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Editorial

Original Articles

Editorial

Migraine in Children and Adults

Mohsin Masud Jan
Editor

Migraine is a common problem worldwide with significant morbidity and economic impact.[1] The direct costs of migraine are directly related to the severity of migraine pain and disability, and rise dramatically with prescription medication usage.[2,3] The indirect costs exceed the costs of medical care, however, and work-related disability is the most important determinant of the economic impact of migraine.[4] Migraineurs often miss work (absenteeism) or have reduced productivity at work (presenteeism).

Migraine is a type of headache characterized by recurrent attacks of moderate to severe throbbing and pulsating pain on one side of the head. The pain is caused by the activation of nerve fibers within the wall of brain blood vessels traveling inside the meninges (three layers of membranes protecting the brain and spinal cord).

Headaches are very common in children and teens. In fact, more than half will suffer from headaches at some point, and by 18 years the majority of adolescents have had them. And while most headaches are part of a viral illness, some are migraines. In fact, recurring migraines affect as many as one in 10 children and teens overall.

Migraines sometimes occur even earlier. Before puberty, boys and girls are equally likely to have them. After puberty, migraines are more common in girls.

Migraines are often one-sided in adults. In children they are more likely to be felt on both sides of the head, either in both temples or both sides of the forehead.

While it's not always easy to tell a migraine from another kind of headache, children often report throbbing pain may experience nausea and sensitivity to light and noise.

The flashing lights and other vision changes people often see as a migraine begins are less common in children. However, parents may notice that their child is more tired, irritable, or pale before a migraine begins and takes a while to get back to normal after it ends.

A number of different factors can increase your risk of having a migraine. These factors, which trigger the headache process, vary from person to person and include sudden changes in weather or environment, too much or not enough sleep, strong odors or fumes, emotion, stress, overexertion, loud or sudden noises, motion sickness, low blood sugar, skipped meals, tobacco, depression, anxiety, head trauma, hangover, some medications, hormonal changes and bright or flashing lights.

Epidemiologic data suggest that successful therapy of the most severely affected migraineurs may significantly impact the overall economic burden of migraine.[5] Migraine therapy employs preventive and symptomatic measures with pharmacologic and non-pharmacologic treatments are often used in both strategies. With careful examination of headache diaries and lifestyle influences, approximately 50-75% of migraineurs are able to identify factors that provoke their headaches.[6,7] Awareness and avoidance of specific migraine triggers are incorporated into the treatment strategy to decrease the frequency of migraine in a given individual. Triggers for migraine include various foods and beverages, stress or relief of stress, and hormonal factors (such as menstruation and pregnancy).[6,8,9]

Migraine is divided into four phases, all of which may be present during the attack. First phase is premonitory symptoms occur up to 24 hours prior to developing a migraine. These include food cravings, unexplained mood changes (depression or euphoria), uncontrollable yawning, fluid retention, or increased urination.

Second phase is Aura. Some people will see flashing or bright lights or what looks like heat waves immediately prior to or during the migraine, while others may experience muscle weakness or the sensation of being touched or grabbed.

Third phase is Headache. A migraine usually starts gradually and builds in intensity. It is possible to have migraine without a headache.

Fourth phase is Postdrome. Individuals are often exhausted or confused following a migraine. The postdrome periods may last up to a day before people feel healthy again.

It appears that migraines are caused by the nerves being more sensitive, and more reactive to stimulation. That stimulation could be stress, fatigue, hunger, almost anything. Migraines run in families. In fact, most migraine sufferers have someone in the family who gets migraines too.

The scientific reasons of migraine are those trigger chemicals, such as serotonin to narrow the blood vessels. Serotonin is a chemical necessary for communication between nerve cells. It can cause narrowing the blood vessels throughout the body. When serotonin or estrogen levels change, the result for some is a migraine.

The best way to prevent migraines is to identify and avoid triggers. The triggers are different in each person, which is why it's a good idea to keep a headache diary.

When a child gets a headache, write down what was happening before the headache, how badly it hurt and where, what helped, and anything else about it one can

think of. This helps to see patterns that can help to understand child's particular triggers. It's a good idea to make sure a child gets enough sleep, eats regularly and healthfully, drinks water regularly, gets exercise, and manages stress. Doing this not only helps prevent migraines, but is also good for overall health.

When a migraine strikes, sometimes just lying down in a dark, quiet room with a cool cloth on the forehead is enough. If it's not, ibuprofen or acetaminophen can be helpful. It's important not to give the child these medications more than about 14 days a month, as giving them more often can lead to rebound headaches and make everything worse. If those approaches aren't enough, a class of medications called triptans can be helpful in stopping migraines in children ages 6 and up.

If a child experiences frequent or severe migraine, leading to missed days of school or otherwise interfering with life, doctors often use medications to prevent migraines. There are a number of different kinds, and your doctor can advise you on what would be best for your child. Some girls get migraines around the time of their period. If that happens frequently, sometimes taking a prevention medicine around the time of menses each month can be helpful.

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Original Article

Frequency of Cardiac Arrest and Arrhythmias Associated with Admitted Patients in the Cardiac Care Unit in Hazara Division

Sardar Fawad Gul[1], Mohsin Khan[2], Mohammad Imran Khan[3], Zia Qamar[2], Adnan Haider[2] and Zulqarnain Dilawar[1]

ABSTRACT

Objective: The present study will determine the arrythmias proportion associated with sudden cardiac arrest in patients admitted to cardiac care unit.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Cardiology Department of Ayub Teaching hospital from April, 2023 to November, 2023.

Methods: The patients who needed cardiac resuscitation were accessed and were included in current study. We recorded initial cardiac rhythm, features of cardiac arrhythmia, demographic variables, comorbidities, and in-hospital complications till the patient's discharge. The categorical variables were presented in terms of percentages while continuous variables were presented as mean and standard deviation. Analysis of variance and chi-square was used to measure the significance which is kept less than 0.005. The data was analyzed using SPSS version 21.

Results: A total of 220 patients met the inclusive criteria and had SCA. The mean age of the studied sample was 65±9 years. The most common rhythm analyzed initially was VT in 32% (70) of individuals followed by PEA in 24% (53). Myocardial ischemia was found to be the most common immediate precipitating cause of arrhythmias (38%). ROSC was attained in 47% of patients, among which 58 patients survived to discharge (STD). PEA carried the worst mortality overall among cardiac arrhythmias while VT had the most favorable outcome with a proportion of 48.5% (34/70).

Conclusion: We concluded that shockable rhythm i.e. VT is still prevalent in developing countries like Pakistan while globally the behavior of arrythmias has been changed to non-shockable rhythms of unknown cause. The patients among which ROSC was restored within 5-10 minutes survived to discharge with good neurological status. However, it was observed that as the time for ROSC is prolonged, the neurological outcome and survival rate declines. Overall, PEA carries the worst mortality.

Key Words: Cardiac care unit (CCU), shockable rhythm, cardiac arrythmias, resuscitation, restoration of spontaneous circulation (ROSC).

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INTRODUCTION

Rapid recognition of peri-infarction malignant arrhythmias in modern cardiac care units evolved into different terrains, where patients suffering from heterogeneous concomitant comorbidities may now be treated successfully. Globally, cardiovascular disease (CVD) is the major cause of morbidity and death[1].

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From 1990 to 2019, there were approximately twice as many CVD prevalence cases (271 million) as there were fatalities due to CVD (12.1 million to 18.6 million)[2]. Current literature suggests that 80% of CVD cases occur in low- and middle-income countries, because of urbanization and ageing[3,4]. According to the study done in Khyber Pakhtunkhwa, the prevalence of cardiovascular disease (CVD) is 17.5%[5].

In a developing country like Pakistan, advanced health care like Primary percutaneous coronary intervention (PCI) is a big challenge to be available in every tertiary care hospital. For this reason, pharmacological thrombolysis is the most common method used in tertiary care hospitals[6]. In our country, due to low socioeconomic status, the presentation of cardiac events to hospitals is delayed. According to one institutional study, the attributed symptoms of other diseases is the most common reason for delayed presentation to hospital[5]. The delayed presentation and underlying comorbidities subject the patient to life-threatening

cardiac arrhythmia. Delayed diagnosis and thrombolysis lead to late blood flow storage, which increases infarct size, and subjects the patient to cardiac arrhythmia. So, the majority of CVD patients— about a third died upon arrival at the hospital, so timely diagnosis and immediate interventions are necessary[7]. Missing thrombolytic treatment also creates a group of individuals at high risk for developing later cardiac events, such as mortality, heart attack, stroke failure, and potentially fatal arrhythmias[8].

Underlying ischemic heart disease is the great victim of sudden cardiac arrest (SCA) in adults. Based on electrophysiology, the SCA can be categorized into ventricular tachycardia (VT), ventricular fibrillation (VF), asystole (ASY), and pulseless electrical activity (PEA). Studies have shown that in-hospital cardiac arrest associated with VT/VF can be survived to discharge because of shockable rhythm[9]. Previously it was thought that VT and VF were the most common arrhythmias associated with SCD but currently, the incidence has declined contrary to PEA/ASY— whose incidence increased for unknown reasons. Over time this change in the behavior of arrythmias also necessitates to study of the nature and prognostic implications of cardiac arrythmias. PEA/ASY is more prevalent and accounts for 30% of cardiac mortality and 20% of total mortality in adults[10]. Globally the overall survival rate from cardiac arrest is <10%[11].

It's important to assess the characteristics of different type of arrhythmias and their response to intervention. With an extensive review of the literature, we have found that the objective data on acute cardiac care and arrhythmias in CCUs are still scarce, and producing evidence-based institutional guidelines remains an issue. Starting from this background we have decided to undertake this study to know the major types of arrhythmias and response to intervention. Moreover, the present study also determined the demographic characteristics, comorbidities, and underlying causes of arrhythmias. This will create reliable data that help treat CCU physicians in better understanding and prevention of arrhythmias in cardiac patients.

METHODS

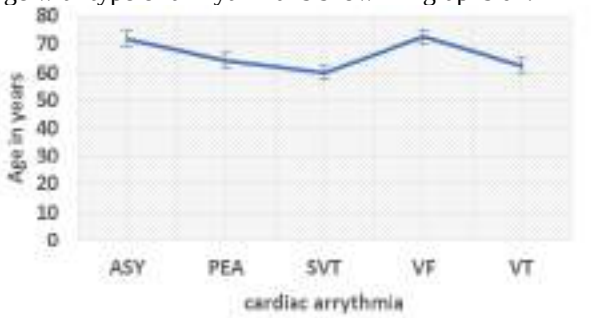
This was a prospective cross-sectional study that recruited all consecutive admissions to the cardiac care unit (CCU) of Ayub Teaching Hospital from 1st April 2023 to 30th November 2023. The institutional ethical committee approved the study with the safety of human subjects. A non-probability purposive sampling technique was applied for sample collection. The source of data collection was an online predesigned Google form, which was filled out by the healthcare professional and submitted with a special ID code.

The CCU at this facility is a single 16-bed, in which all admissions are triaged, accepted, and cured by a certified cardiologist of the institution. Information regarding cardiac arrhythmia, treatment, interventional procedure, and end event was explored from patient's files and electronic data from the Hospital management system (HMS). We categorized primary arrhythmias into seven different groups, namely ventricular fibrillation, ventricular tachycardia, pulseless electrical activity, asystole, torsade de point, supraventricular tachycardia, and unstable atrial fibrillation. We recorded the frequency and type of arrhythmias during admission. Moreover, the treatment, procedure, stay and outcome were also recorded for each patient. The primary endpoint of the study was to determine the frequency and type of arrhythmia in patients admitted to CCU. The patients with asymptomatic arrhythmia, hemodynamically stable atrial fibrillation, asymptomatic bradyarrhythmia, and diagnosed arrhythmia patients who don't need CCU care were excluded from the study.

Interquartile ranges (IQRs) and medians were used to display continuous data, while absolute numbers and percentage values were used to show categorical variables. The chi-square test was used to compare categorical variables, and the one-way analysis of variance was used to compare continuous variables. A p-value less than 0.05 was considered significant. The data was analyzed using SPSS version 21.

RESULTS

About 350 patients were presented with arrhythmias in current study but only 220 patients met the inclusive criteria (n=220) subjects of cardiac arrest were recruited with known initial cardiac rhythm. The mean age of the sample was 65±9years. 77% sampled population was obese with a mean BMI of 34kg/m^2. The relation of an age with type of arrhythmia is shown in graphs 01.



Graph No. 1: Relation age and type of arrhythmia (p=0.000)

Over 92% sampled population was diabetic (204/220) and only 9% (20/220) had controlled diabetes. Eighty-five percent of patients (188/220) were hypertensive and 65% had a duration greater than 5 years. The most common rhythm recorded initially on ECG was VT in 70 patients (32%) followed by, 53 PEA patients (24%), ASY49(22%), VF 40(18%), and SVT 8(4%) patients. No cases of torsade de points and unstable atrial fibrillation were recorded during the study period. The

characteristics are shown in table 1. Myocardial infarction was the most common immediate factor found for arrhythmia with frequency of 84/220(38%), followed by CCF 76(34.5%), arrhythmia with undetermined cause in 53(24%), pulmonary embolism 06(3%) and hypotension in 1 (0.4%) patient. Dilated cardiomyopathy was the most common underlying cardiac comorbidity with frequency of 74(33.6%), Ischemic cardiomyopathy 56(25.4%), valvular 50(22.7%), hypertrophic cardiomyopathy 24(11%) and no underlying structural heart disease was found in 16(7%) of individuals.

About 162 (73.6%) individuals died because of arrhythmia, 44(20%) survived with a good neurological state at hospital discharge while 14(6.3%) had poor neurological sequelae. All patients with PEA died in the hospital while 26 VT patients survived in a good conscious state at the hospital discharge detailed in Table 1. The factor which affects mortality is listed in Table 2.

Table No. 1: Different features of cardiac arrhythmia in patients of CCU

Characteristics		Asystole (ASY) n=49 (22%)	Pulseless Electrical activity (PEA) n=53(24%)	Supra ventricular Tachycardia (SVT)n=08(4%)	Ventricular Fibrillation (VF) n=40 (18%)	Ventricular Tachycardia (VT) n=70 (32%)	P value
Age(years)		71.9	64.5	62	70	65	0.000
BMI (Kg/m^2)		34	25	38	31	34	0.003
Hypertension		45	47	09	44	47	0.005
Diabetes	Poor control	42	45	20	34	43	
	Controlled	06	04	02	02	06	
	Non-diabetic	04	03	04	02	03	0.026
Event location	CCU	44	52	10	38	57	
	Ward	05	01	00	05	05	0.003
	Public	00	00	03	00	00	
Pharmacological agent given for arrythmia	Amiodarone	12	07	05	23	31	
	Atropine	01	02	01	01	03	
	Digoxin	09	01	01	05	02	
	Epinephrine	02	03	01	01	01	0.000
	lidocaine	01	01	01	01	00	
	Nor epinephrine	16	28	00	19	19	
	DNR	02	05	05	04	06	
Preexisting cardiac comorbidities	DCM	28	18	03	13	12	
	HCM	01	03	01	09	10	
	ICMP	04	22	03	11	16	0.000
	Valvular	16	10	01	11	12	
	unknown	04	02	05	00	05	
Electrical cardioversion		12	06	06	25	58	0.000
Discharge status	Survived with good conscious	05	00	07	05	27	
	Survived with poor conscious	00	00	02	05	07	0.000
	Died in hospital	44	53	01	35	29	

Table No.2: Factors significantly affecting hospital discharge status in patients experiencing cardiac arrest

Factors		Died in hospital 162(73%)	Survived with poor conscious status 14(6.3%)	Survived with good conscious status44 (20%)	Total	Significance level
Diabetes	Poor controlled	140	14	30	184	0.001
	Good controlled	10	00	10	20	
	nondiabetic	12	00	04	16	
Hypertension	yes	138	12	38	188	0.017
	no	24	02	06	32	
Event location	CCU	148	13	40	201	0.03
	ward	12	1	3	16	

	Public places	02	00	01	03	
ASY without subsequent VT/VF		44	06	10	60	0.000
PEA without subsequent VT/VF		42	16	10	68	0.001
Underlying comorbidities	DCM	54	05	15	74	0.000
	HCM	18	1	5	24	
	ICMP	41	4	11	56	
	Valvular	37	3	10	50	
	No cause	12	1	3	16	
Return of spontaneous circulation	<5min	01	01	00	02	0.000
	5-10min	19	04	13	36	
	10-20min	19	04	19	42	
	>20min	05	05	12	22	
	Not return	118	00	00	118	
Pharmacological agent	Amiodarone	57	05	16	78	0.001
	Atropine	06	00	02	08	0.001
	Digoxin	13	01	04	18	
	Epinephrine	06	01	01	08	
	Lidocaine	03	00	01	04	
	Nor-epinephrine	61	05	16	82	
	DNR	16	02	04	22	

DISCUSSION

We comprehensively evaluated 220 patients for cardiac arrhythmias who experienced sudden cardiac arrest either in public places, hospital wards, or CCU. Besides the high prevalence of CVD, the national literature regarding arrhythmia in CCU is still scarce.

In the present study, the mean age of sampled data who experienced sudden cardiac arrest is older than reported by Faiza Ahmed et al[12]. — the recent study conducted in Karachi. The reason could be the small sample size, demography, and period of the COVID-19 pandemic. Overpopulation is older than reported by Moosajee, U.S. et al[13] and Khan NU et al[14] but interestingly the mean age is near to that reported by Tseng ZH et al[15]. The sampled population who experienced cardiac arrest due to VF, ASY, and PEA are older than the population with VT and SVT. We observed that the frequency of VT/VF (shockable rhythm) is still higher than reported previously by Faiza Ahmed et al[12]. Although the global incidence of VT/VF is declining because of unknown cause[11]. The reason for the difference could be the hospital setting and sample size, we observed arrhythmia in CCU while Faiza Ahmed et al observed it in Medical ICU, CCU, COVID-ICU, and HDU[12]. Cardiac ischemia is the most common immediate factor responsible for arrhythmias and dilated cardiomyopathy is the most common preexisting cardiac comorbidity in patients who experience sudden cardiac arrest[11]. Contrary to Faiza Ahmed et al. respiratory insufficiency is the most common immediate factor responsible for arrhythmia and ASY is the most common initial rhythm observed in sudden cardiac arrest[12]. Unfortunately, over 85% of all patients who experienced SCA are diabetic, hypertensive with obesity.

ROSC was achieved in 47% of patients, and survived to discharged (STD) proportion is 24%. In comparison with Moosajee, U.S. et al 27% ROSC was achieved and 7.5% STD. The difference in proportion is likely due to event location. In our study, 99% of patients experienced hospital SCD while in Moosajee, U.S. et al only 33% of patients experienced SCD in the hospital. It is predetermined that hospital cardiac arrest has more survival than hospital SCD[12]. All patients in whom the ROSC achieved less than 5 min survived, and greater than 50% in whom ROSC achieved less than 20 min survived while mortality increased after 20 min ROSC. In terms of initial rhythm vs STD, 55% VT and 18% VF (shockable rhythm) STD as compare to 12% ASY and 00% PEA (non-shockable rhythm). These findings are almost consistent as reported by Moosajee, U.S. et al[13]. A negligible mortality difference is noted in patients who experienced ASY vs patients who experienced ASA with subsequent VT/VF while a significant difference is noted in patients with good neurological outcomes in survived patients. A significant difference is noted in the mortality of patients who experienced PEA with subsequent VT/VF Vs only PEA. Mortality is higher in patients with only the PEA group vs the PEA with the VT/VF group which is 80% vs 61% respectively. 45% of patients STD who initially received amiodarone as initial antiarrhythmic while epinephrine was commonly antiarrhythmic reported by Moosajee, U.S. et al[13]. The variance could be due to a relative difference in the proportion of initial cardiac rhythm.

CONCLUSION

The present study concluded that the patients with cardiac arrhythmia are older than previously reported at global and national levels. Over 85% sampled population have poorly controlled hypertension and diabetes. All patients encountered in CCU with arrhythmia are overweight. The incidence of VT is still

high in developing countries like Pakistan despite global decline. The most common immediate cause responsible for arrhythmia is myocardial ischemia. The proportion of ROSC was high in patients who experienced cardiac arrest inside the hospital. The survival to discharge with a good conscious state is high in patients whose ROSC is 5-10min, while mortality and poor neurological outcome drastically increased in patients with whom ROSC is ≥ 20min. PEA carries the worst in-hospital mortality, all patients died during management, while shockable rhythm—VT carries have favorable discharge status among all arrythmias..

Author's Contribution:

Concept & Design of Study:	Sardar Fawad Gul
Drafting:	Mohsin Khan¸ Mohammad Imran Khan
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Revisiting Critically:	Sardar Fawad Gul, Mohsin Khan
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Original Article

Dentists' and Dental Students' Perspectives on Amalgam Restoration in Saudi Arabia

Abdulaziz Alhumaid[1], Abdulaziz Alrebdi[2], Ebrahim Alshawy[3], Nawaf Almutairi[1] and Yasir Alyahya[1] and Ahmed Alharbi[1]

ABSTRACT

Objective: The study aims to assess dentists and dental students prospectively regarding amalgam and their opinions when dealing with it in the dental practice in Saudi Arabia.

Study Design: A cross-sectional study.

Place and Duration of Study: This study was conducted at the Qassim University's College of Dentistry from April 2021 to May 2023.

Methods: A cross-sectional study among dentists and dental students in the Kingdom of Saudi Arabia was conducted. The study included dentists from both public and private health care facilities. Data was collected using online google form, which consisted of demographic information and knowledge, attitude and practices of participants toward the use of amalgam material. Data was analyzed using chi-square test.

Results: Out of 122 participants, the majority were students (n=62), followed by specialists (n=25) and general practitioners (GP) dentists (n=22). A significantly higher percentage of participants revealed that the amalgam is not dangerous in the workplace (n=60, 49.2%). Moreover, a number of 81 participants (66.4%) said that amalgam restorations cannot be replaced by resin restoration. The specialist reported that most of their patients (n=22, 88.0%) do not prefer amalgam restorations due to the dark colour of the amalgam.

Conclusion: According to the results of this study, dental professionals in Saudi Arabia believe that amalgam is a risk-free material. Alternatives to dental amalgam are generally preferred by dental professionals mainly for esthetic concerns.

Key Words: Amalgam, Dentist, Dental Amalgam, Dental restoration, filling, KAP, Mercury

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INTRODUCTION

Dental amalgam has been commonly used as a dental restorative material for over 150 years and has provided patients with a valuable and comparatively affordable treatment ever since. The data that is currently available demonstrates that dental amalgams are beneficial and risk-free; however, some of these concerns have been brought to light.[1]

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Even though there is ongoing debate regarding the impact that waste containing mercury its physical properties, longevity, and less manual dexterity, this substance holds high importance in public health services.[2,3] Likewise national health authorities advised in previous years that amalgam should not be the first choice when placing restorations.[4] In addition, there is a discernible effort in the direction of dental educational institutions placing a greater emphasis on teaching dental students how to use mercury-free substitutes, in accordance with the guidelines outlined in the Minamata Convention on Mercury.

According to reports, public and media discourse influences dentists' views on amalgam.[5] In their survey, Khairuldean and Sadig reported that 75% of Saudi Arabian dentists were aware of the controversy surrounding the safety of amalgam.[5] Approximately, 85% of these dentists believed amalgam to be safe, while only 41% have been cognizant of all of the clinical symptoms of amalgam toxicity. Patients' perspective of dental aesthetics indicates that part of the population is unsatisfied with the metallic colour of the restorations in their teeth. Even so, there was an indication of a transition away from using silver

amalgam to much more aesthetic tooth-coloured restorations over the last decade.[6] This could explain why dentists' and patients' preferences have changed in recent years. We tried to find out the answers to these issues in this report. This research looks at how a subset of dentists and students thought about amalgam and how they felt about dealing with it in Saudi Arabia.

METHODS

A cross-sectional study among dentists in the Kingdom of Saudi Arabia was conducted. This study was carried out at Qassim University's College of Dentistry from April 2021 to May 2023, with approval from the College of Dentistry Research Center (Reg. EA/6110/2021). A sample of 10 dentists and dental students just beginning clinical practice in Saudi Arabia was used for the pilot test of the questionnaire to evaluate its clarity in terms of both its structure and its content. The inclusion criteria were dental students beginning clinical practice and dentists. The study included dentists from both public and private healthcare facilities. Junior students who had not begun their clinical practice were among the exclusion criteria. Reminder emails were sent in two stages to enhance the response rates: one in February 2022 and another in November 2022. The questionnaire has 18 closed-ended questions and it was divided into two sections. The first section was regarding the demographic data and the characteristics of the practice (private practice, government hospitals). The second part focused on measuring the perspective and knowledge of dentists regarding amalgam use and hazards, case selection, and safety concerns. The last question that was posed to the participants inquired as to whether or not they routinely employed amalgam restorations in their professional work. The collected data were analyzed using Statistical Package for Social Science (SPSS Inc). Descriptive statistics and frequency tables were compiled in order to provide an overview of the responses. For the statistical data analysis, the Chi-square test was utilized for categorical variables, and Fisher's exact test was used to assess the variations among groups.

RESULTS

A cross-sectional study was conducted among dental professionals between April 2021 to May 2023. Before the start of the study, Institutional ethical clearance was obtained from the College of Dentistry, Qassim University. The present study questionnaire was sent to 150 participants. Only 122 participants completed the questionnaire (response rate = 81.3%). Out of 122 participants, a number of 80 participants (65.6%) were males and 42 participants (34.4%) were female. It was observed that, out of the 122 participants, the majority of them were students (n=62), followed by specialists (n=25) and GP dentists (n=22). Most of the specialists and GP dentists were working in the government sector (n=108, 88.5%), while 14 participants (11.5%) were working in the private sector (Table 1).

