3.8
3	How many times did you feed the child between 9-12 months?	1-2times	0	0
		2-3times	42	80.7
		>3times	10	19.3
4	Food items given during complimentary feeding up to 8 months?	Only cow's milk/formula milk	29	55.7
		Cow's milk with dal and vegetables	23	44.3

Discussion

Socio demographic features:

Literacy: In our study all women were literate with more than 70% of them with diploma and degree level of education similar finding was seen in a study done in Thrissur where 58.3% (70 out of 120) were graduated[7] but in a study done in National Institute of Mental Health and Neurosciences (NIMHANS) in 2015 shows the percentage of women above PU and degree were nearly only 5%.[8]

Occupation:

Almost 70% of the mothers were home makers in this study where as in a study done is Thrissur only 50% were home makers[7], in one more study done rural south India 97% were employed but, in a study, done at NIMHANS, Bangalore by Vijaya Lakshmi et.al.[8] where only 15% of the women were employed.

Mode of delivery:

In our study 58% of them delivered by LSCS, which is very high compared to study in Thrissur[7] where only 25% of the deliveries were LSCS and in a study done at Bangalore where 25% of the deliveries were by LSCS. Still lower levels of LSCS delivery were found in a study done at Mysore district (17%)[9] and rural areas of North India (12.5).[10]

Initiation of breastfeeding:

In our study only 33% of women started feeding within one hour which is very low compared to a study where 83% of the mothers breast fed the babies within one hour in Kerala, where nearly 60% of women breast fed within one hour in a study done at Vellore and 50% in Maharashtra [11] But similar findings (36%) were seen in a study done at Bangalore.[8]

Feeding on demand:

In this study only 15% of the mothers were feeding on demand which is very low better percentage of women breast fed on demand (60.7%) in a study done in Hubli, 54% in study done in Thrissur[7] and 51% women fed the baby on demand in a study done in Central India.

Pre lacteal feed:

In our study nearly 20% of the women gave pre lacteal feeds similar findings were seen in Thrissur[7] study but in a study done in rural area of North India 50% of them gave pre lacteal feeds which is very high than our study.

Complimentary feeding:

In our study 78.8% women started complimentary feeding at 6 months. Lower levels were seen in studies done by Bably et.al.[12] in 2023, 21% initiated

complimentary feeding at 6 months and in one more study done in Pune in 2023, 42% of mothers initiated complimentary feeding below 6 months.[13] Similarly in a study done in Assam 54.4% of mothers started complimentary feeding at the age of 6 months[14] but in a study done in Chennai more than 90% (91%) of the women started complimentary feeding at 6 months.[15]

Conclusion

Healthy breastfeeding practices have significant effect on mothers and infants. More emphasis should be given to improve the breast feeding practices in working women. Day care services or creches facilities should be provided at work place in order to facilitate breast feeding. The breastfeeding knowledge and positive practices are optimal among mothers. Focused breastfeeding counselling and advice by the health workers with emphasis on correct technique can improve the positive breastfeeding practices.

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Original Research Article

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An Observational Study on Port-site Infection and its Management in Patients Undergoing Laparoscopic Cholecystectomy

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Abstract

Background: With increasing number of performed laparoscopic cholecystectomies, there is an increasing number of port site infection, although it occurs infrequently, but it has significant influence on overall outcomes of laparoscopic cholecystectomy. The aims of the present study was to identify the causative organism involved in port-site infection (PSI) and its management and outcome after laparoscopic cholecystectomy objectives and to evaluate causative organism involved in port site infection after laparoscopic cholecystectomy.

Materials & Methods: Patients who underwent laparoscopic cholecystectomy and now presenting with PSI in General Surgery OPD and Emergency of Burdwan Medical College and Hospital. Thorough clinical history taking followed by swabs was taken for culture and sensitivity in all patients who developed port site infection after laparoscopic cholecystectomy. Tissue samples were taken for detection of mycobacterium tuberculosis by CBNAAT. All patients were followed up for 6 months post operatively. Incidence of PSI in relation to gender, pre-operative diagnosis, spillage, relation with different port sites and the type of microorganism associated was evaluated and compared with previous study.

Results: In the present study 90 patients who underwent laparoscopic cholecystectomy, 19 patients reported port site infection after surgery, whereas the remaining 71 patients had uneventful post operative period. Out of the 19 infected 7 were male [25% of total male cases] and 12 were female [19% of total female cases]. Cases of port site infection were 21% of total cases. **Conclusion:** The incidence of PSI was higher in cases of acutely inflamed GB, biliary spillage, open port creation, avoidance of endo-bag, and in comorbidities. They were managed with either antibiotics, dressing or surgical exploration.

Keywords: Laparoscopic cholecystectomy, port-site infection (PSI), biliary spillage, open port creation

Introduction

No surgical wound is completely immune to infection. Despite the advances in the field of anti-microbial agents, sterilization techniques, surgical techniques, port site infection still prevail. Incidence of SSI after elective laparoscopic cholecystectomy is

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less than that after open elective cholecystectomy due to shorter length of incision.[1]

Laparoscopic surgery also termed as minimally invasive surgery, was first presented in the eighth decade of 20th century, shortly after that it became the surgical treatment of choice for many operations.[2] Now, the laparoscopic cholecystectomy is the gold standard treatment for symptomatic gallstones.[3] Its advantages include decreased hospital stay postoperatively, earlier return to work, decreased post-operative pain[4], minimum surgical incisions and so better cosmetic results and lesser postoperative complications. So, it not only supplanted open cholecystectomy but also more or less ended attempts for the non-invasive management of gallstones, such extracorporeal shock wave, and bile salt therapy.[5]

Generally, most of the surgical procedures may end with complications. One of these complications is surgical site infection (SSI). Infection could be intrinsic and/or extrinsic as the human body enables the survival of a wide variety of microorganisms with potential for infection as a result of surgical intervention.[6] Patient's bacterial flora may become opportunistic and cause infection in special circumstances. This can occur in both open surgeries and to a lesser extent in laparoscopic one.[7] It is a fact that laparoscopic cholecystectomy associated with fewer SSI than open cholecystectomy.[8] However nowadays, with increasing number of performed laparoscopic cholecystectomies, there is an increasing number of port site infection, although it occurs infrequently, but it has significant influence on overall outcomes of laparoscopic cholecystectomy and its final results like delay in return to work, increase cost and bad cosmetic results which become disappointing for both patient and surgeon. The aims of the present study were to identify the causative organism involved in port-site infection and its management and outcome after laparoscopic cholecystectomy objectives and to evaluate causative organism involved in port site infection after laparoscopic cholecystectomy.

Materials and Methods

Patients who underwent laparoscopic cholecystectomy and now presenting with PSI in General Surgery OPD and emergency of Burdwan Medical College and Hospital were included in the observational prospective study between June 2021 to September 2022. The incidence of port site infection after laparoscopic cholecystectomy was found to be 6% from hospital records of previous 2 years which is in accordance to various study findings. Hence p is taken as 6%[5] and d is taken as 5%. Using the formula sample size comes out to be approximately 90.

Thorough clinical history taking followed by Swabs was taken for culture and sensitivity in all patients who developed port site infection after laparoscopic cholecystectomy. Tissue samples were taken for detection of mycobacterium tuberculosis by CBNAAT. All patients were followed up for 6 months post operatively. Incidence of PSI in relation to gender, pre-operative diagnosis, spillage, relation with different port sites and the type of microorganism associated was evaluated and compared with previous study.

Inclusion Criteria: Patients in the age group of [18 years to 60 years] coming to surgery outpatient and emergency with port site infection after laparoscopic cholecystectomy. **Exclusion Criteria:** Patients not willing for study and patients with immuno-compromised status.

For statistical analysis data were entered into a Microsoft excel spreadsheet and then analysed by SPSS (version 24.0; SPSS Inc., Chicago, IL, USA) and Graph Pad Prism version 5. Data had been summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables.

Results

In the present study 90 patients who underwent laparoscopic cholecystectomy, 19 patients reported port site infection after surgery, whereas the remaining 71 patients had uneventful post operative period. Out of the 19 infected 7 were male [25% of total male cases] and 12 were female [19% of total female cases]. Cases of port site infection were 21% of total cases. The infected cases were treated with either antibiotics or exploration. The patients with port site infection had longer hospital Stay where as those with no complications were discharged on 2nd to 3rd post operative day. No mortalities were noted in our study. In this section we will be comparing

between these two groups of patients on the basis of various parameters and surgical techniques and analyse the outcome [Table 1].

Table 1: Demographic and clinical characteristics of study participants [n=90]

Gender	Infected	Non-infected	Total
Male	7	20	27
Female	12	51	53
Age Groups			
18-30 Years	1	9	10
30-40 Years	7	20	27
40-50 Years	8	31	39
50-60 Years	3	11	14
Condition of gall bladder			
Acute	9	12	21
Chronic	10	59	69
Bile Spillage			
Yes	14	15	29
No	5	56	61
Port Creation Technique			
Open	12	21	33
Closed	7	50	57

In the following study patients undergoing laparoscopic cholecystectomy, out of 27 male cases 7 of them has PSI [25%] and 12 out of 63 female cases had PSI [19%]. By applying Chi-square test we get chi-value of 0.55 with corresponding p value more than 0.1. So, there is no significant relation between gender and port site infection. From the above study we can see that nearly 45% of the infected cases belong to 30-50 years age group. This age group also has maximum number of laparoscopic cholecystectomies done in our study. From this we can see nearly 42% of acute gall bladder had PSI. Here chi-square value is 7.46 and the corresponding p value is less than 0.005. Hence, the higher prevalence of infection in acute cases is statistically significant. From this we see 14 out of 29 cases [48%] with bile spillage into the ports during surgery faced PSI. Only 1% of cases with no spillage had infection. Here the chi-square value is 18.9 and the corresponding p-value is less than 0.001. Hence, the higher prevalence of infection in cases of biliary spillage is statistically significant. From this table we can see that 36% of open port creation showed infection compared to only 12% in closed port creation. Here chi-square value is 7.39 with p-value less than 0.005. So, the association between open creation and PSI is statistically significant [Table 1].

Table 2: Distribution of infected cases based on site of infection

Site of infection	No. of cases
Umblical Port	3
Epigastric Port	16
Total	19

From the above data we can see that nearly 84% of port site infection in our study occurs in the epigastric port site. Here chi-square value is 8.8 with corresponding p value less than 0.005. So, the association between umblical port site and incidence of infection is significant [Table 2].

Table 3: Distribution based on usage of retrieval bag and co-morbidities among study participants

Retrieval Bag Used	Infected	Non-infected	Total
Yes	4	37	41
No	15	34	49
Total	19	71	90
Co-morbidities			
Present	11	23	34
Absent	8	48	56

From the above data we can see that nearly 0.1% of cases where retrieval bag was used, infection was noted compared to 30% of cases where it was not used. Chi-square value is 5.83 with p-value less than 0.02. So, the association between usage of retrieval bag and port site infection is significant. From the above details we can see 32% patients with comorbidities like diabetes, HTN etc., develop port site infection compared to 14% of those without these comorbidities. Chi-square value is 4.24 and p-value is 0.05. So, the association between presence of comorbidities and port site infection is significant [Table 3].

Table 4: Distribution on depth of infection, organism isolated and management methods

Depth of Infection	Infected Cases
Superficial Infection	13
Deep Infection	06
Organism Isolated	
Staphylococcus Aureus	7
E.Coli	3
Atypical Mycobacterium	1
Typical Mycobacterium	2
Mixed	2
Others	4
Management Methods	
Conservative management [dressing +antibiotics]	15
surgical exploration of wound	04
Total	19

Here from this data, we can see that 64% of port site infection present with superficial infection which involve skin and subcutaneous tissue and only 32% cases were deep infection including fascia and muscle. Here, we can see majority of port site infection could be managed with antibiotics and dressing [conservative]. Few cases [4/19] required surgical exploration and required extended hospital stay [Table 4].

Discussion

In my study a total of 90 patients who underwent laparoscopic cholecystectomy were divided into two groups based on the occurrence of port site infection [PSI] after the surgical procedure. Out of 90 patients 19 of them had PSI [21%] after laparoscopic cholecystectomy. Amongst the cases which reported PSI 7 were male [36%] and 12 were female [64%] showing an increased incidence of PSI amongst female population though it was not found to be statistically significant. Incidence of PSI is also higher in the age group of 30-50 years which is in coherence with known literature.

Incidence of PSI

Studies associated with incidence	Percentage of cases
Shindolimath et al[6]	6.3%
Den Hoed et al[9]	5.3%
Jan et al[8]	5.07%
Present study	21%

The frequency of PSI observed in our study was 21%. Our results are comparable to Shindholimath et al[6] who has reported an incidence of 6.3%, while, Den Hoed et al[9] and Jan et al8 reported an incidence of 5.3% and 5.07% respectively. Regarding the distribution amongst gender, in our study we can see that 7 out of 19 infected cases were male [36%] compared to 12 out of 19 [64%] were female. Out of total patients who underwent laparoscopic cholecystectomy, 27 were male and nearly 70% were female. This is similar to the study done by Jasim et al[10] but the association turned out to be statistically insignificant.

Condition of gall bladder

Study regarding condition of GB	% of cases in acute phase	% in chronic phase
Mumtaz Al Naser[11]	10.4%	3.5%
Present Study	42%	16%

From the above table we can see that two previous studies showed increased incidence of PSI in cases where laparoscopic cholecystectomy was done in acute stage rather than chronic stage. In our study also nearly 42 % of acute cases which were operated reported PSI with p value being less than 0.005. Hence, it is significant and is relevant with previous literature

Bile Spillage

Spillage of bile, pus or stones which can be retained inside the abdomen or in the wound is highly associated with port site infection and abscess formation. In the above studies we can see that the rate of PSI in cases with bile spillage is nearly 5%. In our study the incidence is found to be a bit higher with 15%. These values are statistically significant hence, bile spillage is considered as a risk factor for port site infection.

Port creation and PSI

Study regarding port creation and PSI	Percentage of PSI with open technique	Percentage of PSI with closed technique
Alam et al[12]	8.5%	2.0%
Nawaz et al[13]	2.6%	0%
Present Study	36%	0.1%

Open port creation technique is associated with a higher incidence of PSI. as we can see from above data two studies by Alam et al[12] and Nawaz et al[13] showed incidence of PSI in oen technique to be 8.5% and 2.6% respectively. In our study this incidence is much higher [36%] and it is statistically significant and in accordance with literature.

Site of port infection

Site of port infection	% of umblical port infection	% of epigastric port infection
Karthik S et al[14]	12%	88%
Mayol et al[15]	100%	0%
Present Study	15%	85%

From the above studies we can see a variable outcome. In the study by Karthik et al[14] we can see high incidence of psi in epigastric port, the reason being it is the port used for retrieval of GB. But another study by Mayol et al[15]had higher incidence of umblical port infection due to increased umblical flora. In our study we see higher incidence of epigastric port infection which is statistically significant.

Use of retrieval bag

From the above study we can see that use of retrieval bag avoids port site infection. Studies by afuk et al[16] and Akhter et al[17] show lower percentage of PSI in cases where retrieval bag was used. Our study also presents a similar picture where 30 % of cases where retrieval bag was not used developed PSI. The data in our study is statistically significant and shows strong relation between use of endobag and port site infection.

Depth of infection

From the above study we can conclude that most of the PSI present as superficial infection involving only the skin and subcutaneous tissue. Deep infections are quite rare and involve deeper planes like muscle and fascia and these may require extensive modes of management like exploration.

Co-morbidities and PSI

From the above study we can see a higher incidence of PSI in patients with co-morbidities like diabetes, hypertension, CVS disorders, and CNS disorders etc. There is significant relation between port site infection and co-morbidities.

Organism isolated

Among the causative organisms of PSIs in majority of cases it was due to Gram positive bacteria (47%). In 26% cases of PSIs it was by Gram negative bacteria. These findings are consistent with some other studies. The organisms were isolated using pus for culture sensitivity and gram stain methods. Most common organism involved is Staphylococcus Aureus [7/19] and 2/19 cases of Enterococcus sp. Gram negative organism include E.Coli [3/19] and 2/19 cases involved infection with Enterobacter sp and 2/19 cases involved mixed infection with gram negative and positive organisms. Approx. 3/19 cases include mycobacterial infection both typical and atypical. Tissue obtained was sent for biopsy and culture in LJ medium. Diagnosis of mycobacterium was done with the help of CBNAAT test which also showed drug susceptibility. Culture in LJ medium can be done but it takes time. One case of M. Chelonei was diagnosed after culture showed presence of this microbe after CBNAAT report came negative.

Conclusion

Port site infection is an uncommon but worrisome complication post laparoscopic cholecystectomy. The incidence of PSI in our study is nearly 20%. The PSI is noted more in male gender and in the age group 30-50 years, though this was not found to be statistically significant. The incidence of PSI was higher in cases of acutely inflamed GB, biliary spillage, open port creation, avoidance of endo-bag, and in comorbidities. These are in coherence with literature. PSI was most common in epigastric site in our study and mostly superficial in nature. They were managed with either antibiotics, dressing or surgical exploration. Special consideration should be taken in chronic deep surgical site infection as mycobacterium tuberculosis could be the cause.

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Original Research Article

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Evaluation between Serum Level CRP and Maternal Outcomes that includes Preterm Delivery: A Prospective Analysis

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Abstract

Background and Aim: C-reactive protein is commonly employed as a biomarker to track the development of inflammatory and infectious disorders. There aren't many researches that have investigated the link between maternal serum CRP concentrations early in pregnancy and preterm birth or neonatal outcomes. The aim of this study was to evaluate the correlation between serum level CRP and maternal and neonatal adverse outcomes including preterm delivery and Small for gestational age (SGA).

Material and Methods: This prospective study was conducted on 400 pregnant women who delivered at the Obstetrics and Gynecology Department of a medical college and affiliated hospital for the period of one year. Pregnant women who met the inclusion and exclusion criteria were enrolled after giving their informed consent, and the serum C-reactive protein levels were measured at the gestational age (GA) of 14 to 20 weeks. Pregnant women were then followed up to delivery, and based on the GA at delivery, they were divided into preterm and non-preterm groups. A reference level of 1.5 mg/dl is used. Therefore, pregnancies with high maternal serum C - reactive protein were those in which the maternal serum level was above 1.5 mg/dl.

Results: A total of 296 individuals in group A and 104 individuals in group B had CRP levels below 1.5 mg/dl, respectively. This study's average gestational age was 18.8 weeks. The minimum and maximum gestational ages were 12+1 and 21+3 weeks, respectively. In this study, 316 individuals delivered at term, while 84 people delivered preterm. In the population under study, 114 individuals underwent LSCS, while the remaining 286 women gave birth vaginally. 400 patients in total were included in the study; 316 had CRP levels under 1.5; of these, 272 had term deliveries, while 24 had preterm births. The remaining 84 individuals had a CRP of greater than 1.5; of these, 60 had preterm deliveries and 24 had term births.

Conclusion: Assessment of maternal concentrations of CRP can be used as suitable biomarker for predicting preterm labor, and also despite the limitation in the number of patients, response to tocolytic therapy in our study was predictable by the evaluation concentrations of CRP of these women.

Key Words: C-reactive protein, Gestational age, pregnancy, Preterm

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Introduction

Preterm birth is a serious health issue, the primary cause of neonatal disease that lasts a lifetime, and it is associated with behavioral repercussions and death in roughly 75% of survivors. Similar long-term neuro-developmental and behavioral issues affect small for gestational age (SGA) newborns later in life. Despite the seriousness of these issues, little is known about how they occur and what causes them. As a result, there are restrictions on the ability to anticipate and stop preterm birth and SGA. The placental-maternal edge abnormalities are the main focus of risk factors for SGA. An accumulating body of evidence suggests that these abnormalities mostly originate at early pregnancy and affect implantation and placental development.[1,2]

For 18.7% to 28.8% of preterm births, iatrogenic causes resulting from maternal or fetal factors will blame. In 7.1% to 5.1% of all preterm births, the membranes prematurely rupture. The most frequent cause of premature birth, accounting for about 50% of cases, is idiopathic preterm labour. Up to 40% of women who spontaneously give birth to a baby before term do not have any apparent, well-known risk factors for preterm labour.[3-5]

Identification of those at risk is a crucial first step in combating the issue of preterm birth. Risk score systems, biochemical markers of inflammation, and infection screening are a few of the ways that have been proposed. In the asymptomatic population, it is crucial to assess these possible predictors both singly and together, as well as to take into account the financial implications of these screening procedures.[6-8]

An essential part of the innate immune system, C-reactive protein (CRP) is an acute-phase protein that is initially created in the liver in response to inflammatory stimuli. CRP is commonly employed as a biomarker to track the development of inflammatory and infectious disorders. Even a slight increase in CRP in the general population is linked to a number of diseases and may be a sign of inflammation or distressed or harmed cells.

Additionally, there aren't many studies looking into the relationship between SGA and immune regulatory modifications such CRP levels. Early diagnosis of SGA newborns and the administration of preventive measures may both benefit from the early evaluation of maternal serum CRP. However, a lot of research points to the possibility that dysregulation of maternal inflammation may affect both maternal and newborn health. There aren't many researches that have investigated the link between maternal serum CRP concentrations early in pregnancy and preterm birth or neonatal outcomes. The aim of this study was to evaluate the correlation between serum level CRP and maternal and neonatal adverse outcomes including preterm delivery and SGA.

Materials and Methods

This prospective study was conducted on 400 pregnant women who delivered at the Obstetrics and Gynecology Department of a medical college and affiliated hospital for the period of one year. All pregnant women presenting themselves for prenatal care were included in the study.

Women between the ages of 18 and 35, singleton foetuses, recalling the precise date of the last menstrual period, GA 20 wk (5 to 20 weeks gestation) at the first visit, regular menstrual periods, BMIs between 18 and 30 kg/m2, and a willingness to participate in the study were the inclusion criteria for the study.

Multiple pregnancies, a poor obstetric history, a history of preterm labour, a history of SGA, an inability to recall the precise day of the last menstrual period, patients undergoing hormone therapy, those taking statins, fibrates, and niacin medications, a history of drinking alcohol or using drugs, multiple pregnancies, a history of SGA, a history of preterm labour, a history of diabetes (type 1 or type 2) **were the exclusion criteria for the study.**

A thorough history was gathered, including information on the mother's socioeconomic situation, anthropometry, way of life, and medical and surgical illnesses. Pregnant women who met the inclusion and exclusion criteria were enrolled after giving their informed consent, and the serum C-reactive protein levels were measured at the gestational age (GA) of 14 to 20 weeks. Pregnant women were then followed up to delivery, and based on the GA at delivery, they were divided into preterm and non-preterm groups. Based on the timing of the last menstrual cycle, the

ultrasound report of 11–14 weeks validated the gestational age. Gestational age is determined on LMP if both the LMP and USGEDD are within 14 days; if > 14 days, USGEDD can be included.

Venous blood samples (7 ml) were collected in dry, sterile tubes, cooled to room temperature, centrifuged, aliquoted, and stored at 80 degrees Fahrenheit until analysis. At enrollment, samples were taken from every participant (median gestational age of 16.3 weeks; interquartile range (14.6–18.6): 12–15.

Laboratory technique: A commercial quantitative ELISA CRP-sensitive kit, an enzyme-immunoassay based on the high affinity of two rabbit anti-CRP antibodies, was used to assess CRP levels. Before any measurement is taken, free components are rinsed away from the test plate after C-reactive protein binds to the immobilised anti-CRP antibodies The amount of CRP is calculated as a concentration from standard curves of known CRP concentrations as an optical density (photometric at 450 nm). The first standard included with the kit is 1.9 ng/ml, and the standard range of this ELISA kit is 0-150ng/ml (0-0.150 mg/l). This assay's detection limit is 0.124 ng/ml. 5.5% and 11.6%, respectively, were the intra- and inter-assay variations.

Depending on the CRP levels, the study group's participants are split into two groups, Group A and Group B. Using ACOG recommendations, the diagnosis of premature birth was made. Using the specific information gathered at the moment of delivery from the relevant medical records, the women who delivered before 37 weeks of gestation were classified as preterm and those who delivered beyond 37 weeks as term.

A reference level of 1.5 mg/dl is used. Therefore, pregnancies with high maternal serum C - reactive protein were those in which the maternal serum level was above 1.5 mg/dl. Using chi-square analysis, the relationship between high maternal blood C-reactive protein and preterm labour was examined. P 0.05 is used for reporting all significance.

Results

A total of 400 patients were involved in the trial, and they were split into two groups according to the levels of serum CRP. A total of 296 individuals in group A and 104 individuals in group B had CRP levels below 1.5 mg/dl, respectively. The patients in this study ranged in age from 18 to 38. The patients in this study were found to be 28 years old on average. Table 1 lists the age distributions of the patients who were included. This study's average gestational age was 18.8 weeks. The minimum and maximum gestational ages were 12+1 and 21+3 weeks, respectively.

In this study, 316 individuals delivered at term, while 84 people delivered preterm. In the population under study, 114 individuals underwent LSCS, while the remaining 286 women gave birth vaginally. 400 patients in total were included in the study; 316 had CRP levels under 1.5; of these, 272 had term deliveries, while 24 had preterm births. The remaining 84 individuals had a CRP of greater than 1.5; of these, 60 had preterm deliveries and 24 had term births. Table 3 showing relationship between CRP and outcome.

Table 1: The age distribution of patients included in the study

Age groups	No. of patients
18 – 21 years	122
22 – 24 years	96
25 – 28 years	94
29 – 32 years	60
Above 32 years	28
Total	400

Table 2: Distribution of patients as per the CRP levels

CRP GROUP	NO. OF PATIENTS
0 – 1.5 (Group A)	296
Above 1.5 (Group B)	104
Total	400

Table 3: TERM and CRP_GROUP Cross tabulation

Term	CRP group distribution		Total
	Group A (0 – 1.5)	Group B > 1.5	
< 37 weeks	24	60	84
> 37 weeks	272	44	316
Total	296	104	400

Discussion

Since there haven't been many studies in this area, the findings of this one could be quite helpful to the intended audience. The findings indicate that preterm labour and preterm delivery were highly likely in women with early uterine contractions and an excessively high level of CRP. No preterm pregnancy complicated by infection showed any clinical indications of infection; nonetheless, in these pregnancies, the high level of CRP may point to the presence of a subclinical intrauterine infection.[9,10]

Preterm birth is a significant obstetric and neonatal problem. Every preterm birth places a significant load on already stretched-thin health care resources and is a substantial contributor to infant mortality and morbidity. Prematurity, accounting for approximately two thirds of neonatal fatalities in Iran, was the major cause of newborn deaths. Over the past 20 years, changes in perinatal management have been linked to a dramatic increase and improved prognosis of these newborns. The prevention of preterm birth is one of the most significant difficulties in contemporary maternity care.[11,12]

In this study, 400 pregnant women of singleton pregnancy between the gestational age of 14 to 20 weeks were enrolled. Maternal serum CRP levels were calculated using the ELISA technique after a thorough history-taking session. Depending on the CRP levels, these women were split into two groups. Preterm birth frequency and delivery technique were recorded in both groups. To investigate whether measured maternal CRP levels have any correlation with newborn morbidity, the incidence of neonatal morbidity in the two groups was examined.

The patients in this study were 25 years old on average. The typical gestation period lasted 16.5 weeks. The minimum and maximum gestational ages were 14+1 weeks and 19+3 weeks, respectively. In the present study 42 participants experienced premature deliveries. Of the 30 patients, 12 had CRP levels under 1.5 mg/dl. In the CRP raised group, 22 patients (42.3%) had term deliveries, while 30 individuals (57.7%) delivered preterm. It was shown that higher maternal blood CRP levels in the first trimester of pregnancy were linked to an increased risk of preterm delivery. According to this study, if the CRP value is 1.5, the sensitivity and specificity for predicting the preterm are 71.4% and 86%, respectively.

Conclusion

Elevated maternal serum CRP concentration in early second trimester was associated with increased incidence of preterm delivery. In conclusion, findings of this study demonstrated that the assessment of maternal concentrations of CRP can be used as suitable biomarker for predicting preterm labor, and also despite of the limitation in the number of patients, response to tocolytic therapy in our study was predictable by the evaluation concentrations of CRP of these women.

Ethical approval was taken from the institutional ethical committee

Written Informed Consent was taken from all the participants.

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Conflict of Interest: None declared.

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Original Research Article

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A Cross Sectional Study on Arch Index among Adolescent Females with Different Body Mass Index Strata

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Abstract

Females in adolescent age have their own way of walking pattern which is unique. Congenital variations are more common in the foot region. Adolescent foot morphology is dependent on gender, genetic, environmental and lifestyle factors. The present study is evidence for analysis of Arch Index within different body mass index strata among adolescent females. The body mass index is classified as underweight (< 18.49), normal weight (18.5-24.9,) overweight (25 – 29.9) and obese (>30). In current study, statistical analysis of Arch Index between the four Body mass index groups by ANOVA was done. High statistical significance (p value < .001) of Arch Index(right),Arch Index(left) between the four BMI groups were identified. The understanding of the pedographic parameters will be informative to anatomists, orthopaedicians, and orthoses manufacturers.

Key Words: Human Foot, Arch Index, Body mass index

Introduction

Human development is a process of physical, behavioral, cognitive, and emotional growth and change from new born to childhood, childhood to adolescence and adolescence to adulthood. Human foot is the most afflicted part with anomalies. The architecture of foot is not flat or horizontal. Instead, foot is ground with the support of ligaments and muscles. They form longitudinal and transverse arches relative to which they absorb and distribute downward forces from the body during standing and moving on different surfaces. Body mass index and arch index of the foot of the individual are directly related to each other. This study is an attempt with subsequent evidence for analysis of Archindex within different body mass index strata among adolescent females. A number of factors influence the anatomy and functioning of the feet, one of them being body weight which increases foot discomfort in obese children, Zonfrillo et al[1], 2008. Many studies have been reported that increased BMI or obesity affects

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the foot by causing pain and alters the foot arch that leads to other musculoskeletal problems, Agic et al2, 2006.

AIM

The aim of the present study is to the analyse the Archindex among adolescent females within different body mass index strata.

OBJECTIVES

Objectives of the study are as follows

- To measure the Arch index and BMI of the participants
- To correlate the BMI with the Arch index of both foot
- To critically consider the significances of BMI and Arch index of footprint

Study Design

The present study is a descriptive cross – sectional study, done in 153 volunteer female students between 18 to 20 years of age from Nursing college in Sri Ramachandra University from March2014 to September 2015. Exclusion Criteria: Participants having neurological disorders, musculoskeletal disorders, with history of foot injury or surgery were excluded.

Materials

The materials used are :

- A4 sheet Paper.
- Weighing machine.
- Measurement scale.
- Draft scale.
- Measuring tape.
- Non-irritant blue ink

Methodology

The study is conducted in stepwise manner.

ETHICAL CLEARANCE

The institutional ethical committee approved the study, ethic approval number: CSP-MED/14/ FEB/11/26. Informed consent was obtained in accordance with ethics committee guidelines.

CONSENT

- Written consent was obtained from the voluntary participants.

BMI RECORD

- Height of the participant measured as distance from floor to the top of the head in centimetres.
- Weight of the participant measured in kilograms using weighing machine.
- BMI (Body mass index) - weight in kilograms divided by height in meter^2 is calculated in kg/m^2

FOOT PRINT RECORD

- A rolling brush is dipped in ink containing tray and painted in the participant's right foot and left foot.
- Foot placed over the A4 sheet paper.
- Impregnation of foot print obtained.

DATA ANALYSIS

Data analysis done with software-AutoCAD (2004).

ARCH INDEX

This is the ratio of the area of the middle third of the toeless footprint to the overall toeless footprint area. A line is drawn between the centre point of the second toe and the posterior-most point on the heel. Two parallel lines perpendicular to this line are drawn to divide the toeless footprint area into equal thirds (Fig.1).

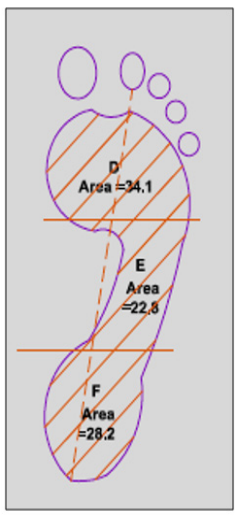

FIGURE -1 :Arch Index E/D+E+F

Result

Among 153 participants, Body mass index revealed 21.6 % underweight, 62.1 % normal, 11.8 % overweight and 4.6 % obese participants. Figure 2 reveals the general demography of our study according to each strata of BMI. %

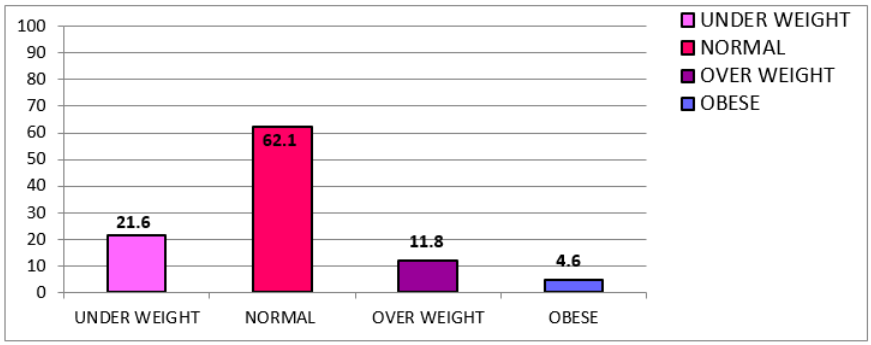

Figure 2 : General demography according to BMI

DESCRIPTIVE STATISTICS

The observations thus obtained were statistically analysed using SPSS version 20. The descriptive statistics obtained are tabulated in Table 1

Table 1: Descriptive statistics of Arch Index

PARAMETER	MIN	MAX	MEAN	SD
ARCH INDEX RIGHT	.17	.30	.2340	.02661
ARCH INDEX LEFT	.16	.29	.2266	.02583

STATISTICAL ANALYSIS OF ARCH INDEX BETWEEN THE 4 BMI GROUPS

High statistical significance (p value is0.001) of Arch Index was observed by ANOVA between the four BMI stratas. Further analysis by post hoc test was done to identify the exact significance of each strata when compared with normal BMI. Table 2, shows the comparative analysis of both right foot Arch Index and left foot Arch Index between BMI stratas by post hoc test.

Table -2 :Arch Index compared within BMI groups (* p - value <0.05)

PARAMETER	BMI	BMI STRATA	MEAN DIFFERENCE	STANDARD ERROR	SIGNIFICANCE (P-VALUE)
RIGHT	NORMAL BMI	UNDER WEIGHT	.03429	.00318	.001*
ARCH		OVER WEIGHT	.02223	.00405	.001*
INDEX		OBESE	.05818	.00617	.001*
LEFT	NORMAL BMI	UNDER WEIGHT	.03104	.00333	.001*
ARCH		OVER WEIGHT	.02057	.00424	.001*
INDEX		OBESE	.05597	.00646	.001*

Arch Index criteria:

Arch index =< 0.21 - High Arch

Arch index 0.21 to 0.26 - Normal Arch

Arch index >= 0.26 – Low Arch

In the current study statistical analysis of Arch Index between these four BMI groups by ANOVA was done. Existence of high statistical significance (p value < .001) of right Arch index and left Arch index between the four BMI groups. Further analysis by post hoc test was done to identify the exact significance of each strata when compared with normal BMI which

portrayed high significance with under-weight, over weight and obese students compared to normal ones (TABLE - 2).

Discussion

The human foot, a highly complex structure with multiple articulations, numerous muscles can be clearly understood by its developmental changes. It is evident that obesity is a major concern for public health and there is greater pontential for over-weight children to become obese. BMI has relation with the morphometric changes of our body. In general, body mass index is classified as underweight (< 18.49) normal (18.5-24.9) overweight (25 – 29.9) and obese (>30). During childhood and adolescence [Parents Complete Guide to Youth Sports; (2006)] , regular exercise is among the many environmental factors essential to achieve full potential for growth.

The similar findings were observed in a study by Kamlesh Khatri et al[2], 2016 which is suggests that, there is a progressive and significant increase in values of arch index from normal to obese ($p<0.05$)

According to Wearing SC et al[3], 2012, the findings were in accordance with the current study, which reveals that the footprint-based measure of arch index was positively associated with BMI. In particular adiposity as measured by BMI, results in relative distortion of the obese footprint, by increasing the contact area of the midfoot, without affecting osseous alignment of the adult medial longitudinal arch.

In contrary to the current study, Evans etal[4] and Ganu et al[5], 2012 showed negative correlation between BMI and flat foot and non – association between BMI and Arch Index.

Mickle et al[6], 2006 researched that thelower plantar arch height found in the overweight/obese children suggests that the flatter feet characteristic of overweight/obese preschool children may be caused by structural changes in their foot anatomy. Further they postulated that these structural changes, which may adversely affect the functional capacity of the medial longitudinal arch, might be exacerbated if excess weight bearing continues throughout childhood and into adulthood.

Conclusion

The current study, with the analysis ofBMI specific comparative analysis and advanced with critical elucidation of significance of the Arch Index of both foot could be used as a quantitative standard by several biomedical specialities and efficient footwear engineering.Knowledge of the pedographic findings is helpful to anatomists, orthopaedic surgeons, plastic surgeons, physiotherapists, orthoses manufacturers and foot wear designers. Further research and categorization of flat foot, normal foot and high arched foot among adolescent females, and supplementary work of analysing the difference in footprint parameters among the females wearing high heels and flat footwears can be taken as future perspectives for this study.

Conflict of Interest: None declared

Source of Funding: No funding sources

Ethical Clearance: The study was approved by the Institutional Ehical Committee SRMC & RI (SRU), Chennai (IEC Ref: CSP – MED / 14 / FEB / 11 / 26)

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Original Research Article

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Add-on Vitamin E in Improving Treatment Outcomes in Diabetic Peripheral Neuropathy: A Prospective Interventional Study

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Abstract

Background: Neuropathy is one of the most common long-standing complications of diabetes, affecting over 50% of the diabetic individuals. Managing DPN and its complications involves comprehensive care and a multidisciplinary approach. Besides pharmacological treatments, botanicals and dietary supplements that have also been found to improve symptoms of DPN without affecting glucose control. The possible role of vitamin E in the management of DPN have been postulated in various studies. The present study thus aimed to prospectively assess whether add-on treatment with vitamin E can improve treatment outcomes in diabetic peripheral neuropathy.

Methods: The study included newly diagnosed patients with diabetic peripheral neuropathy for a period of initial two months. Patients were randomly allocated to either standard treatment Group (Group A) or the intervention Group (Group B). As a part of intervention, patients received vitamin E 400mg once daily in addition to the standard of care. Efficacy Parameters measured at baseline, 6 months and 12 months included changes in visual analog scoring, mean pain score, brief pain inventory and patient's global impression of change. Treatment safety, quality of life and treatment adherence was assessed. Data was statistically analysed.

Result: The study included a total of 100 patients, 50 patients in each Group. Significantly higher decrease of glycaemic measures was noted for Group B compared to Group A in terms of PPPG and serum creatinine, however, there was comparable change in HbA1c and FPG for both Groups. There was comparable significant reduction in mean VAS scoring at 6 and 12 months for Group B. Considering all the efficacy measures, there was highest reduction for the pain interference in the intervention arm (Group B), in comparison to Group A. ($p<0.001$). Quality of life measures and mean adherence scoring significantly increased for treatment group B as compared to A at both 6 months and 12 months of study assessments. No major safety concerns were reported during the study period.

Conclusion: Our study noted that addition of vitamin E as an added supplementation to the standard of care showed benefits in terms of patient reported reduced pain interference and pain perception, which also significantly improved overall quality of life in these patients.

Key Words: Vitamin E, Diabetic Peripheral Neuropathy, Add-on Treatment

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Introduction

Neuropathy is one of the most common long-standing complications of diabetes, affecting over 50% of the diabetic individuals. [1] Diabetic peripheral neuropathy (DPN) refers to nerve damage that occurs specifically in the peripheral nerves of individuals with diabetes. It is a common complication of diabetes, especially in those with poorly controlled blood sugar levels over an extended period. DPN can lead to various complications. Nerve damage can cause loss of sensation in the feet, making it difficult to detect injuries, cuts, or ulcers. Without proper sensation, minor wounds can go unnoticed and develop into serious infections or ulcers. Poor blood circulation due to diabetes can further hinder the healing process, potentially leading to foot ulcers, gangrene, and, in severe cases, amputation. Peripheral neuropathy can also affect balance and coordination, increasing the risk of falls and related injuries. Charcot joint, also known as neuropathic arthropathy, is a condition where the joints, typically in the feet, deteriorate due to nerve damage, which can further result in joint deformities, instability, and chronic pain. DPN can also affect the autonomic nervous system, which controls involuntary bodily functions. This can lead to complications such as gastrointestinal problems (e.g., gastroparesis, constipation, diarrhoea), bladder dysfunction, sexual dysfunction, abnormal heart rate, and changes in blood pressure. DPN can lead to increased susceptibility to infections. Nerve damage can impair the normal function of sweat glands, leading to dry skin that is prone to cracking and infections. In addition, the weakened immune response associated with diabetes can further increase the risk of infections. DPN often presents with symptoms such as tingling, numbness, burning sensations, or sharp pain in the affected areas. This chronic pain can significantly impact a person's quality of life and daily activities. [2-8]

Managing DPN and its complications involves comprehensive care and a multidisciplinary approach. Treatment strategies may include maintaining optimal blood sugar control, pain management, regular foot care, physical therapy, exercises, treating underlying conditions contributing to neuropathy, such as hypertension or high cholesterol and managing autonomic symptoms through medications, dietary changes, and lifestyle modifications. Numerous pharmacological treatments including antidepressant, anticonvulsant, analgesic, and topical medications - have been used to reduce the pain associated with DPN and to improve patients' quality of life. [9] It is important for individuals with diabetic peripheral neuropathy to work closely with their healthcare professionals to develop a personalized treatment plan and to address any complications promptly to minimize their impact on daily life and long-term health.

Alternatively, botanicals and dietary supplements that have also been found to improve symptoms of DPN without affecting glucose control include Evening Primrose oil, alpha-lipoic acid, capsaicin, and vitamin E. The possible role of vitamin E in the management of DPN may be attributed to the concept of oxidative stress and antioxidant treatment. [10] Some researchers have shown that defective nerve conduction in diabetic subjects with mild-moderate peripheral neuropathy may be improved by pharmacological doses of vitamin E supplementation. [11] In a randomized, double-blind, placebo-controlled trial, evaluating the effect of vitamin E on nerve function in type 2 diabetic subjects with mild-to-moderate neuropathy, significant symptom reduction was noted. [12] The present study thus aimed to prospectively assess whether add-on treatment with vitamin E can improve treatment outcomes in diabetic peripheral neuropathy.

Methodology

A prospective interventional study was conducted in eastern India for a period of one year. Permission for the conduct of the study was obtained from the institutional ethics committee and written informed consent was obtained from each participating subject in the study. Patients were randomly allocated to either standard treatment Group (Group A) or the intervention Group (Group B) based on the pre-generated random number table. As a part of intervention, patients received vitamin E 400mg once daily in addition to the standard of care. The study included newly diagnosed patients with diabetic peripheral neuropathy for a period of initial two months. Patient who already received pregabalin and gabapentin for peripheral

neuropathy, pregnant and lactating females and those unable to comprehend the purpose of the study were excluded. Patients meeting the inclusion criteria were enrolled after obtaining consent of participation for the study. Basic demographic data including age, sex, past history of medications, present drug history was obtained. Laboratory investigations included fasting plasma glucose (FPG), post prandial plasma glucose (PPPG), glycosylated haemoglobin (HBA1C) and serum creatinine.

