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FACULTY PROMOTIONS IN MEDICAL TEACHING INSTITUTIONS (MTIS) OF THE KHYBER PAKHTUNKHWA - A SWOT ANALYSIS

Farooq Ahmed

This editorial may be cited as: Farooq A. Faculty Promotions In Medical Teaching Institutions (MTIS) Of The Khyber Pakhtunkhwa- A SWOT Analysis. J Med Sci 2022 October;30(4):239-240

Before 2015, the faculty in the teaching hospitals of the province used to be promoted based on tenure and research papers publications. Upon the introduction of health reforms in KP and promulgation of the MTI act 2015, the promotion of faculty in institutes started to include many other competencies apart from tenure and research. This included excellence in teaching, clinical performance, aptitude for personal and professional development, attending continuous medical education (CME) activities, participation in institutional and administrative activities, feedback, and personal reputation.

These promotion rules have been divided into 2 tracks, a regular and a clinical track. In both of these, there are 2 subdivisions, a normal track, and an accelerated track. The standard set for marks in these 2 tracks was set to be 60% and 70% respectively.

It was observed that the clinical track promotions were only meant for clinical faculty, and there were no clear-cut rules for basic sciences faculty attached to medical schools. Another challenge was the incorporation of giving more weightage to those research papers which are published in the impact factor journals while giving only 1/16th of weightage to those papers which are published in Pakistani journals. A few challenges in such cases are lack of research training among the existing faculty, lack of funds for submitting research papers to impact factor journals, and lack of infrastructure for clinical, educational, and public health research in the existing setups. This is one of the most important factors where the faculty is struggling.

There is a perception by the faculty that the basic sciences faculty has been ignored in clinical track promotions. Rather, the amended rules have incorporated that all basic sciences faculty need to have level III qualification (Ph. D) and supervisor-ship of Ph. D students to be promoted to the next position. Challenges for pursuing a doctorate degree include lack of slots in the existing universities, financial challenges, and a ban by the Higher Education Commission (HEC) to stop M. Phil and Ph. D training in undergraduate medical institutions except in

universities. Moreover, most of the faculty have already passed the necessary tenure for the current post. This has created unrest in the basic sciences faculty as many faculty have either left the public-sector institutions or planning to leave.

There are many strengths of the new promotion rules in the MTI act. These include awareness of the faculty to excel in personal and professional development, research, participation in institutional services, and ultimately improving the overall educational and clinical environment of the colleges and hospitals. This has created an awareness amongst the faculty that mere tenure and 2-3 research papers in a local journal are not sufficient to promote a faculty to the position of a professor.

Faculty that is promoted on the current criteria will be an asset to the current institutions where they are working. Moreover, such faculty can work in other public and private sector institutions where they can produce more effective young professionals, both undergraduate and postgraduate.

However, it is important to mention that many private sector medical institutions are having an eye on competent faculty who feel these criteria as a hindrance and are looking for a suitable job there. The main reason is that the MTI promotion criteria are not aligned with the Pakistan Medical and Dental Council (PMDC) criteria that are followed in Non-MTI institutions.

The policy board should come up with addressing the challenges faced by the faculty, institutions, and administrators in this regard. Some of these challenges include developing a policy for basic sciences faculty keeping the HEC rules in mind, addressing the issue of impact factor publications, and developing a transparent rubric for clinical track criteria of excellence in education, clinical work, and health service management, as weightage given to this section is unclear and are interpreted differently by different individuals and institutions.

Moreover, the leadership of these MTIs needs to develop trained individuals to guide the departmental and

other promotion committees to guide them in the implementation of the existing criteria. Faculty promoted via these set standards will be an asset for the institution in particular and for the country in general.

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SEVERE MATERNAL MALNUTRITION: WHETHER THE BABIES ARE AT RISK OF BOTTLE FEEDING?

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ABSTRACT

Objectives: This research paper aims at finding the association between maternal malnutrition with their choice of feeding practices (breast, bottle, or mix) of infants who are under 6 months of age.

Material and Methods: This cross-sectional study was undertaken from 1st March 2019 to 31st August 2019 at the inpatient and outpatient of the pediatric department of Khyber Teaching Hospital Peshawar. The data was collected on a predesigned proforma recording demographic characteristics of the responders and their feeding practices; exclusive breastfeeding or mixed (breast+ bottle) feeding. Additionally, maternal malnutrition was assessed by calculating their BMI. The data were analyzed in SPSS version 23. Chi-squared was used to analyze the data.

Results: A total of 278 mothers of infants 1-6 months were interviewed about their feeding practices and BMI recorded. The association between maternal malnutrition and breast/bottle feeding was insignificant ($P > 0.05$).

Conclusion: There is no association between maternal malnutrition and the choice of bottle feeding of infants.

Keywords: Infants, bottle feeding, breastfeeding, maternal malnourishment, body mass index

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INTRODUCTION

It is a well-established fact that breastfeeding is the ideal way of feeding newborn babies and infants. It is one of the most important factors which affects the health of children in low to middle-income countries.¹ Annually, 60% of 10.9 million under-five deaths globally are due to malnutrition. Of these, over two-thirds of the deaths are accounted for by sub-optimal feeding practices in the first year of life.²

After birth, growth faltering may begin at 3-5 months of life and becomes more prominent from 6 to 18 months. During this time, the young child is exposed to many infectious diseases, such as diarrhea, that have an adverse effect on growth.³ Promotion of exclusive breastfeeding for the first 6 months of life and continued breast-

feeding for at least the first 2 years, has a beneficial effect on the growth of the young child³.

Bottle feeding should be avoided as far as possible. Feeding babies with bottles carries an increased risk of infections as compared to breastfeeding.³ This in turn can lead to increased morbidity and mortality in young children. There are various factors responsible for bottle feeding including personal choices, employment, lack of education, maternal death, and situations in which breastfeeding is contraindicated.^{4,5}

Maternal malnutrition is a major indicator of maternal food insecurity and is measured in terms of Body Mass Index (BMI) which is a ratio of the weight and height of the individual. It is prevalent (10-19%) in most countries with South Asia as one of the most affected (20%).⁶ It is an established fact that malnourished mothers produce "insufficient milk". Moreover, a series of studies have proven that maternal malnutrition increases the risk of prematurity, low birth weight, and intrauterine growth restriction.^{7,8} These small babies borne by malnourished mothers, later on, are at increased risk of stunting, wasting, and being underweight.⁹

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The quantity and quality of milk produced by malnourished mothers are not much different from that of well-nourished mothers until and unless it is severe malnutrition ($\text{BMI} \leq 18.5 \text{ kg/m}^2$).⁴ Studies have proven that severe maternal malnutrition can lead to deficiency in certain micronutrients like Thiamine, Riboflavin, vitamin B6, B12, A, D, selenium, and Iodine.⁹

There are lots of speculations about the correlation between bottle feeding and maternal malnutrition. However, little empirical research has been done to find the association between malnutrition in mothers and bottle feeding in their babies. The aim of this study is to find the association between maternal malnutrition and their choice of feeding practices. By finding this fact we would be able to address maternal malnutrition in the context of bottle feeding which is not the ideal way of feeding babies and infants. This study was intended to find the association between severe maternal malnutrition and bottle or mixed (breast and bottle) feeding in their babies.

MATERIAL AND METHODS

This study was carried out in the Pediatric department, at Khyber Teaching Hospital Peshawar from 1st March 2019 to 31 August 2019. Mothers of children aged 1-6 months were the study responders. As per the official record of Outpatient and inpatient data of the Pediatric department of Khyber Teaching Hospital, a total number of 650 children constituted the population frame. A sample size of 278 was worked out for a total population of 650 using the formula: $n = r+1(p^*) (1-p^*) (Z \beta + Z \alpha/2)^2 / r(p_1-p_2)^2$

The inclusion criteria of the respondents for the current study included mothers with Babies 1-6 months old who were being bottle fed or having mixed feeding (both breast+ bottle) for at least 1 month or being exclusively breastfed by their mothers for at least 1 month. Infants presenting to both inpatient and outpatient departments of Khyber Teaching Hospital Peshawar were included in the study.

Exclusion criteria included mothers with Twins or triplets babies, infants born with extremely low birth weight (ELBW is $<1 \text{ kg}$ at birth), and those having congenital malformations or metabolic disorders (e.g., Galactosemia).

The data was collected on a well-designed proforma covering the study variables like demographic characteristics of the responders and their choice of feeding

i.e., breastfeeding or mixed (breast+ bottle) feeding. Anthropometric measurements for maternal malnutrition variable, their weight and heights were taken using a digital weighing scale and stadiometer respectively. BMI was calculated using the standard formula. Furthermore, the BMI was categorized into severely malnourished mothers and non-severely malnourished mothers by taking 18.5 as the cut point.

The collected data was coded, edited, and entered into SPSS software (SPSS 23) for its univariate and bivariate analysis. At the univariate level, diagnostic statistics were carried out for demographic variables. In addition, frequencies and percentages proportions of the measures pertaining to breast and bottle-feeding behavior of mothers were worked out. Moreover, the Chi-square test was used to ascertain the association between maternal BMI and bottle/breastfeeding behavior at the bivariate level.

The research followed American Psychology Association standards for ethics in medical research. For this purpose, approval of ethical aspects of the study was solicited from Institution Research Ethical Board. Prior to data collection, the purpose of the study was explained to the responders and informed consent was taken. Moreover, the respondents were ensured of their confidentiality during the research. The respondents were free to respond to some or all of the questions or quit the survey at their will.

RESULTS

A total of 278 mothers were interviewed and anthropometric measurements were taken. Table 1 shows the age, height weight, and BMIs of the mothers. The ages of the mothers are shown in Figure 1. The weight of mothers ranged from 40kg to 110kg (Mean 56.6kg) and height ranged from 1-2 meters (mean 1.56m). The BMI of the respondents ranged from 16-44.6 (mean 23.38). The ages of the babies were from 1-6 months (mean 3 m). Out of 278 mothers, 135 (48.6%) were exclusively breastfeeding their babies while 143 (51.4%) were either bottle-feeding or mixed feeding their babies (Table 4).

Maternal severe malnutrition according to WHO ($\text{BMI} \leq 18.5$) was found in 80(28.7%) mothers while the remaining 198 (71.2%) were not severely malnourished Figure 2. Out of severely malnourished mothers, 40(50%) were exclusively breastfeeding and 40(50%) were not exclusively breastfeeding. In well-nourished mothers, 95(48%) were exclusively breastfeeding their babies while

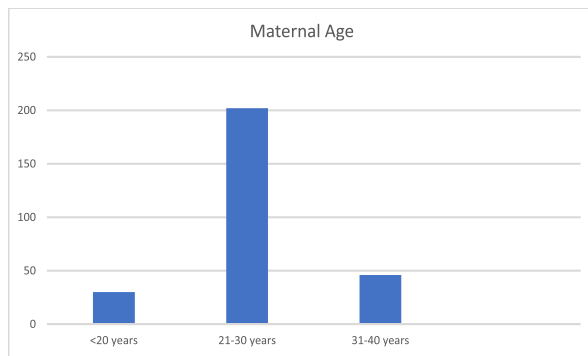


Fig 1: figure showing the maternal age

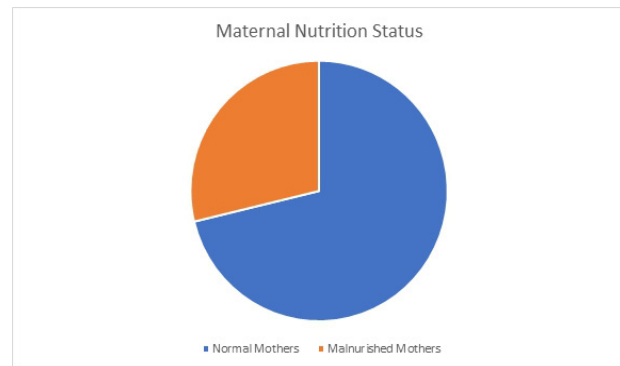


Fig 2: Maternal malnutrition

Table 1: Descriptive statistics of age height weight and BMI of mothers and age of infants

	Age of mothers (years)	Weight of mother (Kg)	Height of mother (meter)	BMI of mother	Age of infant (months)
Mean	26.6043	56.6205	1.56	23.3805	3.054
Std. Deviation	4.92927	12.79563	.061	5.12189	1.5191
Minimum	16.00	40.00	1	16.00	1.0
Maximum	40.00	110.00	2	44.60	6.0

Table 2: Frequency of mothers breast feeding their infants

	Frequency	Percent
Yes	135	48.6
No	143	51.4
Total	278	100.0

Table 3: Association between severe maternal malnutrition and bottle or mixed feeding.

Maternal BMI	Bottle or mixed feeding	Exclusive Breast feeding	Total (percentage)	Statistical results
Malnourished	40 (50.0%)	40 (50.0%)	80 (100.0%)	X ² = 0.093 P = 0.760
Well-nourished	103 (52.0%)	95 (48.0%)	198 (100.0%)	
Total	143 (51.4%)	135 (48.6%)	278 (100.0%)	

103(52%) were using a bottle or mixed feeding technique. In total 278 responders, 135(48.6%) were breastfeeding while 143 (51.4%) were bottle or mixed feeding Table 4. The p-value was calculated as 0.760 which was not significant. Table 5 shows the association of maternal malnourishment status and breast/bottle feeding practice being non-significant ($P > 0.05$).

DISCUSSION

In our study out of 278 mothers, 135(48%) mothers were exclusively breastfeeding their babies which correlates with the international data from Africa, Asia, the Caribbean, and Latin America (47-57%).⁵

Severe maternal malnutrition (BMI <18.5) was found in 28.7% (80) of our respondents. Amongst these

severely malnourished mothers, 50% (40) were exclusively breastfeeding while 50% (40) were using a bottle or mixed (breast + bottle) feeding technique. Of mothers who were not severely malnourished (BMI ≥ 18.5) 48% (95) were exclusively breastfeeding their babies while 52% (103) were not. So, there was not much difference in feeding practices of severely malnourished and but the relatively well-nourished mothers were not exclusively breastfeeding their infants. The same was noted by in a study that suggested socio-economic background influences mothers' choice of feeding practice.⁶ They reported that the mothers who choose mixed or bottle feeding and do not breastfeed their children are because of maternal age, the number of pregnancies, time of first breastfeeding ≥ 12 hours, and early introduction of complementary foods which can positively affect maternal BMI.⁶ Increased

maternal BMI is thought to be negatively correlated with decreased breastfeeding of babies immediately after birth. The same was found in our study. Though maternal malnutrition has no correlation with breastfeeding, normal or high BMI is negatively associated with breastfeeding initiation and intensity as pointed out by many researchers.^{7,8}

Different studies have shown that maternal nutritional status influences the growth of a baby both prenatally and postnatally.^{12, 13} Maternal BMI though has no association with the feeding practices like exclusive breastfeeding or mixed feeding though maternal BMI if high would lead to a higher BMI of the infant as reported by Fanny Aldana-Parra et al.¹³ Some of the studies have shown that maternal malnutrition has little effect over the composition and volume of breast milk until and unless it is severe malnutrition.¹⁴ This finding supports our study's data which indicates no significant difference between malnourished and well-nourished mothers regarding their feeding practices.

While Allen LH et al suggested that the composition is affected but the volume is not by maternal nutrition which in turn will affect the infants.¹⁵ Bzikowska-Jura A suggested in two studies that the choice of infant feeding practice, the composition of milk, and quantity is not affected by maternal BMI same as this study. Thus, maternal malnutrition doesn't affect the choice of feeding practices they make for their infants.^{17, 18}

CONCLUSION

There is no statistically significant correlation between the choice of feeding practice and maternal malnutrition.

Mobilization of mass media and initiating educational programs for awareness raising in masses, provision of incentives for breastfeeding women, revitalizing family institutions for the revival of breastfeeding culture, and mobilizing religious and political leadership for promotion of breastfeeding were some of the policy recommendations in light of study findings.

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AUTHOR'S CONTRIBUTION

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Rehman SKU:	Conceiving the idea, data collection
Amir S:	Literature search writing up the article and Statistical analysis
Shah SIA:	Data collection
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Bashir H:	Bibliography
Bahar S:	Data collection

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PATTERN OF ANEMIA IN DIABETIC PATIENTS PRESENTING TO PRIVATE SECTOR'S TERTIARY CARE HOSPITALS IN PESHAWAR

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ABSTRACT

Objective: To determine the frequency and type of anemia based on MCV in diabetic patients.

Materials and Methods: A Retrospective descriptive study, done at Peshawar Medical College, Peshawar, and its affiliated teaching hospitals from January 2016 to August 2018. It was a Laboratory and Medical OPD record-based study of 450 diabetic patients presenting to these teaching hospitals.

Results: Among 450 diabetic patients, 283(63%) were having anemia (Hb less than 13.5 g/dl in males and 11.5 g/dl in females). Among those who had anemia, 102(36%) had microcytic hypochromic, 176(62%) had normochromic normocytic and 6(2%) had macrocytic anemia on the basis of the mean corpuscular volume of more than 80, 80-95 and 95 fl respectively.

Conclusion: More than 60 % of diabetic patients presented with anemia predominantly suffering from normocytic and normochromic anemia.

Keywords: Anemia, Diabetes, hemoglobin, MCV, Normocytic and Normochromic anemia.

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INTRODUCTION

Anemia is one of the common health problems in Pakistan. It is well identified and documented in most parts of the world but still, its incidence has not reduced probably due to ignoring it and not treating it. It is more common in children and women of childbearing age, especially belonging to low socioeconomic populations.^{1,2} The main reason for its under-treatment is poor nutrition, high prevalence of infectious diseases, poverty, and lack of awareness³.

Some studies^{4,5} also suggest that anemia is commonly associated with non-infectious diseases like diabetes especially type II. Diabetes has taken the status of a global epidemic. In 2000⁴ number of patients suffering

from diabetes was 171 million which is estimated to reach 366 million by 2030.

The incidence of Anemia is twofold in diabetics than in non-diabetics however the mechanism of its development is not clearly understood.^{9, 10}

In Pakistan, the weighted prevalence of diabetes is reported to be 26.3%. The prevalence of diabetes in urban and rural areas has been reported to be 20.3% and 25.3% respectively.

According to Faseeh et al¹¹ 66.8% of patients reporting to a public sector tertiary care hospital in Peshawar are anemic (Hb<13g/dl for males and <12g/dl for females). Generally, anemia is a common health problem in middle and lower-income groups, who seek consultation from public sector hospitals, so in the present study, we planned to look for the condition of anemia in diabetes, reporting to tertiary care hospitals of the private sector in Peshawar. Diabetics have reached an epidemic proportion in Pakistan during the last decade especially Type 2. The aim of the study was to determine the frequency of anemia in patients with diabetes and to assess the common type normally prevailing, based on MCV data of the patient.

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MATERIALS AND METHODS

Data on diagnosed cases of DM type 2 were obtained from medical O.P.D and laboratory records of Mercy and Kuwait Teaching hospitals during the period Jan 2016 to August 2018 after obtaining ethical approval from Peshawar Medical College Ethical Review Board.

The study included both adult male and female subjects. Laboratory data of HbA1C levels of all those patients were taken from the lab registers. Those with HbA1C levels of > 6.5% were selected for the establishment of an association. The hematology analyzer reports were taken out and reviewed. Clinical data and demographic details of the patients were recorded on predesigned proforma. During the study period, a total of 450 cases with HbA1c of >6.5% were seen.

RESULTS

Table II Shows the common type of anemia, which is classified on the basis of MCV. 62% of the subjects suffered from normocytic and normochromic anemia, while a lesser proportion had microcytic hypochromic anemia.

Classification of anemia as macrocytic, normocytic/normochromic, and microcytic/ hypochromic type in both genders was done on the basis of Mean Corpuscular Volume (MCV), with the cut of limits as more than 95 fl, 80–95 fl, and less than 80 fl respectively. The most common anemia in both genders was found to be normocytic normochromic. The data are summarized in table III

Table IV Shows, the common type of anemia, classified on the basis of MCV, in various age groups of diabetic patients.

Table 1: Age and Gender wise distribution of anemic cases

Age in years	Male		Female	
	Number	Percentage (%)	Number	Percentage (%)
Up to 35	17	21.5	30	14.7
36–55	49	62.0	163	80.0
Above 55	13	16.5	11	5.3
	79	100%	204	100%

Table 2: Frequency of Most Common Anemia among Diabetes

Subjects with Anemia	Microcytic, Hypochromic	Normocytic, normochromic	Macrocytic
283	102	176	6
	36%	62%	2%

Table 3: Classification of anemia on the basis of MCV in both genders.

Type of anemia	Male		Female		Total	
	Number	Percentage (%)	Number	Percentage (%)	Number	Percentage (%)
Macrocytic MCV 95 fl)	1	2	4	2	5	2
Normocytic and Normochromic (MCV 95–80 fl)	54	68	123	60	177	62
Microcytic and Hypochromic MCV < 80fl.	24	30	77	38	101	36

Table 4: Type of anemia on basis of MCV in diabetic cases

Age of patient	Macrocytic N= (5)		Normocytic & normochromic N=177		Microcytic & hypochromic N= 101	
	Number	Percentage (%)	Number	Percentage (%)	Number	Percentage (%)
Up to 35	1	(2)	28	(60)	18	(38)
55–36	3	(2)	98	(62)	60	(37)
Above 55	1	(3)	50	(67)	23	(31)

DISCUSSION

Anemia is a common problem among patients with diabetes. Its early identification is of great importance because with the passage of time the condition may worsen and enhance the misery of the patient. Anemia may

aggravate the complications of diabetes, like retinopathy and macrovascular complications.

In the present study among 450 diabetics, 283(63%) people were found, and Sharif et al¹³ also reported the same number of diabetic patients having anemia.

In contrast, another study conducted in Nigeria reported 15.3% anemia in type 2 diabetics.¹⁴ Prevalence of 19.6% was reported in another study.¹⁵

We found more females being affected by anemia as compared to males for obvious reasons. Same were the findings of a study conducted by Beard et al.¹⁶ These findings were also consistent with the findings of Aldallal et al.¹⁷ Though one of the most common causes of anemia in non-diabetic females is iron deficiency but on contrary to our study, most of the patients (62%) had normocytic normochromic anemia which might have been due to nephropathy as a sequel of microvascular complication in diabetics⁶⁻¹⁷.

We compared the frequency of different types of anemia in both genders. In the present study 38% of females while 30% of males were having microcytic hypochromic anemia. This type of anemia is more in females and may be attributed to physiological processes especially childbirth, pregnancy, and menstruation¹⁸⁻¹⁹. On the other hand, 68% of males and 60% of females were suffering from normocytic normochromic anemia. The frequency of macrocytic anemia was the same (2%) in both genders.

We assessed different types of anemias with reference to age. It was found that 67% of diabetics in the age group above 55 years as compared to 62% (36-55 years) and 60% (below 35 years) were having normocytic normochromic anemia. This may be due to anemia caused by renal complications of diabetes²⁰.

Based on age, hypochromic microcytic anemia was found to be the most common type (38%) among the age group less than 35 years as compared to (31%) seen in the age group above 55 years. This could be attributed to probable menopause in females and a relatively decreased growth rate seen in both genders. At young age requirements for iron increase dramatically in both boys and girls due to the expansion of total blood volume, the increase in body mass, and menstruation in young females.²¹

CONCLUSION

The study concludes that normocytic normochromic anemia is the most common type of anemia in diabetic patients. Females are more vulnerable as compared to males. Age-wise analysis showed that at young age microcytic hypochromic anemia while at old age normocytic normochromic anemia is common. The physician should pay special attention to monitoring and management of anemia along with blood glucose levels in diabetic patients.

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Following authors have made substantial contributions to the manuscript as under

Gul A: Concept, Design
Nisar U: Analysis and interpretation of data
Rahman S: Data collection,
Ullah Z: Methodology
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Haq M: Proofreading and Review

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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OVERWEIGHT, OBESITY AND ITS ASSOCIATED RISK FACTORS AMONG SCHOOL GOING CHILDREN OF PESHAWAR, KHYBER PAKHTUNKHWA, PAKISTAN

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ABSTRACT

Objective: To compare the overweight and obesity status and associated factors among children of government and private schools in district Peshawar.

Materials and Methods: A cross-sectional analytical study was conducted from February 2020 to October 2022. A sample size of 300 school-going children between ages 6-15 years from 30 different schools of Peshawar using a multistage sampling technique. The data were gathered on a structured questionnaire. SPSS version 24 was used for data analysis.

Results: The mean age of the children ranged from 15.64 ± 0.48 S.D. 125(41.7%) of the children were from Government schools and 175(58.3%) were from Private Schools. Among 300 study participants 16(53%) were males and 139(46%) were females. overweight and obesity among government and private school children were 9(36.0%), 7 (33.3%) and 16 (64.0%), and 14 (66.7%) respectively (p -value=0.01). Among the Overweight and obese groups respectively there was a positive relationship between the consumption of eggs ($r=0.165$, $p = 0.004$), and fried food ($r=0.180$, $p = 0.002$). The Duration of Outdoor Sports was inversely related to overweight and obesity ($r=-0.333^{**}$, $P = 0.000$).

Conclusion: Comparison between overweight and obesity among both groups shows significant differences due to the mandatory lifestyles of private school children. Both obesity and overweight had an inverse relation with the intensity and duration of physical activities. Effective strategies targeting overweight and obese children are required to make them healthy.

Key Words: Obesity, BMI, Children

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INTRODUCTION

Obesity means having an excess amount of fat, not merely being overweight^{1,2}. The children undergo crucial phases of growth during which there are remarkable changes in physique^{3,4}. Childhood obesity is a major factor for the adult onset of chronic diseases, such as diabetes, high blood pressure, and high cholesterol^{5,6}.

The percentage of overweight children was highest in Latin America and the Caribbean (4.4%), followed by Africa (3.9%) and Asia (2.9%)^{7,8,9}. In India, research in

preschool children showed a low rate of obesity i.e 1.5–1.6%¹⁰. A study in Karachi Pakistan indicates that 6% of school-going children were obese while 19.35% were at risk of developing obesity¹¹. These figures will increase to 2.3 billion for overweight and 700 million for obesity unless drastic measures are taken. Socioeconomic status also affects childhood obesity¹². Obesity and overweight should be controlled from childhood as it leads to adulthood obesity and cause multiple health problems and can overburden the health system of the country^{4,13,15}.

Childhood obesity affects learning ability and cognitive function. Obese children are having low IQ levels as compared to normal children^{16,17}. The present study is therefore very important to know the status of overweight and obesity in school-going children. This study will provide the latest data on school-going age group children and targeted school-based intervention including healthy food provision will be suggested based on study findings.

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MATERIAL AND METHODS

A cross-sectional study was conducted from February 2020 to October 2021. A sample size of 300 was calculated using a 95% confidence interval, desired level of absolute precision as $\pm 5\%$, and a proportion of 23% overweight and obesity in school-going children after adding 10% of non-respondents. A multistage sampling technique was used to select schools and students. According to the official data of educational department districts in Peshawar, there are 272 schools from which we selected 30 schools from each Government and public randomly. Students from both public and private schools with ages 10-16 years studying in grades 6 to 10 were selected.

After approval of the synopsis from ASRB, KMU, a list of all public and private schools in Peshawar will be taken from the education department of Khyber Pakhtunkhwa, a prior field visit was done to ensure the appointment, then schools were visited on given dates, permission was taken from principals of respective schools in district Peshawar. Every selected student was approached by Principle Investigator and his team. Data were collected on structured questionnaires which were filled through an interview with the students by the principal investigator or his team. A team of field supervisors (principal investigator) and two research assistants/data collectors were responsible for data collection in the districts. The data was analyzed using SPSS version 24 for windows. Students were categorized as overweight and obese based on BMI cut-off values. Those having a BMI of 24 and below were labeled as normal those between 24-27 were labeled as overweight and above 28 were labeled as obese. The Chi-Square test was applied for the comparison between the groups i.e. normal, overweight and obese where $P \leq 0.05$ was considered significant.

RESULTS

Mean age of the children was 15.64 ± 0.48 (ranged from 6-15 years). Among 300 children 161(53.7%) were male and 139(46.3%) were female. 125(41.7%) of the children were from Government schools and 175(58.3%) from Private Schools. The mean Weight in Kilograms was 147.14 ± 6.0 while the mean Height in centimeters was 147.14 ± 13.02 cm and the mean BMI of 22.74 ± 3.435 . Table 1 shows the educational status of children in government and private schools. When the BMI categories were compared concerning students of public and private schools, the result revealed that a significant difference was seen among students' BMI ($p=0.01$) as shown in table 2. Table 3 shows a comparison of BMI categories based on gender. Associated factors influencing the Body Mass Index (BMI); determinant of obesity:

Table 4 shows the dietary patterns of school children. When BMI is plotted against variables of dietary and physical activity (table 5), there was a positive relationship ($r=0.165$, $p = 0.004$) between BMI and consumption of eggs as food. There more one consumes eggs the more will be BMI which may lead to overweight and obesity. Similarly, the more one used fried food there more his/her BMI ($r=0.180$, $p = 0.002$). however there was a negative relationship between BMI and Taking Snack Food, but this relationship was statistically not significant ($r=0.011$, $p = 0.855$). the Duration of Outdoor Sports was inversely related to BMI, ($r=-0.333^{**}$, $P = 0.000$) indicating that the more one exercises there will be lesser the chance of being overweight and obese respectively. There was a positive relationship $r=0.014$, $p=.842$ between BMI and frequency of Taking Fast Food. It was interesting to see that those who used to go for outdoor Duration of Outdoor Sports, were more frequently using protein (egg), fried

Table 1: Comparison of children for their parent's education status

	Type of School		P-Value
	Government School	Private School	
Comparison of students with respect to father's educational status			
Un Educated	1(0.8%)	6(3.4%)	0.0001
Under Matric	4(3.2%)	38(21.7%)	
Matriculate	30 (24.0%)	18(10.3%)	
Intermediate	53(42.4%)	95(54.3%)	
Graduate	9(7.2%)	7(4.0%)	
Post Graduate	28(22.4%)	11(6.3%)	
Comparison of students with respect to mother's educational status			
Un Educated	29(23.2%)	44(25.1%)	0.02
Under Matric	30(24.0%)	19(10.9%)	
Matriculate	16(12.8%)	33(18.9%)	
Intermediate	19(15.2%)	19(10.9%)	
Graduate	18(14.4%)	31(17.7%)	
Post Graduate	13(10.4%)	29(16.6%)	

Table 2: Comparison BMI between of children of public and private school

BMI categories	Type of School		P-Value 0.01
	Government School	Private School	
Normal	95(40.3%)	141(59.7%)	
Overweight	9(36.0%)	16 (64.0%)	
Obese	7 (33.3%)	14 (66.7%)	

Table 3: Comparison of Body mass index (BMI) on the basis of gender

	n	Gender of Student		P-value 0.056
		Male	Female	
Normal Weight	236	131(55.5%)	105(44.5%)	
Overweight	25	7(28.0%)	18(72.0%)	
Obese	21	13 (61.9%)	8(38.1%)	

Table 4: Dietary pattern of student:

Dietary pattern of study participants	Frequency	%
No Time Taking Fast Food last months		
2 times	41	13.7
3 times	89	29.7
4 times	41	13.7
5 times	6	2.0
6 times	37	12.3
7 times	03	1.0
Number of Meals taken per day		
Less than Three	49	16.3
Exactly Three	49	16.3
More than three	103	34.3
Tea in Break Fast		
Yes	168	56.0
No	132	44.0
Cream in Break Fast		
Yes	131	43.7
No	169	56.3

Table 5: Correlation between BMI and food and physical activities related variables

	Weakly Eggs Consumption	Number of times taking fried food	Taking Snack Food	Duration of Outdoor Sports	Number of Times Taking Fast Food
Number of times taking fried food	r= -0.046,				
	p = 0.424				
Duration of Outdoor Sports	r=0.284**,	r=263.-0**,	r=0.323**,		
	p = 0.005	p = 0.003	p = 0.001		
BMI	r=0.165**,	r=0.180**,	r=011.-0,	r=333.-0**,	r=0.014,
	p = 0.004	p = 0.002	p = 0.855	P = 0.000	p=.842

foods, and snacks.