Table No.1: Demographic Profile

Variables	Student	Intern	GP dentist	Specialist	Consultant	Total	p-Value
Gender							
Male	37 (59.7%)	3 (27.3%)	17 (77.3%)	21 (84.0%)	2 (100.0%)	80 (65.6%)	0.007
Female	25 (40.3%)	8 (72.7%)	5 (22.7%)	4 (16.0%)	0 (0.0%)	42 (34.4%)	
Age							
20-30	62 (100.0%)	11(100.0%)	22(100.0%)	25(100.0%)	2 (100.0%)	122(100.0%)	
Service sector							
Private	1 (1.6%)	0 (0.0%)	8 (36.4%)	5 (20.0%)	0 (0.0%)	14 (11.5%)	0.000
Government	61 (98.4%)	11(100.0%)	14(63.6%)	20 (80.0%)	2 (100.0%)	108(88.5%)	

Table No. 2: Knowledge about Amalgam

Variables	Student	Intern	GP dentist	Specialist	Consultant	Total	p-Value
5. Patients perception in the amalgam toxicity comes from?							
Social media	49 (79.0%)	10 (90.9%)	16 (72.7%)	19 (76.0%)	1 (50.0%)	95 (77.9%)	0.358
Research	6 (9.7%)	1 (9.1%)	3 (13.6%)	1 (4.0%)	0 (0.0%)	11 (9.0%)	
Banned	5 (8.1%)	0 (0.0%)	2 (9.1%)	3 (12.0%)	0 (0.0%)	10 (8.2%)	
The long contravery	2 (3.2%)	0 (0.0%)	1 (4.5%)	2 (8.0%)	1 (50.0%)	6 (4.9%)	
6.What is your patient's view on the amalgam fillings?							
Safe	13 (21.0%)	3 (27.3%)	1 (4.5%)	11 (44.0%)	1 (50.0%)	29 (23.8%)	0.026
Unsafe	5 (8.1%)	2 (18.2%)	6 (27.3%)	5 (20.0%)	0 (0.0%)	18 (14.8%)	
Uncertain	44	6 (54.5%)	15	9 (36.0%)	1 (50.0%)	75 (61.5%)	

	(71.0%)		(68.2%)				
9- What is your perception in using dental amalgam							
Higher strength and longevity	39 (62.9%)	4 (36.4%)	8 (36.4%)	13 (52.0%)	1 (50.0%)	65 (53.3%)	0.128
Less technique sensitive	9 (14.5%)	2 (18.2%)	2 (9.1%)	2 (8.0%)	1 (50.0%)	16 (13.1%)	
Unconservative restorations	14 (22.6%)	5 (45.5%)	12 (54.5%)	10 (40.0%)	0 (0.0%)	41 (33.6%)	
15- Is dental amalgam an occupation hazard at your place of work?							
Yes	28 (45.2%)	10 (90.9%)	13 (59.1%)	10 (40.0%)	1 (50.0%)	62 (50.8%)	0.047
No	34 (54.8%)	1 (9.1%)	9 (40.9%)	15 (60.0%)	1 (50.0%)	60 (49.2%)	
Total	62 (100.0%)	11 (100.0%)	22 (100.0%)	25 (100.0%)	2 (100.0%)	122 (100.0%)	

Table 3: Attitude about Amalgam use

Variables	Student	Intern	GP dentist	Specialist	Consultant	Total	p-Value
12- How often do you use amalgam for restorations in your daily clinical practice?							
Always	1 (1.6%)	1 (9.1%)	0 (0.0%)	2 (8.0%)	0 (0.0%)	4 (3.3%)	0.003
Sometime	4 (6.5%)	2 (18.2%)	2 (9.1%)	10 (40.0%)	1 (50.0%)	19 (15.6%)	
Rarely	19 (30.6%)	4 (36.4%)	3 (13.6%)	7 (28.0%)	0 (0.0%)	33 (27.0%)	
Never	38 (61.3%)	4 (36.4%)	17 (77.3%)	6 (24.0%)	1 (50.0%)	66 (54.1%)	
14- What is your reasons not to use amalgam filling?A							
Mercury toxicity	27 (43.5%)	3 (27.3%)	5 (22.7%)	3 (12.0%)	0 (0.0%)	38 (31.1%)	0.001
Unesthetics	7 (11.3%)	3 (27.3%)	7 (31.8%)	12 (48.0%)	1 (50.0%)	30 (24.6%)	
Patient's desire	25 (40.3%)	2 (18.2%)	6 (27.3%)	3 (12.0%)	0 (0.0%)	36 (29.5%)	
Unconservative	3 (4.8%)	3 (27.3%)	4 (18.2%)	7 (28.0%)	1 (50.0%)	18 (14.8%)	
16- Do you agree or disagree that successful amalgam restorations can be replaced with composite resin?							
Agree	25 (40.3%)	2 (18.2%)	8 (36.4%)	5 (20.0%)	1 (50.0%)	41 (33.6%)	0.307
Disagree	37 (59.7%)	9 (81.8%)	14 (63.6%)	20 (80.0%)	1 (50.0%)	81 (66.4%)	
18- Do you agree or disagree with the established ban on amalgam use in some countries?							
Agree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	-
Disagree	62(100.0%)	11 (100.0%)	22(100.0%)	25(100.0%)	2 (100.0%)	122(100.0%)	
Total	62(100.0%)	11 (100.0%)	22 (100.0%)	25(100.0%)	2 (100.0%)	122(100.0%)	

Table No.4: Practice of amalgam restoration

Variables	Student	Intern	GP dentist	Specialist	Consultant	Total	p-Value
7- What is your patient concerned regarding amalgam filling?							
Color	53 (85.5%)	8 (72.7%)	16 (72.7%)	22 (88.0%)*	1 (50.0%)	100 (82.0%)	0.000
Toxicity	8 (12.9%)	3 (27.3%)	4 (18.2%)	2 (8.0%)	0 (0.0%)	17 (13.9%)	
Health problem	0 (0.0%)	0 (0.0%)	2 (9.1%)	1 (4.0%)	0 (0.0%)	3 (2.5%)	
Environment effects	1 (1.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (50.0%)	2 (1.6%)	
8- Would you recommend an alternative to amalgam?							
Yes	47 (75.8%)	8 (72.7%)	18 (81.8%)	19 (76.0%)	1 (50.0%)	93 (76.2%)	0.761
No	8 (12.9%)	2 (18.2%)	3 (13.6%)	4 (16.0%)	0 (0.0%)	17 (13.9%)	

Uncertain	7 (11.3%)	1 (9.1%)	1 (4.5%)	2 (8.0%)	1 (50.0%)	12 (9.8%)	
10- What criterion will you use to decide whether or not to replace amalgam restoration? p							
Patient wishes	22 (35.5%)	4 (36.4%)	4 (18.2%)	4 (16.0%)	0 (0.0%)	34 (27.9%)	0.100
Aesthetic	15 (24.2%)	2 (18.2%)	1 (4.5%)	5 (20.0%)	1 (50.0%)	24 (19.7%)	
Criteria of defective restoration	25 (40.3%)	5 (45.5%)	17 (77.3%)	16 (64.0%)	1 (50.0%)	64 (52.5%)	
11- Which of the following amalgam substitutes do you prefer? P							
Glass ionomer and resin modified glass ionomer	11 (17.7%)	1 (9.1%)	3 (13.6%)	1 (4.0%)	0 (0.0%)	16 (13.1%)	0.218
Indirect restoration inlay and onlay	23 (37.1%)	7 (63.6%)	5 (22.7%)	7 (28.0%)	1 (50.0%)	43 (35.2%)	
Resin composite	28 (45.2%)	3 (27.3%)	14 (63.6%)	17 (68.0%)	1 (50.0%)	63 (51.6%)	
13- In which of the following do you use dental amalgam?P							
Simple cavity	7 (11.3%)	0 (0.0%)	0 (0.0%)	1 (4.0%)	0 (0.0%)	8 (6.6%)	0.141
Complex cavity	18 (29.0%)	5 (45.5%)	6 (27.3%)	14 (56.0%)	0 (0.0%)	43 (35.2%)	
Core material	8 (12.9%)	1 (9.1%)	1 (4.5%)	2 (8.0%)	1 (50.0%)	13 (10.7%)	
Not used	29 (46.8%)	5 (45.5%)	15 (68.2%)	8 (32.0%)	1 (50.0%)	58 (47.5%)	
17- If your patient had faulty amalgam restoration, what is your retreatment plan?							
Amalgam	3 (4.8%)	0 (0.0%)	2 (9.1%)	2 (8.0%)	0 (0.0%)	7 (5.7%)	0.888
Composite	26 (41.9%)	4 (36.4%)	12 (54.5%)	11 (44.0%)	1 (50.0%)	54 (44.3%)	
Indirect restoration inlay and onlay	33 (53.2%)	7 (63.6%)	8 (36.4%)	12 (48.0%)	1 (50.0%)	61 (50.0%)	
Total	62 (100.0%)	11 (100.0%)	22 (100.0%)	25 (100.0%)	2 (100.0%)	122 (100.0%)	

Comparative analysis of different dental care professionals and their knowledge, attitude and practices are shown in Tables 2,3 and 4. It was observed that the majority of the participants reported that Social media 95 (77.9%) was responsible for spreading myths about amalgam toxicity. However, a number of 75 participants (61.5%) were uncertain about their view on amalgam safety. On the other hand, most of the participants reported that amalgam is not hazardous at the workplace (n=60, 49.2%) (Table 2).

Table 3 illustrates the attitude of study participants toward amalgam use. It was surprising to know that even though they said it was not hazardous. Most of the participants (n=66 (54.1%)) do not use amalgam restoration in their daily routine. Moreover, a number of 81 participants (66.4%) disagree that amalgam restorations can be replaced by resin restoration. A significant number of respondents (31.1%) chose "Mercury toxicity" as their reason for not using amalgam fillings, followed by "Patient's desire" (29.5%) and then "Unesthetics" (24.6%).

Lastly, participants' perception of their amalgam practice was recorded. Specialists reported that most of the time, their patients do not prefer amalgam restorations due to colour (n=22 (88.0%)) with a p-value of <0.05. The majority of GPs (n=18 (81.8%)) and consultants (n=19 (76.0%)) recommend an alternative to amalgam. The resin composite was found to be the most recommended material by GPs (n=14 (63.6%)) and consultants (n=17 (68.0%)). Most of the consultants (n=14 (56.0%)) would use amalgam only for complex cavities. However, in the case of faulty amalgam restoration, a number of 61 respondents (50.0%) plan to use indirect (inlay or onlay) restorations (Table 4).

DISCUSSION

The utilization of dental amalgam on a global scale has experienced a sizeable decrease over the past two

decades.[7,8] A practical assessment of the uses of amalgam in the past and an amalgam ban in the future requires certain presumptions.[9]

In view of this, we asked the patients about their source of information related to amalgam and it was found that Social media (n=95 (77.9%)) was responsible for spreading myths about amalgam toxicity. These results found similar published by other studies.[9-11] When compared with GPs, the current study found that 11% of specialists thought amalgam was safe to use. Nevertheless, a study carried out by Al-Nahedh HN et al. reported that 60.2% of GPs and specialists proclaimed it to be safe for both the dentist and the patient, whereas only 14.9% proclaimed it to be unsafe for both. Al-Nahedh HN et al. and Yaseen et al. reported contradictory results in terms of the percentage of GDPs (53%) and specialists (48%) who consider amalgam to be safe.[7, 12, 13]

In the current study, the vast majority of intern 10 dentists (90.9 %) and approximately 50% of general practitioner dentists (GP) found amalgam to be an occupationally safe material. The research conducted by Bamise et al[14] revealed that 26% of participants held the belief that mercury could be harmful to the health of humans.[13]

Longevity was cited as the primary reason for considering dental amalgam by the vast majority of respondents findings that were reported by Faraj et al. were consistent with the findings of the current study.[7,9] It was surprising to know that even though they said it was not hazardous but a number of 66 participants (54.1%) did not use amalgam restoration in their daily routine, which was found to be similar to a study done by another author, who reported that 80% of the participants do not frequently use amalgam restorations in their clinical practice. This could indicate an optimistic influence of the Minamata Convention attributes on Mercury on the dental curriculum.

Moreover, a number of 81 participants (66.4%) in the present study disagreed that amalgam restorations can be replaced by resin restoration. Similarly, Alkhudhairy F discovered that 72% of the people who participated in this study had different opinions. On the other hand, the results of another survey revealed that 21% of dentists removed amalgam restoration at the request of their patients. In the present study, specialists reported that due to colour (n=22 (88.0%)) most of the patients do not prefer amalgam restorations with $p<0.05$ and the majority of GPs (81.8%) and consultants (76.0%) recommend an alternative to amalgam. This is consistent with the findings of Yaseen.[12] Glass ionomer was the most preferred option as a restorative material in the study conducted by Faraj and coworkers.[7,9] In terms of colour preferences, similar results were reported by an author and Vidnes- Kopperud et al.[15] favoured esthetics (77.1%) as the main reason to limit the use of amalgam, followed by patients' desire (58.6%). In addition, Espelid et al. found that regardless of gender, patients were more concerned about the aesthetics of their restorations than the longevity of the restorations.[16]

In the current study, to replace faulty amalgam restoration, a number of 61 participants (50.0%) planned to use indirect (inlay or onlay) restorations. While another reported Large restorations (49.4%) and crown build-up (31.5%) were the most common restorative. One of the limitations of the current study is that only a small percentage of dentists participated in the survey, which makes it hard to generalize the results.

CONCLUSION

The results of this study suggested that dentists in Saudi Arabia believe it is safe to use amalgam. Based on these findings, we can draw the conclusion that dental amalgam is well approved by both dentists and patients in Saudi Arabia. Furthermore, the majority of dentists believe that amalgam is safe for both dentists and patients. In general, dentist favor alternatives to dental amalgam for esthetic reasons, and for the most part, dentists do not use dental amalgam routinely as per the requests of their patients.

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Original Article

Effects of Intra-Cameral Dexamethasone after Uncomplicated Phacoemulsification

Muhammad Saad Ullah, Muhammad Usama Rahim and Hassan Shoaib

ABSTRACT

Objective: To assess the efficacy of administering dexamethasone through intra-cameral injection in comparison to the conventional application of topical steroids for individuals undergoing phacoemulsification.

Study Design: Quasi experimental trial study

Place and Duration of Study: This study was conducted at the department of Ophthalmology Ghazi Hospital Dera Ghazi Khan form September 2022 to August 2023.

Methods: Eighty patients of age 55-80 years were enrolled in the study and divided into two groups 1 and 2. In group 1 patient were given intra-cameral dexamethasone and in group 2 equal amount of 0.01 ml normal saline was administered.

Results: At 1st post-operative day mean IOP in group 1 was 14.75±2.55 and in group 2 was 17.85±2.22. Similarly, at day 7 mean IOP in group 1 was 13.18±2.14 and in group 2 it was 12.44±1.74. In comparison pre operative IOP was in group 1 and 2 was 16.19±2.54 and 12.44±1.74 respectively.

Conclusion: Intraoperative inflammation following phacoemulsification surgery can be effectively managed by administering intra-cameral dexamethasone injection, resulting in decreased flare and anterior chamber cells, with comparable impacts on IOP and visual acuity when compared to the use of topical steroids.

Key Words: Dexamethasone, Effectiveness, Intra ocular pressure, Intra-cameral injection, Phacoemulsification.

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INTRODUCTION

Phacoemulsification, a contemporary and widely adopted surgical technique in ophthalmology for cataract removal, emerged as an advancement over the mid-20th-century standard method, extracapsular cataract extraction (ECCE)[1], wherein the entire cloudy lens was removed intact, preserving the outer capsule. Credited to American ophthalmologist Dr. Charles Kelman in the 1960s[2], phacoemulsification innovatively utilizes ultrasound to fragment the lens material, allowing for aspiration through a small incision, revolutionizing cataract surgery[3,4]. Ongoing technological advancements in phacoemulsification machines, marked by superior ultrasound technology, advanced fluidics, and sophisticated control systems, have significantly enhanced the safety and precision of cataract surgery[5, 6].

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However, a prevalent complication associated with this technique is the potential for patients to undergo prolonged inflammation, resulting in elevated intraocular pressure, ocular irritation, and the development of cystoid macular edema, often necessitating additional medications or interventions[7].

Corticosteroids, widely employed in ophthalmology for years, exhibit anti-inflammatory and immunosuppressive attributes[8], proving effective in managing various inflammatory eye conditions[9]. Typically administered as topical eye drops or injections, these steroids are prescribed postoperatively to control inflammation, with topical drops used for a specified duration. Intraocular steroid injections may also be employed intra-operatively or post-operatively, particularly in cases with elevated inflammation risk or pre-existing inflammatory conditions[10, 11].

The findings of this study may contribute to the optimization of postoperative management strategies in cataract surgery, providing evidence-based guidance for the use of intra-cameral dexamethasone in routine clinical practice. Understanding the specific benefits and potential risks associated with this approach could lead to improved patient outcomes, enhanced surgical recovery, and a more tailored and effective postoperative care protocol for individuals undergoing uncomplicated phacoemulsification.

METHODS

Study involved 80 patients having age between 55-80 years and admitted at hospital for phacoemulsification under topical anesthesia. Study was started after approval from chairman authorized committee and consent was obtained from patients after detailed description of procedure and study. Demographic, pre-operative examination findings and post-operative findings at day 1 and day 7 were recorded on predesigned performa. Furthermore, before 1 week of procedure biometry was performed. Patients diagnosed as grade II and IV cataract from nuclear sclerosis, intraocular pressure in normal range and 6/12 or above visual acuity were enrolled in the study. Patients with history of previous ocular surgery, recently using non-steroidal anti-inflammatory drugs, having additional disease of eye, steroid susceptibility and use of immunosuppressant drugs were excluded from the study.

One hour before intervention 0.5% Proparacaine Hydrochloride solution was administered to the pointed eye. After establishment of standard anesthesia phacoemulsification was done with soft intraocular acrylic lens implantation. At the end of surgery, injection of intracameral dexamethasone sodium phosphate was given in group 1 patients at 0.4mg/0.1ml concentration. In group 2, equal volume of normal saline was injected as control. All procedures were performed by same ophthalmic surgeon and uneventfull surgeries were projected. Post operative steroids and antibiotics were given as per ward protocol.

Post-operative examination was done at day 1 and 7 and outcomes were assessed which include intraocular pressure (IOP) that was measured on Goldmann Applanation Tonometer, visual acuity was measured on Snellen chart. Anterior segment was examined on slit lamp. Anterior chamber flare grading was assessed by using scoring system of SUN Working Group Slit Lamp Grading Scheme. SPSS version 27 was used for data analysis. After application of significance test p value below 0.05 was considered significant.

RESULTS

In group 1, age of patients was 62.73±6.28 years and in group 2 64.37±6.09 years. Regarding gender group 1 comprised 11 (27.5%) females and 29 (72.5%) males and in group 2, 13 (32.5%) females and 27 (67.5%) males. The mean pre-operative visual acuity was in group 1 was 0.68±0.21, at 1st post-operative day 0.29±0.09 and it was 0.22±0.07 at 7th day. Similarly visual acuity in group 2 was 0.76±0.18, 0.35±0.08, and 0.23±0.10 in pre-operative, 1st post-operative day and 7th post-operative respectively. Notably, the visual acuity at these time points was comparable between the two groups and showed no statistically significant differences (Table I).

The anterior chamber flare scores in group 1 at day was not found in any patient in 3 (7.5%) patients, in 16 (40.0%) patients it was faint, in 16 (40.0%) patients it was moderate, intensive in 3 (7.5%) patients and marked in 2 (5.0%) patients. In Group II, the corresponding scores showing zero results were 2.5% or 1 patient, faint results were found in 27.5% or 11 patients and moderate results in 57.5% or 23 patients, marked in 10.0% or 4 patients, and intensive in 2.5% or 1 patient. The difference in anterior chamber flare scores at day 1 between the two groups was ($p>0.050$). At day 7, the anterior chamber flare scores in Group I included none in 28 (70.0%) patients, faint in 9 (22.5%) patients, moderate in 2 (5.0%) patients, marked in 1 (2.5%) patient, with no patients exhibiting intensive scores. In Group II, the corresponding scores were none in 12 (30.0%) patients, faint in 23 (57.5%) patients, and moderate in 5 (12.5%) patients. The difference in anterior chamber flare scores at day 7 between the two groups was found to be $p<0.050$ according to Table II.

At 1st post-operative day mean IOP in group 1 was 14.75±2.55 and in group 2 was 17.85±2.22. Similarly, 7th post-operative day mean IOP in group 1 was 13.18±2.14 and in group 2 it was 12.44±1.74. In comparison pre operative IOP was in group 1 and 2 was 16.19±2.54 and 12.44±1.74 respectively. However, the observed differences in mean IOP between the two groups showing $p>0.050$, as indicated in Table III.

Table No. 1: Baseline characteristics and demographics

Characteristic	Group 1	Group 2	p-value
Age (years)	62.73±6.28	64.37±6.09	0.401
Gender			
Male	29 (72.5)	27 (67.5)	0.626
Female	11 (27.5)	13 (32.5)	
Visual Acuity			
Pre-operative	0.68±0.21	0.76±0.18	0.077
1st Post-operative day	0.29±0.09	0.35±0.08	0.010
7th Post-operative day	0.22±0.07	0.23±0.10	0.572

Table No. 2: Anterior chamber cells and flare score

Grading	Group 1	Group 2	p-value
	At Day 1		
None	3 (7.5)	1 (2.5)	0.303
Faint	16 (40.0)	11 (27.5)	
Moderate	16 (40.0)	23 (57.5)	
Marked	2 (5.0)	4 (10.0)	
Intensive	3 (7.5)	1 (2.5)	
At Day 7			
None	28 (70.0)	12 (30.0)	0.002
Faint	9 (22.5)	23 (57.5)	
Moderate	2 (5.0)	5 (12.5)	
Marked	1 (2.5)	0 (0.0)	
Intensive	0 (0.0)	0 (0.0)	

Table No. 3: Intraocular Pressure parameters of the study groups

Intra Ocular Pressure (mmHg)	Group 1	Group 2	p-value
Pre-operative	16.19±2.54	17.85±2.22	0.250
1st Post-operative day	14.75±2.55	14.54±3.81	0.815
7th Post-operative day	13.18±2.14	12.44±1.74	0.098

DISCUSSION

Due to the historically linked undesirable side effects of cataract formation and elevated intraocular pressure associated with intraocular triamcinolone in phakic eyes, we have chosen to employ dexamethasone as an alternative for treating eye inflammation, addressing relevance about triamcinolone crystalline nature and its potential impact on intraocular pressure[12].

The mean age of patients was 62.73 ± 6.28 years in Group 1, while in Group 2, it was 64.37 ± 6.09 years. A previous study by Jan et al[13] found a comparable mean age of 71 ± 9.4 years in Group 1 and 69.8 ± 10.5 years in Group 2. Additionally, El-Haddad et al[14] found non-significant effect of intracameral triamcinolone on IOP. But, anti-inflammatory outcomes were highly effective. Contrast observations were reported by Shaheen et al[15], that topical dexamethasone and intracameral triamcinolone have similar effectiveness when used following phacoemulsification procedure. Another study was conducted by Elkhodary et al[16] and reported that intracameral triamcinolone utilization have much better outcomes on post-operative outcomes following phacoemulsification.

In the present study a statistically significant difference was observed between anterior chamber cells and flare at 7th post-operative day as p value <0.05. But regarding intraocular pressure and visual acuity this difference was not statistically significant p value >0.05. These findings are in concordance with findings of study conducted by Albialy et al[17] reporting significant impact of anterior chamber cells and flare but insignificant regarding IOP. Manzoor et al[18] highlighted anterior chamber reaction as a predominant factor in their findings. Conversely, Gungor et al[19] observed no significant difference in anterior chamber cells and flare between intra-cameral dexamethasone and topical steroid formulation. Interestingly, our study concurs with findings of Gungor et al regarding IOP and visual acuity. Tan et al[20] conducted a study and on comparison of topical drops of dexamethasone and intracameral dexamethasone but no difference was observed regarding outcomes of visual acuity and post-operative inflammation.

Another study was conducted on pediatric population by Khan et al[21], in that study 50% of patients were administered dexamethasone intracameral and other half were administered sub-conjunctival dexamethasone. At the end of study variation was observed regarding ocular inflammation as higher frequency 26.7% was observed in group of sub-conjunctival patients and intracameral administration observed 6.7% inflammation.

Limitations: If the study is conducted at a single center, it might lack external validity. Different healthcare settings, patient populations, and surgical practices in other centers may influence the generalizability of the findings.

Recommendations: Stimulate further research on the long-term effects and cost-effectiveness of intra-cameral dexamethasone. Provide evidence for the integration of intra-cameral dexamethasone in routine phacoemulsification procedures to enhance postoperative outcomes.

CONCLUSION

Intraoperative inflammation following phacoemulsification surgery can be effectively managed by administering intra-cameral dexamethasone injection, resulting in decreased flare and anterior chamber cells, with comparable impacts on IOP and visual acuity when compared to the use of topical steroids.

Author's Contribution:

Concept & Design of Study:	Muhammad Saad Ullah
Drafting:	Muhammad Usama Rahim, Hassan Shoaib
Data Analysis:	Hassan Shoaib
Revisiting Critically:	Muhammad Saad Ullah, Muhammad Usama Rahim
Final Approval of version:	Muhammad Saad Ullah

Conflict of Interest: The study has no conflict of interest to declare by any author.

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Original Article

Anatomical Variation in the Location of Mandibular Foramen with Age Using Cone Beam Computed Tomography

Anatomical Variation of Mandibular Foramen Using Cone Beam CT

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ABSTRACT

Objective: To use cone-beam computed tomography images to assess the mandibular foramen's location in relation to age.

Study Design: Cross-sectional retrospective study examined the hospital records.

Place and Duration of Study: This study was conducted at the Radiology Department of Khyber College of Dentistry (KCD), in Peshawar, Pakistan 4th November 2021 to 3rd May 2022.

Methods: 1000 CBCT radiographs from patients treated over a two-year period were examined in the initial radio-anatomical investigation. The shortest distance between the mandibular foramen (MF) and Point A, Point P, Point MI, Point MN, and Point O were measured. Ratios were also computed to ascertain the MF's location in relation to these anatomical landmarks. For all data statistical analysis, a significance level of $P \leq 0.05$ was used.

Results: 134 mandibular foramens are associated with people between the ages of 15 and 70, with an average age ± (SD) of 39.81±14.71 years. The measured mean distances were 17.29, 12.54, 18.70, and 32.43 from the mandibular foramen to Point A, Point P, Point MI, Point MN, and Point O respectively. The MF was found about 3.65 mm above point O. The average measurement between point A and point P was 49.36 mm, whereas the average measurement between point MI and point MN was 50.60 mm. The computed ratios for AMF/AP and MIMF/MIMN were 0.58 and 0.37 mm. The investigation's findings demonstrated that the location of the mandibular foramen varied statistically significantly among age groups.

Conclusion: The mandibular foramen's location varied dramatically with age, according to the study's findings.

Key Words: Mandibular Foramen, Orthognathic, Cone Beam Computed Tomography

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INTRODUCTION

On the inside surface of the mandibular ramus, there is an uneven opening known as the mandibular foramen.[1] The key area for the inferior dental nerve block, which offers regional anaesthetic for various surgical operations in the lower jaw, is where the IAN invades the MF[2]. The location of the MF varies greatly depending on the population and can change with age even in the same person on both sides[3].

The identification of the mandibular foramen and IAN is required prior to the osteotomy of the ramus of the mandible, and these procedures should be performed with caution to avoid injury[2]. It is very common for IAN block to fail or for ramus to fracture in such orthognathic procedures and they are most commonly caused through being uncertain regarding the precise location of the MF in different age groups, races, or ethnicities. The IAN block's predicted failure rate is between 5 & 15%[4] and 15 to 20%[5]. According to[6] this failure rate could be as high as 45%. Failure of IAN block might occur due to lack of definite anatomic landmarks, anatomical differences such as mandibular foramen located superior or inferior to its normal position; and improper anesthesia method that may be due to limited mouth opening, a needle placed too anterior or posterior to the normal location[7].

The MF location have been determined by different authors using different methods such as, dried human mandibles[8], panoramic radiographs[9,10], CT scan[7] and CBCT to locate mandibular foramen[2-6,11-13]. CBCT offers better accurate localization of many anatomical features and there is less distortion of image as compared to plain radiograph. Moreover, it has higher accuracy, more resolution, less scan time, and decreased radiation dose in comparison with typical CT imaging[2].

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To our knowledge till date no studies have been carried out among the local population on this subject. The current investigation aims to pinpoint the exact position of the MF. Dental surgeons may use the findings of this study to detect the mandibular foramen, which will enable them to select an easy-to-reach target area for the IANB, lowering the risk that it will fail in the majority of patients. This study's findings will also define a safe zone for extra-oral mandibular ramus osteotomy treatments, reducing the possibility of harm to the inferior alveolar nerve in individuals having these procedures.