Efficacy Parameters measured at baseline, 6 months and 12 months included:

- Change in VAS score [13] - The visual analog scale (VAS)scoring instrument is a 100-mm line, oriented horizontally, with the left end indicating "no pain" and the right end representing "very severe pain".
- Change in Mean Pain Score (MPS) - Subjects will be asked to keep a Daily Pain Diary, where they will be required to rate their 24-hour average daily pain intensity perception in a 10-pointer scale.
- Change in BPI-DPN [14] – The Brief Pain Inventory (BPI) assesses the severity of pain (Severity scale), its impact on daily functioning (Interference scale), and other aspects of pain (e.g., location of pain, relief from medications).
- Patient's Global Impression of Change (PGIC) [15] - This questionnaire measures a patient's perception of how treatment has affected their level of activity, symptoms, emotions, and overall quality of life.

Safety parameters included assessment for drug interactions and suspected adverse drug reaction (ADR) monitoring and its subsequent pharmacovigilance work up. Suspected ADRs were assessed for causality using Naranjo [16] and WHO UMC Causality Assessment Scales [17], preventability using Schumock Thornton scale [18] and severity using Hartwig Seigel's Scale [19] respectively. Adherence was assessed using Medication Adherence Rating Scale (MARS) [20]. Quality of Life was assessed using WHO-QoL BREF Questionnaire [21]

Considering changes in the mean visual analogue scoring as the effect, we estimated the standard deviation of control and treatment arm as 17 and 18 respectively, as per literature reports.[22] Calculating for a difference of effect of 10 at 5% level of significance, the estimated sample size was 48 for each arm.

Data collected were statistically analysed. Descriptive data was represented as mean, standard deviation, frequency or percentages. Where possible, continuous and categorical variables were analysed with tests like student's t tests and chi square tests whichever found applicable. A p value of less than 0.05 was considered significant. All statistical measures were analysed using standard statistical software like SPSS V.21.0 and Microsoft Excel.

Results

The study included a total of 100 patients, 50 patients in each Group. Mean age of the study population was 54.8 years, with gender ratio of 1.8:1 (male: female). Baseline patient characteristics were noted as in Table 1. No significant differences in patient characteristics in terms of age, gender and comorbidities were noted for both groups. As a part of standard of care, all patients received glimepiride, metformin and teneligliptin for their diabetic care.

Mean glycaemic measures like FPG, PPPG, HbA1c and Serum creatinine was assessed. Significantly higher decrease of glycaemic measures was noted for Group B compared to Group A in terms of PPPG and serum creatinine, where a mean decrease of 114.76mg/dl and 0.032mg/dl was noted for Group B as against 103.7mg/dl and 0.048 mg/dl for Group A respectively. However, there was comparable change in HbA1c and FPG for both Groups. (Table 2)

Efficacy measures included assessment of VAS, MPS, BPI and PGIC. There was comparable significant reduction in mean VAS scoring at 6 and 12 months for Group B. Considering all the efficacy measures, there was highest reduction for the pain interference in the intervention arm (Group B), in comparison to Group A. ($p<0.001$). There was non-significant comparable improvement of patients' impression of change for both arms. (Table 3)

Quality of life measures was assessed using WHO QoL BREF questionnaire. (Table 4) Domains of WHO QoL BREF namely physical health, psychological health, social relationship and environmental health

– each showed comparable increased in indices for treatment group B as compared to A, over the time points. Mean treatment adherence scoring significantly increased for treatment group B as compared to A at both 6 months and 12 months of study assessments. (Table 4)

No major safety concerns were reported during the study period. Gastric disturbances like constipation and diarrhoea were observed in 3 cases in Group A and 2 cases in Group B. Causality assessment of the reported reactions using Naranjo and WHO-UMC Algorithm suggested the cases to be under 'possible' grade, while severity of the reported ADRs were 'mild' necessitating no change of treatment. The reactions were non-preventable, and were self-resolved. No drug interactions were noted in our study.

Illustrations

Table 1: Patient Characteristics

		Group A	Group B	Inter Group Difference (p value)
Age [Mean ± SD (range)]		55.38 ± 11.85 (36.0 – 72.0)	54.24 ± 11.04 (35.0 – 72.0)	0.6198
Gender [n (%)]	Male	32 (64)	33 (66)	0.839
	Female	18 (36)	17 (34)	
Comorbidities [n (%)]	Hypertension	15 (30)	17 (34)	0.67
	Asthma	5 (10)	3 (6)	0.46

Table 2: Glycaemic Measures

		Group A	Group B	Inter Group Difference (p value)
FPG	Baseline	179.64 (15.42)	185.72 (17.25)	0.066
	6 months	118.86 (12.38)	125.62 (13.51)	0.011
	12 months	88.78 (7.60)	93.82 (7.47)	0.001
PPPG	Baseline	242.00 (29.15)	251.42 (25.05)	0.086
	6 months	173.44 (15.10)	168.84 (15.91)	0.141
	12 months	138.30 (12.88)	136.66 (11.17)	0.498
Serum Creatinine	Baseline	0.78 (0.14)	0.79 (0.13)	0.941
	6 months	0.76 (0.21)	0.77 (0.21)	0.708
	12 months	0.74 (0.16)	0.75 (0.16)	0.579
HbA1C	Baseline	8.20 (0.72)	8.23 (0.76)	0.820
	12 months	6.08 (0.58)	6.01 (0.60)	0.555

Note: Measures expressed as Mean (SD).

Table 3: Efficacy Measures

		Group A	Group B	Inter Group Difference (p value)
VAS	Baseline	91.50 (8.59)	89.90 (10.08)	0.395
	6 months	70.10 (5.30)	68.40 (10.12)	0.295
	12 months	51.50 (6.25)	49.20 (6.34)	0.071
MPS	Baseline	9.66 (0.48)	9.60 (0.49)	0.539
	6 months	7.16 (0.37)	6.90 (1.13)	0.125
	12 months	5.42 (0.76)	5.82 (1.40)	0.078
BPI Pain Severity Index	Baseline	9.52 (0.43)	9.50 (0.46)	0.822
	6 months	7.12 (0.39)	6.90 (1.13)	0.196
	12 months	5.45 (0.78)	4.59 (2.16)	0.009
BPI Pain Interference Index	Baseline	9.43 (0.42)	9.47 (0.40)	0.576
	6 months	7.18 (0.39)	6.47 (1.07)	0.000
	12 months	6.01 (0.42)	4.69 (1.80)	0.000
PGIC	6 months	3.66 (0.66)	3.74 (0.75)	0.572
	12 months	3.84 (0.58)	3.94 (0.55)	0.380

Note: Measures expressed as Mean (SD).

Table 4: Quality of Life and Adherence measures

		Group A	Group B	Inter Group Difference (p value)
WHO QoL BREF				
Physical Health	Baseline	43.62 (13.57)	48.32 (2.72)	0.018
	6 months	41.00 (3.03)	62.24 (4.56)	0.000
	12 months	36.72 (20.65)	62.24 (4.56)	0.000
Psychological Health	Baseline	45.56 (2.66)	52.94 (2.18)	0.020
	6 months	51.68 (5.00)	88.78 (5.66)	0.000
	12 months	51.68 (5.00)	92.62 (8.08)	0.000
Social Relation-ships	Baseline	40.12 (16.39)	41.02 (8.91)	0.734
	6 months	47.00 (15.55)	73.68 (2.51)	0.000
	12 months	48.82 (16.30)	79.20 (2.78)	0.000
Environmental Health	Baseline	42.06 (9.22)	45.58 (13.08)	0.123
	6 months	47.00 (9.42)	78.60 (4.85)	0.000
	12 months	50.26 (11.92)	82.10 (7.29)	0.000
Adherence				
MARS Scoring	6 months	6.9 (0.78)	7.25 (0.94)	0.045
	12 months	7.1 (0.83)	7.60 (0.66)	0.001

Note: Measures expressed as Mean (SD).

Discussion

Our study noted that addition of vitamin E as an added supplementation to the standard of care showed benefits in terms of patient reported reduced pain interference and pain perception, which also significantly improved overall quality of life in these patients. Some studies have investigated the use of vitamin E in managing DPN symptoms, but the evidence regarding its effectiveness is limited and inconclusive. While the exact mechanism is not fully understood, several potential mechanisms have been proposed. Vitamin E acts as an antioxidant by neutralizing free radicals, which are highly reactive molecules that can damage cells and tissues. Diabetes is associated with increased production of free radicals, leading to oxidative stress. By reducing oxidative stress, vitamin E may help protect nerves from damage and prevent or slow down the progression of DPN. Vitamin E has been shown to have anti-inflammatory properties, which may help reduce inflammation in nerve tissues and alleviate neuropathic symptoms. Diabetes can impair blood flow to peripheral nerves, leading to nerve damage. Vitamin E has been suggested to improve blood flow by enhancing vasodilation and reducing the formation of blood clots. By improving blood flow to nerves, vitamin E may further help to maintain their health and function. [23]

Some studies have reported positive benefits of vitamin E supplementation in DPN, such as reduced pain and improved nerve function.[24] However, other studies have shown no significant effects or mixed results. For example, a randomized controlled trial [25] published in Diabetes Care in 1998 found that high-dose vitamin E supplementation (1,800 IU per day) for one year resulted in modest improvements in nerve conduction velocity and subjective symptoms in individuals with DPN. However, it is worth noting that this study had a relatively small sample size and limitations. On the other hand, a larger clinical trial published in the JAMA Neurology in 2018 found no significant benefit of oral mixed tocotrienols in DPN subjects. [26] It is important to note that high doses of vitamin E can have potential risks, including an increased risk of bleeding, especially in individuals taking blood-thinning medications or with certain medical conditions. Therefore, it is crucial to consult with a healthcare professional before starting any new supplement, including vitamin E, for managing DPN.

However, the present study is constrained by its limited sample size and regional interpretation, which challenges its external generalizability. Also, the study may have been limited by its design issues in not being a double-blind placebo controlled one. Future studies should overcome these limitations. Overall, the evidence regarding the effectiveness of vitamin E in DPN is inconclusive. While some studies have suggested potential benefits, others have shown no significant effects. As with any treatment, it is advisable to discuss options with a healthcare professional who can provide personalized advice and guidance based on individual circumstances. Additionally, focusing on optimal blood sugar control, proper foot care, and other recommended treatments for DPN management should be a priority.

Conclusion

Our study noted that addition of vitamin E as an added supplementation to the standard of care showed benefits in terms of patient reported reduced pain interference and pain perception, which also significantly improved overall quality of life in these patients. Future research should further focus on this modality in wide subset of subjects.

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Conflict of Interest: None Declared

CTRI Registration: The Study was prospectively registered with CTRI (CTRI/2020/06/026142) on 25/06/2020.

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Original Article

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Knowledge and Myths Regarding Breast Cancer among Women in Ernakulam District

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Abstract

Introduction: Breast cancer was the world's most prevalent cancer by the end of 2020. This study aims to find out the knowledge and myths regarding breast cancer among women in Ernakulam district.

Methods: A cross-sectional study was conducted in Ernakulam district in the year 2022.Adult females aged more than 20 years were the study participants. Awareness about breast cancer, associated risk factors, and screening methods was assessed using a questionnaire in the local language. The data were analyzed using SPSS software version 20.

Results: The mean age of the study participants was 49.1 ± 12.2 years. 38 participants [27.14% (95% CI– 19.8, 35.3)] had adequate knowledge levels of symptoms, risk factors, diagnosis, and treatment options for breast cancer. 132 (94.3 %) women believed in at least one of the mentioned myths. Most common were theuse of deodorants or perfumes (71.4%) and tight bras (64.3%), increased the risk of breast cancer. Participants who had a family history of breast cancer (p=0.03) and those from urban areas (p = 0.024) had significantly fewer myths regarding breast cancer.

Conclusion: The knowledge among women regarding breast cancer was inadequate. It's high time that health professionals take active steps to improve knowledge regarding breast cancer through campaigns and awareness classes.

Keywords: knowledge, myths, Breast cancer, Breast self-examination

Introduction

Breast cancer was the world's most prevalent cancer by the end of 2020. Globally, in the year 2020, 2.3 million women were newly diagnosed with breast cancer, and 6,85,000 of them lost their lives by virtue of this.[1] Among all the cancers in women, 25.4% were breast cancers.[2] It accounts for the highest burden of disability-adjusted life years (DALYs) in women globally than any other malignancy.[1]

According to the data from Hospital based cancer registries, 73,998 cases of breast cancer were diagnosed in India in 2021.[3] The increasing prevalence of breast cancer may be the tip of the iceberg, as there are only a limited number of population based

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cancer registries in the country. In India, nearly 60% of breast cancer cases are diagnosed at stage III or IV of the disease.[4] This could be the reason for the low 5-year survival rate of breast cancer in India (66%) compared to high-income countries, where it's more than 90%.[1,5]

Breast cancer arises in the epithelial cells of the ducts or lobules of the breast. Initially, the cancerous growth is in situ, and over some time, it may progress to invasive breast cancer, then to regional metastasis and distant metastasis. Treatment for breast cancer can be very effective, especially when it is identified at an early stage. This can prevent further cancer growth and metastasis, thereby saving lives. In high-income countries, age-standardized mortality from breast cancer dropped by 40% between the years 1980 and 2020. These countries have been able to achieve a 2-4% annual breast cancer mortality reduction.[1]

The Global Breast Cancer Initiative (GBCI) aims to avert 2.5 million breast cancer deaths globally between 2020 and 2040. The three pillars of GBCI towards achieving this goal include early detection, followed by timely diagnosis, and comprehensive management of breast cancer.[6] Early detection through mass screening programmes followed by diagnosis has proven successful in many high-income countries.[7-9] Tools likethe Gail model, the Breast Cancer Risk Assessment Tool (BCRAT) and mammography have been used in developed countries. It is challenging to adapt this toa highly populated and resource-limited developing country like India. Mammography is inaccessible and not affordable to the majority of the population, especially the poor in rural areas. Due to cultural taboos and stigma, early symptoms of breast cancer are not freely discussed, and patients are reluctant to come to the health care system.[9] Thus, mostbreast lumps are detected by patients, often accidentally, and the majority are diagnosed in the late stages (stages III and IV).[4] Hence, the disease has a very poor prognosis and a low survival rate. Thus, self breast awareness and self breast cancer screening among the population should be priorities.

Breast cancer awareness in developing countries is not well documented. The lack of awareness and incorrect beliefs about breast cancer are responsible for the late diagnosis and negative perception of the treatment.[10] Therefore, it is important to assess the level of knowledge of symptoms and risk factors in our communities. Moreover, the month of October is observed globally as breast cancer awareness month, so this study was conducted in October 2022 to find out the knowledge and myths regarding breast cancer among women. This study also aimed to assess the attitude and practice regarding breast self-examination among women in South India.

Methods

Study design and study area

From October to November 2022, a cross-sectional study was conducted in the field practise area of the Department of Community Medicine, SNIMS. Participants were recruited from the community using the consecutive sampling method.

Study population:

Adult females aged more than 20 years who had been residing in the study area for more than one year were included in the study. Participants who were suffering from severe physical and mental illnesses were excluded from the study.

Sample size calculation

The sample size was determined using the formula $Z_{\alpha}^2 pq/d^2$ with 95% confidence intervalsand an 8.5% allowable error. A 5% non-response rate was added, and the final sample size was 140.[11]

Data collection:

The awareness of breast cancer, associated risk factors, and recommended screening methods was assessed using a questionnaire in the local language. The questionnaire included four sections:(i) the demographic background of the respondent;(ii) the respondent's knowledge of breast cancer and breast-self examination (BSE); (iii) their attitude towards risk factors for breast cancer; and (iv) their current practise for breast cancer screening and BSE. Regular BSE was defined as performing breast-self examination at least once per month.

Statistical analysis

The collected data were entered in MS Excel and analyzed using SPSS software version 20. Normality was tested by the Kolmogorov-Smirnov test. For

bivariate analysis, the Chi-Square test of significance was applied to find the association between various variables. A p value less than 0.05 was set as the level of significance.

Ethical issues

The objective and study protocol were explained to the study participants, and informed consent was obtained. After data collection, all the women were given health education regarding the signs and symptoms of breast cancer, its risk factors, and the screening, diagnosis, and treatment modalities available. Before analysis, the collected data were anonymized to protect the privacy of participants.

Results

The mean age of the study participants was 49.1 ± 12.2 years (ranging from 21 to 75 years). Around half of the participants were in the 4th or 5th decade of their lives. The majority of them were married. Only 49 (35%) women were employed, and the rest were housewives. 31 women(22.1%) were unskilled workers. Details are given in Table 1.

Table 1: Socio demographic details of study participants

Socio demographic variables	Categories	Number (n= 140)	Percentages (%)
Age groups (years)	21-30	10	7.1
	31-40	25	17.9
	41- 50	38	27.1
	51- 60	45	32.1
	61- 70	17	12.1
	71-80	5	3.6
Place of stay	Urban	44	31.4
	Rural	96	68.6
Education	Illiterate	1	0.7
	Primary School	13	9.3
	Secondary School	22	15.7
	Higher Secondary School	16	11.4
	Intermediate/diploma	62	44.3
	Degree	24	17.1
	Post graduate and above	2	1.4
Occupation	Housewife/ students	91	65.0
	Unskilled	31	22.1
	Semi-skilled	4	2.9
	Skilled	12	8.6
	Professional	2	1.4
Marital status	Unmarried	3	2.1
	Married	125	89.3
	Widowed	12	8.6
Socio-economic status	Above poverty line	87	62.1
	Below poverty line	53	37.9
Relative suffering from cancer	Yes	39	27.9
	No	101	72.1

The knowledge of study participants regarding risk factors and symptoms of breast cancer was low, as shown in figures 1 and 2, respectively. 16 (11.7%) participants were not aware of any risk

factors causing breast cancer. Only around half of the women identified family history (55%), use of tobacco or alcohol (55%), and consumption of high-fatdiets (54.3%) as risk factors for breast cancer. Knowledge regarding modifiable risk factors like lack of exercise (42.9%) and overweight or obesity (36.4%) was also low.45women(31.2%) did not have knowledge of any symptoms of breast cancer. Interestingly, less than one third of the women said change in shape or size of the nipple (31.4%), change in skin colour (30.7%), and change in size or shape of the breast (29.3%) were symptoms of breast cancer.

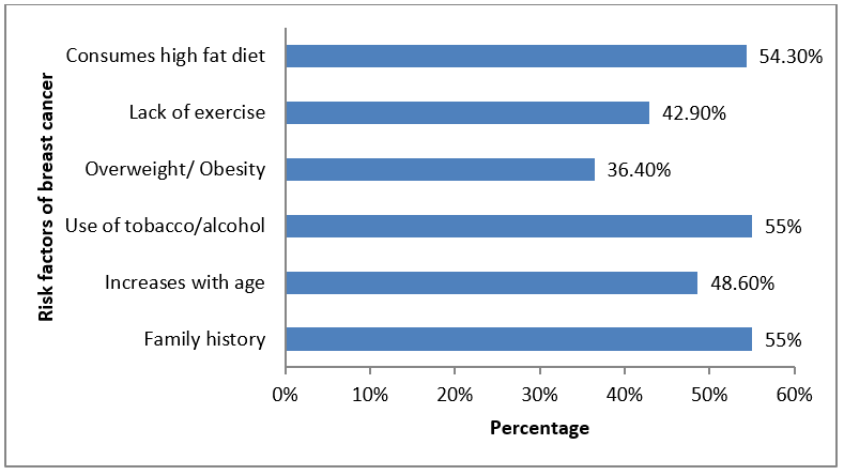

Figure 1: Percentage of women who identified risk factors of breast cancer

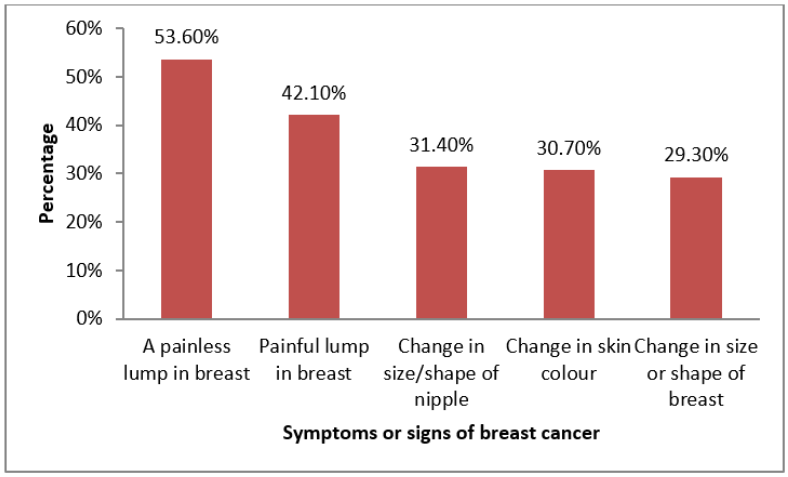

Figure 2: Percentage of participants who had knowledge regarding symptoms or signs of breast cancer

Knowledge regarding the different treatment options for breast cancer was also assessed among the study participants. Among them, 73(52.2%) were aware of chemotherapy, 25 (17.9%) were aware of radiotherapy, and 29(20.7%) were aware of surgery as a treatment option for breast cancer. Only 13 (9.3%) participants were aware of all three different modes of treatment for breast cancer. It was interesting to note that 47(33.5%) were not aware of any treatment options available for breast cancer. Hence, only 38 participants [27.14% (95% CI- 19.8, 35.3)] had adequate knowledge levels of symptoms, risk factors, diagnosis, and treatment options for breast cancer.

Participants who had a family history of breast cancer had better knowledge regarding risk factors for breast cancer (χ^2=6.1, p= 0.014). There was a significant association between socioeconomic status(χ^2=14.7, p< 0.001) and knowledge regarding the risk factors of breast cancer. Above the poverty line participants had four times better knowledge regarding the risk factors of breast cancer (OR=4, 95%CI- 1.9,8.2).

Table 2: Myths believed by study participants regarding breast cancer

Myths of study participants	Number(n-140)	Percentage(%)
Undergoing FNAC/biopsy increases the spread of cancer	72	51.4%
Use of tight bra increases the risk of breast cancer	90	64.3%
Breast cancer is seen only in females	91	65.0%
Use of deodorants/ perfumes increases the risk of breast cancer	100	71.4%

132 (94.3 %) women believed in at least one of the myths mentioned in Table 2. Most common were the use of deodorants or perfumes (71.4%) and tight bras (64.3%), increased the risk of breast cancer. Participants who had a family history of breast cancer had fewer myths (OR= 0.36, 95%CI- 0.14, 0.94) regarding breast cancer (χ^2=4.6, p= 0.03). Participants from rural areas had 2.8 times (OR=2.8, 95%CI- 1.1, 6.9) more myths regarding breast cancer than those from urban areas. This was found to be statistically significant (χ^2=5, p= 0.025).

Attitude and practice towards breast cancer among study participants:

56 (38.6%) participants felt that screening was important to detect breast cancer. 94 participants [67.1% (95%CI- 58.7, 74.8)] showed a positive attitude towards practising breast self-examination. But only 30 participants [21.4% (95%CI- 14.9, 29.2)] were routinely practising monthly breast self-examination.

Table 3: Association between practice and attitude with adequate knowledge of breast cancer (n= 140)

		Total Knowledge level		Odds ratio (95% CI) and p value
		Adequate	Inadequate	
Attitude level	Adequate	32(34%)	62(66%)	OR = 3.44 (1.32,8.97) p = 0.009
	Inadequate	6(13%)	40(87%)	
Practice level	Acceptable	14(46.7%)	16(53.3%)	OR= 3.14 (1.34,7.32) p = 0.007
	Not acceptable	24(21.8%)	86(78.2%)	

The women who had adequate knowledge regarding symptoms, risk factors, diagnosis, and treatment options for breast cancer had a 3.44 times better attitude than those with inadequate knowledge. This was found to be statistically significant (p = 0.009). Moreover, women who had adequate knowledge of breast cancer had 3.14 times better practice of breast self-examination than those with inadequate knowledge (Table 3). This was also found to be statistically significant (p = 0.007).

Table 4: Association between adequate attitude and practice of breast self-examination (n= 140)

		Attitude level		Odds ratio (95% CI) and p value
		Adequate	Inadequate	
Practice of breast self-examination	Acceptable	27(90%)	3(10%)	OR= 5.77 (1.65,20.2) p = 0.003
	Not acceptable	67(60.9%)	43(39.1%)	

The women who had an adequate attitude towards breast cancer had five times better practice of breast self-examination than those with an inadequate attitude (Table 4). This difference was statistically significant (p = 0.003).

Discussion

Despite years of epidemiological and clinical research, breast cancer prevalence continues to increase. The present research found that the participants understanding of risk factors were low.

This was similar to many other Indian studies.[11-14] Use of tobacco products and alcohol, family history, and intake of a high-fat diet were considered risk factors by more than half of participants. However, it was found that participant's knowledge of preventable risk factors such as obesity or overweight, and a lack of exercise were low. This finding was similar to the study done by Prusty et al in Mumbai. [15]

Furthermore, this study found that about one-third of the women had no knowledge regarding the symptoms of breast cancer. A lump in the breast was the most common symptom mentioned by participants. Only a few participants knew that skin changes in the breast, change in the shape or size of the nipple and breast were symptoms of breast cancer. Similar findings were seen in other studies done in India by Prusty et al, Shinde S et al, and Somdatta et al.[13,14,15]

More than 90% of the participants in the present study had at least one misconception regarding breast cancer. The most common are the use of deodorants or perfumes and tight bras, which increase the risk of breast cancer. A study conducted in Ghana reported keeping coins in the bra as a risk factor for breast cancer. Whereas in the study done by Prusty et al in Mumbai, around 50% had the misconception that breast cancer meant losing one's breast(s).[15] Myths related to breast cancer seem to vary from region to region.

We also found that women in this study had a limited understanding of mammography and self-breast examination. The perception of the need for screening for breast cancer was also low in the study population. However, 21.4% of women practised routine self-breast examination in this study. The rates reported were much higher than those mentioned in previous Iranian and Egyptian studies done among nurses, in which only 2.65% and 6% of the general study populations practised self-breast examination monthly, respectively.[16,17]

The study had a limitation. It was a cross-sectional design, and it was not possible to identify any causal relationship between variables. Nevertheless, the findings of this present study provide some understanding regarding knowledge of risk factors, symptoms, and the practice of breast screening among women in Central Kerala. This information can be useful for health promotion and improving the health of women.

Conclusion

The knowledge among women regarding breast cancer was inadequate. It's high time that health professionals take active steps to improve knowledge regarding breast cancer through campaigns and awareness classes. This can lead to improvements in the rates of early detection and increase the chance of curative treatment and survival.

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Source of funding: Self

Conflict of Interest: Nil

Ethical clearance: The study followed Helsinki guidelines and informed consent. Respondents had full right to withdraw from the study. All the information's were kept confidential. IEC clearance was not obtained for the study.

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Research Paper

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Efficacy of Trans Abdominis Plane (TAP) Block for Post-caesarean Delivery Analgesia: A Prospective Randomized Controlled Study

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Abstract

Background: Caesarean delivery is a major surgical procedure after which substantial post-operative pain and discomfort can be anticipated. A substantial component of pain experienced by patients is derived from abdominal wall incision. Currently multimodal analgesia technique involving abdominal field block with parenteral analgesia are becoming popular for these patients. Transversus abdominal plane (TAP) blockcan relieve pain associated with abdominal incision. We carried out this study to evaluate the efficacy of TAP block in providing post operative pain relief and the cumulative requirement of analgesic over first 48 hour in patients who underwent LSCS under spinal anaesthesia.

Methods: This prospective randomized controlled study was carried out with 60 patients posted for elective caesarean section, two groups with 30 patients each. Both groups were compared to see the effectiveness of Trans Abdominis Plane (TAP) Block as a method for post-operative multimodal analgesia technique using VAS score. Total number of rescue analgesia required upto 48hrs and total dose of rescue analgesia given in both the groups was also compared.

Results: The mean VAS score at rest andon movement was decreased significantly after Trans Abdominis Plane (TAP) Block. The total dose and number of rescue analgesia was also decreased significantly.

Conclusions: TAP block as a component of multimodal analgesia after caesarean section was effective in providing analgesia with delayed time for 1st rescue analgesia and reduction in total analgesic requirement in 1st 48 hr.

Keywords: Caesarean section, post-operative analgesia, Trans Abdominis Plane (TAP) Block.

Introduction

Caesarean delivery is a major surgical procedure after which substantial post-operative pain and discomfort can be anticipated and failure to treat it adequately may affect maternal-infant bonding, breast-feeding, as well as may expose the mother to risk of thromboembolism because of immobility. The provision of effective post-operative analgesia is of

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key importance to facilitate early ambulation, infant care, and prevention of post-operative morbidity.

A substantial component of pain experienced by patients is derived from abdominal wall incision. Nonsteroidal anti-inflammatory drug alone may be insufficient to treat post caesarean pain. Systemic or neuraxial opioid are effective for treating post-operative pain, but associated with number of side effects like nausea, vomiting, pruritus, constipation, and respiratory depression. Currently multimodal analgesia technique involving abdominal field block with parenteral analgesia are becoming popular for these patients.

The abdomen wall consists of three muscle layers, the external oblique, the internal oblique, and the transversus abdominis and their associated fascial sheath. This muscular wall is innervated by afferents that course through the transversus-abdominisneuro-fascial plane.

Transversus abdominal plane (TAP) block is a regional block that blocks abdominal wall neural afferent between T6 and L1 and thus can relieve pain associated with abdominal incision. TAP is a neurovascular plane located between internal oblique and transverse abdominis muscle and nerve supplying abdominal wall pass through this plan before supplying anterior abdominal wall. Therefore, if the local anaesthetic is deposited in this space, myocutaneous sensory blockade results.

Rafi A.N. first described the TAP blockin 2001 using the anatomical landmarks by first identifying the lumbar triangle of petit.[1]In 2007, McDonnell J.G. presented preliminary work on TAP block in cadaver and healthy voluntary.[2]TAP block has subsequently been used as a component of multi modal analgesia for post operative pain relief of various surgical procedure such as large bowel resection, open appendicectomy, nephrectomy, hernia repair, laparoscopic cholecystectomy, and caesarean section.

TAP block is given by two techniques. First is Landmark technique described by Rafi through triangle of Petit and second is Ultrasound guided technique by this technique visualization of all anatomical structure, needle and spread of local anaesthetic in transverses abdominis plane are possible.[3]We have used Landmark technique that is loss of double resistance (double pop) in our study.

We carried out this study to evaluate the efficacy of TAP block in providing post operative pain relief and the cumulative requirement of analgesic over first 48 hour in patients who underwent LSCS under spinal anaesthesia. Also, to note VAS score upto 48-hour post operatively, time when first analgesic required (VAS score>4), hemodynamic parameter, and complications (nausea, vomiting, hypotension).

Material and Methods

The present study was carried out in the department of anaesthesiology, Shri M.P. Shah Govt. Medical College, Jamnagar, during the period of July 2019 to July 2020, after approval from the hospital ethical committee. This prospective randomized controlled study was carried out with 60 patients selected from total of 1570 patients who underwent elective caesarean section during study period, two groups with 30 patients each were randomly assigned, in Group B: TAP block was given while in Group C: TAP block was not given (no intervention). Double blinding was done.

Inclusion criteria: Full term pregnancy, Age-20-35 years, Weight 50-70 kg, ASA gradeI/II/III, Elective LSCS under spinal anaesthesia, Informed consent.

Exclusion Criteria: Age <20 or >35 years, Weight <50 or >70 kg, ASA grade IV/V, contraindication to spinal anaesthesia, patients' refusal and not able to understand study protocol, sensitivity to local anaesthetics, patients with compromised renal and liver function, uncontrolled diabetes, severe cardiovascular and respiratory disease, infection, trauma, scar or sinuses at site of block, patients under general anaesthesia.

All patients were thoroughly assessed, by taking history, and examined in detail. All subjects fulfilling the inclusion criteria were explained about the purpose, procedure, and side effects of procedure, objective of the study, methodology, advantage, and likely complications. Patient selected after pre-anaesthetic checkup, and investigations. Informed written consent was taken from those willing to participate in the study. Patients were kept adequately nil by mouth, on the day of surgery, all the basic necessities like anaesthesia machine and resuscitation drugs, airway equipments and suction

apparatus were checked. A good venous access was secured with 20G IV cannula and pre-loading done with 10ml/kg of Ringer's lactate solution prior to induction. Patients were positioned on the operating table in the supine position with left lateral tilt and multipara monitor was attached. All baseline parameters were observed and recorded which consist of non-invasive blood pressure (NIBP), Electrocardiography (ECG), Spo2 before induction and local anaesthetic sensitivity testing was done. All patients were given premedication with Inj. Ondansetron0.08mg/kg I.V. before induction and Inj. Pantoprazole40 mg I.V. slowly, no sedative premedication was given. Under all aseptic and antiseptic precaution all patients were given spinal anaesthesia with 2 ml of 0.5% Bupivacaine heavy in left lateral position.

At the end of surgery, TAP block was performed by senior anaesthetist, in supine position, under all aseptic and antiseptic precautions, using 18 G I.V. set needle with wedge kept between area of costal margin and iliac crest. Landmark technique, described by McDonnel et al[2,4,5] was used. This technique accesses the transverse abdominisplane via the lumbar triangle of petit. LOR technique combined with double "pop" was used. After aspiration, a 20 ml of 0.25% of Bupivacaine hydrochloride was injected on both sides in Group B, while TAP block was not performed in Group C. After completion of procedure, all patients were shifted to post anaesthesia care unit (PACU).In PACU, all patients received standard analgesia according to obstetric department protocol Inj. Tramadol 1mg/kg I.V. 8 hourly.

The post-operative pain relief was assessed by using visual analogue scale (VAS). Rescue analgesia was given in the form of Inj. Diclofenac sodium 1.5 mg/kg I.M. when VAS score is >4. Total dose and time of standard analgesia required in first 48 hour post-operatively was noted. Post block vital parametermonitoring was started from the end of the procedure in both groups up to 48 hours. Post operative monitoring, VAS and complications were assessed by junior resident blinded about the type of procedure done on patients.

Results:

After completion of study observation and results were analyzed statistically using software SPSS. Students' T test was applied for comparing the inter group results and the p value calculated. Nonparametric data was analyzed using the chi square test. Statistical significance was assumed at $p<0.05$.

The number of patients in either group was 30. The mean age of patients was 27.6±4.61 in group B and 26.03±3.72 years in group C. The mean weight of patients was 55.33±6.01 Kg in group B and 56.53±6.73 Kg in group C. The mean height of patients was 153.43±3.82 cmin group B and 155.63±2.45 cm in group C. No statistically significant difference was found in both groups. ($p>0.05$) [Table 1]

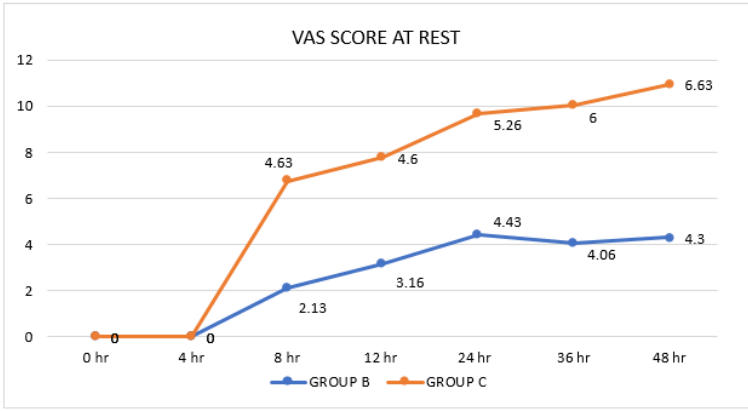
Table 1: DEMOGRAPHIC CHARACTERISTICS

Parameter	Group B	Group C	p value
Number of patients	30	30	>0.05
Age (years)	27.6±4.61	26.03±3.72	>0.05
Weight (Kg)	55.33±6.01	56.53±6.73	>0.05
Height(cm)	153.43±3.82	155.63±2.45	>0.05

The mean VAS score at rest in both groups was 0 at 0 and 4 hours.In group B, VAS score at rest was < 4 at 8 hours. In group C, VAS score at rest was> 4 after8 hours. Moreover, at all-time intervals after 4-hour, VAS score at rest was significantly higher in group C as compared to group B. There was statistically significant difference in both groups. ($p<0.001$) [Table 2]

Table 2: VAS SCORE AT REST

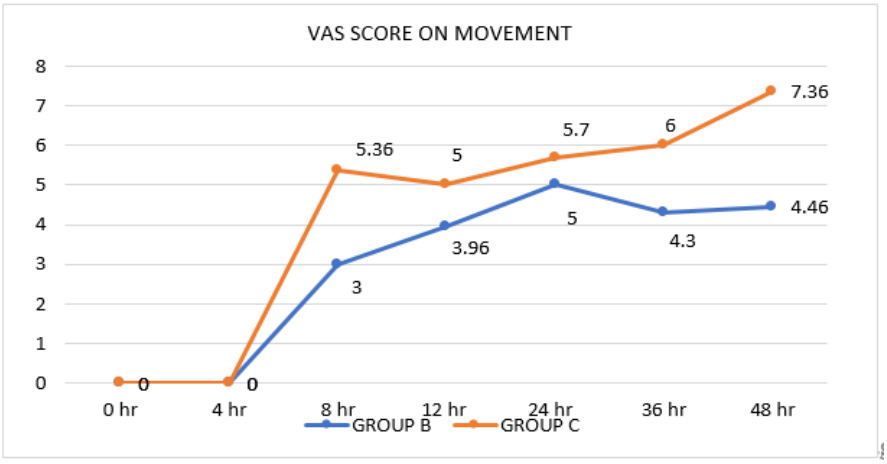
TIME	GROUP B	GROUP C	p value
0hr	0	0	>0.05
4hr	0	0	>0.05
8hr	2.13±0.34	4.63±0.55	<0.001
12hr	3.16±1.31	4.6±0.93	<0.001
24hr	4.43±1.22	5.26±1.14	<0.001
36hr	4.06±0.52	6.0±1.38	<0.001
48hr	4.3±0.65	6.63±1.24	<0.001



The mean VAS score on movement in both groups was 0 at 0 and 4 hours. In group B, VAS score on movement was < 4 at 8 hours. In group C, VAS score on movement was > 4 after 8 hours. Moreover, at all-time intervals after 4-hour, VAS score on movement was significantly higher in group C as compared to group B. There was statistically significant difference in both groups. (p<0.001) [Table 3]

Table 3: VAS SCORES ON MOVEMENT

TIME	GROUP B	GROUP C	p value
0hr	0	0	>0.05
4hr	0	0	>0.05
8hr	3±0.58	5.36±1.06	<0.001
12hr	3.96±1.03	5±1.36	<0.001
24hr	5±0.98	5.7±1.41	<0.001
36hr	4.3±0.70	6.36±1.56	<0.001
48hr	4.46±0.97	7.36±1.27	<0.001



Time for first rescue analgesic dose was significantly prolonged in group B than group C. It was 22.8±7.94hr in group B and 9.33±1.91hr in group C. There was statistically significant difference in both groups. (p< 0.001) [Table 4]

Table 4 – First rescue analgesia time (in hour)

Group B	Group C	p- value
22.8±7.94	**9.33±1.91**	<0.001

In Group B, 24 patients required 1 dose of analgesic, 6 patients required 2 doses of analgesic in 48 hours. In Group C, 1 patient required 2 dose of analgesic and 17 patients required 3 doses of analgesic and 12 patients required 4 doses of analgesic in 48 hours. (p<0.001) [Table5]

Table 5: Number of doses of rescue analgesia in 48 hours

No. of doses	Group B	Group C	p value
1	24pts	0 pts	<0.001
2	6 pts	1pts	<0.001
3	0 pts	17pts	<0.001
4	0 pts	12pts	<0.001

The mean cumulative Inj.Diclofenac sodium requirement was significantly higher in group C as compared to group B. The total dose of Inj. Diclofenac sodium required by patients ingroup B in 48 hrs was 90 ± 30.51 mg, while in group C it was 252.5± 41.70mg. (p< 0.001) [Table 6]

Table 6: Cumulative Inj. Diclofenac sodium Requirement after 48 hours (in mg)

Group B	Group C	p value
90± 30.51	252.5± 41.70	<0.001

On intergroup comparison, there were no statistically significant difference in the mean pulse rate between two groups. (p>0.05)Oncomparison of systolic and diastolic blood pressure, there were no statistically significant difference as compared to baseline till 48 hours after TAP block. (p>0.05)In both the groups, Spo2 was comparable at all times. None of the patient in Group B as well as Group C experienced any complications like nausea, vomiting, bradycardia, hypotension, tachycardia, local anaesthetic toxicity,transient femoral palsy, accidental intra peritoneal or intra vascular injection or bowel perforation.

Table 7: Pulse rate (per minute)

Time	Group B	Group C	p value
Pre-induction	75.23±10.18	74.63±10.86	>0.05
Baseline	83.6±8.63	84.66±7.82	>0.05
0 hour	75.93±8.79	79.66±8.97	>0.05
4 hours	72.73±6.85	71.33±7.95	>0.05
8 hours	74.93±6.36	74.06±5.66	>0.05
12 hours	74.23±4.50	73.9±3.64	>0.05
24 hours	75.33±7.03	78.26±8.11	>0.05
36 hours	72.13±7.00	72.26±8.11	>0.05
48 hours	73.5±7.37	72.6±7.84	>0.05

Table 8: Systolic blood pressure (mm Hg)

Time	Group B	Group C	p value
Pre-induction	120.06±9.77	121.93±8.93	>0.05
Baseline	108.04±7.49	107.85±4.86	>0.05
0 hour	108.86±5.50	111.26±5.44	>0.05
4 hours	114.4±4.65	114.73±4.21	>0.05
8 hours	118.33±5.14	119.13±5.27	>0.05
12 hours	119.73±5.93	120.66±6.13	>0.05
24 hours	117.4±7.96	117.8±7.98	>0.05
36 hours	119.2±7.43	118.6±7.86	>0.05
48 hours	119.33±7.86	118.4±7.79	>0.05

Table 9: Diastolic blood pressure (mm Hg)

Time	Group B	Group C	p value
Pre-induction	72.33±4.90	72.66±4.93	>0.05
Baseline	69.06±7.69	66.8±6.02	>0.05
0 hour	69.8±4.04	68.33±3.15	>0.05
4 hours	66.26±5.72	67.33±5.61	>0.05
8 hours	72.86±6.02	71.86±6.55	>0.05
12 hours	70.04±4.65	69.6±4.93	>0.05
24 hours	70.26±6.40	69.66±5.53	>0.05
36 hours	71.2±6.16	70.86±5.08	>0.05
48 hours	71.26±5.86	71.4±5.20	>0.05

Table 10: Changes in oxygen saturation

Time	Group B	Group C	p value
Pre-induction	98.73±0.52	98.8±0.55	>0.05
Baseline	98.93±0.25	99.00±0	>0.05
0 hour	98.93±0.25	99.00±0	>0.05
4 hours	98.63±0.49	98.83±0.37	>0.05
8 hours	98.8±0.40	98.96±0.18	>0.05
12 hours	98.73±0.44	98.96±0.18	<0.05
24 hours	98.8±0.40	98.96±0.18	>0.05
36 hours	98.8±0.40	98.96±0.18	>0.05
48 hours	98.8±0.40	99.00±0	>0.05

Discussion

The aim of good post-operative analgesia is to produce a long lasting, continuous effective analgesia with minimum side effects. The benefits of adequate postoperative analgesia are reduction in postoperative stress, morbidity and improved surgical outcome. Effective pain control also facilitates rehabilitation and accelerates recovery from surgery. [6,7,8]

A multimodal analgesic regimen is most likely to achieve these goals. However, the optimal components of this regimen continue to evolve. Although single-shot neuraxial analgesic techniques using long- acting opioids, or patient-controlled epidural opioid administration produce effective analgesia, they are associated with a frequent incidence of side effects. IV patient-controlled analgesia (PCA) morphine facilitates a greater degree of patient control, and thereby results in high patient satisfaction levels but the analgesia produced is often incomplete, and opioid-mediated side effects remain common.