DISCUSSIONS

According to the World Health Organization (WHO), public health is concerned with health promo-

tion, disease prevention, and prolonging life among the population as a whole. The main goal of any healthcare strategy in public health should benefit the population. A Nations Wealth depends on its healthy citizens. A Healthy adult emerges from a healthy child. Early childhood rep-

resents/composes the basis of adult productivity and nutrition is a major determinant of the quality or strength of this foundation. As far as a human being is concerned, the earlier stage of growth and development is the vital factor in determining the 'whole' personality of an individual. Childhood obesity has been increasing in prevalence in Pakistan, causing high levels of public concern. In the present case, school-going children in the district of Peshawar have tackled obesity and associated factors. Using the cross-sectional study design data were collected randomly from 20 selected schools in the district of Peshawar.

Mean weight (kg) was 147.14 ± 6.0 while mean height (cm) was 48.69 ± 6.0 cm which accounted for a mean BMI of 22.74 ± 3.435 respectively. a study conducted in Pakistan (in four provinces, a nationwide study indicates that the height (cms) of children was 139.11 ± 18.44 , average weight (kg) was 33.21 ± 11.25 and average BMI was 16.76 ± 3.22 kg/m² (range from 11.3-41.98), which shows that parameter in the present study is greater, however, the difference is because of the age difference of study participant. In the present study only secondary school children were considered while in the reference study, they included all the school children aged 3 to 16 years. the nationwide study revealed that in the age group 3-5 years, >5-10 years, and >10-16 years; 29 (8.1%), 272 (5.1%), and 363 (5.1%) were found to be obese, respectively. CDC height and weight in the three groups of Pakistani children >3-5 years, >5-10 years, and >10-16 years were at the 10-25 centile¹⁸

Among children, 57(19.0%) father died, out of whom Majority was from government schools 33 (57.9%), which indicate that access to private schools is behind the poor people and there is a lack of equal quality of education. Children whose parents are present in the world are pushed to study in government schools. Thus it means that children are entitled to a free quality basic education could create disparity. The problem in many developing countries is that governments lack either the financial resources or the political will to meet their citizens' educational needs. In response, poor parents in some low-income countries have organized and paid for their children's education themselves. School fees and other user payments are indeed a heavy burden for some parents to bear. But, given the alternative—children receiving no education at all—such payments can represent a temporary, if less than ideal, solution to the problem.¹⁹ Among those children whose parents have a divorces history 17 (77.3%) were from private school. These are alarming factors that may lead to failure in students' performance, and also affect the student-teacher and student-parent relationship, as evident from the literature, these factors harm child performance. Social reasons for the weak performance of students include; living with one parent, parental divorce, and low incom²⁰ however when the fam-

ily is wealthy extra empathy/sympathy could be given as indicated by the result of the present study where among 42 children whose both parent died, majority 37 (88.1%) were from private schools indicating that their other family members supporting them and they had got special votes of empathy/sympathy.

Almost all parents want to educate their children in the best possible educational environment. Their decision to invest in children depends on several social, economic, and cultural factors. Education in Pakistan is offered by both public and private sector educational institutions. It is free of cost in public schools whereas, in private schools, the parents have to bear the financial burden. The factors which motivate parents for admitting their children to private schools include the education level of parents, especially the mother, occupation of the father and mother, the income of parents; staff qualifications, and school performance are major factors that affect parents' choice in the selection of private school.²¹ The same trend is seen in the present study where, among private students, the fathers of a majority of students were government employees while the mothers of both groups of children were housewives. Regarding further education level, The fathers of students from the public sector were more educated but few of them had a government job, which means lacking a continuous source of income. This indicates that only education level cant influence the decision income is a major contributor. The result of the present study indicates that mothers of students in private schools were more educated which again supports the evidence from the above literature that a mother's education status does matter in decision-making about their child's educational career. Among students in government schools, 14 (11.2%) were under weigh as compared to 4(2.3%) of students studying in private schools. Similarly, 9(7.2%) of government school children were overweight and 7 (5.6%) were obese as compared to 16(9.1%) and 14 (8.0%) of children from private schools, indicating that private school children are more prone to overweight and obesity respectively which pose significant ($p=0.01$). although this difference was statistically significant in India this gap is worse as compared to Pakistan, where a study indicates that there was under the weight of 44% of government schools, had no incidence of overweight, on the other hand in private schools there is an incidence of 6.8% of overweight and there is no incidence of underweight. In Gana, both undernutrition and overnutrition were common among the school pupils but overweight appeared largely driven by high SES and urbanization while undernutrition was associated with low SES and rural residency. Interventions targeting school children should aim at reducing poverty and hunger as these factors remain underlying causes of malnutrition in childhood.²²

Comparison of BMI among gender indicates that among males, the proportion of underweight was high as

compared to females, However, among 25 overweight individuals, 18(72.0%) were female and 7(28.0%) were male. while among obese (n=21) majority 13 (61.9%) were male as compared to 8(38.1%) female which accounted significant difference ($p=0.056$). A study from India indicates that more females were underweight while the result was persistence with the present study in the area of overweight and obesity, here they also found that the proportion of females among the overweight group was high and the proportion of males among obese was high as also seen in the present study²³. However, another study by Sunil V. Pawar, indicates that the prevalence of overweight and obesity is high in male students as compared to females²⁴, thus gender is not the only factor to influence the individual BMI. Where the more important factor is the socioeconomic position of students

Regarding the associated factors like dietary habits and physical activities, the result of the present study indicates that there was a positive relationship between BMI and consumption of eggs($r = 0.165$, $p = 0.004$), fried food ($r = 0.180$, $p = 0.002$) and fast foods. The literature also indicated that the intake of egg in breakfast results in slightly changing in insulin and glucose level and hence decrease energy intake, hence leading to an increase in BMI which in turn lead to overweight and obesity the same result was noted in the case of consumption of French fried chips where it was associated with increased BMI²⁵. Another study indicates that using Pasta and eggs creates a 0.70 times higher risk of developing overweight and obesity, especially among females²⁶, the result of the present study is not consistence with the finding of Dhobale RV et al. they found that there was no significant association was seen between consumption of milk and eggs with BMI²⁷

The Duration of Outdoor Sports was inversely related to BMI, ($r=0.333^{**}$, $P = 0.000$) indicating that the more one exercise there will be lesser the chance of being overweight and obese respectively. It was interesting to see that those who used to go for outdoor Duration of Outdoor Sports were more frequently using protein (egg), fried foods, and snacks. Literature is consistent regarding the relationship between physical activities and BMI, it is found that lack of participation in outdoor sports among children could lead to both overweight and obesity³⁸. overall results reveal that the important correlates of overweight/obesity were the father's education, father's occupation, class, children playing outdoor games for less than 30 min, and those consuming fast foods

CONCLUSION

the Current study showed that overweight and obesity in school going children is an emergaing public health issue .Effective public health stratigies are needed to save our young generation from growing epidemic of obesity.

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Following authors have made substantial contributions to the manuscript as under

Ghayasuddin S: Concept, design, data collection

Ali W: Data collection, writing, review

Khalil KUR: Data collection, review, statistical analysis

Ali I: Concept, review

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Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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A COMPARISON OF FETAL AND MATERNAL OUTCOMES IN PATIENTS HAVING ESSENTIAL HYPERTENSION VERSUS PREGNANCY-INDUCED HYPERTENSION

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ABSTRACT

Objectives: The purpose of this study was to ascertain whether pregnancy-induced hypertension (PIH) has more serious consequences as compared to essential hypertension on fetal and maternal outcomes or vice versa.

Material and Methods: This study was carried out at the department of Gynecology and Medicine in KRL hospital Islamabad from September 2021 to February 2022. The patient detailed profile was recorded during antenatal follow-up and admissions. Prior approval was taken from the ethical committee. Data were analyzed using SPSS version 23. Descriptive statistics were performed and results were interpreted in frequencies and percentages.

Results. PIH was more common (n=41, 82 %) as compared to essential hypertension (n=9, 18%). The total number of participants was 50. Age ranged from 21-40 years with a mean of 28.24 in the PIH group and 32.8 in the EH group. PIH was relatively more common in Primigravida (n=23, 56.1%) while essential hypertension was common in multigravida (n=6, 66.7%). Maternal complications including preeclampsia, and preterm delivery were fairly more common in PIH (70.7%) as compared to essential hypertension. Fetal complications in the PIH group were, mainly prematurity (51.2%) and IUGR (12.2%). While IUGR was the main complication in patients having essential hypertension (53.6%).

Conclusion: Maternal complication mainly preeclampsia was fairly common (in the PIH group while it was nil in the EH group). The fetal complication in terms of prematurity was about five times more common in the PIH group as compared to the EH group conversely IUGR was common in the EH group as compared to the PIH group.

Keywords: Essential hypertension, PIH, Pre-eclampsia, Eclampsia, IUGR.

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INTRODUCTION

Essential hypertension is a multifactorial condition in which a person has abnormally high blood pressure i.e., systolic blood pressure >140mmHg and a diastolic pressure of >90mmHg, due to some idiopathic cause of pregnancy-induced hypertension or gestational hypertension new-onset hypertension after 20 weeks of gestation¹. Pregnancy-induced hypertension (PIH) and Essential hypertension (EH) both are the leading causes of maternal and neonatal morbidity and mortality.

PIH with proteinuria (300 mg or more of protein in a 24-hour urine collection or a protein: creatinine ratio of 0.3 mg/dL using a spot urine specimen) or thrombocytopenia, renal insufficiency, impaired liver function, pul-

monary edema, or cerebral or visual symptoms is called pre-eclampsia. This can develop into a more severe form called eclampsia in which a patient apart from the symptoms of pre-eclampsia can develop seizures and coma².

PIH can present in any of the following ways a) pre-existing hypertension, b) gestational hypertension and Pre-Eclampsia, c) pre-existing hypertension plus superimposed gestational hypertension with proteinuria and d) unclassifiable hypertension³. One difference between PIH and EH is that later persists even after the delivery while PIH usually resolves after delivery but evidence suggests that women with PIH have a high risk of developing hypertension later in their lives⁴. A family history of hypertension is strongly associated with an increased risk of gestational hypertension⁵.

Studies done in recent years reported that hypertension during pregnancy complicates things to such an extent that the damage is beyond repair. High rates of intrauterine growth restriction, severe brain injury, neonatal respiratory distress syndrome, bronchopulmonary dysplasia, necrotizing enterocolitis, early onset of sepsis, and retinopathy of prematurity have been reported in studies regarding hypertensive disorders of pregnancy⁶. On the

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other side, the mother is at a very high risk of placental abruption, cerebrovascular events, organ failure, and disseminated intravascular coagulation and there has been reported a high rate of cesarean deliveries in such women⁽¹⁾.

In Japanese women, the risk of PIH is approximately 2.7-fold greater in those whose mothers also had PIH compared with those whose mothers did not. PIH is a risk factor for hypertension, hypercholesterolemia, and diabetes mellitus in later life.⁷ While a Considerable amount of work regarding pregnancy and hypertensive disorders has been done on the international level but not much has been done specifically in our region where daily 50-100 women and children lose their lives at the hands of this disease.

The main aim of this study is to identify the maternal and fetal effects caused by essential hypertension and PIH and to compare the effects seen on maternal and fetal outcomes caused by essential hypertension versus Pregnancy induced hypertension.

MATERIAL AND METHODS

This study was carried out at the department of Gynecology and Medicine KRL hospital Islamabad from September 2021 to February 2022. Patient detailed profile was recorded during antenatal follow-up and admissions through the nonprobability random sampling technique. Patients were categorized as having pregnancy-induced hypertension when they had no history of high blood pressure in between pregnancies and during the 1st five months of conception and essential hypertension when there was a history of high blood pressure throughout pregnancy and before conception. Prior approval was taken from the ethical committee at KRL Hospital Islamabad. Data were analyzed using SPSS version 23. Descriptive statistics were performed and results were interpreted in frequencies and percentages.

RESULTS

This study included 50 patients. The sample size was calculated using the Raosoft calculator. 41 (82 %) had PIH and 9 (18%) had EH. Two third of our patients were less than 30 years of age.

Age ranged from 21-40 years with a mean of 28.24 in the PIH group and 32.8 in the EH group. PIH was common in Primigravida (56.1%) while essential hypertension was common in Multigravida (66.7%). Table 1 shows the age-wise distribution in groups.

Common maternal complications with PIH were pre-eclampsia (43.9%), and preterm delivery (19.5%). Common fetal complications with PIH were prematurity (51.2%) and IUGR (Intrauterine growth retardation) (12.2%). IUGR was a common fetal complication with EH

(55.6%). Cesarean section was the predominant mode of delivery in both groups (88.8% EH: 85.3% PIH). Table 2 shows detailed maternal and fetal outcomes in both groups.

DISCUSSION

Hypertensive disorders during pregnancy are one of the leading causes of maternal and infant morbidity and mortality, resulting in complications in about 2-3% of pregnancies⁹. A study conducted locally showed this figure to be 2.06%¹⁰. In our study, it was found that PIH leading to preeclampsia was more common in women of early reproductive years and it was more likely to be associated with fetomaternal complications. Maternal and fetal complications were less likely in cases of essential hypertension. Another study revealed similar results¹¹.

One-third of our patients had a BMI of more than 30. Another study also establishes an association between elevated BMI and hypertensive disorders of pregnancy¹². Yet another study also supports the influence of obesity on maternal and fetal complications¹³.

Our study reveals that preeclampsia was more common in primigravida. In a study, it was found that multiparous women were at low risk of having preeclampsia¹⁴. An inverse relation was found between parity and pregnancy-associated hypertension¹⁵.

In the current study, preeclampsia and preterm labor were frequently observed. A study elsewhere shows that hypertensive disorders were major risk factors for preterm labor and birth¹⁶. A couple of studies have shown fetal growth restriction and preterm birth as major complications of hypertensive disorders of pregnancy¹⁷⁻¹⁸.

The most common mode of delivery in the present study was Cesarean section with a low frequency of spontaneous vaginal births. Similar findings were reported in another study where the rate of cesarean deliveries was 84.9% and was considered a safer mode of delivery than vaginal births¹⁹.

Hypertensive disorders of pregnancy are considered to be the second most common cause of death worldwide²⁰. However, in the present study, no maternal death was reported although severe complications with eclampsia and prolonged ICU (Intensive Care Unit) admission were observed. Similarly, the number of fetal mortality and NICU admissions were also low, although low birth weight and IUGR were commonly observed. The limitation of this study was the relatively small sample size.

CONCLUSION

Maternal complication mainly preeclampsia was fairly common in the PIH group while it was nil in the EH group. The fetal complication in terms of prematurity was about five times more common in the PIH group as com-

Table 1: Age-wise distribution of PIH and EH

AGE GROUPS	PIH		EH	
	(n)	(%)	(n)	
21-25	(%)	24.4	1	11.1
26-30	21	51.2	1	11.1
31-35	10	24.4	5	55.6
>35	0	0	2	22.2
Total	41	100	9	100

Table 2: Maternal and fetal outcomes in PIH and EH group

VARIABLES	PREGNANCY INDUCED HYPERTENSION (PIH) N (%)	ESSENTIAL HYPERTENSION N(%)
PARITY		
Primigravida	23(56.1%)	3(33.3%)
Multigravida	18(43.9%)	6(66.7%)
BMI		
Normal (18.5-22.9)	09(21.95%)	1(11.1%)
Overweight(23-24.9)	24(58.5%)	3(33.3%)
Obese (>25)	08(19.5%)	5(55.5%)
MODE OF DELIVERY		
SVD	6(14.6%)	1(11.1%)
C-section	35(85.3%)	8(88.8%)
MATERNAL COMPLICATIONS		
Pre-eclampsia	18(43.9%)	0(0%)
Eclampsia	2(4.9%)	0(0%)
Preterm delivery	8(19.9%)	2(22.2%)
Miscarriages	1(2.4%)	2(22.2%)
FETAL COMPLICATIONS		
Prematurity	21(51.2%)	1(11.1%)
Birth asphyxia	1(2.4%)	0(0%)
IUGR	5(12.2%)	5(53.6%)
IUD	1(2.4%)	0(0%)
Neonatal deaths	1(2.4%)	0(0%)
NICU admissions	3(7.3%)	0(0%)

pared to the EH group conversely IUGR was common in the EH group as compared to the PIH group.

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Ali A: Concept, Design, and write up
Rehmatullah N: Data collection and literature review
Fayyaz A: Data collection and literature review

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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THE ORAL HEALTH RELATED HABITS, KNOWLEDGE, AND FREQUENCY OF USE OF DENTAL FLOSS AMONG UNDERGRADUATE DENTAL STUDENTS OF A PUBLIC HEALTH SECTOR UNIVERSITY IN KARACHI, PAKISTAN

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ABSTRACT

Objectives: To assess the gap between knowledge of interdental cleaning aids and the usage of dental floss among undergraduate dental students.

Materials and Methods: A cross-sectional study was undertaken at the Jinnah Sindh Medical University, Sindh Institute of Oral Health Sciences, Karachi, Pakistan, between March to May 2022. Using select statistics electronic software, a sample size of 172 was estimated, however, we included 200 participants in the study considering an expected drop-out rate of 15%. A structured questionnaire was designed to collect data from undergraduate dental students. All data were entered and analyzed using SPSS version 26. Percentages and frequencies were calculated to assess the knowledge and implementation of that knowledge among undergraduate dental students. In Association between the year of study and the use of dental floss, a chi-square test was used. A p-value of < 0.05 was set as the cut-off for statistical significance.

Results: A total of 200 participants were included with 24.5% males and 75.5% females. There was a significant association of interdental cleaning aid awareness with gender ($p=0.007$). Only a small percentage of females knew that waterjets and rubber tips were interdental cleaning aids while the majority of the respondents irrespective of gender knew that dental floss is interdental cleaning aid. Dental floss usage was significantly higher in the female population than in males (18.37% vs. 50.33%; $p=0.019$).

Conclusion: Our study concluded that while the majority of undergraduate dental students had knowledge that dental floss should be a routine habit, they themselves were not practicing it. Moreover, about 30% of the study population claimed that they only brushed once a day only. The use of dental floss was significantly more frequent in female undergraduate dental students.

Keywords: interdental cleaning, dental floss, oral health hygiene, dental plaque

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INTRODUCTION

Dental flossing is a preventive measure that is the simplest and most effective method of plaque control.^{1,2} Nevertheless, despite being a cost-effective method to prevent dental plaque, it is a less commonly practiced procedure worldwide as evidenced by recent literature.³ Plaque accumulation, on a daily basis, becomes harder to

manage, and even brushing twice a day is not enough to remove it from the stubborn, difficult-to-reach interdental areas.^{4,5}

The importance of preventive procedures is better understood by the general population when oral health promoters and educators, such as undergraduate dental and medical students, have a clear understanding of these preventive procedures and the impact their regular practice can have. Evidence supports varying attitudes and awareness of oral health among preclinical and clinical undergraduate dental students.^{6,7} These varying attitudes and behaviors reflect the variances that come with education and the year-by-year development of knowledge and skills from the training experience. Therefore, our study aimed to assess the gap between knowledge of interdental cleaning aids such as dental floss and the

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usage of dental floss among under graduate students. Furthermore, it also evaluated self-reported general oral health habits of undergraduate dental students in the public-sector university of Karachi, Pakistan. Finally, we drew a comparison between knowledge and practice of flossing among undergraduate dental students.

METHODS AND MATERIALS

A cross-sectional study was undertaken at the Jinnah Sindh Medical University, Sindh Institute of Oral Health Sciences, Karachi, Pakistan, between March to May 2022, after approval from the Institutional review board of JSMU.

For the enrollment of participants, a non-probability convenience sampling technique was employed. For sample size estimation, select statistics electronic software was used. Knowledge regarding flossing was reported to be 87.14% among the undergraduates of medical and dental institutes. Keeping 87.14%,⁸ as the sample proportion, the margin of error as 5%, and a confidence level of 95%, a sample size of at least 172 was calculated. We included 200 participants in the study considering an expected drop-out rate of 15%.

All undergraduate dental students irrespective of gender, caste, creed, or socioeconomic status were eligible to participate in the study. All participants aged above 18 years were included. The entire teaching and non-teaching dental faculty were excluded from the study. Moreover, graduated students and house officers were also excluded.

A structured questionnaire was designed to collect data from the undergraduate dental students of Jinnah Sindh Medical University, Sindh Institute of Oral Health Sciences. The questionnaire consisted of close-ended questions and it was self-administered.

Periodontitis was defined as a severe gum infection (disease) that can lead to the loss of tooth attachment and other health complications. Soft tissues i.e. the gums are damaged and if not treated, the bone supporting the tooth structure is destroyed.¹

Interdental cleaning aids included all tools that help in removing plaque from the interdental spaces such as dental floss, interdental brushes, and toothpicks. Dental floss was defined as a thread-like cleaning aid that is used especially to remove plaque from the interdental spaces and the gum line.

The data on demographics age, gender, primary way of cleaning teeth, frequency of dental flossing, general oral health habits, assessment of knowledge of interdental cleaning aids, etc. were recorded.

All data were entered and analyzed using SPSS version 26. Percentages and frequencies were calculated to assess the knowledge and implementation of that

knowledge among undergraduate dental students. To assess the association between the year of study and the use of dental floss, a chi-square test was used. A p-value of < 0.05 was set as the cut-off for statistical significance.

RESULTS

Table 1 demonstrates the demographics of the study population. The majority of under graduate dental students who participated were aged between 21 and 23 years with a major female preponderance.

Table 2 demonstrates the association of oral health related habits with gender. Dental floss usage was significantly higher in the female population than males (18.37% vs. 50.33%; $p=0.019$).

There was a significant association of interdental cleaning aid awareness with gender ($p=0.007$).

Furthermore, females were more frequently using dental floss as compared to males as illustrated in Table 4 ($p=0.019$). The knowledge about issues due to not performing interdental cleaning was significantly higher in males ($p=0.038$). The knowledge about the benefits of using dental floss was significantly different with respect to gender ($p=0.009$). Overall, the majority knew floss helps removal of food particles from in between teeth however, only a minority acknowledged that it also helps prevent stains (table 3).

Approximately 40% of the participants used dental floss and out of these, at least 70% started using it out of their own choice. 23 (11.5%) flossed only once a week. The majority of the respondents did not have a specific time during which they did dental flossing. As under graduate dental students, only 52% claimed that dental flossing is extremely important. About 18% of the participants claimed that the biggest issue with flossing is that it is time-consuming (Table 4).

Table 5 also demonstrates the correlation between the frequency of dental floss usage and gender.

DISCUSSION

Oral hygiene still prevails to be the most neglected aspect of daily routine which highlights the significance of conducting this study. In our study population, the plaque was found to be one of the most common oral health issues. This finding is consistent with a result documented by Sreenivasan PK et al with a mean dental plaque score of 2.47 ± 0.55 . Their study showed the majority of the population assessed had dental plaques.⁹ Primary dental cleaning aid in our study, collided with the use of toothbrush and toothpaste. This finding is supported by the American Dental Association (ADA) that recommends the masses, regardless of gender, brush their teeth with fluoride-containing toothpaste.¹⁰ The frequency of tooth brushing was also found to be twice a day in the majority

Table 1: Demographics of the participants

Age	N (%)
18-20	58 (29%)
21-23	140 (70%)
24-26	2 (1%)
Gender	
Male	49 (24.5%)
female	151 (75.5%)
Year of BDS	
1	54 (27%)
2	49 (24.5%)
3	45 (22.5%)
4	52 (26%)

Table 2: Association of oral health related habits with Gender

Parameter	Male (49)	Female (151)	Total (200)	p-value
Primary cleaning				0.513
Toothbrush with toothpaste	49 (100%)	144 (95.4%)	193 (96.5%)	
Toothbrush with tooth powder	0 (0%)	4 (2.6%)	4 (2%)	
Miswak	0 (0%)	3 (1.98%)	3 (1.98%)	
Secondary method				0.019
Mouthwash	31 (63.3%)	43 (28.5%)	74 (37%)	
Dental floss	9 (18.37%)	76 (50.33%)	85 (42.5%)	
Toothpick	2 (4.08%)	11 (7.28%)	13 (6.5%)	
Interdental brushes	5 (10.2%)	14 (9.27%)	19 (9.5%)	
Others	2 (4.08%)	7 (4.64%)	9 (4.5%)	

Table 3: Association of knowledge and awareness regarding dental floss with gender.

Parameter	Male (49)	Female (151)	Total (200)	p-value
Interdental Cleaning aid awareness				0.007
All	13 (26.5%)	45 (29.8%)	58 (29%)	
Issues from not cleaning interdental				0.038
Plaque in Gum Line	15 (30.61%)	64 (42.4%)	79 (39.5%)	
Interdental Caries	16 (32.65%)	58 (38.41%)	74 (37%)	
Calculus	11 (22.45%)	25 (16.56%)	36 (18%)	
Bad Breath	7 (14.29%)	2 (1.32%)	9 (4.5%)	
Other	0 (0%)	2 (1.32%)	2 (1%)	
Role of dental floss				0.009
Remove food particles from teeth	27 (55.1%)	130 (86.1%)	157 (78.5%)	
Prevent Calculus Buildup	11 (22.45%)	12 (7.95%)	23 (11.5%)	
Prevent/Remove Stains	2 (4.08%)	2 (1.32%)	4 (2%)	
Not Sure	7 (14.29%)	2 (1.32%)	9 (4.5%)	
All of the above	2 (4.08%)	5 (3.31%)	7 (3.5%)	

Table 4: Association of frequency of use of dental floss with gender.

Parameter	Male (49)	Female (151)	Total (200)	p-value
Use dental floss				0.846
No	22 (44.9%)	64 (42.4%)	86 (43%)	
Yes	27 (55.1%)	87 (57.6%)	114 (57%)	
Why dental floss				0.203
Recommended by Doctor	5 (10.2%)	9 (5.96%)	14 (7%)	
Recommended by Friend/Relative	4 (8.16%)	2 (1.32%)	6 (3%)	
Encouraged by Curriculum	4 (8.16%)	32 (21.19%)	36 (18%)	
Personal Choice	36 (73.5%)	108 (71.5%)	144 (72%)	
Floss frequency				0.766
Once a day	13 (26.53%)	47 (31.13%)	60 (30%)	
Once a week	9 (18.37%)	14 (9.27%)	23 (11.5%)	
Twice a week	5 (10.2%)	22 (14.57%)	27 (13.5%)	
Never	18 (36.73%)	59 (39.07%)	77 (38.5%)	
Other	4 (8.16%)	9 (5.96%)	13 (6.5%)	

of the responses which is favored by the documented 34% of females by Alshahrani S et al. in their study as well.¹¹

The awareness of using dental floss was found to be more in the female gender than males and similar results were found to be documented by Alshahrani S et al in their study highlighting 64% of females.¹¹ Majority of the individuals reported that the normal frequency of dental flossing should correspond to the frequency of tooth brushing every day, which is a finding consistent with the findings of Madan C et al where 63.90% prescribed flossing routinely.¹²

We found that the majority knew it helps in the removal of food particles from between the teeth however, only a minority acknowledged that it also helps prevent stains. This finding of our study is supported by the results of Chandrapooja J. et al. where 69% were not aware of the benefits of dental floss.¹³ Moreover the knowledge about the benefits of using dental floss was significantly different with respect to gender ($p=0.009$), highlighting the female population to be more aware of the role of dental floss ($p<0.001$) which was also one of the conclusions made by Hamasha AA et al in their study where 67.2% of the females believed in the flossing efficiency as compared to only 48.6% males ($p<0.001$).¹⁴

The female majority used dental floss which is supported by the percentage documented by Fleming EB et al. of the United States where one-third of adults used dental floss in their daily dental hygiene practices.¹⁵ Personalized approach to oral care has always been the most widely adopted method of practicing oral hygiene,¹⁶ and our study highlights how the majority of the participants chose to make dental floss a part of their routine by their own personal choice.

CONCLUSION

Our study highlighted that while the majority believed dental floss should be a routine habit, they themselves were not found practicing it. Only 4% believed flossing to be not important whereas, 57% of the population practiced flossing. Moreover, about 30% of the study population claimed that they only brushed once a day only. The use of dental floss was significantly more frequent in female dental students.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Shah H: Concept, design, Writing
Ahmed S: Writing, review
Talha S: Statistical analysis, review
Irshad M: Data collection, writing
Fatima A: Data collection, writing
Nisar N: Data collection, writing

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ASSESSMENT OF RISK FACTORS OF RELAPSE IN DRUG ADDICTS IN REHABILITATION CENTERS IN PESHAWAR CITY

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ABSTRACT

Objective: To find the common risk factors of relapse in drug addicts after being treated in a rehabilitation center.

Materials And Methods: This descriptive cross-sectional study was conducted in four rehabilitation centers, i.e., Da Haq Awaz, Lady Reading Hospital (LRH), and two Dost welfare Foundations in Peshawar City, from October 2019 to August 2021. The non-probability sampling method selected 70 addicts who had undergone single or multiple relapses. The Data was collected using a questionnaire, developed and validated via a structured seven-step process proposed by AMEE guide no. 87, which provides questionnaire development (conduction of literature review, synthesizing the literature review and development of items) and questionnaire validation (conduction of expert validation; content and face validation, cognitive interviews, and construct validation by pilot study resulting in a Cronbach's $\alpha = 0.7$). Data were analyzed using SPSS-23.

Results: A total of 70 drug addicts participated in the study. All of them were males, out of which 78% were adults, 4.3% were elderly and the remaining 17.1% were adolescents. The most common risk factor of relapse was found to be the lack of hobbies, $n=32$ (45.3%), followed by peer pressure, $n=26$ (33%), while the least common was economic factors, $n=13$ (18.6%). Association among variables such as age, peer pressure, family issues, polydrug abuse, lack of hobbies, disturbed sleep, and financial issues was significant $p<0.05$.

Conclusion: Among various risk factors for relapse, polydrug use, withdrawal syndrome, living status, peer pressure, family factors, lack of hobbies, psychiatric disorders, and financial aspects, lack of hobbies is the most common risk factor for relapse in drug addicts who had relapsed and were currently under the care of rehabilitation centers.

Keywords: Relapse, Drug Addiction, Substance Use Disorder, Rehabilitation.