METHODS

The Institutional Review Board (IRB) of the prime foundation gave its approval to this cross-sectional retrospective study, on 10 Sep. 2021 (Approval no: Prime/IRB/2021-358). Ethical approval for data collection was granted by RRB-KCD vide notification No. 3065/RRB/KCD dated 3rd November 2021.The study was carried out in Peshawar. CBCT images were collected from Khyber College of Dentistry's radiology department (KCD). Khyber College of Dentistry (KCD) is a referral hospital in Peshawar, and its health services are available to all patients from KPK of varying socioeconomic backgrounds. In the supervision of an oral and maxillofacial surgeon, the observer interpreted CBCT images. The Radiology Department of Khyber College of Dentistry (KCD) presently has the CBCT radiographs studied in this study. Planmeca Romexis software was used to import CBCT images into the computer CBCT pictures of individuals between the ages of 15 and 70 had been included in this investigation, however radiographs of patients with asymmetrical faces, pathological lesions in the mandibular ramus, or those who had bilaterally absent or malpositioned mandibular first molars were not included. The senior radiology technician obtained the CBCT images at KCD in accordance with the manufacturer guidelines and a stringent, standardised scanning methodology. These radiographs were produced using a cone beam computed tomography scanner with an exposure period of 9 seconds and a voxel size of 400 m approx. depending on the FOV. To prevent inter-observer variations, the same examiner evaluated all the cone beam computed tomography images. Additionally, they were assessed under standard viewing conditions, which included enhancing radiograph clarity by modifying the brightness and opacity settings. The investigator got training to identify the MF and other mandibular landmarks prior to doing the radiographic examination, using a set of cone beam computed tomographic images that were not a part of the research. The calibration training procedure included hands-on discussion sessions and demonstrations of mandibular CBCT landmark identification techniques as well as demonstrations of the steps involved in determining the distances between mandibular landmarks using the CBCT software. Axial, sagittal, cross-sectional and panoramic views were used to locate MF. The mandibular landmarks used in past studies and the location of the MF were measured using the software ruler to estimate their distances (in millimeters)[2,6,11-13].

Among the landmarks were the anterior border's deepest point on the ramus (A), the deepest point of ramus' posterior border (P), the mandibular first molar's occlusal plane (O), the most superior point of curvature of the mandibular notch (MN), the most inferior point of mandibular incisura (MI),

The subsequent calculations involved the following measurements and ratios:

- The shortest path AP: To ascertain the ramus's horizontal dimension between positions A and P.
- To find the height of the ramus, take the shortest MIMN distance (between points MI and MN).
- The MF's horizontal placement is described by the AMF/AP ratio.
- MIMF/MIMN ratio describes the vertical position of the MF.

Each participant's mandibular foramen was evaluated bilaterally, and its location as well as the patient's MRN number and age was noted on the proforma. Based on their ages, the participants were then separated into the following four groups (Table 1).

Statistical Assessment:

• The statistical analysis was performed using the Statistical Package for Social Sciences (SPSS), version 20.

• To analyse data, descriptive statistics were employed.

• In order to ascertain whether the age groups differed noticeably from one another, a one-way ANOVA test was employed.

• $P \leq 0.05$ was designated as the statistical significance level for the test.

RESULTS

All Cone beam computed tomographic images of patients treated over a 2-year period were investigated in this radioanatomical investigation. A total of 1000 cone beam computed tomographic images were initially evaluated, and of them, 100 CBCTs met the requirements for inclusion in the research. The mandibular foramen of each CBCT image was evaluated mean age ± (SD) of patients were 39.81±14.71 years (range =15-70 years).

Table 1: Age groups included in this study.

Groups	Age
Young adults	From 15 to 25 years
Adults	From 26 to 40 years
Middle age	From 41 to 60 years
Elderly	From 61 to 70 years

To determine if age-related changes were statistically significant, a one-way ANOVA test was used. ($P \leq 0.05$).

Young adults (15-25 years old) had the lowest MIMF, MNMF, OMF, and MIMN values (Table: 2).

PMF and AP values were lowest in adults (26-40 years) while this group showed highest values of MIMF /MIMN ratio (Table: 2).

Middle age group (41-60 years) showed lowest values of AMF and AMF/AP ratio (Table: 2).

AMF, PMF, MIMF, MNMF, OMF, AP, MIMN AND AMF/AP ratio were higher in elderly patients (61-70 years) while MIMF/MIMN ratio decreased in this age (Table: 2).

Values of MIMF, MNMF, MIMN AND MIMF/MIMN ratios differed significantly among different age groups. Nevertheless, there was no age-related statistically significant variation in the levels of AMF, PMF, OMF, AP, or AMF/AP ratio (Table: 2)**.**

Table No.2: The average distance between MF and numerous mandibular landmarks among different age groups

Age Groups		N	Mean ± Std. Deviation (mm)	P value*
Distance from point A to point MF (A-MF)	15-25	112 (56%)	17.31±2.45	0.262
	26-40	74 (37%)	17.36±2.93	
	41-60	12 (6%)	16.23±3.57	
	61-70	2 (1%)	20.07±1.78	
	Total	200	17.29±2.71	
Distance from point P to point MF (P-MF)	15-25	112 (56%)	12.50±2.57	0.097
	26-40	74 (37%)	12.29±2.62	
	41-60	12 (6%)	14.11±1.94	
	61-70	2 (1%)	14.47±2.22	
	Total	200	12.54±2.58	
Distance from point MI to point MF (MI-MF)	15-25	112 (56%)	18.17±3.41	0.046
	26-40	74 (37%)	19.13±3.81	
	41-60	12 (6%)	20.64±3.36	
	61-70	2 (1%)	21.28±4.97	
	Total	200	18.70±3.62	
Distance from point MN to point MF (MN-MF)	15-25	112 (56%)	31.53±5.06	0.034
	26-40	74 (37%)	33.49±5.21	
	41-60	12 (6%)	33.61±5.38	
	61-70	2 (1%)	36.94±4.86	
	Total	200	32.43±5.21	
Distance from point O (mandibular first molar's occlusal plane) to point MF (O-MF)	15-25	112 (56%)	3.39±2.62	0.290
	26-40	74 (37%)	4.00±2.60	
	41-60	12 (6%)	3.60±1.48	
	61-70	2 (1%)	5.62±2.73	
	Total	200	3.65±2.57	
Distance between points A and point P (AP)	15-25	112 (56%)	29.41±3.19	0.325
	26-40	74 (37%)	29.13±2.84	
	41-60	12 (6%)	29.76±2.42	
	61-70	2 (1%)	32.94±2.31	
	Total	200	29.36±3.02	
Distance between points MI and MN (MIMN)	15-25	112 (56%)	49.36±5.45	0.002
	26-40	74 (37%)	51.75±5.99	
	41-60	12 (6%)	53.87±6.94	
	61-70	2 (1%)	57.69±1.21	
	Total	200	50.60	
The AMF/AP ratio	15-25	112 (56%)	0.58±0.09	0.519
	26-40	74 (37%)	0.58±0.12	
	41-60	12 (6%)	0.54±0.09	
	61-70	2 (1%)	0.61±0.10	
	Total	200	0.58±0.10	
The MIMF/MIMN ratio	15-25	112 (56%)	0.37±0.07	0.003

	26-40	74 (37%)	0.38±0.09	
	41-60	12 (6%)	0.38±0.04	
	61-70	2 (1%)	0.16±0.21	
	Total	200	0.37±0.08	

Table No.3: The average distances between various mandibular landmarks and the MF.

The average distances between various mandibular landmarks and the MF.	MEAN (mm)
Distance from point A to point MF (A-MF)	17.29
Distance from point P to point MF (P-MF)	12.54
Distance from point MI to point MF (MI-MF)	18.70
Distance from point MN to point MF (MN-MF)	32.43
Distance from point O (mandibular first molar's occlusal plane) to point MF (O-MF)	3.65
Distance between points A and point P (AP)	49.36
Distance between points MI and point MN (MIMN)	50. 60
The AMF/AP ratio	0.58
The MIMF/MIMN ratio	0.37

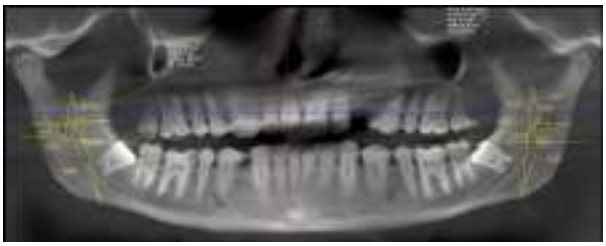

Figure No.1: The shortest distance from the MF to numerous mandibular landmarks on panoramic view of CBCT.

DISCUSSION

The noninvasive way to locate the mandibular foramen precisely is by radiographs, which are essential in oral and maxillofacial surgery[2]. The recommended radiographic method for accurately identifying and examining the mandibular foramen is cone beam computed tomography (CBCT) due to its several advantages over plain films. Many dentists have found CBCT's diagnostic ability to be beneficial. CBCT can express fine structures due to its small voxel size, and it has a lower radiation dose than a conventional mulitislice CT scan. It also requires less tube voltage and current than conventional CT[11].

According to the current investigation, the average distances from the MF to point A, point P, point MI, point MN, & point O were measured to be 17.29, 12.54, 18.70, 32.43, and 3.65 mm, respectively (Table: 3). According to a study by[2] on Jordanians, the average distances between the MF and the ramus's anterior and posterior margins, the mandibular incisura, and the mandibular notch were 17.51mm, 13.16mm, 19.28mm, and 25.66mm respectively. The MF was situated 4.52 mm above the occlusal plane.[2]

The mean vertical height of the ramus was 50.60mm in this study (Table: 3). Nevertheless, this height was measured as 49.4mm in a study done by da Fontoura et al., in 2002.[14]

There were statistically significant differences in the current study in the values of the MIMF, MNMF, MIMN, and MIMF/MIMN ratios across the various age groups, but not for the AMF, PMF, OMF, AP, or AMF/AP ratios. The lowest values of MIMF, MNMF, OMF, and MIMN were found in young adults. Adults had the lowest PMF and AP levels, but they had the greatest MIMF/MIMN ratios. The AMF and AMF/AP ratio were lowest in the middle-aged group. Elderly patients had increased levels of AMF, PMF, MIMF, MNMF, OMF, AP, MIMN, AND AMF/AP ratio, whereas MIMF/MIMN ratio decreased at this age (Table: 2). In a research done on adults under the age of 40, it was observed that the MF's position in regard to landmarks did not vary with age.[11]

The MF was 3.65 mm above the occlusal plane in this study. Previous research found the MF to be 2.5-3.6 mm above the occlusal plane of the molars.[15], and no statistically significant changes in the MF's location with advancing age were seen. Adults had the MF 4.2 mm above the occlusal plane**.**

CONCLUSION

The location of the mandibular foramen was determined using landmarks from CBCT scans.

The location of the mandibular foramen varied dramatically with age, according to the research findings.

Author's Contribution:

Concept & Design of Study:	Asma Sattar
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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Original Article

Obstetric Anaesthesia with Placenta Previa

Evaluation of Obstetric Anaesthesia and its Association with Maternal Outcomes in Women with Placenta Previa: A Cross-Sectional Study

Shandana Bawar, Qudsia Qazi and Syeda Sitwat Fatima

ABSTRACT

Objective: To determine the frequency of mode of anaesthesia (MOA).The secondary outcome was to determine an association between MOA, type 4 PP, previous CS and maternal outcomes.

Study Design: A retrospective cross-sectional study.

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynecology (OBGYN), MTI Lady Reading Hospital Peshawar from January 2020 - December 2022.

Methods: It included women with singleton pregnancy with PP, after 28 weeks of gestation. Women with other causes of antepartum haemorrhage, previous myomectomy and medical disorders complicating pregnancy were excluded. Maternal outcomes included per-operative blood loss (POBL), per-operative RBC transfusion(POBT) and transfer to the critical care unit(TCCU) as mentioned in operative notes. Data was collected and analyzed by SPSS version 22.

Results: A total of 170 women were included in two years. MOA included General anaesthesia (GA) in 96(56.5%) and Spinal anaesthesia (SA) in 74(43.5%) cases.GA was frequently given in Emergency CS (EMCS), elective CS(ELCS) and type 4 PP.POBL of less than 1500ml dominated, POBT of less than or equal to 4 pints was found to be 143(84.1%) while a large number of patients were managed in obstetrical wards 150(88.2%) compared to HDU and ICU with a non-significant association.

Conclusion: GA was frequently adopted in our setup compared to SA, especially with the increasing severity of PP type and previous CS. Both GA and SA were safe with non-significant association with blood loss, RBC transfusion and critical care management.

Key Words: Placenta Previa, Mode of anaesthesia, per operative blood loss, Per operative blood transfusion, Critical care transfer

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INTRODUCTION

Placenta previa is an abnormal location of the placenta in the lower uterine segment, which is associated with grave maternal morbidity in terms of antepartum and per-operative haemorrhage, if not managed timely[1]. Placenta previa is often graded into minor and major based on the distance of the lower edge of the placenta from internal os, types 1 and 2 compromising minor categories while types 3 and 4 constitute major placenta previa[2].

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The rising incidence of placenta previa and morbidly adherent placenta worldwide is attributed to escalated cesarean section rates, while previous curettage, manual removal of placenta, uterine surgery and assisted reproductive techniques are also thought to be the cause of placenta previa[3]. Women with placenta previa may present with painless genital tract bleeding, malpresentation, high presenting part or at times be asymptomatic, diagnosed incidentally on routine clinical examination or ultrasound[4-6]. Unpredictable antepartum haemorrhage in these women often leads to prolonged antenatal admissions in obstetrical wards, to avoid heavy bleeding episodes and related complications, that could be catastrophic to the mother's life, necessitating urgent delivery[7]. This mostly pertains to population who have long distances to travel to a health facility with needed facilities for PP. The mode of delivery is mainly cesarean section however vaginal delivery may occur in case of minor placenta previa[8]. Placenta previa due to its unforeseeable haemorrhage often ends in early delivery, adding neonatal sequelae related to prematurity in

addition to morbidity associated with PP[9]. CS and MOA, have always been under scrutiny, especially when it comes to PP. General anaesthesia was thought to be safer and quicker for women with placenta previa due to anticipated blood loss and chance of conversion of surgical procedure to hysterectomy with possible need of intensive care unit transfer[10]. But now advances in regional anaesthesia, have implicated its use to be equally safer for placenta previa[11]. Several studies can be searched related to the mode of anaesthesia among patients with placenta previa. However, few can be found locally to understand the importance of anaesthesia and hemodynamic stability of these patients. We designed this study to evaluate the mode of anaesthesia in tertiary care that can help establish its safety and practice in obstetrics, thus devising evidence-based local protocols and guidelines for women with PP.

METHODS

This retrospective cross-sectional study was conducted in the department of obstetrics and gynaecology in a tertiary care hospital, MTI Lady Reading Hospital Peshawar between January 2020 to December 2022, after obtaining ethical approval from the hospital Institutional Review Board. This study included all the women with singleton pregnancies diagnosed with PP, clinically or by ultrasound during the antenatal period or CS after 28 weeks of gestation, irrespective of their previous CS status. Women with the local cause of genital tract bleeding, heavy show in labor, placental abruption, morbidly adherent placenta, pregnancy with anaemia, hypertensive disorders, diabetes with polyhydramnios, other medical disorders, and previous gynecological surgery(myomectomy etc.) on the uterus that could add into maternal outcomes were excluded. Retrospective analysis of hospital software and available history charts would determine these confounding factors. The operative notes determined the MOA and maternal outcomes to be studied. Maternal outcomes included per-operative blood loss(POBL), per-operative RBC transfusion(POBT) and transfer to critical care unit(TCCU). POBL was calculated by several abdominal gauze packs used during the operation and their conversion into millilitres as per hospital protocol. POBT was determined as per the number of bags mentioned in the charts. TCCU was divided into departmental OBGYN high dependency unit(HDU) and hospital intensive care unit(ICU) which was also mentioned in operation notes. Data was collected on a specialized proforma designed for the study from the clinical records of patients, maintaining confidentiality. Data was then transferred and analyzed on SPSS version 22. Frequencies and percentages were calculated for categorical variables like PP and its types, previous CS, and maternal outcomes. Mean and standard deviation were calculated for numerical variables like maternal age etc. Chi-square test/Fisher's Exact test was applied to determine the association between mode of anaesthesia and previous CS, type of PP and maternal outcomes, with a p-value ≤ 0.05 was considered significant.

RESULTS

A two-year study included 191 patients with placenta previa. Women with morbidly adherent placenta were 21(10.9%) that were excluded from the study. Further analysis was done with a total of 170 patients with placenta previa. The mean age of participants was found to be 30 ±15 years. Primi gravida(first time pregnant) were 19(11.2%) , multigravida(pregnant 2-5times) were 110(64.7%) , grand multigravida (pregnant 6-8 times) were 30(17.6%) ,and great grand multigravida(pregnant >8times) were found to be 11(6.5%).Mean antenatal and postnatal stay was found to be 10 days± 14 days and 03±0.3 days, respectively, Table 01.Anterior PP was found in 61 (35.9%), posterior PP was found in 59(34.7%) while 50(29.4%)had major placenta previa covering internal OS.

Table No. 1: Demographic features of women with Placenta Previa

Maternal age	**Years (mean)**	**SD**
	30.36	±15.5
Stay obstetrical unit	Days	SD
Antenatal	10.0353	±14.28323
Postnatal	3.0824	±0.39857
Gravida status	**Frequency(N)**	**Percentage (%)**
primi gravida	19	11.2
2- 5 multi gravida	110	64.7
6-8	30	17.6
more than 8	11	6.5
Total	170	100

Table No. 2: Frequency of type of placenta previa and previous cesarean section among women with placenta previa

Type of placenta previa	**Frequency(N)**	**Percentage (%)**
1	02	1.2
2	20	11.8
3	48	28.2
4	100	58.8
Total	170	100.0

Previous cesarean section	Frequency(N)	Percentage (%)
none	148	87.1
1	16	9.4
2	04	2.4
3	01	0.6
4	01	0.6
Total	170	100

Among these 100 (58.8%) were type 4 PP followed by type 3,2 and 1 with frequency of 48(28.2%),20(11.8%), and 02(1.2%) respectively. About 61 (35.9%) had anterior placenta previa,59(34.7%) had posterior placenta previa and 50(29.4%)had major placenta previa covering internal os. About 148(87.1%) had no previous CS. Frequency of previous 1,2 CS was found to be 16(9.4%), 04(2.4%) and 01(0.6%) each for previous 3 and 4 CS, respectively, Table 02.

About 36(21.2%) women had a gestational age less than 34 weeks, 47(27.6%) had a gestational age between 34 and 37 weeks and 87(51.2%) had term gestation at the time of delivery. Emergency CS were 116(68.25%) and elective CS were 54 (31.7%) in number. MOA included GA in 96(56.5%) and SA in 74(43.5%) cases. During EMCS, GA was given in 71(74.05%)while 45(60.8%) had SA. Among elective CS, 29(39.2%) patients had SA while 24(25.0%) had GA, with a non-significant association p-value of 0.104. GA was more frequently given 64(66.7%) in patients with type 4PP than spinal anaesthesia 36(48.6%) bearing a significant association with a p-value of 0.038, however, a non-significant association of MOA with previous CS was determined with a p-value of 0.70, table 3.

Table No. 3: Frequency of type of placenta previa and previous cesarean section among women with Anaesthesia

Placenta previa type	Anaesthesia		p-value
	General	Spinal	
	Frequency %age	Frequency % age	
Type 1	01(50)	01(50)	0.038
Type 2	06(30.0)	14(70.0)	
Type 3	25(52.1)	23(47.9)	
Type 4	64(64.0)	36(36.0)	
Total	96(56.5)	74(43.5)	
Previous cesarian section			
None	82(55.4)	66(44.6)	0.70
Previous 1CS	09(56.3)	07(43.8)	
Previous 2CS	03(75.0)	01(25.0)	
Previous 3CS	01(100.0)	00(0.0)	
Previous 4CS	01(100.0)	00(0.0)	
Total	96(56.5)	74(43.5)	

Among the maternal outcomes POBL less than 1500ml dominated i .e 161(94.7%) while more than or equal to 1500 were 09(5.3%). POBT of less than or equal to 4 pints was found to be 143(84.1%) while more than 4 RBC units were transfused in 15(8.8%). A large number of patients were managed in obstetrical wards 150(88.2%), HDU care within the obstetric department was found to be 13(7.6%) and 07(4.1%) of women were managed in ICU. A non-significant association was seen for a mode of anaesthesia and blood loss, RBC transfusion, and critical care management, with Fischer exact test p-value of 0.30 for POBL, chi-square test p-value for POBT to be 0.139 and chi-square test p-value for TCCU to be 0.980.

DISCUSSION

Our study population was,170 women with PP, after excluding women with morbidly adherent placenta in 2 years. This suggest a large number of these patients in our set-up as compared to 276 patients found by, Ismail S in their study in 14 years. This may be attributed to different study designs and hospital settings, the former being a public sector hospital[12]. PP was most frequently seen in multigravida 110(64.7%) in our study. A similar finding of PP dominance among multigravida 67(58.77%) was encountered in another regional retrospective study by Majeed T et al. However, a comparative more increase in multigravida in our study may be explained by the study duration and contraceptive practices of our country[13]. The most prevalent PP type was 4 in our study same to the findings of Grönvall M et al, who determined 129 cases of major PP. However, theses cases were found in a four year study while we determined major PP in two years. This contrast may be explained by different study design[14]. The anterior location of PP dominated our study with a frequency of 35.9%, opposite to the findings of an Iranian study which determined the anterior location of PP in 44.9% of their study population. The inclusion and exclusion criteria of both studies were different as our study included all the patients with PP but the referenced study included PP in patients with previous scar[15].Oğlak SC et al in their study determined more planned CS 53.4%vs emergency CS 46.6%[16]. On the contrary, our emergency CS was higher than elective CS. The high emergency CS in our study may be due to the non-booked nature, and less or no antenatal visits of our population. Women with PP in our review suggested a percentage of 21.2% for very preterm and 27.6% for preterm deliveries. A Japanese study showed an overall frequency of premature delivery by 45.1%, in association with complete PP, quite similar to our findings[17]. However, we did not conduct the sub-analysis of gestational age with the type of PP like the Japanese study. The frequency of general anaesthesia (56.5%) was slightly higher in our study both for emergency and elective CS. A significant association of GA was determined with type 4 PP. Fan D et al also determined GA(63.76%)a frequent

finding, however, their percentage was quite high compared to us[9].Further, it was emphasized that GA was seen more in emergency CS(26% vs. 38.6%, P = .033) by Fan D. On the contrary two different retrospective studies found neuraxial anaesthesia quiet safe in even complicated cases like morbidly adherent placenta. They determined the conversion rate of neuraxial anaesthesia to GA increased with increase severity of placenta[18,19]. It can be inferred that hemodynamic stability may be the reason for the consideration of regional anaesthesia in the referenced studies. A study by Alsammani Jr determined a high number of ICU admissions 48.27% in their study which is opposite to our findings[20]. We could not discover any significant association between the MOA and POBL, POBT and TCCU, probably because PP in itself, primarily determine these outcomes. The choice of MOA usually depends upon the patient's condition, her vitals and stability. Anaesthesia may secondarily affect the fluid balance and further management of the patient. Lieu X et al suggested that although, regional anaesthesia had lesser operative time, less blood loss and lesser RBC transfusion, nevertheless, with increasing severity of placenta previa, the conversion rate to GA was also increased which was safe[21]. A multi centre study by Orbach-zinger potentiated the results of our study by determining the increases association of GA with complete PP[22]. A good sample size may potentiate our findings, but input from the anaesthesia department would have elaborated the findings in a better way. A combined obstetric and anaesthesia department prospective study comparing the MOA in PP may enhance the safety analysis of GA or RA, and address these limitations of our study.

CONCLUSION

General anesthesia was frequently adopted in our setup compared to regional anaesthesia. General anaesthesia was significantly associated with type 4 placenta previa. Both General and Spinal anaesthesia were safe with no significant association with blood loss, RBC transfusion and critical care management.

Author's Contribution:

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Original Article

The Importance of Immunohistochemical Evaluation of Ki67 in Detecting Early Malignant Changes in Colorectal Adenomatous Polyps

Evaluation of Ki67 in Detecting Early Malignant Changes in Colorectal Adenomatous Polyps

Sabika Batool[1], Talat Mirza[1], Fouzia Lateef[2] and Sobia Hassan[1]

ABSTRACT

Objective: To assess the prevalent clinicopathogical parameters of Adenomatous polyps and association of ki67 with them in order to elucidate its significance as potent marker in determining early malignant changes

Study Design: Retrospective study

Place and Duration of Study: This study was conducted at the Histopathology department and Molecular diagnostic Research laboratory (MDRL), Dr. Ziauddin University and Hospital, Karachi from November 2021 to November 2023.

Methods: A total of 55 colorectal adenomatous polyps and clinical data was retrieved. Fresh frozen plasma sections were stained under Hematoxylin and eosin stain and further analyzed with KI67 IIHC stain. A P-value of less than 0.05 was deemed statistically significant.

Results: Among all 55 cases, 12 (21.8%) cases had age <50 years and 43 (78.2%) cases had age >50 years. Males predilection was observed. Most common clinical symptom was bleeding per rectum in 35 (63.64%) cases, followed by weight loss and chronic diarrhea, anemia, chronic abdominal pain, constipation while one case was accidentally reported on routine endoscopy (1.81%). 41 polyps (74.54%) were <20mm and 14 polyps (25.45%) were >20mm. Most common site was rectum (41.8%), followed by ascending and sigmoid colon, descending colon and transverse colon. Strong association was observed between size of colorectal polyps and grade of dysplasia with ki67 score.

Conclusion: When identifying the individuals with colorectal adenomatous polyps who require close surveillance in follow-up, size of polyp, high grade dysplasia and significant positive immunohistochemistry markers of Ki-67 may be useful criteria. This shall set a target population for screening of pre malignant changes.

Key Words: Dysplasia, Adenomas, ki-67 score

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INTRODUCTION

Intraepithelial pedunculated pre-neoplastic lesions are known as colorectal adenomas. By 50, they are found in almost half of adults and serve as the primary precursors of most cancers in this organ.(1) Adenomas are becoming more common in Asian population due to increased adaptation of Western diets and lifestyles. The epithelial dysplasia that is present in colorectal adenomas is a characteristic.