TAP block is a technique that provides analgesia to the parietal peritoneum as well as the skin and muscle of the anterolateral abdominal wall by blocking neural afferents.[9]Epidural analgesia is a good alternative for postoperative pain relief. But the gravid uterus increases the chances of dural and vascular puncture, also making it difficult to identify the space. Furthermore, it may not be preferred in case of emergency caesarean section. Infiltration of local anaesthetic is also used to provide pain relief, but it is not effective for prolonged analgesia. Currently multimodal analgesia technique involving abdominal field block with parenteral analgesia are becoming popular.

FBonnettet al[10]hasdescribed many advantages of TAP block asit is simple and effective, appropriate for surgical procedure where parietal pain is significant, can be performed when neuraxial blocks are contraindicated as it provides an alternative analgesic solution. Potential drawbacks include, bilateral block is required, duration of block is limited, for some surgeries that induce both parietal and visceral pain, other techniques could be more appropriate and using the anatomical landmark method, inadvertent needle position can result in severe complication like bowel puncture, nerve injury, etc.

Different studies have used different drug, in different doses and also in the different concentration. Local anaesthetic such as 0.375% levobupivacaine, 0.375- 0.75% ropivacaine or 0.25- 0.5% bupivacaine have been used in the amounts 15-20 ml bilaterally.

A N Rafi et al[1]described the use of 20 ml of local anaesthetic agent for each side for analgesia.SParmar et al[11] used 15 ml (0.25%) of bupivacaine on each side in open cholecystectomy under general anaesthesia. They found TAP block reduced VAS pain score on emergence and at all postoperative times up to 12 hours.S Bhattacharjee et al[12] used 0.25% bupivacaine 0.5 ml/kg on each side in patients undergoing total abdominal hysterectomy under general anaesthesia. McDonnell JG et al[4] used Ropivacaine 0.75% with dose of 1.5 ml/kg (max. dose 150 mg per side) in TAP block after caesarean delivery under spinal anaesthesia adjuvant to patient-controlled morphine analgesia and regular diclofenac sodium and acetaminophen. P L Petersen et al[13] used ultrasound guided posterior bilateral TAP block with 20 ml of 0.5% Ropivacaine on each side after laparoscopic cholecystectomy under general anaesthesia adjuvant to oral acetaminophen, ibuprofen, and I.V.Morphine. R Kawahara et al[14] performed USG guided bilateral TAP block with 20 ml of 0.375% Ropivacaine with midaxillary approach after gynecological laparoscopic surgery under general anaesthesia adjuvant to patient-controlled analgesia(PCA) with tramadol. They concluded that postoperative pain, nausea and PCA consumption were significantly lower in patients with TAP block in early postoperativestage.

Above studies show that local anaesthetic agent, volume, concentration, and delivery method differ between studies, these regimens have not yet been compared against each other. TAP block requires large volume of local anaesthetics and to achieve pain relief without local anaesthetic toxicity, in our study we used Inj. Bupivacaine hydrochloride plain 0.25% as at this concentration sensory effects are seen predominantly, has a long duration of action and low tissue toxicity. The volume used in our study was 20 ml on each side.

SParmar et a1[11] in their study observed that TAP reduced VAS score for pain on emergence and at all postoperative time points up to 12 hours. The incidence of post-operative nausea and vomiting, and demand of rescue opioid in the first 12 postoperative hours were also reduced.This shows that TAP block provides better post operative analgesia, which is comparable with our study.P L Petersen et al[13] observed VAS score while coughing was significantly reduced in TAP group compared to placebo unto 12hours but VAS score at rest showed no significant difference between two groups. They concluded thatTAPblock after laparoscopic cholecystectomy may have some beneficial effect in reducing pain while coughing and on opioidrequirements.USrivastava et al[15]showed that at all-time intervals after 4-hour, VAS score at rest and at movement was significantly lower in TAP block.They alsoobserved that time of 1st analgesia was 12hr after TAP block within group B and 6.5 hr after no TAP block. Our results are similar to this study. In our study total consumption of Inj. Diclofenac sodium was 90$\pm$ 30.51 mg in group B whereas it was 252.5 $\pm$ 41.76mg in group C which is highly significant. Our results are in consonance with other studies.

We did not find any perioperative complication like bradycardia, hypotension, tachycardia, local anaesthetic toxicity,transient femoral palsy, accidental intra peritoneal and intra vascular injection or bowel perforation.

Limitations of our study:

First, the TAP block produces sensory analgesia of abdominal wall. Testing would have demonstrated successful block, but we avoided for fear of loss of blinding.Second, we employed the landmark technique for performing block. Ultrasound can improve the certainty and safety of block by confirming the position of needle.Third, although, we did not encounter block related complication in any patient,our sample size was not enough to assess the safety.

Conclusion

TAP block as a component of multimodal analgesia after caesarean section was effective in providing analgesia with delayed time for 1st rescue analgesia and reduction in total analgesic requirement in 1st 48 hr.

Conflict of interest: NIL

Source of funding: Self

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Original Research

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Determinants of COVID-19 Prevalence Rate in Asia: A study using Spatial Analysis

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Abstract

This study aims at finding out the important determinants of prevalence rate of COVID-19 in the Asian continent using spatial analysis. The impact of climatic, socioeconomic, demographic, and health status variables on the prevalence rate of COVID-19 is seen through various spatial models such as Spatial lag, Spatial error, Geographically Weighted regression model, and Multiscale Geographically Weighted regression model. The performance of the models is compared under different comparison criteria. It is found that among all, Multiscale Geographically Weighted regression model outperformed other competitive models. Findings also indicate that cardiovascular health, prevalence of smoking habit, human development index, and net migration rate played significant role in defining the prevalence rate of COVID-19 in Asia.

Keywords: Spatial analysis, COVID-19, global Moran's I, Multiscale Geographically Weighted regression.

Introduction

In March 2020, the World Health Organization classified the COVID-19 outbreak as a worldwide pandemic resulting from the SARS-COV-2 virus (an acute respiratory syndrome). Such pandemic outbreaks rapidly spread infectious diseases over large areas, thus, affecting more people in a short time. The novel coronavirus has contaminated millions of people and changed the lives of nearly every human being on the planet. COVID- 19 pandemic not just affected the health sector of the nations but also affected the social, economic, and political aspects worldwide.

Recent studies have identified several demographics, socioeconomic, and environmental factors that contribute to the spread of communicable dis- eases. Age, population density, poverty, average household income, temperature, air pollution, and smoking are some of the factors which regulated The intensity and speed of COVID-19 transmission and its impact pandemic.[1–5] Also, some analysts claimed that the most affected countries had a higher proportion of older people and poor medical facilities.[6,7] Recent studies on COVID-19 highlighted the importance of the native environment and also investigated the association between contaminated air and virus prevalence.[4] Moreover, some studies linked spatial patterns of COVID-19 channeling and mortality to levels of pollutants, as well as various weather conditions among different countries.[8] In addition,

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various aspects such as poverty, urbanization, and low per capita income had significant impact on the COVID-19 outspread. Another significant factor, enforced by the government, for the COVID-19 ending strategy was the delivery of vaccines. According to numerous research, immunization has a considerable influence on lowering COVID-19 channeling.[9]

Asia is the agglomeration of developed and developing countries and accounts for nearly half of the world's population. It is a rapidly growing economy in terms of nominal GDP and purchasing power parity (refer to www.imf.org). However, its high population, overcrowded residences, and poor health facilities provide ample opportunities to analyze the effect of various climatic, socioeconomic, health, and demographic factors in the spread of COVID-19. Spatial analysis is an effective tool for analyzing the geographic relationship between variety of geographic relationship between variety of factors and infectious disease outbreaks like COVID-19. [10,2]

Spatial distribution of the COVID-19 incident and fatality rate of COVID-19 in Iran, Bangladesh and some European countries have been studied. [3, 5, 11-13] They used various spatial models, such as spatial lag model (SLM), spatial error models (SEM), geographical weighted regression (GWR), and multiscale geographical weighted regression (MGWR), to identify regions exhibiting either a high or low concentration of COVID-19 cases in various countries. Studies found that median household income, literacy rate, and population density directly affect the disease incident rate.[5,12] Thus in this study, statistical spatial analysis has been applied that aids in identifying country-level variation between different possible factors that facilitate the COVID-19 outbreak in the Asian continent.

Methods

Data sources

The present study includes all Asian countries except Turkmenistan, North Korea, and Palestine of which updated COVID-19 data were not available. The 46 Asian countries that are included in this study. Among the 46 Asian countries mentioned, five of them (Georgia, Azerbaijan, Russia, Kazakhstan, and Turkey) are considered transcontinental, as they extend into both Europe and Asia.

In order to study the prevalence rate, data of country-level confirmed cases of COVID-19 in Asia is extracted from the site of the World Health Organization for the period of March 2020 to August 2022. The whole duration considered in this study is divided into three intervals (March 2020 to December 2020, March 2020 to October 2021, March 2020 to August 2022) which are roughly covering the first, second, and third waves cumulatively (see figure 1).[5]

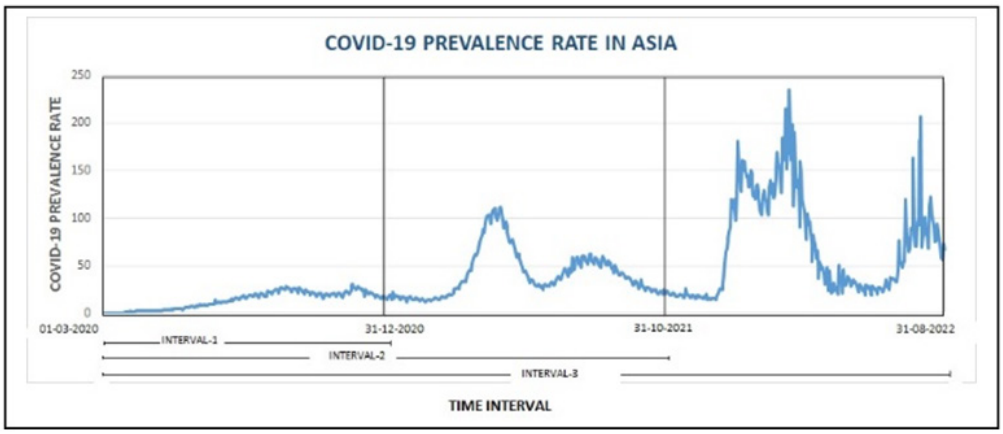

Figure 1: COVID-19 prevalence rate in Asian countries from March 2020 to August 2022

Eighteen different socioeconomic, environmental, health, and demographic variables have been selected in this study based on the previous studies and availability of data. Table 1 describes these variables, and data collected for these variables are from Our World in Data repository (https://ourworldindata.org). These variables help to evaluate a country's ability to determine and retaliate to such crisis.

Table 1: List of explanatory variables, and their description

S.No	Indicators	Abbreviation	Description
1	CO_2 emission per capita	CO_2	CO_2 emission (metric tons per capita)
2	Healthcare expenditure	HE	Total healthcare spending expressed as a percentage of national gross domestic product (GDP).
3	Hospital beds per thousands	HB	Total number of hospitals beds for one thousand population.
4	Basic Hand washing facilities	BHWF	Proportions of populations of having basic hand washing facilities.
5	Basic Drinking water	BD	Proportions of populations of having basic drinking water facilities.
6	Basic Sanitation facilities	BSF	Proportions of populations of having basic drinking water
7	Dependency Ratio	DR	Proportion of dependents (young and elderly) to working-age population (15-64 years).
8	Net migration rate	NMR	(Immigrants - Emigrants) / Population person-years lived.
9	Prevalence of smoking	PS	The share of men and women aged 15 and older who smoke.
10	Extreme poverty	EP	Share of population in extreme poverty (as state by the World Bank, living on less than 1.90 int.-$).
11	Share of urban population	SUP	Percentage of the total population living in urban areas
12	Prevalence of undernourishment	PU	Percentage of population lacking adequate calories for minimum energy requirements.
13	Vaccination rate	VR	Share of population with at least one dose of vaccination
14	Population density	PD	The number of people per km2 of land area.
15	GDP per capita	GDP	Gross domestic product per capita for any country
16	Cardiovascular health	CVH	Annual cardiovascular disease deaths per million population.
17	Diabetes prevalence	DP	Proportion of adults aged 20-79 with type 1 or type 2 diabetes.
18	Human Development Index	HDI	HDI is a summary measure of human development, combining living standards, education, and health.

Spatial Data Analysis

Global Moran's I statistic captured the overall spatial dependence among COVID-19 prevalence rates in Asia. Further, the local indicators of spatial dependence (LISA) tool were applied to obtain the local indicators of spatial association (LISA). After standardizing (normalizing) all variables in this study, the forward stepwise regression approach was used to select a group of variables by removing nonsignificant variables. Subsequently, Pearson's correlation analysis was employed to examine the associations among the chosen variables. Following the identification of multicollinearity using the variance inflation factor (VIF), independent variables were selected for the models. Then spatial models were applied to capture the spatial dependence using the chosen variables. SLM and SEM were fitted using GeoDa 1.14, and MGWR 2.2 was used to obtain GWR and MGWR. The weight matrix was generated using the inverse distance (the impact of one feature on another feature decreases with distance) which calculated using the centroid latitude and longitude locations. To assess the effectiveness of

different models in explaining COVID-19 incidence rates across Asia, R2 and AIC metrics were utilized for performance comparison. R-square measures the goodness of fit; its values range from 0 to 1. Furthermore, AIC is a model performance measure that can compare predictive models while accounting for model complexity. The model with lower AIC value and higher value of R^2 better fits the observed data.

Spatial autocorrelation

Spatial autocorrelation refers to the correlation between the observation of variable at specific location and its corresponding observation at a neighboring location within the same geographic region. The examination of spatial autocorrelation can be conducted on two levels: global and local. Global Moran's I measure spatial autocorrelation and ranges from–1 to 1. Negative values indicate clustered dissimilar value, positive indicate clustered similar values, and values close to zero indicate no spatial pattern or randomness.

Nonetheless, the ability of the Moran's I statistic to detect structural instability within the dataset is limited. Hence, the LISA tool was employed to compute the local spatial autocorrelation instead. It helps to detect spatial non-stationarity or locations of outliers. It describes significant correlations at specific locations as local spatial clusters (hotspots) or correlations between observations and neighboring observations.[14]

The SLM model

The SLM effectively estimates the influence of independent variables on the dependent variable, incorporating spatial dependency between the dependent variable. The SLM model with n number of observations, and m number of independent variables presented in equation 1.

$$y = \rho Wy + X\beta + \in \quad ...(1)$$

where y as the n × 1 vector of dependent variable, X as the $n \times m$ matrix of independent variables, β as the vector of regression coefficients, the spatial autocorrelation coefficient of y represented by ρW as spatial weight matrix and ∈ is random error.

The SEM model

The SEM is an expanded version of the traditional regression model that includes spatial dependence within the disturbance term. Equation 2 presented SEM model with μ vector of spatially dependent disturbance terms, and λ its spatial autocorrelation coefficient.

$$y = X\beta + \mu, \mu = \lambda W \mu + \in \quad ...(2)$$

The GWR model

SLM and SEM models assume spatial stationarity (association between dependent and independent variables do not vary over space). In contrast, the geographically weighted regression model estimates local interactions (estimating the value of regression parameters by fitting a regression model to each feature in the dataset) among the dependent and independent variables.

The GWR model is presented by equation 3 given below

$$y = \sum_{j=1}^{m} X_{ij}\beta_{ij} + \epsilon_i, i = 1,2,\dots,n. \quad ...(3)$$

Parameters estimates for each independent variable at i^{th} location is given by equation 4.

$$\hat{\beta}(i) = (X'W(i)X)^{-1}X'W(i)y \quad ...(4)$$

Where $\hat{\beta}(i)$ is m ×1 vector of parameter estimates, W(i) is spatial weight matrix calculated by the Gaussian kernel function and the bandwidth which is based on Euclidean distance.

The MGWR model

The MGWR model is an extension of GWR that study the relationships of independent and dependent variables at different spatial scales by using the varying bandwidth (used to define the neighborhood around each feature) rather than a single, constant bandwidth for the entire study area. [14]

MGWR model presented in equation 5 with β_{bwj} as the bandwidth used for calibration of the j^{th} relationship.

$$y_i = \sum_{j=0}^{m} X_{ij}\beta_{bwj} + \epsilon_i, \quad i = 1,2,\dots,n \qquad \dots(5)$$

Results

Quantitative spatial distribution and autocorrelation of COVID-19 prevalence rate in Asian countries

Spatial COVID-19 prevalence in Asian countries (Intervals 1, 2, 3 - Figures 2a, 2b, 2c): Western Asia consistently had the highest prevalence. Mongolia and South Korea were highly affected in intervals 2 and 3. East Asia showed low prevalence initially, but with variability. China had low rates, while Mongolia had very high rates. Russian Federation suffered greatly. Southeast Asia generally had medium rates, except India and Nepal with high rates in interval 1, improving later.

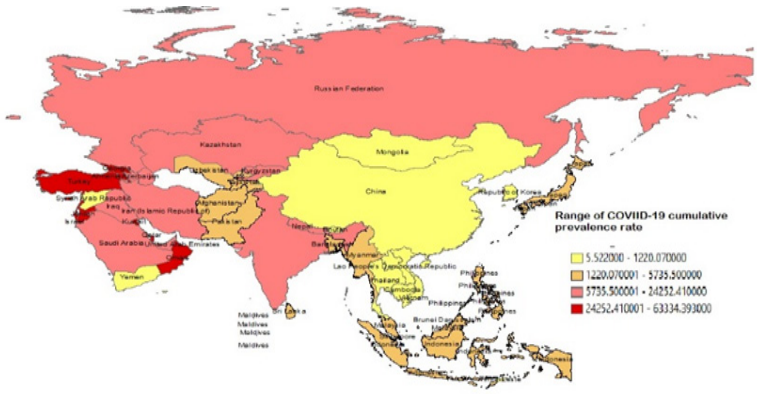

Figure (a): Quantitative spatial distribution (March 2020 to December 2021)

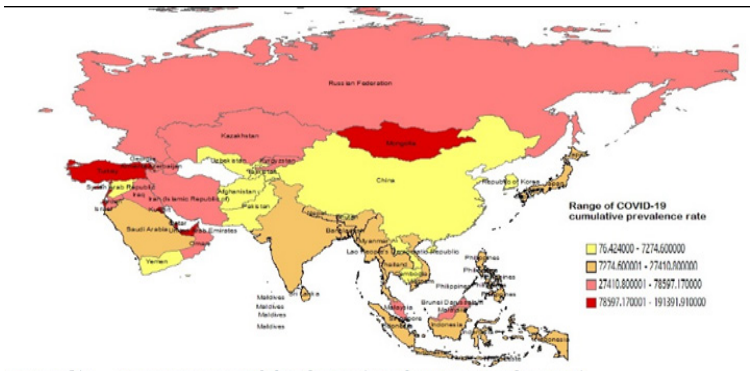

Figure (b): Quantitative spatial distribution (March 2020 to October 2021)

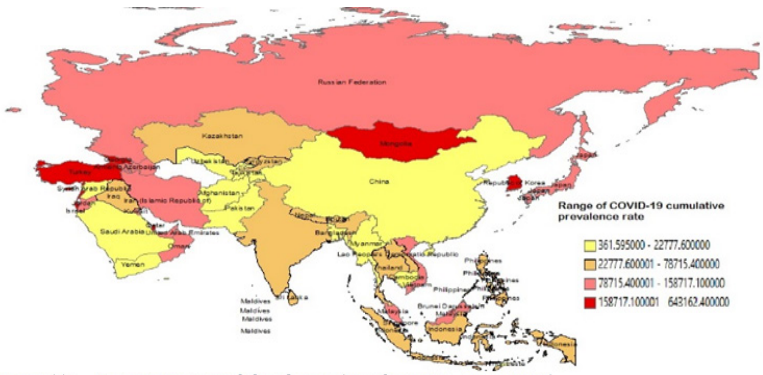

Figure (c): Quantitative spatial distribution (March 2020 to August 2022)

Figure 2: Quantitative spatial distribution of COVID-19 prevalence rate in Asia

Figure- 3a, 3c, 3e show the estimates of Moran's I statistic between the prevalence rate of COVID-19 and their lagged value. The value of Moran's I were 0.417, 0.196 and 0.099 suggesting marginal but significant (p – value < 0.05 spatial dependency in prevalence rate in Asia in interval-1,2,3, respectively. The positive values of the Global Moran's I indicate that the prevalence of COVID-19 in one Asian country may have been spatially associated with that of neighboring countries, particularly in the first wave.

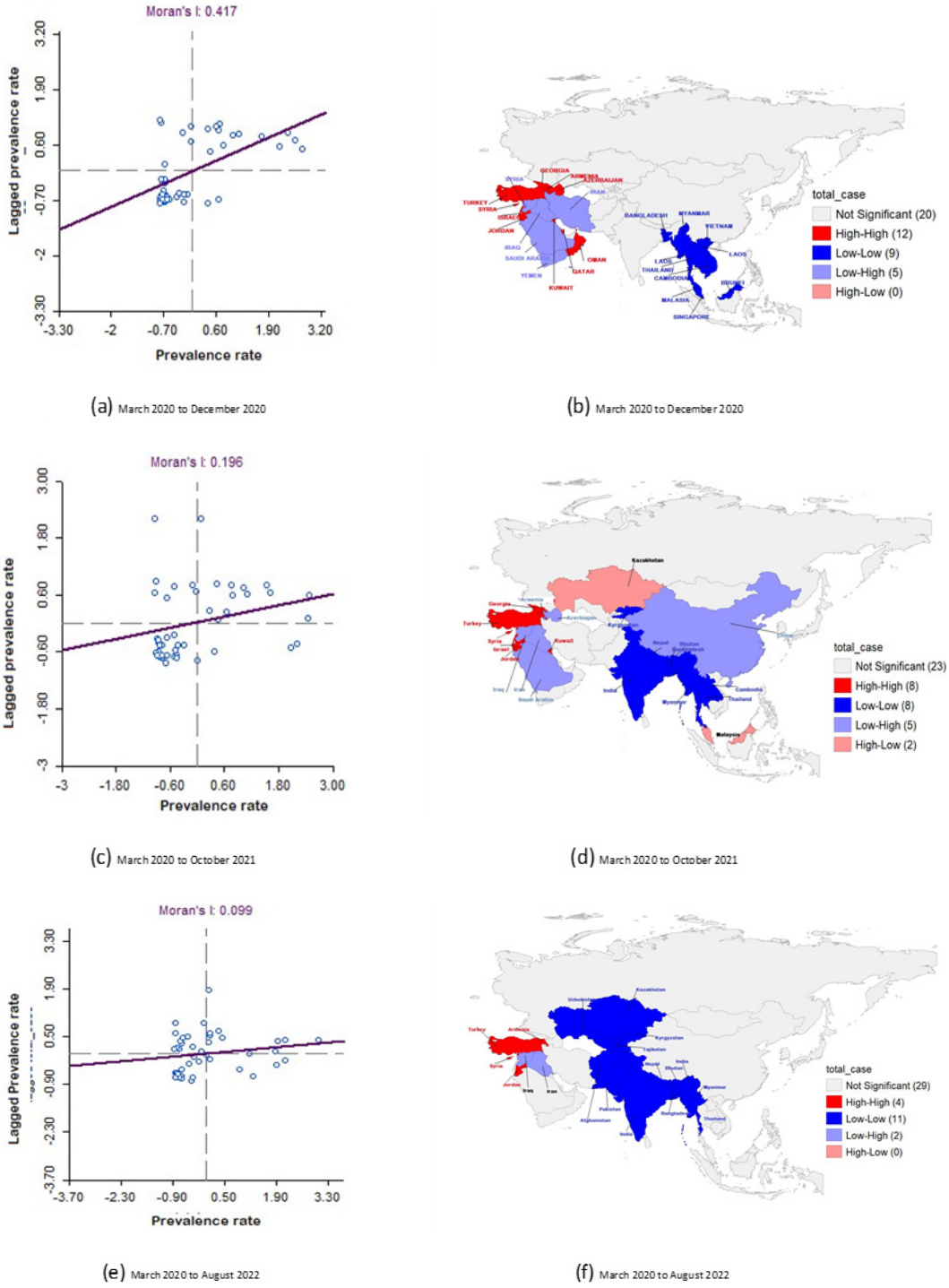

Figure 3: Plot for Global Moran's I statistics and LISA cluster maps for COVID-19 prevalence rates in Asia

The LISA tool was used to calculate the local spatial autocorrelation. LISA clusters map shown in Figure- 3b, 3d, 3f exhibit the High-High, Low-Low, High-Low, and Low-High clusters of the prevalence rate of COVID-19. In Figure 3b, 3d, and 3f, the LISA cluster maps reveal interesting patterns. Iran and Iraq consistently exhibit low COVID-19 prevalence rates throughout the entire duration, while their neighboring countries experience higher rates. During the second wave, Kazakhstan and Malaysia have high prevalence rates, contrasting with their neighboring countries showing low rates. Southeast Asian countries consistently fall into low prevalence rate clusters across the three waves of the pandemic. The LISA cluster maps also indicate a significant number of countries with insignificant spatial clustering, explaining the relatively small values of Global Moran's I. Specifically, during the second and third intervals, 23 and 29 out of 46 countries respectively formed insignificant spatial clusters.

Spatial models summary

Following the standardization (normalization) of all variables in this study, a group of independent variables was chosen by removing non-significant variables using the forward stepwise regression approach. Pearson's correlation analysis investigated the relationships between the selected variables and detecting multi-collinearity with the variance inflation factor (VIF < 7.5).

Spatial models (SLM, SEM, GWR, MGWR) were applied to COVID-19 prevalence rates in Asian countries for all intervals. A significant positive global Moran's I value was observed. The MGWR model demonstrated superior performance, exhibiting low AIC and high R-squared values across all intervals, surpassing other spatial models (refer to Table 2). Tables 3 provide a comprehensive summary of the MGWR model's results for all intervals.

Table 2: Comparison of results of spatial models

Time interval	Model comparison	SLM	SEM	GWR	MGWR
Intrval-1	R^2	0.61	0.59	0.62	0.67
	AIC	111.11	107.17	109.52	102.75
Intrval-2	R^2	0.64	80.64.	0.70	0.84
	AIC	99.85	101.56	98.06	76.80
Intrval-3	R^2	0.56	0.61	0.66	0.71
	AIC	111.5	106.04	105.50	99.74

Results demonstrate that the HDI, a measure of critical aspects of human development, is significantly related to the prevalence rate of COVID-19 in Asian countries. This study consider unit increase in HDI is associated with 0.49% to 0.70% increase in the COVID-19 prevalence rate in all intervals. Despite having a long-life expectancy, a good education, and a good standard of living, Asian countries such as Georgia and Jordan (HDI -0.81 and 0.73) have struggled to deal with the COVID-19 pandemic. Results demonstrate that the Human Development Index (HDI), a measure of critical aspects of human development, is significantly related to the prevalence rate of COVID-19 in Asian countries. Affect of COVID-19 in Asian countries. This study consider unit increase in HDI is associated with 0.49% to 0.70% increase in the COVID-19 prevalence rate in all intervals. Despite having a long-life expectancy, a good education, and a good standard of living, Asian countries such as Georgia and Jordan (HDI -0.81 and 0.73) have struggled to deal with the COVID-19 pandemic. The prevalence of COVID-19 is positively related to smoking prevalence (as the coefficient estimates are 0.233, 0.270 and 0.214 for interval-1, 2, and 3, respectively).

Table 3: Multiscale geographically weighted regression model summary for all selected significant variables.

Interval-1			Interval-2			Interval-3		
Variables	**Coefficient**	**SE**	**Variables**	**Coefficient**	**SE**	**Variables**	**Coefficient**	**SE**
Constant	0.008	0.246	Constant	0.185	0.156	Constant	0.045	0.012
CO_2	0.307	0.015	CO_2	0.185	0.156	CO_2	0.19	0.234
BHWF	0.176	0.077	PD	0.377	1.01	BHWF	0.420	0.063
PS	0.233	0.001	PS	0.270	0.001	PS	0.214	0.147
HCE	0.348	0.001	HCE	0.215	0.00	EP	0.449	0.001
CVH	0.059	0.00	GDP	-0.597	0.00	CVH	-0.339	0.003
HDI	0.426	0.001	HDI	0.749	0.00	HDI	0.741	0.032
NMR	0.163	0.057	NMR	0.358	0.433	NMR	0.170	0.053
HB	-0.400	0.00	HB	-0.451	0.00	BSF	-0.415	0.002

This result supports the World Health Organization's statement that smoking, tobacco, or alcohol exposure can increase the risk of infection from COVID-19. Net migration is another important factor across all time intervals, as an 1% increase in any country's migration rate makes it 0.16 to 0.35% more vulnerable to COVID-19. This study also discovers that the level of pollutants CO_2 emission) in Asian countries has a positive significance on COVID-19 prevalence in all intervals. Moreover, the total number of hospital beds per thousand people is inversely related to COVID-19 prevalence. A significant number of hospital beds reduces an area's resilience and aids in combating the effects of COVID-19. An epidemic or pandemic management depends on easy and affordable access to well-capable healthcare systems and health security. Population density and GDP per capita was found to be significantly impacting prevalence rate in the second interval which covers the first and second wave of COVID-19 in Asia. Although the vaccination rate is a crucial factor in eliminating the mortality of COVID-19 in the third wave, it became an insignificant factor in this study because it was based on cumulative confirmed cases of all three waves and did not consider the mortality rate before and after the allocation of vaccination.

Discussion and Conclusion

This research applied statistical spatial analysis to observe the effect of various climatic, socioeconomic, health, and demographic factors in the spread pandemic's outbreak and may help identify highly vulnerable areas. Global Moran's I value was small but significant. Moreover, LISA clusters also appeared to be significant in 50% of the Asian countries considered in the study, which justified the use of spatial models. In this study, spatial models (i.e., SLM, SEM, GWR, and MGWR) were fitted, MGWR model outperformed all spatial models in the analysis of COVID-19 prevalence in Asian countries, with a low AIC and a high coefficient of determination in all intervals. The spatial models illustrate that the prevalence of smoking, the level of pollutants, HDI, and the migration rate is positively associated with the COVID19 prevalence rate in Asian countries in all intervals. Furthermore, the availability of hospital beds per thousand people is inversely related to COVID-19 prevalence. Expectedly, population density and GDP per capita were found to be significantly impacting the prevalence rate of COVID-19 in Asian countries. We can conclude from this analysis that spatial models are beneficial for monitoring COVID-19 prevalence and its influencing factors. The MGWR model explained significant variations in COVID-19 prevalence rates across Asia. It offered insights to policymakers and communities, aiding the development of effective strategies to prevent disease outbreaks. The spatial models used in this study helped identify transmission hotspots, enabling informed decision-making and targeted prevention measures. While the study focused on national-level data, analyzing regional groupings could have provided further valuable insights if data limitations were not present.

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Original Article

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A Comparative Analysis of the Serum Paraoxonase (PON1) Activity and the Concentration of Parameters of Lipid Profile after 3 Months of Statin Therapy

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Abstract

Background: Human serum paraoxonase (PON1) residing on HDL can prevent the oxidation of low density lipoprotein (LDL), the initiating factor in atherosclerosis. Statins are commonly used to treat dyslipidemia, aknown risk factor for coronary artery disease (CAD).The aim of the studyis to evaluate the alterations in the concentrationof PON1 along with that of other parameters of lipid profile in patients of CAD before and after 3 months of statin therapy.

Materials and Methods: The study included 30 new patients who were put on statin therapy following the diagnosis of acute coronary syndrome. The activity of PON1 (units-IU/L) and the concentration of lipid profile parameters (units-mg/dl) were estimated before starting statin therapy and again after three months. Patients with co-morbidities like diabetes, kidney disease, liver disease and other cardiac diseases of infectious aetiology were excluded.

Results and Analysis: As expected, both PON1 and HDL have increased after 3 months. There was a statistically significant increase in both PON1 ($p<0.05$)and HDL ($p<0.001$) and a decrease ($p <0.05$, also statistically significant) in LDL after 3 months of statin therapy.

Conclusion: This knowledge may be exploited in the follow up CAD patients. The increase in PONI and the similar increase in HDL after 3 months of statin therapy may be exploited in the follow-up of cardiac patients.

Keywords- Paraoxonase I, High density lipoprotein, statin therapy, cardiac patients, follow-up.

Introduction

Human serum paraoxonase (PON1) produced by the liver and almost exclusively residing on high density lipoproteins (HDL) has been demonstrated to prevent the oxidation of low density lipoprotein(LDL), which is the central initiating factor in the causation of atherosclerosis.[1,2] In fact, PON1is responsible

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for the antiatherogenic property of HDL and has been also been shown to prevent accumulation of lipid peroxides on LDL in vivo and in vitro.[3] Thus, PON1 alongwith HDL plays an important role in the pathophysiology of atherosclerosis and consequently coronary artery disease. Several studies have demonstrated a higher risk of cardiovascular mortality in patients with lower levels of PON1. [4] Dyslipidemia (high TG, high TC, and low HDL) is a known risk factor for coronary artery disease(CAD) and predisposes to the microvascular and macrovascular complications of CAD. Several studies have tried to correlate the activity of PON1 with HDL and other atherogenic indices.

Statins have been the cornerstone of management of dyslipidemia to prevent cardiovascular complications for quite some time now. Studies have shown the concentration of LDL decreased and that of HDL increased following administration of statins. Thus statins are known to have a favourable effect on the lipid profile.Thus,PON1 may be used to monitor the trends in dyslipidemia and cardiovascular complications during the management and follow up of these patients.[5.6.7] In this study, we have tried to evaluate to changes in the PON1 concentration along with the concentrationsof HDL and LDL in patients of CAD before and after 3 months of statin therapy in patients of CHD.

Aims and Objectives

The aim of the study is to evaluate the alterations in the activity of PON1 and the other parameters of the lipid profile, namely the HDL and LDL before and after three months of statin therapy in patients of CAD. The purpose is to explore whether PON1 can be used as a comparable marker for assessment of the atherosclerotic risk in individuals with that of LDL and HDL in the follow up of patients of CAD.

Materials and methods

The study was performed in the Biochemistry department in the College of Medicine and Sagore Dutta Hospital in association with the Cardiology department of R.G.Kar Medical College.30new patients who were put on statin therapy following acute coronary syndrome in the cardiology outdoor at the R.G.Kar Medical College were included in the study after taking proper informed consent from them. Patients with co-morbidities like diabetes, chronic kidney disease, chronic liver disease and other cardiac diseases of infectious etiology were excluded from the study. Before starting statin therapy, fasting venous blood samples were drawn from the selected patients in clot vials and analysed for PON1 and the parameters of lipid profile in the clinical laboratory in the Department of Biochemistry at College of Medicine and Sagore Dutta Hospital.

The activity of serum PON 1 was measured by a manual method using a spectrophotometer T60 in the research lab of the Department of Biochemistry. Blood samples (4ml) were drawn from the subjects prior to starting the statin therapy. The blood was allowed to clot, centrifuged and the serum was separated and analysed in the same day.Since calcium ions are required for the stability and activity of the enzyme, and the enzyme is inhibited by EDTA, the blood samples were drawn in plain clot vials,not in EDTA vials.[4]Sodium citrate cannot be used as an anticoagulant as it also chelates the calcium.[5] The activity of PON1 was evaluated by the help of its arylesterase activity when paranitrophenylacetate was used as a substrate.5.5mM of 4-nitrophenylacetate was used as a substrate in 20mM Tris –HCl buffer at a pH of 8.0.The increase in absorbance due to the formation of the yellow coloured 4-nitrophenol was measured by the spectrophotometer at 412 nm for 3mins.PON1 was taken as 1 U/L when the rate of formation of the 4-nitrophenol(substrate)was 1 micro mol /min under the given assay conditions.

After three months of the statin therapy, blood samples were again drawn from the subjects and once again analysed for PON1 and LDL and HDL in a similar manner.

To the best of the author's knowledge, there exists no available control serum for PON1 analysis. Frozen aliquots of pooled samples were used as controls. A single aliquot was analysed ten times to obtain the CV %.A retained aliquot was run on the next day to test the adequacy of the storage conditions. The serum samples were stored at -80 °C for further reference.

Results and Analysis

The data thus generated was tabulated in Excel sheets. The mean, median and standard deviation

of the PON1,LDL and HDL, both before and after starting statin therapy, were calculated and the distribution determined.

Table 1 showing the descriptive statistics of PON1, HDL and LDL.

	PON1(IU/L)		HDL(mg/dl)		LDL(mg/dl)	
	Before therapy	**After therapy**	**Before therapy**	**After therapy**	**Before therapy**	**After therapy**
Mean	36.69	50.358	39.36	44.7	85.4	72.3
Median	29.39	40.655	35.25	43.5	80.3	68
Standard deviation	31.76	38.36	4.91	4.30	17.79	14.5
P --value	<0.05		<0.001		<0.05	
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal

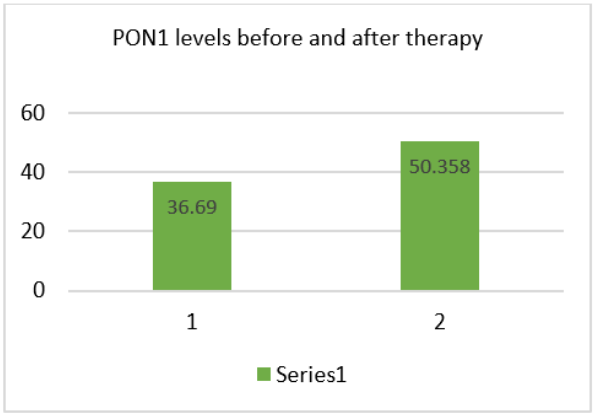

Figure 1: To show the levels of Paraoxonase I before and after 3 months of statin therapy.

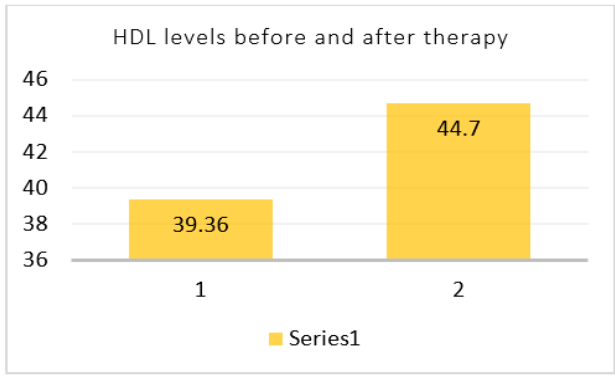

Figure 2: To show the levels of HDL before and after 3 months of statin therapy.

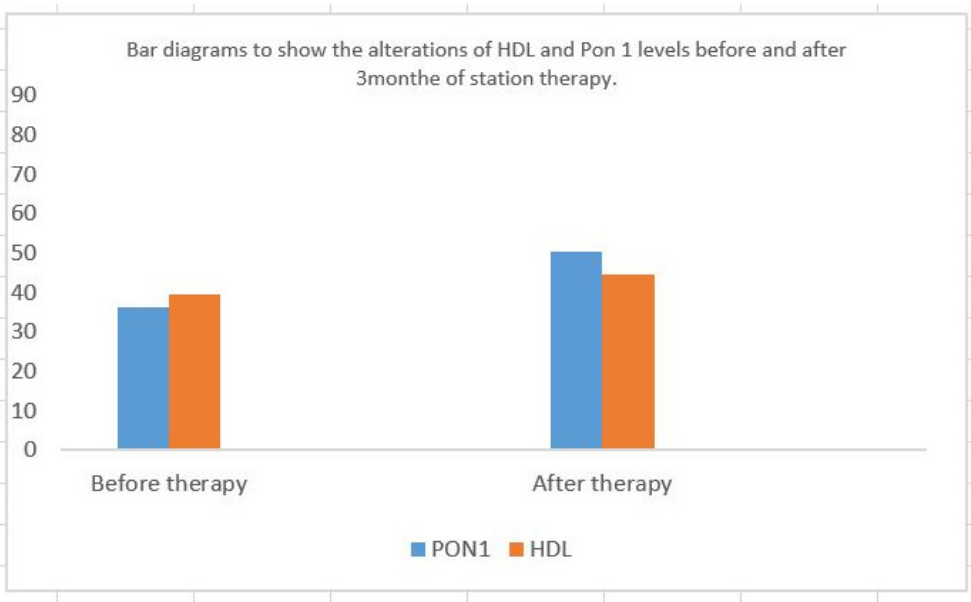

Figure 3: To compare the alterations of HDL and PON1 levels before and after 3 months of statin therapy.

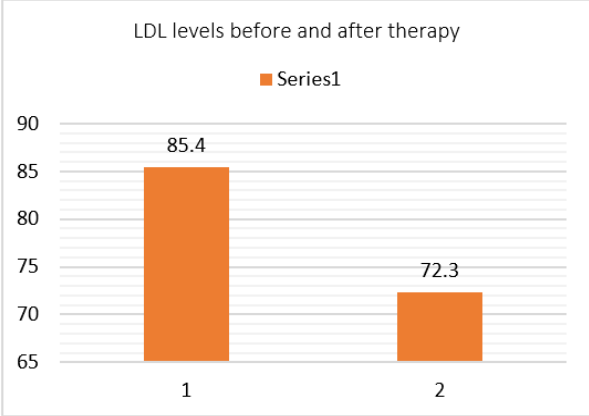

Figure 4: To show the alterations in the levels of LDL before and after 3 months of statin therapy.

Discussion

A quick glance through the above tables and figures throws up some interesting results.The mean value ofPON1 before statin therapy was 36.69 IU/l and after 3 months of statin therapy was found to be 50.35IU/L , an increases which is statistically significant (P<0.05) . On the other hand , the mean values of HDL increased from 35.25mg/dl in statin naïve patients to 44.7 mg/dl in those receiving statins for 3 months .This increase in HDL was also found to be statistically significant. (P<0.001). The mean value of LDL, which is the major incriminating factor for CAD decreased from 85.4 to 72.3 after 3 months of administration of statins. This decrease was also statistically significant (P<0.05).

PON1,nowclassifiedasanaryldialkylphosphatase (EC 3.1.8.1) by the Enzyme Commission of the International Union of Biochemistry and Molecular Biology is a Ca2+-dependent lactonase associated mostly with the small dense HDL3 subfraction.[8-10].A glycoprotein of approximately 354 amino acids, PON1 retains its hydrophobic signal sequence at the amino terminal (barring the methionine) to help it in its attachment with HDL.Of the three members of the paraoxonase (PON) multigene family, PON1 and PON2 are limited to HDL in their distribution , but PON3 is also found in other cells. But, all the three members, PON1,PON2 and PON3 are bestowed with the ability to prevent oxidation of LDL, so they all possess anti-atherogenic property.[11-14].

The antiatherosclerotic mechanisms of PON1 has been explained in several ways. PON1 was the first enzyme shown to prevent /retard LDL oxidation in vitro by Mackness.[15]The enzyme was shown to reduce both the oxidative stress of macrophages as well as their ability to oxidise LDL. The underlying mechanism is the hydrolysis of truncated fatty acids fromphospholipid, cholesteryl ester, and triglycerides whichactually produce substrates which can be naturally degraded by PON1.[16,17]The LCAT enzyme associated with HDL which is mainly responsible for the reverse cholesterol transport, is susceptible to oxidative stress.PON1 has been shown to prevent this oxidative inactivation of LCAT thus prolonging the duration for which that HDL can prevent LDL oxidation.[18]Other mechanisms include prevention of LDL glycation[18], normalization of endothelial function[20] and disposal of the apoptotic toxic products.[21,22] In fact, low PON1 concentrations were associated with major cardiovascular events (MACE; i.e., death, MI, stroke) in both primary and secondary prevention cohorts.[23,24]

It follows from the above discussion that PON1 activity is atheroprotective. Our subjects, when enrolled into our study presented with symptoms of CAD had low levels of PON1 alongwith dyslipidemia (i.e HDL was low and LDL quite high). These patients were prescribed statins and the serum PON1 and HDL and LDL were again estimated after 3 months of statin therapy. The results as presented above show that there was a statistically significant increase in HDL concentrations and a statistically significant decrease in LDL after 3 months. The alterations in lipid profile are predictable and supported by other studies. But, the serum PON 1 concentration also showed a statistically significant increase after three months paralleling the increase in HDL. This encouraging trend in PON1 may be explored as to its utility in being used as a marker in the follow up of patients of CAD. But our study was limited by a small sample size (only 40 samples—this being a pilot study.). The fact that there is a lacuna in our knowledge regarding the regulatory pathways of PON1 in vivo is also a major deterrent to the exploration of our hypothesis.