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INTRODUCTION

Substance abuse is defined as the use of any drug in a manner that deviates from approved social or medical patterns. The severity of substance use disorder (SUD) is classified into 4 levels based on the number of symptoms the patient has: at risk of SUD, mild SUD, moderate SUD, and addiction.¹ A drug addict is defined as a person using a drug such that the stoppage of that drug produces withdrawal symptoms in that person. Relapse is the return to drug-seeking and taking behavior after a prolonged period of abstinence.² While American Addiction Center defined "Relapse" as when a person returns to using drugs

after being sober for some time. Relapse shouldn't be confused with "lapse." A lapse is a tiny slip from the actual course of abstinence; that is, a person goes back to drug abuse but immediately stops. Victims usually undergo frequent lapses during their course of abstinence. Meanwhile, relapse is when a person in abstinence returns to a full-blown addictive lifestyle.³

Highly associated with morbidity and mortality, substance use disorder is the 2nd leading cause of disability according to a Global Burden Disease (GBD) study in 2017.⁴ According to UNODC (United Nations Office on Drugs and Crimes), 284 million people, aged 15 to 64, mostly men, had used drugs in the last 12 months. It is a 26% increase in the last decade, which can be partly attributed to global population growth.⁵ Globally, the prevalence of substance use disorders from 2010-2016 was stable at around 30.5 million, 36 million in 2019, and 36.3 million in 2020, while only 1 in 7 people received treatment for substance use disorder.^{6,7}

Despite the rising trend of substance use disorder

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ders worldwide, there are no recent studies at a national level. A survey done by UNODC in 2013 showed Pakistan has around 6% or 6.7 million drug abusers, where 75% are males and 25% are females. However, 4.25 million individuals were drug-dependent.⁸ Risk factors, Relapse, Drug addiction, Rehabilitation centres, Substance use disorder. Peshawar has a high prevalence of drug abuse because it is geographically located closer to Afghanistan, a major opium producer in the whole world, where the transit across the border is often unchecked.⁹

The situation of drug addiction in Pakistan, a developing country, is challenging, and serious measures must be taken to deal with them. One of the reasons for this high prevalence of drug abuse is relapse. The significant risk factors associated with relapse are peer pressure, lack of acceptance by society, family factors like addicts in the family and conflicts with relatives, polydrug abuse, lack of hobbies, psychiatric disorders, financial instability, and occupational factors.¹⁰⁻¹³

This study aimed to discover the most common risk factors of relapse in drug addicts who have suffered single or multiple relapses and are currently in the care of rehabilitation centers in Peshawar city. The outcomes of this study will be shared with professionals, the general population, and officials with the hope that this study may help them create policies and strategies to prevent relapse among drug addicts.

MATERIALS AND METHODS

A descriptive cross-sectional design was used to assess the contributing factors of relapse in drug addicts from October 2019 to August 2021. This study included subjects who had recovered after being treated in rehabilitation centers but unfortunately relapsed and are again under treatment in rehabilitation centers of Da Haq Awaz located on Warsak Road, LRH Psychiatry ward, Dost Welfare Foundation Warsak Road, and Hayatabad branches, located in Peshawar city. The sample size was calculated using Andrew Fisher's formula, which was 68. However, we included 70 participants.

Data was collected using a self-developed questionnaire and validated via a structured seven-step process proposed by AMEE guide no. 87. First, a questionnaire was developed by performing a literature review; 47 articles were included via the PRISMA approach, interviews were conducted to know the concept of interest among the targeted population, the literature review was synthesized accordingly, and questionnaire items were developed. Secondly, the questionnaire items underwent expert validation; content and face validation, Focus groups, and cognitive interviews were done to ensure the subjects interpreted the items in a manner intended for their use. Construct validation was done by a pilot study to check for reliability resulting in a Cronbach's $\alpha = 0.7$.¹⁴

A statistical software platform SPSS-23 was used to find out the frequencies and associations using the chi-square test for multiple associations with decreased probability of type 1 error using Bonferroni correction.

RESULTS

All 70 participants were males, with $n=58$ (82%) adults and $n=12$ (17.1%) adolescents. More than half of the participants, $n=39$ (55.7%), were single, and $n=39$ (55.7%) belonged to rural localities. Almost two-thirds, $n=44$ (62.9%), were employed, and three fourth, $n=52$ (74.3%), lived in a joint family system. And more than three fourth, $n=55$ (78.6%), had an education level up to secondary school, as shown in Table 1.

According to this study, lack of hobbies, $n=32$ (45.4%), was the most common risk factor for relapse in drug addicts, and peer pressure, $n=26$ (37.2%), was the second most common risk factor for relapse. The financial instability factor, $n=13$ (18.6%), was the least common risk factor for relapse in drug addicts treated in various rehabilitation centers in Peshawar, as shown in figure 1.

We found significant associations between various variables, including age and peer pressure, age and family conflicts, family status and polydrug abuse, withdrawal syndrome and peer pressure, withdrawal Syndrome and mood swings, withdrawal syndrome and disturbed sleep, disturbed sleep and family conflicts, disturbed sleep and financial issues, financial issues and family conflicts.

DISCUSSION

The study included drug addicts older than 15 years of age currently under treatment in different rehabilitation centers in Peshawar city. According to previous studies, socioeconomic factors play a major role in relapse among drug addicts.¹⁵ An increase of 1% in unemployment creates the probability of relapse by 3% of drug usage, as shown in a study done by Kassani et al. The study participants were unemployed with no sense of responsibility and had free time to get involved in drug usage.¹⁶ These findings are contrary to our results as our findings showed that financial instability (18.6%) is the least common factor leading to the relapse of addicts.

Previous studies also suggested how illiterate or less educated people are more inclined to relapse.¹⁷ But our study revealed no apparent correlation between education and relapse. Some of the older studies highlighted the role of peer pressure in relapse among addicts. Peer pressure is one of the crucial indicators leading to deterioration among 50% of drug addicts.¹⁸ Another research conducted in Saudi Arabia also showed that peer pressure played a major role in the relapse of drug addicts.¹⁹ Our findings show that peer pressure (37.2%) is the second most common risk factor for relapse. However, this finding contradicts a study done in Bangladesh to assess relapse

Table 1: Study findings of demographic parameters of participants.

Variables		Frequency (%)
Age	15-19 (Adolescent)	12(17.1%)
	20 - 50 (Adult)	55 (78.6%)
	50 - Above (Old)	3(4.3%)
Gender	Male	70(100.0%)
	Female	0(0%)
Marital Status	Single	39(55.7%)
	Married	31(44.3%)
Region	Urban	31(44.3%)
	Rural	39(55.7%)
Occupation	Unemployed	26(37.1%)
	Employed	44(62.9%)
Family	Joint	52(74.3%)
	Nuclear	14(20.0%)
	None	4(5.7%)
Family	Illiterate	11(15.7%)
	Primary	7(10.0%)
	Middle	16(22.9%)
	Secondary	32(45.7%)
	Professional	4(5.7%)

Table 2: Study findings of demographic parameters of participants.

Variable	Associated with	Chi-2Value	Sig.Value at $\alpha=.05$
Age	Peer pressure	9.894	.042
	Family issues	13.428	.004
Family Status	Polydrug abuse	17.76	.023
	Joint family	28.95	.000
Withdrawal Syndrome	Polydrug use	42.740	.000
	Peer pressure	28.5	.000
	Lack of hobbies	26.644	.009
	Mood Swings	37.935	.002
	Disturbed Sleep	37.629	.002
Polydrug use	Peer pressure	50.229	.000
	Lack of hobbies	37.80	.000
	Difficulty Focusing	46.716	.000
Disturb sleep	Family Conflicts	21.464	.044
	Mood Swings	46.608	.000
	Difficulty Focusing	39.412	.000
	Financial issues	36.68	.002
Financial instability	Family Conflicts	28.362	.005

in victims of substance use disorder.²⁰ The age factor also plays a big role in relapse among addicts. Worldwide the studies regarding relapse and adolescents have variable results, where some show an increased risk while others favor decreased risk.^{21,22} Our results showed that the risk of relapse is remarkable among adults (78.6%) while other age groups, including adolescents (17.1%) and old age

(4.3%), are least likely to relapse.

There is an obvious relationship between drug-seeking for emotional stability and reassurance. If one's family disowns a person, one cannot rely on others for support.^{23,24} These results follow our findings. Our results showed that family factors like addicts in the family

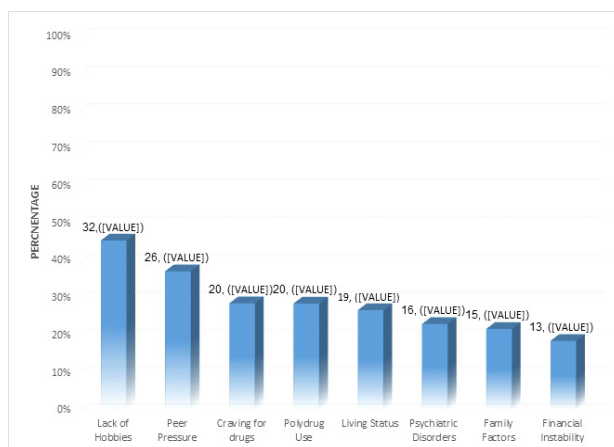


Fig 1: Age distribution of all subjects

and conflicts with relatives (21.8%) play an essential role in relapse among addicts. Relapse was more profound in polydrug abusers as compared to single-drug users.²⁵⁻²⁷ Our results also supported these findings that one-third of participants who had relapsed were using multiple drugs simultaneously, which led to more relapse chances. Psychiatric disorders are highly associated with drug abuse and relapse among addicts.²⁸ Our results also proved that psychiatric disorders (23.1%), including mood swings and weeping spells, are responsible for relapse among addicts, with disturbed sleep and insomnia being highly accountable.

Our study highlighted that a lack of hobbies (45.4%) plays a major role in relapse among addicts. Most of the individuals under study confessed that they were aware of all the negative impacts of addiction but failed to control their urges under any circumstances because they felt like their day did not go right without doing drugs. Another major finding of our study is withdrawal syndrome (28.6%) leading to relapse. Withdrawal syndrome as a risk factor for relapse was not measured previously. Instead of struggling with withdrawal symptoms and embarrassment alone in front of family and the public because of the lack of rehabilitation services, relapse seemed a better option for subjects. Few of the previous studies showed these factors playing a role in relapse,¹³ but the literature of our region lacked the assessment for these two factors.

Another important aspect of our study was finding associations between various variables, indicating that relapse is not dependent solely on one factor but is a multifactorial phenomenon. Most of the previous literature didn't show associations between various risk factors for relapse, so significant associations between risk factors for relapse is our new finding.

CONCLUSION

This study concluded that the most common risk factor for relapse was lack of hobbies (sitting idly), followed by peer pressure, while the least common was

financial factors. It was found that other risk factors for relapse, including polydrug abuse, withdrawal syndrome, etc. play a minor role in relapse. Our findings also indicated that relapse in the victims of a substance use disorder is dependent not merely on single but multiple factors. Policies at public health levels should be devised and implemented in the form of activities that involve the victims of substance use disorder to avoid relapses in them.

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EFFECT OF MANDIBULAR DISTRACTION OSTEOGENESIS ON AIRWAY IN PATIENTS WITH TEMPOROMANDIBULAR JOINT ANKYLOSIS

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ABSTRACT

Objectives: To assess clinically and cephalometrically the pharyngeal airway following distraction osteogenesis of the mandible in patients with Temporomandibular joint (TMJ) ankylosis and retrognathic mandible.

Material and Methods: A total of ten patients were included in this study. These patients were thoroughly evaluated pre-operatively and post-operatively both clinically and radiologically using McNamara analysis allowing comparison of pre-op and post-op findings.

Results: Out of 10 patients seven were females while three were male (Mean age 13.40 ± 5.358 SD). The mean pre-operative UPPER airway width was 6.20 ± 3.155 SD as compared to the mean post-operative upper airway (7.30 ± 2.907 SD) with a statistically significant p-value (0.003). Mean The mean operative LOWER airway width was 4.90 ± 1.969 SD as compared to the mean post-operative lower airway (7.10 ± 2.9282 SD) with a statistically non-significant p-value (0.013). There was a negative correlation between post-operative lower airway and age ($r = -0.26$, $\text{sig} = 0.48$).

Conclusion: Distraction Osteogenesis of the mandible can be used successfully in TMJ ankylosis patients with retrognathic mandible for the improvement of pharyngeal airway dimensions and relief from symptoms of obstructive sleep apnea due to decreased pharyngeal space.

Keywords: Mandibular distraction osteogenesis, airway assessment, Cephalometric analysis

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INTRODUCTION

Malocclusions and craniofacial malformations result from structural changes during the growth and development of the facial skeletal complex. The genetic polymorphisms may disturb the normal sequence of developmental events of the craniofacial complex and can lead to dentofacial anomalies.¹ The deformities in the craniofacial region are fairly common due to certain acquired and congenital conditions. In the dentofacial region, the most common anomaly is due to the short mandible, leading to retruded lower face profile.² The common causes of acquired mandibular retrognathia include Juvenile idiopathic arthritis (JIA), Temporomandibular joint (TMJ) ankyloses, and infections.³⁻⁵ Congenital causes include Pierre

robin sequence, Nager syndrome, and Treacher Collins syndrome. The most common acquired condition related to mandibular retrognathia is TMJ ankylosis.³ Temporomandibular joint ankylosis leads to limited mouth opening and alters the pattern of growth of the mandible in pre-pubertal patients. The decreased proportion of the mandible and its retro position leads to displacement of the tongue posteriorly and results in a decrease of the oropharyngeal airway orifice, causing airway obstruction and can lead to obstructive sleep apnea syndrome (OSAS).⁶ Patients affected by TMJ ankylosis usually suffer from OSAS due to mandibular retrognathia.⁷

Distraction is an advanced and relatively safe procedure for increasing the length and height of the mandible, particularly in children. Mandibular distraction osteogenesis is being used for upper airway obstruction in growing children due to mandibular retrognathia or hypoplasia. In this regard, a case series was issued in 1992, for the first time.⁸ Majority of the patients managed with this technique were having mandibular hypoplasia. Mandibular distraction may result in relieving sleep-related upper airway obstruction. These patients are at risk for constant obstructive sleep apnea (OSA) and are reported with com-

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plaints of snoring, gasping, respiratory pauses, and disturbed sleep.^{9,10} Polysomnography is the well-established tool for the assessment and analysis of OSA.¹⁰ Several studies have confirmed the effectiveness of distraction osteogenesis in the management of sleep apnea in patients having TMJ ankylosis for initial management. This procedure will also help in the improvement of the aesthetic concerns of the patient by lengthening the mandible. However, published studies are deficient in the long-term usefulness of distraction osteogenesis of the mandible for the management of sleep apnea in patients having TMJ ankylosis.

This study aimed to analyze the pharyngeal airway clinically and radiographically through cephalometric analysis, following distraction osteogenesis of the mandible in patients having TMJ ankylosis and retrognathic mandible.

MATERIALS AND METHODS

A prospective evaluation of patients was performed who presented to the Department of Oral and Maxillofacial Surgery at Khyber College of Dentistry with temporomandibular joint (TMJ) ankylosis, symptoms of obstructive sleep apnea (OSA) and managed with distraction osteogenesis of the mandible. A total of ten patients were included in the study.

Data of patients included in the study was recorded on a specifically designed proforma after taking informed consent. It included the biodata of the patients, followed by detailed history, clinical examination, and radiographic examination including orthopantomogram and lateral cephalogram for airway assessment using McNamara analysis.

On follow-up visits after lengthening of the mandible with distraction osteogenesis, history, clinical examination, and postoperative cephalogram analysis were carried out to compare preoperative airway status with

post-operative status.

Radiographic Airway Assessment McNamara Analysis was used to assess the airway status. The width of the upper airway was taken from the point on the posterior soft palate outline to the nearest point on the posterior side of the pharyngeal wall, taken on the anterior half of the soft palate. The intersection of the posterior border of the tongue and the inferior border of the mandible to the nearest point on the posterior pharyngeal wall was taken as reference points to measure the width of the lower airway. The normal range of upper airway space is 15-20 mm and the range of lower airway space is 11-14 mm.

Information so collected was analyzed using SPSS version 22. Means were calculated for age and UPPER and LOWER airway widths. A T-test was applied to compare the mean values while Pearson correlation analysis was carried out to determine the relationship between airway widths and the age of the patient.

RESULTS

A total of 10 patients were included in the study where seven were females while three were male (Mean age 13.40 ± 5.358 SD). All patients reported an improvement in their clinical symptoms 6 months postoperatively. Results of t-test analysis showed that the mean pre-operative UPPER airway width was 6.20 ± 3.155 SD as compared to the mean post-operative upper airway (7.30 ± 2.907 SD) with a statistically significant p-value (0.003) see Table 1. Similarly, the mean pre-operative Lower airway width was 4.90 ± 1.969 SD as compared to the mean post-operative lower airway (7.10 ± 2.9282 SD, p-value=0.013) Table 2.

Pearson correlation test was applied to find out the statistics of the correlation between post-operative lower airway and age. The result of this test showed that there was a negative correlation between post-operative lower airway and age ($r = -0.26$, sig=0.48) Fig 1,2,3,4.

Table 1: Descriptive statistics of baseline characteristic

Variable	Minimum	Maximum	Mean	Std. Deviation
Age	6.00	22.00	13.4000	5.35828
Pre-operative upper airway	2.00	11.00	6.2000	3.15524
Post-operative upper airway	3.00	12.00	7.3000	2.90784
Pre-operative lower airway	2.00	7.00	4.9000	1.96921
Post-operative lower airway	4.00	11.00	7.1000	2.28279

Table 2: Mean difference in airway width (Pre-operative and Post-operative)

Variable	Mean	95% Confidence Interval of the Difference		t	P value
		Lower	Upper		
Mean difference of upper airway (pre-operative post-operative)	-1.10000	-1.72636	-.47364	-3.973	.003
Mean difference of lower airway (pre-operative post-operative)	-2.20000	-3.81022	-.58978	-3.091	.013

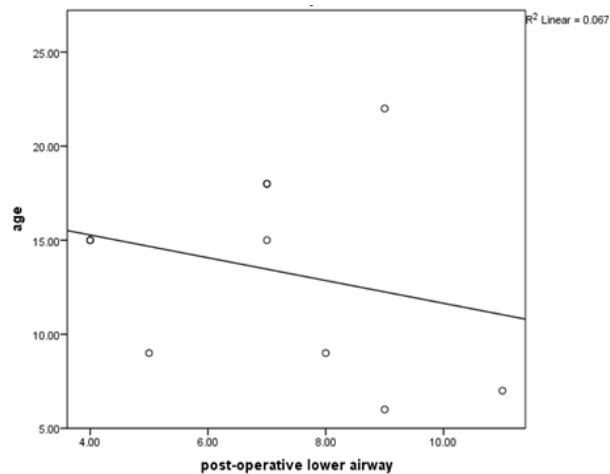


Fig 1: Correlation between age and Post-operative Lower airway ($R^2=-0.258$)

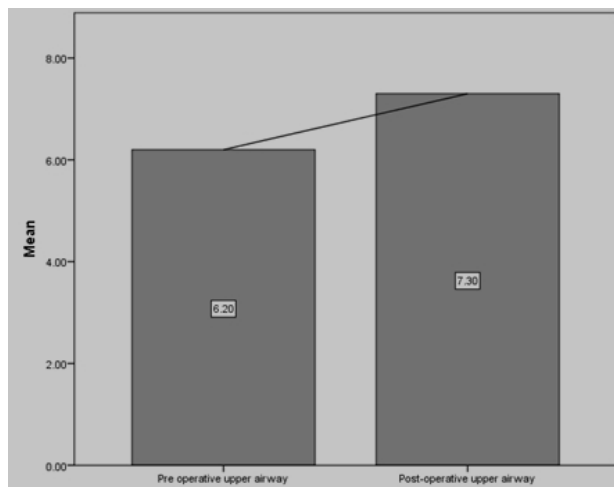


Fig 2: Mean difference between Pre-op upper airway and Post-op upper airway

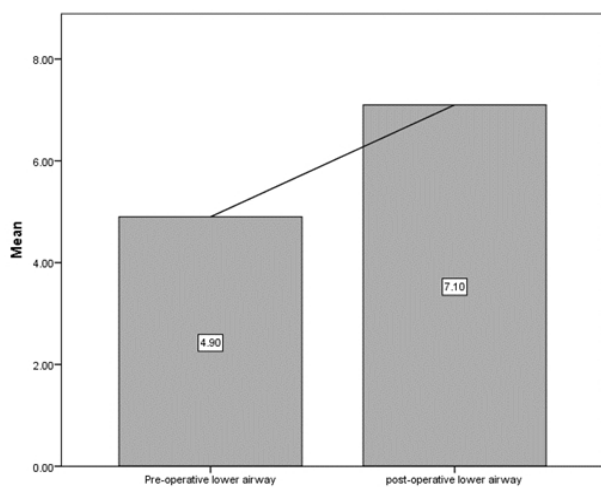


Fig 3: Mean difference between Pre-op Lower airway and Post-op Lower airway

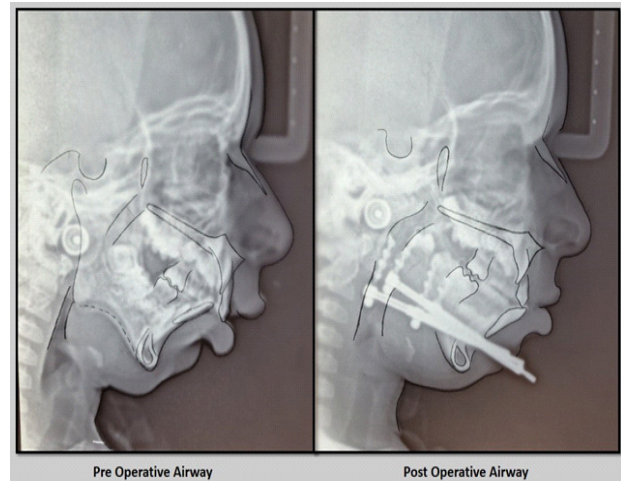


Fig 4: Pre-op and Post-op airway widths

DISCUSSION

It is important to look for clinical signs and symptoms of obstructive sleep apnea (OSA) in patients with TMJ ankylosis and retrognathia.⁷ Orthognathic surgical procedures are used for treating dentofacial anomalies and adaptation of ideal skeletal relationship.¹¹ the mandibular advancement through distraction osteogenesis surgery, alters the pharyngeal airway dimensions, and the breathing patterns.^{11,12}

The structure of the pharyngeal airway can be evaluated in a three-dimensional evaluation through cephalometric analysis. The radiographic cephalometry provides direct visualization of airway structures and is easily executed; having low cost and minimal radiation exposure.¹ the airway dimensions were evaluated by lateral. This radiographic cephalometry is a valuable tool to analyze the important structures in relation to airway obstruction and is an equally valuable means for assessment of the airway after surgical intervention. The role of cephalometric analysis gains more importance in patients with ankylosis of the TM joint, because of the inability of direct visualization of the airway due to limited mouth.¹³ Thorough physical examination, nasopharyngoscopy, CT scan, MRI, and certain other advanced investigatory procedures are also mentioned in the literature which is used for upper airway evaluation and assessment of OSAS.¹⁴ However, due to cost and availability; these methods were not used for patients in this study. Moreover, the cephalometric analysis is a safer and easily cost-effective investigatory tool for the assessment of the airway.

The patients with craniofacial anomalies and mandibular retrognathia were usually managed with a tracheostomy, endotracheal intubation, and extended nasal airways, before the introduction of mandibular distraction.¹⁵ In 1992, McCarthy et al⁸ presented a series of patients who underwent distraction osteogenesis of the mandible, aided in the avoidance of tracheotomy in some children with the hypoplastic mandible. The hypoplasia of

the mandible is addressed by lengthening the mandible through distraction osteogenesis which provides support supraglottic and pharyngeal airway. Though the original study published by McCarthy et al.⁸ was aimed at the improvement in the aesthetic outcome in children with craniofacial anomalies through the use of mandibular distraction. This was followed by several subsequent studies that demonstrated the improvement of the airway dimensions in children with mandibular hypoplasia through the use of mandibular distraction. In a study by Carls and Sailer¹⁶ a series of seven children having severe mandibular hypoplasia and secondary breathing difficulty were treated with distraction osteogenesis. All of these patients were having improvement in their respiratory symptoms after the procedure.

In the present study, an improvement in the clinical symptoms was reported post-operatively by all the patients included. This finding was reinforced by an increase in the dimensions of the airway measured radiographically. Results of the t-test analysis showed that the mean pre-operative upper airway width was 6.20 ± 3.155 SD as compared to the mean post-operative upper airway (7.30 ± 2.907 SD) with a statistically significant p-value (0.003). Similarly, the mean pre-operative lower airway width was 4.90 ± 1.969 SD as compared to the mean post-operative lower airway (7.10 ± 2.9282 SD) with a statistically non-significant p-value (0.013).

Several studies have reported similar findings including a local case report by Qiam et al, who document findings consistent with our study results. Zeitoun, in his study of nine patients having bilateral ankylosis of the TM joint, was treated in two stages.^{17,18} In the first stage the body length or ramus height was increased and in the second stage, the ankylotic mass was resected after achieving the consolidation neo bone formed as a result of distraction. This was followed by post-operative radiographic and clinical assessment. He reported that six patients out of seven showed that there was a significant reduction of snoring and improvement in obstructive sleep apnea, which is in accordance with the results of our study. Similar study results were reported by Prado et al and Lin et al^{1,15}.

Our results showed a negative correlation between post-operative lower airway and age ($r = -0.26$, $\text{sig} = 0.48$). Martin et al.¹⁹ studied the association of age, gender, and posture with upper and lower airway size in Edinburgh UK, and demonstrated similar results. They showed that the Pearson correlation coefficient between age and upper airway was in the range of -0.25 to -0.34 in seated and supine positions respectively.

The results of the study carried out by Eikermann²⁰ and his colleagues were also in agreement with our study. They showed that increased age was significantly correlated with the collapse of the pharyngeal wall ($r = 0.69$; $p <$

0.01) and pharyngeal resistance while sleeping ($r = 0.56$; $p < 0.01$). This correlation was independent of gender and body mass index. These data from the literature may explain the underlying mechanisms of the tendency for pharyngeal collapse in advanced age. The only difference between the present investigations and the studies done by Martin et al. and Eikermann is that our study has been conducted on post-operative Distraction osteogenesis patients while the former has on non-operated individuals^{19,20}.

The small sample size is one of the major limitations of our study. Large-scale studies are needed with bigger sample sizes to address the issue with better clinical reliability and significance. Moreover, mass awareness programs on print and electronic media should be initiated to address the gravity of this problem in the initial stages of trauma-related ankylosis and subsequent changes in the airway.

Otolaryngologists should work in close liaison with the maxillofacial surgical team so that procedures like lower airway dilatation can also be performed along with upper airway widening by distraction osteogenesis.

CONCLUSION

Distraction osteogenesis for mandibular lengthening is an effective means of increasing the dimensions of the pharyngeal airway in patients with TMJ ankylosis who have signs and symptoms of airway obstruction. It leads to obvious clinical and radiological improvement in the nasopharyngeal airway improving the quality of life.

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Rehman B: Design, Writing manuscript and Data Collection

Ahmad T: Measurements, Data Collection

Khan M: Measurements, Data Collection

Shafi H: Surgical procedure

Farhad A: Data Analysis

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Rehman N: Measurements, Data Collection

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DIAGNOSTIC ACCURACY OF ULTRASOUND BI-RADS IN DIAGNOSING BREAST LESIONS UTILIZING THE CORE NEEDLE BIOPSY KEEPING HISTOPATHOLOGY AS A GOLD STANDARD

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ABSTRACT

Objective: To determine the diagnostic accuracy of Ultrasound BI-RADS classification in diagnosing breast lesions utilizing the core needle biopsy method keeping histopathology as a gold standard.

Materials and Methods: A cross-sectional study was conducted in the Radiology department of CMH Peshawar incorporating 51 patients having breast lesions as presenting complaints. After performing ultrasonography, lesions were categorized as benign and malignant according to BI-RADS scoring. A core needle Biopsy of lesions was done and histopathology reports were collected. Diagnostic accuracy, Sensitivity, Specificity, Positive predictive and Negative predictive value of "BI-RADS classification were calculated by analyzing data.

Results: The mean age was calculated as 45.63 ± 16.83 years. According to the BI-RADS score, 17 cases (33.3%) were categorized as benign and 35 cases (66.7%) as malignant while Histopathology reported 20 cases (39.2%) as benign while 31 cases (60.8%) as malignant. Diagnostic accuracy, Sensitivity, Specificity, Positive predictive value Negative predictive value for ultrasound BI-RADS turned out to be 90.19%, 96.77 %, 80.00%, 88.23% and 94.11% respectively.

Conclusion: Ultrasound BI-RADS classification has high diagnostic accuracy in differentiating benign from malignant lesions. Universal application of ultrasound BI-RADS guidelines will help in the early diagnosis of malignant breast lesions while avoiding unnecessary biopsies in benign lesions.

Keywords: Breast imaging, Core needle biopsy, Diagnostic accuracy

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INTRODUCTION

Breast cancer is the second most common malignancy and a significant contributor to the female mortality rate. Annually new 1.6 million cases of breast cancer are diagnosed.^{1,2} The incidence of breast cancer is >80 per 100,000 population in developed countries which is higher than the developing countries accounting for <40 per 100,000 population.³ In Asia, Pakistan has the greatest prevalence rate of 50.3/100,000 for breast cancer which is higher than the worldwide prevalence of 43.3/100,000.⁴ Mostly, females over 40 years of age are affected but cases are now also reported in younger individuals accounting for up to 7 % of all breast cancers in USA.^{5,6}

The majority of solid masses of breast are benign,

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however, due to fear of malignancy, they are unnecessarily biopsied. If the US BI-RADS lexicon is applied, unwanted breast biopsies can be avoided leading to an increased rate of breast conservation.² The malignant lesions of the breast can be invasive and non-invasive. The commonest of invasive carcinoma is invasive ductal carcinoma while Ductal carcinoma in situ (DCIS) is the most common among non-invasive carcinomas.^{2,7}

Breast Ultrasound is a cheaper and easily available imaging modality that is non-invasive and accurate in diagnosing breast lesions. It differentiates solid from cystic lesions and can help in the pre-surgical detection of tumors as small as 2mm in size. It is also used for better characterization of palpable masses in dense tissues which are not detected on mammography. Ultrasonography also has an edge on mammography as the sensitivity of mammography is 90% leaving 10% of carcinomas being undetected initially, particularly in a dense breast, which is later on detected by ultrasonography or MRI.^{3,5}

With the increasing rate of newly diagnosed cases, radiological and pathological findings must show consistent agreement for precise diagnosis of breast lesions.⁸ In

2003, a universally accepted data and reporting system named ultrasound lexicon for BI-RADS was developed for uniformity in diagnosing breast lesions among radiologists which was revised in 2013.⁹

Percutaneous breast biopsy under image guidance is a fundamental tool for diagnosing breast pathology. Technological improvements in imaging modalities and core biopsy equipment have led to the broader application of ultrasound-guided biopsy for nearly all breast lesions even non-mass pathologies and micro-calcifications. Image-guided core needle biopsy (CNB) has high diagnostic accuracy in diagnosing breast lesions and has proven as an accurate substitute for surgical excision biopsy.

Sonomammography was first reported in 1975 yet its widespread implication was not utilized until 1993 when Parker et al reported 100% agreement in CNB and surgical excision in diagnosing breast lesions. A false negative rate of 14-gauge ultrasound-guided CNB is low ranging from 0.1% to 3.7% being equivalent to open surgery.¹⁰ BI-RADS is a risk assessment and quality assurance reporting system developed by the American College of Radiology. It applies to mammography, ultrasound, and MRI. Core Needle Biopsy is a diagnostic test that uses a wide-bore needle to remove a piece of tissue from a lesion through a percutaneous approach. The collected sample is then examined under the microscope for histopathology. Literature reveals that most of the work has been done on mammographic findings of breast lesions and where ultrasound findings have been documented, a standard scoring system is not used. This study aims to compare the diagnostic capability of ultrasound BIRADS scoring with histopathological outcomes using the CNB method for optimal differentiation of benign from malignant lesions resulting in early diagnosis and treatment of carcinomas avoiding unnecessary surgical interventions in benign lesions. The rationale of the study is to prove that ultrasound can be effectively used for evaluating breast lesions, particularly in centers where facility of mammography is not available.