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The frequency of colorectal adenomas and colorectal carcinoma are correlated which can link the risk of recurrence and the emergence of colorectal malignancies to adenomas.15% of all adenomas larger than 1 cm are predicted to develop into carcinomas within ten years of initial detection.(2)

Colorectal polyps are intraepithelial neoplasms growing through from the wall of the colon and rectum to its origin can be found in different sizes ranging from small polyps to large ones. Generally, colon polyps are more founded pathology and commonly seen over 50 aged patients and are not only the malignant pathology but more the precursor of malignant neoplasms, where the polyps have a high likelihood of cancer. Cancer normally develops in around 5% of adenomatous polyps.(1,2) Colorectal polyps are intraepithelial neoplasms growing through from the wall of the colon and rectum to its origin can be found in different sizes ranging from small polyps to large ones. Generally, colon polyps are more founded pathology and commonly seen over 50 aged patients and are not only the malignant pathology but

more the precursor of malignant neoplasms, where the polyps have a high likelihood of cancer. Cancer normally develops in around 5% of adenomatous polyps.[1,2] Colorectal polyps are intraepithelial neoplasms growing through from the wall of the colon and rectum to its origin can be found in different sizes ranging from small polyps to large ones. Generally, colon polyps are more founded pathology and commonly seen over 50 aged patients and are not only the malignant pathology but more the precursor of malignant neoplasms, where the polyps have a high likelihood of cancer. Cancer normally develops in around 5% of adenomatous polyps.[1,2] Colorectal polyps are intraepithelial neoplasms growing through from the wall of the colon and rectum to its origin can be found in different sizes ranging from small polyps to large ones. Generally, colon polyps are more founded pathology and commonly seen over 50 aged patients and are not only the malignant pathology but more the precursor of malignant neoplasms, where the polyps have a high likelihood of cancer. Cancer normally develops in around 5% of adenomatous polyps.[1,2] Colorectal polyps, which can range in size from tiny to large intraepithelial neoplasms, grow through the colon's and the rectal mucosal wall.[3] In Colon, polyps which are more commonly found in patients over 50, are often a precursor to malignant neoplasms. Approximately 5% of adenomatous polyps typically develop cancer.[4] Ki-67 is frequently used in standard clinical work [5,6] and has been researched in connection with the onset and evolution of human colorectal cancer[1]. It was regarded as a crucial predictor of human colorectal cancer. [1] A previous study found that the percentage of tumor cells positive for Ki-67 correlates inversely with overall survival, and that overexpression of Ki-67 in colorectal cancer (CRC) is linked to a worse prognosis. [5] Some studies, though, have not been able to prove its prognostic significance.[4] Although some researchers linked higher Ki-67 expression to a worse prognosis, others found that higher Ki-67 expression was associated with a better prognosis[7]. Higher Ki-67 expression has been reported by Melling et al.[8] as an independent predictive marker in human colorectal cancer, despite the fact that its prognostic value is still debatable [7]

Ki-67 protein is an additional immunohistochemical marker used to identify proliferating cells. With the exception of the G0 phase, it manifests in every stage of the cellular cycle. Ki-67 is a nuclear protein as well as a nucleolus protein[8] Ki67 protein is continually lacking in dormant cells and is undetectable during DNA repair processes.[9] Because of the nucleus's significant function in the upkeep or control of the cell cycle, the presence of the Ki-67 antigen is thus exclusively associated with the cell cycle. [10] Ki67 has been used by numerous researchers as a backup indicator to track the proliferation activity of tumor cells in different systems [11].

For the purpose of early diagnosing and predicting the prognosis of cancer, various biomarkers linked to growth factors, angiogenesis, tumour suppressor genes, oncogenes, and proliferating cells factors are employed. Because of its excellent sensitivity, Ki67 is widely used to evaluate the rate at which cancer cells proliferate. [12]

Aim of current study was to examine the Immunohistochemical activity of Ki67 alongwith its correlation to size of polyp and grades of dysplasia in colorectal Adenomatous polyps in order to elucidate its significance as marker of early pre malignant changes.

METHODS

This retrospective study was conducted at Histopathology department and Molecular diagnostic Research laboratory (MDRL) , Dr. Ziauddin University and Hospital, Karachi.55 polypectomy specimens from patients in the form of Fresh Frozen Plasma Embedded tissues diagnosed as colorectal Adenomatous polyps were included.

Preparation of H&E sections: Hematoxylin and Eosin was used to stain paraffin-embedded sections from each colorectal polyp according to proper H&E staining protocols[13]

Preparation of IHC slides (immunohistochemical analysis):In order to establish a clear connection between the presence of protein ki67, and dysplasia in neoplastic tissues, IHC ki67 interventions have been performed on all adenomatous polyps exhibiting dysplasia following the IHC staining protocols [14]

Ki67 scoring technique: Without introducing the primary antibody (Ki-67) to the specimen, a negative control was employed.

Ki-67 expression counted in three high power fields (40X). Fraction of positive cells was calculated from atleast 500 tumor cells from the region where positivity was obvious and highlighted. 15 % or more Tumors cell staining positive was considered high ki67 score. Less than 15% tumors cells when stained positive were considered as low ki67 score [15]

Data analysis was carried out by SPSS 24.0. Chi-square test was performed for association between two variables. P value <0.05 was deemed statistically significant.

RESULTS

Clinicopathological parameters of patients included in study are expressed in table 1. 10 out of 21 polyps with mild dysplasia showed low ki67 score and 11 showed high ki67 score, all 3 polyps with moderate dysplasia showed high ki67 staining meanwhile 13 of 31 severely dysplastic polyps had low ki67 score and remaining 18 had ki67 score.

Table No. 1: Baseline demographics of the colorectal adenomatous cases

Variables	Frequency (n=55)	%
Gender		
Male	36	65.5 %
Female	19	34.5 %
Mean age (years)	53.27±10.84	
Clinical symptom		
Bleeding per rectum	35	63.64%
Chornic diarrhoea and weight loss	8	14.55%
Anemia	6	10.91%
Chronic abdominal pain	3	5.45%
constipation	2	3.64%
Accidental finding	1	1.81%
Site of Colorectal Adenomatous		
rectum	23	41.81%
ascending colon	10	18.2%
Sigmoid colon	10	18.2%
Descending colon	7	12.7%
transverse colon	5	9.09%
Size of Colorectal Adenomatous Polyps		
>20mm	14	25.45%
<20mm	41	74.54%
Dysplasia in colorectal adenomatous polyps		
Mild	21	38.19%
moderate	3	5.45%
Severe	31	56.36%

Table No. 2: showing Association of size of colorectal Adenomatous polyps with ki67 score

Ki-67 Score				
		High	**Low**	**Total**
size	<20mm	19	22	41
	>20mm	13	1	14
Total		32	23	55
Chi-Square Tests				
		Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square		9.281[a]	1	.002
Continuity correction[b]		7.468	1	.006
Likelihood Ratio		10.944	1	.001
N of Valid Cases		55		

Chi square test was performed and P value of less than 0.05 was obtained showing strong association between size of polyps and ki67 score.

Table No. 3: Shows Association between Grades of dysplasia and ki67 score

		Ki-67 Score		**Total**
		High	**Low**	
Grades dysplasia	Mild	7	14	21
	Moderate	2	1	3
	Serve	23	8	31
Total		32	23	55
Chi-Square Tests				
Pearson Chi-Square		8.685[a]	2	.013
Likelihood Ratio		8.811	2	.012
N of Valid Cases		55		

Chi-square test was performed and P-value of < 0.05 was obtained showing stronger association.

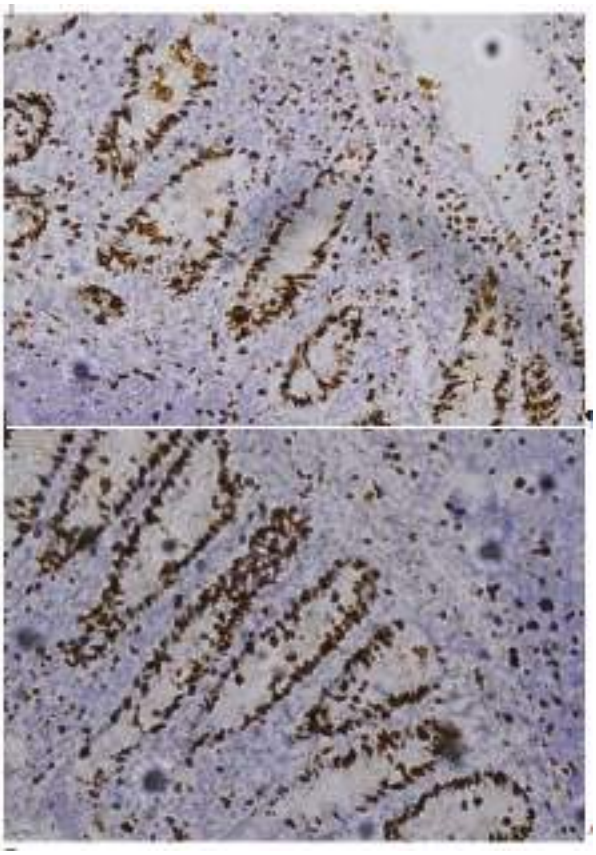

Figure Nos. 1 & 2: showing high Ki67 staining in the glands.

DISCUSSION

A number of tumors in humans have been shown to express Ki-67, which is linked to malignancies.[16] Although some research[17] failed to show the prognostic significance of higher Ki-67 expression, others reported this marker as an independent predictor of human colorectal cancer. [18]

In current study, 55 adenomatous polyps were retrieved. There were 36 (65.5%) males and 19 (34.5%) females in this study. Patients mean age was 53.27±10.84 years. Results were inline with the study done by Nusrat et al[19] Our study reported vast majority of severely dysplastic colorectal Adenomatous polyps, their proportion can be considered quite high when compared to previous research. [17,18]

High expression of Ki67 is also strongly associated with the incidence and progression of colorectal cancer[20] The severity of dysplasia and Ki-67

expression did not significantly correlate, according to research by Vernillo et al[21]. Another study showed significant correlation between size of colorectal Adenomatous polyps and grades of dysplasia with ki67 score, these findings were aligned with the findings of another study.

Ki67 score showed also significant correlation with size, type and high grade dysplasia in a previous study and the role of this marker was highlighted as an ancillary marker for the risk of transformation and as a target for chemo-preventive drugs [22], while our study worked on size and dysplasia correlation with ki67 score and the type of adenoma part should be considered for further research. High levels of ki67 positive cells in colonic samples indicated poor prognosis and comparatively adverse stage of colorectal carcinoma[23] This indicates the significance of ki67 screening in aiding in early diagnosis and prompt treatment of malignantly potential polyps.

Another study revealed significant association between dysplasia and ki67 score while the association remained insignificant in other studies [24].

Overall, the importance of ki67 scoring in dysplastic colorectal Adenomatous polyps with large size is significantly evident in screening and early diagnosis of colorectal Adenomatous polyps with potential of malignant transformation.

CONCLUSION

When identifying the individuals with colorectal adenoma who require close monitoring in follow-up prevention activities, high grade dysplasia and significant positive immunohistochemistry markers of Ki-67 may be useful criteria. Particularly in patients with a large size adenoma and high grade dysplasia.

Author's Contribution:

Concept & Design of Study:	Sabika Batool
Drafting:	Talat Mirza, Fouzia Lateef
Data Analysis:	Sobia Hassan
Revisiting Critically:	Sabika Batool, Talat Mirza
Final Approval of version:	Sabika Batool

Conflict of Interest: The study has no conflict of interest to declare by any author.

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Original Article

Analysis of Fingerprint Patterns in Relation to ABO Blood Groups: A Comparative Study

Zulfiqar Ali Buzdar[1], Mansoor Mirza[2], Ambreen Serwer[3], Muhammad Anwar Sibtain Fazli[3] and Faiza Munir[4]

ABSTRACT

Objective: To assess and analyze the potential association between blood groups and fingerprint patterns.
Study Design: Descriptive Cross-sectional Study
Place and Duration of Study: This study was conducted at the Forensic Medicine & Toxicology Department of Sahara Medical College Narowal, Punjab-Pakistan from July 2020 to June 2023.
Methods: A sample of 293 participants was meticulously studied, categorizing individuals based on their blood groups and assessing their respective fingerprint patterns. This research delves into the intriguing relationship between blood groups and fingerprint patterns, shedding light on potential associations that could have far-reaching implications.
Results: The findings are presented in a comprehensive cross tabulation analysis, revealing a statistically significant association between blood groups and fingerprint patterns ($p = 0.013$). Particularly, the blood group of an individual appears to influence the distribution of their fingerprint pattern.
Conclusion: These results provide a promising foundation for further exploration of the mechanisms underlying this association and its potential applications in fields such as forensics and medical diagnostics. This study marks a crucial step towards understanding the intricate interplay between genetic factors and biometric features, opening new avenues for research and practical applications.
Key Words: ABO, Blood Group, Rh factor, Fingerprint Patterns, Biometrics, Forensic Investigations, Genetic Determinants.

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INTRODUCTION

Fingerprint patterns and blood groups are distinctive and integral biological characteristics that have captivated the attention of researchers across diverse fields for decades[1]. The uniqueness of fingerprints in forensic science and biometric authentication has long been recognized, making them invaluable tools for individual identification and criminal investigations[2].

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Simultaneously, the classification of human blood into different ABO and Rh groups is of paramount significance in medical, medicolegal and clinical practices with implications for transfusions, organ transplantation, and disease susceptibility[3]. Intriguingly, the potential relationship between these two biological markers has largely remained unexplored. While both fingerprint patterns and blood groups are genetically determined, the concept of an association between the two holds the promise of uncovering novel insights into the hereditary basis of these traits[4]. Such an association could have implications not only in the fields of forensics and biometrics but also in understanding the broader genetic underpinnings of human variation[5].

This research endeavors to bridge this intriguing gap by conducting a systematic examination of the potential correlation between fingerprint patterns and ABO blood group types, considering the presence or absence of the Rh antigen[6]. Our study delves into a dataset comprising 293 individuals, meticulously categorizing their blood groups and analyzing their corresponding fingerprint patterns. The results, presented in a cross tabulation table, reveal a statistically significant association ($p = 0.013$) between blood groups and fingerprint patterns. Specifically, the blood group of an individual appears to influence the distribution of their fingerprint pattern[7].

These findings not only provide a novel perspective on the potential interplay between genetics and biometric features but also have practical implications in the realms of forensic science, biometric security, and medical diagnostics[8]. A deeper understanding of this association could lead to more accurate and personalized biometric systems, as well as improved forensic and medical practices[4-8].

This study marks a crucial step toward unraveling the complex genetic determinants of these unique biological traits and underscores the significance of multidisciplinary research in uncovering novel associations and applications within the scientific community.

METHODS

Data for this research study were collected from a targeted population consisting of students enrolled at Sahara Medical College, falling within the age range of 19 to 23 years. The study specifically focused on students during their third year of academic sessions, spanning from July 2020 to June 2023. Prior to the commencement of data collection, the research protocol adhered to a stringent ethical framework. Informed consent was obtained from each participant, accompanied by a detailed explanation of the study's nature and objectives, the voluntary nature of participation, and the assurance of data confidentiality. Furthermore, this study received approval from the Institutional Review Board (IRB) of Sahara Medical College, ensuring ethical adherence and compliance with established research protocols.

The research involved the administration of a structured questionnaire designed to gather information related to both ABO blood group configurations (including the Rh antigen) and the pattern of fingerprint. The cross-sectional study was carried out using convenient consecutive sampling technique specifically targeted students in the stipulated age group who were willing to participate.

RESULTS

Demographics:

The study included 293 research participants. There were 5 students of 19 years of age, 73 students of age of 20 years, 152 were 21 years old while 60 students were 22 years of age and lastly there were only three students in the 23rd years of their age. The frequencies are shown in the table 01 below.

Table No. 1: Age

Serial No.	Age (in Years)	Frequency	Valid Percentage
1	19	5	1.6
2	20	73	24.9
3	21	152	51.9
4	22	60	20.5
5	23	3	1.0
Total		293	100.0

Out of 293 students there were 106 (36.2%) males just and remaining 187 (63.8%) were females. The composition depicts almost 1:3 ratio from male to female respectively. The frequencies are shown in table 02 below.

Table No. 2: Gender

Serial No.	Gender	Frequency	Valid Percentage
1	Male	106	36.2
2	Female	187	63.8
Total		293	100.0

Analysis of Fingerprint and Blood Group Association:

Fingerprint Pattern: The predominant fingerprint pattern observed in the sample was the "Loop," with 101 instances (34.5% of the total patterns). Within the "Loop" category, the "Radial" sub-variation was the most frequent, accounting for 45.7% of all patterns. In contrast, the "Ulnar" sub-variation within the "Loop" pattern was observed 33 times, making up 11.3% of the total patterns. The "Whorl" pattern was the second most common, representing 36.9% of the total patterns. Among "Whorl" patterns, the "Plain" sub-variation was the most prevalent, constituting 40.6% of the "Whorl" patterns. The "Double Loop" and "Composite" patterns were less frequent, with 3.8% and 0.7% of the total patterns, respectively.

Blood Groups Analysis: The most common blood group in the population was "A positive," representing 20.8% of the total blood groups. In contrast, "A negative" blood group was relatively less common at 0.7%. Notably, "B positive" blood group was the most prevalent in the study population, accounting for 35.2% of the total blood groups. "B negative" blood group was observed in 2.4% of the cases. The "AB positive" blood group was identified in 13.0% of the individuals, while "AB negative" comprised 1.4% of the sample. The "O positive" blood group was observed in 23.9% of the cases, with "O negative" accounting for 2.7% of the total blood groups.

Table No. 3: Analysis of Blood Group and Pattern of Fingerprint

Blood Group Configuration		Fingerprint Pattern							Total	P Value
		Loop		Arch		Whirl		Composite		
Blood Group	Rh Factor	Radial	Ulnar	Plain	Tentated	Plain	Double Loop			
A	Positive	27	3	5	2	22	2	0	61	0.013

	Negative	0	0	0	0	2	0	0	2
B	Positive	32	10	14	1	42	3	1	103
	Negative	3	2	1	0	1	0	0	7
AB	Positive	12	8	3	0	13	1	1	38
	Negative	2	1	0	0	0	1	0	4
O	Positive	22	9	9	1	28	1	0	70
	Negative	3	0	1	1	0	3	0	8
Total		101	33	33	5	108	11	2	293

Statistical Significance: A chi-square test of independence was conducted to investigate the potential relationship between "Blood Group" and "Pattern of Fingerprint." The results of this analysis indicate a statistically significant association ($p = 0.013$) between these two variables.

Specifically, "Blood Group" appears to influence the distribution of "Pattern of Fingerprint" within the study population. This finding suggests that the prevalence of specific fingerprint patterns may be associated with an individual's blood group. These results serve as a significant foundation for further research into the mechanisms underlying this association and the potential implications within the broader context of our study on the correlation between blood groups and fingerprint patterns.

DISCUSSION

The pursuit of understanding the intricate and nuanced facets of human biology has long captivated the scientific community[9]. In this study, we endeavored to unravel a potential relationship between two distinct biological traits: blood groups and fingerprint patterns[10]. This endeavor is underpinned by the premise that both characteristics are genetically determined and could potentially exhibit an association[6,10,11,12]. The statistical analysis of our data revealed a significant association between "Blood Group" and "Pattern of Fingerprint." Specifically, the chi-square test of independence yielded a p-value of 0.013, signifying that the distribution of fingerprint patterns is not independent of blood group. This finding sheds light on a previously under-explored dimension of biometric research and raises a multitude of questions and considerations.

The observed association prompts the need for a deeper understanding of its significance and potential implications[13,14]. One possible explanation for this association could be the genetic determinants that influence both blood group and fingerprint pattern development[15]. The influence of genetics on fingerprint patterns is well-established, and it is plausible that genes governing blood group also play a role in the formation of fingerprint patterns[16]. The implications of this association are multifaceted. In the realm of forensic medicine, where fingerprint patterns hold great significance, the knowledge that blood groups may influence these patterns opens new avenues for investigation[17]. Fingerprint analysis in forensic investigations could benefit from considering an individual's blood group in conjunction with pattern analysis, potentially aiding in the identification and profiling of individuals[6,18]. Moreover, in biometric security, the findings of this study have the potential to enhance the accuracy and reliability of fingerprint-based authentication systems, contributing to both security and convenience[19].

CONCLUSION

In conclusion, the association between blood groups and fingerprint patterns represents a fascinating intersection of genetic factors and biometric features. Our study has illuminated a statistically significant link between these two variables, creating a foundation for future research endeavors. The potential applications of this association in forensic science, biometric security, medical diagnostics, and genetic studies are promising. This discovery underscores the ever-evolving landscape of biometric research and the intriguing interplay between genetics and human variation.

Author's Contribution:

Concept & Design of Study:	Zulfiqar Ali Buzdar
Drafting:	Mansoor Mirza
Data Analysis:	Ambreen Serwer
Revisiting Critically:	Muhammad Anwar Sibtain Fazli
Final Approval of version:	Faiza Munir

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Original Article

Gender-Based Analysis of the Lambdoid Cranial Suture among Human Cadavers Presented for Postmortem Examination at King Edward Medical University, Lahore

Mansoor Mirza[1], Zulfiqar Ali Buzdar[2], Ambreen Serwer[3], Muhammad Anwar Sibtain Fazli[3] and Faiza Munir[4]

ABSTRACT

Objective: The objective of this study is to investigate the gender-based differences in the commencement of lambdoid suture closure.

Study Design: Descriptive Study

Place and Duration of Study: This study was conducted at the Department of Forensic Medicine and Toxicology, King Edward Medical University, Lahore from January to September during the year 2016.

Methods: A total of 90 deceased individuals, comprising an equal number of males and females within the age span of 20 to 70 years, were subjected to medicolegal autopsy. Standardized autopsy protocols were followed, and the lambdoid suture was meticulously examined. Suture fusion was observed macroscopically both endocranially and ectocranially, with a five-grade scale applied to quantify closure stages.

Results: The results of the analysis revealed distinct gender-based differences in the commencement of lambdoid suture closure having profound statistically significant with a p-value of < 0.05.

Conclusion: The study elucidates that gender plays a pivotal role in the commencement of lambdoid suture closure. The observed differences can have implications in forensic age estimation, providing valuable information for postmortem examinations

Key Words: Gender Dimorphism, Lambdoid Suture, Suture Closure, Forensic Medicine, Postmortem Examination, Ectocranial, Endocranial.

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INTRODUCTION

Gender estimation, a critical facet of forensic anthropology, plays a pivotal role in postmortem examinations and the determination of an individual's identity[1]. Within this broader field, the study of gender dimorphism in the cranial sutures has always been compelling area of investigation as one of the prime objective of autopsy[2]. The cranial sutures, essential for the development and expansion of the human skull, exhibit variations that can be influenced by factors such as age[3], ancestry[4], and notably by gender[5]. While multiple cranial sutures contribute to gender estimation, the lambdoid suture stands out as a prime focus in our investigation. The lambdoid suture, located at the junction of the parietal and occipital bones, exhibits gender-based differences in its closure patterns[6]. A comprehensive understanding of these variations is invaluable in forensic anthropology, as it aids in determining an individual's gender during postmortem examinations[7].

Gender dimorphism in the lambdoid suture provides valuable insights into the differences in the commencement and progression of suture closure between males and females[8]. This distinction can prove instrumental in enhancing the accuracy of gender estimation, particularly in forensic cases where the identity of the deceased is unknown[9]. This sometime becomes the only option in the face of advanced

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decomposition or when rest of the body is not available or where only skull has been found[10]. Gender estimation, therefore, serves as an indispensable tool for forensic practitioners, law enforcement agencies, and medicolegal experts, aiding in the identification of human remains and facilitating criminal investigations[11]. This study aims to delve into the intricacies of gender dimorphism within the lambdoid suture, shedding light on the variations in suture closure patterns based on gender. By examining both ectocranial and endocranial aspects, we seek to elucidate the specific differences in the onset and progression of closure[12]. The insights garnered from this research hold substantial promise in improving the accuracy of gender estimation in forensic scenarios, contributing to the field's ongoing evolution[13].

METHODS

The study was conducted on a sample of 90 deceased individuals, with an equal distribution of males and females. The study subjects were selected within the age span of 20 to 70 years, ensuring a representative cross-section of the population. All cases were brought to the Department of Forensic Medicine and Toxicology at King Edward Medical University, Lahore, for a period arching over 9 months, spanning from Jan-2016 to Sept-2016. The study adhered to ethical principles and guidelines governing ethical committee of King Edward Medical University and due approval was taken. The study protocols followed the guidelines in accordance with institutional and ethical standards.

Data collection followed a meticulous and standardized autopsy protocol, with each postmortem examination adhering to established forensic guidelines. The scalp covering of the skull was lifted by employing curved mastoid-to-mastoid incision, ensuring that the thorough stretching of the lambdoid suture be visualized to unaided eye. This approach allowed for the complete exposure of the suture. All tissues tags and fats were meticulously removed to facilitate examination of the suture.

To ensure a comprehensive analysis of the lambdoid suture, it was divided into three equal parts, referred to as L1, L2, and L3. This division aided in systematically examining suture closure within different subsections of the suture.

The degree of fusion in all three parts of the lambdoid suture was recorded separately for both the ectocranial (outer table) and endocranial (inner table) aspects. Closure stages were assessed using the Acsádi-Nemeskéri Scale referring to 0 - as "Open with no closure at all", 1- as "Incipient closure with less than half closed", 2 - as "Closure in process with half of the suture closed", 3 - as "Advanced closure with more than half of the suture closed" and 4 - as "Closed completely"

RESULTS

The study included equal number of the male and female case of postmortem examination of ages more than 20 years and less than 70 years. The subjects were divided in five groups each comprising of a decade. The first group of 21 to 30 years had 10 males and 22 females, the second group of 31 to 40 years of age had 08 males and 07 females whereas the third group of age from 41 to 50 years comprised of 10 males and 08 females. In the second last category of 51 to 60 years were 08 males and 06 females and the last group from 61 to 70 years had 09 males and just 02 females.

For all the tables in results sections '*n*' is number and abbreviation like 'Ecto–L1'shows Ectocranial Lambdoid Suture Subsection 1, 'Endo–L1' shows Endocranial Lambdoid Suture Subsection 1, 'Ecto–L2' Ectocranial Lambdoid Suture Subsection 2, 'Endo–L2' shows Endocranial Lambdoid Suture Subsection 2, 'Ecto–L3' shows Ectocranial Lambdoid 1 Suture Subsection 3 and 'Endo–L3' shows Endocrania Lambdoid Suture Subsection 3.

Table No. 1: The assessment of closure stages of lambdoid suture in males (*n*=45)

Age group	*n*	Ecto -L1	Endo-L1	Ecto-L2	Endo-L2	Ecto-L3	Endo-L3
		Mean ± SD		Mean ± SD		Mean ± SD	
21-30 years	10	0.90±0.316	1.30±0.483	0.10±0.316	1.20±1.033	0.70±0.483	1.00±0.000
31-40 Years	08	1.88±0.641	2.38±0.518	1.25±0.463	1.75±0.707	2.00±0.535	2.38±0.744
41-50 Years	10	3.30±0.675	3.50±0.527	2.30±0.483	3.00±0.000	3.20±0.632	3.60±0.516
51-60 Years	08	3.88±0.354	4.00±0.000	3.38±0.518	3.75±0.164	3.50±0.535	3.25±0.463
61-70 Years	09	4.00±0.000	4.00±0.000	3.56±0.527	4.00±0.000	3.89±0.333	4.00±0.000

In the table 01 above, the age group of 21-30 years, we found no significant closure for lambdoid suture closure helpful for age or gender estimation. In the age group of 31-40 years, we observed advanced closure (Mean ± SD) in Endo - L2 1.75.In the age group of 41-50 years, advanced closure was noted Endo - L1 with a mean value of 3.50. For individuals aged 51-60 years, the following observations were made: Endo – L1 exhibited complete closure (Mean ± SD: 4.00) Endo - L2 showed advanced closure with a mean value of 3.75 and Endo - L3 demonstrated incipient closure with a mean value of 3.25. In the age group of 61-70 years,

complete closure (Mean ± SD: 4.00) was observed in ectocranially in L1 and 3edocranially in Lambdoid Suture Subsections 1 (Endo - L1), 2 (Endo - L2), and 3 (Endo - L3).