Limitations

There were a few limitations in our study. First and foremost, the sample size was very small, but this was intentionally maintained since the method

of estimation of PON1 was entirely manual and resources were poor. Secondly, to the best of author's knowledge no reference range of PON1 was available .This makes it very difficult to objectively compare the results across similar studies. It is therefore suggested that larger population studies be planned to determine the reference range of PON1.

Conclusion

It may be concluded from the above study that the activity of PON1 may be used to indicate the changes in the lipid profile in the follow up of patients of CAD being treated with statins. It is however necessary to conduct larger, well designed studies to explore whether it may be used as a marker better than HDL in the follow up of these patients and whether it is practically feasible in clinical practice.

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Original Article

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A Cross Sectional Study on the Prevalence Risk Factors and Clinical Presention of Laryngopharyngeal Reflux Disease at a Tertiary Care Hospital

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Abstract

Background: Laryngopharyngeal reflux disease is an extraesophageal variant of gastro-esophageal reflux disease. It is a disease with high prevalence which is usually under reported or misdiagnosed due to lack of definite diagnosis. It can affect the quality of life of the patients. Hence, it is important to identify the risk factors associated with the disease.

Methods: This was a hospital based cross sectional study conducted in a tertiary care hospital of Kerala for a period of one year. All patients with more than 18 years of age presented with throat and voice symptoms for more than six weeks were included in our study. A questionnaire based on Reflux Symptom Index (RSI) put forward by Belafsky were distributed to the patients and the responses were collected. Out of patients who responded, those who had an RSI score > 13 were diagnosed to be suffering from LPRD. Additional questions were included in the questionnaire to assess the risk factors. All patients having RSI >13 underwent flexible endoscopic examination to establish Reflux Finding Score (RFS) put forward by Belafsky et al. Patients having a score of 7or higher were classified as having LPRD.

Conclusion: In our study we found the prevalence of laryngopharyngeal reflux to be 20.89%.The most common symptoms among the LPRD positive patients in our studygroup were sensation of lump in throat and heart burn, chest pain, indigestion or stomach acid coming up.

Keywords: Laryngopharyngeal reflux, prevalence, risk factors

Introduction

Laryngopharyngeal reflux disease (LPRD) was first observed by von Leden and Moore in 1960 and was largely accepted in otolaryngology practice with Koufman's landmark thesis on the subject in 1991[1,2]. Laryngopharyngeal reflux is the retrograde flow of gastric contents into the pharynx and larynx where it comes in contact with the tissues there and cause symptoms[2].The prevalence of LPRD ranges from 5 to 30% worldwide. The incidence of patients presenting with reflux symptoms in otolaryngology clinics has been estimated to be 4 to 10%[3]. The other terminologies for LPRD includes extra esophageal

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reflux, chronic laryngitis and supra esophageal complication of gastro-esophageal reflux. The common symptoms of LPRD include hoarseness, globus sensation, frequent throat clearing, chronic cough, vocal fatigue, excessive throat mucous etc. Laryngopharyngeal reflux is a multi-factorial disease with a varying clinical presentation. Because of the high prevalence of laryngopharyngeal reflux and the potential complications associated with it, we should be familiar with the various perspectives of this disorder. We conducted this study in order to find laryngopharyngeal reflux disease prevalence in our area and the different habits of the people that are associated with increased risk of developing the condition.

Materials and Methods

This was a hospital based cross sectional study conducted for a period of one year from December 2021 to November 2022in a tertiary care medical college hospital in Kerala. All patients with more than 18 years of age presented with throat and voice symptoms for more than six weeks were included in our study. An informed written consent was taken from all the patients before they were included in the study. A questionnaire based on Reflux Symptom Index (RSI) put forward by Belafsky[4] were distributed to the patients and the responses were collected. Out of patients who responded, those who had RSI score > 13 were diagnosed to be suffering from LPRD. Additional questions were included in the questionnaire to assess the risk factors. All patients having RSI >13 underwent flexible endoscopic examination to establish Reflux Finding Score (RFS) put forward by Belafsky et al[5].RFS is an eight-item severity rating score based on endoscopic findings. Patients having a score of 7or higher were classified as having LPRD. Patients with other laryngeal pathologies and malignancies were excluded from our study. For analysis all patients who were found positive for LPRD were included in group 1 and others were included in group 2.

Questionnaire

Table 1: Questionnaire

SL No	QUESTIONNAIRE	RESPONSE
1.	Name	
2.	Age	
3.	Habit of smoking /alcoholism	YES/NO
4.	Consumption of spicy/fatty food	YES/NO
5.	Habit of drinking carbonated drinks	YES/NO
6.	Lying down in less than 2 hours after a meal	YES/NO
7.	Habit of regular exercising	YES/NO

PATIENT SYMPTOMS

Table 2: Reflux Symptom Index(Reflux Symptom Index (RSI) put forward by Belafsky[4])

REFLUX SYMPTOM INDEX (0:NoIssue, 5:Severe Issue)	0	1	2	3	4	5
HOARSENESS OR PROBLEM WITH YOUR VOICE	0	1	2	3	4	5
CLEARING YOUR THROAT	0	1	2	3	4	5
EXCESS THROAT MUCOUS OR POSTNASAL DRIP	0	1	2	3	4	5
DIFFICULTY SWALLOWING FOOD, LIQUID OR PILLS	0	1	2	3	4	5
COUGHING AFTER YOU ATE OR AFTER LYING DOWN	0	1	2	3	4	5
BREATHING DIFFICULTIES OR CHOKING EPISODES	0	1	2	3	4	5
TROUBLESOME OR ANNOYING COUGH	0	1	2	3	4	5
SENSATIONS OF SOMETHING STICKING IN YOUR THROAT OR LUMP IN THE THROAT	0	1	2	3	4	5
HEARTBURN, CHESTPAIN, INDIGESTION OR STOMACH ACID COMING UP	0	1	2	3	4	5
TOTAL						

ENDOSCOPIC FINDINGS

Table 3: Reflux Finding Score (RFS)(Reflux Finding Score (RFS) put forward by Belafsky et al[5])

REFLUX FINDING SCORE(RFS)				
SUBGLOTTIC EDEMA	0 - Absent / 2 – Present			
VENTRICULAR OBLITERATION	Partial - 2		Complete - 4	
ERYTHEMA/ HYPEREMIA	Arytenoids only - 2		Diffuse – 4	
VOCAL FOLD EDEMA	Mild - 1	Moderate - 2	Severe - 3	Polypoid – 4
DIFFUSE LARYNGEAL EDEMA	Mild - 1	Moderate - 2	Severe - 3	Obstructive - 4
POSTERIOR COMMISSURE HYPERTROPHY	Mild - 1	Moderate - 2	Severe - 3	Obstructive - 4
GRANULOMA/ GRANULATION TISSUE	0 - Absent / 2 – Present			
THICK ENDOLARYNGEAL MUCOUS	0 - Absent / 2 – Present			

Results

The questionnaire was distributed, and data was collected from 201 patients. Out of the 201 patients 129 were females and 72 were males. The patients were distributed across all ages. The youngest age in the LPRD positive group was 24 years and the oldest was 61 years. Out of the 201 patients 42 patients had RSI score more than 13 and were considered as suffering from LPRD. 159 patients have RSI < 13 and were considered as not having LPRD. The prevalence of laryngopharyngeal reflux disease in the study group was found to be 20.89%. Out of the total positive patients of LPRD 73.8% (31) were females and (26.2%) 11 were males. The prevalence of LPRD in females was 24.03 and in males it was15.27. In our study group 38 % (16) of patients with LPRD had the habit of smoking /alcoholism. 82% (32) of patients with LPRD in our study group had the habit of consuming spicy or fatty food. 66% (28) of patients with LPRD in our study population had the habit of lying down in less than 2 hours after a meal. In our study out of the 42 patients with laryngopharyngeal reflux disease 29 patients (70%) were consuming carbonated drinks frequently. In our study 27 patients with LPRD did not have any regular exercise.

TABLE SHOWING ASSOCIATION OF RISK FACTORS WITH LPRD

Table 4: Association of risk factors with LPRD

Variables	Categories	Group 1(n=42)	Group 2(n=159)	P value
Smoking /Alcoholism	Yes	16(38.1)%	22(13.8%)	0.001
	No	26(61.9%)	137(86.2%)	
Spicy /Fatty food	Yes	32(82.1%)	7(17.9%)	0.001
	No	9(5.6%)	152(94.4%)	
Lying <2hr after meal	Yes	28(66.7%)	14(33.3%)	0.001
	No	14(8.8%)	145(91.2%)	
Carbonated drinks	Yes	29(70.7%)	12(29.3%)	0.001
	No	13(8.2%)	146(91.8%)	
Regular exercises	No	27(50.0%)	27(50.0%)	0.001
	Yes	15(10.2%)	132(89.8%)	

All the risk factors showing significant (<0.05) association with laryngopharyngeal reflux disease.

TABLE SHOWING THE SCORES OF THE SYMPTOMS IN LPRD POSITIVE PATIENTS

Table 5: Scores of the symptoms in LPRD Positive Patients

Variables	Scores	Group 1 (n=42)
HOARSENESS OR PROBLEM WITH YOUR VOICE	0	27(64%)
	1	10(24%)
	2	3(7%)
	3	2(5%)
CLEARING YOUR THROAT	0	1(2%)
	1	1(2%)
	2	17(40%)
	3	15(36%)
	4	7(7%)
	5	1(2%)
EXCESS THROAT MUCOUS OR POSTNASAL DRIP	0	2(5%)
	1	5(12%)
	2	17(40%)
	3	12(29%)
	4	3(7%)
	5	3(7%)
DIFFICULTY SWALLOWING FOOD, LIQUID OR PILLS	0	23(55%)
	1	13(31%)
	2	4(10%)
	3	2(5%)
COUGHING AFTER YOU ATE OR AFTER LYING DOWN	0	11(26%)
	1	13(31%)
	2	8(19%)
	3	10(24%)
BREATHING DIFFICULTIES OR CHOKING EPISODES	0	35(83%)
	1	7(17%)
TROUBLESOME OR ANNOYING COUGH	0	12(29%)
	1	12(29%)
	2	14(33%)
	3	4(10%)
SENSATIONS OF SOMETHING STICKING IN YOUR THROAT OR LUMP IN THE THROAT	0	0(-)
	1	0(-)
	2	19(45%)
	3	18(43%)
	4	2(5%)
	5	3(7%)
HEARTBURN, CHESTPAIN, INDIGESTION OR STOMACH ACID COMING UP	0	0(-)
	1	1(2%)
	2	9(21%)
	3	18(43%)
	4	11(26%)
	5	3(7%)

In our study among the LPRD positive patients 15 patients had hoarseness (35.71%) 41 patients (97.6%) had frequent clearing of throat. Excess throat mucous or postnasal drip was present in 40 patients (95.23%).19 patients (45.23%) had difficulty in swallowing food. 31 patients (73.80%) had the symptom of coughing after eating food or lying down. 7 patients (16.6 %) had breathing difficulties or choking episodes.30 patients (71.4%) had symptoms of annoying cough. 100 % of patients had the symptoms of heart burn and sensation of lump in throat. Thus, the most common symptoms among the LPRD positive patients in our study group were sensation of lump in throat, chest pain, heart burn and indigestion or stomach acid coming up. The least common symptoms among LPRD positive patients in our study group were difficulty in breathing, choking episodes and hoarseness of voice.

REFLUX FINDINGS FREQUENCY DISTRIBUTION

Table 6: Reflux findings frequency distribution

Variable	Scores	Frequency	Percentage
Subglottic edema	Absent	42	100.0
Ventricular obliteration	Absent	30	71.4
	Present	12	28.6
Erythema /Hyperemia	Present	42	100.0
Vocal fold edema	Present	42	100.0
Diffuse laryngeal edema	Present	42	100.0

Continue.....

Posterior commissure hypertrophy	Present	42	100.0
Granuloma/Granulation tissue	Absent	32	76.2
	Present	10	23.8
Thick Endo laryngeal mucous	Absent	23	54.8
	Present	19	45.2

In our study erythema, vocal fold edema, diffuse laryngeal edema and posterior commissure hypertrophy were the reflux findings found in the majority of our patients. Subglottic edema (0%), ventricular obliteration (12%) and thick endo-laryngeal mucous (19%) were the less frequent findings.

Discussion

Laryngopharyngeal reflux is one of the major health problems in developing countries like India. The prevalence of LPRD is different in different countries[6].It's prevalence ranges from 5 to 30%. The prevalence of laryngopharyngeal reflux has been increasing at a rate of 4% every year according to El-Seraj[7].In a study conducted by Prasun Mishra, Deeksha Agarwal, the prevalence of LPRD in Indian population was found to be 11%[8]. The overall prevalence of LPRD in our study was found to be 20.89%. The prevalence of LPRD in females was 24.03 and in males was 15.27. In a study conducted by Willyboard A. Massawe, AslamNkya et al. in a tertiary hospital Tanzania showed the overall prevalence of LPRD to be 18.4%, in males the prevalence was 19.1% and in females 17.6%[6]. This was comparable to the results in our study.

In our study factors like smoking and alcoholism, consumption of spicy/fatty food, frequent use of carbonated drinks, lack of regular exercise, lying down in less than 2 hours were found to be significantly associated with LPRD. In a study conducted by Nikolas Spantideas, Eirini Drosou et al. smoking and alcoholism was found to be risk factors of LPRD[9]. In a study conducted by Kesari SP, Chakraborty S et al. in Sikkimese population found that reflux symptoms were higher in alcoholics, people with frequent usage of aerated drinks and in those having spicy food. The study also showed that reflux was more in those going to bed immediately after dinner[10]. In our study group 38 % (16) of patients with LPRD had the habit of smoking /alcoholism. 82% (32) of patients with LPRD in our study group had the habit of consuming spicy or fatty food. 66% (28) of patients with LPRD in our study population had the habit of lying down in less than 2 hours after a meal. In our study, out of the 42 patients with laryngopharyngeal reflux disease, 29 patients (70%) were consuming carbonated drinks frequently. In a study conducted by MeiguiWang, Tingting Mo et al. carbonated drink consumption was found to be a risk factor of LPRD[11]. The most common symptoms among the LPRD positive patients in our study group was sensation of lump in throat, chest pain, heart burn and indigestion or stomach acid coming up. The least common symptoms among LPRD positive patients in our study group were breathing difficulties or choking episodes and hoarseness. In a study conducted by Raghvendra Singh Gaur et al. the common symptoms were sensation of foreign body in the throat followed by frequent throat clearing[12]. In a study conducted by Willyboard A. Massawe et al. in Tanzania the commonest symptoms were foreign body sensation, hoarseness and frequent throat clearing[6]. In a study conducted by Nikolaos Spantideas, Eirini Drosouet al. the common symptoms of LPRD were heart burn, chest pain and stomach acid coming up[8].In our study erythema, vocal fold edema, diffuse laryngeal edema and posterior commissure hypertrophy were the reflux findings found in majority of the patients. Subglottic edema (0%), ventricular obliteration (12%) and thick endolaryngeal mucous (19%) were the less frequent findings. In a study conducted by WillybroadAMassawe et al. the most frequent findings were thick endolaryngeal mucus followed by partial ventricular obliteration[6] and vocal fold edema. In the study conducted by Belafsky and Koufman posterior commissure hypertrophy was the most frequent finding[5].

Conclusion

The prevalence of LPRD is high in our population. There are many risk factors associated with LPRD. Further studies are required to identify the factors

associated with the development of LPRD. Health programs should be conducted to create awareness among the public for the early identification and treatment of the condition.

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Original Research

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Practise of Self-Monitoring of Blood Glucose Among Pregnant Women with Gestational Diabetes Mellitus Attending a Tertiary Care Hospital in Lucknow, Uttar Pradesh

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Abstract

Background: Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance of varying degree diagnosed first time during the pregnancy. Blood glucose values revert to the normal level soon after the delivery. But the women carry a lifetime risk of getting overt diabetes within 5 years. The management of GDM mainly comprises of medical nutrition therapy, exercise, weight management and Self-Monitoring of Blood Glucose (SMBG). Among all the management components, SMBG is the mostly neglected especially among pregnant women with GDM. Overall, the practise of SMBG in developing nation like India is not up to the mark. Aim: The aim of the present study was to determine the practice of SMBG amongst the pregnant women with GDM. The study was conducted in the antenatal OPD of Queen Mary's Hospital KGMU, Lucknow, Uttar Pradesh. Methodology: It was a quasi-experimental study on 188 pregnant women with GDM managed on life style intervention. Statistical analysis: Descriptive statistics in the form of frequencies and percentages were used to analyse the sociodemographic factors. ANOVA was applied to compare the mean score between the two groups. Result: The overall adherence to the SMBG practice was found to be very low among the study participants. No significant difference was observed between the two groups. Conclusion: Patient empowerment and imparting proper information regarding SMBG may be helpful in managing the GDM with better maternal and foetal outcomes.

Key Words: Self-Monitoring of Blood Glucose, Gestational Diabetes, Adherence, Quasi experimental

Introduction

Gestational diabetes mellitus (GDM) is a common pregnancy medical issue that can severely affect both the mother's and the baby's health [1]. GDM is defined as high blood sugar that is detected for the first-time during pregnancy in the absence of any pre-existing Type-1 or type-2 diabetes[2]. In GDM, the high blood sugar is temporary and usually returns to normal after the delivery of the baby[3].

Self-Monitoring of Blood Glucose (SMBG) is the checking and monitoring of blood glucose readings by a patient, caretaker and/or healthcare provider

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at different times of the day, at home or in the hospital [4,5]. It is a vital part of diabetes management. It allows pregnant women and their healthcare providers to select the most efficient method (eg. medical nutrition therapy, physical exercise, insulin/ oral hypoglycaemic agents) for managing glucose levels and minimizing the risk of diabetes-related complications. Among all the management component of managing diabetes SMBG is the most neglected especially among pregnant women with GDM. Recently in 2017, Research Society for the Study of Diabetes in India (RSSDI) published guidelines for the management of type 1 diabetes mellitus, type 2 diabetes mellitus and diabetes in pregnancy. RSSDI provides two levels of recommendations: "Recommended care" and "Limited care"[7].

We have a scarcity of data related to SMBG practise in India among pregnant women with gestational diabetes. With the above background a study was planned to determine the level of practise of self-monitoring of glucose among women diagnosed with GDM who were managed with dietary modification and exercise recommendations.

Materials and Method

The data on practice of self-monitoring of blood glucose by the pregnant women with GDM was collected from 188 pregnant women diagnosed with gestational diabetes mellitus enrolled for PhD research work titled "Effect of Dietary Modification and Physical Activity on Blood Glucose Level of Pregnant Women with Gestational Diabetes Mellitus - An Interventional Study"carried out in antenatal OPD at Queen Mary Hospital at King George's Medical University, Lucknow, Uttar Pradesh. All the study participants were treated with lifestyle modification (diet regimen, physical activity, and counselling). It was a Quasi experimental study on 188 pregnant women diagnosed with gestational diabetes mellitus. The sample size was determined by taking the reference from a previous study[11]. They reported a mean difference in fasting blood glucose level of 9.11 mg/dl with standard deviation of 19.43 at 36 weeks of pregnancy. Assuming the same mean fasting blood sugar in our study, sample size was calculated using formula:

$$n = \frac{2\,\sigma^2 (Z_\beta + Z_{\alpha/2})^2}{(d)^2}$$

Where,

$Z_{a/2}$=standard normal deviate for two-tailed test based on alpha level (relates to the confidence

interval level) = 1.96

Z_β=standard normal deviate for two-tailed test based on beta level (relates to the power level) at 80% = 0.84

σ =standard deviation of mean difference=19.43

d= mean difference in blood glucose=9.11

A total of 71 subjects in each group with 95% confidence interval and power of 80% were required. Further taking 20% of dropout rate, 85 subjects in each group were required. However, the total number of pregnant women with GDM enrolled were 188 i.e., 94 pregnant women with GDM in each group. Consecutive method sampling was used to select the study participants. The data collection was donebetween November 2021 to June 2022. The data collection was started after the clearance from Institutional Review Board, KGMU, Lucknow, Uttar Pradesh India (110th ECM II B-PhD/P2) and written consent was obtained from the study participants. The inclusion criteria for the study participants were pregnant women who were diagnosed with GDM according to DIPSI criteria, up to 28 weeks of gestation, who gave their consent to participate in the study and those who were living within a 15-kilometer radius of KGMU, Lucknow. The exclusion criteria were pregnant women diagnosed with Type 1 & Type 2 Diabetes Mellitus before their current pregnancy, GDM cases with spontaneous or recurrent abortion, GDM cases on corticosteroids and treating obstetrician did not find the pregnant women fit for study because of any obstetric complication. The study participants were interviewed using a pretested semi structured interview schedule that included details on sociodemographic variables,

past and present obstetric history. Socioeconomic status was assessed using modified Kuppuswamy socioeconomic scale.

SMBG assessment: Pregnant women with GDM were divided into two equal groups i.e., group 1 & group 2 with 94 study participants in each group. All the pregnant women with GDM were instructed to do SMBG at least once in a week and for four times in a day i.e., (Fasting blood glucose & three post-meal values at least once a week) according to RSSDI recommended care [7]. "The Summary of Diabetes Selfcare Activities (SDSCA)"scale was used to assess the details of the diabetes selfcare activities with respect to diet, exercise and, blood glucose monitoring in the previous week prior to the interview. Mean score of self-monitoring of blood glucose was calculated as per the scoring method given in the scale[12]. The author's permission to use the tool was sought. The author permitted to add, omit, or use the full scale or part of it. Those pregnant women who followed the SMBG recommendation for all the follow-up visits had been considered as adherent to SMBG practice. They were followed up as per their scheduled visit for the antenatal check-up. The pregnant women from both the groups were followed till delivery.

Data analysis:

Data was analysed using R software version 4.1.1. (R Core Team, 2021). All categorical data was presented using frequency and percentages. The comparison of baseline demographic and clinical parameters of pregnant women between the two groups was done using Chi-square test or Fisher's exact test for categorical observations based on the expected frequency. Independent sample t-test or Mann-Whitney U test for continuous measurements after checking the normality assumption using Shapiro-Wilk test. The change in the scores for SMBGat different follow-up was assessed by repeated measures ANOVA using mixed linear model.

Results

The mean age of the pregnant women with GDM was 27.6±3.7 years and 27.9±3.9 years in intervention and in control group respectively. There was no significant difference in age distribution of the pregnant women with Gestational Diabetes Mellitus in both the groups. The pregnant women with GDM were not significantly different in terms of other variables like, religion, education, socioeconomic status, occupation, type of family and family history of diabetes mellitus.

Table 1 shows that majority of women did not perform SMBG throughout the pregnancy after being diagnosed with GDM. The proportion of pregnant women managed with diet and exercise performing SMBG at least once in a week was 31.9 % at first follow up, 28.7 % at the second follow up and 32.4 % and 35.6% at the third and fourth follow up respectively. Overall, 21.3% of pregnant women performed SMBG as recommended at first follow up and, 23.4 % at the fourth follow up.

Table 2 shows the proportion of pregnant women with GDM practicing SMBG at least once in a week increased from 30.9% to 45.7 % from first follow-up to fourth follow-up among women in intervention group. The practice of SMBG as recommended (i.e., At least once a week and four times in a day) also increased from 21.3% to 37.2% among women in intervention group. Amongst the pregnant women in control group, 31% of pregnant women performed SMBG at least once in a week at the first follow up and only 25.5 % practised SMBG at the fourth follow-up. The practice of SMBG as recommended (i.e., At least once a week and four times in a day) at the first follow-up was done by 21.3 % women and by only 9.6% of women at the fourth follow up in control group. The adherence to the SMBG practice among the study participants in the two groups is shown in table 3. No statistical difference was found in the SMBG score of the pregnant women with GDM as shown in table 4.

Table 1: Frequency of practicing SMBG by the pregnant women with GDM at different follow up (N=188)

SMBG PRACTICES	FOLLOW UP	NO OF DAYS IN A WEEKS – N (%)							
		0	1	2	3	4	5	6	7
TESTED BLOOD SUGAR	I	108 (57.4)	60 (31.9)	11 (5.9)	6 (3.2)	0 (0.0)	1 (0.5)	1 (0.5)	1 (0.5)
	II	110 (58.5)	54 (28.7)	16 (8.5)	3 (1.6)	3 (1.6)	1 (0.5)	0 (0.0)	1 (0.5)
	III	104 (55.3)	61 (32.4)	13 (6.9)	10 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	IV	101 (53.7)	67 (35.6)	13 (6.9)	6 (3.2)	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)
TESTED AS PER RECOMMENDATION*	I	141 (75.0)	40 (21.3)	5 (2.7)	2 (1.1)	0 (0)	0 (0)	0 (0)	0 (0)
	II	147 (78.2)	33 (17.6)	6 (3.2)	2 (1.1)	0 (0)	0 (0)	0 (0)	0 (0)
	III	147 (78.2)	35 (18.6)	6 (3.2)	0 (0.0)	0 (0)	0 (0)	0 (0)	0 (0)
	IV	137 (72.9)	44 (23.4)	7 (3.7)	0 (0.0)	0 (0)	0 (0)	0 (0)	0 (0)

Table 2: Frequency of women in intervention and control group practising SMBG at different follow up. (N=188)

SMBG Practices		Intervention group n=94(%)				Control group n=94 (%)			
	Follow up				Follow up				
		I	II	III	IV	I	II	III	IV
Tested blood sugar	Zero day	52 (55.3)	50 (53.2)	46 (48.9)	41 (43.6)	56 (59.6)	60 (63.8)	58 (61.7)	60 (63.8)
	1 day	29 (30.9)	31 (33.0)	35 (37.2)	43 (45.7)	31 (33.0)	23 (24.5)	26 (27.7)	24 (25.5)
	2-4 days	13 (13.8)	13 (13.8)	13 (13.8)	10 (10.6)	4 (4.3)	9 (9.6)	10 (10.6)	10 (10.6)
	5-7 days	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (3.2)	2 (2.1)	0 (0.0)	0 (0.0)
Tested as per recommendation	Zero day	67 (71.3)	67 (71.3)	63 (67.0)	53 (56.4)	74 (78.7)	80 (85.1)	84 (89.4)	84 (89.4)
	1 day	20 (21.3)	21 (22.3)	27 (28.7)	35 (37.2)	20 (21.3)	12 (12.8)	8 (8.5)	9 (9.6)
	2-4 days	7 (7.4)	6 (6.4)	4 (4.3)	6 (6.4)	0 (0.0)	2 (2.1)	2 (2.1)	1 (1.1)
	5-7 days	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 3: Adherence to SMBG practice of pregnant women with GDM in intervention and control group at different follow up. (N=188)

SMBG practice	Follow up	Intervention Group (n=94)		Control group (94)		Overall	
		Adherent	Non-adherent	Adherent	Non-adherent	Adherent	Non-adherent
Tested blood sugar	I	42 (44.7)	52 (55.3)	38 (40.4)	56 (59.6)	80 (42.6)	108 (57.4)
	II	44 (46.8)	50 (53.2)	34 (36.2)	60 (63.8)	78 (41.5)	110 (58.5)
	III	48 (51.1)	46 (48.9)	36 (38.3)	58 (61.7)	84 (44.7)	104 (55.3)
	IV	53 (56.4)	41 (43.6)	34 (36.2)	60 (63.8)	87 (46.3)	101 (53.7)
Tested as per recommendation	I	27 (28.7)	67 (71.3)	20 (21.3)	74 (78.7)	47 (25.0)	141 (75.0)
	II	27 (28.7)	67 (71.3)	14 (14.9)	80 (85.1)	41 (21.8)	147 (78.2)
	III	31 (33.0)	63 (67.0)	10 (10.6)	84 (89.4)	41 (21.8)	147 (78.2)
	IV	41 (43.6)	53 (56.4)	10 (10.6)	84 (89.4)	51 (27.1)	137 (72.9)

Table 4: SMBG score of pregnant women with GDM in intervention and control group at different follow up. (N=188)

Follow up	Mean SMBG score		P-VALUE	change from first follow up		Change in mean difference	P-VALUE
	Intervention group (n=94)	Control group (N=94)		Intervention group(n=94)	Control group (n=94)	MEAN (95% C.I)	
I	0.51±0.72	0.42±0.69	0.945	-	-	-	-
II	0.52±0.72	0.38±0.65		-0.01 (-0.23,0.21)	0.03 (-.19,0.25)	-0.04 (0.19, -.27)	0.716
III	0.54±0.65	0.33±0.52		-0.03 (-0.25,0.19)	0.09 (-.13,0.30)	-0.12 (0.11, -.35)	0.318
IV	0.61±0.63	0.31±0.5		-0.1 (-0.32,0.12)	0.11 (-.11,0.33)	-0.21 (0.02, -0.44)	0.076

Discussion

Various international bodies across the world currently advocate SMBG as the first line of monitoring for GDM. However, NICE UK guideline supports measuring blood glucose levels daily, in fasting and one hour after meals, whereas ACOG guidance suggests glucose monitoring four times a day, once after each meal and one reading of fasting. The ADA did not provide the recommendations about the frequency of SMBG for mild GDM in their 2021 report.[14–16]

In the present study the overall adherence to SMBG practice was found to be only 25%. A randomised control trial conducted by JesrineGek Shan Hong et al. 2022, compared practice of SMBG thrice a week to once a week practice of SMBG amongst women with GDM between 20 and 30 weeks who were managed by lifestyle changes. The less-intensive once a week practice of SMBG arm had a greater compliance rate for self-monitoring blood glucose (86.5% vs. 81.3%). Each participant was provided with a personal glucometer, glucose strips, lancet needles, and alcohol swabs.[17] Distribution of glucometer could be one of the reasons for the adherence rate of 80%.

J Guo et al. 2018, found that 42.9% of patients with diet-controlled GDM practiced SMBG at least four times a week, but no patient with insulin-treated

GDM performed SMBG i.e., seven times per day to fulfil the criteria for active SMBG participation.[18]

According to Sousa AM da S et al.2016, 97.5% of women had complied with the SMBG guidelines, 17% of GDM patients reported that the lancet of the needle and the duration of time it took to perform the SMBG test were obstacles to SMBG[19]. This is line with findings from other studies which mentions that patients find SMBG inconvenient because of pain, a cumbersome procedure, difficult to adopt SMBG as a daily routine practise, cost of the test strips and needles and carrying glucometer while travelling.[20,21]

Cosson et. al.2017;reported 61.5% of GDM affected women tested their blood glucose as recommended both pre- and postprandially. This finding was significantly associated with family history of Type-2 diabetes among first-degree relatives[22].According to the Mackillop et al. 2014, which included 104 women with GDM as participants, using a smartphone to record blood glucose levels led to high SMBG-testing compliance. Nearly 85% of the participants in their study performed the test in accordance with the advice[23].

To help patients to adhere to medical recommendation for performing SMBG, we must allocate more resources on schooling women and their families about GDM and devising therapeutic approaches and recommendations that are specific to their requirements. Effective communication between patients and doctors might increase patient compliance with medical recommendations. Data on the practice of SMBG among Indian women with GDM are scarce. Future research should focus on the factors associated with low practice of SMBG among pregnant females with GDM in India. Culturally relevant strategies to increase SMBG involvement are recommended. Pregnant women with GDM may be inspired to take part in SMBG by highlighting how important it is to promote the health of unborn children. Limitation of the present study includes that the findings of the present research cannot be generalised. The data was collected from a single centre.

Ethical Clearance: The data collection was started after the clearance from the institutional Ethics Committee Review Board, KGMU, Lucknow, Uttar Pradesh India (110th ECM II B-PhD/P2)

Conflict of interest: None

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Original Article

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Chest X Ray and C-reactive Protein as Diagnostic Modalities for Monitoring Complications of Mild to Moderate COVID-19 Infections: Experience from a Dedicated COVID Hospital, Kolkata

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Abstract

Introduction: SARS-COV-2 has created havoc during 2019-2021. Diagnosis and managing complications needed both laboratory investigations and imaging modalities.

Aims and objectives: To find out the association between socio-demographic and clinical profiles of the study subjects with their different laboratory investigations and imaging modalities and to compare normal investigations with their gold-standard variants.

Materials and Methods: During the first wave of COVID-19, a descriptive, observational, and cross-sectional study was carried out on 120 consecutive samples of mild to moderate COVID patients using a convenience sampling technique in a COVID indoor ward of Medical College, Kolkata. The semi-structured data collection form used in the study was predesigned, pretested, face and content validated. SPSS version 25 and Microsoft Excel version 19 was used for data analysis after coding. Ethical approval was taken. (Ref No. MC/KOL/IEC/Non-Spon/842/11/2020).

Results: Old age, uncontrolled diabetes and hypertension, presence of symptoms especially shortness of breath is significantly associated with low levels of SpO2, elevated C reactive protein (CRP) and D-dimer, abnormal Chest X-ray (CXR) and CT Thorax. A Kappa analysis suggested CRP and CXR can also be done instead of D-dimer and CT Thorax respectively, in a COVID patient for monitoring complications.

Conclusion: CRP and CXR are cost-effective alternatives and can be used as diagnostic modalities for monitoring of complications of mild to moderate COVID-19 infections.

Keywords: COVID-19, Kolkata, CRP, Chest X-ray, cost-effective

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Introduction

The seventh human coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was identified in Wuhan, Hubei province, China, in January 2020.[1] Similar to SARS (2002 and 2003) and Middle East respiratory syndrome (MERS) (2012 to the present), two other coronavirus outbreaks that occurred in the past 18 years, the Covid-19 outbreak has presented significant difficulties for the fields of public health, research, and medicine.[2]Infection occurs through human-to-human transmission as well as interaction with infected environmental surfaces. In order to avoid contamination, good hand hygiene is essential. In some circumstances, wearing personal protection equipment is advised. Fever, cough, lethargy, mild dyspnoea, sore throat, headache, conjunctivitis, and gastrointestinal problems are the predominant signs and symptoms of COVID-19. Using samples from a nose swab, tracheal aspirate, or bronchoalveolar lavage, real-time PCR (RT PCR) is employed as a diagnostic technique. Findings from computed tomography are crucial for both diagnosis and follow-up.[3]

During hospitalisation, CRP values over 100 mg/dL and D-dimer levels over 500 ng/ml may indicate an increased risk of in-hospital mortality. Higher levels at presentation could be a sign of impending clinical decline.[4] According to a study, non-survivors' D-dimer and CRP levels were higher than those of survivors, as well as increasing more quickly. This implies that D-dimer and CRP dynamics may be used to track the progression of diseases.[5]

A study suggests using CXRs to identify patients for further RT-PCR testing first. This could be helpful in a hospital situation where the current systems are having trouble deciding whether to retain the patient in the ward with other patients or isolate them in COVID-19 sections. Additionally, it would assist in identifying patients who had a high risk of having COVID and who had a false-negative RT-PCR and required further testing.[6]Thorax CT has a high sensitivity in COVID-19 individuals with false-negative RT-PCR results, and it is crucial for diagnosis and follow-up. In the early stages, thorax CT abnormalities may be present even before the beginning of symptoms.[7]

It is evident that CXR and CRP are equally useful in monitoring complications of mild to moderate COVID-19 as well as in its diagnosis. This study aims to determine the relationship between the sociodemographic and clinical characteristics of the study subjects and their various laboratory investigations and imaging modalities in order to compare standard investigations with their gold-standard variants.

Methodology

A descriptive, observational and cross-sectional study has been conducted in COVID indoor ward of a dedicated COVID tertiary care hospital of Kolkata, West Bengal; during the first wave of COVID-19. 120 consecutive samples of mild to moderate COVID patients had been chosen by convenient sampling technique. According to ICMR guidelines, mild case was defined as cases with upper respiratory tract symptoms without shortness of breath and moderate case was defined as respiratory rate > 24/min and SpO2 < 94% on room air. Addiction among the subjects was defined as a chronic, relapsing disorder characterized by compulsive drug seeking and use despite adverse consequences.[8] The confirmed COVID positive patients who were admitted in indoor wards were included in this study excluding the subjects who were admitted in CCU (critical care unit) and HDU (high dependency unit). As the study involved inflammatory markers like CRP, other causes of raised CRP like arthritis or inflammatory bowel disease were excluded from the study. The study tool used was a predesigned, pretested, semi-structured data collection form, which was face and content validated by experts of Medicine and Public health. It consisted of four sections. The initial section consisted of socio-demographic profile which included Age in completed years, Gender, Addiction, if any, in their lifetime and presence of contact history. The next section consisted of the comorbidity profiles of the patient which stated presence of comorbidity, if any. The details of separate comorbidity included Diabetes, whether on control, Hypertension, whether on control, cardiovascular disease, Respiratory diseases, Cancer, Liver Diseases, Thyroid disorders. (Record based). In the subsequent section, the symptomatology of COVID were captured (history of symptoms experienced, if any, history

of fever, cough, sore-throat, shortness of breath (SOB), diarrhea, vomiting, myalgia in last 7 days or on admission). The final section was about the investigations data of the study subjects, consisting of SpO2 of patients, blood levels of CRP, D- dimer, interpretation of CXR and CT Thorax. At the end the collected data was coded and entered in Microsoft Excel software version 10 and analyzed in SPSS version 25 software. Written consent was taken from each of the respondents before interview and ethical approval taken from Institution Ethics Committee of Medical College and Hospital. (**Ref No. MC/KOL/IEC/Non-Spon/842/11/2020), Date-5/11/2020**.

Results and discussion

Table 1: Distribution of study subjects according to their sociodemographic profile (n=120)

S. No	Attribute	Sub-group	Frequency	Percentage
1	Age (in years)	<18	3	2.50
		18-59	63	52.50
		>=60	54	45.00
2	Gender	Male	75	62.50
		Female	45	37.50
3	Addiction	Yes	51	42.50
		No	69	57.50
4	Contact history	Yes	50	41.67
		No	70	58.33
5	Any comorbidity	Yes	89	74.17
		No	31	25.83

Comments: Majority of the study subjects belong to the adult age group (52.5%), followed by geriatric population (45%). 62.5% of them were males, majority (57.5%) did not have any history of addiction in their lifetime, 58.33% did not have contact history, whereas 74.17% has history of comorbidity.

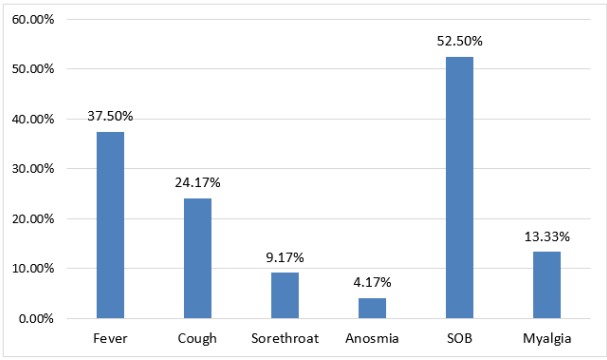

Fig 1: Distribution of study subjects according to the symptoms experienced during COVID (n=120)

Comments: The above bar diagram shows that majority of study subjects experienced SOB (52.5%), followed by fever (37.5%) and cough (24.17%)

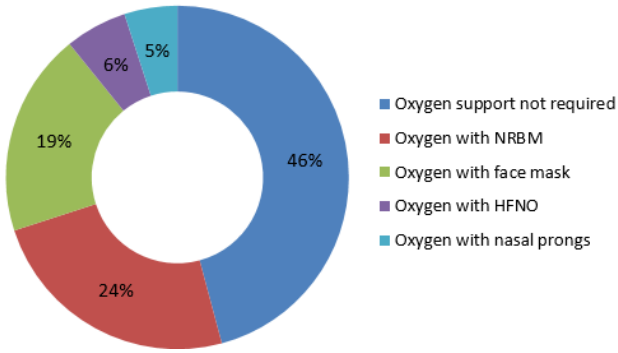

Fig 2: Distribution of sudy subjects according to their need of oxygen for survival with modality of oxygen delivery (n=120)

Comments: The above Doughnut shows that majority of the study participants survived with room air (46%). Out of the people who required oxygen, majority needed non-rebreathing mask(NRBM)(24%), followed by face mask (19%),high flow nasal oxygen (HFNO) (6%) and lastly nasal prongs (5%)

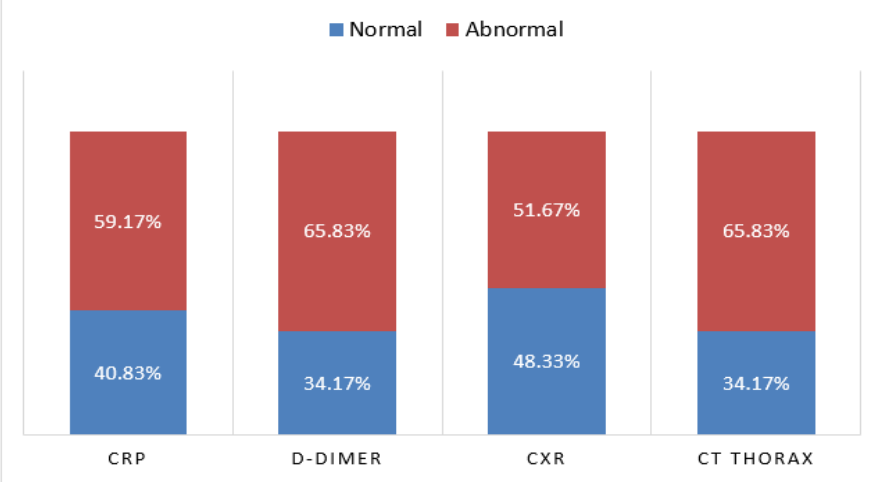

Fig 3: Distribution of study subjects according to laboratory investigations and findings of imaging modality (n=120)

Comments: The above diagrams show that D-dimer has increased more (65.83%) than CRP (59.17%) in COVID patients. Also, CT thorax depicts clearly about the abnormalities better (65.83%), than those with CXR (51.67%).

Table 2: Association of sociodemographic and clinical profiles with outcome variables.

Variable (n)	P-value				
	Low Spo2	High CRP[d]	High D-dimer[e]	Abnormal CXR[f]	Abnormal CT Thorax[g]
Old age[a] (120)	0.080	0.131	0.013	0.132	0.004
Presence of addiction (120)	0.379	0.659	0.54	0.014	0.035
Presence of comorbidity (120)	0.243	0.32	0.001	0.208	290
Uncontrolled Diabetes[b] (43)	0.049	0.001	0.082	0.137	0.238
Uncontrolled Hypertension[c] (58)	0.195	0.476	0.488	0.039	0.196
Presence of cardiac disease (120)	0.049*	0.346	0.181	0.526	0.035
Presence of symptoms (120)	0.001	0.011	0.564	0.000	0.000
Presence of fever (120)	0.603	0.039	0.345	0.509	0.881
Presence of cough (120)	0.144	0.000	0.001	0.994	0.624
Presence of SOB (120)	0.000	0.000	0.004	0.000	0.000

*Fischer's exact test, [a] Age ≥ 60 years, [b] Capillary blood glucose > 200 on admission or on OHA/ insulin from records, [c] Blood pressure ≥ 140/90 on admission or on antihypertensives from records, [d]CRP < 10mg/L, [e]D-dimer <0.5 mg/L FEU, [f]Abnormal CXR includes prominent broncho-vascular markings, opacification, pleural effusion, interstitial abnormalities, cardiomegaly, [g] Abnormal CT Thorax includes ground glass opacity.