MATERIALS AND METHODS

The radiology department of CMH Peshawar conducted a cross-sectional study from September 2020 to September 2021 after taking study approval from Hospital Ethical Committee. Any breast abnormality that presented as a lump, swelling, redness or rash associated with dimpling or nipple discharge was included. Female patients who presented with breast lesions and underwent both Ultrasonography and Core Needle Biopsy for evaluation of these lesions were evaluated. Diagnosed patients with breast cancer who were already categorized as BI-RADS score 6, those who differed to participate in this study, cases with untraceable CNB results, and CNB results reported as inadequate biopsies were excluded.

Fifty-one patients met the inclusion criteria and were included in the study. Non-probability convenient sampling technique was used. Each patient underwent breast ultrasound on Xario 200 ultrasound machine using a linear probe of 5-7Hz frequency. These scans were performed by a consultant radiologist with more than 10-year experience. Ultrasound reports were categorized (scale: 0-6) in accordance with guidelines provided by ACR BI-RADS Atlas 5th Edition.

Breast lesion was assessed on the basis of breast composition, characteristics of the mass, calcifications, associated feature, and special cases. Characteristics of mass were further elaborated as shape, margin, orientation, echo pattern and posterior features. On the basis of these features BI-RADS score was assigned as BIRADS: 0 as incomplete, 1 as Negative, 2 as benign, 3 as Probably benign, 4 as suspicious for malignancy, 4a as low suspicious for malignancy, 4b as moderate suspicious for malignancy, 4c as High suspicious for malignancy, 5 as malignancy and BI-RADS 6 as proven malignancy.⁹ Patients with BI-RADS scores 3 and below were characterized as negative and BI-RADS scores 4 and above as positive. The decision for biopsy in patients with BI-RADS 2 and 3 was done based on their request or the physician's decision.

All these patients then underwent core needle biopsy under strict aseptic measures by a consultant radiologist having more than 10-year experience. Bard Monopty Disposable 18G core biopsy needles were used for this purpose. These samples were then sent to the Department of Pathology for Histopathological analysis. CNB reports were traced from the Pathology department and a self-made proforma was used to collect the data. SPSS version 20 was used for analyzing Data calculations. Quantitative variables like age had their Mean and Standard deviation estimated. Calculations of Simple frequency and percentage were done for categorical variables. 2X2 tables were utilized to calculate Diagnostic Accuracy, Sensitivity, Specificity, Positive predictive value (PPV), and Negative predictive value (NPV) of BI-RADS classification keeping histopathology outcomes of core needle biopsy as a gold standard.

RESULTS

The mean age of 51 patients included in this study was calculated as 45.63 ± 16.83 years ranging from a minimum of 20 years to a maximum of 79 years of age. Results of ultrasonography findings in accordance with the BI-RADS score are shown in Table 1. No patients were reported with BI-RADS scores of 0, or 6. BI-RADS score 2 was reported in 06 patients (11.8%) corresponding to benign findings, BI-RADS score 3 was reported in 10 patients (19.6%) corresponding to probably benign findings, BI-RADS 4 was reported in 31 patients (60.8%) corresponding to suspicious abnormality while 04 patients (7.8%) had BI-RADS 5 score suggestive of high suspicion of malignancy.

nancy. BI-RADS scores 3 and below were considered benign while BI-RADS scores 4 and above were considered malignant. On the basis of the BI-RADS score, 17 (33.3%) cases were categorized as benign while 34 (66.7%) cases as malignant. The mean age of patients diagnosed with malignant and benign lesions was 48.82 ± 17.25 and 39.29 ± 14.39 respectively.

The distribution of cases on histopathology reports using CNB is given in Figure 1. Twenty cases (39.2%) turned out to be benign with mastitis (7 cases) being the most common pathology followed by Fibroadenoma (6 cases). Thirty-one cases (60.8%) turned out to be malignant with Infiltrating ductal carcinoma (19 cases) being most common pathology followed by mucinous carcinoma (6 cases). Out of 16 patients categorized as BI-RADS 2 or 3 and considered benign, only one case turned out to be malignant on histopathology, while all the 17 cases cat-

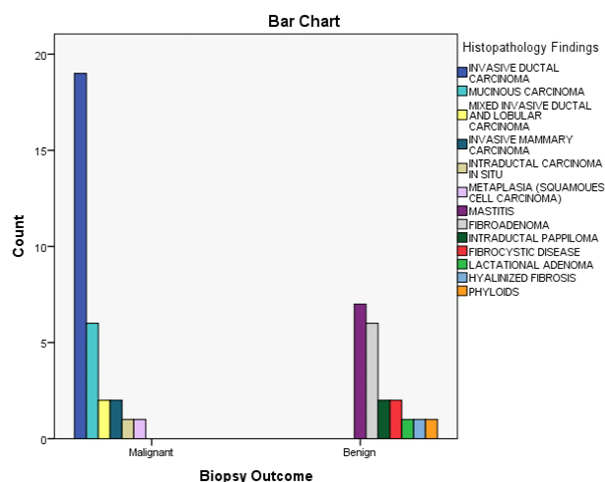


Fig 1: Categorization of Histopathological findings (benign and malignant)

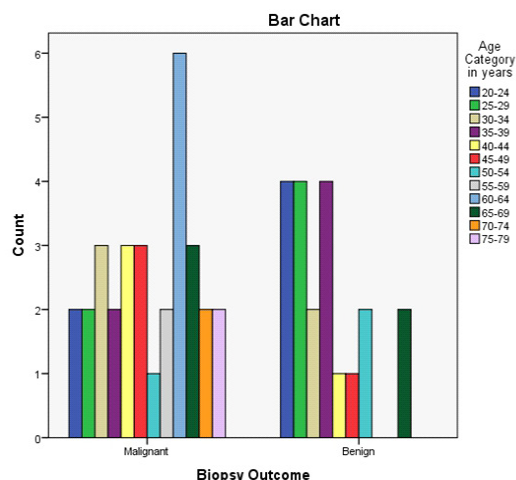


Fig 2: Age-wise distribution of benign and malignant lesions according to histopathology reports

Table 1: Ultrasound BI-RADS score

BI-RADS score	Frequency (n)	Percent (%)
BI-RADS 2	6	11.8
BI-RADS 3	10	19.6
BI-RADS 4a	6	11.8
BI-RADS 4b	12	23.5
BI-RADS 4c	13	25.5
BI-RADS 5	4	7.8
Total	51	100.0

Table 2: Core needle biopsy outcome according to Histopathology categorized as benign or malignant

Core needle Biopsy Outcome	Frequency (n)	Percent (%)
Malignant	31	60.8
Benign	20	39.2
Total	51	100.0

Table 3: Table comparing BI-RADS and Core needle biopsy outcomes categorized as malignant and benign

BI-RADS RESULTS	Biopsy Outcome		Total
	Malignant (Positive)	Benign (Negative)	
Malignant (Positive)	30 (TP)	4 (FP)	34
Benign (Negative)	1 (FN)	16 (TN)	17
Total	31	20	51

Key: TP = True positive, FP = False positive, FN = False negative, TN = True Negative

Sensitivity = $[\text{TP}/(\text{TP} + \text{FN})] \times 100$

Specificity = $[\text{TN}/(\text{FP} + \text{TN})] \times 100$

Positive predictive value (PPV) = $[\text{TP}/(\text{TP} + \text{FP})] \times 100$

Negative predictive value (NPV) = $[\text{TN}/(\text{FN} + \text{TN})] \times 100$

egorized as BI-RADS 4c or 5 turned out to be malignant. A comparison of BI-RADS results with core needle biopsy outcomes is shown in Table 3. For ultrasound BI-RADS classification diagnostic accuracy, sensitivity, specificity, positive predictive value and negative predictive value turned out to be 90.19%, 96.77 %, 80.00%, 88.23% and 94.11% respectively.

DISCUSSION

There is a high prevalence of breast pathologies in females accounting for a high mortality rate. In developing nations, inhabitants are oblivious to breast pathologies and also exhibit reluctance to unveil breast abnormalities resulting in the diagnosis of breast pathologies at advanced stages.¹¹ Jallad et al., reported that breast ultrasound can reliably differentiate benign from malignant lesions and can reduce the rate of unwanted biopsies. Taking this into consideration, breast ultrasound should be routinely used as the first-line technique to distinguish benign and malignant breast lesions avoiding unnecessary biopsies in

younger patients yet identifying suspicious lesions.²

Our study estimated Diagnostic accuracy, sensitivity, specificity, PPV, and NPV for BI-RADS classification as 90.19%, 96.77%, 80%, 88.23%, and 94.11% respectively. Broad variability in the sensitivity of sonomammography for breast lesion diagnosis has been reported ranging between 67% and 97%.³ A study conducted at Islamabad Diagnostic Centre, Islamabad, determined the Sensitivity, Specificity, PPV, and NPV as 80%, 75%, 82%, 92%, and 54% respectively for ultrasound BI-RADS.⁴ The specificity and PPV are analogs with our study while sensitivity and NPV of this study are lower than our study. Shrestha M K et al., in Nepal, described the specificity and sensitivity of ultrasound BI-RADS scores as 95% and 78.9 respectively.¹² Our study has sensitivity greater while specificity is lower than this study. Evans et al., estimated the sensitivity and specificity of the ultrasound BI-RADS score as 95% and 69% respectively where specificity is marginally lower than our study.¹³ In a study conducted by Tan et al., the sensitivity, specificity, and diagnostic accuracy of the ultrasound BI-RADS classification came out to be 87.75 %, 90.89 %, and 91.04 % respectively.¹⁴ Hille et al., reported analogous findings of sensitivity, specificity and diagnostic accuracy of BIRADS as 92%, 85% and 87% respectively.¹⁵ Conclusions of these two studies are analogous with our study. Timmers et al. described a sensitivity of 66 % and a specificity of 99 % for BI-RADS.¹⁶ Gao et al., described the sensitivity and specificity of breast ultrasound BI-RADS classification as 73% and 91% respectively.¹⁷ These two studies illustrated lower sensitivity while higher specificity compared to our study. Emine et al. reported sensitivity and specificity for sonomammography as 72.6 and 88.5% respectively.¹⁸ The results of this study were lower compared to our findings. Keeping in view the statistics of previous studies, it is evident that integrating BI-RADS guidelines in breast ultrasound technique results in achieving high diagnostic accuracy for diagnosing malignant breast lesions as most of these international studies are in concordance with our study.

In our study, the core needle biopsy method was used to acquire samples for histopathology. Excision biopsy is regarded as a benchmark for diagnosing breast lesions, yet CNB has also shown promising results in precisely diagnosing breast pathologies. Sun et al., reported that CNB has some limitations yet it could be used for the preoperative analysis of breast neoplasm leading to a convenient treatment regimen and an increased number of breast conservations.¹⁹ Homesh et al., and Usami et al. compared CNB & FNAC and found sensitivity ranging from 91–99% and specificity between 96% and 100%, while positive predictive value, and negative predictive value were 100% for CNB correlating to FNAC.²⁰⁻²¹ These findings suggest that core needle biopsy has proved to be an accurate technique in diagnosing breast lesions and should be the preferred technique for diagnostic

purposes. In our study, the mean age was reported as 45.63 ± 16.83 which is in line with the findings of Malik et al., (40.27 ± 4.48 years).⁴ Moreover, Tan et al. reported the mean age as 55.72 ± 10.85 years which is higher compared to our findings.¹⁴ The mean age of patients having malignant lesions on ultrasound was 48.82 ± 17.23 years which is slightly higher than the peak incidence determined by Khemka et al., as 40-44 years.²²

Our study revealed that among cases confirmed as malignant on histopathology, 29.07% were reported in individuals younger than 40 years. Wong et al. stated that in younger patients' ultrasound is elementary for breast screening and ensuring positive findings.²³ It has been reported that almost 7% of all breast carcinomas in the USA are diagnosed in females less than 40 years of age.⁵ This suggests that though breast carcinoma is still more prevalent in females aged 40 and above, younger patients are also at risk of malignancy and an increasing number of cases are now being reported. The strength of our study is that the standardized scoring system BI-RADS was used for the assessment of breast lesions which is accepted globally and the findings of our study are in keeping with previously reported findings. The limitation of the present study was that the CNB results of some patients could not be traced which resulted in their exclusion from this study.

CONCLUSION

Ultrasound is a rapid, convenient, and effective modality for evaluating breast lesions. Ultrasound BI-RADS classification has high diagnostic accuracy for diagnosing breast lesions. CNB is a convenient, less invasive, and effective method for diagnosing breast lesions that are suspicious on ultrasonography. Universal application of ultrasound BI-RADS guidelines will help in the early diagnosis of malignant breast lesions while avoiding unnecessary breast biopsies in benign lesions.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

- Nisar U:** Concept, proposal writing, and data collection
- Anwar J:** Writing and data collection
- Ihsan HR:** Data collection and review
- Yadain SH:** Writing and data collection
- Sultana SM:** Data collection
- Khan M:** Writing, review, and statistical analysis

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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THE RELATIONSHIP OF PLACENTA ACCRETA SPECTRUM WITH PREVIOUS CESAREAN SECTION IN PATIENTS WITH PLACENTA PREVIA- A CASE-CONTROL STUDY IN TERTIARY CARE HOSPITAL OF PESHAWAR

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ABSTRACT

Objective: To determine the relation of placenta Acreta Spectrum with previous Cesarean section in patients with placenta previa.

Material and Methods: This case-control study was conducted in a tertiary care hospital in Peshawar from 1st July 2019 to 30th June 2021. All the cases with placenta Previa were included. Women with placenta Acreta Spectrum diagnosed on obstetric ultrasound served as cases. Patients with placenta previa without accrete served as controls. Their records were studied in detail and all the data was recorded in a Proforma specially designed for this study. Odds ratios at the end of the study were calculated using SPSS-23.

Results: During our study period, a total of 102 patients with placenta previa were enrolled. The ages ranged between 20-45 years. The majority of the patients were > 40 years old (31.3%). On the basis of gravidity, different groups were found i.e. 45 patients (44.1 %) were between G5-G6. A total of 14 women were found with placenta accrete spectrum making an incidence of 13.72%. Of all the patients' i.e.100% (odd ratio 1.1) were having a history of previous Cesarean birth. 6 out of 14 patients (42.8%) had a history of previous 1 Cesarean section while two patients (10%) had a history of 4 c/s in the past. Nearly all patients had major placenta previa except one patient who had minor placenta previa (7%).

Conclusion: Our study highlighted the striking relationship of placenta Accreta spectrum with previous Cesarean delivery in patients with placenta previa however it was not found that increasing the number of previous Cesarean sections resulted in an increased number of placenta Accreta spectrum.

Keywords: Placenta Accreta spectrum, Cesarean section.

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INTRODUCTION

The World Health Organization reported that in 2007 approximately 295000 maternal deaths occurred during the antenatal and postnatal period. Mostly low and middle-income countries were affected where about 810 deaths occurred on daily basis from preventable perinatal complications¹. Worldwide obstetric hemorrhage is considered the leading cause of maternal mortality. Among the etiologies of peripartum hemorrhage, the Placenta

Accreta spectrum is placed on the top. Placenta Accreta spectrum, PAS, which includes both adherent placenta (placenta Accreta) and invasive placental disorders (placenta increta and percreta) is the nightmare of obstetricians^{2,3} and was first described eighty years ago as a clinic pathological diagnosis in which the placenta fails to separate from the uterine wall partially or completely. With the passing years, there has been an exponential rise in the number of cases of placenta accrete spectrum and in recent years it has risen from 1 in 2500 to 1 in 500 cases. This rise is mostly attributed to the rising number of Cesarean sections. Other than that, the rising maternal age, the introduction of in vitro fertilization, and increase in the smoking have contributed significantly to this life-threatening condition⁴. Therefore, the identification of high-risk patients is important for early diagnosis and management. Placenta Accreta spectrum is a term used by FIGO in consensus with the RCOG, defined as the penetration of the trophoblastic tissue through the deciduas basalis into the

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underlying uterine myometrium, the uterine serosa or even beyond, extending to the pelvic organs. The preoperative diagnosis of placenta accrete spectrum can be made as early as the second trimester using the color flow Doppler ultrasound by an experienced sonologist. Magnetic Resonance Imaging is also utilized in its diagnosis with equal sensitivity and specificity. Confirmatory diagnosis is made intraoperatively when exploration is done to deliver the placenta spontaneously or with simple cord traction. However, the gold standard for its diagnosis is the histopathological examination.

There is no consensus about the optimal protocol for the management of the placenta accrete spectrum. The Conservative approach can be used in women without significant hemorrhage and where fertility needs to be preserved but it comes with the cost of delayed postpartum hemorrhage and maternal sepsis^{5,6}. When conservative management is successful, it results either in the gradual resorption or delayed delivery of the placenta⁷. Among conservative management, methotrexate is the most common and simple approach, based on the fact that it leads to rapid involution of the placenta. Traditionally cesarean hysterectomy at the time of delivery is a safe procedure for the mother. But this results in the loss of fertility as well as is associated with perioperative risks⁸. The presence of the placenta Accreta spectrum is associated with major pregnancy complications. The immediate and most common complication of the placenta Accreta spectrum is the post-partum hemorrhage during an attempt at manual removal of the placenta or during the surgical excision of PAS with the invasion of the extra uterine organs and the cesarean hysterectomy⁹. It is also known to increase the risk of maternal death¹⁰. Patients have to undergo extensive lifesaving surgical procedures such as perioperative hysterectomy, ligation of major pelvic vessels, and massive blood transfusions. As there is a global rise in the rates of Cesarean section (between 0.01% to 1.1% of pregnancies)^{11,12,13,14} and so concurrently the prevalence of PAS is also on the rise. We felt the need to design this study and determine the current relationship between PAS and previous Cesarean birth in our population. The findings of this study will alert our Gynecologist to note the importance of previous Cesarean sections, and timely diagnosis and hence manage the placenta Accreta spectrum more efficiently.

MATERIALS AND METHODS

The study protocol was reviewed by the Ethical Review Board which granted approval and access to the medical record of the Gynae department at Khyber Teaching hospital Peshawar. The study period was from 1 July 2019 to 30th June 2021. All women with ages 18 to 45 years with Placenta previa were included in the study. The diagnosis of PAS was made on the transabdominal and transvaginal ultrasound which are complementary

diagnostic technologies. In some cases, operative findings also helped to reach the diagnosis of PAS. The histopathology tool for the diagnosis was not recorded as it was not available in all the cases. Patients younger than 18 and those with normal imaging studies were excluded from the study. Similarly, a history of smoking was also not included as our patients usually do not smoke. Also due to social reasons, our history does not include this risk factor. Details about the previous Cesarean birth were recorded especially the number of previous Cesarean sections. All other patient data including age and parity was recorded and entered in the proforma especially designed for this study. Data was entered and analyzed by SPSS version 23 computer-based software programs.

RESULTS

The demographic features of the patients are shown in table 1 and table 2. The total number of cases of placenta previa and those with placenta Accreta presented to Gynae "C" Unit KTH between 1st July 2019 to 30th June 2021 are shown in table 3.

Amongst 102 cases, the total numbers of Placenta Previa with Accreta were 14 and without Accreta was 88. All 14 Placenta Previa cases with Accreta had a history of previous C/Section scar. None of the cases of Accreta were reported without a history of previous C/section scar (figure 1). 6 Patients with Placenta Previa and Accreta had a history of Previous 1 C/section, 3 Patients had a history of Previous 2 C/section, 3 Patients had a history of Previous 3 C/section while 2 Patients had a history of Previous 4 C/section (Figure 2).

Thirteen cases of Placenta Previa had Major Placenta Previa and only 01 case had Minor Anterior placenta Previa. In our study, Placenta Accreta is found in 14 cases with Placenta Previa. However, it was not found that increasing the number of previous Cesarean sections resulted in an increased number of placenta Accreta spectrum.

DISCUSSION

Previously referred to as morbidly adherent placenta is now called placenta accrete spectrum or abnormal invasion of the placenta (AIP)¹⁵ and includes placenta increta, placenta Percreta and Placenta Accreta. It is becoming more common and has significant morbidity and mortality. Among several risk factors, the most common is previous Cesarean delivery. The increasing rate of placenta Accreta spectrum can be related to the increased rates of Cesarean sections over the past four decades¹⁶.

In the last 2 years, we managed 102 patients with the antenatal diagnosis of placenta previa. The Placenta Accreta spectrum was found in 14 cases. The striking association of past Cesarean scar was found in 100% of cases of PAS. Thus, none of the patients with placenta Accreta was found without having a history of the previous c/



Fig 1: Association between Previous C/Section Scar and Placenta Accreta in patients with Placenta Previa

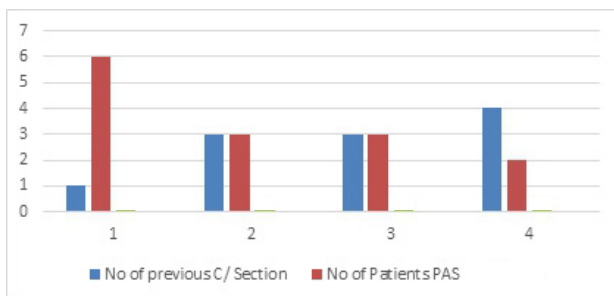


Fig 2: Effect of the number of Previous C/Section on PAS

Table 1: Patient groups according to age.

Age Group in Years	Number (%)
20-25	10 (9.8%)
26-30	10 (9.8%)
31-35	20 (19.6%)
36-40	24 (23.5%)
> 40	32 (31.3%)

Table 2: Patient groups according to gravidity

Gravida	Number (%)
G2-G3	26 (25.5%)
G4-G5	31 (30.4%)
G5-G6	45 (44.1%)

Table 3: cases diagnosed as placenta previa and placenta Accreta

Total No of cases of Placenta Previa	102
Total No of cases of Major Placenta Previa	94
Total No of cases Minor Placenta Previa	08
Total No of Placenta Previa with Accreta	14
Total No of Placenta Previa without Accreta	88

section. The incidence of PAS increases as the number of previous Cesarean deliveries increases, i.e. 0.3% in one Cesarean section while 6.79% in the case of ≥ 5 Cesarean sections in the past.^{17,18}

In our study, a striking difference has been noted.

The number of patients with PAS decreased as the number of previous Cesarean birth increased (shown in the figure-2). Our six patients with PAS had a history of previous C/S while only 2 patients had previous four C/S.

This is important to note that recent epidemiological studies have challenged the previous association between the number of previous Cesarean sections and the risk for PAS, confirming that there is a plateau of risk for PAS after the second C/section^{19, 20, 21}. However much-advanced research is needed in this regard to solve this issue.

Another risk factor associated with PAS is placenta previa. Among the global burden of 5.2 per 1000 placenta previa pregnant women, the highest prevalence has been noted for Asian women²². As already linked with PAS, the previous Cesarean section has been associated with placenta previa. A recent study done by sadietal found a history of the previous Cesarean in about 60.30% of her patients with placenta previa²³. In our study, the incidence of past Cesarean delivery was found in 100% of patients with placenta Accreta spectrum i.e. all 14 patients had a history of the scarred uterus. In international studies, the incidence of PAS in the absence of previous Cesarean section has been found very low i.e. 3%¹⁶. Thus, placenta previa when associated with multiple prior Cesarean sections is the strongest risk factor for PAS. In case of such significant history, the obstetricians should be vigilant enough to diagnose and timely manage it antenatal.

CONCLUSION

Our study highlighted the striking relationship of placenta Accreta spectrum with previous Cesarean delivery in patients with placenta previa (100%, odd ratio 1.1), however, it was not found that increasing the number of previous Cesarean sections resulted in an increased number of placenta Accreta spectrum.

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THE DIAGNOSTIC ACCURACY OF H. PYLORI CULTURE AND RAPID UREASE TEST IN THE DIAGNOSIS OF H.PYLORI INFECTION KEEPING HISTOPATHOLOGY AS THE GOLD STANDARD

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ABSTRACT

Objective: The aim of this study was to determine the diagnostic accuracy of biopsy-based tests in the detection of Helicobacter Pylori infections keeping histopathology as a gold standard.

Materials and Methods: This validation study was conducted from August 2018 to February 2019 at Khyber medical college, pathology department, Peshawar, and comprised biopsy samples of 87 patients obtained via endoscopy which was done at the gastrointestinal endoscopy department, Hayatabad medical complex (HMC). Patients with a history of prior antibiotics and PPIs were excluded from the study. Rapid urease test (RUT) and culture of gastroduodenal biopsies were validated against the histopathological examination of gastroduodenal mucosa.

Results: Out of 87 patients, 57.47% (50/87) were male and 42.52% (37/87) were female patients with an age range of 18 -80 years and a mean age of 45 years. Endoscopic findings showed 64.36% (56/87) of patients with gastritis, duodenitis with 6.89% (6/87), peptic and duodenal ulcers with 22.98% (20/87), erosion with 4.59% (4/87) and adenocarcinoma of stomach with 2.29% (2/87). The sensitivity and specificity of culture were 45.45% and 90.7% respectively, while positive and negative predictive values were 62.5% and 83% respectively. The sensitivity and specificity of the rapid urease test (RUT) were 81.81% and 90% while positive and negative predictive values were 90% and 94% respectively.

Conclusion: The sensitivity and specificity of the rapid urease test were 82 and 90% respectively, while that of culture was 45 and 91% respectively.

Keys Words: Helicobacter Pylori, Gastritis, Rapid urease test, Adenocarcinoma

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INTRODUCTION

Helicobacter Pylori is the main cause of most gastrointestinal diseases in humans. Being a fastidious, gram-negative bacterium and possessing microaerophilic nature, it contributes to the pathogenesis of many stomach diseases including chronic gastritis, peptic ulcers,

and gastric carcinoma¹. It also contributes to the development of mucosa-associated lymphoid tissue lymphoma (MALT)². It has been declared by the world health organization as a class-1 carcinogen³. Helicobacter Pylori affects fifty percent of the world's population with its associated diseases². The prevalence of infections in developing countries is higher as compared to developed countries and the infection is acquired at an early age⁴. The prevalence of infection in Pakistan is about 92%³. The survival of this bacterium in the highly acidic environment of the human stomach is through its utilization of the urease enzyme which hydrolyzes urea to release Carbon Dioxide and Ammonia, thus providing a neutral niche in the gastric mucosa⁵. It also requires motility by means of flagella to penetrate the gastric mucosa. Both factors play an important role in gastric colonization⁶. Fecal oral, oral-oral

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routes, and drinking water are some of the routes of transmission of *Helicobacter pylori* infections^{7,8}.

Various diagnostic tests are available for the detection of *Helicobacter pylori*. These include invasive tests such as rapid urease test (RUT)¹⁰, bacterial culture and histology after obtaining biopsy through endoscopy, and several non-invasive tests which include urea breath test, serology, and stool antigen^{11,12}. The choice of diagnostics depends upon the patient's age, complaints, availability of tests in hospitals, cost-effectiveness, and technical difficulty levels. Culturing bacteria, though labor intensive because of the fastidious nature of the bacterium, is a highly sensitive test to detect *H.pylori* from gastric biopsies. One added advantage of culturing bacteria is the benefit of performing antibiotic susceptibility testing¹³. Histology is another invasive technique that is employed for the direct detection of the organism¹⁴. Several stains can be employed for the detection of *H.pylori* like Hematoxylin and eosin (H & E), Giemsa, Warthin-Starry & immune-histochemical stains¹⁵. Molecular identification of *H.pylori* by polymerase chain reaction (PCR) has been so far the most reliable method to detect the bacterium from gastric biopsy specimens, saliva, stool, and gastric juice^{16,17}.

The present cross-sectional study aimed to identify *Helicobacter pylori* from gastric biopsies obtained through endoscopy, to compare detection with other invasive techniques such as bacterial culture, rapid urease test (pronto dry), and histological detection.

MATERIALS AND METHODS

This validation study was conducted from August 2018 to February 2019 at Khyber medical college, pathology department, Peshawar and comprised of total 87 patients who underwent endoscopy at the gastrointestinal endoscopy department, Hayatabad medical complex (HMC) Peshawar, with symptoms of gastrointestinal disturbances like acid reflux, abdominal pain, heartburn/dyspepsia, and vomiting and the study was approved by the ethical review committee of Hayatabad Medical Complex, Peshawar.

Patients with prior history of intake of antibiotics and proton pump inhibitors (PPIs) were excluded from the study. Informed consent was taken from each patient prior to the endoscopy. A total of 6 biopsy specimens were taken each from the antral and corpus regions of the stomach. For bacterial culture, two specimens were collected in sterile tubes containing 10 ml of thioglycolate broth (TGB), (Oxoid UK), and two of the specimens were collected for histopathology in ependroph tubes with 10% formalin, stored at 4°C. The remaining two specimens were collected for pronto dry rapid urease test. The specimens were transported to Khyber medical college, pathology department within one hour of collection to avoid desiccation and to maintain bacterial motility.

The biopsy specimen was chopped and inoculated on Columbia blood agar supplemented with 10 % sheep blood and DENT supplement (OXOID U.K). The culture plates were incubated at 37°C for 48-72 hours in an anaerobic jar with Campy-Gen sachets to provide a microaerophilic environment and then observed for colonies to appear. After obtaining colonies from the culture, Gram staining was performed to confirm curved gram-negative rods. Urease test, catalase, and oxidase tests were done for confirmation of *Helicobacter pylori*. Rapid Urease Test, (RUT) was done using (Pronto Dry, Gastrex, France) which consists of a dry filter paper containing urea, a pH indicator (phenol red), buffer, and a bacteriostatic agent sealed in a plastic slide. A positive test was shown by the change of color of the dot from yellow to pink. The test result was read at 30 minutes and 1 hour after sampling as per the manufacturer's instructions.

Biopsy specimen which was taken for histological identification was fixed in formalin for 24 hours, dehydrated, and then embedded in paraffin wax. Sectioning was done under the microtome and stained with hematoxylin-eosin and Giemsa stains. The slides were read by an experienced histopathologist who was completely blinded to the clinical information. Curved-shaped rods were identified on the mucosal surface and were taken as positive.

Determination of sensitivity and specificity, positive predictive values (PPV), and negative predictive values (NPV) were done for comparative studies. The frequency of Infection was expressed as percentages.

RESULTS

Out of 87 patients, 57.47% (50/87) were male and 42.52% (37/87) were female patients with the age range of 18 -80 years and a mean age of 45 years who underwent endoscopy.

Endoscopic findings revealed 64.36% (56/87) of patients with gastritis, duodenitis with 6.89% (6/87), peptic and duodenal ulcers with 22.98% (20/87), erosion with 4.59%(4/87) and adenocarcinoma of stomach with 2.29% (2/87) as shown in table 1. Total positive *H.pylo-ri* isolates obtained by bacterial culture were 16(18.39%) while 22(25.28%) of the isolates were detected to be positive for *H.pylori* by Giemsa and hematoxylin-eosin stain. 18 (20.68%) of the patients were identified as positive for *H.pylori* on the pronto dry urease test.

In our study, culture, Histopathology and RUT were considered the gold standard for the determination of sensitivity, specificity, and positive and negative predictive values of the tests. At least two of the three tests were taken as positive cases for diagnosis of *H.Pylori* infections. Out of 87 patients who underwent endoscopy, 4 of the patients were excluded because of negative results in 2 of the 3 invasive tests.