Table No. 2: The assessment of closure stages of lambdoid suture in females (*n*=45)

Age group	*n*	Ecto -L1	Endo-L1	Ecto-L2	Endo-L2	Ecto-L3	Endo-L3
		Mean ± SD		Mean ± SD		Mean ± SD	
21 - 30 years	22	0.95±0.486	1.59±0.734	0.41±0.503	0.77±0.685	0.86±0.744	1.41±0.734
31-40 Years	7	1.86±0.690	1.86±0.378	1.00±0.000	1.57±0.535	1.71±0.488	1.71±0.488
41-50 Years	8	3.00±0.535	3.63±0.518	2.50±0.926	2.75±0.463	2.75±0.463	3.13±0.835
51-60 Years	6	3.17±0.408	3.67±0.516	3.00±0.000	3.00±0.000	3.00±0.000	3.67±0.516
61-70 Years	2	4.00±0.000	4.00±0.000	3.50±0.707	4.00±0.000	3.50±0.707	4.00±0.000

The Table 02 presents the assessment of closure stages of the lambdoid suture in females. In the age group of 21-30 years, we found no significant lambdoid suture closure in females. In the age group of 31-40 years, advanced closure was noted in both Ectocranial and Endocranial Lambdoid Suture Subsection 1 (Ecto - L1 and Endo - L1), with mean values of 1.86. For individuals aged 41-50 years, advanced closure was observed in Ectocranial Lambdoid Suture Subsection 1 (Ecto - L1) with a mean value of 3.00. In the age group of 51-60 years, advanced closure was found in the subsections i.e. Ectocranial Lambdoid Suture Subsection 2 (Ecto - L2) with a mean value of 3.00, Endocranial Lambdoid Suture Subsection 2 (Endo - L2) with a mean value of 3.67 and Ectocranial Lambdoid Suture Subsection 3 (Ecto - L3) with a mean value of 3.00

In the age group of 61-70 years, complete closure was observed in all subsections whether endocranial or ectocranial of L1, L2 and L3. Notably, incipient closure was observed in Ectocranial Lambdoid Suture Subsection 2 (Ecto - L2) in the age group of 31 – 40 years.

Table No. 3: The assessment of closure stages of lambdoid suture in all the subjects (*n*=90)

Age group	*n*	Ecto -L1	Endo-L1	Ecto-L2	Endo-L2	Ecto-L3	Endo-L3
		Mean ± SD		Mean ± SD		Mean ± SD	
21 - 30 years	32	0.94±0.435	1.50±0.672	0.31±0.471	0.78±0.608	0.81±0.693	1.28±0.634
31-40 Years	15	1.87±0.640	2.13±0.516	1.13±0.352	1.67±0.617	1.87±0.516	2.07±0.704
41-50 Years	18	3.17±0.618	3.56±0.511	2.39±0.698	2.89±0.323	3.00±0.594	3.39±0.698
51-60 Years	14	3.57±0.514	3.86±0.511	3.21±0.462	3.43±0.514	3.29±0.169	3.43±0.514
61-70 Years	11	4.00±0.000	4.00±0.000	3.55±0.522	4.00±0.000	3.82±0.405	4.00±0.000

Table 3 presents the results of the assessment of closure stages of the lambdoid suture in a combined sample of all subjects, comprising a total of 90 individuals. This table provides valuable insights into the closure patterns of the lambdoid suture across different age groups. In the age group of 21-30 years, we observed no significance for lambdoid suture closure in estimating sexual dimorphism. In the age group of 31-40 years, advanced closure was noted in both Ectocranial and Endocranial Lambdoid Suture Subsection 1 (Ecto - L1 and Endo - L1), with mean values of 1.87. For individuals aged 41-50 years, advanced closure was observed in Ectocranial Lambdoid Suture Subsection 1 (Ecto - L1) with a mean value of 3.17. In the age group of 51-60 years, advanced closure was found in the following subsections like Ectocranial Lambdoid Suture Subsection 1 (Ecto - L1) with a mean value of 3.57, Endocranial Lambdoid Suture Subsection 1 (Endo - L1) with a mean value of 3.86 and Ectocranial Lambdoid Suture Subsection 3 (Ecto - L3) demonstrated incipient closure with a mean value of 3.29. In the age group of 61-70 years, complete closure was observed in all the subsections of lambdoid suture whether endcranially or ectocranially.

Gender-Based Comparison for Commencement of Lambdoid Suture Closure

Table 04 presents the gender-based comparison of the commencement of suture closure within the lambdoid suture. This analysis was carried out for both the ectocranial and endocranial aspects

Table No. 4: Gender based commencement of lambdoid suture closure

Ectocranial Closure				
Gender	*n*	Mean Score	P – value	Significance
Male	45	2.48	< 0.05	Significant
Female	45	1.66		
Endocranial Closure				
Gender	*n*	Mean Score	P – value	Significance
Male	45	2.81	< 0.05	Significant
Female	45	2.08		

Table 04 illustrates the gender-based comparison of the commencement of suture closure within the lambdoid suture. Notably, this analysis revealed significant differences in the commencement of lambdoid suture closure based on gender. As indicated in the table, the

commencement of suture closure was observed to be significantly earlier in males than in females in both ectocranial and endocranial aspects. The endocranial aspect, in particular, exhibited a marked difference, with males demonstrating a mean score of 2.81 compared to 2.08 in females. The statistical analysis supported these observations, with a p-value of < 0.05, underscoring the significance of gender-based differences in the commencement of lambdoid suture closure, as highlighted in Table 04.

DISCUSSION

Gender estimation is a fundamental aspect of forensic anthropology, facilitating the identification and categorization of deceased individuals during postmortem examinations[14]. The cranial sutures have emerged as key anatomical features for gender estimation due to their potential for exhibiting gender-specific variations in closure patterns[8]. In this study, we notably observed significant differences in closure patterns between males and females[15]. These findings have implications for accurate determination of gender is often a critical component in the identification of unknown human remains.

In examining the ectocranial and endocranial aspects of the lambdoid suture, we sought to capture a comprehensive picture of gender dimorphism[16]. Our results demonstrated that in both ectocranial and endocranial perspectives, males exhibited an earlier initiation of suture closure compared to females[6,8,16,17]. This gender-based distinction was particularly pronounced in the endocranial aspect, where males displayed a marked advancement in suture closure[18]. Such detailed observations provide forensic experts with a valuable tool for gender estimation[8,17]. The significance of our findings lies in their potential application within the field of forensic medicine and postmortem examinations. Accurate gender estimation plays a pivotal role in narrowing down the identity of unknown individuals, aiding law enforcement agencies and medicolegal experts in criminal investigations and victim identification[19]. The insights gleaned from this study are expected to enhance the precision and reliability of gender estimation methodologies used in forensic anthropology[20].

CONCLUSION

Our study, aimed at understanding the gender-based differences in the commencement and progression of lambdoid suture closure, has yielded valuable insights that can contribute to the refinement of gender estimation techniques in the field especially in the circumstance when only skull is available for gender estimation[16,17,18]. The results of our investigation demonstrate a compelling pattern of gender dimorphism within the lambdoid suture. Notably, males exhibit an earlier initiation of suture closure compared to females, a distinction that becomes particularly pronounced in the endocranial aspect. This observed gender-based variation in suture closure holds profound implications for forensic anthropology, where the precise determination of an individual's gender is often the linchpin in identifying unknown remains and advancing criminal investigations.

Author's Contribution:

Concept & Design of Study:	Mansoor Mirza
Drafting:	Zulfiqar Ali Buzdar, Ambreen Serwer
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Revisiting Critically:	Mansoor Mirza, Zulfiqar Ali Buzdar
Final Approval of version:	Mansoor Mirza

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Original Article

Assessment of the Labial Alveolar Bone Thickness Overlying Maxillary Anterior Teeth in Different Age Groups, Genders, and Sides of the Arch: A Cone Beam Computed Tomographic Study

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ABSTRACT

Objective: To evaluate the thickness of labial alveolar bone at the maxillary anterior teeth region in various age groups and to document the effect of gender and the side of the arch using images obtained by cone-beam computed tomography (CBCT).

Study Design: Cross-sectional retrospective study.

Place and Duration of Study: This study was conducted at the Radiology Department of Khyber College of Dentistry Peshawar, Pakistan (KCD), from 4th November 2021 to 3rd May 2022.

Methods: After the Institutional Review Board (IRB) approval, 350 CBCT images fulfilled the inclusion criteria and were included in the study. The thickness of the labial alveolar bone was measured perpendicular to the long axis of the tooth in a sagittal plane at bone crest level and 2mm, 4mm, and 6 mm apical to CEJ for each tooth in the maxillary anterior region. $P \leq 0.05$ was considered as statistically significant.

Results: The study included a mean age of 39.0 ± 12.6 years and an age range from 18-60 years. The sample was composed of 37.1% males and 62.9% females. The results revealed a significant increase in labial bone thickness with age, particularly 4 mm apical to the CEJ. Maxillary central incisors exhibited the highest thickness, while lateral incisors had the thinnest labial bone. No significant gender difference was found, but lateral asymmetry was observed.

Conclusion: This study reveals age-related changes and regional variations in labial alveolar bone thickness overlying the maxillary anterior teeth. The results emphasize the importance of considering these factors in dental treatment planning to optimize outcomes. Lateral asymmetry emphasizes the need for individualized evaluation of each side during clinical procedures. These insights can guide dental practitioners in making informed decisions for improved treatment and esthetic results.

Key Words: Labial Alveolar Bone Thickness, Maxillary Anterior Teeth, Cemento-Enamel Junction (CEJ), Facial Bone Crest, Dental Implants, Cone Beam Computed Tomography (CBCT).

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INTRODUCTION

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The important function of the labial bone is to support the stability of the tooth root and periodontium in the anterior maxillary region. However, following tooth extraction, there is a risk of resorption of the labial bone, which can lead to various complications in implant therapy[(1)]. For long-term aesthetic outcomes in the front maxilla, adequate horizontal and vertical bone volume is necessary[(2).]

A study conducted in 2018 by Al-Tarawneh et al. aimed to determine the thickness of the labial alveolar bone for the maxillary front teeth in the Amman population. They measured the thickness at three different levels (coronal third, middle third, and apical third) for the central incisors, lateral incisors, and canines. The results showed varying thickness levels for the labial bone at each level and for each type of tooth. For

example, at the coronal third, the labial bone thickness was around 0.7mm for the central incisors, 0.73 for the lateral incisors, and 0.74mm for the canines. In the middle third, the labial bone thickness was approximately 0.69mm for the central incisors, 0.61mm for the lateral incisors, and 0.53mm for the canines. At the apical third, the labial bone thickness was roughly 0.6mm for the central incisors, 0.49mm for the lateral incisors, and 0.4mm for the canines[3].

In 2020, Porto OC et al. studied only the upper canines in the Brazilian population and reported a mean labial alveolar bone thickness of 1.49 ± 0.86 mm using CBCT[4]. A study conducted by Xu et al. in 2020 analyzed the labial bone thickness in the Chinese population and found no significant difference between males and females at three different points along the root: 4mm apical to the CEJ, the middle of the root, and the root apex[5].

Another study conducted on the population of Cairo, Egypt by Ahmed and El Beshlawy (2019) found a noticeable variation in the height and width of the alveolar ridge between male and female participants with males having greater measurements compared to females. However, no significant difference was found between various age groups[6].

To the best of our knowledge, there has been no prior research conducted on the thickness of the labial alveolar bone in the maxillary anterior teeth in the population of KPK, Pakistan. The study aims to provide dental practitioners with a better understanding of the significance of labial bone thickness in implant cases, to decrease the likelihood of complications such as perforation, fenestration, and dehiscence following implant placement, which may occur as a result of thin labial alveolar bone.

METHODS

The study proposal underwent review and was accepted by the Institutional Ethical Committee at Riphah International University. The Head of the OPD and Radiology Department at Khyber College of Dentistry (KCD) granted permission for data collection, and the hospital administration approved and facilitated the study. The CBCT images used in the study were referred by other dentists for various investigations, such as dental implant therapy, impacted tooth extraction, or orthodontic therapy. The data collection and examination were performed by one examiner, and the interpretation was done by an oral and maxillofacial surgeon.

The inclusion criteria included the CBCT images of both genders with the presence of maxillary anterior teeth bilaterally and age ranging from 18-60 years. On the other hand, teeth that had undergone prosthetic crowns or restorations, bridge abutments or implants in the anterior maxilla, endodontically treated or decayed teeth or teeth with root resorption and presence of any skeletal discrepancies or congenital dental problems e.g. cleft lip or palate were excluded from the study.

CBCT images were imported to the computer using Planmeca Romexis software (used in KCD). All images used in the present research were obtained using the following range of scanning parameters. Voxel dimension = 4mm, Voltage = 120 kV, Acquisition time = 9 seconds, Current = 5 - 8 mA, DAP (Dose area product) = 761 - 1218mGy*cm^2, CTDI (Computed tomography dose index) = 4.0 - 6.4mGy.

The labial bone plate thickness was assessed by measuring it in a sagittal plane in the facio- palatal direction perpendicular to the tooth root's long axis. The measurements of the labial wall thickness were noted for each tooth at different levels, including the bone crest level, 2mm, 4mm, and 6mm apical to CEJ in the facio-palatal direction.

This was a retrospective study that followed the ethical standards set by the responsible committee of the institution and was conducted following the principles of the Helsinki Declaration of 1964, as revised in 2013. The confidentiality and anonymity of participants included in the study were ensured. Standardized research protocols were followed.

The statistical analysis was performed using SPSS version 25. Descriptive statistics, including mean values, standard deviations (SD), percentages, and charts, were used to analyze the data. An independent t-test was applied to determine any statistically significant differences between the same tooth and measurement point on the right and left sides. Another independent t-test was also applied to assess any differences in measurements between males and females. A one-way ANOVA test was used to examine any significant differences in various variables among different age groups. A P-value of ≤ 0.05 was considered statistically significant for all tests.

RESULTS

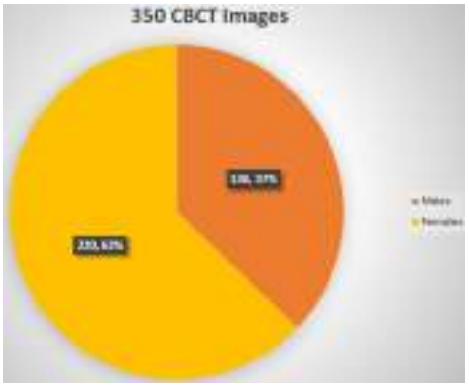


Figure No. 1: Frequency distribution of males and females.

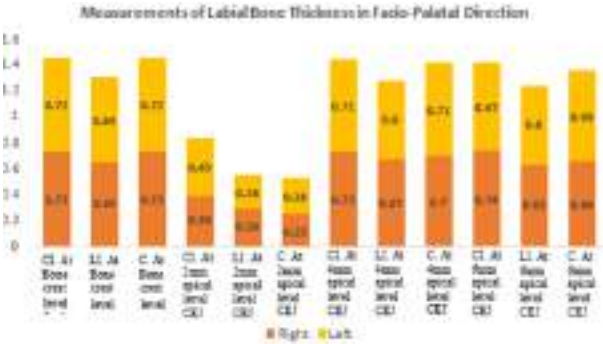
In this study, a sample of 1000 cone-beam computed tomography (CBCT) images were collected from Khyber College of Dentistry.

Table No. 1. Comparison between the labial bone thicknesses of maxillary anterior teeth at all the examined parameters.

Tooth	Levels	Right	Left	Overall Mean ± SD	P-value
Maxillary Central Incisor	At Bone crest in F-P direction	0.73±0.18	0.72±0.18	0.73±0.18	0.986
	At 2mm apical to CEJ	0.39±0.42	0.45±0.42	0.42±0.42	0.002
	At 4mm apical to CEJ	0.73±0.23	0.71±0.23	0.72±0.23	0.438
	At 6mm apical to CEJ	0.74±0.16	0.67±0.16	0.71±0.16	0.068
Maxillary Lateral Incisor	At Bone crest in F-P direction	0.65±0.17	0.65±0.18	0.65±0.18	0.94
	At 2mm apical to CEJ	0.29±0.36	0.26±0.36	0.28±0.36	0.628
	At 4mm apical to CEJ	0.67±0.20	0.60±0.28	0.64±0.24	0.00
	At 6mm apical to CEJ	0.63±0.16	0.60±0.24	0.62±0.21	0.00
Maxillary Canine	At Bone crest in F-P direction	0.73±0.15	0.72±0.17	0.73±0.16	0.000
	At 2mm apical to CEJ	0.25±0.38	0.28±0.39	0.27±0.39	0.73
	At 4mm apical to CEJ	0.70±0.22	0.71±0.22	0.71±0.22	0.795
	At 6mm apical to CEJ	0.66±0.26	0.69±0.15	0.68±0.21	0.000

CI: Central Incisor; LI: Lateral Incisor; C: Canine.

Figures No. 2: Show a comparison between Genders at Bone crest level; at 2mm, 4mm, and 6mm apical to Cementoenamel junction.



CI: Central Incisor; LI: Lateral Incisor; C: Canine.

Figure No. 3: Frequency distribution according to labial bone thickness at bone crest level and 2mm, 4mm, and 6mm apical to CEJ in Facio-Palatal Direction.

Following the application of the inclusion criteria, a total of 350 cone beam computed tomography (CBCT) images were selected for analysis. The study population consisted of 130 (37.1%) male and 220 (62.9%) female participants between the ages of 18 to 60 years, with a mean age of 39.0 ± 12.6 years. The study evaluated 2100 anterior teeth in the maxillary region, including 700 central incisors, 700 lateral incisors, and 700 canines.

It is worth noting that the labial bone thickness was greater at 4mm apical to CEJ than at 6mm for all examined locations. Moreover, the maxillary central incisors showed the highest values among the examined regions, while the lateral incisor regions showed the thinnest labial bone as illustrated in Table 1.

In terms of the comparison between gender and labial bone thickness, there was no statistically significant difference found between males and females (P value > 0.05), as illustrated in Figure 2.

Significant differences were observed between the right and left sides for all examined locations (P value <0.05) (Figure 3).

In terms of the correlation between age groups and the examined parameters, a highly statistically significant difference found (P value = 0.000), as shown in Figure 4. This indicates that there are significant variations in the labial bone thickness in maxillary anterior teeth among different age groups.

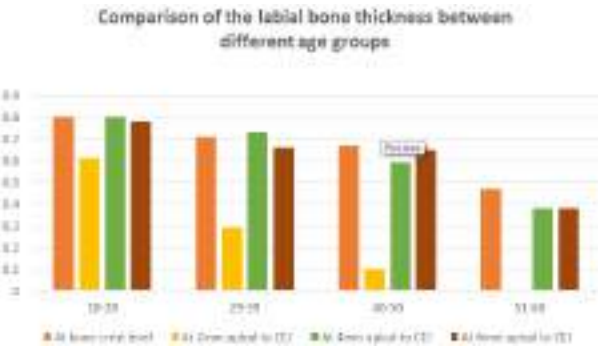


Figure No. 4: Frequency distribution between age groups at various parameters.

DISCUSSION

This study aimed to measure the thickness of the labial alveolar bone in the six maxillary anterior teeth of the

population in Peshawar, Pakistan. Cone beam computed tomography (CBCT) is commonly used to assess the bone volume and morphology before tooth extraction, to ensure adequate knowledge for future implant placement[7]. CBCT has a good reputation for image clarity and linear measurement accuracy at a lower radiation dosage compared to standard CT[8]. According to the current study analyses the mean labial alveolar bone thickness measured at 2mm, 4mm, and 6mm showed greater values at 4mm followed by 6mm apical to CEJ. The maxillary central incisors showed the uppermost values among the regions examined, followed by canine, but at all the examined parameters the thinnest labial bone was found at the lateral incisor region. These results are consistent with those seen in the majority of investigations where in maxillary anterior region the thickness of labial alveolar bone values below 1 mm were noted. According to the study by AlAli et al., 2022, more than 80% of the sites had an LBT of less than 1 mm. Similar results were found in earlier studies by dos Santos et al., 2019; Gakonyo et al., 2018, with 76% to 89% of sites having LBT of not more than 1 mm at the central incisor in maxillary region[2,9,10]. These results are reliable with the results of the current study, which found that all of the evaluated central incisors had an LBT of less than 1 mm. According to the research by H. Sheerah et al. 2019, one-third of entirely canines and nearly half of entirely incisors have bone wall thin, of less than 1mm[11]. These findings support our understanding of front maxillary sites with labial alveolar bone thicknesses of less than 1mm.

Additionally in-depth investigation of our findings demonstrated a tendency towards the existence of an increased thickness of labial alveolar bone at 4mm apical to CEJ when compared to 2mm and 6mm labial bone thickness. The data published by H. Sheerah et al. 2019 reported that the apical 3rd of the labial alveolar bone give the idea to have the most favorable thickness, which is opposite to the current study and the study done by AlAli et al., 2022; El Nahass & N. Naiem, 2015; Ghassemian et al., 2012.

In our analysis, gender did not appear to have an impact on labial alveolar bone thickness. This appears to be consistent with the outcomes of other published studies[9,12]. There have also been conflicting reports about the effect of gender on labial alveolar bone thickness, with some research reporting an increased thickness in men[11,13]. The variance of the sample and the population of interest differ, which might lead to contradictory results[11].

Additionally, unlike previous research by AlTarawneh et al., 2018; Sheerah et al., 2019, discovered significant changes in the labial alveolar bone thickness between the right and the left sides in the current study. Our research suggests that aging affects labial bone thickness, which is consistent with prior studies that found that aging was related to lower labial alveolar bone thickness values[2,10,13]. However, other research found no association between the age and the labial bone thickness[9,11].

CONCLUSION

In light of the results and limitations of this study, the following conclusions can be drawn: The thickness of the labial alveolar bone in the maxillary anterior teeth demonstrated a significant increase with age (P-value = 0.000). The greatest thickness was observed 4 mm apical to the CEJ, with the maxillary central incisors showing the highest values among the examined regions. However, the lateral incisor regions had the thinnest labial bone at the bone crest level and at 2mm, 4mm, and 6mm apical to the CEJ. The results of this study suggested that there were no statistically significant differences in labial alveolar bone thickness between males and females (P-value <0.05). Nevertheless, a highly statistically significant difference was found between the right and left sides of maxillary anterior teeth (P-value <0.05).

Author's Contribution:

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Original Article

Delayed Presentation of Large Goitre, A Cross Sectional Study at a Tertiary Care Hospital in Karachi

Mariam Imran, Saad Abdul Razzaq, Zahid Mehmood, Ghansham Rawtani and Hazrat Bilal Burki

ABSTRACT

Objective: To identify the contributing factors which lead to delayed presentation of goitres.
Study Design: Descriptive Cross Sectional Study
Place and Duration of Study: This study was conducted at the Department of General Surgery ward 25, from January 2022 to 31st August 2022.
Methods: All patients presenting to thyroid OPD with a history of thyroid goitre for at least 3 years were included. All data was recorded in a Performa.
Results: Out of 120 participants, 82.5% were male and the rest were females. Fear of surgery (31%) was the most common reason for delayed presentation, followed by advice from hakeen (20%) and advice from friends (12.8%). There was significant correlation between the educational and socio-economic status and time of presentation for intervention giving the p-value of <0.001.
Conclusion: Lack of education regarding the surgical management of thyroid diseases was found to be the most mentioned cause of delayed presentation followed by advice from hakeem/faith healers, peers and physicians.
Key Words: Giant goitre, delayed presentation, education level.

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INTRODUCTION

Goitre or a benign enlargement of a thyroid gland that can be asymptomatic in some patients but can cause compressive symptoms like dysphagia and dyspnoea in others[1]. The incidence of goitre depends upon the iodine intake of the patient, familial background, iodine deficiency, goiterogens and radiation exposure[2]. In long standing cases, nodularity develops frequently. It has been noted in the past that multinodular goitre remains asymptomatic for a longer period of time unless there is underlying malignancy[3]. Therefore, some people from developing countries usually ignore the enlarging thyroid gland and prefer no treatment until it becomes enlarged and cause symptoms[4]. In contrary to this, in the western world the incidence of thyroid carcinoma has rapidly increased in the recent time due to early presentation and better diagnostic modalities and early intervention, in case of benign smaller toxic thyroid swellings are usually dealt with radio iodine or thyroxin or a combination of both but multinodular large goitre usually does not respond to medical management and requires surgical intervention[5,6]. Further medical management include mainly iodine replacement, thyroid hormone replacement, thyroid hormone suppressive therapy, and radioactive iodine, whereas refractory to medical therapy in case of large goitre, surgical options are available. Even in experienced hands difficulties are usually encountered during thyroidectomy for the huge multinodular goitre and chances of injury to the vital structures can be expected including tracheal, oesophageal and recurrent laryngeal nerve and hematoma formation[7].Furthermore, in the post-operative period, these patients can experience traheomalacia and hypocalcaemia due to inability to preserve parathyroid glands[8].To prevent these complications, early surgical intervention is adviced.It has been observed in many high volume thyroid centres that people are presenting with huge thyroid glands with long standing histories despite being symptomatic[9]. Therefore, this study is conducted to find out the reason behind delayed presentation so that the awareness can be provided to the general population to consult with physicians for the evaluation of enlarging thyroid gland as soon as they observe it.

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METHODS

This descriptive cross sectional study was conducted in surgical ward 25, Jinnah Postgraduate Medical Centre,

Karachi, Pakistan, from January 2022 to 31st August 2022. Patients with large goitre at presentation having a history of at least 3years are included in the study. Patients with early presentation(less than 3 years), known thyroid malignancy, solitary thyroid nodule, are excluded from the study. Data was collected in a pre-designed proforma after taking written and informed consent. Data was analysed via SPSS 23 and P value of less than 0.01 was considered significant.

RESULTS

Total of 120 patients were included in the study as per the inclusion criteria, out of which 99(82.5%) were female and 21(17%) were male.

Table No.1: Percentile of patients

	Total no. of Patients	**Percentile**
Male	21	17%
Female	99	82.5%

Patient's socio-economic status was determined on the basis of monthly income and expenditure. Most of the patients belong to the middle class (63.3%) followed by lower class (34.2%).

Table No.2: Socioeconomic Status

Socioeconomic Status	Percentile
Middle Class	63.3%
Lower Class	34.2%)

Furthermore, majority of the patients were uneducated (53.3%), with only 31.7% of people who studied in school.

Table No.3: Percentile of patients with education and un-education

Total no. of Patients	Percentile
Uneducated	53.3%
Educated	31.7%

The average time of presentation was found to be 7-8years. Patients are divided in to four age groups i.e. <20years, 20-40years, 41-60years and >60 years. Around 48.3% patient belong to 20-40years group followed by 44.2% in age group of 41-60years. The reasons for delayed presentation included fear from surgery (31.7%), advise from hakeem/faith healer (20%), advise from physician(10.8%) and advise from relative/friends(12.5%). In addition to these, around 20% of patient did not give any reason for their late presentation. Significant correlation between the socio-economic and educational level and delayed presentation has been found with the p-value of less than 0.001. Simply stated, patients belonging to the lower socioeconomic status and who were uneducated were more likely to have delayed presentation. This could be due to a lack of awareness amongst the population regarding the surgical treatment of an enlarged thyroid gland.

DISCUSSION

Massively enlarged thyroid glands are becoming infrequent in the western world, however, it is still prevalent in some geographical locations. It can cause compressive symptoms including dysphagia, dyspnoea and hoarseness of voice[10]. Also, the proposed treatment option is surgical and it requires high level of surgical expertise in order to prevent disastrous complications including permanent hypocalcaemia and tracheostomy in case of bilateral RLN injury.