Comments: The above table shows that old age is significantly associated with elevated D-dimer and abnormal findings in CT Thorax, which is around 2 and 3 times respectively, than that of lower age. Addiction is significantly associated with abnormal findings of CXR and CT Thorax. Presence of comorbidity in COVID patients causes significant increase in Ddimer. Uncontrolled diabetes lowers SpO2 4 times than diabetic COVID patient on control, whereas uncontrolled hypertension causes significant abnormality in CXR. Cardiac disorders are responsible for significantly lowering the SpO2 and causing abnormality in CT Thorax. Symptomatic COVID patients has 16 times significantly lower SpO2, 5 times elevated CRP, 2 times abnormal CXR and 28 times abnormal CT Thorax than asymptomatic COVID patients. CRP in a COVID patient increases more if the patient has fever. Presence of cough elevates CRP 5 times and D-dimer 4 times in a COVID patient than the patient without cough. Presence of shortness of breath is significantly associated with SpO2, CRP, D-dimer, CXR and CT Thorax.

Table 3: Kappa analysis for laboratory investigations and imaging modality. (n=120)

Variables	D-dimer		% Agreement	p-value
CRP	Normal	High		
Normal	32	17	78.33	0.000
High	9	62		
	CT Thorax			
CXR	Normal	Abnormal		
Normal	40	18	84.17	0.000
Abnormal	1	61		

Comments: The above table shows Kappa analysis between laboratory tests and various imaging modality. Assuming D-dimer a gold standard test for COVID patients, the percentage agreement found between CRP and D-dimer is 78.33%, which is a good one (p=0.000). Also, assuming CT Thorax, a gold standard imaging modality for COVID patients, a good percentage agreement is found between CRP and D-dimer (84.17%, p=0.000). Thus, CRP and CXR can also be done instead of D-dimer and CT Thorax in a COVID patient for monitoring complications.

Discussion

The present study showed that abnormal CXR and high CRP both can act as important tools for monitoring complications in mild to moderate COVID 19. While abnormal CXR was significantly associated with presence of addiction, uncontrolled hypertension, presence of symptoms and presence of SOB, high CRP was associated with uncontrolled diabetes, presence of symptoms, presence of fever, presence of cough, and presence of SOB. Assuming D dimer and CT thorax as gold standard investigations in COVID 19, there was good agreement between high CRP and high D dimer. Similarly, good agreement was observed between abnormal CXR and CT thorax.

As there was a surge of COVID 19 cases worldwide, it became evident that some patients might experience rapid clinical deterioration without premonitory symptoms.[9]Hence, research focused on different biomarkers as predictors of progression to severe disease. Severe or fatal cases of COVID-19 are associated with an elevated white cell count, blood urea nitrogen, creatinine, liver enzymes, CRP, IL-6, lower lymphocyte (<1000/µl) and platelet counts ($<100\times10^9$ /L) as well as lower albumin levels compared with milder cases.[10,11.12] Commonly used laboratory biomarkers like D-dimer or PT/ aPTT can be used as markers of disease severity in a controlled setting.

CRP is a widely available and cost-effective test to assess disease severity in a multitude of inflammatory and infectious conditions. As inflammation and cytokine release are the basis of development of complications in COVID 19, CRP assay finds use in COVID 19 cases as well. Studies have shown that higher levels of CRP in the initial phase of infection occurs in critically ill patients.[13] CRP values were very high in selected patients who succumbed to the disease.[14] Increasing or decreasing trend in the serial

values of CRP can predict disease progression or resolution, as also response to tocilizumab therapy. [10] An elevated CRP in a mildly symptomatic individual warrants close monitoring for early identification of complications.[15]

In order to minimize morbidity and mortality, early detection of COVID 19 is required.[16] Though HRCT chest is the imaging modality of choice in COVID 19, it is not available in most centres, and is also costly. It may be pertinent to go for a CXR in all patients with confirmed or suspected COVID 19, given the wide availability and significantly lower cost. Though CXR is frequently non-contributory in the early phase of disease, it is abnormal in severe disease.[17] It is sometimes the only imaging feasible, as in ventilated patients or very severely ill patients. A portable antero-posterior CXR provides adequate information on the severity and extent of lung involvement, as well as presence of complications like pleural effusions, pneumothorax or lung collapse. It also provides information on any pre-existing cardiac condition, and helps to identify pulmonary edema.[18] Baseline CXR findings consist of consolidation and hazy opacification.[19] Different CXR-based scoring systems were used in risk stratification of COVID-19 patients to plan early interventions and management.[20,21] In countries with resource constraints, CXR may remain the most frequently used tool to identify and monitor patients with moderate to severe COVID 19.

Limitation

The scope of obtaining history from patients was often limited to available documents only. All CXR and HRCT reports could not be availed at the time of data collection, hence sample size needed to be reduced as matching was not possible.

Conclusion

The study concluded that a symptomatic patient especially with presence of SOB lowers SpO2, elevates serum levels of CRP and D-dimer, portrays abnormalities in CXR and CT Thorax. On the other hand, it also becomes evident thatCRP and CXR can also be done instead of D-dimer and CT Thorax in a COVID patient for monitoring complications of mild to moderate COVID-19 infection.

Recommendation: As the above study suggests checking serum levels of CRP and performing CXR can also monitor complications of mild to moderate COVID-19 and these tests are cost-effective, we recommend to use the above tests before checking D-dimer or a CT Thorax.

Conflict of interest: Nil

Source of Funding: Self

Ethical Clearance: Ethical approval was taken from Institution Ethics Committee of Medical College and Hospital. (**Ref No. MC/KOL/IEC/Non-Spon/842/11/2020), Date-5/11/2020.**

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Original Article

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A Descriptive Cross-Sectional Study Regarding Quality of Life among Medical Students During MBBS Course at Government Medical College and Rajindra Hospital, Patiala (Punjab)

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Abstract

Introduction: In order to prevent and treat the syndemic of lifestyle diseases and other non-communicable diseases, following healthy lifestyle and improving the overall quality of life is of utmost important. Healthy lifestyle behaviours are positively and independently associated with academic achievement.[1] Hence this study is trying to estimate the quality of life of medical students at Government Medical College (Patiala), whose lifestyle will be percolated in turn into their family and field of practice.

Aims and objectives: To evaluate the Quality of Life (QOL) and find association between QOL and academic achievements.

Material and methods: A 26 item WHO QOL- BREF scale was used to collect data from 326 MBBS students from Government Medical College and Rajindra Hospital, Patiala.

Results: Out of 326 MBBS students, 54% were female 46% were male. Majority of the students were hailing from urban area (93%) as compared to rural area(7%). The average scores in each domain of WHOQOL – BREF were 63.71 in Physical health domain, 61.51 in psychological domain, 57.91 in social relationship domain and 53.7 in environment domain. There was no significant association between academic scores and different domain scores of WHOQOL-BREF scale.

Conclusion: Majority of the students perceived their quality of life to be good to very good (66%). 48% of students felt their health to be satisfied to very satisfied. The average score of WHOQOL BREF in physical and psychological domains were above 60 (63.71, 61.51 respectively), whereas it was less than 60 in social and environmental domain (57.91 and 53.7 respectively). There was no significant association between academic scores and different domain scores of WHOQOL-BREF scale.

Key Words: Quality of life, WHOQOL-BREF, Academic, Medico

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Introduction

Adolescence represents a critical period of development during which personal lifestyle choices and behaviour patterns establish, including the choice to be physically active. To control the syndemic of lifestyle diseases and to reduce the preventable death due to lifestyle diseases, we have to understand the current problems, acknowledge and address them, to provide proper remedies and improve the global quality of life. It is suggested that attention should be given to prevention and treatment of non-communicable diseases and the major way to prevent non-communicable diseases, is by following healthy lifestyle and improving the overall quality of life. The World Health Organization (WHO) states that — Quality of life is defined as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.[2]

Healthy lifestyle behaviours are positively and independently associated with academic achievement.[1] It demonstrate that lifestyle behaviours are associated with academic achievement, potentially identifying these lifestyle behaviours as effective targets to improve academic achievement in early adolescents. Hence this study is trying to estimate the quality of life of medical students, at Government Medical College and Rajindra Hospital, Patiala. It will be useful to form basis to create awareness among the young intellectuals to follow healthy lifestyle and reducing the premature morbidity and mortality associate with NCDs. The healthy lifestyle adopted by medical students will be instrumental in percolating healthy lifestyle among immediate family members and in their field practice

Material and Methods

Study design:

A college based cross-sectional study was conducted among the medical students studying MBBS at Government Medical College and Rajindra Hospital, Patiala. 65 students from each batch of 2019 batch,2018 batch,2017 batch,2016 batch and 2015 batch, was considered for the study after randomization and consent obtained from them. Self-administered questionnaire made from WHO-QOL BREF, and questions about academic scores, was given to the participating students.

Inclusion criteria

1. Students of MBBS course, who were studying in Government Medical College and Rajindra Hospital, Patiala
2. Students who were willing to give consent for the study

Exclusion criteria

1. Students who were not willing to give consent
2. Students who were not present at the time of study

Sample size

- Population size(N): 1500
- Hypothesized % frequency of healthy lifestyle(p): 30.7%+/-5.[3]
- Confidence limits as % of 100(absolute+/-%): 5%
- Design effect(for cluster surveys-DEFF): 1

- **Formula: n= [DEFF*Np(1-p)] / [(d^2/Z^2 (N-1)+p*(1-p)]**

- Sample after calculation: 269
- Expected loss during study(procedural): 20%

- **Sample size for study: 269+54=323**

- Final Sample Size rounded off= 325

STUDY TOOLS

Scale used:

WHOQOL-BREF:

The World Health Organization Quality of Life (WHOQOL) [4] project was initiated in 1991 by WHO. WHOQOL-BREF is an abbreviated form of WHOQOL-100, which was developed by the WHOQOL group, with fifteen international field centers, in an attempt to develop a quality of life assessment that would be applicable cross-culturally. The WHOQOL-BREF instrument comprises 26 items, which measure the following broad domains:

1. Physical health,
2. Psychological health,
3. Social relationships, and
4. Environment.

This scale has been widely field tested. Cronbach alpha values for each of the four domain scores ranged from .66 (for domain 3) to .84 (for domain 1), demonstrating good internal consistency. First domain contains 6 questions, second contains 3 questions, third domain contains 6 questions and 1 question about sedentary lifestyle, comprising 16 questions.

DATA COLLECTION

Data was collected from 326 students, who were randomly selected, about 65 students per batch, including all five academic years of first year, second year, third year, final year and interns. The data was descriptively described; wherever required appropriate statistical test was applied. The data was analyzed using Microsoft Excel Software 2016 and Epi-info CDC Atlanta version 7.2.2. Academic average score was categorized as good if scored >60 marks and bad if scored <60 marks.

Results and Discussions

Table 1: Distribution of students by the area where currently living

GENDER	NUMBERS	PERCENTAGE
MALE	150	46%
FEMALE	176	54 %
AREA CURRENTLY LIVING		
Urban	304	93%
Rural	22	7%
PRESENT RESIDENCE PLACE		
Home	77	24%
Hostel	235	72%
Paying guest	14	4%
RESIDENCE IN PAST 3 YEARS		
Home	69	21%
Hostel	248	76%
PG	9	3%

Table 1 shows that 176 (54 %) of students, were female and 150 (46 %) were males, out of total 326 MBBS students. Majority of students were hailing from Urban area (93%) compared to that of rural area (7%). Majority of the students were staying in hostel (72%) during the period study was conducted, followed by home (24%) and Paying guest (PG) (4%) respectively.

Table 2: Distribution of students by overall perception of qualityof life by WHOQOL- scale.

CATEGORY OF QUALITY OF LIFE	NO. OF STUDENTS	PERCENTAGE
1 (Very poor)	3	1%
2 (Poor)	10	3%
3 (neither poor nor good)	97	30%
4 (Good)	151	46%
5 (Very good)	65	20%
TOTAL	326	100%

Table 2 shows that Majority of students perceive their quality of life to be good (46%), followed by neither poor nor good (30%), very good (20%), poor (3%) and very poor (1%) respectively.

Table 3: Distribution of students by overall perception of their health by WHOQOL- scale

Category of perception of health	No. of students	Percentage
1 (very dissatisfied)	6	2%
2 (dissatisfied)	30	9%
3 (neither satisfied nor dissatisfied)	133	41%
4 (satisfied)	122	37%
5 (very satisfied)	35	11%
TOTAL	326	100%

Table 3 shows that Majority of students felt neither satisfied nordissatisfied by their health (41%), followed by satisfied (37%), very satisfied (11%), dissatisfied (9%) and very dissatisfied (2%) of their health respectively.

Table 4: Association between academic average score and scores of domains of WHOQOL-BREF scale

	Academic score		
Domain 1 Score	**GOOD**	**POOR**	**P value**
Bad	92 (86.79%)	14 (13.21%)	0.2467 N.S.
Good	136 (80.95%)	32 (19.05%)	
Domain 2 Score			
Bad	98 (84.48%)	18 (15.52%)	0.7439 N.S.
Good	129 (82.17%)	28 (17.83%)	
Domain 3 score			
Bad	109 (83.85%)	21 (16.15%)	0.8715 N.S.
Good	117 (82.39%)	25 (17.61%)	
Domain 4 score			
Bad	148 (82.22%)	32 (17.78%)	0.6118 N.S.
Good	80 (85.11%)	14 (14.89%)	

The association between academic average score and score of WHOQOL- BREF scale was calculated. It shows that out of 274 students who had answered their academic marks, 46 scored averages of less than 60 marks and 228 students scored average of more than 60 marks. The association between academic average and physical health domain score was considered to be not statistically significant. 116 students had psychological health domain score less than 60 and 157 students scored above 60 score.130 students had social relationship domain score less than 60 and 142 students scored above 60 score.180 students had environment domain score less than 60 and 94 students scored above 60 score. The association between academic average and environment domain score isconsidered to be not statistically significant

In the present study, Table 1 shows that 176 (54 %) of students, were female and 150 (46 %) were male, out of total 326 MBBS students This is in concordant with the study by Pruthvi H. Patel et al [5] (2016), about lifestyle pattern of UG medical students in metropolitan Medical college in Mumbai, that out of 172 students, 94 (54.65%) were females and 78 (45.35%) were male students. this is found to be similar with study by Shivani Dhodi et al [6] (2018) in a study about demographic characteristics of final year medical students in Northern States of India (Uttar Pradesh, Punjab, & Chandigarh), that majority of students were Male [457 students (67.5%)] than Female [220 students (32.5%)].

In table 1 of current study, distribution of students by the area where currently living is shown. It shows that majority of students were hailing from Urban area (93%) as compared to that of rural area (7%). This is similar to the finding by Sitanshu Sekhar Kar et al [7] (2014), among the fifth semester MBBS students in South India, that majority of students were hailing from urban area (96.8%), than rural area (3.2%).

In the current study, table 1 shows the distribution of students by their present place of Residence. It shows that majority of students were residing in hostel (72%) during the study was conducted, followed by home (24%) and Paying guest (PG) (4%) respectively. This is in concordance with study by Sitanshu Sekhar Kar et al [7] (2014), among the fifth semester MBBS students in South India, that majority of the students were Hostellers (71.9%) compared to day scholars (28.1%). Another study conducted by Soma Gupta et al [8] (2015) among medical students in Kolkata, showed the similar results that the residents of college hostel were the majority (82.3%). Table 1 in the current study shows the distribution of students by their residence in past 3 years. Table 1 depicts that most of the students were residing at hostel (76%) in past 3 years, followed by home (21%), and Paying guest (3%) respectively. This result was almost similar to the results of present place of residence for the students.

In our study, the graph depicts the distribution of WHOQOL-BREF average scores, in all 4 domains such as physical health domain, psychological

health domain, social relationship domain and environmental health domain. It shows that average score in Physical health domain was 63.71, psychological domain was 61.51, social relationship domain was 57.91 and environment domain is 53.7. Silva PAB et al [9] (2014) concluded that cutoff < 60 for overall quality of life obtained excellent sensitivity and negative predictive value for tracking probable worse quality of life and dissatisfied with health. If we take cut-off value as >60 for good quality of life, our students had good scores in physical health and psychological health domains, where as it was worse in social relationship and environment domain. In a study conducted by Malibary. H et al [10] (2019) about Quality of Life (QoL) among medical students in Saudi Arabia using the WHOQOL-BREF instrument, they found that the environmental domain had the highest mean score at 67.81 ± 17.39, followed by the psychological health domain at 64.37 ± 14.27, the social relationship domain at 55.67 ± 23.95, and finally the physical domain at 46.94 ± 14.24.

Table 2 in our study depicts the distribution of students by overall perception of quality of life, as answered by the first question in WHOQOL BREF scale. It shows that majority of students perceive their quality of life to be good (46%), followed by neither poor nor good (30%), very good (20%), poor (3%) and very poor (1%) respectively. This is similar to the study conducted by Malibary. H et al [10] (2019) about Quality of Life (QoL) among medical students in Saudi Arabia using the WHOQOL-BREF instrument, that 33.6% of the students described their QoL as —very good, 39.7% as —good, and only 2.1% felt it was —very poor.

Table 3 in our study shows the distribution of students by their individual perception of health. It shows that majority of students felt neither satisfied nor dissatisfied by their health (41%), followed by satisfied (37%), very satisfied (11%), dissatisfied (9%) and very dissatisfied (2%) of their health respectively. Thus, the total of students who felt satisfied or very satisfied about their health were 48%. This is in concordance with the study conducted by Malibary. H et al [10] (2019) about Quality of Life (QoL) among medical students in Saudi Arabia using the WHOQOL-BREF instrument, that majority felt satisfied with their health, as 23.7% were —very satisfied and 36% were —satisfied, while only 3.5% acknowledged that they were —very dissatisfied with their health.

In our study, Table 4 depicts the association between academic average score which is categorized as good if scored >60 marks and bad if scored <60 marks vs domain 1 (physical health) score of WHOQOL-BREF scale. It shows that out of 274 students, who had answered their academic marks, 46 scored average of less than 60 marks and 228 students scored average of more than 60 marks. 106 students had physical health domain score less than 60 and 168 students scored above 60 score. Fischer's exact test - Two tailed P value equals 0.2467. The association between academic average and physical health domain score is considered to be not statistically significant. However in a study conducted by Vijay Kumar Chattu et al [11] (2020) about the quality of life and its relationship with academic performance among students in medical and other health professions, at Canada, that significant association (p- 0.002) was present between Grade Point Average (GPA) and physical domain of WHOQOL BREF. Table 4 also depicts the association between academic average score vs domain 2 (psychological health) score of WHOQOL-BREF scale. It shows that out of 273 students, who had answered their academic marks, 46 scored average of less than 60 marks and 227 students scored average of more than 60 marks. 116 students had psychological health domain score less than 60 and 157 students scored above 60 score. Fischer's exact test - Two tailed P value equals 0.7439. The association between academic average and psychological health domain score is considered to be not statistically significant. However in a study conducted by Vijay Kumar Chattu et al [11] (2020) about the quality of life and its relationship with academic performance among students in medical and other health professions, at Canada, that significant association (p- 0.033) was present between Grade Point Average (GPA) and Psychological domain of WHOQOL BREF. Table 4 depicts the association between academic average score vs domain 3 (social relationship) score of WHOQOL-BREF scale. It shows that out of 272 students, who had answered their academic marks, 46 scored average of less than 60 marks and 226 students scored average of more than 60 marks. 130 students had social relationship domain score less than 60 and

142 students scored above 60 score. Fischer's exact test - Two tailed P value equals 0.8715. The association between academic average and social relationship domain score is considered to be not statistically significant. However in a study conducted by Vijay Kumar Chattu et al [11] (2020) about the quality of life and its relationship with academic performance among students in medical and other health professions, at Canada, that significant association (p-0.011) was present between Grade Point Average (GPA) and Social domain of WHOQOL BREF.

Table 4 also depicts the association between academic average score vs domain 4 (environment) score of WHOQOL-BREF scale. It shows that out of 274 students, who had answered their academic marks, 46 scored average of less than 60 marks and 228 students scored average of more than 60 marks. 180 students had environment domain score less than 60 and 94 students scored above 60 score. Fischer's exact test - Two tailed P value equals 0.6118. The association between academic average and environment domain score is considered to be not statistically significant. However in a study conducted by Vijay Kumar Chattu et al [11] (2020) about the quality of life and its relationship with academic performance among students in medical and other health professions, at Canada, that significant association (p- 0.000) was present between Grade Point Average (GPA) and Environmental domain of WHOQOL BREF.

Conclusion

Majority of the students perceived their quality of life to be good to very good (66%). 48% of students felt their health to be satisfied to very satisfied .The average score of WHOQOL BREF in physical and psychological domains were above 60 (63.71, 61.51 respectively), whereas it was less than 60 in social and environmental domain (57.91 and 53.7 respectively). There were no significant associations between academic scores and different domain scores of WHOQOL-BREF scale.

Conflict of interest: Nil

Source of funding: Self

Ethical clearance: taken from institute ethical committee and review board

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Original Article

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Etiological Assessment of Splenomegaly by Clinical and Laboratory Methods in Paediatric Age Group (3 Months To 18 Years)

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Abstract

Introduction: Splenomegaly is the enlargement of spleen. Splenomegaly is a sign seen in various disease processes in infants and children. So, an attempt was made in the present study to know the various etiological factors and clinical features and clinical outcome of splenomegaly in the cases admitted in Prathima institute of medical sciences, Nagunoor, Karimnagar

Aim and objectives: 1. To establish the possible etiology of Splenomegaly in children by clinical and laboratory methods

Material and methods: 100 children from 3 months to 18years, with varying grades of Splenomegaly of different etiologies, admitted to paediatric wards of Prathima Institute of Medical Sciences, Karimnagar were studied in this observational study between Decembers 2015 to November 2017. Detailed study of each case including history, thorough physical examination and necessary investigations were done to reach the diagnosis.

Results: Male preponderance was seen in present study. Maximum incidence of Splenomegaly was seen between 3 months to 6 years age group (62%). Majority of the cases had moderate Splenomegaly (62%). Fever was the most common presenting feature associated with Splenomegaly. Hepatomegaly was the most common association with Splenomegaly. Infections (42%) were the most common cause of Splenomegaly, followed by hematologic (25%) causes.

Conclusions: Infections was the most common cause of Splenomegaly in present study. Male preponderance was seen; majority of cases had moderate Splenomegaly and belonged to preschool age group.

Keywords- Fever, Splenomegaly, Hepatomegaly, Infection

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Introduction

The spleen is an important organ of the immune system, with lymphoid, reticuloendothelial and vascular components. Disturbance of any of these may cause splenomegaly.[1] Splenomegaly is defined as enlargement of the spleen measured by size or weight. The spleen plays a significant role in haematopoiesis and immune surveillance. The major functions of the spleen include clearance of abnormal erythrocytes, removal of microorganisms and antigens as well as the synthesis of immunoglobulin G (IgG). Splenomegaly may be a transient condition due to acute illness or may be due to serious underlying acute or chronic pathology[2] Splenomegaly is one of the most common clinical findings in our country, especially in infants and children. It may be normally found in 15% of neonates, 10% of normal children and 5% of adolescents[3].The tip of the spleen is palpable in most prematureinfants[1]. The spleen in infants and children is commonly involved in a variety of pathologic processes. Some of these processes cause isolated splenic disease where as others involve the spleen as a part of a systemic illness[3]. Causes of Splenomegaly vary from area to area and period to period. The commonest diseases associated with Splenomegaly were hematologic (lymphoma), hepatic (chronic liver disease), infectious diseases (AIDS and endocarditis), congestive (CCF), primary splenic (splenic vein thrombosis) and others (malignancy).[4] In the present study, an attempt had been made to find out the causes of Splenomegaly in children in a medical college hospital setting.

Aim and Objectives

1. To establish the possible etiology of Splenomegaly in children by clinical and laboratory methods.
2. To study the incidence of Splenomegaly in various age groups and to assess age incidence in each etiological group.
3. To study the incidence of Splenomegaly in different sex groups.
4. To study the signs and symptoms associated with Splenomegaly
5. To study the various grades of enlargement of spleen and their incidence in each etiological group.

Materials and Methods

Study Design: Hospital based prospective observational study

Study Sample Size: 100

Study Population: Children with Splenomegaly in age group from 3 months to 18 years attending the wards and PICU of Prathima Institute of Medical Sciences with varying degree of Splenomegaly of different etiology

Study centre: The study was conducted in the Department of Paediatrics of Prathima Institute of Medical Sciences, Nagunoor, Karimnagar.

Study period: 18 months (December 2015–November 2017)

Inclusion Criteria:

- Children in the age group of 3 months to 18 years with splenomegaly.
- Parents/guardians of children who are willing to give informed consent.

Exclusion criteria:

- Children with pushed down spleen that is palpable due to lung pathologies
- Spleen palpable as a result of visceroptosis
- Parents or guardians those who are not willing to give informed consent.

Method

On admission, informed consent was taken from the parents/ guardians of the children and detailed study of each case including history, through physical examination and necessary investigations within the limitations of the available laboratory facilities were done depending up on the history and clinical findings. Cases were analysed to evaluate the following data:

1. Age incidence
2. Sex incidence
3. Signs and symptoms
4. Grades of enlargement
5. Etiology
6. Age incidence in each etiological group
7. Grades of enlargement in each etiological group

Routine investigations like complete blood count, peripheral smear, urine and stool analysis, chest X-ray, Mantoux test were done initially. Relevant investigations like Widal test, HIV, VDRL, liver function test, bone marrow examination, bleeding time and clotting time, Hb electrophoresis, X-ray skull, Xray wrist, barium swallow for oesophageal raises, blood group, blood culture was done in relevant cases, depending up on the provisional diagnosis made on history and clinical examination. Special investigations like CT scan, sickling test osmotic fragility test was done in few cases where as indicated. Though history and physical examination provide clues for diagnosis, final diagnosis could be confirmed only after investigations.

Institutional ethical committee approval:

Ethical clearance was obtained from the Institutional Ethical Committee, Prathima Institute of Medical Sciences, Karimnagar.

Results

Highest incidence of Splenomegaly was seen in 0-6years age group (62%) followed by 27% in 7-12 years age group followed by 11% in 13-18years age group.

Male preponderance was seen in present study accounting for 67% of cases.

Fever was the most common presenting symptom accounting for 67% of cases followed by cough (20%). Hepatomegaly was the most common presenting sign accounting for 78% followed by anaemia in 55% of cases.

Highest incidence was seen in moderate Splenomegaly group (4-7cms) accounting for 62% followed by 23% in marked Splenomegaly group (>7cm) followed by15% in mild Splenomegaly group (1-3cms).

In this study, infectious disorders formed the most common etiologic agent accounting for 42% of cases of Splenomegaly followed by hematologic disorders in 25%, figure 1 shows the etiological analysis of the present study.

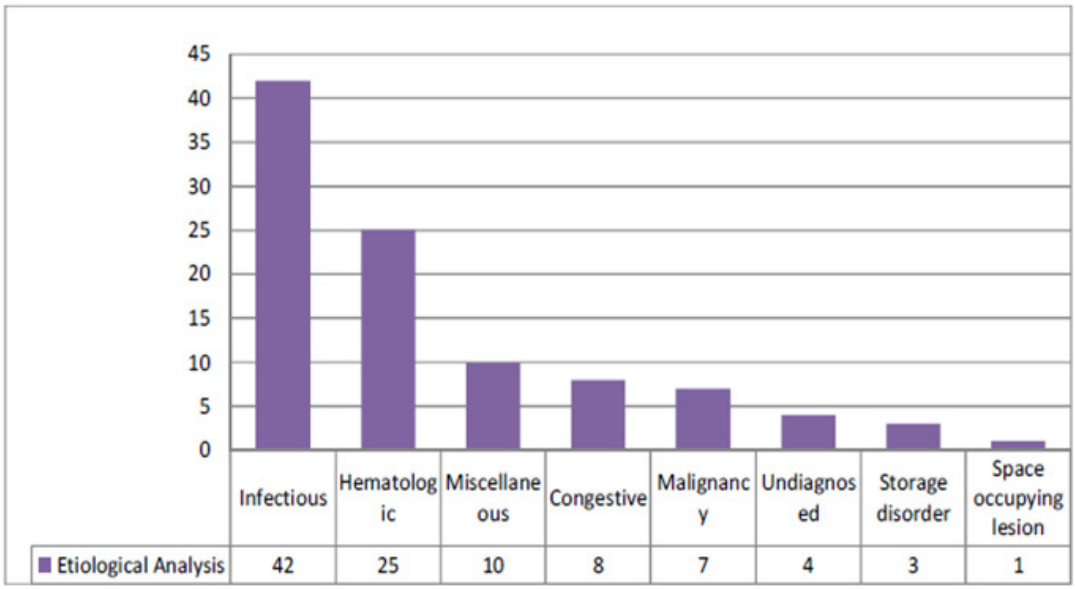

Figure 1: Graph showing Etiological groups of 100 Cases

In 3 months-6 years and 7-12 years age group, majority of cases of Splenomegaly were caused by infections, accounting for 37% (23 out of 62 cases) and 59% (16 out of 27 cases) respectively, whereas in 13-18 years age group, hematologic etiology was common accounting for 36% (4 out of 11cases), figure 2 represents a graph showing the etiology is specific age groups.

Mild and moderate Splenomegaly was seen commonly in infectious etiology group accounting for 66% (10 out of 15cases) and 45 % (28 out of 62 cases) respectively. Massive Splenomegaly was seen

commonly in congestive Splenomegaly group 21% (5 out of 23 cases) followed by infectious etiology 17% (4 out of 23 cases).

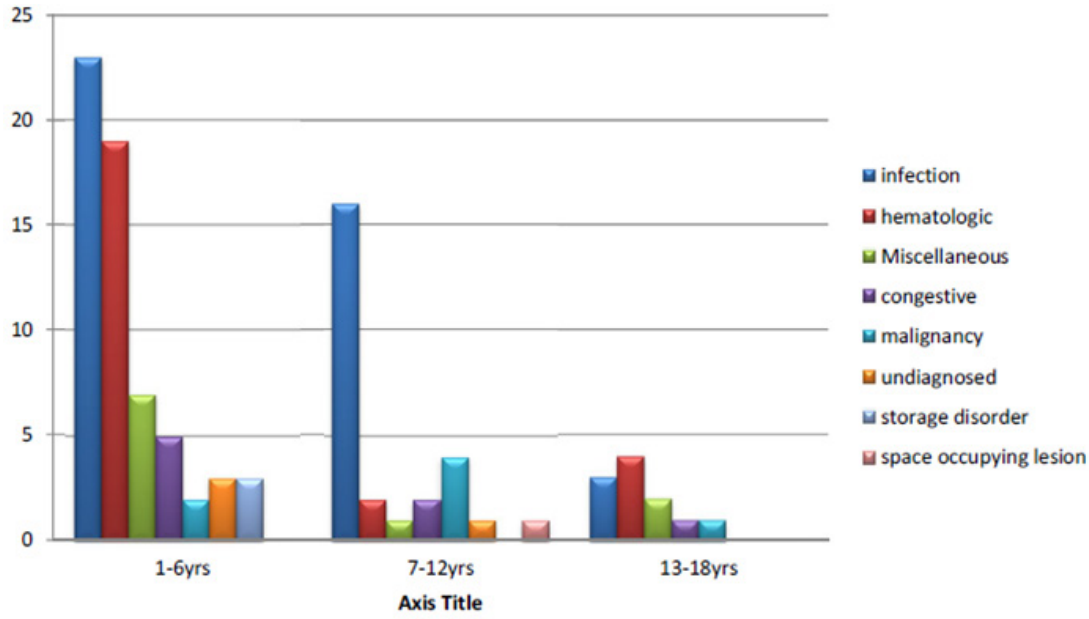

Figure 2: Graph showing age incidence in each etiological group

Discussion

Splenomegaly is a common clinical finding in paediatric practice. Splenomegaly is not a disease but a sign seen in various diseases. Hundred cases of varying grades of Splenomegaly of different etiologies in paediatric age group were studied in paediatric wards of Prathima institute of medical sciences, Karimnagar. Etiological analysis was done by history, clinical examination and available laboratory facilities in the hospital. Splenomegaly was studied between three months to eighteen years. Maximum incidence was found in first age group of 3m-6 years i.e.,62% followed by 27% in 7-12 years age group, followed by 11%, in 13-18 years age group. Males are affected more often than females. Splenomegaly was seen in 67% of males compared to 33% of females. Splenomegaly was classified in to three grades on clinical grounds[5]. In present study, 15% belonged to mild Splenomegaly (1-3Cms) group, 62% belonged to moderate Splenomegaly (4-7Cms) group, whereas 23% belonged to marked Splenomegaly group (>7 cms). None of our cases had massive Splenomegaly that is reaching beyond umbilicus.

Because of the multiplicity of factors responsible for Splenomegaly in tropics, more than one pathology contributes to an increase in splenic size in a particular patient.6 Commonest cause of mild Splenomegaly in this study was infections disorders, accounting for 66.66% of cases of mild Splenomegaly group. Commonest cause of moderate Splenomegaly was also found to be infections disorders, accounting for 45.16% of moderate Splenomegaly cases, followed by hematologic disorders. Commonest cause of massive Splenomegaly was found to be congestive disorders in present study, accounting for 21.73% of cases of massive Splenomegaly group. Commonest cause of Splenomegaly in 3m- 6 years and 7-12 years age group was of infections origin accounting for 37.09% and 59.25% respectively. Commonest cause of Splenomegaly in 13-18 years age group was hematologic comprising 36.36% of cases in this age group. Fever was the most common presenting feature in present study associated with Splenomegaly followed by cough, swelling of the face or feet, jaundice, breathlessness, pain in abdomen, distension of abdomen, vomiting, mass in abdomen, rash, failure to thrive and bleeding in decreasing order of frequency. In a study from Brazil, fever, pallor, weight loss and jaundice were the most common presenting symptoms.[7] Most studies quote that the fever is the most common presenting symptom associated with Splenomegaly.7,8,9,10 A study on

Hepatosplenomegaly and anaemia also observed that fever was the most common presenting symptom followed by abdominal distension, pallor, failure to thrive, edema, dyspnoea and jaundice.11 The most common sign associated with Splenomegaly was Hepatomegaly accounting for 78%of cases followed by anaemia (55%) and then lymphadenopathy (36%).

Table 1: Observed results compared to other studies

	Infections	Hematologic	Miscellaneous	Congestive	Malignancy	Undiagnosed	Storage disorder	Space Occupying lesions
Champatiray	50%	36%	4%	6%	8.1%	%	1.3%	-
Somaiah	68%	22.67	3.3%	2%	-	-	2%	-
Ali N	-	73%	-	-	18%	-	9%	-
Present Study	42%	25%	10%	8%	7%	4%	3%	1%

Infections (42%) were the most common cause of Splenomegaly in present study followed by hematologic (25%), miscellaneous (10%), congestive (8%), malignancy (7%), undiagnosed (4%), storage disorder (3%) and space occupying lesion (1%) of cases in decreasing order of frequency. Among infections, enteric fever was the most common etiology accounting for 7% of cases followed by malaria (5%). Among hematologic disorders, Thalassemia was the most commonly encountered disorder accounting for 7% of cases, followed by megaloblastic anaemia. Among the congestive disorders, portal hypertension secondary to cirrhosis (6%) was the most commonly encountered disorder. Among the malignant group of disorders, acute myeloid leukaemia (3%) was most commonly encountered followed by acute lymphoblastic leukaemia (2%) and hepatoblastoma (2%).

In Somaiah study, 68% of cases showed infectious etiology forming the most common cause of Hepatosplenomegaly in children. In the infectious group, 29.33% were due to Malaria, 13.33% were of Enteric Fever, 11.33% were due to Viral Hepatitis, 6.67% due to Tuberculosis, 4.67% due to Dengue fever, 2.67% are due to Septicemia.[12] In champatiray study, infections were the most common cause of Splenomegaly constituting 50% of the cases of which Malaria was most common.[13] In this study, to conclude infections group compromised 42 % of children with Splenomegaly whereas it was 50% in champatiray and 68% in somaiah study. Second common group in present study was hematologic compromising 25% of children which was almost similar to the study by somaiah i.e., 22.67% and was less compared to the study by Ali N. from Pakistan. Miscellaneous group compromised 10% in this study, where as it was 3.3% in study by Somaiah study. Congestive group compromised 8% in this study which was more compared to the study of Somaiah which had 2%, Reddy Y.R and friends in their study showed that mild Splenomegaly accounted for 57% of cases followed by moderate in 32% of cases, marked in 6% of cases and massive Splenomegaly in 5% of the cases[8]. Table 1 shows the results of the above-mentioned studies and the results of the present study to compare.

Diagnosis in every case was confirmed by routine, relevant and if required special investigations. USG abdomen's abdomen was done in all the cases to confirm the grade of Splenomegaly detected by

clinical examination. Treatment was directed towards the primary cause of Splenomegaly. Surgery if was advised wherever required like portacaval shunts in portal hypertension, excision in hepatoblastoma and Hydatid cyst.

Conclusion

Most of the cases was seen in 3 months-6 years age group (62%) and male preponderance (62%) was seen in present study. Moderate Splenomegaly (4-7Cms) was the most common in present study (62%). Commonest cause of moderate Splenomegaly was infectious disorders (45.16%) followed by Hematologic disorders (30.6%). Commonest cause of mild Splenomegaly was infections disorders (66.66%). Among infections, enteric fever was the most common etiology accounting for 7% of cases followed by malaria (5%).

Commonest cause of Splenomegaly in 1-6 years and 7-12 years age group was of infections origin accounting for 37.09% and 59.25%respectively. Commonest cause of Splenomegaly in 13-18years age group was Haematological disorders (36.36%).

Fever was found to be the most common presenting feature in present study The most common association with Splenomegaly was Hepatomegaly accounting for 78% followed by anaemia (55%) and then lymphadenopathy (36%).

Among hematologic disorders, Thalassemia was the most common disorder accounting for 7% of cases, followed by megaloblastic anaemia. Among the congestive disorders, Portal Hypertension secondary to Cirrhosis (4%) was the most common disorder.

Ultrasonography of the abdomen proved to be a useful tool to detect and confirm Splenomegaly.

Conflict of Interest: NIL

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Research Article

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Association of Heamoglobin Concentration during Pregnancy with Gestational Diabetes

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Abstract

The prevalence of gestational diabetes is rapidly rising, ranging from 9 to 26% of pregnancies globally. Much evidence has shown that hyperglycemia during pregnancy not only increases perinatal morbidity and mortality in both mothers and children but also increases features of disease later. A case control study carried out in the Department of Obstetrics and Gynecology at Al-Elwiya Teaching Hospital in Baghdad-Iraq during a period of one year from 1st of December 2021 till end of November 2022. It included 80 pregnant women with singleton pregnancy with viable fetus and gestational age ≥28 weeks and receiving iron supplement from the 2nd trimester of pregnancy or earlier. They were divided into two groups: Case group included 40 pregnant women who had diagnosed with gestational diabetes and control group included 40 healthy pregnant women without any complaint matched with the case group in age and gestational age. First trimester hemoglobin level taken from the medical records during antenatal care. In our study, Pregnant women with gestational diabetes had significantly higher mean of first trimester hemoglobin level compared with controls (12.04g/dl versus 10.99g/dl, p=0.001). First trimester hemoglobin level was found to be significant independent risk factor for greater likelihood of gestational diabetes. Higher hemoglobin level during pregnancy were associated with increased risk of gestational diabetes.

Keywords: Hemoglobin, Gestational diabetes, Pregnancy.

Introduction

Gestational Diabetes Mellitus (GDM) is defined as type of diabetes diagnosed during pregnancy that is not clearly type-1 Diabetes Mellitus (T1DM) or type-2 Diabetes Mellitus (T2DM). About 74% of hyperglycemia cases during pregnancy are the result of GDM, while the remaining 26% are due to preexisting T1DM or T2DM[(1)]. Many evidence has shown that hyperglycemia during pregnancy not only increases perinatal morbidity and mortality in both mothers and children but also increases features of disease later[(2)]. GDM is a pregnancy complication, in which hyperglycemia observed during pregnancy. According to the most recent International Diabetes Federation (IDF) estimates, GDM affects about 14% of pregnancies globally, representing about 18 million births annually[(3)]. The prevalence of GDM is rapidly rising, ranging from 9 to 26% of pregnancies globally, and is highest in ethnic groups that have a higher incidence of T2DM: Hispanic, African American, Native American, and Asian or Pacific Islander

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individuals. Etiology is related to the pancreatic β-cell dysfunction or delayed response of the β- cell to the glycemic levels, and insulin resistance secondary to placental hormonal release[4].

Iron found in diet in two forms, heme iron (15-35%), the type found predominantly in blood and muscle (lean red meat, chicken and fish) and absorbed better than non-heme iron (2-20%), which is predominantly found in plants and increase the risk of cancer, stroke, heart diseases and metabolic syndrome[5]. Pregnant women are particularly vulnerable to iron deficiency and related adverse pregnancy outcomes and, as such, are routinely recommended for iron supplementation. Emerging evidence from both animal and population-based studies, however, has raised potential concerns since significant associations observe between greater iron stores and disturbances in glucose metabolism, as increased risk of T2DM among non-pregnant individuals[6]. The iron expelled from the macrophage is quickly oxidized to ferric iron (Fe^{+3}) and bound to transferrin for transport to target sites, including the bone marrow for production of hemoglobin and the liver for storage[7]. The aim of study to determine whether hemoglobin levels were associated with increased risk of gestational diabetes.

Material and Methods

This was a case control study carried out in the Department of Obstetrics and Gynecology at Al-Elwiya Teaching Hospital in Baghdad-Iraq during a period of one year from 1st of December 2021 till end of November 2022. The study protocol was approved by the scientific counseling of obstetrics and Gynecology. All patients informed about the nature of the study and verbal consent was taken from them. The study included initially 80 pregnant women with singleton pregnancy with viable fetus and gestational age ≥28 weeks and they were divided into two groups: Case group: Included 40 pregnant women who had diagnosed with gestational DM.Control group: Included 40 healthy pregnant women without any complaint matched with the case group in age and gestational age. Inclusion criteria, Singleton pregnancy, diagnosed with GDM for patients in case group and hemoglobin levels during first trimester. Exclusion criteria: Pre-pregnancy conditions, such as previous diabetes mellitus, diseases affecting glucose metabolism, hypertension, chronic illness, medical treatments and supplementation with micronutrients other than iron.

Statistical analysis

The data analyzed using Statistical Package for Social Sciences (SPSS) version 26. The data presented as mean, standard deviation and ranges. Categorical data presented by frequencies and percentages. Independent t-test (two tailed) was used to compare the continuous variables accordingly. Receiver operating characteristic (ROC) curve analysis was used for first trimester hemoglobin level in predicting of GDM. Logistic regression analysis applied, using presence of GDM as the dependent variable and first trimester hemoglobin level as the independent variable. A level of P-value less than0.05 was considered significant.

FINDINGS

The total number of study patients were 80 pregnant women. They were divided into two groups: Case group included 40 pregnant women diagnosed with gestational diabetes and control group included 40 healthy pregnant women

Demographic and clinical characteristics: In case group, patients' age ranged from 18 to 40 years with a mean of 28.7 years and standard deviation (SD) of ±7.12 years, and 19 patients (47.5%) were aged<25 years. Age of the controls ranged from 18 to 39 years with a mean of 29.4±8.07 years, and 15 women (37.5%) were aged between (25–35) years. The calculated BMI showed that the highest proportion of case and control groups had normal Body mass index (BMI) level (45% and 52.5% respectively). We noticed that 8% of case group and 6% of controls were current smoker and had family history of diabetes; while the highest proportion of case and control groups were housewives (57.5% and 52.5% respectively) as shown in Table (1).

Table 1: Distribution of study groups by demographic characteristics.