Comparison of culture and Histopathology: The sensitivity and specificity of culture versus histopathology as in our study were 45.45% and 90.7% respectively, while positive and negative predictive values were 62.5% and 83% respectively shown in table 2.

Comparison of Rapid Urease Test and Histopathology: The sensitivity and specificity of RUT versus histopathology in our study were 81.81% and 90% while positive and negative predictive values were 90% and 94% respectively (Table 2).

Table 1: Endoscopic findings of patients (n=87)

Endoscopy	Number of Patients	Percentage
Gastritis	56	64.36%
Duodenitis	6	6.89%
Peptic and Duodenal Ulcers	20	22.98%
Erosions	4	4.59%
Adenocarcinoma of stomach	2	2.29%

Table 2: Comparison of different Invasive tests in the diagnosis of H.P infections

Diagnostic Tests	Sensitivity	Specificity	Positive Predictive Values	Negative Predictive Values
Culture vs. Histopathology	45.45%	90.7%	62.5%	83%
Rapid Urease Test vs. Histopathology	81.81%	96.92%	90%	94%

DISCUSSION

Helicobacter Pylori infections are so common worldwide that half of the world's population is reported to be affected. The prevalence of infection is higher in underdeveloped countries and infection is attained at an early age¹⁸. For effective management, it is important to do initial diagnosis through invasive gastric biopsy methods including bacterial culture or histopathology with a rapid urease test (RUT) or molecular-based detection of the bacterium. Non-invasive tests like the urea breath test and H.pylori stool antigen test should not be employed in the initial diagnosis of H.pylori infection, although these tests provide good support of evidence in the case when only histopathology is used as an invasive test for diagnosis.

In our study, 22.28% of patients were positive for Helicobacter Pylori. 18.39% of patients were diagnosed by bacterial culture. Culturing of this bacterium is recommended in case of failure of antibiotic treatment. This technique gives an added advantage as antibiotic susceptibility testing can be conducted which helps the clinicians in prescribing appropriate antimicrobial treatment¹⁹. 22.28% of patients were diagnosed through histological identification. Rapid urease test was positive in 20.68% of patients. The sensitivity and specificity of culture in comparison to histopathology in our study were 45.45% and 90.7%. This low sensitivity of culture owes to many reasons which include low bacterial count and the presence of morphologically different forms of Helicobacter Pylori which are though viable but otherwise non-culturable. The use of prior antibiotics also contributes to low sensitivity and false negative results. The low sensitivity of culture in our study is in accordance with previous studies²⁰. Another study conducted by Cosgun Yasemin et al showed that culture had lower sensitivity as compared to histopathol-

ogy¹¹. The reason for the low sensitivity of culture lies in the difficulty of culturing this bacteria due to its microaerophilic nature, isolation time (5 -7 days), and special growth requirements²¹. In case of clinical indication of performing endoscopy to obtain a gastric biopsy for Helicobacter Pylori-associated gastric diseases, the first choice is the rapid urease test as it provides quick and easy detection of urease activity in the gastric biopsy specimen. This test which was first defined and performed by McNulty and Wise in 1985, has gained recognition due to its high sensitivity in the detection of Helicobacter Pylori in gastric biopsy samples²². Many studies have shown the sensitivity of this test between 80 - 99%.^{23,24,25}

In our study, the sensitivity and specificity of the rapid urease test as compared to histopathology were 81.81% and 96.92%. The results of our study affirm previous studies in which RUT sensitivity was higher.²⁶ Study conducted by Dechant, Franz-Xaver, et al also shows that the rapid urease test is more sensitive in comparison to the histopathology of the gastric biopsy for confirmation of Helicobacter Pylori.²⁷

An important observation of this study is the significant association of Helicobacter Pylori with gastric adenocarcinoma. A literature review has revealed that there is a substantial risk of progression to gastric adenocarcinoma in patients diagnosed with Helicobacter Pylori gastritis which is why it is suggested that early detection of the bacteria may help in eradication and effective treatment of Helicobacter Pylori which may lead to lower risks of progression to adenocarcinoma of the stomach.²⁸ In our study, the percentage of adenocarcinoma was 2.29%.

Owing to the small size of the study population, our study may not reflect the actual burden of Helico-

bacter Pylori-related diseases. Another limitation was the difficulty in culturing viable bacteria due to the unavailability of a CO₂ incubator.

CONCLUSION

The present study suggests that *Helicobacter Pylori* remains a leading cause of many gastrointestinal diseases including peptic ulcers, duodenitis, gastric erosions, and adenocarcinoma of the stomach. The sensitivity and specificity of the rapid urease test were 82 and 90% respectively, while that of culture was 45 and 91% respectively.

In order to get an actual frequency of *Helicobacter Pylori*-related gastric diseases, a study of longer duration with a large study population is required.

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Gul A:	Writing, Proof Reading, Critical appraisal
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Ihsanullah:	Statistical analysis and bibliography
Qudrat A:	Literature search, write up

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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PATTERN OF INJURIES IN ROAD TRAFFIC ACCIDENTS AT PESHAWAR: AN AUTOPSY BASED STUDY

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ABSTRACT

Objective: To assess the pattern of injuries in autopsy examination of road traffic accident cases at Peshawar.

Material and Methods: A community-based descriptive cross-sectional study included a total of 94 candidates presented for autopsy at the forensic medicine department, Khyber medical college from 01st July 2020 to 30th June 2021.

Results: The age of the subjects ranged from 2-80 years with a mean age of 36.9 ± 20.7 years. 96.8 % of subjects were having multiple injuries whereas, 3.2% were having a single injury. Overall, 94 cases had a total number of 303 injuries, out of which 90.76% were small-sized, 7.92% were medium-sized and 1.32% were large-sized including all kinds of injuries. The most common presenting injury was laceration (87.2%), preceded by abrasion (59.6%), then contusion (51.1%), fracture (23.4%), and hematoma (2.1%). The most common region involved in RTA was head & neck with 86.17%. Maximal deaths occurred within 3-6 hours following an RTA. The most common cause of death was an injury to the brain and its associated vessels. There is no significant correlation noted between the patterns of injury and the cause of death of subjects ($p < 0.05$).

Conclusion: Our study shows the pattern of injuries and causes of death via RTA, as there is no study conducted in this region. It will be useful to Law Enforcement agencies in implementing rules and regulations in preventing RTA and public awareness.

Keywords: Road Traffic accidents, Autopsy findings

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INTRODUCTION

A Road Traffic Accident (RTA) is defined as an incident that arises on a way or street open to public traffic; which results in the injury or killing of one or multiple individuals and involves at least one mobile vehicle. It's a human disaster. It costs untimely deaths, injuries, and loss of productivity by including severe human miseries and socioeconomic costs.¹ Road traffic accidents causing injuries and death are a major health issue in developing countries, as well as in developed countries causing 85% of all deaths and 90% of total cases of injuries and disabilities in younger life. Road traffic accidents will become 5th leading cause of death globally by 2030. About 91% of total road traffic accident victims are from lower to middle socio-economic countries. The majority of victims of RTA were aged between 5 and 25 years. About 186,300 children (under 18) died from RTA every year which is 3

times greater than in developed countries.² According to the most recent WHO data published in 2018, the mortality rate in Pakistan reached 30,046 or 2.42% of total deaths. The age-adjusted death rate is 17.12 per 100,000 of the population making Pakistan the 95th in the world.³

The highest risk factors for road traffic accidents are a distraction while driving, not following the right path, and high speeds. Generally, high speed increases the risk of an incident and its severity. Pedestrians have a 4.5-fold increased risk to die if hit by a vehicle traveling at high speed. Other risk factors include alcohol and drug intake, the non-use of helmets, and seatbelts, the use of mobile phones, impaired vehicles and roads, inadequate emergency medical treatment, and enforcement of traffic laws.⁴ Age and gender are the utmost important risk factors in assessing RTAs. According to gender and age, young males have been reported to be more prone to this.^{5,6} Hence, it is important to understand RTA fatalities in terms of age and gender-based variation occurring in the populated cities of Pakistan to identify the population at risk and implement safety measures. RTAs can also be classified based on the anatomical cause of death and site of fracture. RTA fatalities are more prone to head and cerebral injuries.⁵⁻⁷ The highest proportion of traumatic head injuries was sustained by pedestrians, followed by cyclists, car occupants, and motorcyclists. It was observed that sub-

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dural and subarachnoid hematomas were more frequent in pedestrians and cyclists, followed by motorcyclists and car occupants because of a direct hit of the skull to the road. In motorcyclists, top fracture of neurocranium is very common. Different regions have different types of victims of RTA.

It depends on the types of vehicles used, traffic safety rules, public awareness, and the condition of the road. Such information enables medical practitioners in casualty departments to recognize the severity of RTA cases and provide quick and accurate medical care. It has been observed that after trauma from RTA many people had psychological effects. Of these, some had long-lasting effects which deteriorated the quality of their lives. This study will add new data for the pattern of injuries in road traffic accidents in Peshawar. Previously, no such study in this region is available.

The data would be helpful for Forensic Experts, Public Health Experts, and Law Enforcement agencies to cover and cope with the evil of Road Traffic Accidents. The data further can be used to aware the public has the maximum preventive measures to avoid major fatal injuries in the future. Additionally, laws and legislation can be amended based on the data. To assess the pattern of injuries in autopsy examination of road traffic accident cases at Peshawar.

MATERIALS AND METHODS

This cross-sectional chart review was conducted at the Department of Forensic Medicine, Khyber Medical College, Peshawar from 1st July 2020 to 30th June 2021. All the cases reported in the department during the period were enrolled in the study. All Road Traffic Accidents (RTAs) of any age and gender were included and cases with incomplete documentation or being referred from other districts were excluded.

The data as per the study sample shall be collected after taking Ethical/Institutional approval for the said study. After following principle guidelines, maintaining the ethical concerns and confidentiality of the participant, a pre-designed autopsy Performa shall be used to extract the data.

The pre-designed Performa will have a demographic component and closed-ended questions regarding the pattern of injuries in road traffic accident cases. The data will be extracted in Microsoft Excel software for analysis. SPSS v.25.0 was used to analyze the data. Categorical variables will be analyzed descriptively in the form of frequency and percentages while numerical variables will be analyzed descriptively in the form of mean and stand deviation.

Post stratification two categories will be associated by Chi-Square Test. Analysis will be presented in the form

tables and figures. The patterns of injuries included the types, sites, dimensions, duration, and fatal injuries.

RESULTS

A total of 94 cases were included in the study, out of which 93.6% (88/94) were males and 6.4% (6/94) were females. The age of the subjects was ranging from 2-80 years with a mean age of 36.9 ± 20.7 years. The group-wise distribution is given in Table 1. In total 94 cases of road traffic accidents, minimum of 1 and maximum of 6 injuries were noted, where 3.2% (3/94) had a single injury and 96.8% (91/94) had multiple injuries, with a maximum frequency of 2 injuries, of all kinds.

Table 2 shows the frequency of different types of injuries in the total cases. In the cases, of the subjects with single injuries, 2 out of 3 had head & neck injuries, whereas 1 had a pelvic injury.

However, cases with multiple injuries include different regions given their frequencies and percentages in table 3. Moreover, overall 94 cases had a total number of 303 injuries, out of which 90.76% (275/303) were small-sized, 7.92% (24/303) were medium-sized and 1.32% (4/303) were large sized including all kinds of injuries.

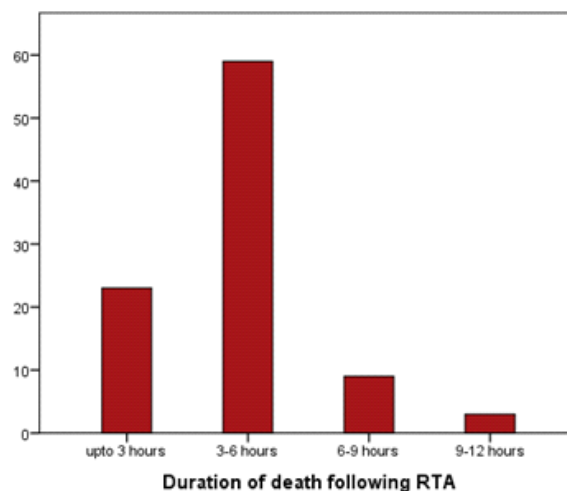


Fig 1: Frequencies illustrating duration of death following RTA

Table 1: Group-wise distribution of our subjects (n=94)

Sr. No	Age (in groups)	Number	Percentage (%)
1.	< 11 years	8	8.5
2.	11-20 years	16	17.0
3.	21-30 years	26	27.7
4.	31-40 years	12	12.8
5.	41-50 years	7	7.4
6.	51-60 years	8	8.5
7.	> 60 years	17	18.1

Table 2: Frequencies and percentages of different types of injuries

Sr. No	Type of injury	Present (%)
1.	Abrasion	56 (59.6)
2.	Contusion	48 (51.1)
3.	Laceration	82 (87.2)
4.	Hematoma	2 (2.1)
5.	Fracture	22 (23.4)

Table 3: Frequencies and percentages of different types of regional injuries

Sr. No	Cause of death	Frequencies	Percentages
1.	Injury to brain and associated vessels	61	64.89
2.	Injury to femoral vessels	11	11.70
3.	Injury to thoracic/abdominal aorta or both	8	8.51
4.	Injury to brain and femoral vessels	5	5.32
5.	Injury to brain and thoracic viscera	5	5.32
6.	Injury to abdominal viscera and associated vessels	2	2.13
7.	Injury to thoracic viscera and associated vessels	1	1.06
8.	Injury to brain and abdominal viscera	1	1.06

Table 3: Frequencies and percentages of different types of regional injuries

Sr. No	Regional Injuries	Frequencies	Percentages
1.	Head & Neck Injuries	81	86.17
2.	Lower Extremity Injuries	58	61.70
3.	Upper Extremity Injuries	33	35.11
4.	Abdomen & Pelvis Injuries	27	28.72
5.	Thorax Injuries	22	23.40

Table 4: Correlation between the pattern of injuries and cause of death

Sr. No	Cause of death		Abrasion		Contusion		Laceration		Hematoma		Fracture	
			Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	Injury to brain and associated vessels	Count	37	24	31	30	56	5	1	60	15	46
		Exp. Count	36.3	24.7	31.1	29.9	53.2	7.8	1.3	59.7	14.3	46.7
2	Injury to femoral vessels	Count	5	6	6	5	8	3	0	11	4	7
		Exp. Count	6.6	4.4	5.6	5.4	9.6	1.4	.2	10.8	2.6	8.4
3	Injury to thoracic/abdominal aorta or both	Count	3	2	1	4	4	1	1	4	3	2
		Exp. Count	3.0	2.0	2.6	2.4	4.4	.6	.1	4.9	1.2	3.8
4	Injury to brain and femoral vessels	Count	4	4	4	4	7	1	0	8	0	8
		Exp. Count	4.8	3.2	4.1	3.9	7.0	1.0	.2	7.8	1.9	6.1
5	Injury to brain and thoracic viscera	Count	1	0	0	1	1	0	0	1	0	1
		Exp. Count	.6	.4	.5	.5	.9	.1	.0	1.0	0.2	0.8
6	Injury to abdominal viscera and associated vessels	Count	2	0	1	1	1	1	0	2	0	2
		Exp. Count	1.2	.8	1.0	1.0	1.7	.3	.0	2.0	0.5	1.5
7	Injury to thoracic viscera and associated vessels	Count	4	1	4	1	4	1	0	5	0	5
		Exp. Count	3.0	2.0	2.6	2.4	4.4	.6	.1	4.9	1.2	3.8
8	Injury to brain and abdominal viscera	Count	0	1	1	0	1	0	0	1	0	1
		Exp. Count	.6	.4	.5	.5	.9	.1	.0	1.0	0.2	0.8
		P-value	0.58		0.57		0.48		0.30		0.18	

DISCUSSION

Road traffic accidents are one of the major causes of morbidity and mortality among humans. It is believed to be the fifth leading cause of death within the next 10 years. It was important in our setting to determine the various aspects of RTAs presenting to trauma centers in

Peshawar. Our study showed a total of 93.6% males and 6.4% females involved in RTAs presenting to trauma and emergency. This can be attributed to a lot of known factors that increase a male susceptibility to be involved in RTAs. Similar findings were noted in a study done in Yazd, Iran by Yashar et al.⁹ which showed 80.5% of males and

19.5% of females were involved in RTAs. Our results are also in accordance with a similar study done in Karachi, Pakistan by Khurshid, A. et.al¹⁰ which showed 85.8% male and 14.2% female involvement.

Age-wise distribution of patients showed the majority of them occurring in the age group 21-40 years (40.5%). A similar study showed 54.5% of patients in the age group 18-40¹⁰. The difference in reference range can be attributed to the different age group ranges used in both studies. With respect to the number of injuries occurring in each patient that presented with RTA, the majority of patients had multiple injuries amounting to 96.8% whereas 3.2% of patients had single injuries. In comparison to this, two similar studies done in India and Ghana respectively showed results in close accordance with our results⁽¹¹⁻¹²⁾. Variation in results can be attributed to multiple factors including abiding by traffic laws, use of protection on roads such as wearing a helmet, and seat belt use and strictly following the speed limitations individually.

Regionally, our study indicated that most injuries that occurred were located in the head and neck region accounting for 86.17% of patients. This was followed by lower and upper extremity injuries occurring in 61.7% and 35.11% of injuries respectively. Comparing it to a similar study done in Saudi Arabia¹³, showed lower limb injuries occurred in 40.77% of patients, upper limb in 38.08% of patients, and skull injuries occurred in 7.21%. The difference in statistical findings can be attributed to the use of protective gear being more prevalent in Saudi Arabia compared to our study population.

The most common cause of death from RTA occurred due to the brain and associated vessel injury in our study accounting for 64.89% of total deaths. This finding is in accordance with a similar study done in Karachi, Pakistan⁽¹⁰⁾ which showed deaths from injury to the brain and skull accounting for 64.6% of all fatalities. Comparatively, our study finding was in discordance with a similar study done in India which showed only 47% of deaths occurred from the head and associated injuries¹⁴. Thus, correlating the pattern of the injuries with the cause of death showed p-values above 0.05, which signifies that there is no impact on each other. No such relation is conducted in the region.

CONCLUSION

Our study shows the pattern of injuries and causes of death via RTA, as there is no study conducted in this

region. It will be useful to Law Enforcement agencies in implementing rules and regulations in preventing RTA and public awareness.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Nadeem F: Concept, design, data collection

Wasif M: Data collection, writing, review

baqi NU: Data collection, review

Ahmad I: Concept, review

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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PLATELET INDICES IN LEUKEMIAS: - A CROSS SECTIONAL STUDY

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ABSTRACT

Objective: To evaluate the pattern of changes in the platelet indices in different Leukemias.

Material and method: This descriptive cross-sectional study was conducted in the Pathology Department of Khyber Teaching Hospital from January 2021 to December 2021 (1-year duration). Diagnosed acute and chronic leukemia cases were included while those receiving therapeutic chemotherapy were excluded. The platelet count was analyzed as a part of complete blood counts by the Sysmex Hematology analyzer in the Hematology section of the Pathology department. The changes observed in the platelet counts in different types of leukemia were recorded in a proforma. Mean, standard deviation, frequency and percentages were used to compute variables.

Results: The age range of the 100 included cases of leukemia was 01 - 50 years. The mean age of the study population was 30 ± 10 SD years. Platelet count was low in acute Leukemias and chronic lymphocytic leukemia. Only in chronic myeloid leukemia, raised platelet count was seen (in 62% of cases). Mean platelet volume and platelet distribution width were decreased in all leukemias.

Conclusion: Platelet indices are decreased in Leukemias, with the exception of chronic myeloid leukemia where platelet count is raised.

Keywords: Platelet count, Acute lymphoid leukemia, Acute myelogenous leukemia, Chronic lymphocytic leukemia, Chronic myelogenous leukemia.

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INTRODUCTION

Leukemia is a malignant proliferation of precursor cells of lymphoid and myeloid lineage where there is uncontrolled proliferation of immature cells, replacing normal hematopoietic tissue in bone marrow^{1,2}. The tumor cells not only occupy the bone marrow but also infiltrate distant body tissues through circulation². The malignant white cells divide abnormally to such an extent that the megakaryocytes and other hematopoietic cells are replaced by these malignant clones of cells^{1,2}. This causes a decreased production of platelets in addition to other hematopoietic cells and thus a low platelet count occurs^{1,2}.

The incidence of leukemias is on the rise in the Pakistani population²⁻⁵. The alarming situation is in Northern areas of Pakistan, where leukemia is the second commonest malignancy^{5,6}. Acute lymphoid leukemia (ALL) commonly occurs in childhood as compared to adults^{3,7,8,9}. Acute myelogenous leukemia (AML) is common in the adult population⁹. The mean age of diagnosis of AML is around 70 years¹⁰⁻¹². The worldwide incidence of ALL is about 3 per 100,000 population [8,13]. In Pakistan, the mean age of ALL patients is about 6 years^{14,15}. The worldwide incidence of Chronic lymphocytic leukemia (CLL) is 5 per 100,000 population^{16,17}.

Generally, leukemia is classified into two broad categories on the basis of the duration of onset of signs and symptoms, i.e. acute and chronic leukemia^{18,19}. Further classification of each type is done by the hematopoietic cells, whether lymphoid or myeloid is involved. So, acute leukemia is further classified either into acute lymphoid leukemia if it affects the lymphoid lineage of hematopoietic cells, or acute myeloid leukemia if the myeloid lineage of cells is affected in the bone marrow¹⁸. In the same way,

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chronic leukemia is classified either into chronic lymphocytic leukemia or chronic myelogenous leukemia depending on whether lymphocytic lineage or myeloid lineage cells are affected in the bone marrow respectively^{19,20}. The complete blood count is the initial routine laboratory investigation for leukemia²¹⁻²⁵. The study of the complete blood count shows that platelet counts are almost always abnormal in leukemic patients^{25,26,27}. Usually, the platelet count is decreased in the case of leukemia, along with a decrease in hemoglobin level and an increase in white cell count^{24,26,27}. Additional investigations which help in the sub-typing of leukemia include flow cytometry and cytogenetic analysis^{21,22,23}. In our setup, there is no such study to determine the pattern of changes in the platelet indices in leukemias. Therefore, this study was conducted to evaluate the pattern of platelet indices in acute and chronic leukemia in our setup.

MATERIALS AND METHODS

This descriptive Cross Sectional study was conducted in Pathology Department, Khyber Teaching Hospital from January 2021 to December 2021 (1-year duration). The study was started after obtaining ethical approval from the ethical board of the institute. Sampling was done using nonprobability purposive sampling. Newly diagnosed cases of leukemia were included in the study. Patients who were getting treatment for leukemia were excluded from the study. Platelet indices were determined by the Sysmex analyzer in the Hematology section and recorded in the proforma. Platelet indices recorded included

platelet count, mean platelet volume, and platelet distribution width. Results were drawn accordingly. Mean and standard deviation was used for quantitative variables. Frequency and percentages were used for qualitative variables.

RESULTS

The gender distribution of 100 cases of Leukemia is shown in Figure 1. Platelet count is low in all leukemias except chronic myeloid leukemia as shown in table 1. On the other hand, mean platelet volume and platelet distribution width are low in all leukemias. Table 2 shows that platelet count was increased only in CML. All the remaining platelet indices were decreased in all subtypes of leukemia

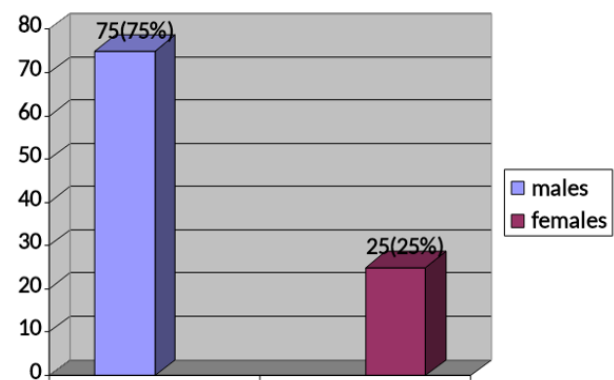


Fig 1: Sex distribution of the study population

Table 1: Platelet indices in leukemia (n=100).

Subtypes of Leukemia	Platelet count (x103/ μ L)		Mean platelet volume (fL)		Platelet distribution width (%)	
	Range	Mean $\pm$ SD	Range	Mean $\pm$ SD	Range	Mean $\pm$ SD
Acute Myeloid Leukemia	4-198	35 $\pm$ 11	5.1-7.5	7.1 $\pm$ 2	7-9	7.6 $\pm$ 2.1
Acute Lymphoblastic leukemia	7-498	75.9 $\pm$ 18	4-7.1	5 $\pm$ 1	5-9	8 $\pm$ 3.2
Chronic myeloid Leukemia	140-187	600 $\pm$ 167	5-7.5	7.0-7.4 $\pm$ 3	6-9	8.1 $\pm$ 2.3
Chronic Lymphocytic Leukemia	2-400	156 $\pm$ 87	6.1-7	6.9 $\pm$ 1	4-8	7.2 $\pm$ 1.2

Table 2: Pattern of changes in platelet indices in leukemias (n=100).

Leukemia subtype	Platelet count			Mean platelet volume			Platelet distribution width		
	Increasedn (%)	Decrease n(%)	Normal n(%)	Increased n(%)	Decrease n(%)	Normal n(%)	Increased n(%)	Decrease n(%)	Normal n(%)
Acute Myeloid Leukemia	0(0%)	36(92.3%)	2(7.7%)	3	65(65%)	32(32%)	5(5%)	74(74%)	21(21%)
Acute Lymphocytic leukemia	6(12%)	44(88%)	0(0%)	0	75(75%)	25(25%)	0(0%)	85(85%)	15(15%)
Chronic myeloid Leukemia	5(62.5%)	0(0%)	3(37.5%)	0	64(64%)	36(36%)	0(0%)	75(75%)	25(25%)
Chronic Lymphocytic Leukemia	0(0%)	7(58%)	5(42%)	2	74(74%)	24(24%)	3(3%)	87(87%)	10(10%)

DISCUSSION

Worldwide, leukemia is being reported to become one of the commonest malignancies, as there is a trend toward a gradual increase in the number of cases diagnosed over time²⁸. The first test done in cases of leukemia is the complete blood count²⁴. Platelet indices are determined from the complete blood count. The pattern of variation in the platelet indices in leukemia is basically the projection of the changes that happen in bone marrow stroma due to malignant clones of cells²⁴. Changes in the platelet indices in leukemic cases are quite characteristic and the clinician must be aware of it in order to not miss the diagnosis in tricky cases^{24,25}.

The pattern of changes in the platelet indices in leukemia is basically due to the changes brought about by leukemia in the bone marrow stroma²⁴. Malignant clones of cells divide in the bone marrow to such an aggressive extent that the normal hematopoietic cells in the bone marrow are replaced by these malignant cells^{1,2}. Replacement of hematopoietic cells in bone marrow by the malignant cells causes a decreased number of megakaryocytes in the marrow^{30,31}. This reflects in peripheral blood counts as the decreased value of platelet indices. A decrease in values of all platelet indices is the usual finding in almost all cases of leukemia^{24,29,30,31}.

In the present study, it was found that platelet indices were decreased in most cases of ALL. A decrease in values of all platelet indices in ALL has been reported in the literature as well^{29,31}. Moussavi F from Iran 2014 reported a decrease in the platelet count in 89.7% of cases of ALL patients²⁴. Perez JC from Spain also reported the same findings²⁶.

When platelet count was analyzed in the cases of CML, it was found that the platelet count was increased in the majority of cases of CML. Similar data is reported by Amer AH in his study in 2017³⁰. He has reported an elevated platelet count in CML, which is much more than that in the present study³⁰. The increase in the platelet count in CML patients is due to the fact that it is a myeloproliferative condition. It means that all the hematopoietic cells in the bone marrow, including the megakaryocytes, are dividing in an uncontrolled fashion. The excessive abnormal proliferation of megakaryocytes in the bone marrow leads to increased platelet count in CML³⁰. So, CML differs from other leukemias in this regard where platelet count is decreased^{30,32}.

In the present study, it was found that platelet indices were decreased in the majority of cases of CLL. Zee-shan 2015 also presented in his study the same finding of low platelet count in CLL patients³². It is a well-established fact that thrombocytopenia is a bad prognostic factor in CLL because it represents an advanced stage of CLL³².

CONCLUSION

The platelet indices are mostly decreased in leukemias. It is only in chronic myeloid leukemia, that the platelet count is raised.

It is recommended to do further comparative studies where the changes in platelet indices are compared in cases of thrombocytopenia caused by leukemia (hyper productive thrombocytopenia) with that caused by excessive peripheral platelet destruction (hyper destructive thrombocytopenia).

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- Idrees M:** Literature search, Data collection, Final approval of draft, overall supervision
- Qayyum S:** Write up, Proof Reading
- Waqas M:** Statistical analysis and data handling
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Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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THE RELATIONSHIP OF HS-CRP IN TYPE 2 DIABETIC PATIENTS PRESENTING WITH ACUTE MYOCARDIAL INFARCTION

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ABSTRACT

OBJECTIVE: To determine the relationship of Hs-CRP with type 2 diabetes mellitus in patients with acute myocardial infarction.

Material And Methods: It was a cross-sectional study conducted at Hayatabad Medical Complex, Rehman Medical Institute, and Khyber Girls Medical College Peshawar. A total of 90 subjects were enrolled in the study. These subjects were split into two equal groups; Group 1 comprised patients having type 2 diabetes mellitus (T2DM) and acute myocardial infarction (acute MI). Group 2 comprised patients having T2DM only. Patients from both genders who presented within 6-12 hours of acute MI were included in group 1.

Results: Mean age of subjects of group 1 was greater than that of group 2 while the number of males within group 1 was greater than that of females. The median values of Hs-CRP were higher in group 1 subjects as compared to group 2. There was a significant difference between the values of both groups.

Conclusion: The Hs-CRP values were higher in diabetic patients with acute MI as compared to those with diabetes alone because the patients who suffered from acute MI had enhanced ongoing low-grade inflammatory process which was a possible reason for their MI.

Keywords: type 2 diabetes mellitus, coronary artery disease, hs-CRP, myocardial infarction, atherosclerosis.

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INTRODUCTION

Coronary artery disease (CAD) is a major cause of morbidity and mortality throughout the world¹. CAD accounted for 382,820 deaths in 2020 according to the Centers for Disease Control (CDC)².

T2DM is one of the strong risk factors for the causation of CAD. Patients having T2DM have 2 to 4 times the chances of developing CAD, or ischemic stroke, and a 1.5 to 3.6 times rise in death incidence³. More than 50% of patients having diabetes die due to CAD⁴. The prevalence of diabetes mellitus has increased dramatically throughout the world in the last two decades. Three hundred sixty-six million people had diabetes mellitus in 2011 and it is

estimated that the number of cases is increasing and it will rise by 2030 to 552 million⁵.

People with diabetes have an enhanced risk of developing atherosclerosis and therefore CAD. They experience high morbidity and mortality after acute MI than those without diabetes⁶.

Atherosclerosis is a process associated with persistent low-grade inflammation. The process of inflammation is present during all stages of atherosclerosis and is closely related to atherosclerotic plaque formation and its rupture⁷. Therefore, the assessment of ongoing systemic inflammation is emerging as a tool in cardiovascular disease risk prediction. The main markers for the detection of this low-grade inflammation are Hs-CRP, Serum Amyloid A, IL-6, Homocysteine, Apolipoprotein B-100, and Soluble intercellular adhesion molecule type 1⁸. Out of these markers, Hs-CRP has proven the most promising for risk prediction of cardiovascular events⁸.