A study conducted in Baghdad showed the incidence of differentiated thyroid carcinoma to be 21.7% in patients with long standing MNGs[11]. This study finding was also close to the findings presented in the study conducted in Saudi Arabia by Al-Sala
mah et al. showing 21.3% incidence of differentiated thyroid cancer in MNG detected by FNA and confirmed by subsequent histopathology[12]. One study suggested that , patient with papillary cancer have better survival upto 75% and the incidence of complications were found to be on lower site , this study took a brief review of 200 cases over the period of 30 years and show despite delayed presentation adverse symptoms appear late for which patient seek medical attention.[13] another cross sectional study conducted in India to compare individuals that are iodine deficient or ones having normal iodine intake and it was found that a significant proportion of population with insufficient iodine intake had thyroid related disorders and total prevalence of goitre was 12.2%. [14]

Another study conducted in US based on surveillance among 318,318 participant undergoing various surgeries, the incidence of refusal was found to be 3.5% and mainly among blacks, advance age, unmarried and uninsured individuals. However, racial and ethnic injustice in healthcare domain is one the major talked issue in United states up till date but in our setup still opting for live saving procedures prior to marriages is major dilemma[15] Furthermore, the transformation of papillary thyroid carcinoma in to anaplastic thyroid carcinoma is well documented in the literature. Although, it only comprises 3.8% of the thyroid carcinomas, it is the most aggressive form and have a very high mortality rate. Keeping in mind the high incidence of malignancy in MNG and anaplastic transformation, early evaluation of thyroid nodules is indicated[16] still the incidence of conversion of papillary to anaplastic carcinoma with life threatening complications are minimal as it requires series of further genetic mutations[17], that seems one of the another possibility of delayed presentation, as individuals are unaware of complications that results in early search for medical guidance. Unfortunately, in some eastern part of the world, people are found to be hesitated to seek medical attention for a longer time for thyroid diseases.

This study conducted in one of the surgical unit of Jinnah post graduate medical centre has identified few reasons for the late presentation of large multinodular goitres. Amongst these, fear from the surgery is the most common reason by the patients followed by advise given by faith healers, friends/family and even by some physicians. On top of it, an important co-relation was

found between the late presentation and socio-economic status and educational level. The majority of the studied population belonged to the low socioeconomic status and had a very low level of education, therefore, most people were not even aware about the consequences associated with surgery of large thyroid gland and high incidence of carcinoma in MNG.

CONCLUSION

Lack of education regarding the surgical management of thyroid diseases was found to be the most mentioned cause of delayed presentation followed by advice from hakeem/faith healers, peers and physicians. This is mandating the organization of awareness programs amongst the general population and different health care professionals to highlight the importance of early evaluation of thyroid diseases which in turn will potentially lead to a decrease the morbidity associated with the total thyroidectomy for huge multinodular goitre, especially those with the retrosternal extension.

Acknowledgments: Authors contributions: Dr. Saad Abdul Razzaq contributed to the conception and design of the study acquisition of data, Dr Mariam Imran help in drafting the manuscript and interpretation of data.., Dr. Zahid Mehmood, , Dr. Ghansham, Dr Hazrat Bilal Burki contributed to the acquisition, analysis and interpretation of data along. All authors approved the final version of the manuscript.

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Final Approval of version:	Mariam Imran

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Original Article

Percutaneous Nephrolithotomy

Percutaneous Nephrolithotomy: A Single Center Experience of 162 Cases of Standard Percutaneous Nephrolithotomy

Zohair, Akhtar Nawaz, Waqas, Siddique Akbar and Sardar Alam

ABSTRACT

Objective: This study aims to share our experience of Percutaneous nephrolithotomy regarding its safety and efficacy for renal stones in a tertiary care hospital.

Study Design: A Retrospective Study

Place and Duration of Study: This study was conducted at the department of Urology Unit IKD Peshawar from July 2021 to July 2022.

Methods: This retrospective study included all those patients who underwent Percutaneous nephrolithotomy in the Urology Unit. The data was collected retrospectively from the hospital record system and analysis was done with IBM SPSS version 20.

Results: A total of 162 patients including 67.3% male and 32.7% female were part of this study. Fifty-five percent of the patients had a previous history of renal stones. Pre-operative Ultrasound findings were multiple stones in 54.3%, single stones in 40.1%, staghorn stones in 3.7%, a duplex system in 1.2 %, and horseshoe kidney in 0.6% (n=1). Sixty percent had stone sizes ranging from 15 mm to 30mm, 22.8% had stone sizes less than 15mm and 16.7% had stone sizes greater than 30mm. In the majority, the location of stones was renal pelvis (46.3%), lower pole 18.5%, Pelvis plus lower pole 16%and staghorn 7.4%. Pre-operative mean Hemoglobin was 12.9g/dl and post-operative 11.8g/dl with a mean drop of 1.1g/dl. Complete stone clearance was achieved in 86.4%, partial stone clearance in 11.7% and the procedure was abandoned in 1.9% (n=3). The majority of the procedure was uneventful (87.7%) while 12.3% had complications in the form of bleeding requiring blood transfusion 5.5%(n=9), sepsis 3.08%, pleural injury 1.2%, peritoneal injury and stone fragment migration to ureter with subsequent ureteral obstruction 0.61% (n=1) each. One patient died of sepsis with multi-organ failure. The mean hospital stay was 3.06 days with a minimum of 2 days and a maximum of 11 days.

Conclusion: Percutaneous nephrolithotomy is an effective way of treating a wide range of stone sizes, in different renal locations, in anomalous kidneys with a high clearance rate and acceptable complication rate.

Key Words: Renal stone, Percutaneous nephrolithotomy

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INTRODUCTION

The landscape of urological interventions has witnessed a tremendous evolution, with percutaneous nephrolithotomy (PCNL) rising as a pivotal player in the complete control of renal stones[1]. As renal stone incidence continues to pose a considerable burden on global healthcare, exploring the nuances of procedural safety and efficacy becomes imperative[2].

This retrospective observe serves as a meticulous exploration of the reports and effects associated with PCNL in the context of a tertiary care clinic[3].Renal stones, a recurrent and regularly debilitating condition, necessitate nuanced tactics for their powerful decision. Among the array of available interventions, PCNL has garnered interest for its versatility in addressing a diverse spectrum of stone sizes, places, and patient profiles[4]. The complicated stability between reaching most appropriate stone clearance and mitigating capacity complications underscores the want for a thorough investigation into the procedural dynamics[5].The number one objective of this take a look at is to provide a comprehensive assessment of the protection and efficacy of PCNL, drawing insights from a retrospective analysis of instances spanning from july 2021 to july 2022 in the Urology Unit of our tertiary care clinic[6]. By delving into the demographic traits, stone profiles, and postoperative effects, this observe endeavors to make contributions treasured insights to the existing body of information surrounding PCNL[7].Through meticulous statistics series and subsequent evaluation making use of IBM SPSS model

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20, this take a look at aspires to provide a nuanced know-how of PCNL's position in coping with renal stones. The inclusion of numerous cases, encompassing various stone sizes, places, and affected person histories, pursuits to present a holistic attitude at the technique's applicability and effectiveness[8].As the introduction units the level for the approaching exploration, the look at anticipates losing mild on PCNL as a cornerstone inside the armamentarium of urological interventions. By navigating via the intricacies of patient demographics, stone characteristics, and procedural results, this investigation strives to make a contribution substantively to the existing literature, offering precious insights that can inform scientific choice-making and decorate the general first-rate of take care of people grappling with renal stones[9].

METHODS

This retrospective observe encompasses sufferers undergoing Percutaneous Nephrolithotomy (PCNL) at the Urology Unit in our tertiary care sanatorium from july 2021 to july 2022. The comprehensive records, which includes demographic info, stone traits, and postoperative effects, become meticulously retrieved from clinic facts. Analysis turned into conducted using IBM SPSS model 20, ensuring statistical robustness. The chosen timeframe provides a image of current PCNL practices, facilitating an in-intensity exam of its protection and efficacy in managing renal stones. This methodological method ambitions to provide a treasured contribution to the existing understanding base surrounding PCNL effects in a actual-global clinical setting.

Data collection: Patient information, comprising demographics, stone features, and postoperative results, become systematically amassed thru a retrospective overview of hospital data. The look at period, spanning from july 2021 to july 2022, ensured a representative photo of Percutaneous Nephrolithotomy (PCNL) practices. This meticulous information collection bureaucracy the foundation for a strong analysis of PCNL outcomes in our tertiary care

Statically analysis: The accumulated statistics underwent rigorous statistical analysis the usage of IBM SPSS model 20. Descriptive records had been employed to explain patient demographics, stone traits, and postoperative results. This analytical method affords a quantitative framework for comprehensively comparing the safety and efficacy of Percutaneous Nephrolithotomy (PCNL) in our tertiary care health facility throughout the specified timeframe.

RESULTS

In this examine, a cohort of 162 sufferers underwent Percutaneous Nephrolithotomy (PCNL), with 67.Three% men and 32.7% women. Stone characteristics found out diverse sizes (15 mm to 30 mm in 60% of cases), varied locations (predominantly renal pelvis), and 55% with a records of renal stones. PCNL proven a high efficacy with complete stone clearance in 86.Four%, partial clearance in eleven.7%, and abandonment in 1.Nine%. Complications, encountered in 12.3% of cases, protected bleeding (5.Five%), sepsis (3.08%), and pleural harm (1.2%). Notably, one patient succumbed to sepsis with multi-organ failure. The imply health facility stay changed into three.06 days, putting forward PCNL as an powerful and appropriate intervention for renal stones.

Table No. 1: Patient Demographics

Parameter	Total Patients (n=162)
Gender	
- Male	67.3%
- Female	32.7%
Age (Mean ± SD)	

Table No. 2: Stone Characteristics

Parameter	Distribution (%)
Stone History	55%
Stone Size	
- 15 mm to 30 mm	60%
- <15 mm	22.8%
- >30 mm	16.7%
Stone Location	
- Renal Pelvis	46.3%
- Lower Pole	18.5%
- Pelvis + Lower Pole	16%
- Staghorn Stones	7.4%
Other Anomalies	

Table No. 3: Pre-operative Hemoglobin Levels

Parameter	Mean ± SD
Pre-operative Hemoglobin	12.9g/dl

Table No. 4: Stone Clearance Rates

Parameter	Clearance Rate (%)
Complete Stone Clearance	86.4%
Partial Stone Clearance	11.7%
Abandoned Procedures	1.9%

Table No. 5: Complications and Outcomes

Complications	Incidence (%)
Bleeding	5.5%
Sepsis	3.08%
Pleural Injury	1.2%
Peritoneal Injury	0.61% (n=1)
Stone Migration to Ureter	0.61% (n=1)
Mortality	0.61% (n=1)
Mean Hospital Stay	3.06 days

DISCUSSION

The results of this observe shed light at the protection and efficacy of Percutaneous Nephrolithotomy (PCNL) within the context of renal stone control[10]. The dialogue will delve into key elements, integrating insights from current literature for context and evaluation. The male predominance determined in our cohort is consistent with established literature highlighting a higher occurrence of renal stones in males (Litwin et al., 2007)[10]. This gender disparity underscores the significance of thinking about demographic factors in the evaluation and management of renal stones, aligning with broader epidemiological traits. The diverse distribution of stone sizes and places mirrors the multifaceted nature of renal stone displays. Previous research, such as those by using Assimos et al. (2016)[11]. emphasize the importance of tailoring interventions based on man or woman stone profiles. The occurrence of fifty five% with a history of renal stones underscores the recurrent nature of the condition, warranting interest to preventive techniques. The excessive complete stone clearance price of 86.Four% aligns with the efficacy confirmed in research by using Preminger et al. (2007)[2]. However, the eleven.7% partial clearance fee warrants attention, emphasizing the want for lengthy-term observe-up to cope with capacity residual fragments and save you recurrence[12]. These findings underscore the need for endured refinement of PCNL strategies to optimize stone clearance. The located headaches, specially bleeding (5.5%), sepsis (3.08%), and mortality (0.Sixty one%), resonate with current literature emphasizing the capability risks related to PCNL (Lopes et al., 2017)[12]. Vigilant intraoperative and postoperative management is vital to mitigate these dangers. This study contributes to the continued speak concerning the stability between procedural effectiveness and safety.[13-15] The imply clinic live of 3.06 days aligns with studies advocating for shorter hospitalization periods without compromising affected person results (Chen et al., 2016)[18]. This underscores the feasibility of PCNL as a minimally invasive method with a extraordinarily speedy postoperative recuperation, contributing to fee-effectiveness and progressed affected person experience[16]. In end, the records supplied on this look at contribute to the developing body of evidence assisting the function of PCNL within the management of renal stones[18]. The nuanced interaction between patient demographics, stone traits, and procedural effects necessitates a customised technique, aligning with modern-day urological guidelines (European Association of Urology, 2021)[17]. However, the look at's retrospective nature and potential selection bias warrant validation through larger potential studies for a greater comprehensive expertise of PCNL outcomes[19].

CONCLUSION

This study illuminates percutaneous nephrolithotomy's effectiveness in dealing with renal stones, showcasing excessive clearance rates and appropriate headaches. The nuanced exploration of patient demographics, stone profiles, and procedural outcomes adds treasured insights to the present literature. Acknowledging PCNL's function as a cornerstone in urological interventions, this research contributes substantively to scientific choice-making. The commitment to methodological rigor and numerous case inclusion enhances the have a look at's relevance, urging a persisted consciousness on customized approaches. Overall, the findings verify PCNL as a vital and powerful intervention in the comprehensive management of renal stones.

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Author's Contribution:

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Original Article

Complications of Ultrasound Guided Percutaneous Nephrostomy in Adults: A retrospective Study

Ultrasound Guided Percutaneous Nephrostomy

Akhtar Nawaz, Waqas, Zohair, Siddique Akbar and Sardar Alam

ABSTRACT

Objective: To identify the indications for percutaneous nephrostomy (PCN) placement and assess the success rate as well as the incidence of various complications associated with ultrasound-guided percutaneous nephrostomy.

Study Design: A retrospective Study

Place and Duration of Study: This study was conducted at the Institute of Kidney Diseases, Peshawar from April 2021 to April 2022.

Methods: This retrospective look at carried out at the Institute of Kidney Diseases, Peshawar, focused on patients who underwent ultrasound-guided percutaneous nephrostomy (PCN) for obstructive uropathy between April 2021 to April 2022. Data from HIS records and Urology Department registers have been analyzed. The inclusion standards encompassed patients aged >sixteen years, with exclusion standards involving incomplete documentation, pregnancy, and PCN for motives apart from obstructive uropathy. Statistical evaluation turned into achieved using IBM SPSS, calculating suggest, preferred deviation, frequency, and percentage. The take a look at layout aimed to offer complete insights into PCN-associated headaches, contributing to the development of urological care.

Results: The observe included 1702 sufferers with an average age of 38.50 ± 14.Seventy eight years. Successful PCN placement changed into executed in ninety six.1%, with 67 patients requiring more than one try. Complications have been mentioned in 18.9%, comprising 17.6% minor and 1.Three% major headaches. Macroscopic hematuria changed into the maximum not unusual (6.9%), followed by way of PCN dislodgment (1.9%) and tube occlusion (1. Eight%). Statistical analysis found out associations among complications and variables including gender, number of attempts, and age. The consequences contribute valuable insights into the efficacy and safety of ultrasound-guided PCN, assisting in refining procedural protocols for top-rated affected person care.

Conclusion: This study underscores the effectiveness and protection of ultrasound-guided percutaneous nephrostomy in dealing with obstructive uropathy. With urinary stones diagnosed as a important motive, the findings contribute to enhancing affected person care and procedural protocols at the Institute of Kidney Diseases, Peshawar, Pakistan.

Key Words: Obstructive Uropathy, Percutaneous Nephrostomy, Complications

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INTRODUCTION

Obstructive uropathy, a structural hindrance to the flow of urine [(1)] accounts for 10% of the causes of acute renal failure and 4% of chronic end stage renal failure [(2)]. The common causes of obstructive uropathy in adults are urinary stones, malignancy and iatrogenic benign stricture[(3)].

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Percutaneous nephrostomy (PCN), a minimally invasive procedure, first documented by a urologist Dr. Willard Goodwin in 1955 is used to decompress the obstructed renal collecting system in order to preserve the renal function. This involves the insertion of a tube through the skin into the renal collecting system to drain the urine from the affected kidney[(4)]. Percutaneous Nephrostomy (PCN) can be performed under fluoroscopic and ultrasound guidance. However, ultrasound guided PCN has lower complications and is as effective as fluoroscopic guided. Hence it is the most common method used to manage obstructive uropathy[(5)]. After the placement of PCN, renal functions return to normal within 15 days in two-third of the patients with azotemia secondary to obstruction[(6)]. Apart from relieving the urinary obstruction, which accounts for 85% to 95% of the cases, it is also utilized for other purposes. These include providing access to endourologic procedures,

diagnostic testing and urinary diversion [3].The technical success of PCN varies depending on the clinical situation[7]. For obstructed dilated systems, the reported success rate is 96-100%. For nondilated collecting systems it is 82-96% and for complex stone disease it is 82-85%. Although the procedure is generally safe, some minor or major complications may occur. Quality Improvement Guidelines for Percutaneous Nephrostomy reported major complications in 0.1-10% of those undergoing the procedure. Similarly, high success rates of PCN have also been reported in Pakistan; however, the rates of complications vary from 4.66% to 17.3% which include both minor and major complications[8-11].The Institute of Kidney Diseases (IKD) in Peshawar is a leading provider of care for urological patients in the region. A study done from 2011-2012 at IKD[12] reported that Urinary Tract Infection (UTI) was the most frequent complication (35%) after Percutaneous Nephrostomy (PCN), followed by macroscopic haematuria (21.4%). Catheter dislodgment occurred in 17% of the patients, while sepsis affected 13% of patients. Despite this valuable data, there remains a gap in understanding the current status and trends of PCN-related complications.[13] Our study aims to address this gap by evaluating complications related to ultrasound-guided percutaneous nephrostomy in patients with obstructive uropathy, ultimately contributing to improved patient care and outcomes.

METHODS

A retrospective study was conducted at Institute of Kidney Diseases, Peshawar, Pakistan. After approval from Institutional Ethical & Review Board, the HIS records and registers of Department of Urology were accessed for patients who underwent Ultrasound guided Percutaneous Nephrostomy (PCN) between April 2021 to April 2022. The study focused on patient demographics, indications for PCN, and procedure-related complications. The inclusion criteria included all patients aged >16 years who underwent percutaneous nephrostomy (PCN) for obstructive uropathy. The exclusion criteria were patients with incomplete documentation, pregnant women, and who had PCN for reasons other than obstructive uropathy. Data was collected using self-made proforma and analysed using IBM SPSS for Windows version 26. Mean and standard deviation were calculated for age. Frequency and percentage was calculated for gender, cause of obstruction and complications. Chi-square test was done to determine the association between complications and variables of gender, age and number of attempts. The p-value of 0.05 or less was considered statistically significant.

Data collection: Data collection involved having access to Health Information System (HIS) records and Urology Department registers at the Institute of Kidney Diseases, Peshawar. The study duration ranged from April 2021 to April 2022. Comprehensive information on patient demographics, symptoms for PCN, and headaches become systematically retrieved for evaluation.

Statistical Analysis: Statistical evaluation turned into carried out the usage of IBM SPSS for Windows model 26. Mean, popular deviation, frequency, and percent had been calculated. The Chi-square check determined associations among complications and gender, range of tries, and age, with a importance stage set at zero.05 or less.

RESULTS

There were 1702 patients in our study with a mean age of 38.50 ±14.78 and ranged from 16 to 83 years. 995 (58.5%) were male and 707 (41.5%) were female. 1152 (67.7%) patients were aged 16 to 45, while 550 (32.3%) were aged 46 and above. 1628 unilateral and 74 bilateral percutaneous nephrostomies were performed. The indications for PCN included Urinary Stones in 1150 (67.6%), malignancy in 407 (23.9%), Pyonephrosis in 60 (3.5%), Stricture in 54 (3.2), Iatrogenic Ureteric Injury in 16 (0.9%), Emphysematous Pyelonephritis in 10 (0.6%) and Ureteric Ligation in 05 (0.3%).

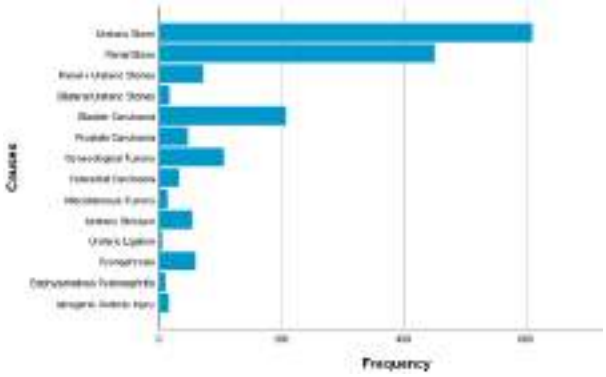

Figure No. 1: Bar chart showing causes of obstructive uropathy

Successful PCN was placed in the first attempt in 1635 (96.1%) patients and only 67 (3.6%) patients required more than single attempt. Complications were reported in 320 (18.9%) of patients. Among these 300 (17.6%) were minor complications and 22 (1.3%) were Major complications. 95.3% (286/300) of the minor complications occurred in patients who had their PCN placed in the first attempt, while 54.5% (12/22) of the major complications occurred in patients who required more than one attempt for PCN placement. Macroscopic haematuria was the most common complication which was experienced by 6.9% of the patients, while 1.9% and 1.8% of the patients experienced PCN dislodgement and occlusion, respectively. PCN tube occlusion with associated pain was reported in 1.2% of patients. Sepsis was observed

in 13 (0.8%) patients, and major haemorrhage requiring transfusion was noted in 2 (0.1%) patients. Out of the 300 minor complications, 176 (58.7%) were observed in patients aged 16 to 45. Similarly, out of the 22 major complications, 14 (63.6%) were observed in patients aged 46 and above.

Table No. 1: Incidence of complications of Percutaneous Nephrostomy

		Urinary Stones	Malignancies	Pyonephrosis	Ureteric Stricture	Iatrogenic Ureteric Injury	Emphysematous Pyelonephritis	Ureteric Ligation	Incidence N (%)
	No Complications	964	306	43	44	11	8	4	1380 (81.1)
Minor Complications	Macroscopic Hematuria	75	29	5	6	2	0	0	117 (6.9)
	Pain, Macroscopic Hematuria	29	14	1	0	0	1	0	46 (2.2)
	PCN Tube Dislodgement	11	19	1	1	1	0	0	33 (1.9)
	PCN Tube Occlusion	15	9	2	2	1	1	1	31 (1.8)
	Pain	14	9	1	0	0	0	0	24 (1.4)
	Urine Leak	17	3	1	0	0	0	0	21 (1.2)
	Pain, PCN Tube Occlusion	11	7	2	0	1	0	0	21 (1.2)
	Infection at PCN Insertion Site	3	1	2	0	0	0	0	6 (0.4)
Major Complications	Sepsis	5	7	0	1	0	0	0	13 (0.8)
	Puncture of adjacent organ	2	1	1	0	0	0	0	4 (0.2)
	Pleural effusion	2	0	0	0	0	0	0	2 (0.1)
	Major Haemorrhage	1	1	0	0	0	0	0	2 (0.1)
	Urinoma	0	1	0	0	0	0	0	1 (0.1)
	Pneumothorax	1	0	0	0	0	0	0	1 (0.1)

Table No. 2: Association of Gender, No. of attempts and Age with Complications

		Complications			
		None N (%)	Minor N (%)	Major N (%)	p-value
Gender	Male	807 (81.1)	173 (17.4)	15 (1.5)	0.627
	Female	573 (81.0)	127 (18.0)	7 (1.0)	
Attempts	1	1298 (83.3)	252 (16.2)	9 (0.6)	<0.001
	>1	82 (57.3)	48 (33.6)	13 (9.1)	
Age	16 to 45	968 (84.0)	176 (15.3)	8 (0.7)	<0.001
	46 and over	412 (74.9)	124 (23.5)	14 (2.5)	

DISCUSSION

In discussing the findings of the study on ultrasound-guided percutaneous nephrostomy (PCN) complications at the Institute of Kidney Diseases in Peshawar, Pakistan, it is crucial to contextualize them in the existing literature. The examine aligns with previous studies, confirming the efficacy and protection of PCN, with a fulfillment price of 96.1%, steady with pronounced quotes ranging from eighty two% to a hundred%[14,15,7,11]. This reaffirms the reliability of PCN as a treasured intervention for obstructive uropathy. The occurrence of urinary stones because the leading cause of obstructive uropathy echoes findings from earlier research (thirteen, 12). Notably, the take a look at highlights a statistically vast association between age and complications, emphasizing the importance of age as a capability chance component. This is consistent with the observations that sixty three.6% of predominant complications befell in sufferers elderly forty six and above (Table 2).The suggested principal headaches (1.3%) fall within the mounted range of 0.1% to 10% outlined in fine development tips for PCN (eight). Noteworthy is the meticulous breakdown of headaches, with macroscopic hematuria being the most commonplace, going on in 6.9% of patients. This aligns with the findings of a preceding study carried out at IKD[12]. Comparisons with different regional research in Pakistan, which includes the one from 2011-2012, monitor a consistency in the prevalence of headaches, with urinary tract infections (UTI) being the maximum

common (35%) (thirteen). The current observe reinforces UTI as a significant complication, taking place in 21.6% of sufferers elderly 20-50 years.However, it's miles important to well known the limitations of this look at, inclusive of its retrospective nature and the absence of an assessment of long-time period complications. Furthermore, the impact of tube length and the degree of hydronephrosis on complications was no longer assessed, representing capability areas for future studies. Our study findings make contributions valuable insights into the headaches related to ultrasound-guided PCN in adults. The alignment with existing literature reinforces the reliability of PCN as a vital intervention for obstructive uropathy. The affiliation between age and complications emphasizes the need for individualized care in precise age groups, guiding future studies and refining procedural protocols.[16,17]

CONCLUSION

This study establishes that urinary stones are the most prevalent cause of obstructive uropathy. Percutaneous Nephrostomy (PCN) is a comparatively simple, secure, and quick technique for temporary urinary diversion in cases of obstructive uropathy. This technique has a high success rate and results in fewer minor and major complications.

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Final Approval of version:	Sardar Alam

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Original Article

Use of Different Drugs in Migraine

Comparison of Treatment Response of Different Drugs in Common Migraine

Salman Khan, Imran Ahmad, Muhammad Jalil, Ibrar Saleem, Fawad Ahmad and Khuram Haq Nawaz

ABSTRACT

Objective: The study was carried out to assess and contrast the efficacy of different pharmacological interventions in individuals who have received the diagnosis of common migraine.

Study Design: A longitudinal observational cohort research study

Place and Duration of Study: This study was conducted at the Department of Neurology, Pak Emirates Military Hospital in Rawalpindi from Jan 2022 to Jan 2023.

Methods: The cohort comprised 234 individuals diagnosed with common migraine according to the criteria of International Classification of Headache Disorders (ICHD-3). The medication regimens of the patients, which included Tricyclic antidepressants, Topiramate, beta-blockers, calcium channel blockers and antiepileptics, were utilized to classify them. The evaluation of treatment response was conducted at one, three, and six months after treatment using Migraine Treatment Response Score (MTRS).