Demographic Characteristics	Study Groups		Total (%) n=80
	Case(%) n=40	Control(%) n=40	
Age(Year)			
<25	19(47.5)	14(35.0)	33(41.3)
25-34	12(30.0)	15(37.5)	27(33.7)
≥35	9(22.5)	11(27.5)	20(25.0)
BMI level			
Normal	18(45.0)	21(52.5)	39(48.8)
Overweight	12(30.0)	16(40.0)	28(35.0)
Obese	10(25.0)	3(7.5)	13(16.2)
Smoking status			
Currents moker	8(20.0)	6(15.0)	14(17.5)
Nonsmoker	32(80.0)	34(85.0)	66(82.5)
Occupation			
Housewife	23(57.5)	21(52.5)	44(55.0)
Employee	10(25.0)	14(35.0)	24(30.0)
Student	7(17.5)	5(12.5)	12(15.0)
Family history of diabetes			
Yes	8(20.0)	6(15.0)	14(17.5)
No	32(80.0)	34(85.0)	66(82.5)

Concerning parity, 24(60%) of case group and 19(47.5%) of controls were nulliparous. The Gestational age (GA) was ≥ 37 weeks in 26(65%) and 30(75%) of the pregnant women in case and control groups respectively (Table 2).

Table 2: Distribution of the study groups by certain obstetrical characteristics

Obstetrical Characteristics	Study Groups		Total(%) n=80
	Case(%) n=40	Control(%) n=40	
Parity			
Nulliparous	24(60.0)	19(47.5)	43(53.8)
Multiparous	16(40.0)	21(52.5)	37(46.2)
GA (Weeks)			
28-36	14(35.0)	10(25.0)	24(30.0)
≥37	26(65.0)	30(75.0)	56(70.0)

The comparison between study groups by certain characteristics showed that there were no statistical significant differences between the two groups in terms of age, BMI, parity, and GA (P≥0.05).

First trimester hemoglobin level

In the present study, there was a statistically significant difference in first trimester hemoglobin level between the study groups. Pregnant women with GDM had significantly higher mean of first trimester hemoglobin level compared with controls (12.04g/dl versus 10.99g/dl, P=0.001) (Table 3 and Figure 1).

Table 3: Comparison in mean level of first trimester hemoglobin between study groups.

	Study groups		p-Value
First trimester hemoglobin level(g/dl)	Case Mean±SD	Control Mean±SD	
	12.04±1.15	10.99±1.0	0.001

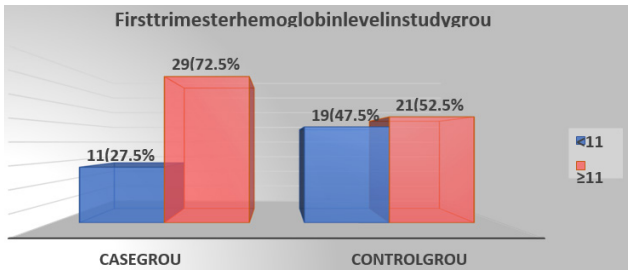

Figure 1: First trimester hemoglobin level in study groups.

Receiver operating characteristic (ROC) curve analysis was constructed for first trimester hemoglobin level as a predictor for GDM. The cut point of the first trimester hemoglobin level was 11.5g/dl. Hence, first trimester hemoglobin level >11.5 g/dl is a predictor for GDM, as a large significant area under the curve (AUC= 79.7%) indicating a significant association between the higher level of first trimester hemoglobin and having GDM. First trimester hemoglobin level was 82.5% sensitive, 80% specific, and 81.3% accurate in diagnosis of GDM (Table 4 and Figure 2).

Table 4: Diagnostic accuracy of first trimester hemoglobin level as a predictive marker for GDM.

First trimester Heamoglobin (Hb) level(g/dl)	Cut-off value	Sensitivity	Specificity	PPV(Positive predictive value)	NPV(Negative predictive value)	Accuracy
	11.5	82.5%	80%	80.5%	82.1%	81.3%

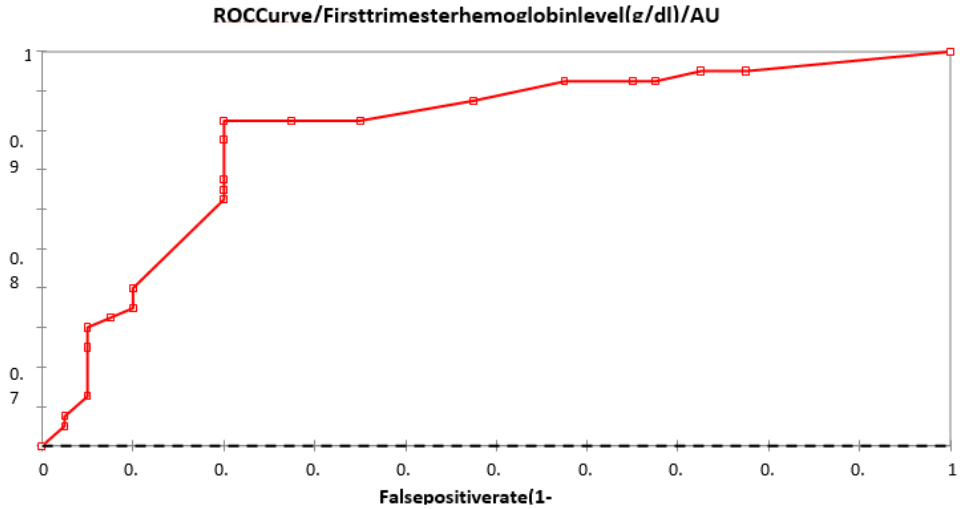

Figure 2: ROC curve for first trimester hemoglobin level in predicting of GDM.

Logistic regression analysis was applied (Table 5) using presence of GDM as the dependent variable and first trimester hemoglobin level as the independent variable.First trimester hemoglobin level was found to be significant independent risk factor for greater likelihood of GDM (OR=1.27, p= 0.031).

Table 5: Logistic regression analysis for association of first trimesterhemoglobinlevel with development of GDM.

First trimester Hb level (g/dl)	Odd'sratio (OR)	95% C.I for odd's ratio	p-value
	1.27	1.11–2.34	0.031

Discussion

In the current study, pregnant with GDM had significantly higher mean of first trimester hemoglobin level compared with controls (p=0.001). As compared to other studies, an agreement observed in study at 2022, in which 1828 patients with GDM were enrolled. They found that women with GDM had a significantly higher 1st trimester Hb levels, concluded that a higher Hb levels in the 1st trimester associated with an adverse metabolic profile leading to increased risk for GDM[8]. Similarly, 290 pregnant women with GDM were participated in study at 2021, in which researchers reported that the median of the hemoglobin levels during early pregnancy was significantly higher in women with GDM (p<0.014)[9]. In the same manner, 4337 pregnant women diagnosed with GDM were participated in another study, they found that women who subsequently developed GDM had significantly higher hemoglobin level in the 1st trimester than control subjects (P<0.05)[10].

This study reported that ROC curve analysis was constructed for first trimester hemoglobin level as a predictor for GDM. The cut point of the 1st trimester Hb level was 11.5 g/dl. Hence, 1st trimester Hb level > 11.5 g/dl is a predictor for GDM. 1st trimester Hb level was 82.5% sensitive, 80% specific, and 81.3% accurate in diagnosis of DM.

As compared to other studies, study evaluated the quality of Hb level by calculating the specificity, sensitivity, and area under the ROC curve for each developed model. Using Hb as a linear variable, crude Hb had 70.0% sensitivity and 42.0% specificity (ROC AUC 0.591, 95% CI [0.565; 0.617]) on prediction of GDM[8].

Logistic regression analysis, in this study, revealed that first trimester hemoglobin level was found to be significant independent risk factor for greater likelihood of GDM (OR=1.27, p=0.031). In the same accordance, a multicenter case–control study includes 1828 patients with GDM enrolled in study at 2022, in which a multivariable regression analysis revealed that Hb levels remained an independently risk factors for GDM after adjusting for key covariates (OR=1.019, 95% CI[1.007;1.031])[8]. Similarly, in 2021, study reported that results of the binary regression showed that a high haemoglobin level was the only factor associated with GDM (OR=1.52, 95% CI=1.07-2.16, p=0.019). Women with haemoglobin >10.8 g/dl were at a higher risk of GDM (OR=2.52, 95% CI=1.02-6.27, p=0.044)[9].

Indeed, maternal hemoglobin levels can indicate the status of the embryo. Its increase by more than 146 milligrams per deciliter can increase the incidence of stillbirths. High levels of maternal hemoglobin in the first trimester and the incidence of GDM and early detection of these disorders affect the preconception care in this group of mothers[11]. The relation observed in the current study and other studies in regard to the association between Hb levels and the risk of GDM seems biologically plausible. Notably, the results of different studies showed that women with high Hb levels had higher pre-pregnancy BMI, which suggested that the high Hb levels may be a consequence of their better nutritional status[12].

Accumulating evidence has demonstrated that iron is a strong pro-oxidant, and iron overload can increase β-cell oxidative stress, thus causing insulin resistance and impaired glucose metabolism[10].In this study, mean and SD of age in case group was 28.7±7.12 years, ranged from 18 to 40 years, of which 47.5% were aged <25 years. Regarding BMI, highest proportion of case and control groups had normal BMI level (45% and 52.5% respectively). Moreover, 20% of case group and 15% of controls were current smoker and had family history of diabetes; while highest proportion of case and control groups were housewives (57.5% and 52.5% respectively). Concerning parity, 60% of case and 47.5% of controls group were nulliparous, GA was ≥37 weeks in 65% of cases.

Four women had a past medical history of T_2DM and 9.6% of gravid mothers had a past medical history of GDM. Fourteen women reported previous birth complications (13%)[13]. In other study, mean and SD of the age was 28.02±5.7 years. Out of 254 women, 37(14.3%) women were rural residents, 62(23.9%) women had a history of miscarriage and 155(59.80) had a family history of T2DM. Around one third (29.3) of them were housewives and 32(12.40%) women had an education level≤ secondary level (11 years of education)[9]. In other study, majority were housewives (90%). Mean and SD of age was 23.8±2.94 years and the range was 18-33. Majority of them

(63.3%) were in the 21-25 age group and 25.8% were above 25 years of age. With respect to education, 8.3% of the women were illiterates, 9.2% had primary education, 65% had secondary education, and 17.5%, higher education. Half (50%) of them were primi-gravida[14]. In the present work, there were no statistical significant differences between the two groups in terms of age, BMI, parity, and GA.

By comparison to other study, an agreement reported, as found that there were no significant differences in maternal age, gestational age at diagnosis of GDM, BMI and parity between those with GDM and control group ($p>0.05$)[15]. This agrees with a previous study in which maternal age, parity, education, employment status, place of residence and previous pregnancy complications did not affect the risk of GDM among Ghanaian women enrolled[16]. Differently, the results obtained revealed a non-significant difference in age, parity between the women in participated in the study, BMI before gestation was similar in control and GDM women, despite a higher BMI in 2nd trimester ($p<0.05$)[17]. The difference reported above related to different sample size and different study design. Additionally, educational level, ethnic and socioeconomic factors were among the factors determined the difference reported above.

Conclusion

Higher levels of hemoglobin concentration during first trimester could be associated with glucose impairment during pregnancy. It can elevate glucose values at the OGTT test both in gestational diabetic and norm glycemic women.

Ethical Clearance: Verbal permission was obtained from each patient prior to collecting data, and all information's were anonymous. Names were removed and replaced by identification codes. All information kept confidential in a password secured laptop and data used exclusively for the research purposes.

Ethical approval was taken form ministry of Health committeein Iraq.

Conflict of Interest: The author declares that shehas no conflict of interest.

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Original Research Article

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Study on Anxiety and Loneliness among General Population in a City of South India

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Abstract

Background: The outbreak of corona virus disease 2019 prompted people to face a distressing and unexpected situation. In particular, restrictions due to the quarantine increased feelings of loneliness and anxiety. The risk of contamination and the experience of social distancing changed people's behaviors and deeply impacted individual feelings, daily habits, and relationships.

Objectives: The objectives of the study are to know the prevalence of anxiety and loneliness among general population and to study factors associating anxiety and loneliness in Tumkur city**.**

Materials & Methods: This Cross sectional study was conducted in Tumkur, Karnataka state. Study subjects were general population of age 18 yrs to 65 yrs. Study duration was from June 2020 to January 2021. 374 subjects were selected by purposive sampling.

Results: In our study, 374 subjects were examined ranging from age 18-65 years situated in, Tumkur. Out of 374 subjects 176 (47.1%) subjects had minimal anxiety followed by mild anxiety in 97 (25.9%) subjects and moderate anxiety in 64 (17.1%) subjects. 9.9% of the subjects had severe anxiety.

Conclusion: Mild to moderate anxiety and loneliness was seen among general population. Thus by proper communication by using the social network, video calling people can stay connected and thereby reducing the anxiety and loneliness during these tough times.

Keywords: Covid 19; Pandemic; Anxiety; Loneliness.

Introduction

The outbreak of corona virus disease 2019 (COVID-19) prompted people to face a distressing and unexpected situation. In particular, restrictions due to the quarantine increased feelings of loneliness and anxiety. The risk of contamination and the experience of social distancing changed people's behaviors and deeply impacted individual feelings, daily habits, and relationships. Uncertainty about

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the timeline of the growing pandemic strengthened people's fears.[1] India is no different from rest of the world, when it comes to the lockdown.[2] For Indians, Challenges in the medical sector, further deepens the worries that heighten psychological distress. Stress can be explained as a feeling of emotional and physical tension which arises from any event that threatens our homeostasis. On the other hand, the fear of the unknown is termed as anxiety, that is the body's natural response to stress.[3,4] Most people have a strong need for social relationships in which they find solidarity, affection, and connectedness. Feelings of loneliness and mental health problems are found to be the most serious consequences of bereavement.[5]

In times of an epidemic, people tend to experience fear of getting infected with the virus or disease resulting in anxiety, stress, and depression which is bound to happen when the time taken for curtailing the situation is rather long.[6] The most common precautions recommended to the general population were to increase hand hygiene, remain physically distant from others, self-isolate, avoid crowded public places, avoid travel and wear face-masks.[7-9] For many people, the COVID-19 pandemic prompted feelings of social isolation, uncertainty, depression, stress reaction, generalized anxiety, and fear of the virus.[7,8] As each country addressed the pandemic in its own specific manner and pace, it is possible that individual perceptions and reactions across countries varied. Thus far, there is a lack of larger-scale, longitudinal, cross-national comparative studies and comparisons on mental-health indicators.[10]

Several studies about anxiety and loneliness prevalence have been done in different parts of India, which shows that there is an increase in anxiety and loneliness prevalence. These studies not only help us to understand the severity and distribution of anxiety and loneliness but also in planning appropriate preventive measures. There is paucity of such data in the state and the literature review does not reveal many such studies from our area. In view of addressing the demand for this need, the present study was undertaken, with the objectives of determining the prevalence of anxiety and loneliness in Tumkur district and to study factors associating anxiety and loneliness. Thus, the present research is an attempt to fill this gap so that effective mental health management can be planned by practitioners and policymakers.

Materials and Methods

This Cross sectional study was conducted in Tumkur, Karnataka state. Study subjects were general population of age 18 yrs to 65 yrs. Study duration was from June 2020 to January 2021. The sample size was calculated as 310 based on the anxiety prevalence of 28 % and allowable error of 5 % and 95% confidence interval.[11] 374 subjects were selected by purposive sampling. Informed consent was taken from all the participants. As the study was conducted during the lockdown, the questionnaire was sent through social media using google forms. This study was conducted using generalized anxiety disorder 7 (GAD-7) scale and UCLA Loneliness scale.

Questionnaires with respect to anxiety includes: Feeling Anxious, Nervous and on Edge, Not being able to Stop or Control Worrying, Worrying too much about different things, Trouble relaxing, Being so restless that it's hard to sit still, Becoming easily annoyed or irritable, Feeling afraid as if something awful might happen. Questionnaire with respect to loneliness includes : I'm unhappy doing so many things alone, I have nobody to talk to, I can't tolerate being alone, I lack companionship, I feel as if nobody really understands me, I feel myself waiting for people to call or write, there is no one I can turn to, I'm no longer close to anyone, my interest and idea are not shared by those around me, I feel left out, I feel completely alone, I am unable to reach out and communicate those around me, my social relationship are superficial, I feel starved for company, no one really knows me well, I feel isolated from others, I am unhappy being so withdrawn, it is difficult for me to make friends, I feel shut out and excluded by others, people are around me but not with me.

Statistical Analysis

Data were compiled in an Excel worksheet. The Data was analyzed by using SPSS version 21.0. Descriptive statistics including frequency, percentage, mean, standard deviation was done. Chi square test was used to see association between anxiety and loneliness and other variables like age and sex. A P-value less than 0.05 was considered statistically significant.

Results

In our study, 374 subjects were studied ranging from age 18-65 years situated in, Tumkur. The mean age of the study population was 25.155 and standard deviation of 10.690.

Table 1: Socio Demographic Characteristics of Study Population

Socio Demographic Profile		Frequency	Percentage
Age (In years)	<18	60	16.0
	19-25	230	61.5
	26-40	52	13.9
	>40	32	8.6
Sex	Female	209	55.9
	Male	165	44.1
Marital Status	Single	315	84.22
	Married	59	15.77
Total		374	100.0

Majority of study subjects belong to 19 to 25 years age group that is 230 (61.5%) followed by less than 18 years age group 60 (16%). Among 374 people 165 (44.1%) were males and 209 (55.9%) were females. With respect to marital status of the population, among 374 people 315(84.22%) were single and 59 (15.77%) were married.

Table 2: Prevalence of Anxiety among Study Population

	Frequency	Percentage
Minimal Anxiety	176	47.1
Mild Anxiety	97	25.9
Moderate Anxiety	64	17.1
Severe Anxiety	37	9.9
Total	374	100.0

In our study out of 374 subjects 176 (47.1%) subjects had minimal anxiety followed by mild anxiety in 97 (25.9%) subjects and moderate anxiety in 64 (17.1%) subjects and 9.9% of the subjects had severe anxiety.

Table 3: Prevalence of Loneliness among Study Population

	Frequency	Percentage
Low Degree	186	49.7
Moderate Degree	100	26.7
Moderately High Degree	56	15.0
High Degree	32	8.6
Total	374	100.0

In our study out of 374 subjects 186 i.e. 49.7% of the subjects had low degree of loneliness, followed by 100 i.e. 26.7% of the subjects had moderate degree of loneliness and 56 (15%) of the subjects had moderately high degree of loneliness and high degree of loneliness was seen in 8.6% of the subjects.

Table 4: Association between Socio Demographic Characteristics and Anxiety among study population

Parameters		Anxiety				Total
		Minimal	Mild	Moderate	Severe	
Age (In years)	<18	33(55.0 %)	13(21.7%)	08(13.3%)	06(10.%)	60(100%)
	19-25	106(46.1%)	57(24.8%)	45(19.6%)	22(9.6%)	230(100%)
	26-40	22(42.3%)	19(36.5%)	7(13.5 %)	4(7.7%)	52(100%)
	>40	15(46.9%)	8(25.0%)	4(12.5 %)	5(15.6%)	32(100%)
		P=0.600				
Sex	Male	76(46.1%)	42(25.5%)	31(18.8%)	16(9.7%)	165(100%)
	Female	100(47.8%)	55(26.3%)	33(15.8%)	21(10.%)	209(100%)
		P=0.636				

The chi square test was applied to see the association between age and sex with anxiety. Statistical analysis showed that level of anxiety was different in different age groups and gender and it was not statistically significant, p value 0.600 and 0.636 respectively.

able 5: Association between Socio Demographic Characteristics and Loneliness among study population

Parameters		Loneliness				Total
		Low degree	Moderate	Moderately high	High	
Age (In years)	<18	39(65.0 %)	12(20.0%)	06(10.0 %)	03(5.0%)	60(100%)
	19-25	106(46.1%)	63(27.4%)	37(16.1 %)	24(10.%)	230(100%)
	26-40	21(40.4%)	18(34.6%)	10(19.2 %)	3(5.8%)	52(100%)
	>40	20(62.5%)	7(21.9%)	3(9.4%)	2(6.2%)	32(100%)
		P=0.166				
Sex	Male	70(42.4%)	54(32.7%)	26(15.8%)	15(9.1%)	165(100%)
	Female	116(55.6%)	46(22.0%)	30(14.4%)	17(8.1%)	209(100%)
		P=0.061				

The chi square test was applied to see the association between age and sex with Loneliness. Statistical analysis showed that level of Loneliness was different in different age groups and gender and it was not statistically significant, p value 0.166 and 0.061 respectively.

Discussion

In our study, 374 subjects were included ranging from age 18-65 years. 176 (47.1%) subjects had minimal anxiety followed by mild anxiety in 97 (25.9%) subjects and moderate anxiety in 64 (17.1%) subjects. 9.9% of the subjects had severe anxiety. 186 i.e. 49.7% of the subjects had low degree of loneliness, followed by 100 i.e. 26.7% of the subjects had moderate degree of loneliness and 56 (15%) of the subjects had moderately high degree of loneliness and high degree of loneliness was seen in 8.6% of the subjects.

With respect to loneliness, 13.90% of them often feel that "I'm unhappy doing so many things alone", 9.62% of them often feels that "I have nobody to talk to", 9.62% of them often feels that "I can't tolerate being alone", 9.09% of them often feels that "I lack companionship", 13.36% of them often feel that "I feel as if nobody really understands me", 11.49% of them often feel that " I feel myself waiting for people to call or write", 8.02% of them often feel that " there is no one I can turn to", 8.28% of them often feel that " I'm no longer close to anyone", 10.42% of them often feel that " my interest and idea are not shared by those around me", 8.28% of them often feel that " I feel left out", 11.22% of them often feel that " I feel completely alone", 8.28% of them often feel that " I am unable to reach out and communicate those around me", 9.62% of them often feel that " my social relationship are superficial", 9.3% of them often feel that " I feel starved for company", 12.29% of them often feel that "no one really knows me well", 6.68% of them often feel that "I feel isolated from others", 6.14% of them often feel that "I am unhappy being so withdrawn", 7.21% of them often feel that "it is difficult for me to make friends", 7.21% of them often feel that "I feel shut out and excluded by others", 13.36% of them often feel that "people are around me but not with me".

This research shows that during COVID-19 pandemic, social loneliness increased slightly. A comparison with the situation earlier to Covid 19 demonstrates the consequences of the pandemic. To the best of our knowledge, there are only two other studies on loneliness before and during the pandemic. In cross-cohort analyses, Bu et al,[12] assessed a loneliness prevalence of 37% among adults of all ages in 2017–2019. During the pandemic in 2020 they found a loneliness prevalence of 51%.[13] The reasons for the anxiety and loneliness may be due to low contact frequency with children and grandchildren. Many older adults may have sought alternative modes of contact and used contact via social media as a substitute for in-person contact.[14]

To restrict the spread of this disease, many governments across the world enforced 'lockdowns'

of varying degrees and in India, the lockdown came into force on 24th March 2020 and was enforced for 21 days following which, on April 14th, 2020, this lockdown was extended up to 17th May 2020, taking the total number of days under lockdown to beyond 50 days.[15] In the present study, we looked into the lockdown related mental health changes among the general population considering the sense of demoralization and despair during the covid–19 pandemic where perhaps they were forced to live alone and were consequently suffering from loneliness and social isolation which account as well-known risk factors for suicide in late life, similar results are obtained by study conducted by de Leo D et.al.[16] A study done by Usama Rehman *et al.*,[17] showed that anxiety and stress not only depend on the financial resources of the family but are also related to the socio-economic status of a family.

Research indicates that anxiety and loneliness can lead to psychological distress, which has the potential to develop into long-term and severe mental illness.[18] Loneliness, in particular, is a prominent risk factor for future anxiety and depression; thus, we also aimed to investigate whether certain subgroups of the population samples demonstrated poorer mental-health outcomes compared to others. Thus, we believe that healthcare systems would benefit from identifying subgroups of individuals who are more susceptible to anxiety and loneliness during the physical-distancing phases of lockdowns in order to reduce downstream healthcare burdens.

Limitations

Some of the challenges faced during the study included the limited outreach services with regards to the Covid–19 pandemic which made it a little difficult for data collection. We could not separately mention any participants having co-morbid conditions as they were likely to experience more psychological stress this could result in a bias in the outcome. We did not grade or compare the psychological problems faced by individuals in the pre-COVID 19 era ; this would have more clearly delineated the exacerbation experienced due to lockdown and social isolation.

Conclusion

Mild to moderate anxiety and loneliness was seen among general population. Reassurance, Counseling and social and economical support is needed to these individuals. Also proper communication by using the social network and by video calling, people can stay connected and thereby reducing the anxiety and loneliness during these tough times.

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Conflict of interest: None.

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Original Article

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Health Gadgets usage among Healthcare Personnel in the Perambalur Municipality area of Tamilnadu, India

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Abstract

Introduction: Health gadgets are worn 24/7 to capture biometric data. However, there is limited data on the use of wearable devices in India. Therefore, the present study aims to assess the attitudinal and behavioral predictors of use of health apps and to determine the association between the use of health-related apps and various socio-demographic factors.

Materials and Methods: We carried out the cross-sectional study among 601 medical professionals using a semi-structured questionnaire from November 2021–May 2022. The questionnaire contained six parts: demographic details; knowledge about health gadgets; types of health gadgets; and practice of health gadgets. We analyzed the collected data using SPSS version 21 software.

Results: This survey included 340 health gadget users (56.6 percent). Nearly 226 (66.9%) healthcare personnel said the apps were easy and good, and 194 (57.4%) thought the time spent using them was appropriate. Nearly 38.7% of participants had never heard of health applications, and 10.3% have no health apps or gadgets.

Conclusion: Using health gadgets or wearable devices was significantly high among healthcare personnel, and the level of satisfaction was also high among them. The influence of social factors like gender and education was also significant for the use of wearable devices.

Keywords: Health gadgets, Healthcare personnel, health app, fitness, wearable devices

Introduction

Consumers use wearable gadgets, also known as "health gadgets," all the time and everywhere, to record or track biometric data about their health or fitness. [1] Using biometric tracking in wearable technology is one of the major sources of data generation. [2] They will keep track of information of many different kinds and from many different places and times without stopping.[3] A variety of sensors

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are built into these wearable devices, such as smart watches, wristbands, health apps for mobile phones, iPads, etc. [4]

These sensors can detect users' locations, physical activities, and physiological information like heart rate, SpO2, and other data in realtime.[5] At present, the utilization of these technologies in health monitoring and medical diagnosis has reached unprecedented heights.[6]

In recent years, most of the global population (especially students) have used smartphones because of their wide range of applications, and after the COVID-19 lockdown, the use of health promotion applications has gained further importance.[7] The iTunes and Google Play shops both offer over 100,000 health-related apps, making them highly popular. [8] This huge number shows both how big the market is for new tools to help people reach their diet, fitness, and weight goals and how limited the current healthcare system is in its ability to provide these tools.[8]

These health apps not only promote personal health but can also play a vital role in patient education, disease self-management, remote monitoring of patients, and the collection of dietary data. Hence, it is not surprising that mobile health (mHealth) apps have been a topic of investigation in health care in recent days.[9,10]

Even though the number of people who own mobile phones and use health apps has grown a lot, and they have the potential to improve health, there is still a lack of clinical evidence for how well they work, as well as a lack of integration with the healthcare delivery system, the need for formal evaluation and review, and risks to privacy and safety.[11,12]

Although previous studies have described the sociodemographic factors associated with mobile health application usage, it is a rapidly developing area where the most recent published data is more reliable than older data. There is a lack of information on the users of health apps in terms of their sociodemographic and health characteristics and health behaviors.[10] This information is important for future health-improving initiatives and for identifying appropriate uses of health applications among population groups. Lack of a robust tool for interpreting the impacts of wearable technologies and maximizing their efficiency. Even though there are a lot of studies, not much is known about how people in India use wearable devices.

Therefore, the present study would serve as a benchmark for future studies and aims to assess the attitudinal and behavioral predictors of the use of health apps for health promotion and to determine the association between the use of health-related apps and various socio-demographic factors.

Materials and Methods

Study design

The present study is a cross-sectional, analytical study.

Study population, place, and duration

We carried out a cross-sectional study among healthcare personnel working in tertiary care hospitals in Perambalur. Perambalur, a district in Tamil Nadu, India, is convenient in the central part of the state, approximately 267 kilometers south of Chennai. The data collection was interview-based, and the study period was from November 2021–May 2022.

Ethical clearance and informed consent

Before the study began, we got an ethical clearance certificate from the Institutional Ethics Committee of Dhanalakshmi Srinivasan Medical College and Hospital (approval number: IECHS/IRCHS/No.122). Before consenting to take part in the study, we informed participants of the study's goals.

Inclusion and exclusion criteria

We have collected the data from all physicians and healthcare personnel during their hospital working hours at a tertiary care hospital in Perambalur. We included all medical and paramedical personnel as study participants. If a study participant was on leave or not present during the time of the survey, we did

not include them in the study.

Sample size

According to a study conducted by Ranganathan Chandrasekaran et al., 30% of people use wearable health devices.[13]Considering the above prevalence, we calculated the sample size using the formula, n = $3.84*p*q/d^2$ [p = 30, q = 70, d = 5], and the sample size came up to 333. Considering a 10% non-responsive rate, the final calculated sample size was 366, and the present study collected data from 601 healthcare personnel. To collect data, we used a quota sampling method to select study participants, stratifying them based on gender and educational qualification.

Data collection procedure

We carried out a direct face-to-face interview among the health professionals using a semi-structured questionnaire. The questionnaire contained six parts: demographic details; knowledge about health gadgets; types of health gadgets; and practice of health gadgets. The general characteristics included age, gender, professional level, co-morbidity, sleep pattern, dietary changes, physical activity, behavioral changes, and awareness of health. During the data collection, we didn't get any personal information from the respondents, like their names, email addresses, or places of work.

Data entry and analysis

We entered the collected data into Microsoft Excel (Microsoft Corp., Redmond, WA, USA) and analyzed using SPSS version 21 (IBM Corp., Armonk, NY, USA) software. The descriptive analysis was done, and we represented the data as frequency and percentage, or mean and standard deviation. Further, we did inferential analysis using appropriate statistical tests, like the Chi-square test.

Results

We classified the participants into health gadget users and non-users. The total number of health gadget users was 340 (56.6%). (Figure 1)

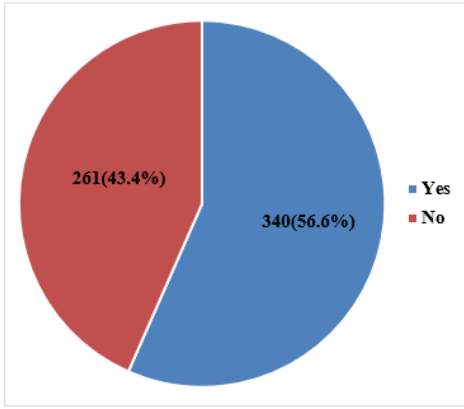

Figure 1: Heath gadgets utilization among healthcare personnel (n=601)

Among the health gadget users, 152 (47%) were male and 188 (53%) were female. There were 72 (27.5%) men and 189 (72.4%) women among non-users of health gadgets. (Table 1)

Most of the participants were medical students, followed by doctors, staff nurses, and paramedical workers. Among 601 participants, 263 (77.4%) of medical students, 48 (14.1%) of doctors, 20 (5.9%) of staff nurses, and 9 (2.6%) of paramedical workers use health gadgets. In contrast, 170 (65.1%) of medical students, 26 (10%) of doctors, 52 (19.9%) of staff nurses, and 13 (5%) of paramedics did not use health devices. The total participants with comorbidities were 43 (57.3%) among health gadget users and 32 (42.7%) among health gadget non-users. (Table 1)

Following comorbidities were present among the participants who were using health gadgets:4 (1.2%) had diabetes mellitus, 6 (1.8%) had hypertension, 2 (0.6%) had coronary artery disease, 22 (6.5%) had obesity, 6 (1.8%) had hypothyroidism, 14 (4.1%) had PCOD, and 4 (1.2%) had other comorbidities. Among the participants who were not using health gadgets, 2 (0.8%) had diabetes mellitus, 5 (1.9%) had hypertension, 1 (0.4%) had coronary artery disease, 12 (4.6%) had obesity, 7 (2.7%) had hypothyroidism, 9 (3.4%) had PCOD, and 3 (1.1%) had other comorbidities.

Table 1: Bivariate analysis of health gadget usage with socio-demographic factors (n=601)

Demographic Variables	Health Gadgets Users, N (%)	Health Gadgets Non-Users N, (%)	P Value
Age			
18-29yrs	321(57.6)	236(42.4)	0.113
30-39yrs	14(45.2)	17(54.8)	
40-49yrs	5(50)	5(50)	
50-59yrs	0	3(100)	
Sex			
Male	152(67.9)	72(32.1)	<0.001
Female	188(49.9)	189(50.1)	
Education Qualification			
Medical Students	263(77.4)	170(65.1)	<0.001
Doctors	48(64.9)	26(35.1)	
Staff Nurses	20(27.8)	52(72.2)	
Paramedical Workers	9(40.9)	13(59.1)	
Comorbidities			
Yes	43(57.3)	32(42.7)	0.902
No	297(56.5)	229(43.5)	

Among 601 participants, 211 (35.1%) people were aware of health gadgets, and 390 (64.9%) people were not aware of health gadgets. (Figure 2)

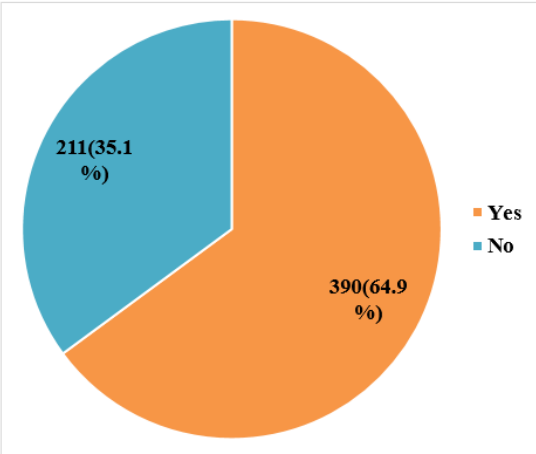

Figure 2: Heath gadgets awareness among healthcare personnel (n=601)

Only 116 (34.4%) people update their height daily, while 224 (64.9%) do not update their height at all. Nearly 193 (56.8%) track weight, 160 (47.1%) track calorie intake, and 218 (64.1%) track physical activity. The healthcare personnel use health gadgets for the following reasons: 267 (78.5%) for tracking fitness, 160 (47.3%) for tracking water intake, and 150 (44%) for monitoring sleep intervals. (Table 2)

Table 2: Distribution of health gadget usage characteristics among health gadget users (n=340)

Characteristics	Frequency, N	Percentage (%)
Daily health tracking		
Height Tracking		
Yes	116	34.4
No	224	65.9
Weight Tracking		
Yes	193	56.8
No	147	43.2
Calorie Intake Tracking		
Yes	160	47.1
No	180	52.9
Physical Activity Tracking		
Yes	218	64.1
No	122	35.9
Reasons for using Health Gadgets		
Fitness Tracking		
Yes	267	78.5
No	73	21.5
Tracking Calorie Intake		
Yes	186	55
No	152	45

Continue.....

Tracking Water Intake		
Yes	160	47.3
No	178	52.7
Monitoring Sleep Interval		
Yes	150	44
No	188	55.6

Use of health applications and gadgets had the following impacts on the participant's lifestyle: 239 (70.3%) increased in consumption of fruits and vegetables; 277 (81.5%) increased in water intake; 101 (53.8%) avoided taking cool drinks or beverages; 272 (80.0%) started doing more physical activity; and 216 (63.5%) regularized their sleep pattern. (Figure 3)

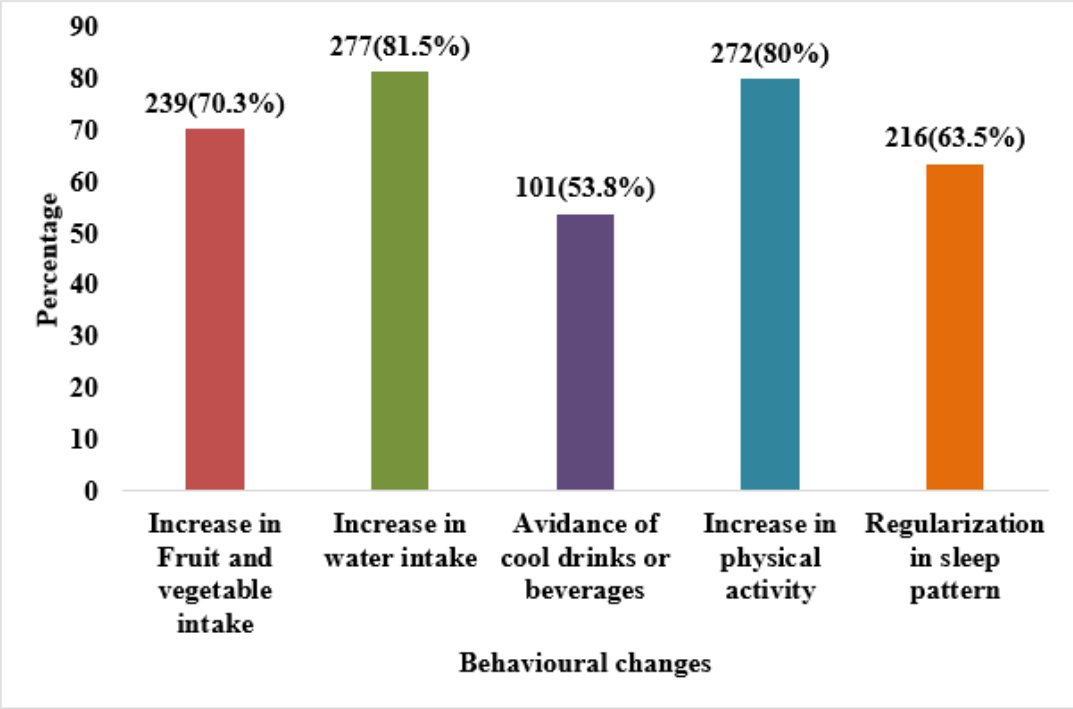

Figure 3: Behavioral adaptations following health gadget usage (n=340)

Nearly 226 (66.9%) felt that the health applications are easy and good to use, and 194 (57.4%) agreed that the time spent on using them is acceptable. While 98 (29%) thought the health applications were unfriendly, 50 (14.8%) thought they were boring to use. (Table 3)

Table 3: Attitude towards health apps and gadgets (n=340)

Attitude	Agree	Not sure	Disagree
Easy And Good to Use	226(66.9%)	106(31.4%)	8(1.8%)
Time Spent Using It Was Acceptable	194(57.4%)	136(40.2%)	10(2.4%)
Difficult To Remember to Use It	98(29%)	158(46.7%)	84(24.3%)
Boring To Use	50(14.8%)	164(48.5%)	126(36.7%)
Can Recommend It to Others	189(55.9%)	139(41.1%)	12(3.0%)

Nearly 205 (60.7%) participants felt that health applications motivated them to change their lifestyle habits and helped them understand the benefits of improving their lifestyle. Nearly 196 (58%) of those polled agreed that these health apps also helped them set personal goals for their lives. (Table 4)

Table 4: Experience in using health apps and gadgets (n=340)

Experience	Agree	Not sure	Disagree
Motivated me to change the lifestyle habits	205(60.7%)	119(35.2%)	14(4.1%)
Helped me to understand the benefits of improving my lifestyle habits	207(61.2%)	122(36.1%)	9(2.7%)
Helped me with ways to change my lifestyle habits	213(63%)	113(33.4%)	12(3.6%)
Helped me set personal goals for my lifestyle habits	196(58%)	128(37.9%)	14(4.1%)

Nearly 101 (38.7%) did not know about health apps; 27 (10.3%) did not have health apps or gadgets; 52 (19.9%) do not trust them; 79 people (30.3%) thought the health gadgets were useless; 99 people (37.3%) said they didn't have enough time to use them; and 128 people (49% said they didn't want to use them). (Table 5)

Table 5: Reasons for not using health gadgets (n= 261)

Reasons	Agree	Not sure	Disagree
Haven't heard of health apps	101(38.7%)	91(34.9%)	69(26.4%)
Not having phone or health gadgets	27(10.3%)	72(27.6%)	162(62.1%)
Don't trust them	52(19.9%)	133(51%)	76(29.1%)
Unnecessary	79(30.3%)	120(46%)	62(23.8%)
Not enough time to use	99(37.9%)	108(41.4%)	54(20.7%)
Lack of motivation to use	128(49%)	100(38.3%)	33(12.6%)

Discussion

We have carried out a cross-sectional study to assess the utilization and the level of satisfaction and motivation to use health gadgets among healthcare personnel in Perambalur. Based on our study, the health gadgets' utilization was 340 (56.6%).

Most of the study participants were medical students (263, or 77.4%) in our study. This contrasts with the study conducted by Neethu George et al.,[14] where 43.5% were doctors and 40.5% were medical students. This difference could be because of differences in study location and study setting.

In our study, four people (1.2%) with diabetes mellitus, six (1.8%) with hypertension, two (0.6%) with coronary artery disease, 22 (6.5%) with obesity, and six (1.8%) with hypothyroidism were using health gadgets. In contrast, Anastasia Kononova et al. found that 4 (44%) people with diabetes, 6 (67%) with hypertension, 2 (22%), with coronary artery disease, 4 (44%) with obesity, and 3 (33%) with hypothyroidism used health gadgets.[15]

In keeping with the findings of previous studies, we found that healthcare personnel have good awareness of and attitudes toward mHealth apps.[16,17] This may be because of the large number of people who use mobile devices because of urbanization and India's rising socioeconomic standing. The high number of smartphone owners was consistent with the global trend. An important factor in the deployment of mHealth technologies is public health awareness.[18] In our study, we motivated more than half of the users of health gadgets to embrace this technology to promote health outcomes. Similarly, many studies have found the same behavior among medical professionals.[19–22]

Under health-related impact, participants who are using health apps have observed some changes in their lifestyle habits, such as 239 (70.3%) who started an increase in consumption of fruits and vegetables, 101 (53.8%) who avoided taking cool drinks or beverages, and 272 (80.0%) who started doing more physical activity. Similarly, in a study conducted by Jennifer K. Carroll et al., 545 (63.7%) increased in their consumption of fruits and vegetables, 630 (84.96%) avoided taking cool drinks or beverages, and 707 (82.9%) started doing more physical activity.[8]This difference is primarily because Jennifer K. Carroll et al.'s study population is the public.

The association between health app use, intention to change lifestyle behaviors, and meeting recommendations for healthy lifestyle factors is interesting and could be because of several reasons. First, there may be differences between people who use health apps and those who don't, even before they use them.

Users of health apps may have greater motivation and interest in changing their diet, weight, or physical activity. A recent review found that very few apps help people meet lifestyle recommendations based on evidence.[23]Maybe app users are engaging with health apps to help them simply track or self-manage differently than their counterparts; thus, there could be differences in preferences or needs. Because the data only shows correlations, we can't say anything about relationships or chains of events.

The number of studies investigating the usage of wearable health gadgets by medical professionals is scarce.[24,25] It is one of the major strengths of our study, and it throws light into a dark area.

Limitations One of the major limitations of the study was that the number of questions limited us. For example, we did not have details about specific health apps or features of apps used, the intensity of use, whether the apps were interactive and linked to other health promotion supports, or other strategies used for health behavior change. One other limitation was that we restricted the study population to a single setting, which may affect the generalizability of the results. The study did not look at the effects of using health gadgets. We did not compare the urban and rural variations in the usage of health gadgets.

Conclusion

Using health gadgets or wearable devices was significantly high among healthcare personnel, and the level of satisfaction was also high among them. The influence of social factors like gender and education was also significant for the use of wearable devices.