C-reactive protein is an acute-phase reactant produced by the hepatocytes during the process of inflammation. After an inflammatory stimulus, different cytokines in a cascade manner cause the production of interleukin-6

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(IL6), and IL6 finally causes the production of CRP from hepatocytes⁷. Hence inflammation and CRP production go side by side. Most of the clinical studies show that CRP is an independent marker for risk prediction of atherosclerosis⁹, myocardial infarction,¹⁰ hypertension¹¹, and cardiovascular events. The standard CRP estimation has been replaced by a more sensitive variant of CRP, high-sensitivity CRP (Hs-CRP). The Hs-CRP in today's world is proving itself to be the strongest and independent marker for risk prediction of atherosclerosis and CAD^{8, 12}. In studies conducted by Ridker et al and Danesh et al^{13, 14} Hs-CRP levels were measured in apparently healthy individuals. These studies showed that Hs-CRP levels in the upper normal range, independently predicted major vascular events, like MI and cerebrovascular accidents.

According to CDC and AHA (American Heart Association), the Hs-CRP level stratification for the cardiac risk assessment in apparently healthy individuals is¹⁵ High risk: >3.0 mg/ L. Diabetic individuals due to hyperglycemia have higher levels of Hs-CRP than people without diabetes as hyperglycemia itself can lead to raised levels of the marker irrespective of other factors¹⁶. This study was an attempt to establish a correlation between Hs-CRP, diabetes, and its complications like CAD, and acute MI, and the prognostic importance of Hs-CRP in acute MI.

MATERIALS AND METHODS

The study was conducted after approval by the ethical committee of Khyber Girls Medical College (KGMC) and Hayatabad Medical Complex (HMC). Sampling was carried out at the cardiology and endocrinology units of HMC and Rehman Medical Institute (RMI), Peshawar. Samples were analyzed at the pathology departments of KGMC and RMI. It was a descriptive cross-sectional study. The study was conducted from February 2016 to November 2016. A total of 90 patients were selected for the study after informed consent. Subjects were selected according to the non-probability consecutive sampling technique. Known type 2 diabetic patients from both genders who presented with acute MI within 6-12 hours of acute MI to the cardiology units of HMC and RMI were included in the study. Known type 2 diabetic patients without acute MI from both genders were also included in the study. So, the study population comprised two groups of subjects. Group 1 subjects had T2DM and acute MI and group 2 subjects had diabetes mellitus alone.

Patients having acute infections, inflammatory disorders, any malignancy, type 1 diabetes mellitus, severe liver dysfunction, renal impairment, taking NSAIDs, low-dose Aspirin, and lipid-lowering drugs were not included in the study.

A venous blood sample (5ml) was collected from each subject. The serum was separated and stored in containers at a temperature of -70 °C for future measurement

of Hs-CRP and other parameters. After the completion of the sample collection process, the serums of all patients were thawed and analyzed. The Hs-CRP concentrations were measured on Abbott's Architect ci 8200 analyzers by Immunoturbidimetric method using Abbott's FDA-approved kit (Multiagent CRP Vario).

SPSS 20 was used for statistical analysis. The Hs-CRP values were subjected to Kolmogorov Smirnov and Shapiro-Wilk tests to assess the normality of the data. The data were not normally distributed. So for the Hs-CRP, median values and interquartile ranges (IQRs) were determined. The level of significance for the difference in the ages between the groups was determined by using an independent t-test while the medians of Hs-CRP of both groups were compared by using the Mann-Whitney U test. A value of $\leq .05$ at a confidence interval of 95% was considered significant.

RESULTS

The mean age of subjects in group 1 was 58.98 ± 9.10 years while that of group 2 subjects was 47.75 ± 4.51 years with a significant difference of 0.001. The number of male subjects in group 1 was more than females while the number of females was more than males in group 2. The median value of Hs-CRP in group 1 subjects was higher than that of group 2 subjects and there was a highly significant difference between both groups. On gender-wise analysis, the median Hs-CRP levels in group 1 were more in males as compared to females. There was a significant difference between both entities. In group 2, contrary to group 1, Hs-CRP levels were higher in females than males but without any significant difference.

Upon further analysis of subjects from both groups according to CDC and AHA risk stratification, it was found that most of the high-risk patients were in group 1 as compared to group 2 which had only 1 patient in the high-risk category. The majority of patients in group 2 were in the low-risk range while in the average-risk category the number of patients in both groups was almost the same.

DISCUSSION

The mean age of patients in group 1 (59.24 ± 8.35) in this study was comparable to that in the study done by Suleiman M et al¹⁷ which was (61.33 ± 12.33). The present study showed that the number of male subjects in the group1 was greater than that of females and it was comparable to the study done by A U Saleh et al.¹⁸ and Nayandak T et al.¹⁹. This might be because pre-menopausal females have got protection from CAD due to female sex hormones.

There was a significant difference between the median Hs-CRP levels of group 1 and group 2 subjects. This was in accordance with the study by G Chetan²⁰. This difference indicates that the enhanced process of low-grade

Table 1: Frequencies of males and females in both groups

Groups	Males	Females
Group 1	29	16
Group 2	14	31
Total	43	47
Percentage	47.77%	52.22%

Table 2: Median Hs-CRP of both the groups

Groups	Median Hs-CRP	IQR	p-value
1	2.20	7.55) 7.80 – 0.25)	.003*
2	0.40	0.6) 0.20 – 0.80)	

*Mann Whitney U test

Table 3: Gender-wise analysis of Hs-CRP in group 1 and 2

Group	Gender	Number	Median	IQR	p-value
1	Male	29	3.80	0.40 – 9.00 8.6))	0.018*
	Female	16	0.50	0.10 – 2.13 2.03))	
2	Male	14	0.20	0.10 – 0.73 0.63))	0.208*
	Female	31	0.40	0.20 – 0.80 0.60))	

*Mann Whitney U test

Table 4: Hs-CRP risk stratification of both group subjects according to CDC and AHA guidelines

Hs-CRP cardiac risk levels according to AHA and CDC	Group 1	Group 2
Low risk- <1mg/L	16	34
Moderate risk 3-1- mg/L	12	10
High risk- >3mg/L	17	1

inflammation was going on in individuals who were diabetics and experienced acute MI as compared to individuals who did not experience any such event. On gender-wise analysis of both the groups, it was evident that the levels of the marker were higher in group 1 males as compared to females. It was consistent with the study done by Amrut D et al⁽²¹⁾. It means that males after acute MI are more prone to develop future complications. On the other hand, the values of the marker were higher in females than males in group 2 and it was in accordance with the study by G Chetan²⁰.

While comparing the median Hs-CRP levels of two groups according to CDC and AHA risk stratification, it was found that the number of individuals in group 1 was too high as compared to group 2 in high-risk category. So, the majority of group 1 individuals were prone to develop future complications of acute MI.

One can object that group 1 subjects had raised levels of Hs-CRP due to tissue damage and consequent inflammation as a result of acute MI. This question can be answered with the help of different studies. In a study

done by Mahajan S.N. et al.²², the mean Hs-CRP levels in acute MI subjects and unstable angina subjects were 9.8 ± 6.08 mg/L and 9.7 ± 4.36 mg/L respectively (no difference in values of both groups). Similarly, Berk et al (1990) found raised levels of CRP in 37 subjects with unstable angina as compared to 32 patients with stable angina. In the same way, Winter et al compared the CRP levels of patients with unstable angina and non-Q-wave acute MI and found a rise in the levels of both sets of patients. It means that higher levels of CRP in individuals with acute coronary syndromes are found due to the underlying process of inflammation inside the plaque and not as a result of myocardial damage as unstable angina is not associated with any tissue damage.

Although the number of group 1 individuals who were in the high-risk category was more as compared to group 2 yet the number of subjects in the moderate-risk category in group 2 i.e. 10 was not ignorable. It means those individuals were prone to develop CAD in the future.

This study signifies that Hs-CRP can be used as a marker for the risk prediction of future complications of acute myocardial infarction as well as for the risk prediction of developing CAD in diabetic patients in the future.

CONCLUSION

The study concludes that Hs-CRP is a very sensitive biomarker for the risk assessment of developing CAD and acute myocardial infarction. Moreover, it has got a very good prognostic value in the prediction of the development of future complications of acute MI.

It is recommended that such studies with a larger sample size should be conducted in Pakistan to establish the role of Hs-CRP as a marker for the prediction of CAD and its sequels.

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- Ishaq A:** Discussion and Manuscript review
- Shah S:** Data collection
- Javed K:** Manuscript review , Statistical analysis
- Parvez A:** Data collection and Manuscript review
- Eman L:** Literature search

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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CLINICO-PATHOLOGICAL PROFILE OF PATIENTS OF DENGUE FEVER IN DISTRICT PESHAWAR

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ABSTRACT

Objectives: This study was conducted with the aim to highlight the clinic-pathological profile of patients with dengue fever in Peshawar.

Materials and methods: It was a cross-sectional study conducted at Khyber Teaching Hospital, Peshawar from September 2021 to January 2022. All cases with positive Dengue serology as done by ICT kit were included in the study. Cases with significant symptoms of Dengue but negative serology were excluded from the study. Clinical data and results of liver function tests were recorded. Mean and standard deviation was used for quantitative data while frequency and percentages were used for qualitative data.

Results: About 100 diagnosed cases of dengue fever were included. Seventy-four (74%) cases had dengue fever, while 24 (24%) cases had dengue hemorrhagic fever. About 2 (2%) cases had dengue shock syndrome. Serum Alanine transaminase level was abnormal in most of the cases.

Conclusion: The study reveals that the majority of the cases of dengue fever have mild to moderate disease. Severe disease was seen in a very small proportion of patients.

Keywords: Dengue hemorrhagic Fever, Liver Function Tests, Platelets count.

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INTRODUCTION

Dengue fever is a viral illness that is transmitted through mosquito bites. It has recently emerged as a disease of great concern as it is a massive burden on the healthcare system ^{1,2}.

Dengue fever can be mild or severe. World health organization (WHO) has categorized severe forms of disease into two entities, i.e. dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) ³. Literature suggests that the number of cases of dengue is gradually increasing globally. This is true, especially for tropical and subtropical countries ^{1,4}. There are many causes of the increase in the incidence of dengue fever. Some of the

causes of the increased incidence of dengue include poor hygiene of homes, increased urbanization, and frequent traveling of passengers from areas where dengue is prevalent to other areas of the world ^{1,2}.

The causative agent of dengue fever is Dengue virus. It comes off from Flavivirus family. This virus is known to have four types. The subtypes are designated as DEN 1, 2, 3, and 4 ⁵. The virus is spread so extensively that all these four types can be found in any tropical and/or subtropical areas worldwide ^{1,6}. Dengue virus is transmitted through the bite of the *Aedes Aegypti* mosquito. Another mosquito that is found to be involved in the transmission of the virus is *Aedes albopictus* ^{3,7,8}. However, the latter is rarely involved.

Dengue virus is a single-stranded RNA virus. The single strand of RNA is actually the genome of this virus. It is an enveloped virus and it has an icosahedral shape. The virus encodes three types of proteins, i.e.: precursor membrane, envelope E, and capsid proteins. In addition to these, there are certain other proteins that are encoded by the virus; one of them is called NS1. It is used in the detection of the virus in the human body ^{1,9}.

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The dengue virus causes dengue fever. The WHO has classified the disease into three types, i.e.: dengue fever, dengue hemorrhagic fever, and dengue shock syndrome^{10, 11}. Dengue fever presents as fever, shivers, body aches, and pain behind the eyes³. There is a low platelet count and there are bruises and purpura on the skin. In severe cases, there can be frank hemorrhage from body orifices. This happens only if the disease recurs in the same patient and is then referred to as dengue hemorrhagic fever³. The organ most commonly affected is the liver. The disease may present in many different ways. Usually, it is asymptomatic clinically, in which case only the transaminase levels are increased. In other extreme cases, the patient may present with acute liver failure.

In Pakistan, the dengue virus has spread in almost all parts of the country. Cases begin to appear after a rainy period of monsoon. The incidence has further increased after floods in some areas of the country¹². This study was done to find the prevalence of dengue in Peshawar, and find the clinic-pathological profile of patients having dengue fever.

MATERIALS AND METHODS

It was a descriptive cross-sectional study. About 100 diagnosed cases of dengue fever at Khyber Teaching Hospital, Peshawar were included in the study. The study was conducted from September 2021 to January 2022. Ethical approval for the study was obtained. The blood counts were done by Sysmex X21 analyzer. COBAS 501 was used for doing Chemistry.

Diagnosed cases of dengue fever, of both sexes and all ages, were included in the study. The diagnosis was confirmed by if there was a positive NS1 antigen or IgM serology. A cut of less than 4000×10^9 /L leukocytes was taken for leukopenia.

A cut-off of less than 150×10^9 /L was taken to define thrombocytopenia. The dengue fever cases were categorized as Dengue Fever, Dengue Hemorrhagic Fever, and Dengue Shock Syndrome as per World Health Organization (WHO) criteria^{10, 11}.

Cases with negative NS1 Negative Antigen and non-consenting participants were excluded from the study. Five ml of blood was taken and serum was used to determine ALT, Bilirubin, Creatinine, Urea, and Sodium. Statistical Analysis was done by SPSS-22.

RESULTS

A total of 44 males and 56 females were included in the study. The severity and outcomes of dengue fever are shown in Tables 1 and 2, clinical features in table 3, platelet count in table 4, and TLC in Figure 1. Changes in immunological and laboratory parameters are shown in Tables 5 and 6.

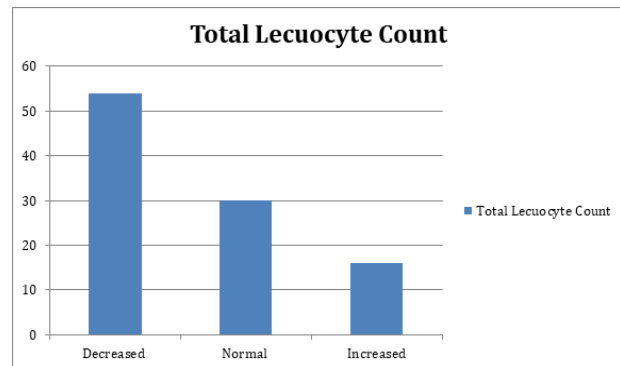


Fig 1: Changes in Total leukocyte count in cases of dengue fever

Table 1: Distribution of dengue fever among the study sample.

Dengue subtypes	n (%)
Dengue fever	74(74%)
Dengue hemorrhagic fever	24(24%)
Dengue shock syndrome	2(2%)

Table 2: Outcome of Dengue in study sample

Outcome	n (%)
Patients alive/ survived	98(98%)
Patients dead	2(2%)
Dengue shock syndrome	2(2%)

Table 3: Clinical features of study participants

Clinical features	n (%)
Fever	98 (98%)
Malaise	92 (92%)
Vomiting	90 (90%)
Weakness/fatigue	86 (86%)
Anorexia	84 (84%)
Muscle pain	80 (80%)
Joint pain	76 (76%)
Chills and rigors	72 (72%)
Abdominal pain	64 (64%)
Headache	62 (62%)
Retro orbital pain	62 (62%)
Nausea	58 (58%)
Skin rashes	50 (50%)
Pruritus	38 (38%)
Sore throat	30 (30%)
Epistaxis	24 (24%)
Diarrhea	22 (22%)
Cough	8 (8%)
Hypertension	6 (6%)
Gastritis	2 (2%)
Splenomegaly	2 (2%)
Hepatomegaly	%2) 2)

Table 4: Platelet counts in patients of dengue fever

Platelet count (106/L)	n (%)
Less than 50,000	84(84%)
50,000-1,49000	13 (13%)
Above 1,50000	3(3%)

Table 5: Results of Positive and Negative Immunoglobulin

immunoglobulin	Positive (%)	Negative (%)
Ig M	70 (70%)	30 (30%)
Ig G	40 (40%)	60 (60%)

Table 6: Changes in Laboratory parameters in cases of dengue fever

Laboratory parameters in dengue cases	Increased n (%)	Decreased n (%)	Normal n (%)
Serum Alanine Trans-aminase	89 (89%)	-	11 (11%)
Serum Bilirubin	7 (7%)	-	93(13%)
Serum Sodium	3 (3%)	2(2%)	95 (44%)
Serum Urea	59 (59)	-	41 (41%)
Serum Creatinine levels	11(11%)	-	89 (89%)

DISCUSSION

The current research sheds light on clinical and pathological features and the death rate of patients with dengue fever in the district of Peshawar. Studies showed that there was male predominance as compared to females. The data also showed that most of the patients of dengue in Peshawar had only a milder form of the disease. These findings are comparable to that done by Rehman MZ in 2017¹³.

The cause for male predominance can be due to the fact that males are more likely to get health care as compared to females in our setup. Males are more prone to mosquito bites due to being exposed in workplaces. In the current study, it was revealed that dengue fever was commoner as compared to dengue hemorrhagic fever and dengue shock syndrome. This finding is the same as that reported in the study of Rehman et al¹³.

When hematological parameters were considered in dengue patients, it was found that platelet counts were low in the majority of the patients while total leukocyte count was decreased in most of the patients, Similar findings are reported by studies done by Nagaram PP and Hassan Z^{14, 15}.

When chemical parameters were analyzed in cases of dengue fever, it was seen that alanine transferases and urea were raised in most of the patients but creatinine,

serum sodium, and bilirubin were normal in the vast majority. Similar findings were reported by previous studies¹⁶⁻¹⁸.

CONCLUSION

Dengue fever presents a wide variety of clinical and pathological features. Changes in hematological parameters include low platelet count and decreased total leukocyte count. Changes in chemical parameters include increased levels of serum urea and alanine transaminase.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Idrees M: Conception, literature search and overall supervision
Hussain Z: Data handling and critical analysis
Qayyum S: Manuscript drafting
Riaz H: Statistical Analysis, Literature review
Waqas M: Bibliography
Khan MI: Data Collection

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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EFFECTIVENESS OF LIRAGLUTIDE IN REDUCING BODY WEIGHT AND IMPROVING GLYCEMIC CONTROL IN PATIENTS WITH T2DM

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ABSTRACT

Objective: This study aimed to determine the effects of Liraglutide on glycosylated hemoglobin (HbA1c) and body weight in patients with type 2 diabetes.

Material and Methods: A prospective observational study was conducted in a private tertiary healthcare setting. A total of 58 adult patients with T2DM using oral anti-diabetic agents with or without insulin were enrolled in the study from November 2020 to April 2022. Liraglutide was administered at a dose of 0.6 mg/day which was raised to 1.2 mg/day after 1 week and later to 1.8 mg/day depending upon patient preferences and tolerability. Patients were assessed for changes in their body weight, fasting blood glucose (FBG) level, random blood glucose (RBG) level, and HbA1c at the 1st and 2nd follow-up visits i.e. 8th and 16th week, respectively.

Results: At the 16th week, the mean weight was 100.78 ± 17.56 vs 102.74 ± 17.26 and 104.11 ± 17.95 at the 8th week and baseline visit, revealing a significant difference across three-time points [$F(1.4, 36.45) = 8.57, p = 0.003$]. A post hoc pairwise analysis showed that weight significantly decreased from baseline and 16th-week follow-up visits ($p = 0.011$). Similarly, a significant decrease was observed in mean HbA1c across three-time points [$F(2, 39.40) = 8.81, p = 0.001$]. Mean HbA1c at 16th week was $6.61 \pm 1.13\%$ vs $8.09 \pm 1.43\%$ at baseline ($P = 0.001$). No significant reduction in FBG, RBG, blood pressure, and serum lipid profile were observed. Moreover, no major side effects occurred in any patient.

Conclusion: Liraglutide is an effective and well-tolerable drug in improving glycemic control, causing significant weight loss in the study population when used as a monotherapy or in combination therapy.

KEYWORDS: Liraglutide, Glucagon-like peptide-1 agonist, Type 2 diabetes mellitus, Glycemic control, Weight loss

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INTRODUCTION

Diabetes mellitus (T2DM) is a chronic disorder defined by insulin resistance and beta cell dysfunction, associated with several complications.¹ Despite the availability of a range of anti-diabetic agents, attainment, and maintenance of glycemic control are quite challenging with the progression of the condition.² There are multiple pharmacological options available for the management of T2DM, with varying effects on blood pressure and body weight, making it difficult for the physician in selecting the appropriate regimen.³ Thus a patient-centered approach should

be used in deciding upon the optimal regimen taking into account the comorbid conditions, disease progression, and complications with the primary aim of attaining individualized glycemic goals with minimum adverse effects.⁴

After many years of cardiovascular outcome trials, two classes of anti-diabetic agents, i.e. Sodium-glucose co-transporter (SGLT-2) inhibitors and Glucagon-like peptide 1 receptor agonists (GLP-1RA) demonstrated cardiovascular advantages independent of glycemic control. This led to new treatment avenues in the management of T2DM.⁵ Liraglutide is a long-acting GLP-1RA that improves glycemic control by promoting insulin secretion, suppressing the production of glucagon, and inducing weight loss.⁶ It reduces systolic blood pressure and has a direct cardioprotective effect as well.⁷

LEADER (Liraglutide Effect and Action in Diabetes: Evaluation of Cardiovascular Outcome Results) trial was commenced in 2010 to evaluate the long-term effects of Liraglutide on cardiovascular outcomes and other important clinical parameters. This study demonstrated a 23%

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decrease in the primary endpoint.⁸ Furthermore, a systematic review demonstrated that all GLP-1 RA improves HbA1c and decreases body weight, however; the long-acting agents including Liraglutide were found to be more effective in reducing fasting blood glucose and glycated hemoglobin (HbA1c).⁹

Studies conducted on the Indian population with T2DM showed that Liraglutide is effective in controlling glycemic levels, inducing weight loss, and is associated with a lower risk of hypoglycemia.^{10, 11} Few such studies are also performed on Pakistani T2DM patients demonstrated significant improvement in HbA1c and reduction in their body weights.^{3, 12} But keeping in view the fact that Liraglutide effectiveness varies greatly by region and scarcity of currently available data in the literature on Pakistani population, this study was designed to look into the effects of Liraglutide on HbA1c and body weight in T2DM patients in the local population of Khyber Pakhtunkhwa.

MATERIAL AND METHODS

A prospective study was conducted in the Department of Endocrinology, North-west General Hospital & Research Center, Peshawar from November 2020 to April 2022 after getting ethical approval from the institutional committee. Adult patients of either gender with T2DM were enrolled in the study. Patients of age less than 18 years, having Type 1 DM, or those receiving Liraglutide already were excluded. After informed consent, data regarding the demographics of the patient, duration of T2DM, and presence of co-morbidities like hypertension, thyroid disorders, ischemic heart disease, chronic kidney disease, and dyslipidemia was recorded on a predesigned proforma. Baseline information like type and number of anti-diabetic agents, BMI, Blood pressure, HbA1c, fasting blood glucose (FBG), random blood glucose (RBG), Urine Albumin to creatinine ratio (ACR) and lipid profile was recorded. A total of 67 patients with T2DM, obesity (BMI ≥ 23 kg/m²), and poor glycemic control (HbA1c $> 7\%$) were prescribed Liraglutide. But 9 patients were lost during follow-up or discontinued the treatment. All patients were on oral anti-diabetic agents with or without insulin. Liraglutide was initiated at the dose of 0.6 mg/day. After 1 week, the dose was increased to 1.2 mg/day and later to 1.8 mg/day depending upon patient preferences and tolerability. Patients were assessed for change in their body weight, FBG, RBG, and HbA1c at 1st and 2nd follow-up visits of 8 and 16 weeks, respectively.

In addition, BP and common GI adverse effects like nausea, vomiting, and diarrhea were also enquired about at each follow-up visit.

Data were analyzed by SPSS version 22 and frequencies and proportions were calculated for categorical variables. Mean, SD and IQR were calculated for variables with continuous nature. Repeated measure ANOVA was

used for within-group comparison of the patient's anthropometric, biochemical parameters, and blood pressure across baseline, week 8, and week 16. Post hoc analysis was conducted using paired t-tests with Bonferroni adjustment. A p-value < 0.05 was taken as a level of significance.

RESULTS

A total of 58 patients were included in the final analysis having a mean age of 49.29 ± 9.15 years and a female predominance of 45 (77.59%). The mean duration of DM since diagnosis was 5.48 ± 4.78 years. The most common co-existing illness was dyslipidemia 15 (37.5%) followed by hypertension 14 (24.14%), thyroid disorder 6 (10.34%), and ischemic heart disease 4 (6.90%). Medication history revealed that most of the patients were using oral antidiabetic drugs (OADs), with biguanide being the most common group i.e. 14 (30.44%) followed by biguanide + DDP4 and biguanide + SGLT2. On the other hand, 6 patients were on both OADs and Insulin. Anthropometric characteristics and biochemical parameters at different intervals are given in Table I.

Liraglutide's starting dose was 0.6 mg/day at the baseline. After the first week, 72.0% of patients were switched to 1.2 mg/day, and later on, 17% were started on 1.8 mg/day. Moreover, 25 (43.10%) patients were given Liraglutide monotherapy whereas the remaining subjects were prescribed Liraglutide combination therapy (Table II).

None of the participants discontinued Liraglutide as no major side effects occurred. Nearly half of the participants reported nausea followed by diarrhea 4 (6.89%).

A repeated-measures ANOVA with a Greenhouse-Geisser correction ascertained a significant reduction in mean weight across three-time points [$F(1.4, 36.45) = 8.57, p = 0.003$]. A post hoc pairwise analysis with a Bonferroni's correction showed that there was a considerable difference in weight between baseline vs. 16th week and 8th week vs. 16th week with p values < 0.05 as shown in Figure 1.

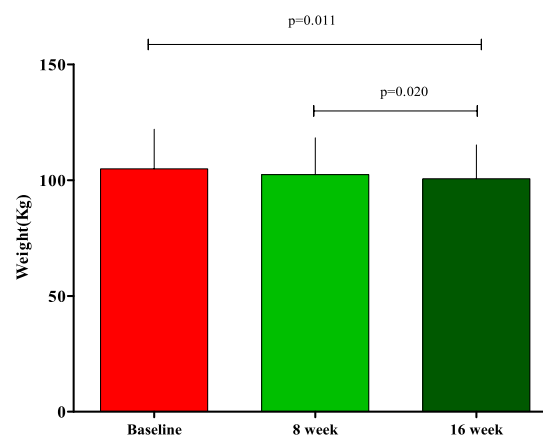


Fig 1: Bonferroni post hoc analysis of weight over three-time points

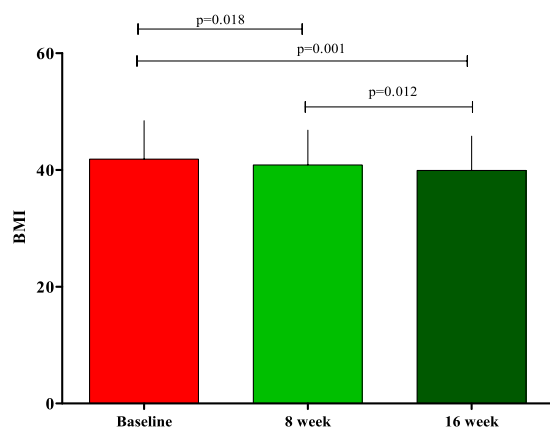


Fig 2: Bonferroni post hoc analysis of BMI over three-time points

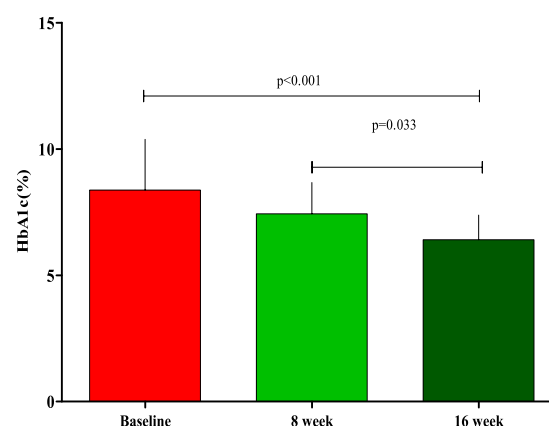


Fig 3: Bonferroni post hoc analysis of HbA1c over three-time points

Table 1: Descriptive statistics and Repeated-measures ANOVA within subjects

Parameters	Baseline Mean ± SD	8th week Mean ± SD	16th week Mean ± SD	p-value
Weight (kg)	104.11±17.95	102.74±17.26	100.78±17.56	0.003
Body Mass Index	41.73±7.03	40.80±6.41	39.92±6.60	0.000
HbA1c (%)	8.09±1.43	7.45±1.96	6.61±1.13	0.001
FBG (mg/dl)	147.40±19.23	132.40±41.62	125.60±14.71	0.403
RBG (mg/dl)	214.83±104.14	189.67±70.66	166.17±27.50	0.262
Systolic Blood Pressure	135.33±14.54	137.57±20.15	130.61±21.20	0.178
Diastolic Blood Pressure	90.61±11.59	93.33±13.26	88.52±16.69	0.392

Table 2: Liraglutide as Monotherapy and Polytherapy

Therapy		N (%)
Liraglutide Only		25 (43.1)
Liraglutide+ Insulin	Liraglutide + Basal bolus insulin	1 (1.72)
	Liraglutide + Premix insulin	2 (3.45)
Liraglutide + OADs + Insulin	Liraglutide + Premix insulin + Metformin + DDP4	1 (1.72)
	Liraglutide + Premix insulin + Metformin + SGLT2	3 (5.17)
	Liraglutide+ Basal bolus insulin + Metformin	1 (1.72)
Liraglutide + OADs	Liraglutide + Metformin	11 (18.97)
	Liraglutide + Metformin + SGLT2	11 (18.97)
	Liraglutide + Sulphonylurea	1 (1.72)
	Liraglutide + Sulphonylurea + Metformin + DDP4	1 (1.72)
	Liraglutide+ Sulphonylurea + Metformin+ SGLT2	1 (1.72)

Similarly, BMI on repeated measures ANOVA with Greenhouse-Geisser correction revealed a significant reduction in mean values across three-time points [$F(1.5, 38.45) = 13.86, p < 0.001$]. Bonferroni's correction for pairwise comparisons found that there was a considerable difference in BMI between baseline vs. 8th week, baseline vs. 16th week, and 8th week vs. 16th week with p values < 0.05 as shown in Figure 2.

Repeated measures ANOVA with conformance of assumption of Mauchly's test of sphericity, $\chi^2(2) = 2.49,$

$p = 0.288$, showed that change in HbA1c level over time was significant in the study participants as a whole. Bonferroni's correction for pairwise comparisons found that there was a considerable difference in HbA1c between baseline vs. 16th week and 8th week vs. 16th week with p values < 0.05 as shown in Figure 3.