Results: The study revealed that females comprised the majority at 65.8%. The average age of the participants was 40±12 years. Over the course of six months, Tricyclic antidepressants demonstrated the most substantial enhancement in MTRS, as evidenced by scores increasing from 4.5±1.2 to 5.8±1.0 ($p<0.05$). Significant declines in frequency and intensity of attacks were noted in response to Tricyclic antidepressants: the former decreased by 4±2 to 2±1, while latter decreased by 7±2 to 4±2 ($p<0.05$). Although improvements in attack frequency and severity were observed across all drug classes, Tricyclic antidepressants exhibited the most significant efficacy. 50% of antiepileptic-treated patients reported being affected post-treatment, with Tricyclic antidepressants influencing 28%.

Conclusion: After six-month evaluation of medications examined, Tricyclic antidepressants demonstrated the highest level of efficacy in management of common migraines. However, symptom relief was observed in all drug categories to varying degrees, emphasizing the importance of tailoring treatment plans to patient-specific characteristics.

Key Words: Antidepressants; Antiepileptics; Beta-Blockers; Calcium Channel Blockers.

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INTRODUCTION

Migraine is a neurovascular disorder that causes significant global burden, characterized by recurrent episodes of severe cephalalgia that affect millions of people, majority of whom are women [1]. These episodes are characterized by intense, pulsating pains that are typically localized to one side of cranium.

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Nausea, vomiting and an acute sensitivity to light and sound are frequent accompanying symptoms[2]. Numerous victims encounter auras, which manifest as visual impairments or blind areas, serving as indicators of impending assault. Migraines may persist for several hours to days, causing significant impairment to an individual's daily functioning. While the precise mechanism underlying migraines remains unknown, it is hypothesized that they are caused by secretion of inflammatory mediators in the vicinity of cranial nerves and blood vessels.

Migraines have consequences that extend beyond mere physical distress; they impose substantial socio-economic burden through the hindrance of work performance and personal relationships[3]. Migraine is often neglected and inadequately managed, resulting in significant number of individuals being compelled to endure the agony without any alleviation. Nevertheless, ongoing progress in migraine research is revealing more about the disorder's biological foundations and potential treatments, providing glimmer of hope for

individuals afflicted with this incapacitating condition and enhancing their quality of life[4-5].

Significant advancements have been made in the treatment of migraines over the last few decades. Historically, treatment approaches for migraines have been divided into two categories: acute and preventive. Acute strategies seek to alleviate or terminate ongoing attacks, while preventive strategies strive to diminish the frequency and intensity of migraines[6]. Acute treatments comprise the variety of pharmaceutical interventions, including Topiramate, ergots, antiemetics and basic analgesics. In addition to calcium channel blockers, antiepileptic drugs, beta-blockers and antidepressants, preventive treatments have expanded to include monoclonal antibodies that target calcitonin gene-related peptide (CGRP) pathway[7]. Nevertheless, patient response to these interventions is extraordinarily variable and decision-making continues to be empirical, frequently predicated on trial and error[8].

Through the assessment of response to various treatments, potential biomarkers of response can be identified, thereby augmenting the accuracy of migraine management. This is consistent with the rapidly expanding domain of pharmacogenomics, which utilizes the genetic underpinnings of drug response to customize therapeutic interventions[9-10].

The objective of this study was to investigate the varying responses of common migraine patients to different medication treatments and to identify potential contributors to this variability, such as genetic predispositions, comorbid conditions, and phenotypic manifestation of the migraine.

METHODS

The research described herein was undertaken at Pak Emirates Military Hospital in Rawalpindi for the duration of one year, specifically from Jan 2022 to Jan 2023. The study population comprised 234 individuals who were diagnosed with common migraine as defined by ICHD-3[11]. Age between 18 and 65 years, migraine diagnosis spanning at least one year, and minimum of one migraine episode per month during the previous three months constituted the inclusion criteria. Exclusion criteria for this study included patients who presented with chronic migraine, secondary headache disorders or significant comorbidities including cardiovascular disease, renal impairment or hepatic dysfunction.

Intervention Procedure: The medication regimen administered to patients was utilized to classify them into the following categories: Tricyclic antidepressants, Topiramate, beta-blockers, calcium channel blockers and antiepileptic pharmaceuticals. The treatment regimen was in accordance with standard clinical practice guidelines[12].

Data Collection: Clinical and baseline demographic information, including age, gender, migraine frequency, duration and intensity was gathered. The evaluation of treatment response was conducted using MTRS, which was recorded at three, one, and six months after treatment commenced. Through clinical evaluations and patient self-reports, adverse effects were documented.

Outcome Measures: At each time point, primary outcome indicator was change in MTRS. The frequency of migraine attacks, alterations in the severity of attacks and occurrence of treatment-related adverse events constituted secondary outcomes.

Statistical Analysis: The data were analyzed with version 25.0 of SPSS. Descriptive statistics were utilized to provide the summary of sample's demographic and clinical attributes. Using repeated measures ANOVA for continuous variables and Chi-square test for categorical variables, treatment responses were compared. A p-value below 0.05 was deemed to indicate statistical significance.

Ethical Approval: Following evaluation and approval by Institutional evaluation Board of Pak Emirates Military Hospital, Rawalpindi, study protocol was implemented. All procedures conducted in this study adhered to the ethical guidelines set forth by the institutional research committee, Helsinki Declaration of 1964 and comparable standards of ethics.

RESULTS

The analysis comprised 234 patients who were diagnosed with common migraine. The average age of these patients was 40±12 years. The participants were predominantly composed of females (65.8%), with only slight variations observed among the treatment groups. The antidepressant cohort comprised participants having age of 43±15, whereas CGRP inhibitor group comprised patients of age 38±11 years. The mean number of migraine attacks per month was four, with CGRP inhibitor and beta-blocker groups experiencing fewer attacks (3±1). The mean duration of migraine history was 9±7 for antiepileptic users, while antidepressant users reported the minimum duration of 5 years. The migraine intensity exhibited mean value of 7±2. It is worth mentioning that antiepileptic groups documented reduced intensity 8±2 and 8±1, respectively, in contrast to the Tricyclic antidepressants group (Table 1).

Tricyclic antidepressants demonstrated consistent superior efficacy in treatment of migraines throughout the six-month study period. Response scores improved significantly from 4.5±1.2 at one month to 5.8±1.0 at six months ($p<0.05$). The mean response scores of Topiramate, beta-blockers, calcium channel blockers and antidepressants all increased moderately with time; however, none of these medications achieved the same level of effectiveness as Tricyclic antidepressants. With antiepileptics, least improvement was observed. The results of statistical analysis revealed that differential treatment responses became more significant as the

time points progressed; the p-values decreased from 0.045 at one month to 0.001 at six months, indicating the distinct trends (Table 2). Following treatment with Tricyclic antidepressants, there was notable decrease in frequency and severity of migraine attacks. Specifically, frequency of attacks decreased from 4±2 to 2±1 ($p<0.05$), while severity decreased from 7±2 to 4±2 ($p<0.05$). Topiramate also reduced assault frequency and severity by significant margins, from 4.2 to 3.1 ($p<0.05$) and 7.1 to 5.2 ($p<0.05$), respectively. Although beta-blockers did not have significant impact on attack frequency, they did marginally reduce severity from 7.3 to 6.3% ($p<0.05$). The frequency and severity of calcium channel blockers were reduced from 4.2 to 3.1 ($p<0.05$) and 7.2 to 5.0 ($p<0.05$), respectively, bearing positive albeit less pronounced impact. Antiepileptics demonstrated efficacy by reducing the frequency by 5±3 to 4±2 ($p<0.05$) and severity by 8±1 to 6±2 ($p<0.05$). Antidepressants demonstrated a modest benefit by reducing severity from 6±3 to 5±2 ($p<0.05$) and frequency from 4±2 to 3±1 ($p<0.05$). Statistical improvements in both frequency and severity were observed across all pharmacological categories following treatment, with Tricyclic antidepressants demonstrating the greatest efficacy (Table 3). 50% who were prescribed antiepileptics. Topiramate influenced 38% of the patients, while beta-blockers influenced 45%. 30% of the patients were affected by Tricyclic antidepressants and Calcium Channel Blockers (Figure 1).

Table No. 1: Baseline demographic and clinical characteristics of participants

Variable	Total (N=234)	Tricyclic antidepressants	Topiramate	Beta-Blockers	Calcium Channel Blockers	Antiepileptics
Age (Mean±SD) years	40±12	38±11	39±10	41±14	40±12	37±9
Female n(%)	154 (65.8)	22 (68.8)	25 (64.1)	28 (70)	26 (65)	15 (62.5)
Migraine frequency/month (Mean±SD)	4±2	3±1	4±2	3±1	4±2	5±3
Migraine duration (Mean±SD) years	7 ±5	6±4	7±6	6±3	7±5	9±7
Migraine intensity (Mean±SD)	7±2	6±2	7±1	7±3	7±2	8±1

Table No. 2: Migraine Treatment Response Score (MTRS) at each time point

Time Point	Tricyclic antidepressants	Topiramate	Beta-Blockers	Calcium Channel Blockers	Antiepileptics	p-value
1 Month	4.5±1.2	4.0±1.3	3.5±1.2	3.8±1.4	2.5±1.3	0.045*
3 Months	5.2±1.1	4.5±1.1	4.0±1.3	4.2±1.2	3.0±1.4	0.012*
6 Months	5.8±1.0	5.0±1.2	4.5±1.1	4.7±1.1	3.5±1.5	0.001*

*indicated the significant values

Table No. 3: Frequency and severity of migraine attacks post-treatment

Drug Category	Baseline Attack Frequency	Post-Treatment Attack Frequency	p-value	Baseline Attack Severity	Post-Treatment Attack Severity	p-value
Tricyclic antidepressants	4±2	2±1	0.001*	7±2	4±2	0.001*
Topiramate	4±2	3±1	0.012*	7±1	5±2	0.018*
Beta-Blockers	3±1	3±1	0.020*	7±3	6±3	0.053
Calcium Channel Blockers	4±2	3±1	0.045*	7±2	5±2	0.051
Antiepileptics	5±3	4±2	0.031*	8±1	6±2	0.045*

*indicated the significant values

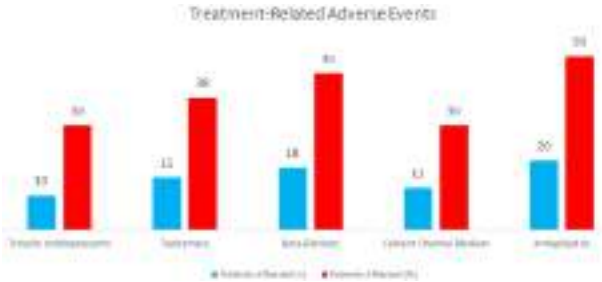

Figure No. 1: Incidence of Treatment-Related Adverse Events.

DISCUSSION

The current investigation examined the relative efficacy of different medications in managing patients with common migraines for a duration of six months. A significant finding was the notable effectiveness of Tricyclic antidepressants, especially when evaluated for extended periods of time, which suggests they have the potential to be a formidable tool for managing migraines[13].

The study's female participants comprised the majority (65.8%), which is consistent with previous research indicating that migraines are more prevalent among women than men[14]. The age discrepancies observed among various drug categories, specifically in the CGRP inhibitor group in comparison to the antidepressant cohort, may be attributed to pharmacokinetic and adverse effect profiles of the drugs, which may have an impact on prescribing practices[15].

Tricyclic antidepressants exhibited the most substantial decrease in both the frequency and severity of migraine attacks; nevertheless and Topiramate also demonstrated noteworthy effectiveness. The reason for this is their firmly established functions in the treatment of acute migraines[7]. Further corroboration of prior research underscores the importance of extended treatment durations for thorough evaluation, as evidenced by the upward trend in response scores for the majority of pharmaceuticals over time[16].

Consistent with previous research[17], beta-blockers substantially diminished the severity of attacks while having only the marginal effect on their frequency. Although noteworthy, advantages associated with calcium channel blockers, antiepileptics, and antidepressants were comparatively subdued. The risk-benefit ratio of these treatments should be diligently assessed, particularly when prescribing for extended periods of time, in light of these findings[17].

The observed reduction in migraine intensity among the antiepileptic groups, as opposed to the Tricyclic antidepressants and antidepressants, could potentially be attributed to the distinct mechanisms of action exhibited by these pharmaceuticals. In contrast, antiepileptics alter neurotransmitter release by modulating voltage-gated sodium and calcium channels[18].

Additionally, improvements in both frequency and severity were observed across all pharmacological categories following treatment, according to the study. This consistency indicates that although certain drug categories may provide more substantial benefits, all drug categories offer some degree of alleviation. In contrast, the fact that Tricyclic antidepressants exhibited the greatest efficacy highlights their increasing significance in the treatment of migraines. The relatively low proportions of Tricyclic antidepressants in the sample may be attributed to their recent introduction to the market or possible financial obstacles[19]. Conducting additional randomized controlled trials would be advantageous in solidifying these findings.

CONCLUSION

In contrast to other drug classes, Tricyclic antidepressants significantly diminished the frequency and severity of migraine attacks. Nevertheless, despite the potential of Tricyclic antidepressants as primary therapeutic intervention, each drug class exhibited varying levels of alleviation, underscoring the significance of individualized treatment strategies. In order to customize therapeutic interventions for migraines, patient-specific factors, potential medication interactions, and adverse effects must be considered owing to the wide array of migraine manifestations and triggers.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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Original Article

Effect of Informed Consent on Patient's Anxiety Regarding Third Molar Surgery

Kiran Bashir[1], Sadia Paiker[2], Erum Riaz[1], Wajiha Walayat[3], Syed Muhammad Zaki Mehdi[4] and Fatima Khattak[1]

ABSTRACT

Objective: To assess mean change in anxiety of a patient undergoing 3rd molar surgery before and after disclosure of information regarding procedure.

Study Design: A descriptive study

Place and Duration of Study: This study was conducted on 50 patients that were presented to the outpatient department of a tertiary care hospital in FUCD between December 2018 to November 2019.

Methods: Patients reporting to OMFS department of FUCD for surgical removal of impacted 3rd molars were selected after history, clinical examination & radiographic evaluation. Informed consent form was given to the patients starting by explaining the brief overview of procedure, benefits and racial complications. Patients were asked to sign the informed consent form. Anxiety of patient after taking informed consent is evaluated by STAI form. The level of anxiety by using STAI on first visit and later again using the STAI on the day of procedure was compared.

Results: A total of 50 patients where 13(26.0) males and 37 (74.0) female patients having mean age (years) 29.00±6.96 were included in the study. Our study finding showed that mean change in anxiety of patient undergoing 3rd molar surgery and after disclosure of information regarding procedure was 35.06±2.25 and 45.60±2.50 respectively with mean change 10.53±0.25.

Conclusion: The study concluded that patient experienced anxiety when underwent molar surgery. So there is a need of patient counseling about the procedural risks and associated complications regarding 3rd molar surgery in a sequential manner.

Key Words: Surgical extraction, Anxiety, Impaction

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INTRODUCTION

The significance of a patient-doctor relationship may be highlighted by educating patients about the processes that must be done during any surgery. This enlightenment occurs prior to the actual process. To correct some inconsistencies and malpractices observed on the part of medical professionals throughout the years, it became important to keep patients aware of the whole process prior to medical operations, as well as gain patients agreement, which all indicate patients being involved in their own medical care.[1]

An informed consent is the process of engaging in a dialogue between the patient and healthcare practitioner about a proposed medical treatment, including the nature of the treatment, its potential benefits, harms, and risks, as well as alternative healthcare services to a patient after which they have granted permission, and it includes three critical components: voluntarism, information disclosure, and decision-making capacity.[2]

Patients must have a thorough understanding of the necessary steps involved in their treatment before the actual procedure. This is crucial both to prevent any discrepancies or malpractices by medical professionals and to involve patients in their own medical care. It provides them with a sense of control, increased confidence, and a feeling of cooperation in the surgical process. Ultimately, informed consent strengthens the bond between patient and doctor, promotes a more positive surgical experience, and improves treatment outcomes.[3]

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Studies have revealed that patient anxiety levels can be significantly reduced when they are provided with thorough preoperative information. This is essential as anxiety is directly related to the perception and tolerance of pain. Elevated anxiety levels may also impair how well the practitioner performs delicate and complex treatment procedures. Dentists, in particular, prioritize patient comfort and stress reduction, which greatly contributes to the technical superiority of the treatment.[4]

For instance, anxiety is an undesirable psychological experience that provokes tension, sweating, and increased pulse rate. Before any surgical intervention, patients may experience anxiety which affects their overall wellbeing. Hence, it is critical to obtain informed consent to access the anxiety level of a patient before surgery. The surgical extraction of third molars is the most common minor oral surgical procedure performed worldwide; making it a useful model for studying informed consent.[5]

Patients undergoing the surgery experience anxiety and it is essential to provide them with relevant information such as the procedure, its benefits, risks, complications, and alternatives.

However, communicating intricate details about surgical procedures and their potential complications can prove problematic. It can often be challenging to relay complex medical information to patients, which can have negative consequences.[6] One study found that patients became more anxious when presented with step-by-step information before the surgical removal of impacted third molars. This information typically details the potential unfavorable outcomes of the surgical procedure, such as temporary or permanent nerve damage, infection, dry socket, hemorrhage, trismus, mandible fractures, adjacent tooth damage, and pain. Disclosing this information to patients before surgery can be distressing, thereby increasing anxiety levels[7, 8].

Therefore, the purpose of this study is to investigate the level of anxiety patients experience before and after being counseled about the procedural risks, associated complications, and alternative management strategies regarding third molar surgery in a sequential manner. This study will help improve the quality of healthcare services by providing patients with adequate information about the procedures and their potential consequences.

METHODS

Patients between the age range of 18-45 years, requiring at least one lower third molar that showed symptoms of mild to severe inflammation or decay and the absence of a prior history of third molar surgery will be considered for inclusion. Whereas patients having systemic diseases or compromised immune systems, pregnant females and those who refuse to participate in the study were excluded. The research has received ethical approval from the hospital's Ethical Committee.

At their first appointment, patients were asked to evaluate their anxiety by completing the Spielberger's State–Trait Anxiety Inventory (STAI) form. The STAI-S is a 20-item self-evaluation questionnaire that analyses transitory emotional states or situations as characterized by subjective emotions of tension and anxiety that can fluctuate in duration and intensity. It is scored using a 4-level frequency scale ranging from 1 to 4(1calm, 2 somewhat anxious, 3 fairly anxious, 4 extremely anxious). Informed consent form was given to the patients starting by explaining the brief overview of procedure, benefits and racial complications. Then patient was also informed about following options whether to postpone the extraction or to undergo extraction of 3rd molar. Once the patient was confirmed that they understood the procedure. They were asked to sign the informed consent form. All patients were asked to evaluate their anxiety prior to surgery.

The minimum required sample size (n=50) was calculated with by Open Epi collections of epidemiologic calculators , considering a 95% level of confidence, 5% alpha error, 90% study power, Population mean after informed consent=42.46, Population SD after informed consent=7.076.

Results were analyzed using SPSS version 20.0 for quantitative variable like age whereas qualitative variables like gender, education and socioeconomic status (SES) was measured as frequency and percentage. Paired sample t-test was applied to compare pre and post STAI score. Effect modifier like age, gender, SES, education level was controlled by stratification. Post stratification paired sample t-test was applied. P-value <0.05 was considered significant.

RESULTS

Out of 50 patients, 13 (26%) were males and 37 (74%) were females as shown in Fig No 01. Mean age (years) of the patients in this study was 29.00$\pm$6.96. Frequency and percentage of education level was assessed in the study in terms of education (primary, middle, matric, and graduation, post-graduation) and non-education. Majority of the patients have education background, following by 12 (24%) primary education, 10 (20%) middle education whereas there were 11 (22%) patients had no education background. Socio economic status was in the study in terms of frequency and percentage of low (<20,000 PKR), middle (20,000-50,000) and upper level (>50,000) of socio economic status. Majority of the patients 37 (74.0) belonged from low income status and 12 (24.0) patients belong to middle income status (20,000-50,000), as shown in Table 1.

The objective of the study was to assess mean change in anxiety of patient undergoing 3rd molar surgery and after disclosure of information regarding procedure. Our study finding showed that mean change in anxiety

of patient undergoing 3rd molar surgery and after disclosure of information regarding procedure was 35.06+2.25 and 45.60+2.50 respectively with mean change 10.53+0.25, as shown in Table. No.02.

Table No.1: Descriptive statistics of Demographic data.

Variable		Frequency	tage %	
Gender	Male	13	26.0%	
	Female	37	74.0%	
	Total	50	100%	
Education level	Uneducated	11	22.0%	
	Primary	12	24.0%	
	Middle	10	20.0%	Mean age 29±6.96
	Matric	8	16.0%	
	Graduated	8	16.0%	
	Post graduate	1	2.0%	
	Total	50	100%	
Socio-Economic status	Lower class	37	74.0%	
	Middle class	12	24.0%	
	Upper class	1	2.0%	
	Total	50	100%	

Effect modifier like age was stratified and compared with mean change in anxiety of patient undergoing 3rd molar surgery and after disclosure of information regarding procedure. Among patient with age 31 – 45 years, mean change in anxiety of patient undergoing 3rd molar surgery and after disclosure of information regarding procedure was 35.09+1.9 and 45.44+2.13 respectively with mean change 10.35±2.11. Effect modifier like gender was stratified and compared with mean change in anxiety of patient undergoing 3rd molar surgery and after disclosure of information regarding 3rd molar surgery and after disclosure of information regarding procedure was 35.03±2.59 and 45.78±2.92 respectively with mean change 10.74±2.14.

Effect modifier like education level was stratified and compared with mean change in anxiety of patient undergoing 3rd molar surgery and after disclosure of information regarding procedure. Among patients who have primary education background, mean change in anxiety of patient undergoing 3rd molar surgery and after disclosure of information regarding procedure was 35.10±2.01 and 45.16±2.82 respectively with mean change 10.35±2.04, as shown in Table. No.3.

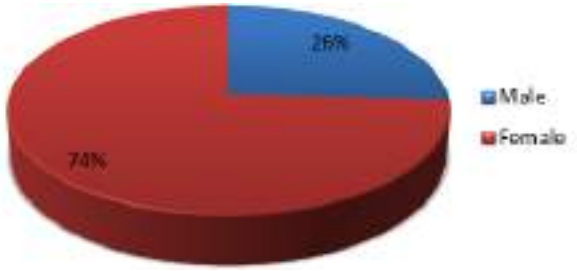

Figure No. 1: Pai Chart of Gender Distribution.

Table No.2: Descriptive statistics of STAI-S scale (before and after).

	N	Min.	Max.	Mean	Std. Deviation
STAI scale (before)	50	30.20	40.20	35.06	2.25
STAI scale (after)	50	38.00	49.00	45.60	2.50

Anxiety (STAI scale score)	**before**	**after**	**mean change**	**p-value**
	35.06+ 2.25	45.60+ 2.50	10.53+ 0.25	0.000

Table No.3: Demographic data stratification with comparison of mean change in anxiety of a patient undergoing 3rd molar surgery before and after disclosure of information regarding procedure.

Variable		Anxiety (STAI scale score)			***p*-value**
		Before	**After**	**Mean change**	
Age	**18-30years**	35.09±1.97	45.44±2.13	10.35±2.11	0.000
	31-45years	35.03±2.59	45.78±2.92	10.74±2.14	0.000
Gender	**Male**	35.03±2.59	45.78±2.92	10.74±2.14	0.000
	Female	35.10±2.25	45.51±2.39	10.41±2.07	0.000
Education level	**Uneducated**	35.48±2.56	45.00±3.16	9.51±2.56	0.000
	Primary	35.10±2.01	45.16±2.82	10.05±2.04	0.000
	Middle	34.17±2.70	45.70±1.88	11.53±2.31	0.000
	Matric	35.10±1.47	4.37±1.40	11.27±1.08	0.000
	Graduation	35.91±2.17	46.75±2.12	10.83±1.64	0.000
	Post-graduation	35.82±2.02	45.21±2.30	9.39±0.28	0.000
Socio-Economic status	**Low**	35.24±2.15	45.86±2.28	10.61±1.84	0.000
	Middle	34.33±2.53	44.66±3.08	10.33±2.94	0.000
	Upper	34.29±2.24	44.59±3.12	10.30±0.88	0.000

DISCUSSION

There is a belief that providing patients with detailed information about their treatment could exacerbate their anxiety and lead to a reluctance to undergo the procedure. Conversely, studies have shown that doctor-patient communication fosters a collaborative relationship and can help alleviate anxiety. However, it is important to note that this communication can have a reciprocal effect, where the doctor can be influenced by the patient's anxiety and vice versa. Thus, the purpose of this study was to assess how an informed consent protocol impacts patient anxiety levels.[9]

Informed consent is crucial for clinical practice. It is still primarily a legal and ethical concept. The key consideration in any informed consent is its substance. By content, we mean the informed consent's material, which must always transmit two sorts of information. The first type is the therapy or operation that the patient will get. In other words, the patient is educated about the various stages of the procedure: pre, intra, and postoperative. The second piece of information is on the feelings that the patient is likely to have: pain, somnolence, stiffness, and so on. The importance of risks disclosure in the informed consent process cannot be overstated, as it is necessary to highlight potential adverse effects and avoid medical malpractice litigation cases.[10]

It has been shown that the efficacy of informative procedures is heavily influenced by patients' attitudes. The information provided has been shown to have positive effects on those who try to overcome stressful situations by gathering as much information as possible about them, but it may have negative effects on "avoidant" patients (those who reject all information in order to overcome anxiety by not thinking about the problem).[11]

Patients appear to be more interested in information related to benefits and post-procedure complications than risks, which are more important from an ethical standpoint. The study's findings showed a mean change in anxiety levels of 35.06±2.25 and 45.60±2.50 before and after disclosing information regarding the procedure. Casap et al.[12] the influence of informed consent on stress levels linked with the removal of impacted mandibular third molars was evaluated. They discovered that presenting excessively thorough lists and disclosures prior to excision of impacted mandibular third teeth might enhance patient anxiety. Another study reported a mean change in anxiety levels of 36.6 and 42.4 before and after information disclosure regarding the procedure.[13-15]

Overall, the informed consent process is a critical component of any surgical procedure. However, it is essential to recognize the potential anxiety-inducing nature of this process and to take steps to alleviate patient anxiety in the hours and days leading up to the procedure. Vigilant patients who seek out information benefit more from the informed consent process. The timing of information disclosure may not be as critical as once thought and patients appear to be more interested in benefits-related information than risks.[14-20]

This study has several limitations. First, the sample was selected from a single local hospital. The patients included in this research were relatively young, which may have caused a selection bias. The representativeness of the sample might be restricted, and our results may have poor generalizability. Secondly, the exposure and outcome variables were collected through self–completed questionnaires, which may not accurately reflect the situation. For sample selection, it would have been ideal to conduct the study in a multicenter setting. Finally, no postoperative pain evaluation technique was intended for this study, and grading surgical difficulties in connection to anxiety level was not addressed.

CONCLUSION

The study concluded that patient experienced anxiety when underwent molar surgery. So there is a need of patient counseling about the procedural risks and associated complications regarding 3rd molar surgery in a sequential manner. Indeed, the informed consent form itself was a major contributor to elevate patient anxiety. The presentation of detailed information and nonsurgical treatment options might dissuade patients from undergoing extractions.