Although variations in gender and educational achievement still exist, many individual sociodemographic characteristics are losing their influence on mobile device engagement and the usage of health apps. As healthcare undergoes technological advancement, the use of health gadgets and applications to monitor and share data is not very far off. This study adds to the literature by providing up-to-date information on health gadget utilization and aids in determining the reasons for non-utilization. The purpose of this study is to serve as a guide for commercial developers and public health programs when designing eHealth technology, with a focus on innovations and developments.

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Conflict of Interest: Nil

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Original Study

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Food-related Taboos during Pregnancy and Lactation among Women of Rural Haryana: A Cross-sectional Study

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Abstract

Background: Pregnancy and lactation are those physiological periods when nutrient demands are considerably increased. Food taboos practiced during these periods influence food's nutritional quality, which subsequently affects pregnancy and birth outcomes.

Aim: To study the food practices and related taboos during pregnancy and lactation among women in households of village Juan, Sonepat, Haryana

Material and Methods: This cross-sectional study was conducted among 90 study households selected by systematic random sampling from September to October 2021. Data were collected by interviewing a female respondent from each household using an open-ended questionnaire.

Results: During pregnancy, the most commonly consumed foods were milk (98.9%), green leafy vegetables (96.7%), and fruits (91.1%); whereas avoided foods were spicy foods (35.6%), oily/fried foods (34.4%), papaya (31.1%), sapota (13.3%) due to fears of miscarriages and maternal deaths.

During lactation, the most commonly consumed foods were soft porridge with butter (98.9%), milk with dry dates (41.1%), and cumin water (37.8%). Foods commonly avoided were cold foods such as buttermilk/curd (95.6%), rice (54.4%); whole pulses (35.5%) due to fear of cough/cold and colic in baby.

Conclusion: A substantial proportion of study households had good practices of consuming foods rich in essential nutrients but were restricted by a few study households.

Keywords: food taboos, pregnancy, lactation, households, Haryana

Introduction

Nutrition plays a quintessential role in maternal and child health.[1] Nutritional requirement increases physiologically during pregnancy and lactation.[2,3] The diet must include an adequate intake of energy in the form of proteins, vitamins, and minerals to

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meet the increased needs and to prevent "nutritional stress" during pregnancy and lactation. Even though adequate dietary intake could be affected by many factors including affordability and accessibility, food taboo has been recognized as one of the factors contributing to maternal and child malnutrition during pregnancy as well as after delivery.[1,2] Food taboos and beliefs are a global phenomenon intended to positively affect the practicing community, including conserving a scarce or sacred resource, maintaining social norms, morals, group cohesion, and identity, and protecting human health.[4] These determine not only the consumability of food but prescribe foods during particular phases of the life cycle such as pregnancy and childbirth and are crucial in the acceptance, rejection, and promotion of certain food items.[1] These are associated with traditional beliefs such as difficult delivery, fear of abortion, fetal abnormalities, premature or low birth weight babies who are also at a substantially increased risk of stunting during childhood, and reduced mental and physical capacity.[1,2,4,5] Consumption of special food is mainly to improve the quality and quantity of milk, strengthen the baby, and improve hemoglobin.[1] The practice of food taboo is widespread in developing countries, and varies from society to society, depending on geography, ecology, religion, culture, tradition, and belief system.[1] The "hot" and "cold" theory of humoral medicine is deeply rooted in Asia and other developing countries. The general belief is that "hot" foods are harmful and "cold" foods are beneficial during pregnancy. "Hot" foods such as lentils, meat, and eggs are encouraged during the last stage of pregnancy to aid the expulsion of the fetus. "Cold" foods such as cucumber, and watermelon are recommended during pregnancy because they are believed to increase body water and enhance fetus comfortability in the womb.[2] Cold and spicy foods are avoided during lactation.[3] In India, most food practices and traditions have stemmed from deeply rooted traditions and customs, especially in rural settings.[1,5] Every household has some traditions of avoidance or acceptance of food and all member shares these food taboos and beliefs. These are followed as a symbol of respect for elders, may or may not have any scientific basis, and may sometimes lead to negative health outcomes such as lack of nutrition.[2,6] They may influence women to disobey the recommendations or advice from health care practitioners.[1]

In the Sonipat district of Haryana, a total of 61% of pregnant women between the age of 15 to 49 years were reported anemic indicating that the maternal nutritional status is vulnerable.[7] Therefore, this unique and demanding situation (nutrition stress) needs to be addressed with an adequate diet (both quantitatively and qualitatively).[1]

So, this study was undertaken to find out the food practices and related taboos during pregnancy and lactation among women in households of a rural area of district Sonipat, Haryana which affect their nutritional status to a greater extent.

Material and Methods

A community-based cross-sectional study was conducted from September to October 2021 among households of the village Juan, the field practice area of the Department of Community Medicine, Bhagat Phool Singh Government Medical College, Khanpur Kalan Sonepat. It is habituated by around 950 households as per the record maintained by the Department of Community Medicine.

Study population: All the households in Village Juan constituted the sampling frame. A list of all the households that were located at least for 6 months or more was obtained from the Department of Community Medicine.

Sample size: 10% of the sample size (90 Households)

Sampling Technique: The study households were selected through Systematic random sampling. As there were around 950 households and 90 households were chosen, the sampling interval calculated was 10. The first house was chosen at random using a lottery method. Following that, every 10th household was selected for data collection.

Study tool: A married woman more than 18 years of age from each selected study household was interviewed using an open-ended study schedule regarding food-related taboos during pregnancy and lactation. If a household had more than one eligible woman, one woman was randomly selected and interviewed.

Inclusion criteria: The households that were located for 6 months or more were included in the study

Exclusion criteria: Households that didn't give written informed consent were excluded.

Statistical analysis: The data were collected from the study households and entered in the Microsoft Excel spreadsheet 2019. Following the cleaning of data, it was analyzed using Statistical Package for Social Sciences for Windows, Version 16.0. Chicago, SPSS Inc. The data were expressed in terms of frequency, and Proportion.

Ethics approval

This study was carried out in accordance with the Helsinki Declaration of 1975, which was later amended in 2013. We explained the study's purpose and procedures and their right to withdraw at any time. The participants' biological samples were not collected. The study participants provided informed written consent. The participants' confidentiality and anonymity were strictly maintained. Data access was restricted to the study's investigators only. Ethics approval was taken from the Institutional Ethics Committee of BPS GMC (W), Khanpur Kalan, Sonepat (Reg. no. BPSGMCW/RC 637/IEC/20). Following the completion of data collection from each study household, health education was provided to all women in that study household. They have explained the scientific reasons for the food practices and taboos in the study household.

Results

Table 1: Distribution of the study households by their self-reported avoidance of selected foods during pregnancy

Foods avoided (n=90 for each food item)	n (%)	Reasons for avoidance
Spicy foods	32 (35.6)	Causes heartburn
Oily/ fried foods	31 (34.4)	Causes heartburn, nausea, and vomiting, and increases the mother's blood pressure
Papaya	28 (31.1)	Abortifacient
Sapota	12 (13.3)	Abortifacient
Cauliflower/ cabbage	12 (13.3)	forms a gas to the mother
Brinjal	11 (12.2)	Darkens the skin of baby
Hot foods*	11 (12.2)	Abortifacient
Potato	8 (8.9)	Excessive weight gain to the mother
Tea	7 (7.8)	Causes heartburn
Sweet foods	6 (6.7)	Causes eczema, Excessive weight gain to the mother/ Makes the baby big/difficult delivery
Eggs	5 (5.6)	Abortifacient
Bitter gourd	4 (4.4)	Darkens the skin of the baby
Ladyfinger	3 (3.3)	hard to digest and bloating to the mother
Nonvegetarian foods	3 (3.3)	Abortifacient

*Carom seeds, honey, coffee

Table 1 reveals that one-third of study households reported avoidance of spicy food (35.6%), oily or fried foods (34.4%) and less than one-tenth (7.8%) avoided Tea as these were considered to cause heartburn during pregnancy. Almost one-third (31.1%) of study households reported avoidance of papaya and more than one-tenth of study households reported avoidance of sapota (13.3%), as well as hot foods (12.2%) such as carrom seeds, honey, and coffee. Five study households reported avoidance of eggs, three avoided nonvegetarian foods such as meat, and chicken and only one avoided banana (not shown in the table) during pregnancy as these were considered abortifacients. Thirteen percent of study households reported avoidance of Cauliflower/cabbage and 3.3% reported avoidance of Ladyfinger as these were considered hard to digest and bloating to the mother during pregnancy.

Nine percent (8.9%) of study households reported avoidance of Potato, followed by sweet foods (6.7%) such as table sugar, sugarcane, or any packed juices as these may cause excessive weight gain to the mother and makes the baby big and difficult delivery. Sweet foods may cause skin problems in the baby. More than one-tenth (12.2%) of study households reported avoidance of brinjal and 3.3% avoided bitter gourd as these were considered to darken the skin of the baby during pregnancy. Only one study household reported avoidance of rice as it was considered to provide less strength and reduce hemoglobin of the mother during pregnancy and milk with no specific reason. (Not shown in table)

Table 2: Distribution of the study households by their self-reported foods preferences and their reasons during pregnancy

Foods recommended (n=90 for each food item)	n (%)	Reasons for preferences
Milk and milk products	89 (98.9)	strength to the mother
Increase the amount of food intake in the pre-pregnant state	88 (97.8)	strength to the mother
Green leafy vegetables	87 (96.7)	strength to the mother, increases blood formation
Fruits (mainly apples, and pomegranates)	82 (91.1)	strength to the mother, increases blood formation
Jaggery and roasted Bengal gram	21 (23.3)	strength to the mother, increases blood formation
Curd on an empty stomach	7 (7.8)	Makes the baby's skin fair
Milk with saffron	6 (6.7)	Makes the baby's skin fair
Milk with turmeric	2 (2.2)	Makes the baby's skin fair

Table 2 shows that nearly all the study households preferred more intake of milk and milk products (98.9%), green leafy vegetables (96.7%), fruits (91.1%), and increased quantity of food as compared to pre-pregnant levels (97.8%). Almost one-fourth (23.3%) of study households preferred the inclusion of jaggery and roasted Bengal gram in pregnant women's diets. These food items were considered to provide strength to the mother and increase blood formation. Less than one-tenth of study households preferred an intake of curd on an empty stomach (7.8%), milk with saffron (6.7%), and milk with turmeric (2.2%) by pregnant women as these were considered to make the baby's skin fair.

Table 3: Distribution of the study households by their self-reported food preferences during lactation

Foods recommended (n=90 for each food item)	n (%)	Reasons for preference
Soft porridge with clarified butter	89 (98.9)	Gives strength to the mother
Pudding (semolina/ edible gum/ dry fruits)	87 (96.7)	Gives strength to the mother
Tea with biscuits/ bread	87 (96.7)	Easy to digest
Milk and dry dates	37 (41.1)	Gives strength to the mother
Cumin seeds water	34 (37.8)	Increases the milk production

Table 3 shows that almost all the study households preferred soft porridge with clarified butter (98.9%), Pudding (made of semolina/ edible gum/ dry fruits) (96.7%) to increase the strength of the mother, and tea with biscuits/ bread (96.7%) for easy digestion to be consumed by women during the postpartum period. Two-fifths (41.1%) of the study households preferred an intake of milk and dry dates to increase the strength of the mother and cumin seeds water (37.8%) to increase the milk production by the mother during this period.

Table 4: Distribution of the study households by

their self-reported avoidance of selected foods during lactation

Foods avoided (n=90 for each food item)	n (%)	Reasons for avoidance
Buttermilk/ curd/ cold water	86 (95.6)	Causes cough and cold in the fetus
Rice	49 (54.4)	Causes cough and cold in the fetus
Whole pulses	32 (35.5)	bloating to the baby and hard to digest by the mother
Cauliflower, cabbage	12 (13.3)	forms a gas to the mother
Milk	3 (3.3)	May decrease the milk production of that cattle

Table 4 shows that almost all of the study households reported avoidance of Buttermilk/ curd/ cold water (95.6%) and half (54.4%) reported avoidance of rice, as these foods may cause cough and cold in the fetus. One-third (35.5%) of the study households reported avoidance of whole pulses and more than one-tenth (13.3%) reported avoidance of foods such as Cauliflower, and cabbage as they may cause bloating to the baby and are hard to digest by the mother during lactation. Only three study households reported avoidance of milk during this period due to the belief that the milk of that particular cow/buffalo will get reduced if consumed by the lactating female.

Discussion

According to the findings of the current study, avoidance of one or more foods was reported during pregnancy and lactation due to food taboos. Our study reported several good dietary practices during pregnancy such as intake of green leafy vegetables, fruits, milk, jaggery, and roasted Bengal gram to provide strength to the mother, and the growth of the baby as these foods are rich in proteins, vitamins, and minerals. The findings are supported by studies done by Catherin et al and Riang M et al but contradict Ramulondi M et al and Banu KK et al.[1,2,4,9]

Despite the good practices, certain food items which are good sources of protein, iron, and vitamins & minerals, essential for the growth and development of the baby as well as for the mother, may relieve constipation during pregnancy, are avoided by our study households due to fear of abortion, increase in blood pressure or severity of morning sickness to the mother, increase in the weight of mother and baby resulting in difficult delivery and pigmentation of fetal skin. The findings are consistent with the studies reported elsewhere in India and World.[1,2,4,8-11] During postpartum recovery, curd, rice, whole pulses, and cabbage are avoided due to the belief of cold and cough in the baby, increase flatulence, and difficulty in digestion by the mother. The findings are supported by studies done by Catherin N et, Joshi A et al, and Banu KK et al.[1,3,9]

The present study had a few strengths. It was a community-based study with a high level of participation. Because the sampling was systematic random, there was less chance of selection bias, and the results could be externally validated. After training, the data was collected by a single investigator, reducing interobserver bias. Limitation: Intake of quantity and variety of food was self-reported and could be subjected to bias because of social desirability

Conclusion

A large majority of study households had good practices of consuming foods rich in essential nutrients but were restricted by a few study households, implying the need for strengthening nutrition education to dispel such food taboos practiced in the study community. Based on the findings, the study provides a basis for developing culturally appropriate nutritional interventions and empowerment programs to provide effective nutritional counselling targeting pregnant and lactating women. This may improve birth outcomes and long-term quality of life.

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Declarations

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Original Article

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Clinical Profile and Outcome of Neonates Admitted in Intensive Care Unit: A Cross Sectional Study in District Hospital

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Abstract

Neonatal period, which is the first 28 days of an infant's life, is the most crucial and vulnerable period. A remarkable decline in mortality rates during neonatal period for the past two decades is due to the advances of obstetric practice in term of medical screening and surveillance and increased neonatal specialization. However, respiratory tract disorders, along with sepsis and other types of infection, are the major causes of neonatal morbidities and mortalities. Hence, this study is aimed to bridge these gaps and provide inputs to the program implementers to design necessary interventions that could contribute to the reduction of neonatal morbidity and mortality.

Aims: To determine the clinical profile and neonatal outcome admitted to NICU in district hospital **Objectives**: 1. To determine the socio demographic factors associated with neonatal outcome 2. To determine the obstetric profile associated with neonatal outcome.

Methods: This hospital based retrospective study was conducted in the NICU of Tumakuru district hospital from Jan to March 2023. Records of all the admitted neonates were reviewed. The details were collected based on a structured questionnaire prepared in English. This contained information regarding obstetric and antenatal care (ANC), gestational age at birth, birth weight, sex, APGAR score, age at admission, admission diagnosis, neonatal outcomes and other related details.

The data collected was entered in Microsoft excel (MS Excel) and quantitative variables was analysed by mean and qualitative variable by proportion by epi in go 3.4.3. Chi square was used to find out the association between the neonatal outcome and other variables. P value <0.05 was considered significant.

Results: A total of 120 neonates were admitted during the study period. 47 (39.1%) mothers of the neonates were aged 21-25years and followed by 34 (28.3%) mothers in the age of 26-30 years. Association between neonatal outcome and socio demographic components was not statistically significant but definitely outcome was better

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with the good socio demographic profile. Regarding ANC follow up, 119 (99.1%) mothers had attended at least one prenatal visit and majority 100 (80%) were having ANC check-up at government hospital. The most common causes of neonatal mortality were respiratory distress syndrome 4(3.33%), followed by low birth weight 4(3.33%), and preterm 3(2.5%).

Conclusion: Inspite of improved technology and facilities available still the neonatal outcome is worst. These all are preventable causes of neonatal mortality and morbidities which has to be taken care bygiving due importance to its predictors. Maternal and environmental factors has to be taken care and dealt.

Keywords: neonatal outcome, neonatal mortality, respiratory distress

Introduction

The neonatal period, which is the first 28 days of an infant's life, is the most crucial and vulnerable period. Children face the highest risk of mortality in their first month of life at an average global rate of 17 deaths per 1,000 live births in 2022. In comparison, the probability of dying after the first month and before reaching age 1 was estimated at 11 deaths per 1,000 and the probability of dying after reaching age 1 and before reaching age 5 was estimated at 9 deaths per 1,000 in 2022. Globally, 2.4 million children died in the first month of life in 2022 – approximately 6,500 neonatal deaths every day – with about a third of all neonatal deaths occurring within the first day after birth, and close to three-quarters occurring within the first week of life [1].

Currently the neonatal mortality rate in India is 26 per 1000 live births [2]. Over 70% of these early neonatal deaths were due to conditions that could be prevented or treated with access to simple and affordable interventions. Majority of these deaths are caused by respiratory disorders, neonatal sepsis, asphyxia, low birth weight and prematurity being the risk factors [3,4].

Neonatal mortality rate remains a challenge in most countries due to the risk factors associated with neonatal mortality which are considered quality indicators for improving health care provided in Neonatal Intensive Care Unit (NICU), as well as an indicator of population health and well-being. The NICU must have highly sophisticated facilities and equipment's to address critical cases, facilitate adjustment of the newborn to the extra-uterine life, and establish and maintain normal respiration of a high-risk newborn. Although NICU helps to reduce preterm mortality, it is scarce and is a financial burden on the healthcare system in a developing country like India with about more than 50% being rural population[5,6].

A remarkable decline in mortality rates during neonatal period for the past two decades is due to the advances of obstetric practice in term of medical screening and surveillance, and increased neonatal specialization. However, respiratory tract disorders, along with sepsis and other types of infection, are the major causes of neonatal morbidities and mortalities. Consequently, the length of hospital stay, intensive care costs, and burden on the healthcare system have increased. The continued reduction in neonatal deaths is critical to the progress of a nation. Therefore, determining causes and predictors of neonatal death is essential. Knowledge about the diseases and early interventions are lacking which should be given priority. Hence, this study is aimed to bridge these gaps and provide inputs to the program implementers to design necessary interventions that could contribute to the reduction of neonatal morbidity and mortality.

Aims: To determine the clinical profile and neonatal outcome admitted to NICU in district hospital.

Objectives: To determine the socio demographic factors associated with neonatal outcome

To determine the obstetric profile associated with neonatal outcome

Methods

This hospital based retrospective study was conducted in the NICU of Tumakuru district hospital from Jan to March 2023. This facility has been providing health services for an estimated population including both urban and rural populations. The NICU affiliated to the hospital has a capacity of Incubators. The facilities provided here are:

respiratory support system including ventillators and CPAP, phototherapy, parenteral nutrition, oxygen gas supply system, monitoring of oxygen and carbon dioxide level in the blood, and laboratory tests.

Records of all the admitted neonates were reviewed. The details were collected based on a structured questionnaire prepared in English. This contained information regarding obstetric and antenatal care (ANC), gestational age at birth, birth weight, sex, APGAR score, age at admission, admission diagnosis, neonatal outcomes and other related details.

Statistical analysis

The data collected was entered in Microsoft excel (MS Excel) and quantitative variables was analysed by mean and qualitative variable by proportion by epi ingo 3.4.3. Chi square was used to find out the association between the neonatal outcome and other variables. P value <0.05 was considered significant.

Results

Table 1: Association of socio-demographic factors with neonatal outcome

Variables	Categories	Condition of baby		Total	Chi-Square, P-value
		Improved	Death		
Age of mother	<=20	26 (100%)	0 (0.0%)	26 (100%)	4.536, 0.209
	21-25	45 (95.7%)	2 (4.3%)	47 (100%)	
	26-30	31 (91.2%)	3 (8.8%)	34 (100%)	
	>30	11 (84.6%)	2 (15.4%)	13 (100%)	
Address	Urban	44 (95.7%)	2 (4.3%)	46 (100%)	0.300, 0.584
	Rural	69 (93.2%)	5 (6.8%)	74 (100%)	
Religion	Hindu	93 (94.9%)	5 (5.1%)	98 (100%)	0.520, 0.471
	Muslim	20 (90.9%)	2 (9.1%)	22 (100%)	
Occupation	Elementary occupation	53 (94.6%)	3 (5.4%)	56 (100%)	2.969, 0.396
	Plant or machine operators	9 (90.0%)	1 (10.0%)	10 (100%)	
	Skilled agriculture	12 (85.7%)	2 (14.3%)	14 (100%)	
	Skilled workers	39 (97.5%)	1 (2.5%)	40 (100%)	
Education	Illiterate	8 (100%)	0 (0.0%)	8 (100%)	11.495, 0.042
	Primary school	2 (66.7%)	1 (33.3%)	3 (100%)	
	Middle school	13 (81.3%)	3 (18.8%)	16 (100%)	
	High school	43 (97.7%)	1 (2.3%)	44 (100%)	
	Intermediate or diploma	31 (93.9%)	2 (6.1%)	33 (100%)	
	Graduate	16 (100%)	0 (0.0%)	16 (100%)	
S.E.Status	16-25 Upper middle	3 (100%)	0 (0.0%)	3 (100%)	7.426, 0.059
	11-15 Lower middle	42 (95.5%)	2 (4.5%)	44 (100%)	
	5-10 Upper lower	67 (94.4%)	4 (5.6%)	71 (100%)	
	<5 Lower	1 (50.0%)	1 (50.0%)	2 (100%)	
Married life	1-5	73 (93.6%)	5 (6.4%)	78 (100%)	0.912, 0.634
	6-10	27 (93.1%)	2 (6.9%)	29 (100%)	
	> 10	13 (100%)	0 (0.0%)	13 (100%)	
Parity	Primigravida	58 (95.1%)	3 (4.9%)	61 (100%)	0.189, 0.664
	Multipara	55 (93.2%)	4 (6.8%)	59 (100%)	

A total of 120 neonates were admitted during the study period. 47 (39.1%) mothers of the neonates

were aged 21-25years and followed by 34 (28.3%) mothers in the age of 26-30 years. 74 (61.6%) the patients were from rural areas .98 (81.6%) belonged to Hindu religion. 56 (46.6%) of the parents were coolie by occupation. 44 (36.6%) mothers attended high school and 8 (6.6%) mothers were unable to read or write. 71 (59.1%) belonged to upper lower class according to modified kuppuswamy classification. 59 (49.1%) neonates were delivered from multiparous mothers. Association between neonatal outcome and socio demographic components was not statistically significant but definitely outcome was better with the good socio demographic profile.

Table 2: Association of antenatal care and clinical factors with neonatal outcome

Variables	Categories	Condition of baby		Total	Chi-Square, P-value
		Improved	Death		
ANC follow up	Yes	112 (94.1%)	7 (5.9%)	119 (100%)	0.062, 0.803
	No	1 (100%)	0 (0.0%)	1 (100%)	
Place of ANC	Government	93 (93.0%)	7 (7.0%)	100 (100%)	1.487, 0.223
	Private	20 (100%)	0 (0.0%)	20 (100%)	
No. Of ANC visits	1-3	19 (86.4%)	3 (13.6%)	22 (100%)	3.736, 0.154
	4-6	25 (92.6%)	2 (7.4%)	27 (100%)	
	>=7	69 (97.2%)	2 (2.8%)	71 (100%)	
TT completed	Yes	109 (94.0%)	7 (6.0%)	116 (100%)	0.256, 0.613
	No	4 (100%)	0 (0.0%)	4 (100%)	
Fe and fc taken	Yes	110 (94.0%)	7 (6.0%)	117 (100%)	0.191, 0.662
	No	3 (100%)	0 (0.0%)	3 (100%)	
Gestational age	Early preterm(<34w)	11 (84.6%)	2 (15.4%)	13 (100%)	5.872, 0.053
	Late preterm(34-36w)	21 (87.5%)	3 (12.5%)	24 (100%)	
	Term(37-42w)	81 (97.6%)	2 (2.4%)	83 (100%)	
Type of delivery	NVD	62 (89.9%)	7 (10.1%)	69 (100%)	5.494, 0.019
	LSCS	51 (100%)	0 (0.0%)	51 (100%)	
Duration of labour (NVD)	<=4	20 (90.9%)	2 (9.1%)	22 (100%)	0.076, 0.963
	5-12	35 (89.7%)	4 (10.3%)	39 (100%)	
	>=12	7 (87.5%)	1 (12.5%)	8 (100%)	
Place of delivery	Government	98 (93.3%)	7 (6.7%)	105 (100%)	1.062, 0.786
	Private	13 (100%)	0 (0.0%)	13 (100%)	
	Home	1 (100%)	0 (0.0%)	1 (100%)	
	Other	1 (100%)	0 (0.0%)	1 (100%)	
Birth attendent	Doctor	59 (98.3%)	1 (1.7%)	60 (100%)	4.169, 0.244
	Nurse	52 (89.7%)	6 (10.3%)	58 (100%)	
	Self	1 (100%)	0 (0.0%)	1 (100%)	
	Others	1 (100%)	0 (0.0%)	1 (100%)	
Amniotic fluid status	Clear	103 (94.5%)	6 (5.5%)	109 (100%)	0.234, 0.629
	Meconium stained	10 (90.9%)	1 (9.1%)	11 (100%)	
Obs complications during pregnancy	Preeclampsia/ eclampsia	16 (84.2%)	3 (15.8%)	19 (100%)	8.947, 0.030
	PROM	2 (66.7%)	1 (33.3%)	3 (100%)	
	APH	1 (100%)	0 (0.0%)	1 (100%)	
	None	94 (96.9%)	3 (3.1%)	97 (100%)	

Regarding ANC follow up, 119 (99.1%) mothers had attended atleast one prenatal visit and majority 100 (80%) were having ANC check-up at government hospital. However only 22(18.3%) had not received the recommended ANC follow up for their current pregnancy (which was 4 or more ANC visits). 4 (3.3%) of them had not taken TT Injections for the present pregnancy and 3 of them did not take any iron and folic acid tablets. Among the newborn, 37 babies were born preterm where by 13 of them were born before 34 weeks of gestation. Lower segment caesarean section and normal vaginal delivery was almost equal where as 50% of the delivery was done by nurse and other trained birth attendant.23 (19.1%) mothers had complications during pregnancy where as Preeclampsia or eclampsia accounted for 19 (15.8%).

Table 3: Association of neonatal morbidity Indications with neonatal outcome

Indication	Condition of baby		Total
	Improved	Death	
Fetal distress	3 (100%)	0 (0.0%)	3 (100%)
Aspiration	4 (100%)	0 (0.0%)	4 (100%)
Cord abnormalities	4 (100%)	0 (0.0%)	4 (100%)
CPD	6 (100%)	0 (0.0%)	6 (100%)
Abnormal lie, presentation	4 (100%)	0 (0.0%)	4 (100%)
Amniotic fluid abnormalities	10 (100%)	0 (0.0%)	10 (100%)
Placental, uterine abnormalities	3 (100%)	0 (0.0%)	3 (100%)
Other(eclampsia/DM/prev LSCS)	21 (100%)	0 (0.0%)	21 (100%)

Table 4: Association of comorbidities among mother with Neonatal outcomes

Variables	Condition of baby		Total	Chi-Square, P-value
	Improved	Death		
DM	9 (100%)	0 (0.0%)	9 (100%)	0.603, 0.438
HTN	0 (0.0%)	0 (0.0%)	0 (0.0%)	-
Thyroid disorder	4 (100%)	0 (0.0%)	4 (100%)	0.256, 1.00
Cardiac disease	0 (0.0%)	0 (0.0%)	0 (0.0%)	-
Anemia	41 (89.1%)	5 (10.9%)	46 (100%)	3.444, 0.063
Infections	14 (87.5%)	2 (12.5%)	16 (100%)	1.494, 0.235
Other	0 (0.0%)	0 (0.0%)	0 (0.0%)	-
None	56 (96.6%)	2 (3.4%)	58 (100%)	1.163, 0.441

Table 4 Association of comorbidities with Neonatal outcomes Despite 98(81.6%) mothers had more than 4 ANC visits, 46(46.9%) mothers were anemic and out of which 5(10.8%) newborns delivered by these mothers died.

Table 5: Association between reason for admission and outcome

Reason for admission	Condition of baby		Total	Chi-Square, P-value
	Improved	Death		
RDS	68 (94.4%)	4 (5.6%)	72 (100%)	0.025, 1.000
Neonatal jaundice	16 (100%)	0 (0.0%)	16 (100%)	1.144, 0.285
Neonatal sepsis	13 (100%)	0 (0.0%)	13 (100%)	0.903, 0.342
Meconium aspiration	12 (92.3%)	1 (7.7%)	13 (100%)	0.092, 0.562

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Birth asphysia	16 (94.1%)	1 (5.9%)	17 (100%)	0.000, 1.000
Preterm	26 (89.7%)	3 (10.3%)	29 (100%)	1.417, 0.358
LBW	26 (86.7%)	4 (13.3%)	30 (100%)	4.096, 0.065
Congenital malformation	2 (100%)	0 (0.0%)	2 (100%)	0.126, 1.000
IUGR	8 (100%)	0 (0.0%)	8 (100%)	0.531, 1.000
Convulsions	7 (87.5%)	1 (12.5%)	8 (100%)	0.694, 0.391
Other(excessive cry, refusal of feeds)	16 (100%)	0 (0.0%)	16 (100%)	1.144, 0.592

Among admitted newborn, 7(5.83%) died and the remaining survived from admission to discharge in the NICU. The most common causes of neonatal mortality were respiratory distress syndrome 4(3.33%), followed by low birth weight 4(3.33%), and preterm 3(2.5%).

Table 6: Association factors with neonatal outcomes

Variables	Categories	Condition of baby		Total	Chi-Square, P-value
		Improved	Death		
Complications during labour	Prolonged	7 (87.5%)	1 (12.5%)	8 (100%)	0.855, 0.931
	Obstructed	1 (100%)	0 (0.0%)	1 (100%)	
	Fetal distress	1 (100%)	0 (0.0%)	1 (100%)	
	Cord prolapse	1 (100%)	0 (0.0%)	1 (100%)	
	None	103 (94.5%)	6 (5.5%)	109 (100%)	
Sex of baby	Male	69 (94.5%)	4 (5.5%)	73 (100%)	0.042, 0.837
	Female	44 (93.6%)	3 (6.4%)	47 (100%)	
Age of baby (in days)	<=1	75 (91.5%)	7 (8.5%)	82 (100%)	3.445, 0.179
	2-7	32 (100%)	0 (0.0%)	32 (100%)	
	>7	6 (100%)	0 (0.0%)	6 (100%)	
Birth weight(in g)	<1000	1 (33.3%)	2 (66.7%)	3 (100%)	27.737, <0.001
	1000-1499	6 (75.0%)	2 (25.0%)	8 (100%)	
	1500-2499	47 (95.9%)	2 (4.1%)	49 (100%)	
	2500-3999	58 (98.3%)	1 (1.7%)	59 (100%)	
	>=4000	1 (100%)	0 (0.0%)	1 (100%)	
Temp on adm	<36.5	37 (97.4%)	1 (2.6%)	38 (100%)	1.136, 0.567
	36.5-37.5	75 (92.6%)	6 (7.4%)	81 (100%)	
	>37.5	1 (100%)	0 (0.0%)	1 (100%)	
APGAR score at 5min	<=3	1 (100%)	0 (0.0%)	1 (100%)	8.735, 0.033
	4-6	25 (83.3%)	5 (16.7%)	30 (100%)	
	7-10	71 (97.3%)	2 (2.7%)	73 (100%)	
	Unknown	16 (100%)	0 (0.0%)	16 (100%)	
BF within 1st hour	Yes	34 (91.9%)	3 (8.1%)	37 (100%)	0.504, 0.478
	No	79 (95.2%)	4 (4.8%)	83 (100%)	
Formula Feeding	Yes	27 (96.4%)	1 (3.6%)	28 (100%)	0.340, 1.000
	No	86 (93.5%)	6 (6.5%)	92 (100%)	

Low 5min APGAR score, low birth weight, preterm birth, febrile illness, and feeding status were independent predictors of neonatal mortality in neonatal intensive care units. Newborns with low 5min APGAR score were times more likely to die compared with 5min APGAR score greater than or equal to 7. Low birth weight babies were times more likely to die when compared with normal birth weight. Neonates for whom breast feeding was not initiated within first 24hrs were more likely to die than those who were on exclusive breastfeeding within the first 24hrs of life.

Discussion

73 babies born were male as compared to female (47) which was similar in other studies[7]. 44 (36.6%) mothers attended high school and 8 (6.6%) mothers were unable to read or write. 71 (59.1%) belonged to upper lower class according to modified kuppuswamy classification and 59 (49.1%) neonates were delivered from multiparous mothers which was almost similar to other studies[8,9] .

In a study done by Gebremariam H et all three quarter (75.6%) of the neonates had normal birth weight and 80.0% were term as compared to our study where 60% (60) babies had adequate birth weight. Majority (75.4%) of the neonates was delivered vaginally and 92.7% were delivered at health facility. Neonatal infection (33.0%), birth asphyxia (20%) and prematurity (14.3%) were the top three primary causes of neonatal admission to the Neonatal Intensive Care Unit as compared to the study done by verma et all the major cause of morbidity observed was respiratory distress 555 (39%) , neonatal sepsis 347 (24%) , neonatal hyperbilirubinemia 188 (13%) followed by birth asphyxia 42(3%) and congenital anomaly (2.5%). Birth weight had got a significant predictor for neonatal outcome which was similar to other studies.

Conclusion

Inspite of improved technology and facilities available still the neonatal outcome is worst These all are preventable causes of neonatal mortality and morbidities which has to be taken care by giving due importance to its predictors. Maternal and environmental factors has to be taken care and dealt.

Study limitations: Since this study was a retrospective hospital-basedstudy, the role of awareness about the conditions and where there was delay in recognising the problems to the baby could not be analysed. Prospective studies will give more chance to analyse the socio cultural factors in delay of treating the patients.

Conflict of interest: nil

Ethical clearance: taken from IEC,Sri Siddhartha medical college,Tumkur

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Review Article

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Challenges of Bioterrorism: An Indian Perspective

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Abstract

Bioterrorism is the deliberate release of viruses, bacteria, toxins, or other harmful agents to cause illness or death in people, animals, or plants. A biological weapon is useful to terrorists mainly as a method of creating mass panic and disruption to a state or a country. Bioterrorism agents are classified as categories A, B, and C. Bioterrorism imposes particularly heavy demands on the nation's public health and health care system because ultimately it will be the public health system that will be called on to mitigate and ameliorate the consequences of a bioterrorism attack. India is the second-most populous country in the world and has a diverse demography consisting of various religions, cultures, and languages. The unique nature of India's population makes it vulnerable to bioterrorism attacks that can result in catastrophic consequences. This review article aims to focus on the challenges of bioterrorism from Indian perspective and to outline the methods on preparedness and prevention of bioterror attacks.

Key Words: Bioterrorism, Bioweapon.

Introduction

The world we live in today is more connected and accessible than ever before. However, with this increased connectivity comes a greater risk of bioterrorism. Bioterrorism can be defined as "the intentional use of microorganisms or toxins derived from living organisms to cause death or disease in humans or the animals and plants on which we depend."[1] Bioterrorism is a growing concern in today's world, and India is no exception. The impact of such an attack could be catastrophic, especially in a country like India, given its unique and diverse demography. With its large population and diverse demographics, the nation faces unique challenges when it comes to responding to bioterrorist threats. The potential for devastating consequences cannot be ignored - from economic loss to human casualties - making it essential that we understand the risks and develop effective strategies for prevention and response.[2] The aim of this article is to explore the specific challenges of bioterrorism in India and what can be done to mitigate this threat.

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Bioterrorism as a Global Health Threat

Bioterrorism may be either natural or man-made outbreak of infectious agents into the environment claiming lives of many people. In such sudden outbreaks, it takes time for the investigators to identify the cause of death in the victims and to alert the public and create awareness among them to keep themselves safe. Terrorists tend to use biowarfare because they are extremely difficult to detect and do not cause infection or illness for several hours to several days. Some bioterrorism agents like smallpox virus can be spread from person to person and some like anthrax cannot. Bioterrorism is an attractive weapon because of easy availability and inexpensive nature of biological agents. They can be easily disseminated, and can cause widespread fear and panic beyond the actual physical damage.[3,4] Combating a bioterror attack may involve the development of biological identification systems. In addition, forensic technologies are working on identifying biological agents, their geographical origins and/or their initial source. Bio surveillance is also a potential tool in preventing bioterrorism as this can help in identification of such attacks in nascent stage itself. The Government agencies that would respond to a bioterror attack include law enforcement, hazardous materials/decontamination units and emergency medical units, if they exist.[5]

Role of Indian demography

India is the second-most populous country in the world and has a diverse demography consisting of various religions, cultures, and languages. The unique nature of India's population makes it vulnerable to bioterrorism attacks that can result in catastrophic consequences. The high density of people living in urban areas, coupled with limited healthcare resources in certain regions, presents a significant challenge for responding to an outbreak caused by bioterrorism. In addition to this, there are also several factors such as poor hygiene practices and inadequate sanitation facilities which make the Indian population more susceptible to infectious diseases. Moreover, India shares its borders with several countries where terrorist organizations have been known to operate. This increases the likelihood of terrorists using biological agents as a weapon against India.[6]

Considering all these challenges associated with India's demography and infrastructure capabilities, combating bioterrorism requires a multi-pronged approach involving cooperation between different agencies at both national and international levels. Strengthening public health systems throughout the country should be prioritized along with intelligence sharing mechanisms among different nations. Understanding how demographics impact preparedness for bioterrorism is crucial for developing effective response strategies. Additionally, addressing gaps in healthcare infrastructure across various regions can help mitigate potential impacts on human life during future outbreaks or attacks caused by biological agents used as weapons by terrorists or other malicious groups.[7]

Threat level of bioterrorism in India

India is known for its diverse culture, heritage and population. However, it is also vulnerable to bioterrorism attacks due to its large population density, inadequate public health infrastructure and porous borders. The threat level of bioterrorism in India is high because several terrorist organizations have access to biological agents and expertise. The country has faced several epidemics like the recent COVID-19 pandemic which has exposed the fragility of the public healthcare system. Bioterrorist attacks using viruses or bacteria can cause widespread panic and chaos among already overwhelmed hospitals which can further lead to many fatalities.[8]

Moreover, India shares borders with countries where some terrorist organizations have a free hand in developing biological weapons without any checks or balances. This makes it easier for them to transfer these dangerous agents across national boundaries undetected.[9] While there are no specific threats currently reported regarding bioterrorism in India, given its current circumstances as well as past experiences with diseases outbreaks such as Ebola virus disease outbreak that occurred during 2014–16, the possibility cannot be ruled out completely.[10] It is therefore crucial that India invests more resources into strengthening its public health infrastructure and border surveillance capabilities so that it can prevent any potential bioterrorist attack from occurring on its soil.

Possible impacts of bioterrorism in India

The possible impacts of bioterrorism in India are undoubtedly severe and far-reaching. Given its large population, it is highly susceptible to biological attacks that can rapidly spread and cause significant damage. The consequences of a bioterrorist attack on India could be catastrophic, affecting not only the country but also the entire world. In addition to causing widespread illness and death among the affected population, a bioterrorist attack could lead to panic and chaos across the country. This would make it difficult for emergency response teams to provide timely assistance to those who need it most.[11]

Moreover, such an incident could have long-term economic implications for India as well as other countries due to disruption in global trade networks. Investors may shy away from investing in Indian businesses due to uncertainty surrounding their safety measures against bioterrorism. The potential impact of a bioterrorist attack on India cannot be underestimated.[12] It is vital that government agencies at all levels work together with public health officials, law enforcement authorities, scientists, and private industry stakeholders proactively preparedness measures that can reduce this risk significantly.[13]

Mitigation of threat

When it comes to bioterrorism, there are many discussions that need to happen in India. One of the most important discussions should be around preparedness and prevention. How can we ensure that our healthcare system is equipped to handle a potential attack? Are our hospitals and clinics ready for an influx of patients with infectious diseases? Another key discussion should be around response time. In the event of a bioterrorist attack, every second counts. How quickly can we identify the pathogen and contain its spread? What resources do we have at our disposal to respond effectively?[14]

Furthermore, there needs to be a discussion on collaboration between various stakeholders such as government agencies, private sector organizations, and international partners. Sharing information and resources will be crucial in responding effectively. There needs to be a conversation about public awareness and education. [15,16] Many people may not understand what bioterrorism is or how it could affect them personally. It is important to educate the public, so that they know what steps they should take in case of an emergency. These are just some of the discussions that need to happen in India regarding bioterrorism preparedness and response. It is up to all of us i.e., individuals, communities and governments to work together towards ensuring that we are ready for any potential threat that may arise in the future. [17,18]

Conclusion

Bioterrorism is a serious threat in India that cannot be ignored. While there are various challenges and limitations in dealing with bioterrorism, it is important for the government to take proactive measures to prevent and respond to such attacks. The need of the hour is increased awareness among citizens about potential threats and how they can stay safe. It is also important for the scientific community to continue researching new technologies that can help detect and mitigate bioterrorist activities. It might not be possible to completely eliminate the risk of bioterrorism, but with proper planning, resources, and cooperation between different agencies at national as well as international levels we could reduce its impact significantly. So let us work together towards this common goal of making our country a safer place for everyone by being vigilant against any signs of bioweapon development or attack on our soil.

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A Study on Impact of Smoking on Semen Parameters

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Abstract

Introduction: Infertility approximately affects 15% of couple in India, among which male factor infertility is associated as contributing factor causing infertility in 40- 50% of cases and sole cause in 15 -20% of cases. Semen analysis is a standard investigating tool in evaluating male infertility. Lifestyle factors namely diet, obesity, smoking, alcohol, stress, play a major role in health. Among these factors smoking is inevitable, causing detrimental effects on semen parameters and associated with lower fertility rates.

Methodology: A cross sectional study was conducted among 295 male partners of women with infertility, attending the fertility Clinic, in reproductive medicine department over 10 months. Two hundred andninety five men satisfying the inclusion and exclusion criteria were selected by simple random sampling technique. The semen parameters of the participants were analysed, entire socio-demographic profile and detailed history was obtained using structured questionnaire and confidentiality was maintained. The results were ascertained using SPSS.

Results: Among 295 participants, total 99 (33.55%) men had abnormal semen parameters. Nearly half of the study subjects (i.e.) 148 (50%) among 295 subjects were found to be smokers. Among 99 male with abnormal semen parameters, 60 (61%) men who had abnormal semen parameters were smokers. This study proves a strong association between smoking on male fertility (1.9 times greater risk among smokers). Significant association ($x^2 = 6.492$, $p = 0.0108$) was found between smoking, reduced semen parameters and quality.

Conclusion: Lifestyle modifications such as cessation of smoking, premarital and pre-conception health check-ups, counselling, voluntary fertility testing by male partners, early detection and appropriate intervention the saves the reproductive potential. Men must be health educated for developing knowledge on ill effects of smoking, positive attitude, behavioural change and accept his responsibility for strengthening and caring his female partner amidst the societal pressures. Thus the present study substantiates more evidence to the existing literature.