DISCUSSION

Liraglutide has been observed to be an effective treatment option in lowering the blood glucose level and

also the risk of non-fatal cardiovascular (CV) events and CV mortality in adults with T2DM and CV disease.^{6,9} Since 2016, Liraglutide is approved for use in Pakistan for the management of T2DM. Because GLP-1 agonists are relatively new class of glucose-lowering drugs; there are several concerns about their efficacy. The effectiveness has largely varied by region as identified in published literature¹³ so we conducted this study to investigate the effects of Liraglutide on HbA1c and weight in T2DM. Liraglutide in obese type 2 diabetics with poor glycemic control on OADs ($\pm$ insulin) was assessed. A significant reduction of 0.64% in the 8th week and 1.48% in the 16th week in HbA1c was observed from the baseline resembling the results of LEAD (Liraglutide Effect and Action in Diabetes) trials, where HbA1c reduction of up to 0.8-1.6% at recommended doses (1.2 and 1.8mg) over a period of 6 months of treatment has been demonstrated.¹⁶⁻²⁰ Though the maximum reduction was higher than the findings of our study. Likewise, in Italy, a group of 400 patients who received Liraglutide demonstrated a substantial decrease in HbA1c following a year follow-up.¹⁴ Another study with 5 years of Liraglutide therapy revealed a drop in HbA1c from $7.9 \pm 0.9\%$ at baseline to $7.0 \pm 0.7\%$.¹⁵ Therefore, it appears that the results on HbA1C (a total reduction of roughly 1.5 %) in our patients are the best that could be obtained in our real-world setting in Pakistan. A local study conducted by Rashid, Muhammad Owais et al. reported HbA1c reduction of 0.95% and 1.05% at 3 and 6 months respectively from baseline.³

In contrast to many other treatment options, which often result in weight gain, incretin-based medications can help patients lose weight. Liraglutide was also found to be effective in reducing weight and BMI when administered alone or in combination with other anti-diabetic drugs in our study. The respective mean weight and BMI reduction from baseline were 3.33kg and 1.81 kg/m². The mean weight loss in our study was although the same as expected after 16 weeks of therapy, it was greater than the weight loss in the LEAD trial, which was less than 3 kg, and equivalent to LEAD-6, which revealed 3.24 kg of weight loss.²¹ The reason for this could be that weight reduction with Liraglutide is dose-dependent, and the majority of the study patients have received titrated doses up to a daily maximum dose of 1.8 mg. Parjeet et al reported the weight loss as early as one month, further describing the continued trend and maximum weight loss of around 4 kg was seen in 3rd month.¹⁰ Along with adequate glycemic control, losing weight was one of the most crucial elements in keeping the patients motivated to continue taking Liraglutide.

Literature showed that Liraglutide therapy reduces blood pressure.^{3,10,12} This study also demonstrated a reduction in mean SBP and DBP of 4.72 mm Hg and 2.09 mm Hg, respectively from the baseline at follow-up visits. These findings were higher than the reported figures of LEAD trials i.e. a drop of SBP ranged from 2.7 to

2.9 mmHg.¹⁶⁻²¹ On the other hand, a review of real-world data from India revealed a reduction in SBP of 9.7 mmHg, which is rather higher than our findings.¹¹

Liraglutide is generally well tolerated, some clinical studies documented GI adverse effects such as nausea, vomiting, and diarrhea.^{3,10,12} Though, no major side effects occurred in our study, nearly half of the participants reported nausea followed by diarrhea. In the LEAD trials, nausea was the most reported adverse event. Other side effects were vomiting, constipation, dyspepsia, and diarrhea.¹⁶⁻²¹ These GI events were frequently dose-dependent, minor, and observed to diminish within a few days or weeks of continued treatment.

This study has a few worth mentioning limitations like its observational study design and small sample size. Secondly, the time interval between HbA1c assessments was not consistent. Some patients did not report dose adjustment of insulin after initiation of therapy. While good BMI and HbA1c% were reported at follow-up, various variables like diet and physical activity could not be tracked.

CONCLUSION

Liraglutide is found to be an effective and well-tolerable drug in improving glycemic control, causing considerable weight loss in the obese study population with T2DM, when used as a monotherapy or in combination with other anti-diabetic drugs. Longer follow-up studies with large sample sizes are needed to establish its long-term efficacy and safety profile.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Ullah S: Concept, Design, Data collection

Hussain A: Execution of study , Data collection

Kanwal S: Data analysis and interpretation

Jamal A: Critical review and Bibliography

Faisal MS: Manuscript writing and statical analysis

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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ACCEPTANCE OF COVID-19 VACCINE AMONG THE RESIDENTS OF KARACHI, PAKISTAN

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ABSTRACT

Objectives: This study aimed to evaluate the acceptance of the coronavirus vaccine and the attitude of people residing in the southern part of Karachi, Pakistan.

Methods: This web-based cross-sectional research was conducted among the citizens of the southern part of Karachi from Oct to Dec 2021. The survey for the study was adopted and modified from the formerly conducted study by El-Elmat et al, comprising individuals aged more than 18 years of age. Acceptance and predictors of vaccine acceptance were assessed using the Chi-square test and Binary logistic regression.

Results: The acceptance rate for the coronavirus vaccine was quite high (87%). Males demonstrated a higher acceptance rate. The older aged individuals (>35 years old) also showed higher acceptance when likened to younger participants (OR = 1.84, 95 CI% = 2.893–1.171, p < .008). Individuals not infected with COVID-19 showed less acceptance towards vaccinations (OR = 0.431, 95CI% = 0.233– 0.799, p < .008). Similarly, respondents believing the COVID-19 vaccine to be a conspiracy were less likely to show acceptance towards the vaccination process (OR= 0.893, 95 CI% = 0.575- 1.387, p= 0. 614).

Conclusion: Differences in the acceptance rate between males of older age as compared to younger population and females have demonstrated higher acceptance towards vaccination. Sinopharm followed by Sinovac was the most frequently used to provide immunization to the Pakistani population.

Keywords: Adverse effects, Immunology, Coronavirus, Vaccine.

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INTRODUCTION

Vaccines can be described as biological mediators which can provoke an immune reaction against a particular antigen, created from the pathogen.¹ Vaccine comprises antigens that are derived from either pathogen or formed synthetically that signifies the components of the pathogen.² Vaccines can be categorized as living or non-living, as the latter contains attenuated forms of

the particular pathogen. In addition to this, “viral vectors”, “nucleic acid-based RNA”, virus-like elements, and DNA-based vaccines have also been incorporated within the vaccines.³ Vaccine protects with the help of B and T cell-dependent pathways, by producing antibodies, and lastly due to the presence of immune memory.² Vaccines help prevent not only the clinical manifestations of infection but also protect against asymptomatic illness, thus reducing the risk of infection by creating herd immunity.⁴

COVID-19 caused by SARSCoV-2 originated in China, in December 2019.⁵ Due to its spread worldwide, WHO declared coronavirus as a pandemic.⁶ The major features included fever, shortness of breath, and cough while in some cases it presented as sore throat, anorexia, malaise, nausea, and diarrhea.⁷ The prime mode of transmission was airborne in form of respiratory droplets that

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could remain as an aerosol on any surface for a longer duration.^{8,9} These aerosols can travel all the way through the ventilation systems in buildings and enclosed spaces.¹⁰ Until January 2021 reports from 81 countries, revealed that about 20.5 million lives were lost due to the current pandemic.¹¹ In Pakistan males in the age group 19-59 were highly susceptible to COVID-19 due to greater social interaction.¹²

Till now, numerous vaccines have been articulated for immunization.¹³ Safe and easily obtainable vaccines assist in reducing the illness, that has badly affected the health, financial, and communal aspects.¹⁴ Though, vaccine trials were initiated in March 2020, and by April 2020, various vaccines were articulated, amongst them, five reached the clinical assessment phase whereas more than 70 entered the exploratory phase.^{15,16} However by November 2020, the number of vaccines amplified and increased in the figure. Vaccines efficaciously that entered into final phase comprised AstraZeneca, Moderna, Pfizer, University of Oxford, and Gamaleya's Sputnik V vaccine.^{16,17}

World Health Organization's "Strategic Advisory Group of Experts (SAGE)" has described "vaccine hesitancy" as a setback in acknowledgment or denial of vaccine acceptance regardless of vaccine availability.¹⁷ Vaccine reluctance is quite variable and time specific.¹⁸ It has been found that vaccine hesitancy arises when individuals feel less confident concerning the efficacy of the vaccine and especially about the organization endorsing and providing it.¹⁹ Lastly, they also felt that access to the vaccine was quite difficult and troublesome.²⁰

A previously conducted study in the U.S. identified that the criteria for recognition of coronavirus immunization among the individuals were founded on providing sufficient understanding regarding the effectiveness of vaccine along with the extent of immunity provided, and more importantly, faith of the public in the government leaders and organizations.²¹ Research by Ruiz and Bell also demonstrated that recognition rate of coronavirus vaccine was quite less at 14.8%.²² While in Hong Kong, it was noted that the acceptance rate for the vaccine got reduced from 44.2% to 34.8% owing to greater apprehension regarding the safety and possibility of side effects from the coronavirus vaccine.²³ Analysis concerning the beliefs regarding the COVID-19 vaccine will help improve vaccine acceptance across different populations. The present research was meant to identify the acceptance of coronavirus vaccine along with the attitude towards vaccinations among the residents of the southern part of Karachi, Pakistan.

MATERIAL & METHODS

ETHICAL CONSIDERATIONS

The official ethical approval for the study was at-

tained from the institutional ethical committee of Bahria University Medical and Dental College. This study was conducted according to the declaration of Helsinki.

STUDY POPULATION AND SAMPLING METHOD

This cross-sectional survey was conducted amongst the citizens residing in the southern part of Karachi, Pakistan, from October to December 2021. Participants aged 18 years and over and from both genders were considered for this study, while participants not willing to consent and providing incomplete information were excluded. It required 5-7 minutes to completely fill out the questionnaire.

STUDY QUESTIONNAIRE

The questionnaire used for the research was adopted from a study led by El-Elmat et al.²⁴ The questionnaire included questions on sociodemographic factors, which comprised of gender, age, education level marital and smoking status, presence of medical insurance, and details regarding the medical history. The next section assessed information related to COVID-19, which included getting infected with coronavirus or knowing people who got infected, the most trusted source regarding coronavirus vaccines, kind of vaccine, any side effects, and personal views regarding the vaccine. Participants' responses to the questionnaire were assessed using Likert-type scale.

QUESTIONNAIRE DISTRIBUTION

The survey was formed on google forms and it was distributed using social media platforms which included Facebook and WhatsApp to circulate the questionnaire among the participants from the city of Karachi.

SAMPLES SIZE CALCULATION & ANALYSIS

The sample size for the study was found to be 1200, which was evaluated using OpenEpi software. Keeping the α at 0.05, the margin of error at 4.7%, and confidence limit at 95%. The statistical analysis was performed using SPSS v.23. Categorical variables have been described as frequency and percentages; Binary logistic regressions were conducted to assess the acceptance of vaccine amongst the Population.

RESULTS

GENERAL CHARACTERISTICS OF THE STUDY POPULATION

The total questionnaires completed were 1194 from a total of 1200 and were considered for further analysis. Among them more than half comprised of 56.4% females while 43.6% were males. About 26% of participants aged more than 35 years, 47.9% were aged 18-25 years

and 26.4% belonged to the 26-35 years of age group. Among the study participants 35.4 % were married, 53.6 % were single and 11% did not specify. Most of the participants (70.3%) had no medical insurance while only 29.7% were insured. Ninety percent stated being nonsmokers. About 81.7% confirmed being medically sound, whereas 15.9% responded as being unsure and 2.3% were medically compromised.

Regarding the education level of participants, 13.1% completed high school, 49.2% participants had undergraduate degrees and 37.7% had postgraduate qualifications. Employment status included the majority 51% being unemployed while 49% were employed. (See Table 1)

Table 2 represented the participant's knowledge regarding the COVID-19 vaccination. Only 28% received the influenza vaccine. A considerable number of participants were vaccinated (83%), while only 17% remained unvaccinated. 77.4% stated not infected with COVID-19,

while 22.6 responded positively. Approximately 70% responded COVID-19 is a conspiracy. Regarding getting tested for COVID-19, 40% of the participant's family members got infected. About 60% stated not getting worried about the news circulated regarding vaccination, while 20.4% responded positively.

Information provided by the health care providers (40.6%) followed by government officials was the most trusted source of information. Acceptance for Vaccine

As described in Table 3, the acceptance level for getting vaccinated was 83%, while 17% responded negatively. Linear regression analysis was performed to identify the independent factors that predicted the acceptance level. Males showed higher acceptance for the vaccine (OR = 1.927, 95 CI % = 1.290 – 2.878, $p < .001$). The older age groups (>35 years old) also demonstrated higher acceptance as compared to younger age groups (OR = 1.84, 95 CI% = 2.893–1.171, $p < .008$). In addition, employed

Table 1: Demographic characteristics of study participants

Variable	n	%
Gender		
Female	674	56.4
Male	520	43.6
Age		
>35 years	307	25.7
18-25 years	572	47.9
26-35 years	315	26.4
Marital status		
Married	423	35.4
Others	131	11
Single	640	53.6
Education		
Postgraduate	450	37.7
School education	156	13.1
Undergraduate	588	49.2
Employment status		
Employed	574	49
Unemployed	620	51
Health Insurance		
Insured	355	29.7
Uninsured	839	70.3
Smoking Status		
Current Smoker	32	2.7
Ex-smoker	28	7.3
Non-smoker	1134	90
Medically fit and well		
Maybe	190	15.9
No	26	2.3
Yes	976	81.7

Table 2: Participants attitude towards COVID-19 vaccination

Variable	n	%
Received the influenza vaccine		
No	861	72.1
yes	333	27.9
People tested positive for COVID-19		
A family member	480	40.2
Friend	177	14.8
Neighbor	58	4.9
Colleague	46	3.9
Myself	138	11.6
No one	295	24.7
Infected with COVID-19?		
No	924	77.4
Yes	252	22.6
Maybe	18	1.5
Are you vaccinated?		
No	194	17
Yes	1000	83
Do you find vaccines safe?		
Maybe	287	24.0
yes	307	26
No	600	50
Is COVID-19 a conspiracy?		
No	837	70.1
yes	357	29.9
News of side effects prevented you from getting vaccinated?		
Maybe	236	19.8
No	714	59.8
Yes	244	20.4
Chances of reinfection is lessened after vaccination?		
Maybe	573	48
No	423	35.4
Yes	198	16.6
Most trusted source		
Family member	129	10.8
Government official	218	18.3
Health care providers	485	40.6
Television news	56	4.7
Pharmaceutical companies	22	1.8
Research articles	140	11.7
Social media	144	12.1
Is it imp to get vaccinated to protect against covid-19		
Maybe	187	15.7
No	34	2.8
Yes	973	81.5

Table 3: Predictors of acceptance regarding COVID-19 vaccine

	Parameters	B	S.E.	Wald	P-value	OR	95% C.I. for EXP(B)	
							Lower	Upper
Gender	Male	0.656	0.205	10.275	0.001	1.927	1.290	2.878
	Female					reference		
Age	18-25					reference		
	26-35	0.568	0.271	4.402	0.036	1.764	1.038	2.999
	> 35years	0.610	0.231	7.002	0.008	1.841	1.171	2.893
Marital Status	Not Specified					reference		
	Single	-1.234	0.324	14.495	0.000	0.291	0.154	0.550
	Married	-2.423	1.006	5.804	0.016	0.089	0.012	0.637
Education	Postgraduate					reference		
	Undergraduate	-0.124	0.220	0.318	0.573	0.883	0.573	1.360
	School	-0.297	0.297	0.997	0.318	0.743	0.415	1.331
Employment status	Employed	0.482	0.343	1.973	0.160	1.619	0.826	3.173
	Un-employed					reference		
Health insurance	Insured	0.811	0.266	9.263	0.002	2.250	1.335	3.792
	Un-insured					reference		
Smoking status	Non-smoker					reference		
	Ex-smoker	-0.412	0.545	0.572	0.449	0.662	0.228	1.926
	Current Smoker	-1.059	0.473	5.021	0.025	0.347	0.137	0.876
Systemic health fitness	Yes					reference		
	No	-0.567	0.250	5.152	0.023	0.567	0.348	0.926
	Maybe	-1.913	0.413	21.499	0.000	0.148	0.066	0.331
Received the influenza vaccine this year	Yes					reference		
	No	17.575	0.852	0.000	0.998	0.429	0.000	0.
Association with COVID-19 positive	Family member	19.462	2.824	0.000		reference		
	Friend	0.771	0.238	10.477	0.001	2.162	1.355	3.448
	Neighbour	1.609	0.446	12.989	0.000	4.996	2.083	11.983
	Colleague	0.824	0.544	2.293	0.130	2.279	0.785	6.619
	Myself	1.350	0.741	3.316	0.069	3.857	0.902	16.487
	No one	0.290	0.312	0.864	0.353	1.337	0.725	2.464
Infected with COVID-19	Yes	18.207	0.935	0.000		Reference		
	No	-0.841	0.315	7.136	0.008	0.431	0.233	0.799
Do you feel vaccines are safe?	Yes					Reference		
	No	-0.379	0.241	2.477	0.116	0.684	0.427	1.098
	Maybe	-1.934	0.295	42.872	0.000	0.145	0.081	0.258
Do you think that COVID-19 pandemic is a conspiracy?	Yes	-0.113	0.225	0.255	0.614	0.893	0.575	1.387
	No					Reference		

Type of vaccine received	AstraZeneca					Reference		
	CanSino	-2.186	0.467	21.867	0.000	0.112	0.045	0.281
	Moderna	-1.363	0.493	7.646	0.006	0.256	0.097	0.672
	Pfizer	-2.541	0.524	5.624	0.998	0.953	0.022	0.1859
	Sinopharm	-3.033	0.423	51.445	0.000	0.048	0.021	0.110
	Sinovac	-0.918	0.277	10.989	0.001	0.399	0.232	0.687
	Family mem- bers					Reference		
	government	0.596	0.875	0.464	0.496	1.814	0.327	10.074
	Healthcare providers	-2.000	0.538	13.840	0.000	0.135	0.047	0.388
	News from TV	-1.090	0.535	4.161	0.041	0.336	0.118	0.958
	reports from pharmaceutical companies	-1.435	0.666	4.640	0.031	0.238	0.065	0.879
	research articles	-2.996	0.673	19.786	0.000	0.050	0.013	0.187
	body ache					Reference		
	fatigue, body ache	-0.916	0.405	5.112	0.024	0.400	0.181	0.885
	fatigue, fever, body ache, pain on arm	-1.548	0.326	22.615	0.000	0.213	0.112	0.402
	fatigue, fever, nausea, body ache	-1.689	0.608	7.728	0.005	0.185	0.056	0.608
	fatigue, nausea	-3.682	0.605	37.087	0.000	0.025	0.008	0.082
	fatigue, nausea, body ache	-2.008	0.622	10.434	0.001	0.134	0.040	0.454

B, B coefficient; SE, standard error; Wald, Wald chi-square test; p, p-value; OR, odds ratio; CI, confidence interval.

*Significance taken at $p < 0.05$

participants (OR = 1.619, 95 CI% = 0.826– 3.173, $p < .160$) seemed less likely to show acceptance for coronavirus vaccines as compared to unemployed participants. Participants who were unsure regarding their medical history were less likely to accept COVID-19 vaccination (OR = 0.148, 95CI% = 0.066– 0.331, $p < .001$) Individuals not infected with COVID-19 showed less acceptance towards vaccinations (OR = 0.431, 95CI% = 0.233– 0.799, $p < .008$).

Study participants who seemed unsure regarding finding a vaccine to be safe seemed less likely to demonstrate acceptance towards vaccination (OR= 0.145, 95CI% =0.081- 0.258, $p < 0.00$). Respondents believing the COVID-19 vaccine to be a conspiracy, exhibited reduced acceptance (OR= 0.893, 95 CI% = 0.575- 1.387, $p= 0. 614$). Respondents receiving Pfizer would demonstrate higher acceptance (OR = 0.953, 95 CI% = 0.022–0.1859, $p=0.998$), while participants receiving Sinopharm will have lower acceptance (OR = 0.048, 95CI% = 0.021–0.110, $p=0.048$). Participants whose trusted source of information regarding vaccination was provided by government officials were more likely to demonstrate

higher acceptance (OR = 1.814, 95CI% = 0.327–10.074, $p=.496$).

DISCUSSION

This research intended to assess the acceptance of the coronavirus vaccine among the residents of Karachi. It is known that vaccination plays an essential role in decreasing the burden of infections.²⁵ Vaccinations can play an effective role in providing herd immunity among the community, provided its acceptance rate is high.²⁶ In the current study acceptance rate of 87% was identified regarding their willingness towards getting vaccinated. Among the previously conducted research evaluating the public readiness to obtain the coronavirus vaccines globally, Jordan had the lowermost acceptance rate.²⁴ Similarly many developing countries such as India, South Africa, and Brazil also demonstrated higher predisposition toward acceptance of vaccines.²⁷ A previously conducted study in Pakistan identified that 50% of the study participants seemed unsure regarding the COVID-19 vaccine.²⁸ However, this can be attributed to the increasing number of health campaigns conducted by healthcare officials

and the strict action taken by the government regarding vaccination.

Findings from the current study revealed that older people demonstrated higher acceptance of vaccines which is in line with the previously conducted studies which have also identified higher acceptance rates among older participants.^{28,29} These outcomes are however in disagreement with a study done by El-Elmat et al where the majority of the younger participants should be willing towards the vaccine.²⁴ This can be because older individuals being more experienced, understand the importance of getting immunized.

Contrasting reports regarding the gender-wise acceptance of COVID-19 vaccines have previously been reported.^{24,30} Pakistani males responded positively by getting vaccinated. These findings are in agreement with research conducted by Nikolovski et al.³¹ This could be clarified by the fact that gender-based differences exist with respect to adverse reactions and the humoral immune reactions subsequently that occurs once vaccinated, more common amongst the females, whereas for males there are higher risks associated for complications, infections, and death.^{32,33} Employed participants in the current research seemed less inclined to accept the vaccine, which is in contrast with the previously carried out research in the USA, where jobless participants demonstrated lower acceptance of the coronavirus vaccine.²⁸ These findings identify the point that despite the presence and availability of vaccines some individuals whether employed or unemployed would remain highly susceptible to continued health outbreaks.

Most of the respondents stated finding the COVID-19 vaccine to be safe, these results are in contrast with the formerly led research in Jordan, where a low acceptance rate among Jordanians was found.²⁴ It could be linked with the pace at which the whole process of vaccine formulation and process was conducted resulting in the availability of vaccine quite early which could have resulted in reducing the acceptance of vaccine worldwide. Additionally, many participants responded positively regarding the COVID-19 vaccine being a conspiracy, these outcomes are in line with research piloted by Hughes et al.²⁸ This can be attributed to the fact that negative and falsely fabricated news spread by anti-vaccination groups on social media due to vaccine development in a such a short span of time has influenced and affected the beliefs of many people.

The Sinopharm vaccine had been formulated using an inactivated virus.³⁴ In Pakistan the majority of the individuals got immunized with the Sinopharm and with the Sinovac vaccine. Pfizer and Astra Zeneca both formulated using RNA and DNA-based viral vectors were introduced quite later in Pakistan and for the majority of individuals provided as a booster dose.³⁵ During phase one of vac-

cination in Pakistan healthcare professionals directly in contact with patients were initially vaccinated followed by law professionals and professions having minimal public contact subsequently got vaccinated.³⁶ Various previously conducted studies have evaluated the post-vaccination adverse effects associated with Pfizer, Moderna, Sinopharm, Sinovac, and Astra Zeneca vaccines.³⁷⁻⁴⁰ The severity and type of side effects linked with the vaccines have a significant association with the vaccine type. AstraZeneca had higher side effects as compared to Pfizer-BioNTech, while Sinopharm has the least.⁴¹ However in Pakistan most of the population was vaccinated initially with Sinopharm followed by Sinovac. However, the frequently stated side effects included fatigue, temperature, and body aches. The most reliable source providing adequate evidence about the coronavirus vaccines was the information provided by health workers and government officials. These outcomes are consistent with the previously led research by Malik et al carried out in the USA where many respondents trusted the opinions of Health care professionals more than any other source.²⁷ Additionally, these findings are confirmed by other studies that also predicted higher faith in health providers.^{42,43}

LIMITATIONS

Despite a comparatively large sample, the generalizability of the findings can be affected due to the non-random sampling technique used. Participants under 18 years were not involved and the efficacy of the vaccine in this age group remains unknown. Secondly, as the questionnaire was formed using google forms hence the respondents required the use of a smartphone, Laptop, or any other electronic device to participate, which could have probably led to selection bias. Moreover, we wanted to evaluate the attitude of participants when vaccines were recently developed and the majority of the southern Karachi population got vaccinated, hence this can affect the attitude towards the vaccine, as identified from the study. The current research did not evaluate the psychological issues and their impact on acceptance. Nonetheless, the current research evaluated various factors associated with the suitability of COVID-19 vaccination, which can assist in directing future community health attempts aiming to escalate the acceptance of COVID-19 vaccines.

CONCLUSION

The findings from the current study made an important contribution to the scientific literature by identifying a higher acceptance rate of 87% among the citizens of southern Karachi, regarding COVID-19 vaccination. The difference in the acceptance rate between males of older age as compared to younger population and females have demonstrated higher acceptance towards vaccination. Sinopharm followed by Sinovac was the most frequently used to provide immunization to the Pakistani population.

It was further identified that general public greatly trusted the information provided by the health care professionals and the government officials, hence government should make sure in the future also to incorporate the trust of the population on themselves.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

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Khan U: Literature search, Data collection
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Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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INDUCTION TO DELIVERY INTERVAL AND ITS EFFECT ON FETOMATERNAL OUTCOMES IN ECLAMPSIA AND SEVERE PRE-ECLAMPSIA

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ABSTRACT

Objectives: To identify the fetomaternal complications in patients with Eclampsia and severe preeclampsia patients in association with induction to the delivery interval.

Material & Methods: This descriptive observational study was conducted From June to December 2019 in the department of obstetrics and Gynaecology at the Lady Reading Hospital, Peshawar, Pakistan. Antenatal patients with Eclampsia and pre-Eclampsia were included. IBM SPSS, Version 23.0 was used for data analysis, and tests were applied to find an association between induction to delivery interval and fetomaternal complications, chi-square test was applied and P -value < 0.05 was considered significant.

Results: The final cohort comprised 60 women with a mean age of 28.72 ± 6.02 . Most Maternal complications were 25% (n= 15) seen in more than 18hr duration from induction to delivery, deranged renal function was the most common maternal complication 13% (n= 8), Pearson chi-square value of 0.01 shows a highly significant association between an increase in induction to delivery duration and maternal complications while stillbirth was most frequent fetal complication 13.3% (n= 8A). A P-value of 0.6 shows a non-significant association between induction to delivery duration and fetal complications

Conclusion: Our study concludes that with an increase in induction to delivery time, maternal and fetal complication increases.

Keywords: Eclampsia, Pre-eclampsia induction to delivery interval

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INTRODUCTION

Eclampsia is defined as convulsions in pregnancy not attributed to any other cerebral or metabolic condition, related to high blood pressure and proteinuria. Severe Pre-eclampsia usually precedes Eclampsia. Preeclampsia is a preeminent cause of maternal morbidity and mortality during pregnancy, complicating 5–9% of all pregnancies¹. Preeclampsia and Eclampsia contribute to at least 16% of maternal mortality (63000 pregnant women annually) in developing countries. Thus, it ranks second only to hemorrhage as a specific, direct cause of death. In developing countries WHO estimates preeclampsia incidence to be seven-fold greater as compared to developed countries. I.e., 2.8% of live birth versus 0.4% in developed countries.^{2,3} Maternal morbidity is more in these patients owing to its association with progressive maternal deterioration

via pulmonary edema, renal and liver failure, abruption of the placenta, Stroke, multisystem failure, and HELLP (hemolysis, elevated liver enzyme, and low platelets. The exact etiology is still not known, a suggestive mechanism is an endothelial damage almost affecting all systems of the body³, fetal complications usually arise from placental insufficiency leading to growth restriction, fetal distress, and stillbirth.⁴

The Working Group on High Blood Pressure in Gestation recommends that for women with Eclampsia, once the decision about delivery is finalized, labor initiation should be expedited.⁵ we conducted this study to identify the maternal and fetal outcomes in eclamptic and severe preeclamptic patients related to the start of induction to the delivery interval. The results of this study will provide us with local statistics and help develop local protocols regarding timing and mode of delivery and this will open a window for further research.

MATERIAL AND METHODS

This descriptive observational study was conducted From June to December 2019 in the department of Obstetrics and Gynaecology at the Lady Reading Hospital, Peshawar, Pakistan. Written informed consent and

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ethical approval from the hospital committee were taken. Pre-designed forms were used to record demographic details and the gestational age of the patients. Antenatal woman with a singleton pregnancy, gestational age more than 28 weeks, unfavorable bishop score (≤ 6), with severe pre-eclampsia (BP $\geq 160/110$) plus one or more of the following symptoms i.e., severe headache, visual disturbance, epigastric pain, nausea vomiting, or patients with Eclampsia were included in the study. while women with intrauterine fetal demise, intrauterine growth restriction, placental abruption on admission, chronic hypertension, chronic renal disease, connective tissue disease, and gestational hypertension were not included.

We defined Induction as the use of a cervical ripening agent (prostaglandin E2, Misoprostol, or Foleys catheter) in presence of a < 6 bishop score. Induction to the delivery interval was noted from the start of induction till the delivery of the baby. Prolonged labor was defined as ≥ 24 hours from the start of induction to delivery.

Following Maternal outcomes were noted. Renal dysfunction was categorized as deranged renal function (urea, creatinine, uric acid results higher than the normally accepted range with urine output $> 30\text{ml/ hour}$ and renal failure (anuria or oliguria $< 30\text{ml/ hour}$ with urea, creatinine $>$ two times of baseline in 48 hours. Other outcomes were HELLP syndrome, pulmonary edema, stroke, and disseminated intravascular coagulopathy (DIC).

Fetal outcomes were stillbirth, NICU admission, early neonatal death, and significant meconium. For sample size calculation, Openepi software was used, according to which sample size was 60 (taking the prevalence

of pre-eclampsia and eclampsia as 5 to 6% with a 95% confidence interval).

IBM SPSS Statistics for Windows, Version 23.0 (IBM Corp., Armonk, NY) was used for data analysis. Categorical variables were reported as frequencies and percentages, while continuous variables were reported as mean and standard deviation. The Chi-square test and Pearson's correlation test were applied with the level of significance set at P-value < 0.05 .

RESULTS

A cohort of 60 women with an age range from 16 to 43 years and a mean age of 28.72 ± 6.02 were included in the study. The majority were multigravida 45% ($n=27$), with 46.7 % ($n=28$) having a gestational age of 33 -36 weeks. Prostaglandin E2 was used as a method of induction in 51.7 % ($n=31$) Table 1.

Maternal complication started to increase after 12 hours from induction to delivery duration, a peak 25% ($n= 15$) was seen in more than 18hr duration from induction to delivery, and deranged renal failure was the most common maternal complication at 13% ($n= 8$), (Table 2) Pearson chi-square value of 0.01 shows a highly significant association between an increase in induction to delivery duration and maternal complications while stillbirth was most frequent fetal complication 13.3% ($n= 8$) (Table 3). Pearson Chi-square value of 0.6 shows a non-significant association between induction to delivery duration and fetal complications there were 3.3% ($n=2$) maternal death.

Table 1: Basic demographic features

Obstetrical History	Primigravida	33.3% ($n=20$)
	Multigravida	45% ($n=27$)
	Grand Multigravida	21.7 % ($n= 13$)
Period of gestation	29 - 32 Weeks	23.3% ($n=14$)
	33 - 36 Weeks	46.7 % ($n=28$)
	37 - 40 Weeks	23.3% ($n=14$)
	> 40 weeks	6.7% ($n=4$)
Mode of delivery	Normal vaginal delivery	55.0 % ($n= 33$)
	Instrumental Delivery	21.7% ($n=13$)
	Caesarean Section for failed Induction	18.3% ($n=11$)
	Direct Caesarean Section	5 % ($n=3$)
Methods of induction	Misoprostol	27.7 % ($n=16$)
	Prostaglandin E2	51.7 % ($n= 31$)
	Foley's Catheter	21.7 % ($n= 13$)
	< 1.5	10.0 % ($n= 6$)
	1.6 – 2.5	33.3 % ($n= 20$)
	2.6- 3.5 kg	56.7 % ($n= 34$)

Table 2: Induction to Delivery Interval * Maternal Complications Crosstabulation

Induction to Delivery Interval	Maternal Complications									Total
		no complication	Maternal Mortality	Renal Failure	Help Syndrome	Pulmonary Oedema	DIC	deranged RFTS	stroke	
1 - 6 Hours		1	0	0	0	0	1	0	0	2
12 -7 Hours		8	0	1	1	0	0	0	0	10
12 - 18 Hours		13	2	1	1	0	1	2	0	20
18 - 24 Hours		7	0	1	0	0	0	5	2	15
> 24 Hours		7	0	0	2	3	0	1	0	13
Total		36	2	3	4	3	2	8	2	60

Table 3: fetal Complications * Induction to Delivery Interval Crosstabulation

		Induction to Delivery Interval					Total
		6 - 1 Hours	12 -7 Hours	18 - 12 Hours	24 - 18 Hours	> 24 Hours	
fetal Complications	alive and healthy	1	8	12	10	5	36
	Still Birth	0	1	2	2	3	8
	ENND	0	0	2	0	2	4
	NICU admission	0	0	3	1	2	6
	significant meconium	1	1	1	2	1	6
Total		2	10	20	15	13	60

DISCUSSION

Eclampsia and Preeclampsia are one of the leading causes of maternal morbidity and mortality⁶, timely and efficient management of various aspects like early recognition, management of fit, controlling blood pressure and planning delivery can have a positive impact on adverse fetomaternal outcomes, one of the important factor is fit to the delivery interval. In this study increase in maternal complications was observed as an induction to the delivery interval increased by more than 12 hours with a peak at 18 hours. Renal function was most frequently affected in mothers while stillbirth was the most common complication in fetuses. Eclampsia and severe-eclampsia-related complications increase with an increase in duration from diagnosis of the condition and starting induction to the delivery interval. These complications are more in this part of the world possibly due to poor antenatal care facilities, delays in seeking medical treatment, lack of awareness, early pregnancies, and inadequate healthcare facilities.⁷

A major part of our study's population i.e., 33 (55%) patients was in the 21-30 age group, similar to the findings reported in the study done by Mahalaxmi et al.⁸ and Aparna Khan et al.⁹ Patients between 21 and 30 years of age form 76.34% of the population as per the NER data. In this study, the frequent maternal complication was deranged renal function and HELLP syndrome 13.3% & 4% respectively, the incidence of acute kidney injury (ev-

ident in form of deranged renal function) with these two conditions is reported as between 7-60% in multiple studies, and it's found to be the most frequent complication, in index study 3.3 % of patients were affected by stroke. A relevant study concluded an 80% increased risk of stroke in patients with preeclampsia compared to women with uncomplicated pregnancy.⁹⁻¹³

Regarding fetal complications in this study, 13.3% of stillbirths occurred in eclamptic patients, with 10% of neonates admitted to the NICU. The probable reasons behind perinatal mortality were delayed arrival of patients in the hospital after the onset of seizure resulting in severe intrauterine hypoxia of the fetus and intrauterine death, and shortage of adequate facilities in the nursery can also be a contributory factor. Higher perinatal deaths were reported in the studies done by Swain et al.¹⁴ During this study there were 3.3 % maternal deaths, one had HELLP syndrome, and the other was admitted with Stroke and multiorgan failure. There was a delay in seeking medical care, both had no antenatal checkups and had multiple fits at home. A related study in India reported maternal mortality of 6%, which is quite similar to ours regarding poor healthcare system.¹⁵ By comparing the fetal and maternal complications with induction to delivery time, as the time increases the rate of complication increases, and the association was statistically significant. Our finding was also supported by Levind et al.¹⁶ who suggest

that with an increase in delivery time maternal morbidity as well as mortality increases. Eclampsia and pre-eclampsia are serious entities in the pregnant population and their management and complication management add a great financial burden to the already compromised healthcare system. Awareness should be created for early recognition and timely referral of these patients to the health care facility, where a multidisciplinary team can manage these patients. We recommend further research on this topic, as one of the limitations of this study was a small sample size, and lack of data on long-term complications associated with this condition.

CONCLUSION

Delivery should be expedited in a proper health-care facility to decrease the frequency of maternal and fetal complications related to Eclampsia and pre-eclampsia. The maternal and fetal complications increase with the increase in induction to delivery time.

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Following authors have made substantial contributions to the manuscript as under

Raees M: Study conception, Literature search, Data Entry, Write up, Critical review

Hussain SS: Study conception, Literature search, Data analysis, Critical review

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Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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FREQUENCY OF HELICOBACTER PYLORI INFECTION AS DETECTED BY STOOL ANTIGEN TEST IN PATIENTS WITH FUNCTIONAL DYSPEPSIA

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ABSTRACT

Objectives: To determine H. Pylori frequency in patients presenting with functional dyspepsia using H. Pylori antigen test in the stool sample.

Materials & Methods: One hundred and sixty-five adult patients presenting with symptoms suggestive of functional dyspepsia to the medical outpatients' Department of Khyber Teaching Hospital Peshawar, were tested for Helicobacter Pylori by detecting stool Helicobacter Pylori antigen. Patients with chronic debilitating illnesses or peptic ulcer disease were excluded from the study. The frequency of the positive test was calculated. The independent-sample t-test and Chi-square test were used to compare the results for different variables. A P-value of 0.05 was considered significant.

Results: Out of 165 patients, 54% were males and 46% were females. The mean age of the patients was 32 ± 7 years, ranging from 18 to 52 years. The stool antigen test for H. Pylori was positive in 58% of patients. Proton pump inhibitor drugs significantly affect the positive results. Alanine aminotransferase levels were significantly different between the stool antigen-positive and stool antigen-negative patients.

Conclusion: Helicobacter Pylori infection is quite common in patients with functional dyspepsia. These patients with positive antigen tests should be treated with H. Pylori eradication therapy.

Keywords: Helicobacter Pylori, Dyspepsia, Stool antigen test

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INTRODUCTION

Dyspepsia is a symptom or combination of symptoms pointing toward discomfort in the upper abdomen. The most common symptoms of dyspepsia include pain epigastrium, heartburn, early satiety, abdominal fullness, bloating, belching, or discomfort in the upper abdomen.¹ In about 25 % of cases, dyspepsia has some definite cause but in the majority of cases, its cause is not known. Functional Dyspepsia is said to be present if gastric ulcer, gastritis, or any other organic problem or structural diseases are excluded.^{2,3} About 25 % of the population suffer from such symptoms annually, resulting in absence from the workplace, economical burden, and poor quality of life. Some of the patients instead of seeking expert opinion, use recurrent courses of self-medication which further increase the monetary loss.⁴ The exact pathophysiology

of functional dyspepsia is not clear yet but Helicobacter Pylori infection has been found to be associated with this disorder, which results in alteration of gut motility and sensitivity.^{5,6} It is a spiral-shaped microaerophilic, gram-negative bacterium, that varies from 3-5 micrometers in length. Its prevalence varies globally and ranges from 20 to 80%, being less common in developed countries than in developing countries.^{7, 8} Although the majority of the patients with Helicobacter Pylori infection remain asymptomatic, it slowly and gradually leads to chronic gastritis in most of the patients and Peptic ulcer disease in about 15%, even gastric cancer⁹ and Functional dyspepsia in up to 25% of patients.¹⁰

A number of methods, both non-invasive and invasive, are available to make a diagnosis of infection with Helicobacter Pylori. Rapid urease test, the histopathological examination which is the gold standard test^{11,12}, and culture all need an endoscopic examination of the Stomach, which is not always feasible. The non-invasive tests include Helicobacter Pylori Ig G antibodies in the serum, urea breath test, and stool antigen test for Helicobacter Pylori. All these tests have reasonably high sensitivity and specificity of more than 85%. The urea breath test is expensive and not available everywhere.¹³ Serology is easily available but it does not differentiate between past and

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present infection. It is also not used for monitoring the infection as it remains positive up to two years after successful eradication therapy.¹⁴

The stool antigen test uses monoclonal antibodies is easy to perform, is commonly used in epidemiologic surveys, always shows a present and active infection, and turns negative after successful eradication therapy.¹⁵ Different strategies are followed to manage dyspepsia.¹⁶ One of the strategies is to test patients for infection with *Helicobacter Pylori* and to give eradication therapy if the test is positive.¹⁶

The aim of our study is to find out the frequency of infection with *Helicobacter Pylori* by stool antigen test in patients with symptoms suggestive of dyspepsia in whom endoscopy was normal.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Outpatient Department of Medicine, Khyber Teaching Hospital Peshawar from July 2020 to June 2021. The sample size was 165, using a 30% prevalence, 95% confidence level, and 7% margin of error, under the WHO formula for sample size determination, using the non-probability convenience sampling technique. Adult patients of age more than 14 years with functional dyspepsia having symptoms for at least three months and with normal recent (within a week) upper GI endoscopy reports were included in our study. While those patients who had the chronic debilitating disease or had gastritis, peptic ulcer, Gastroesophageal reflux disease, or other pathologies on endoscopy were excluded from this study. Patients who were currently using any proton pump inhibitors were also excluded from the study group, as PPIs inhibit the growth of *Helicobacter Pylori*.

The institutional ethical committee approval was taken. Participants were appropriately informed and written consent was taken from them. After demographic information, patients were asked to collect stool specimens in a small bottle to be dispatched to the hospital laboratory. *Helicobacter Pylori* stool antigen was detected by the Enzyme-linked immunoassay technique. After collection, the Data was entered on a proforma, specially designed for this study, and was analyzed by Statistical package for social sciences (SPSS) version 26. Percentages and Frequencies were used for categorical variables while the mean and standard deviation was used for numerical variables. Chi-square was applied to compare nominal variables. While an independent sample t-test was applied to do a comparison of numerical variables. Data were presented in tables and graphs where necessary.

RESULTS

Out of the total 165 patients, 89 (54%) were male and 76 (46%) were female. The mean age of the patients

was 32 ± 7 years, ranging from 18 to 52 years. The majority of our patients (86%) belonged to the age group below 40. Table. 1

Stool antigen for *H. Pylori* was positive in 95 (58%) of patients and negative in 70 (42%) of cases. *H. Pylori* was positive in 83 % of males and 77% of females with no significant statistical difference. (P-value 0.483). Similarly, the positive rate was above 80% in all age groups with no difference between the groups. Table 2

The common symptoms of functional dyspepsia were a burning sensation in the epigastrium (64%), followed by postprandial fullness (57%), pain epigastrium (42%), and early satiety (42%). Table 3. The presence of *H. Pylori* was not associated with any particular symptom of functional dyspepsia. Table 3.

There was quite a significant difference in the mean level of ALT in patients with and without stool antigens of *H. Pylori*. (p-value 0.009). The presence of stool antigen of *H. Pylori* was not affected by the levels of hemoglobin, HbA1c, and BMI. Table 4.

DISCUSSION

In our study, the overall frequency of *Helicobacter Pylori* detected by stool antigen was 58%. Almost similar frequencies have been reported in a number of studies eg 51% by Rafee et al.¹⁷, 64% by Awan et al.¹⁸, 57% by Najim et al.¹⁹, and 58% by Sodhi et al.²⁰ The first two studies were reported from Pakistan and the later two studies were reported from India. Countries with better sanitation and higher socioeconomic conditions have lower rates. For example, a study by Niknam et al from Iran found a frequency of 31%.²¹ Iran is a country with advanced sanitary conditions and better hygiene. Similarly, the frequency of *Helicobacter Pylori* antigen in stool was reported to be 33% from Turkey and 35% from KSA.^{22,23}

On the other hand countries with poor sanitation systems, overcrowding, underdeveloped infrastructures, lower level of education, and poor socioeconomic conditions have higher rates. Frequency as high as 80% has been reported from Far East Asian and African countries.^{24,25}

The prevalence of *Helicobacter Pylori* increases with increasing age. But in our study, there was almost no significant difference amongst various age groups, except with slightly reduced frequency in the age group 40-50 years^{27,28} (Table 1). This study did not show any significant difference in *Helicobacter Pylori* regarding other factors like gender, area of abode, cigarette smoking, and the presence of chronic viral hepatitis. Globally conflicting data are present regarding these factors. Our findings are

Table 1: Helicobacter Pylori Frequency In Different Age Groups

Age in years	Total number	Helicobacter Pylori positive	Helicobacter Pylori negative	p-value
	89 (50.3%)	44 (53%)	39 (47%)	0.233
31-40	60 (36.4%)	36 (60%)	24 (40%)	0.63
41-50	18 (11%)	13 (72%)	5 (28%)	0.18
> 50	4 (2.4%)	02 (50%)	02 (50%)	0.76

Table 2: Helicobacter Pylori in different groups

Factor			p-value
Gender	Male 55 (62%)	Female 40 (53%)	0.23
Abode	Rural 54%	Urban 61%	0.38
Smoking	Smoker 56%	Non-smoker 59%	0.75
DM	Diabetic 70%	Non-diabetic 55%	0.14
Hypertension	Hypertensive 68%	Normotensive 56%	0.25
HCV	Positive 60%	Negative 57%	0.81
HBV	Positive 67%	Negative 57%	0.5
Use Of antibiotics	Yes %48	No 62	0.10
Age groups			
< 30	%53		0.475
40-31	%60		
50-41	%72		
> 50	%58		

Table 3: Symptoms of FD and Helicobacter Pylori

Symptom	Symptom present (%)	Symptom absent	p-value
Burning of epigastrium	(%)	53	0.4
Postprandial fullness	59	56	0.78
Pain epigastrium	57	58	0.92
Early satiety	54	60	0.4

Table 4. Helicobacter Pylori Group Statistics

	H. Pylori status	N	Mean	Std. deviation	P-value
ALT	Positive	90	30.58	11.3	0.009
	Negative	70	26.5	7.3	
HbA1c	Positive	19	8.5	1.4	0.24
	Negative	10	9.2	1.6	
Hb	Positive	95	13.35	1.16	0.25
	Negative	70	13.13	1.28	
BMI	Positive	94	22.8	2.48	0.17
	Negative	69	22.2	1.87	

supported by Alghamdi TS et al in a study conducted in the Kingdom of Saudi Arabia²³, but Soomro RA et al from Karachi found higher frequencies for males.²⁹

Common symptoms of functional dyspepsia in our study did not show any correlation with Helicobacter Pylori. Hassan et al found a significant difference in the

symptoms of patients with and without Helicobacter Pylori infection. Furthermore, Helicobacter Pylori eradication leads to relief from epigastric burning and pain but not from abdominal fullness and early satiety.³⁰

Mean levels of ALT were significantly higher in patients with positive Helicobacter Pylori antigen tests.

(30±11 vs. 26±7, P-value 0.009). this may be attributed to the use of multiple drugs which are used for the symptomatic relief of dyspepsia. In addition, studies show higher rates of infection with Helicobacter Pylori in patients suffering from non-alcoholic fatty liver disease (NAFLD), as shown by a recent meta-analysis by Karn W et al.³²

CONCLUSION

Functional dyspepsia is common in the younger population. Many of these patients carry Helicobacter Pylori infection. Further studies are needed to find whether Helicobacter Pylori eradication therapy would help in alleviating the symptoms of functional dyspepsia.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Abbas G: Study conception, Literature search, Data Entry. Write up, Critical review

Iqbal S: Study conception, Literature search, Data analysis, Critical review

Jamaluddin: Literature search, data entry

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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VASCULAR MALFORMATION WITH OSSEOUS METAPLASIA OF THE MESENTERY AS A CAUSE OF ACUTE ABDOMEN IN A SEVEN YEARS OLD CHILD

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ABSTRACT

Objective: Vascular anomalies are of two types: 1 Hemangiomas and 2 vascular malformations (VMs). Hemangiomas are apparent at birth but they may be noticed or become symptomatic later in neonatal life. The natural course of hemangioma is early proliferation during the first few years of life and regression in late childhood. They disappear usually by the age of 12 years. VMs, on the other hand, usually develop later in life and the size of the mass increases with age. An exclusive mesenteric vascular anomaly is a rare entity. Specifically, the incidence of VMs type of anomaly with osseous metaplasia is infrequent. In the available literature, two cases of abdominal vascular anomaly of hemangioma type have been reported. This case is being reported to alert clinicians to the wide variety of mesenteric and retroperitoneal masses and their varied presentation sometimes in emergencies like an acute abdomen or intestinal obstruction. The radiological signs may also be confusing at times as in this case where the radio-opaque shadow on an x-ray was mistaken for a phytobezoar.

Keywords: vascular malformation, osseous metaplasia, acute abdomen

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CASE PRESENTATION

A seven-year-old, 26 kg boy presented to our emergency pediatric surgical unit with a history of pain abdomen, fever, vomiting, and constipation for 3 days. Past surgical and medical history was insignificant except for a similar episode of pain a month ago. General physical examination was unremarkable except for pallor. His abdomen was mildly distended with mild tenderness around the umbilicus. There was no palpable mass or organomegaly. Total leukocyte count was raised ($14500/\text{mm}^3$), Hemoglobin was low and platelet count was normal. C-reactive protein was within the normal range. Initial ultrasonography showed no pathology except for the fluid-filled gut loops with hypoperistalsis. X-ray erect abdomen showed a round radio-opaque shadow in the center of the

abdomen right lateral to L4 (Figure 1). The lateral plain film confirmed that the lesion is separate and not

arising from the spine (Figure 2). An initial diagnosis of phytobezoar was made and the patient was conservatively managed with intravenous antibiotics, fluids, and analgesics. The patient did not improve in 36 hours and was subsequently explored. Per operatively, there was a mass in the mesentery of the small bowel with extension into the retroperitoneal space cranially and closely abutting the pancreas (Figure 3).

The patient recovered uneventfully. He was discharged on the 4th postoperative day with a total hospital stay of 6 days and was called for follow-up after 2 weeks with the histopathology report. On the follow-up visit, the patient was doing well. The wound had normally healed. He was pain-free, tolerating orally and passing stools. The chest and abdomen were normal on examination. Histopathology of the specimen revealed mesenteric vascular malformation with osseous metaplasia.

DISCUSSION

The initial diagnosis in this patient was phytobezoar leading to mechanical obstruction. Various vegetable matter such as pumpkin, grape skin, prune, and persimmons cause phytobezoar as it contains a large amount of non-digestible fibers. In this case, vomiting, with one episode of bilious vomiting, constipation, fever, radio-opaque shadow on the plain abdominal radiograph, and no im-

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Fig 1:: Plain Abdominal Radiograph showing a Round Radio-opaque Shadow



Fig 2: Laterear view plain xray film showing Radio-opaque shadow separate from Spine

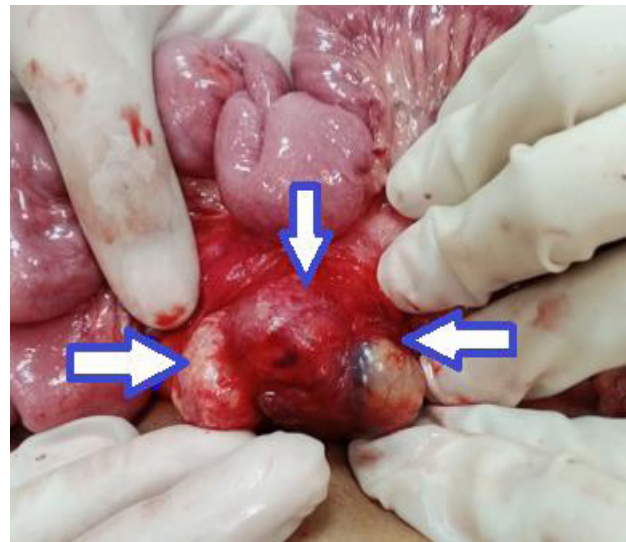


Fig 3: Intraoperative image showing mass/VM.

provement with conservative management led to the belief that this was a case of phytobezoar, although there was no history of ingestion of common edibles leading to phytobezoar and the x-ray abdomen did not show any signs of obstruction. Other differential diagnoses, in this case, were worms obstruction and retroperitoneal teratoma.

A very similar case was reported by Thambidorai and colleagues where a female child aged 4 years was seen at the clinic with the signs and symptoms of acute appendicitis ⁶.

A Lanz incision laparotomy was carried out for appendicitis and intra-operatively, a mass was found near the right kidney. The mass was suspected to be a renal tumor with retroperitoneal extension or a solitary retroperitoneal neoplasm.

An appendectomy was done, and the patient was advised to consult a surgical oncologist. Upon recovery and stabilization, the patient was re-explored and the mass was excised. The histopathology of the specimen revealed a solitary mesenteric VA that could not be differentiated into low-flow VMs or a regressing hemangioma ⁶.

This shows the spectrum of varied presentation, misdiagnosis, and improper management, leading to morbidity and economic burden on the patient and health system. This also warrants a thorough search for rare diseases in cases where history is suggestive and laboratory investigation or radiology shows abnormal findings.

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EDITORIAL POLICY OF JOURNAL OF MEDICAL SCIENCES (JMS), KHYBER MEDICAL COLLEGE, PESHAWAR

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3 Authorship

According to the ICMJE criteria, authorship is based on 4 criteria; (1) conceptualization and designing, (2) AND, data collection, (3) AND, writing and critical review, (4) AND, taking responsibility for the authenticity and integrity of all the research process. All those designated as authors should meet all these 4 criteria. The

co-authors should declare their roles and contributions in the research process explicitly. Those who do not meet all 4 criteria should be **ACKNOWLEDGED** only. If agreement cannot be reached about who qualifies for authorship, the institution(s) where the work was performed, not the journal editor, should be asked to investigate. If authors request removal, addition or change in the sequence of an author after manuscript submission or publication, journal editors should seek an explanation and signed statement of agreement for the requested change from all listed authors and from the author to be removed or added. The corresponding author is the one individual who takes primary responsibility for communication with the journal during the manuscript submission, peer review, and publication process. The corresponding author typically ensures that all the journal's administrative requirements, such as providing details of authorship, ethics committee approval, clinical trial registration documentation, and disclosures of relationships and activities, are properly completed and reported.

4 Submission of manuscript

The manuscript should be submitted through journal website which is using the Online Journal System (OJS) along with the Institution research and ethics board (IREB) certificate. The article should have the following format:

- 4.1: The abstract should be structured with word count of not more than 250 words.
- 4.2: The fonts should be Calibri, with size 12, and spacing of 1.5, with justified margins in MS office format.
- 4.3: The whole document should not be more than 3000 words (excluding references and appendices).
- 4.4: The number of figures and tables should not exceed 5 in the whole document.
- 4.5: The pictures and tables should be black and white in color.
- 4.6: Copied pictures and tables from other sources will not be entertained, unless a written approval from the original researcher and publisher is provided

5 Institutional research and Ethics board (IREB) certificate

Under no circumstances, an article will be accepted if approval from the relevant ethical board / committee is not taken before the start of a research. The board / committee should assess the proposal of a research in both ethical and technical aspects before giving a certificate of approval.

6 Conflict of interest

To ensure transparency in the research conduction, writing and publication, the authors, peer reviewers and editors have to declare conflicts of interest regarding financial aspects, academic competitions, and relationships during writing, reviewing and publishing the manuscripts. Details of sponsors along with their roles and access to data should be clearly stated.

7 Confidentiality

The editorial board in no way should publicize the work of a researcher in any form unless it is published. They should not publicize the comments and critique given by reviewers. Similarly, the reviewers are bound to keep the confidentiality of the work of researchers during and after the review. The work of researchers and the critique should never be discussed or exemplified in forums. The confidentiality of the researchers should be maintained in every possible way when the documents are sent for review. However, our review process is open (non-blinded) in the first phase, as per policy of the journal. In this case, the policy is clearly displayed on journal's website for the researchers. Reviewers must not retain the manuscript for their personal use and should destroy paper copies of manuscripts and delete electronic copies after submitting their reviews. If a manuscript is rejected, it should be deleted from the editorial system. If an article is published, the manuscript along with its reviews and other relevant documents should be retained for a period of 3 years and then deleted. The only situation where confidentiality needs to be breached is when a situation of fraud or misconduct is found during the review process or after publication. Still, the authors and sometimes the reviewers, have to be notified.

8 Correction and retraction of articles

The guidelines for correction and retraction of articles are as follows:

- 8.1: A specific page is allocated in the journal (both electronic and printed) that will be used for news related to corrections in articles published in previous journals.
- 8.2: The editor should also post a new article version in the journal with details of the changes from the original version and the date(s) on which the changes were made.
- 8.3: Previous electronic versions will prominently note that there are more recent versions of the article (that will be placed at the end of abstract). Similarly, the more recent version should be cited by the authors or others.
- 8.4: If the error is judged to be unintentional, and the underlying science appears valid, and the changed version of the paper survives further review and editorial scrutiny, then retraction with republication of the changed paper, with an explanation, allows full correction of that research paper.
- 8.5: If serious violation of credibility or quality of a research paper is found after the publication, the article has to be retracted after approval of at least 3 members of the editorial board in consultation with chief editor. The whole process will follow the guidelines presented by Committee on publication ethics (COPE).
- 8.6: The retracted article should clearly be notified on the website and the word "retracted" should be mentioned along the title of the article.

9 Correspondence

Correspondence for submitting an article in JMS will be through a corresponding author. The duties of a corresponding author have already been presented in a previous section. Correspondence regarding debating an article is given high value and a separate page for letters to the editors has been allocated. Derogatory and demeaning letters are screened and letters which promote debates and critique are encouraged to be

published. However, correspondence about the articles published in the last 1 year will be included only.

10 Fee submission process

The editorial board in a recent meeting has fixed a fee of 7000/- Rs (Pakistani), for local authors and 250 \$ (US) for international authors. The fee should be submitted as bank draft/online payment through account (IBAN) no: PK56NBPA0388004048685170 (Branch code: 0388 / National Bank of Pakistan, University campus branch, Peshawar, Pakistan) as follows:

- 1) Article processing fee of 3000/- PKR at the time of submission of article after acceptance for preliminary / initial triage, open review by the Chief Editor. This amount will be non-refundable.
- 2) Article publication fee of 4000/- PKR at the time of acceptance of article after external review. This amount will be refundable if the article is rejected for any reason.
- 3) For international authors, the amount of 250 US dollars will be accepted after both internal and external review. Researchers belonging to countries other than Pakistan are advised to submit the fee after the whole process of review is completed and the article is accepted for publication.

11 Roles of editorial board, editors and members

The editorial board of JMS is following the Higher Education Commission (HEC) policy for research journals. The roles of the editorial board for JMS are mentioned below:

- 11.1: The roles of the Editorial Board are:
 - 11.1.1: To offer expertise in their specialist area
 - 11.1.2: To review submitted manuscripts
 - 11.1.3: To advise on journal policy and scope
 - 11.1.4: To work with the Editor to ensure ongoing development of the journal
 - 11.1.5: To identify topics for special issues of the journal or recommend a Conference which would promote the journal, which they might also help to organize and/or guest edit
 - 11.1.6: To attract new and established authors and articles

11.1.7: To submit some of their own work for consideration, ensuring that they adhere to Conflict of Interest rules and stating their relationship to the journal. This is very important as the journal cannot be seen to publish only papers from members of the Editorial Board.

11.1.8: It is important that Editorial Boards have a regular communication forum with other boards of similar nature, either face to face in person (depending on their country of origin, funding availability, etc.) or as more journals are doing today, communicating by teleconference, Skype or other web platforms.

11.2: The Patron:

The Patron is usually the Dean of the institute, and is overall in charge of the journal, who needs to be kept informed of the decisions taken by the editorial board. The patron is the final authority to approve the decisions and policies of the editorial board.

11.3: The Chief Editor:

11.3.1: The criteria for selection of Chief Editor are:

- i. Expertise and experience in the specialist field related to the journal
- ii. Publication record of a number of articles and /or books (usually in / related to the specialist field)
- iii. Being a reviewer for an international peer-reviewed journal
- iv. Senior research position with equivalent experience in research and scholarship
- v. Enthusiasm to undertake the Editor role
- vi. Preferably a diploma, master or doctoral degree in Education and Research. It is not necessary to fulfill all the criteria to become a chief editor

11.3.2: The roles of Chief Editor are:

- i. The key role of a journal's chief editor is to promote scholarship in the specialist field associated with the journal, whilst also promoting the journal as the best journal to publish in. For any journal, the editor will need to encourage new and established authors to submit articles and set up a reliable panel of expert reviewers. Editors are also

responsible for offering feedback to reviewers when required and ensure that any feedback to authors is constructive.

- ii. An editor should also familiarize themselves with the Committee on Publication Ethics (COPE) 'Code of Conduct and Best Practice Guidelines for Journal Editors'.
- iii. Depending on how the journal is managed and how it is structured, an Editor may have to make all the decisions regarding which articles to accept or reject for publication.

11.3.3: Managing editor:

The roles of managing editor are:

- i. To help the chief editor to achieve the above-mentioned goals
- ii. To communicate with the authors, reviewers, publishers and other agencies for smooth running of the journal
- iii. To regularly evaluate the research work
- iv. To communicate with funding and regulating agencies (HEC and others) for grants and accreditations.

11.3.4: Executive editor:

The roles of executive editor are:

- i. To evaluate the research articles presented for publication
- ii. To help the editorial board in policy making
- iii. To help the editorial board in smooth publishing
- iv. To communicate with reviewers and collaborate with external agencies for relevant purposes

11.3.5: Section editors:

Section editors are allotted different responsibilities. Some of these are mentioned below:

- i. Bibliography
- ii. Proof-reading

- iii. Academic writing reviewing, grammar and spell checking
- iv. Dissemination of articles for review
- v. Contact with publishers under the supervision of senior editorial team
- vi. Training of future reviewers, young members and other faculty members
- vii. others

11.3.5: Editorial advisory board:

Editorial advisory board members consist of national and international senior academicians, researchers, clinicians and others to help the current editorial board in designing, implementing and evaluating policies regarding upgrading the quality of research work. These people also share best practices to help the editorial team to refine their research work.

12. POLICY REGARDING RECRUITMENT AND CONTINUATION OF EDITORIAL BOARD

Policy for recruitment and continuation of the editorial board is based on the guidelines discussed in the previous section. The chief editor, managing editor and executive editors are recruited by the patron in-Chief. Members are then selected by them from amongst

the faculty who have an aptitude for research, and their names are endorsed by the patron. The tenure of editorial board is decided by the Patron after a period of 3 years whether to continue or recruit a new team or member. The editorial advisory board members are recruited for indefinite period by the editorial team of JMS.

13. Plagiarism policy

he journal is following the plagiarism policy of Higher Education Commission of Pakistan, and for this purpose, a plagiarism standing and review committee has been established under the chairmanship of Chief Editor of JMS along with 4 members amongst senior faculty. The committee has been given the authority to review research papers and plagiarism complaints related to published work in the journal.

14 Contact information

The office of managing editor or chief editor should be contacted anytime in working hours or can be contacted through their emails for correspondence.

REFERENCES

1. ICMJE recommendations
2. COPE guidelines
3. SCOPUS

This document is prepared in January 2020 to be used by editorial board, reviewers, researchers and faculty as a guide to make them aware of policies and procedures of publishing, conducting, writing, reviewing and evaluating the research published in JMS. This document is developed by including the recommendations of ICMJE (2019) and COPE guideline and in case of any conflict, lack of clarity and ambiguity, the recommendations of latest ICMJE recommendation and COPE will prevail.