Key Words: Smoking, Semen parameter, Lifestyle, Male infertility

Introduction

Infertility is inability to become pregnant after one year of unprotected regular sexual intercourse involving both male and female partners[1]. Infertility approximately affects 15% of couple in India, among which male factor infertility is associated as contributing factor causing infertility in 40- 50%

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of cases and sole cause in 15 -20% of cases. Semen analysis is a standard investigating tool in evaluating male infertility. Several researches predicts, decline in quality of semen among men in recent years. The most primary etiological factors are lifestyle and personal habits. Lifestyle factors namely obesity, smoking, alcoholism play a major role in health. Among these factors smoking is inevitable, causing detrimental effects on semen parameters. Smoking consists, carbon monoxide, nicotine, cadmium, lead that causes the following negative effects. It reduces the sperm count, quality of semen, lowers sperm concentration, increases sperm DNA damage, abnormal DNA fragmentation, erectile dysfunction and male sexual impotence. Oxidative stress resulting from excessive production of ROS- Reactive Oxygen Species, may cause profound effect on sperm plasma membrane and functional integrity of sperm. Elevated ROS level, being cytotoxic leads to loss of sperm motility and vitality. One third of the global population are smokers. Tobacco in any form is injurious to health. India is the second country with highest level of tobacco consumers. Worldwide leading preventable cause of death is tobacco use. About 8 million deaths are attributed to tobacco use every year. Tobacco kills around 1.35 million people yearly in India. Average life expectancy of smokers is 10 years lesser than non-smokers. Increased prevalence of smoking along with raise in infertility necessitates to explore the association between smoking and male infertility. The current study is aimed at addressing above issues. Among several associative factors assessed, the main objective of the study is to assess the impact of smoking on male infertility which is discussed in this article.

AIM

To assess the impact of smoking on male infertility there by implementing the findings to improvise the infertility management.

OBJECTIVES

- To evaluate the association between smoking in men and abnormal semen parameters.

Methodology

The present study is a cross sectional study conducted among male partners of women with infertility, attending the Department of Reproductive Medicine, Chettinad Hospital and Research Institute, Chennai from September 2016 to June 2017 over a period of 10 months.

Inclusion criteria

Men in age group 25 – 40 years of age with smoking habit and history of infertility for more than 12 months of intercourse. Only men with voluntary participation and consent were included in the study.

Exclusion criteria

Men with the following conditions;

Previous history of surgery associated with reproductive function

Vasectomy or revival vasectomy

Previous history diseases like cryptorchidism, epididymitis, varicocele, cryptorchidism

Chemical or occupational exposure

Genetic defects

Chronic debilitating diseases (Diabetes, hypertension thyroid disorders) were excluded.

On treatment for infertility

Sample size

According to previously available literature, related to prevalence of male infertility based on seminal analysis was 56.5%, considering it as 'p' with limit of accuracy as 10% the sample size is calculated as,

$N = Z_{(1-a/2)\,2} \times P \times Q / L^2$

N: Required sample size

Z(1-a/2): Reliability coefficient at the level = 1.96

Significance level (alpha): 100- Confidence level is 100-95 =5%

P = Anticipated Population Prevalence from previous literature = 56.5%

Q= 100 – P = 43.5%

Absolute precision desired (as L% of P that is 10 % of P) = 56x10 /100 =5.6

N=1.96 × 1.96 ×56.5×43.5 / 5.65×5.65 = 3.84 x 2457.75 / 31.92 = 295.6 rounded to 295.

N = 295

Therefore, among men attending the reproductive medicine department, 295 men satisfying the inclusion and exclusion criteria were selected by simple random sampling technique for the study. All the participants were provided with structured questionnaire for eliciting their information on socio demographic characteristics (age, education, occupation, duration of infertility, past medical and surgical history and personal habits (smoking status), their information were recorded and confidentiality maintained. The report results were disclosed and discussed to the couple in person by the doctor. Data on background characteristics and risk factors were obtained from all participants. After required exclusions participant eligible for the study were requested to provide their semen sample after 3 days to 5 days of abstinence. The supporting and nursing staffs were trained prior to counsel the male partners of the infertile couple. The participants were instructed to wash their hands properly before semen collection. The semen samples were collected in designated room in the department under sterile conditions. The semen samples were shifted to the laboratory within 15 minutes. Analysis was performed according to WHO guidelines of semen analysis [4]

Materials

The materials used for the study were:

- sterile semen collection container
- sterile pastuer pipette
- cryocell counting chamber
- glass slide
- cover slip
- pH paper
- microscope

- Both macroscopic and microscopic analysis was done.
- In macroscopic analysis, semen volume, Ph, viscosity, liquefaction time was observed.
- With sterile pastuer pipette viscosity and volume of liquefied semen sample was noted.
- pH was measured according to the colour change in the pH paper.
- In microscopic analysis, sperm concentration, motility, morphology, aggregation were assessed.
- Sperm concentration and motility were analysed with the help of cryocell counting chamber.
- Sperm aggregation observed in wet slide with cover slip.
- Sperm morphology was examined with staining method.

Statistical analysis

The data was entered and analysed using SPSS version 20. Descriptive statistical analysis done by calculating percentages, chi-square test and odds ratio for association of risk factor and 95% CI were computed. Total of 295 men participated in the study. The semen analysis revealed that 196 (66.5%) had normal and 99 (33.5%) had abnormal semen parameters which was discussed in previous article. Among the risk factors evaluated, association between smoking and infertility is discussed in this research article.

Results

TABLE – 1: Distribution of semen parameters based on smoking habit.

FACTOR	ABNORMAL SEMINOGRAM	NORMAL SEMINOGRAM	TOTAL
SMOKERS			148
Observed (O)	60 (a)	88 (b)	
Expected (E)	49.67	98.33	
Chi-Square Contribution **$(O-E)^2/E$**	2.15	1.09	

Continue.....

NON-SMOKERS			147
Observed (O)	39 (c)	108 (d)	
Expected (E)	49.33	97.67	
Chi Square Contribution **$(O-E)^2/E$**	2.16	1.09	
TOTAL	99	196	295

X^2test static= 2.15 + 1.09+ 2.16 + 1.09 = 6.49

Alternate method to calculate x^2 = n x (ad- bc) ^{2}/ (a+c) (b+d) (c+d) (a+b)

X^2 = 295 x (6480- 3432)^2/ 99 x 196 x 147x 148

X^2= 295 x 3048 x3048 /422153424 = 6.492

Table 1 reveals the Observed, Expected frequencies and Chi-square contribution of each cell. The entire distribution of semen parameters based on smoking is portrayed in Table 1**.**

Table 2: Association between Smoking and Abnormal semen parameters

FACTOR	SEMEN-ANAYSIS PARAMETERS		TOTAL	ODDS RATIO	95% CI	CHI-SQUARE x^2	p value
	ABNOR-MAL	NORMAL					
SMOKERS	60 (61 %) a	88 b	148	1.9	1.154 -to- 3.087	6.492	0.0108
NON-SMOKERS	39 c	108 d	147				
TOTAL	99	196	295				

The Chi-square statistic x^2 is 6.492 . The p-value is 0. 011. Significant at $p < 0.05$

The Chi-square statistic with Yates correction is 5.878. The p-value is 0.0153. Significant at $p < 0.05$ (Yates correction prevents over- estimation of statistical significance)

Table 2 depicts that among 295 participants, total 99 (33.55%) men had abnormal semen parameters. Nearly half of the study subjects (ie) 147 (50%) among 295 subjects were found to be smokers. Among 99 male with abnormal semen parameters, 60 (61%) men who had abnormal semen parameters were smokers.

ODDS RATIO =

$$\frac{\text{Odds of exposure among diseased a / c}}{\text{Odds of exposure among non – diseased b / d}}$$

= ad/ bc = 60 x 108/39x 88 = 1.888

It conveys that alcohol consumers are 1.9 times at a greater risk of developing abnormal semen parameters than never users of alcohol. To know, whether this result has occurred by chance / sampling error or not, we calculated 95% confidence interval which is 1.154– 3.087, as it does not contain 1(one), it can be concluded that there are higher odds of developing abnormal semen among smokers as compared to non- smokers and is statistically significant.

The chi square table value at one degree of freedom at 0.05 level of significance is 3.84. The calculated chi square value is 6.492 is greater than the table value. Hence the positive association between the smoking and abnormal semen parameters is statistically significant at p = 0.0108 (p=0.05) has not occurred by chance or sampling error.

Discussion

It was observed that findings of the present study was similar to the cross-sectional study done by CH Ramlau-Hansen et al[2], which revealed smoking in adult life moderately impairs the semen quality, volume, count, motility and concentration.

Joesbury et al[3]study done on couple attending IVF Clinic supports the current study. Its suggests that smoking habit of male partner lowers the chances of achieving pregnancy and affects the fertility potential. Colagar A H et al[4] and Hassa Het al[5]studies predicted that smoking has adverse effect on motility of sperm irrespective of total number of cigarettes used daily. The above findings substantiates the present study.

The present study findings correlates with Jason R. Kovac article[6], which provides a strong evidence that abstaining men from smoking would improve their reproductive potential.

Meta analysis done by M F Vine et al[7]indicates cigarette smoking is an independent predictor of sperm density and proves a markable association between smoking and lowered sperm density. A Evidence Based Review on Smoking and Male Infertility done by AviHarlev, Ashok Agarwalet al [8]states that not only smoking but also smokeless tobacco (tobacco consumption in any form) increases the oxidative stress which causes devastating impact on sperm parameters and reduces male fertility. Tremellen K et al [9]and Kao SH et al[10] studies exposure to reactive oxygen species ROS namely hydrogen peroxide, superoxide, cadmium present in smoke causes negative effects on male fertility factor. A Systematic review- Meta analysis done by Pravesh Kumar Bundhun et al[11]using Cochrane central database of RCT, EMBASE, MEDLINE analysed that tobacoo smoking was associated with increased morphological changes in sperms (defects) and lowered sperm count. Above contributions corresponds with the facts of present study.

The results of current study with p value =0.01, is consistent with Banerjee et al[12]and Shriniwas S Chitta et al [13]articles with statistically significant ($p<0.05$) association between semen quality parameters and smoking status of male partner.

The present study findings agrees with Ranganathan et al[14]findings which shows negative effect of smoking on all semen parameters of infertile male partner. Our study accepts the observations of Deniz Kulaksiz[15]et al study which suggests that sperm concentration, total sperm count and semen volume increases after smoking cessation in infertile male .

Nadeemet al[16]studyobserved that 66.7% of smokers had abnormal semen parameters markably motility ($p= 0.04.\%$) which was slightly higher compared to the current study with 61% men with sperm abnormalities were smokers. The above observation was statistically significant with p value 0.01.The odds ratio was 1.9 which denotes smokers had 1.9 times greater risk of developing semen abnormalities compared to non-smokers, thereby smoking attributes to destructive effect on spermatogenesis and reduces the male fertility potential. Advice on cessation of smoking immediately at the earliest is highly recommended for male partners.

Conclusion

The present study reveals markable association between smoking and male infertility. The study highlights that smoking is a high-risk factor for development of male infertility. Couple should be aware of factors causing infertility. It requires prompt and early interventions – such as premarital, pre-conceptional counselling, appropriate health education for lifestyle modifications. Behavioural Change Communication plays a vital role, in changing the attitude of the male for voluntary fertility testing and accepting his responsibility as a male to protect his female partner from societal pressure. Health promotion programs for behaviour change is a essential measure. Semen analysis with complete history taking and clinical evaluation enhances better infertility management. Infertility health care services must be integrated with primary care services for better utilisation of the services. The present study substantiates majority of evidences to the existing literatures. The study strongly suggests that couple should quit smoking to improve their chance to achieve safe conception.

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Original article

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Taste Dysfunction and its Relationship to HbA1C Level and Disease Duration in Type 2 Diabetes Mellitus Patients with Autonomic Neuropathy

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Abstract

Background and Aim: Type 2 diabetes mellitus (T2DM) effect quality of life very much and causes various complications. Diabetic autonomic neuropathy (DAN) is one of the common complications in diabetes. Thus present study was aimed at determining taste dysfunction in a population of T2DM subjects and its correlation with HbA1c level.

Material and Methods: This was an observational cross sectional study which was carried over a period of one year in the department of medicine, Tertiary care institute of India. The 100 patients of T2DM with autonomic neuropathy and 100 healthy controls were taken for the study. Autonomic neuropathy was assessed clinically. Chemical taste test using four solutions of basic tastes (sweet, sour, salty, bitter) were done.

Results: There was a significant difference between the 2 groups in terms of HbA1c (%) ($p \leq 0.05$), with the median HbA1c (%) being highest in the chemical taste dysfunction: sweet: yes group. Strength of association (Point-Biserial correlation)=0.49. There was a significant difference between the various groups in terms of distribution of chemical taste dysfunction: Sweet ($p \leq 0.05$). There was no significant difference between the groups in terms of duration of T2DM (years) ($p > 0.05$).

Conclusion: The study found a significant correlation between taste dysfunction and HbA1C level and blood sugar fasting level in type 2 diabetes mellitus patients. Alteration in taste was mainly for sweet. Sour, and bitter did not show any difference in case groups compared to controls.

Key Words: HbA1C, Neuropathy, Taste Dysfunction, Type 2 diabetes mellitus

Introduction

Type 2 diabetes mellitus (T2DM) is a multifactorial, complex disease associated with chronic hyperglycemia, resulting from the interplay of genetic, environmental, and epigenetic factors.[1] Diabetes is caused by a defect in insulin secretion,

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insulin action or both. Pathogenic processes involved in the development of diabetes range from autoimmune destruction of beta cells of the pancreas to abnormalities in carbohydrate, fat, and protein metabolism.[2] This chronic hyperglycemia is associated with long term damage, dysfunction, and failure of different organs and result into macrovascular and microvascular complication.

T2DM often presents with mild manifestations, to the point that at the time of diagnosis many patients already present with one or more complications which negatively affect the patient's quality of life and account for the mortality and morbidity associated with the disease. Taste perception and food preferences are shown to be important determinants of dietary practices, thus guiding and helping us in the identification and consumption of nutrients.[3,4,5]

Diabetic autonomic neuropathy (DAN) is one of the common complications in diabetes. DAN may manifest with gastrointestinal (GI) symptoms like gastroparesis, esophageal dysmotility, constipation, diarrhea, fecal incontinence, or gallbladder atony.

Taste is the sensory modality that guides organisms to identify and consume nutrients while avoiding toxins and indigestible materials. For humans, sweet, umami, sour, salty, and bitter called "basic" tastes. An important, unrecognized aspect of taste is that it serves 'functions' in addition to guiding dietary selection. Stimulating the taste buds initiates physiological reflexes that prepare the gut for absorption and other organs for metabolic adjustments. Abnormalities in any or several taste receptors are known to influence intake of specific food components or ingredients related to the taste receptor.[6] To date, there very few reports describing changes in overall taste sensitivity in T2DM. Whether/ not environmental influences, such as habitual diet, can alter taste sensitivity, or vice versa, is still unclear. Thus present study was aimed at determining taste dysfunction in a population of T2DM subjects and its correlation with HbA1c level.

Material and Methods

This was an observational cross sectional study which was carried over a period of one year in the department of medicine, Tertiary care institute of India. Patients of age above than 30 years and known case of T2DM for more than 5 years of any sex included in study. Type 1 diabetes mellitus patients, smokers and alcoholics, patients on prescribed medicines known to cause taste alteration like sulphonylureas, ace inhibitors, pregnant and lactating women, patients with upper respiratory dysfunction and herpes infection excluded from studies. Total 100 patients were included in the study.

The study procedure was fully explained after the procedures and prior to the anthropometric parameter measurements and taste test execution. The controls were healthy, non-T2DM volunteers, selected in the same period among hospital healthcare professionals and their relatives, and they were matched for sex, age, and body mass index with patients.All required details about cases such as demographic data, clinical presentation general examination findings, systemic examination taste test were carried out. Blood sample were taken from all patients to check HbA1C, fasting blood sugar, post prandial blood sugar. Diabetes mellitus was defined as an HbA1C>6.5 g% or history of receiving treatment for diabetes mellitus or previously diagnosed diabetes mellitus.

Solution was prepared as directed below.[7] Each solution was made using a volumetric flask to ensure precision of concentrations to ±0.0002 M. The compounds included were: 1. Quinine (bitter): Place 0.011 g of quinine HCl dihydrate in a 500 ml volumetric flask. Add water to bring the volume to 500 ml, producing a solution with a final concentration of 56 µM. 2. Sodium chloride (salty): Place 7.5 g of sodium chloride in a 500 ml volumetric flask. Add water to bring the volume to 500 ml, producing a solution with a final concentration of 0.25 M. 3. Sucrose (sweet): place 60 g of sucrose in a 500 ml volumetric flask. Add water to bring the volume to 500 ml, producing a solution with a final concentration of 0.35 M and 4. Citric acid (sour): place 25 g of citric acid in 500 ml volumetric flask.Add water to bring volume to 500 ml, producing a solution with a final concentration of 0.26 M.

Subjects were provided with 4 solutions, a bottle of water, empty cup, pen, and pen-and-paper taste questionnaire samples, 2 subjects were instructed to rate both the intensity and quality of each tastant and 3 subjects were asked to rinse mouth twice with water and spit it out in the cup provided. After that

5 ml of sample was provided whose nature was kept unknown to the subject and asked to hold it there for 5 seconds before spitting the solution into the cup. After which they were asked to mark the quality and intensity of solutions in the questionnaire scale as mild, moderate and **severe**. Afterward, was asked to rinse mouth with water twice before proceeding to the next sample.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

Results

There was a significant difference between the 2 groups in terms of HbA1c (%) ($p \leq 0.05$), with the median HbA1c (%) being highest in the chemical taste dysfunction: sweet: yes group. Strength of association (Point-Biserial correlation)=0.49.There was a significant difference between the various groups in terms of distribution of chemical taste dysfunction: Sweet ($p \leq 0.05$).

Participants in the group case had the larger proportion of chemical taste dysfunction: sweet: yes. Participants in the group control had the larger proportion of chemical taste dysfunction: sweet: no.

The variable duration of T2DM (years) was not normally distributed in the 2 subgroups of the variable chemical taste dysfunction: sweet. Thus, non-parametric tests were used to make group comparisons. There was no significant difference between the groups in terms of duration of T2DM (years) ($p > 0.05$). Strength of association (Point-biserial correlation)=0.01

Table 1: Comparison of the 2 subgroups of the variable chemical taste dysfunction: sweet in terms of HbA1c (%) (n=100).

HbA1c (%)	Chemical taste dysfunction: sweet		P value
	Yes	No	0.01*
Mean (SD)	10.44 (2.20)	8.16 (2.01)	

* indicates statistically significance at $p \leq 0.05$

Table 2: Comparison of the 2 subgroups of the variable chemical taste dysfunction: sweet in terms of duration of T2DM (Years), (n=100).

Duration of T2DM (Years)	Chemical taste dysfunction: sweet		P value
	Yes	No	0.52
Mean (SD)	9.42 (2.50)	9.53 (4.19)	

Statistically significance at $p \leq 0.05$

Discussion

It has been noticed that the taste sensation is an important factor in the regulating type of food ingestion, in digestive process control, and in the release of neuroendocrine hormones for hunger and satiety. It has been largely demonstrated that the sense of taste is an important tool in the regulation of nutrient ingestion, in digestive process control, and in the release of neuroendocrine hormones for hunger and satiety. Many studies have focused on changes in taste sensitivity in both physiological and pathological situations.[8,9]

A decrease in taste function in patients with diabetes, particularly concerning the sweet taste.[10] There were no differences in sour and bitter sensation sensitivity between diabetic and non-diabetic healthy individuals. A rise in taste threshold has been shown to be related with hyperglycemia.[11]A significant correlation between taste thresholds and plasma glucose concentration has been described in many previous studies, indicating that patients with T2DM are almost insensitive to the sweet taste response.[12]

Our results show significant relationship between taste dysfunction and HbA1c levels. An increase in taste threshold has been shown to be associated with hyperglycemia.[13] A significant correlation between taste thresholds and plasma glucose concentration has been described in a previous study, suggesting that patients with T2DM are almost insensitive to the sweet taste response Individuals less sensitive to sweetness could be at risk of long-term health outcomes, such as diabetes, as they need to introduce more sugar compared to more sensitive people, to obtain the same taste sensation.[14] Although there is no conclusive evidence suggesting that the decrease in sweet taste function in T2DM patients results from an alteration in glucose homeostasis, or vice

versa, the reduced sensitivity to sweet taste might explain the development of a vicious circle leading to a deterioration of glycemic control. Different nutritional surveys have described the presence of a significant prevalence of sweet foods in the diet of elderly people[15]

Our study didn't show any correlation between taste dysfunction and type of treatment being taken by the patients. Though some previous studies showed some gender related differences in taste function among healthy and diseased individuals.[9] While in some previous studies gender-related differences in taste function among healthy and diseased individuals were recognized.[16] Moreover, in agreement with Gondivkar et al[21], no correlation regarding side of stimulation was found; thus, taste function was equivalent on left and right sides of the tongue.

Limitation of the study was sample size of our study was relatively small, so the subject pool may not be entirely representative of general population.

Conclusion

The study found a significant correlation between taste dysfunction and HbA1C level and blood sugar fasting level in type 2 diabetes mellitus patients. Alteration in taste was mainly for sweet. Sour, and bitter did not show any difference in case groups compared to controls. The taste dysfunction was not related to gender, duration of T2DM or type of treatment being taken.

Ethical approval was taken from the institutional ethical committee and written

Informed Consent was taken from all the participants.

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Original Research Article

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Obesity and Helplessness-Pessimism: A Study of Psychological Well-Being and Reaction Injustice among Students

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Abstract

Background: Obesity is one of the major concerns among adolescents, and various factors play a significant role in determining the status of being obese. The sense of helplessness-pessimism is one of them which involves feelings of incompetence, hopelessness, and resignations due to repeated failures. There is a need to determine the role of helplessness-pessimism about obesity as a moderator of those negative effects.

Methods: A cross-sectional study design was used to collect the data for the present study. A total of 28 female students with obesity were enrolled following the BMI general guidelines. All had faced verbal indecent comments. Participants were given a self-administered, pre-tested questionnaire with helplessness-pessimism, self-concept, depressive affect, general distress, and general morale. Descriptive analysis with proportion was used to analyze the data.

Results: Result findings revealed a significant difference between high helplessness-pessimism and low helplessness-pessimism on self-concept competence, positive attitude, potency power, creativity, anger, depressive affect, general distress, and general morale of the participants. However, no significant difference was found between self-rated physical and perceived health change.

Conclusion: A higher sense of helplessness-pessimism does have significantly moderated psychological consequences of obesity for the female respondents.

Keywords: Obesity, Helplessness, Pessimism, Self-concept, General Morale.

Introduction

The World Health Organization (WHO) and other research estimates suggest that there is an increasing prevalence of obesity or overweight over the globe among young adults.[1-4] The rates of obesity have tripled since 1975. The cases of overweight among children, teen, and women and their numbers are growing.[5] The coronavirus pandemic has an impact on young people's diets. The causes of weight gain included unusual eating patterns, a sedentary

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lifestyle, greater screen time, and induced overeating. Additionally, social isolation may encourage more inactivity, sedentarism, and weight gain.[6] Online meal delivery services have seen an increase in popularity since the epidemic, which has directly affected peoples' eating habits and increased their urgent need for food. World Obesity Federation estimated that India, China, and the US are expected to have the most obese children worldwide by 2030.Obesity has reached epidemic proportions globally, with at least 2.8 million people dying each year because of being overweight or obese. Once associated with high-income countries, obesity is now also prevalent in low- and middle-income countries. The prevalence of overweight and obesity is reported to be higher among women as compared with men across the globe, in both developed and developing countries. [7]. The recent report of world obesity atlas 2022 stated that one billion people globally, including 1 in 5 women and 1 in 7 men, will be living with obesity by 2030. The majority of the obese are from low- and middle-income countries.[8]

Generally, the negative effects of obesity are related to social attitudes toward both obesity as a social problem and obese people as a social category. The effect of obesity may differ with age, sex, and social circumstances. It is conceived as positive, neutral, and negative by the obese person, their family, friends, and others in society at large. The stereotypes of the obese are strongly negative in society and obese people are also portrayed as ugly.[9] These stereotypes reveal negative social attitudes, stigmatize obese or overweight people and set the stage for outright discrimination. They are derogated, devalued, and discriminated against on the basis of their being obese in appearance. These everyday life circumstances, stressors, and the perception of the inability to lose weight naturally instil a sense of helplessness-pessimism in them.[10] Hence, there is clearly a need to determine the role of helplessness-pessimism about obesity as a moderator of those negative effects.

Helplessness-pessimism is definedas the feelings of incompetence, hopelessness, and resignation due to repeated failures.[11] In this context, the sense of helplessness-pessimism is concerned with the expectations to control obesity and can change it by losing weight for the better. According to the learned helplessness model a sense of helplessness-pessimism in turn results in poor self-concept, lower self-esteem, lower sociability, social alienation, more emotional suffering, and other symptoms of distress among obese, especially women or girls are more prone to these consequences. Hence, it was predicted that obese females with a higher sense of helplessness-pessimism would report poor self-concept, lower morale, greater depressive affect, and distress than their counterparts with less helpless-pessimistic sense. A study found emotional reactions like anger affect the eating habits of people with obesity and this would increase learned helplessness as well.[12]

The second focus of this investigation is concerned with the transient events in the life of obese individuals that radically alter the way people respond to it and how far they can cope with it. Any traumatic event such as rude comments, taunting, or maltreatment and decision by their peers, family members and the public at large can aggravate the psychological distress resulting from obesity.[6] Children obesity ha sbecome the most serious public health challenge after the COVID pandemic.[13]

People with obesity have helpless pessimistic views about changing the outcome and tend to blame themselves for their obesity. When asked to explain their obesity, they tend to supply dispositional reasons rather than environmental or external factors and also take abusive or critical comments as a self-reference.[14] Hence, it may be expected that obese people would not consider the abuse as unjust or frankly exploratory in the Indian context with reference to obese people but does not negate its usefulness.

Material and Methods

Participants and Procedures

The sample consisted of 28 female students. The sample for the study was deliberately drawn from persons with obesity. They were primarily selected following BMI general guidelines for obesity, overweight, and normal weight (with a BMI greater than 30 are considered obese) from various schools and colleges situated in Bhiwani district Haryana, India. All of them sometimes faced verbal indecent

comments or taunts from their peers, family members, neighbours, strangers, etc. rest were excluded. The age of the sample ranged from 15 to 20 years and the mean age of the sample was 17.79 years (SD =1.32). At the initial stage, the sample was administered on helplessness-pessimism measure and subjects were classified into high (above the median mean =29) and low helpless-pessimistic (below the median, mean=18.5; groups following median criterion (median score=25). Further, they were tested on self-concept, depressive feelings about obesity, distress due to obesity and general morale as indices of psychological well-being and causal attribution about their society. Later, all participants read four vignettes describing a situation pertinent to abuse, though the situation, source and phrasing differ, the crux of each abusive vignette was constant. They were further asked to give their reactions to the abusive events. The testing for the study was conducted individually under anonymous conditions at their residences.

Study tools:

Helplessness-Pessimism: Ten items were included that were assumed to be related to the degree to which a person might feel helpless, and pessimism and the remaining items concerned feelings of control and helplessness. The items were as follows: (1) "How confident were you about losing your weight when you started to do so?" (2) "How difficult do you think it will be for you to lose or reduce weight for the better?" (3) How long do you think it will take for you to get the weight reduced when started to do so?" (4) "Do you have any future hope or prospects of losing your weight?" (5) How helpless do you feel about whether or not you will succeed in losing your weight?" (6) Do you think you have much control whether or not you will succeed in reducing your weight? (7) Do you think that you have objectively enough control over your weight reduction activities? (8) How helpless do you feel to keep distanced yourself from the risk factors of obesity? (9) Generally speaking, as an obese, how helpless do you feel? (10) I do not like being fat, nothing seems to help?" All these items involved 1-to-7-point rating scales.

Self-concept measure: Subjects rated self-using 21 bipolar adjective scales (competence, positive attitude, potency or power, activity, and anger), divided into six sub-scales, presented in the semantic differential format. For each scale, subjects were asked to check a category on a seven-point scale that described "how you see yourself".

Depressive affect: Depressive affect was taped by using six items designed for the study and participants were asked to answer. The items used were: (1) "When you think about being obese, how does it make you feel?" really glad/really depressed. (2) "When you think about being obese, how does it make you feel?" Really not at all guilty/really more guilty. (3) "When you think about being obese, how angry do you feel?" Really not at all/really more. (4) "When you think about being obese, how tense do you feel?" Really not at all tense/really very tense. (5) "When you think about being obese, how sad do you feel?" Really not at all sad/really very sad. (6) "When you think about being obese, how dissatisfied do you feel?" really satisfied/really dissatisfied.

General Distress: General distress was measured by a single item designed specifically for the study. The item was: "Overall, how distressed do you feel due to your obesity at the present time?" The responses were taken on seven-point scale anchoring (1) "Not at all distressed" and (7) "More distressed."

General Morale: The item used was: "On the whole, how is your general mood these days?" to which the subjects were asked to respond on a five-point scale ranging from "Good almost all the time" (1) to "Bad almost all the time" (5) The item has been widely used in previous studies.

Self-rated physical health: The health status (quality of health) was assessed on a five-point (1 excellent to 5 poor) scale by a single item that asked, "Overall, how would you rate your physical health at the present time?"

Perceived health change: Respondents were asked to rate their perceived health change on a five-

point scale (1 much better to 5 worse) by a single item, "How would you say that compares with about a year ago your health better now, has it stayed the same or got worse?"

Causal attribution: The causal attribution question was quite general and intended to assess the extent of personal responsibility/ self-blame or not responsible for the current obesity. The question used and to be answered by the subjects on a 7-point scale, from (1) "Not at all my fault to (7) "all my own fault" was "How much do you think that your current obesity is your

The situations/stories were presented in a random order which varied from subject to subject, since no previously constructed inventories were available. Simple items, varying in five categories, were devised based on primary data. It was hoped that respondents would project their beliefs or thinking about themselves into their responses.

There were three major categories of responses.

1. Fatalism/Helplessness Responses.
2. Put yourself in my place Responses.
3. Justification of Unfairness.

The participants were asked to respond on the self-administered, pre-tested questionnaire and their responses were recorded. The data collection period was from January 2023 to March 2023. A verbal and written consent was taken from each participant and they were contacted according to their convenient time. Descriptive data analysis was used to analyze.

Results and Discussion

Table-1 presents the means and standard deviations for each variable of psychological well-being, and self-rated physical health. Perceived health change causal attribution for high and low helpless-pessimistic obese respondents. Also presented are the results of the t-test for the comparison of high and low helpless-pessimistic respondents.

Table-1: Means (standard deviations), and t-ratios for various measures of psychological well-being (n=28)

Measures	High helpless-pessimistic	Low helpless-pessimistic	t-ratios	p-value
	Mean (SD)	Mean (SD)		
Self-concept competence	13.57 (3.06)	30.71 (4.95)	7.08	.01
Positive attitude	5.71 (2.19)	8.50 (3.64)	2.45	.05
Potency power	7.50 (2.92)	12.29 (4.67)	3.28	.01
Creativity	5.14 (1.81)	7.36 (3.52)	2.08	.05
Anger	4.36 (2.22)	3.50 (1.92)	1.39	.05
Depressive affects	17.64 (7.47)	8.50 (3.27)	4.19	.01
General distress	3.07 (1.83)	2.21 (1.42)	1.39	.05
General morale	3.00 (1.25)	2.00 (0.85)	2.50	.05
Self-rated physical health	3.36 (1.72)	2.57 (0.73)	1.58	(ns)
Perceived health change	3.36 (1.11)	2.64 (1.11)	1.71	(ns)
Causal attribution	3.93 (1.44)	1.64 (0.89)	5.09	.01

ns = not significant

As the result signifies, the stranger and family members' abuse evoked more fatalistic/helpless responses than doctors' and peers' responses. Peers' abuse evoked more counter-abuse responses. However, counter-responses to peer abuse show some efforts of reasonable adjustment (persistence, solving that problem by reporting to others instead of merely postponing it, withdrawal from the situation or attributing it to fate).

Table-2: Distribution of responses chosen and source of abuse among participants (n=28)

Psychological reactions/ responses	Source of abuse Frequency (%)			
	By stranger	By family member	By peer member	By health professional
Fatalism/helplessness	14 (50)	12 (42)	1 (3)	7 (25)
Put in my place	3 (10)	2 (7)	3 (10)	4 (14)
Unfair	5 (17)	4 (14)	7 (25)	6 (21)
Denial of accuracy	2 (7)	5 (17)	3 (10)	2 (7)
Counter abuse	3 (10)	2 (7)	12 (42)	No response
No argument	1 (3)	3 (10)	2 (7)	9 (32)

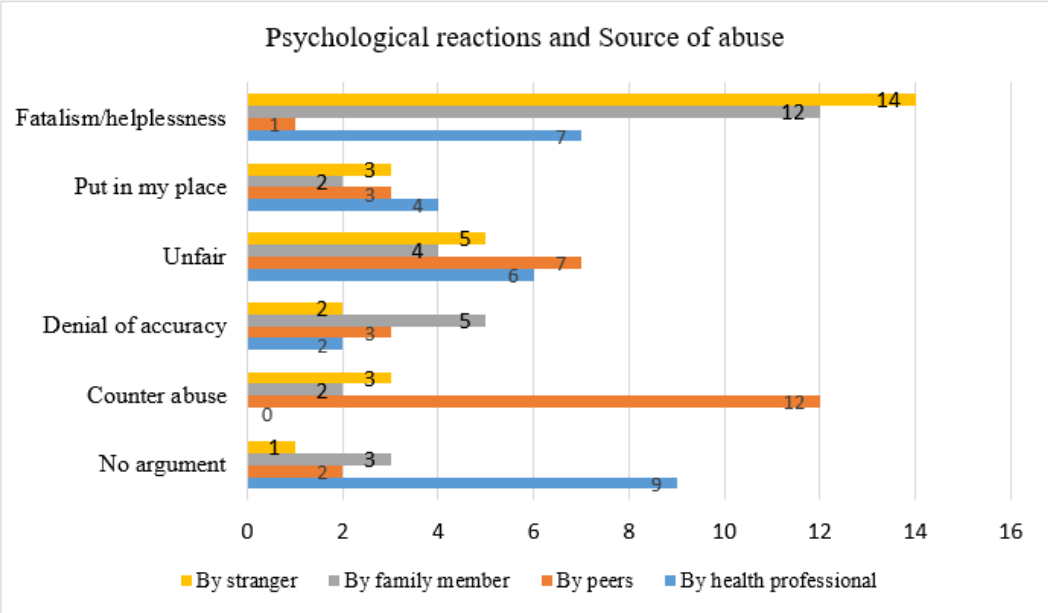

Fig. 1 Psychological responses and source of abuse

The result shows the frequency of responses chosen and their source of abuse among female students. The comments from strangers were expressed by the majority on the domain of helplessness, followed by family members and healthcare professionals Similarly, "unfair" was another domain where participants showed their concerns (Table 2). Fig. 1 shows the frequency of psychological responses over the different sources of abuse, faced by participants.

The major finding from the study is that a higher sense of helplessness-pessimism does have significantly moderated psychological consequences of obesity for the female respondents. Under the umbrella of the learned helplessness framework, we can only speculate as to the explanation for this finding, it is possible that in obesity conditions higher level of helpless pessimism regarding losing weight may accentuate stress rather than reduce the impacts of obesity. Sobczak andLeoniuk[15] stated that healthcare professionals sometimes discriminate against obese patients due to their weight, which is a social issue.

Our indicator of helplessness-pessimism may actually be measuring the passivity, non-contingency between efforts and outcome, and lower hope or expectation of success to reduce weight.

As expected, the analysis revealed a statistically significant difference in mean scores between high and low helpless-pessimistic respondents. It was

observed that low helpless-pessimistic respondents tend to score higher on competence, self-rated positive attitudes, self-rated potency or power, and activity levels than their counterparts with high helpless-pessimistic respondents. Low helpless-pessimistic respondents were less likely to report experiencing depressive affects, or personal fault as cause for their obesity and to provide higher ratings of general morale. The difference in means for anger, general distress, self-rated physical health, and perceived health change, however, statistically could not reach the significance levels.

The findings of this study should be considered in the light of some limitations. Firstly, the sample size of this study was less to generalize on population. Secondly, there must be a possibility of social desirability bias which may hinder the result findings and their interpretation.

Conclusion

The present study found a significant difference on the helplessness-pessimism domain of psychological well-being. Obesity plays an important role in determining the health systems and disease burden. There are findings that state that obesity is a multifactorial issue and psychological well-being is one of the major concerns. Helplessness-pessimism determines the further extension of obesity among different age groups, in which adolescents should be taken care of with utmost priority.

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Ethical clearance: The study was approved by the Institutional Ethics Committee of the Department of Psychology, Central University of Haryana. The study participants were briefed about the purpose and nature of the study, and informed consent was obtained before data collection.

Conflict of interest: There is no conflict of Interest**.**

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Original Research Article

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Mental Health among Preschool Children Social Anxiety Disorder among Preschool Children in Baghdad / Iraq

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Abstract

Background: Social anxiety (SA) is an intense fear of performing in front of people or other social situations in which the child may feel embarrassed, humiliated or the focus of more attention than he or she wants(1). Children who suffer from social anxiety usually fear from looking foolish or stupid in front of other children or adults(2). Children with social anxiety (SA) avoid social situations or may enter these situations with extreme anxiety, nervousness and stress(3).

Social anxiety (SA) is different from shyness. Shy children may be uneasy and quiet around others, but they do not necessarily avoid social or public situations (4). Also, after a short period, shy children usually feel more comfortable while social anxiety disrupts a child's life by making it difficult to deal with school, social relationships and public situation (5). Few publishing on preschool SA in Iraq. This was the impetus to carry out this work.

Objective: Enhancement the attendance care of mental health of preschool children.

Key words: Social Anxiety disorder, feel embarrassed, avoid social situation, preschool children.

Introduction

Mental disturbance is a major problem for Iraq's population especially the children. They were exposed to wars, witnesses or victims of violence, being displaced from homes, failure of the education and health system which effect on the mental health well-being. Social anxiety disorders for children cause extreme fear and worry, and changes in a child's behavior, sleep, eating, or mood. Al-Resafah site of Baghdad has high number of public and private kindergartens and it faced explosions and violence and sectarian. Therefore, this study was carried out in this site to comment on Social anxiety disorder of preschool children.

Materials and Methods

A total of 423 preschool children were included in the study. They were recruited from public and private kindergartens. The sample was selected by multistage random sampling. Al-Resafah selected

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randomly from the two sides of Baghdad. Al-Resafah Al-Thanih directorate was selected randomly from 3 educational directorate in Al-Resafah side of Baghdad. The selected kindergartens were Four private and four public kindergartens randomly from directorate.

Spence child anxiety scale-parent version (SCAS-P) was used. The SCAS-P is with good psychometric properties [6].

Socioeconomic status was determined according to the recent published data [7]. Anxiety was dichotomized (Anxiety and no Anxiety). The data was collected by direct interview with one parent, usually the mother. Chi square was used to test the impact of independent variables on dependent variable and Fisher's Exact test when recommended. P value < 0.05 was considered significant.

Results

Out of total, 111 (26.2 %) were with SA. It was 35 (22.3%) at age 5 years old while at age 4 and 6 years old very closely rate 37 (27.0%), 39 (30.2%) respectively. There was no significant association between social anxiety and the age of preschool children. (χ^2 =2.4, d.f.=1, p=0.3). P value > 0.05.

Social Anxiety was mainly in female 66 (29.5%) while 45 (22.6%)in male children. There was no significant association between Social Anxiety and sex of preschool children (χ^2 =2.5, d.f.=1, p=0.1). P value > 0.05.

Social anxiety was 92 (43.6%) at public kindergartens while 19 (9.0%) at private kindergartens. There was significant association between social anxiety and type of kindergartens (χ^2 =65.5, d.f.=1, p=0.0001). P value < 0.05.

High percentage of Social anxiety with low socioeconomic status was 62 (59.6%) while middle socioeconomic status there was 38 (16.8%) children and the lower percentage with high socioeconomic status 11 (11.8%). There was significant association between Social anxiety and SES according to Chi square test (P value =0.0001). P value < 0.05.

Undergraduate fathers of children with Social anxiety were29 (46.0%) while those with postgraduate fathers were 19 (22.9%) and those with graduate fathers were 63(22.7%). There was significant association between Social anxiety and paternal education according to Chi square test (P value =0.001). P value < 0.05.

Social anxiety with undergraduate maternal education was 38 (55.1%) while graduate maternal education was 58 (21.7%) and the lower percentage with postgraduate mothers 15 (17.2%). There was significant association between Social anxiety and maternal education according to Chi square test (P value =0.0001). P value < 0.05.

There were high percentage of Social anxiety with children caring by one parent 86 (88.6%) while there were 25 (9.2%) with children caring by both parents and there were no children had Social anxiety living with grandparents. There was significant association between Social anxiety and caregiver of children (Fisher's Exact Test= 245, p = 0.0001). P value < 0.05.

Table No. 1: Distribution of Social Anxiety Disorder with determinant factors:

Variable	Total	SA		Chi square χ^2
		No.	%	
Age				
4	137	37	27%	χ^2 =2.4, d.f.=1, p=0.3
5	157	35	22.3%	
6	129	39	30.2%	
Sex				
female	224	66	29.5	χ^2 =2.5, d.f.=1, p=0.1
male	199	45	22.6%	

Continue.....

Kindergarten				
public	211	92	43.6	χ^2 =65.5, d.f.=1, p=0.0001
private	211	19	9.o%	
SES				
Low	104	62	59.6%	χ^2 = 45.5, d.f.= 2, p =0.0001
Middle	226	38	16.8%	
High	93	11	11.8%	
Paternal education				
Postgraduate	83	19	22.9%	χ^2 = 14.9, d.f.= 2, p =0.001
Graduate	277	63	22.7%	
Undergraduate	63	29	46.0%	
Maternal education				
Post graduate	87	15	17.2%	χ^2 = 36, d.f.= 2, p =0.0001
Graduate	267	58	21.7%	
Undergraduate	69	38	55.1%	
Caregiver				
One parent	97	86	88.6%	Fisher's Exact Test= 245, p = 0.0001
Both parent	271	25	9.2%	
Grandparent	55	0	0.0	

Discussion

Social anxiety experience extreme distress when they are faced public situations[8]. DSM-5 provides 11 different anxiety disorder, and only 4 for preschool (GAD, SA, Social anxiety and specific phobia)[8].

The obvious high rate of social anxiety was 26.2% explained by continuous and repeated conflicts in Iraq which in turn lead to sharp decline in children free play with other children. Free play refers to activity that is freely chosen and directed by the participants and undertaken for its sake not consciously pursued to achieve ends that are distinct from the activity itself. It was documented that the decline in free play was associated with rise in psychopathology in children [9]. The familial factors i.e. high prevalence of mental disorders among families e.g. aggression [10] and depression [11] and widely overuse of media (television, mobile, tablets and videogames) [12] are adding factors in explaining the high rate of social anxiety.

Female children show high rate66 (29.5%) while 45 (22.6%) male children among kindergartens. Literatures shows high rate of SA among female children [13].

SA has significant association with type of kindergartens p value <0.05. This might due to good care of children, good building and they provide all playful tools in private kindergartens while the public usually old building and a smaller number of teachers so the care for children will be less efficiency.

Low socioeconomic status has significant affect on increase rate of SA among children. Also, literature might show the same effect[14].

Children cared by one parent were significant higher complain of SA (p = 0.0001). This might attribute to increase in stress on child by absence of one parent. It is in agreement with that reported in other countries[15].

This study shows significant association between the paternal and maternal education and the anxiety of children. SA of children increased with parents have undergraduate education (secondary school or less). This might be due to the education of parents plays important role in upbringing of the children [16].

Conclusion

A higher rate of Social Anxiety Disorder among preschool Iraqi children.

Conflict of interest: nil

Source of funding: self-source

Ethical clearance:

1. The approval of scientific board of community medicine –ethical committee obtained.
2. The official agreement obtained from the Research Ethical Committee in ministry of health –Iraq.
3. The official permission obtained from the ministry of education.
4. The collection of data kept confidential and not be divulging.
5. A written consent taken from the parents for participating in this study and the manager of kindergarten.

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