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Original Article

The Influence of Surgical Volume on Outcomes in Radical Cystectomy: A Population-Based Analysis

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ABSTRACT

Objective: The purpose of this research was to look at the effect of surgical volume on postoperative outcomes in patients receiving radical cystectomy for bladder cancer in a population-based cohort of 113 patients.

Study Design: A prospective analysis design study

Place and Duration of Study: This study was conducted at the Department of Urology IKD, Peshawar between August 2021 to August 2023.

Methods: Radical cystectomy was performed on 113 patients between August 2021 and August 2023. Data on demographics, comorbidities, surgery volume, and outcomes was collected. Based on operations conducted by each surgical practitioner, surgical volume was low, midrange, or high. Postoperative complications, hospital stay, and 30-day mortality were key outcomes.

Results: The study consisted 113 patients: 23 low volume, 34 middle volume, and 56 high volume. All participants had a mean age of 65.2±7.1 years. The majority of patients (52.17%) were female. 82.61% had radical cystectomy, 17.39% partial. The majority of procedures were open (100%). Most patients reported infection (5.31%), followed by hemorrhage (3.54%) and serious problems (7.08%). Surgical volume did not significantly affect complications or LOS >7 days (adjusted OR 0.75, 95% CI 0.53-1.06, p=0.105). These data imply that surgical volume may affect significant complications but not overall complications, LOS, or mortality.

Conclusion: Our study revealed a link between surgical treatment volume and significant side effects in cystectomy patients.

Key Words: Radical Cystectomy, Surgical Volume, Bladder Cancer, Population-Based Analysis, Postoperative

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INTRODUCTION

Bladder cancer is a major worldwide health issue, and radical cystectomy is a crucial aspect of its treatment[1]. The results of radical cystectomy, a highly intricate surgical technique, may be affected by several variables, such as the number of surgeries conducted by the surgical care providers[2,3]. Extensive study has been conducted on the correlation between the number of surgeries performed and the results after surgery.

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Evidence indicates that a greater number of surgeries may be linked to better patient outcomes[4]. This study, based on a population, seeks to add to the current knowledge by investigating how the number of surgeries performed affects the outcomes after radical cystectomy in a group of 113 patients.

Bladder cancer poses a significant challenge to healthcare systems globally, requiring efficient solutions to improve surgical treatment and better patient outcomes[5,6]. The concept of surgical volume, which refers to the quantity of operations carried out by a surgical care provider, has been identified as a possible factor influencing the quality of different surgical interventions[7]. Previous research has shown a positive association between increased surgical volumes and enhanced outcomes in operations such as coronary artery bypass grafting and pancreatectomy[8]. However, the influence of the number of surgeries performed on the results of radical cystectomy in the setting of bladder cancer is still a subject that needs further research.

This study used a population-based methodology, using a heterogeneous sample of 113 individuals who had radical cystectomy within a certain era and healthcare system. The aim is to evaluate whether there is a

correlation between the number of cystectomy surgeries conducted by surgical care providers and differences in postoperative complications, duration of hospitalization, and mortality within 30 days. Our objective is to analyze surgery volume and classify it as low, the middle, or high in order to uncover any discernible trends that may be used to shape healthcare policy and clinical decision-making.

Gaining insight into the correlation between the number of surgeries performed and the resulting results in radical cystectomy is essential for maximizing patient care and efficiently allocating resources. The results of this investigation might have significant ramifications for healthcare professionals, governments, and patients, highlighting the potential advantages of centralizing cystectomy services. The ultimate objective is to provide significant insights that may improve the quality of treatment for persons who are having radical cystectomy for bladder cancer.

METHODS

The study included a total of 113 patients. Data about demographic factors, coexisting medical conditions, and clinical attributes were gathered. Patient identifiers were anonymzed to guarantee confidentiality. The surgical volume was classified according to the quantity of radical cystectomy operations conducted by each surgical professional. Centers were categorized as low, middle, or high volume based on specified criteria identified by the distribution of cases in the dataset. The primary variables assessed were surgical complications, duration of hospitalization, and mortality within 30 days. The postoperative complications were classified based on predefined criteria and their severity was assessed.

Statistical Analysis: Patient demographics and clinical features were summarized using descriptive statistics. The correlation between the number of surgeries performed and the resulting results was evaluated using suitable statistical procedures, such as chi-square for categorical variables and analysis of variance (ANOVA) for continuous data. A multivariate analysis was performed to account for any confounding factors.

Ethical Considerations: The work complied with ethical criteria and obtained permission by the IKD, Peshawar Review Board, and Ethics Committee. Strict adherence to patient confidentiality was ensured, and data were managed in compliance with applicable privacy legislation.

RESULTS

The study had 113 patients in total, distributed as follows: 23 in the low volume group, 34 in the intermediate volume group, and 56 in the high volume group. The average age of all participants was 65.2±7.1 years. Females constituted the majority of patients, at 52.17% of the overall patient population. Regarding comorbidities, hypertension was the prevailing disease, reported by 26.09% of patients. Among the patients, 21.74% reported having diabetes, making it the second most common comorbidity. Upon comparing the three volume groups, no substantial disparities were seen in terms of age or gender distribution. However, there were discrepancies in the occurrence of comorbidities, as a greater percentage of patients in the low volume category disclosed hypertension and diabetes in comparison to the intermediate and high volume categories. The research sample exhibited diversity in age, gender, and comorbidities, making it a representative sample for the study (Table-1).

The surgical characteristics of study participants are shown in Table 2. 17.39% of the 113 individuals had partial cystectomy, whereas 82.61% had radical cystectomy. The majority of procedures were open (100%). All subjects had a mean operational time of 240 minutes and a standard variation of 30 minutes. Cystectomy type and surgical method did not vary across the three volume groups. The high volume group had a mean operating time of 200 minutes, compared to 220 minutes in the intermediate volume group and 240 minutes in the low volume group. These surgical features reveal what was done on study participants and may affect their results.

The study participants' postoperative complications are shown in Table 3. Out of 113 patients, 29.20% had post-surgery complications. Most individuals reported infection (5.31%), followed by hemorrhage (3.54%) and serious problems (7.08%). Complication rates were similar among the three volume groups. The low volume group (13.04%)%) had more serious problems than the intermediate (8.82%%) and high volume (3.57%) groups. These data imply that all volume groups have postoperative difficulties, although low volume centers may have a greater risk of significant complications.

Table 4 shows the study participants' LOS and mortality rates. All individuals' mean LOS was 6.5 days, with a 2.0-day standard deviation. The mean LOS was similar among the three volume groups. However, low volume (7.0 days) had a tendency towards longer LOS than intermediate (6.5 days) and high volume (6.0 days). A larger percentage of low volume participants (34.78%) experienced a LOS of more than 7 days than intermediate (11.76%) and high volume (7.14%) groups. The 30-day mortality rate was 3.54% for all individuals, with the low volume group (8.70%) having a greater risk than the intermediate (2.94%) and high volume (1.79%) groups. These data show that low-volume centers may have longer hospital stays and greater fatality rates than intermediate and high-volume centers.

Table 5 shows multivariate surgery volume and outcome statistics. After controlling for possible confounding variables, surgical volume did not predict

any complication (OR 0.75, 95% CI 0.53-1.06, p=0.105) or LOS >7 days (OR 1.32, 95% CI 0.88-1.97, p=0.186). However, surgical volume was associated with severe complications (adjusted OR 0.61, 95% CI 0.37-1.00, p=0.048), with intermediate and high volume centers having lower chances than low volume centers. Surgical volume did not affect 30-day mortality (adjusted OR 0.92, 95% CI 0.47-1.78, p=0.796). These data imply that surgery volume may affect significant complications but not overall complications, LOS, or mortality.

Table No. 1: Demographic Characteristics of Study Participants

Demographic Factor	Total (n=113)	Low Volume (n=23)	Intermediate Volume (n=34)	High Volume (n=56)
Age (years)	Mean (SD)	65.2±7.1	64.8±6.5	66.4±7.8
Gender	Female	12 (52.17%)	19 (55.88%)	26 (46.43%)
	Male	11 (47.83%)	15 (44.12%)	30 (54.56%)
Comorbidities	Hypertension	6 (26.09%)	10 (29.41%)	11 (19.64%)
	Diabetes	5 (21.74%)	7 (20.59%)	6 (10.71%)

Table No. 2: Surgical Characteristics

Surgical Variable	Total (n=113)	Low Volume (n=23)	Intermediate Volume (n=34)	High Volume (n=56)
Type of Cystectomy	Radical	19 (82.61%)	27 (79.41%)	51 (91.07%)
	Partial	4 (17.39%)	7 (21.59%)	5 (8.93%)
Surgical Approach	Open	23 (100%)	34 (100%)	56 (100%)
Operative Time (min)	Mean (SD)	240 (30)	220 (25)	200 (20)

Table No. 3: Distribution of Postoperative Complications

Complication Type	Total (n=113)	Low Volume (n=23)	Intermediate Volume (n=34)	High Volume (n=56)
Any Complication	33 (29.20%)	9 (39.13%)	12 (35.29%)	12 (21.43%)
Major Complication	8 (7.08%)	3 (13.04%)	3 (8.82%)	2 (3.57%)
Infection	6 (5.31%)	2 (8.70%)	1 (2.94%)	3 (5.36%)
Hemorrhage	4 (3.54%)	2 (8.70%)	1 (2.94%)	1 (1.79%)

Table No. 4: Length of Hospital Stay (LOS) and Mortality Rate.

LOS Variable	Total (n=113)	Low Volume (n=23)	Intermediate Volume (n=34)	High Volume (n=56)
Mean LOS (days)	6.5 (2.0)	7.0 (1.5)	6.5 (1.8)	6.0 (2.2)
LOS >7 days	16 (14.16%)	8 (34.78%)	4 (11.76%)	4 (7.14%)
30-Day Mortality	4 (3.54%)	2 (8.70%)	1 (2.94%)	1 (1.79%)

Table No. 5: Multivariate Analysis of Surgical Volume and Outcomes

Outcome Measure	Adjusted Odds Ratio (95% CI)	P-value
Any Complication	0.75 (0.53-1.06)	0.105
Major Complication	0.61 (0.37-1.00)	0.048
LOS >7 days	1.32 (0.88-1.97)	0.186
30-Day Mortality	0.92 (0.47-1.78)	0.796

DISCUSSION

The findings of this study indicate that the number of surgeries performed may influence the probability of significant complications in individuals receiving cystectomy. This finding aligns with other research that has similarly shown a substantial correlation between the number of surgeries performed and the results after different surgical procedures[9]. In a research conducted by Finlayson EV et al.[10] in 2003, it was shown that there is a correlation between a larger number of surgeries performed and a decreased occurrence of postoperative complications and mortality in patients having major cancer surgery. Similarly, a research conducted by Hanchate AD et al.[11] in 2010 discovered that performing a larger number of surgeries was linked to reduced occurrences of postoperative complications and death in patients following coronary artery bypass graft surgery.

Our study revealed that the total complication rate was 29.20%, with significant problems seen in 7.08% of patients. These results align with the findings of a research conducted in 2010, which indicated that patients who had cystectomy experienced an overall complication rate of 30.5% and a serious complication rate of 8.3%[12]. In addition, our research revealed a 30-day mortality rate of 3.54%, which is slightly lower than the 5.1% reported by Wolters M, et al (2017)[13]. The resemblance in complexity and fatality rates suggests our research sample accurately reflects the whole patient population receiving cystectomy.

Our analysis revealed a noteworthy correlation between surgical volume and major complications, indicating that intermediate and high volume centers had a lower risk of major problems compared to low volume centers. The earlier result aligns with the findings of a research conducted by Konety et al.[14] in 2007. This study likewise observed a noteworthy correlation between the number of surgeries performed and the occurrence of serious problems in patients having cystectomy. However, our research did not discover a substantial correlation between the number of surgeries performed and the occurrence of complications, length of hospital stay, or mortality rates. This contrasts with the results reported by Konety et al. (2005). The observed disagreement might be attributed to variations in the research's design and sample size. Our study, with a lower sample size, may have lacked sufficient statistical power to identify significant relationships.15

Study Limitation: Our study has various limitations that should be addressed when interpreting outcomes. First, our prospective research may have biased participant selection and data collection. Second, our investigation was done at one center, which may restrict its applicability. Finally, our small sample size may have prevented us from finding substantial relationships between surgery volume and outcomes. Despite these limitations, this analysis sheds light on how surgical volume affects cystectomy outcomes.

CONCLUSION

The results of our research revealed a significant correlation between the number of surgeries performed and the occurrence of severe complications in individuals having cystectomy. These findings align with other research and emphasize the significance of surgical volume in affecting postoperative results. Healthcare organizations should contemplate the consolidation of certain surgical procedures in high-volume centers to enhance patient outcomes. Additional study is required to have a deeper understanding of the processes behind this correlation and to pinpoint measures for enhancing outcomes in centers with low patient volumes.

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Original Article

Frequency of Peptic Ulcer Disease in Patients with Chronic Use of Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

Peptic Ulcer with Chronic Use of NSAIDs

Shakeel Ahmad[1], Muhammad Naeem[2], Hamid Ullah[3] and Liaqat Ali[1]

ABSTRACT

Objective: To ascertain how often individuals on chronic nonsteroidal anti-inflammatory Drugs (NSAIDs) develop peptic ulcer disease.

Study Design: A Cross Sectional Study

Place and Duration of Study: This study was conducted at the Department of Gastroenterology, Qazi Hussain Ahmad Medical Complex Nowshera, from June 2022 to June 2023.

Methods: During the study period all patients with endoscopic findings of peptic ulcer and chronic use of NSAIDs were enrolled for the study. Age, gender, current indications for NSAIDs use, and period of NSAID use were noted. Patients were also assessed for other associated risk factors.

Results: During the study period 184 patients had peptic ulcers on endoscopy. In 15.8% (29/184) of individuals, peptic ulcers was caused by chronic NSAIDs use. Arthritis and malignancy related pain were the most common indications for chronic NSAIDs use and diclofenac was the most commonly used NSAIDs. H. pylori-infection was the most common associated risk factor (48%).

Conclusion: Our study showed the significant association of the chronic NSAIDs use and multiple other risk factors with the peptic ulcer disease. It emphasizes cautious use of NSAIDs in high risk patients, particularly who have multiple other risk factors.

Key Words: Peptic Ulcer Disease, Chronic Use, Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

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INTRODUCTION

Peptic ulcer is one of the most common diseases of the gastrointestinal tract with estimated lifetime prevalence of approximately 5−10% in the general population.[1] It is defined as a breach in the mucosa of the alimentary tract. It is produced when there is imbalance between the aggressive factors like gastric acid, and proteolytic enzyme and protective factors[2,3] like mucus and bicarbonate secretion and prostaglandins production, combined with superimposed injury from environmental or immunologic agents.[4]

H. pylori infection, cigarette smoking, alcoholism, psychological stress, ischemia, certain medications like chronic NSAIDS and corticosteroid use, antiplatelet and anticoagulants are the common risk factors for peptic ulcer disease. Nonsteroidal anti-inflammatory drugs (NSAIDs) are widely prescribed and marketed to treat pain and inflammation, and are therefore, the leading cause of non-H—Pylori peptic ulcers.[5]

Chronic use of NSAIDs causes suppression of mucosal prostaglandin (PGE2) and direct irritative topical effect. Prostaglandins stimulate mucus and bicarbonate production, and regulates blood flow to the GI tract.[6] Its inhibition by NSAIDs leads to loss of alimentary protective factors and in combination with multiple environmental risk factors and H. pylori infection leads to peptic ulcer disease.[7]

Peptic ulcer disease predominantly presents with dyspeptic symptoms like epigastric burning sensation, epigastric pain, pyrosis, nausea, vomiting, bloating and belching.[8] It may sometimes present with complications like anemia, hematemesis, melena, perforation, gastric or duodenal outlet obstruction or peptic stricture. Malignant formation is rare and related to underlying gastritis.[9,10]

Since H. pylori infection is decreasing, NSAID-related peptic ulcers are rising because of the injudicious use of the NSAIDs without a prescription[11,12]. The aim of our study is to find out the frequency of Peptic ulcer disease in our population because of chronic NSAIDs use so

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that the issue is highlighted and appropriate steps taken for its prevention in the future.

METHODS

This is a cross sectional study conducted in the Gastroenterology department of Qazi Hussain Ahmad Medical Complex, Nowshera from June 2022 to June 2023. All patients with endoscopic findings of peptic ulcer and chronic use of NSAIDs were enrolled for the study. Chronic NSAID use is defined as if these medications are taken more than three times a week for more than three months.

Age, gender, current indications for NSAIDs use, and period of NSAID use were noted. Patients were also assessed for associated risk factors like H. pylori infection, alcoholism, smoking, tobacco chewing etc.

RESULTS

During the study period 184 patients had peptic ulcers on endoscopy. In 15.8% (29/184) of individuals, peptic ulcers was caused by chronic NSAIDs use (figure 1). Arthritis and malignancy related pain were the most common indications for chronic NSAIDs use (table 1).

Diclofenac was the most commonly used NSAIDs, linked to peptic ulcer in 41.37% (12/29) of individuals (table 2). Duodenal ulcers outnumbered gastric ulcers, 41.37% (12/29) and 34.48% (10/29) respectively (table 3). H. pylori-infection was also noted in 48% (14/29) of the patients (figure 2). Other peptic ulcer risk factors were noted and also shown in figure 2.

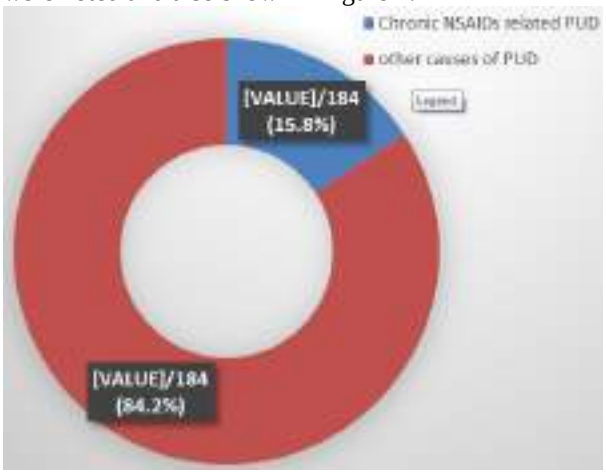

Figure 1: Etiological pattern of PUD

Table No. 1: Common indications for chronic NSAIDs use

Indications	Percentage (N) of Patients
Arthritis	38% (11/29)
Malignancy related pain	31% (9/29)
Chronic body aches	10.3% (3/29)
Chronic Headache	10.3% (3/29)
Others	10.3% (3/29)

Table No. 2: NSAIDs Linked to Peptic Ulcers in the Study

NSAID	Percentage of Patients with Peptic Ulcers
Diclofenac	41.37% (12/29)
Neporoxen/piroxicam	20.68% (6/29)
Others (ibuprofen, mephenamic acid, aceclofenac, ketorolac etc.)	20.68% (6/29)
Combination of NSAIDs	17.24% (5/29)

Table No. 3: Location of Peptic Ulcers in Patients

Type of Ulcer	Percentage of Patients with Peptic Ulcers
Duodenal Ulcer	41.37% (12/29)
Gastric Ulcer	34.48% (10/29)
Ulcers in both stomach and duodenum	24.13% (7/29)

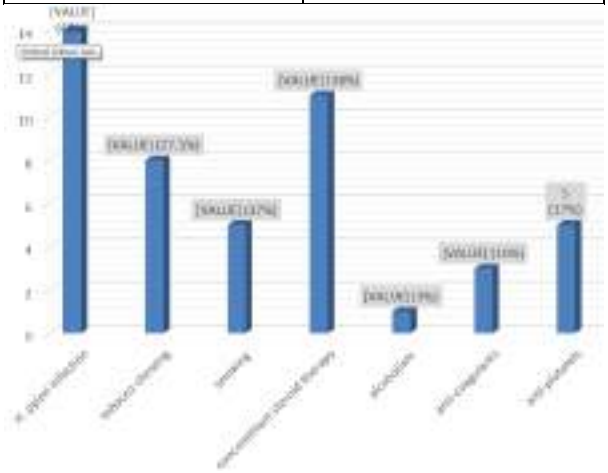

Figure No. 2: Associated risk factors

DISCUSSION

Peptic ulcer disease is a well-known complication of NSAID use. Our study showed comparatively high prevalence (approximately 16%) of peptic ulcer disease in patients with chronic NSAIDs use as compared to other studies which showed the prevalence of 6-11%[13,14].

In our study diclofenac and naproxen/piroxicam are the most common NSAIDs associated with peptic ulcer, which is similar to findings in other studies[12]. However, in our study naproxen/piroxicam was the second most common NSAID used as compared to aspirin as in other studies[12]. Diclofenac is the most widely prescribed analgesic in our population because of the easy availability and low cost. This finding emphasizes the need for cautious use of this drug, particularly in patients who already have multiple other risk factors for peptic ulcer disease like having a history of prior peptic ulcer or are receiving concurrent steroid treatment.

In our study like most of the other studies, NSAIDs induced duodenal ulcer outnumbered gastric ulcer. According to our data the correlation between NSAID-

induced peptic ulcers and H. pylori infection exists in approximately half of the patients with peptic ulcer[15]. It emphasizes the importance of H. pylori testing and eradication prior to initiation of NSAIDs use[16].

Finally, the research emphasizes how important it is to take into account various other risk variables like drinking alcohol and smoking when discussing NSAID-related peptic ulcers. In summary, this research offers important new information on the prevalence and risk factors of NSAID-induced peptic ulcer disease in local population. With this knowledge, medical professionals may prescribe NSAIDs more cautiously and create individualized treatment plans for individuals who are susceptible to peptic ulcers because of the associated risk factors[17].

CONCLUSION

Our study showed the significant association of the chronic NSAIDs use particularly diclofenac and aspirin with the peptic ulcer disease. It emphasizes cautious use of NSAIDs in high risk individuals, particularly who have multiple other risk factors like H. pylori infection.

Author's Contribution:

Concept & Design of Study:	Shakeel Ahmad
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Data Analysis:	Liaqat Ali
Revisiting Critically:	Shakeel Ahmad, Muhammad Naeem
Final Approval of version:	Shakeel Ahmad

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Original Article

Comparison of the Skin Closures Using Staples Versus Prolene Sutures in Patients Undergoing Clean Elective Abdominal Surgeries.

Shumaila Naseer[1], Tariq Hayat Khan[2], Ayaz Gul[3] and Nida Mumtaz[2]

ABSTRACT

Objective: To assess the surgical site infection and skin closure time of individuals receiving clean elective abdominal operations with prolene sutures vs staples.

Study Design: Randomized Controlled Trial study

Place and Duration of Study: This study was conducted at the Department of Surgery, Lady Reading hospital, Peshawar from 1st Jan 2021 to July 2021.

Methods: This Randomized Controlled Trial study was conducted with the necessary approvals from the ethical board and research committee of the CPSP at the Department of Surgery, Lady Reading hospital, Peshawar. A total of 124 patients, of various genders, underwent clean elective abdominal surgery and were included in the study. Patients in group A underwent skin closure using the staple method, while patients in group B underwent skin closure using the prolene suture method after surgery.

Results: Participants in this research ranged in age from 18 to 65, with Group A averaging 45.048±7.83 years and Group B 43.451±9.27 years. SSI rates differed significantly between groups A and B. SSI occurred in 19 (30.6%) of group A patients and 37 (59.7%) of group B patients (P= 0.001). The mean skin closure time in group A was substantially lower than group B (p=0.000). Group A had an average closure time of 126.774±32.78 seconds, whereas Group B had 459.677±60.43 seconds.

Conclusion: Our study results indicate that skin staples have been found to result in lower rates of wound infection compared to sutures in clean elective surgeries.

Key Words: Clean procedures, Skin closures, Staples, Prolene sutures, Surgical Site Infection, Closure time

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INTRODUCTION

A wound closure technique should be easy to use, have similar strength across the incision, ensure skin apposition till healing, avoid wound infection, and be aesthetically pleasing. A good wound closure material is cheap, non-allergic, and easy to create and use.[1] Any skin approximation method must keep the margins in place long enough for healing[2]. The wound closure technique and material contribute to wound infection because the substance acts as a foreign entity and causes a variable inflammatory response that limits tissue blood flow and causes ischemia.[3] Braided suture gaps may harbor pathogens. The surgeon should employ less-traumatic sutures with enough mechanical strength. To minimize scarring, remove sutures promptly[4]. Carefully suture incisions and wounds, using suitable closure methods[5]. Surgical wounds are usually sutured. The surgeon may use continuous or interrupted, natural or synthetic, absorbable or non-absorbable, single filament or braided sutures, depending on wound length and location[6]. Staples may be better for surgical wound closure because to their low tissue reactivity. Contaminated wounds are more resistant to infection because foreign material cannot enter and damage the local immune response. Staples may reduce incision diameter, wound healing time, local inflammation, and cross marks.[7-9]

Inert polypropylene monofilament sutures are one type. They reduce infection risk. Silk and other coated sutures induce infection more often. Metal skin staples made of stainless steel are easy to install. They may close skin 80% faster than subcuticular or interrupted suturing[10]. Previous research found substantial differences in skin closure time and surgical site

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infection (SSI) incidence between prolene suture and staples groups: 251.07 ± 28.61 vs. 87.28 ± 17.20 seconds (p <0.0001) and 61.2% vs. 38.8% (p 0.024).
Current study will test skin staples and prolene sutures for SSI and skin closure time following elective abdominal surgery.

METHODS

With CPSP ethics board and research council approval, Lady Reading Hospital's Department of Surgery in Peshawar, Pakistan, conducted this Randomized Controlled Trial from 1st Jan 2021 to July 2021. The study comprised all eligible out-of-department patients. The patients were told about the research's purpose, benefits, and surgical method before signing their informed consent. Every patient was examined and historyd. Each patient was randomly assigned to two groups using a blocking approach. Group A patients received staples for skin closure after surgery, whereas group B got prolene sutures. A single, qualified general surgeon with at least five years of experience conducted each treatment.
Using a timer, the student tracked the time between the first and last skin sutures throughout the surgery. All patients received standard post-op care.
Diabetes, liver cirrhosis, using steroids within six months, and severe renal sickness were eliminated from the study owing to their potential to bias the results. The next 30 days, all patients were followed for SSI. Data was analyzed using SPSS 20. Chi square was utilized to compare SSI across groups, and independent samples measured skin closure time. A significance level of <0.05 was used for the T Test.

RESULTS

The study has 18–65-year-old participants. In Group A, the average age was 43.45 years ±9.27SD, weight was 69.983 Kg ±10.94SD, height was 1.538 meters ±0.11SD, BMI was 29.837 Kg/m2±5.29SD, and skin closure time was 459.677 sec ±60.43SD. Ages ranged from 18 to 65 in the research.at Group B. Mean scan time is 0.7463, however age, weight, height, and BMI p-values are not significant. A 0.000 p-value showed that both groups closed differently.
Group A included 43 males (69.4%) and 47 women (75.8%), whereas group B had 19 women (30.6%) and 15 men (24.2%). Males dominated both groups but were statistically insignificant with a p-value of 0.5463. Table III shows surgery distribution by group within each group. Group A had 23 exploratory laparotomies (37.1%), 25 open appendices (40.3%), and 14 hernia repairs (22.6%).
Surgical site infection (SSI) occurred in 19 (30.6%) patients in group A and similar pattern was found in group B, although neither group was significantly different (-value = 0.7673 Fig. 1 SSI was substantially greater in Group B than Group A (p=0.001). Compared to prolene suture, staple is more practicable. Table 1

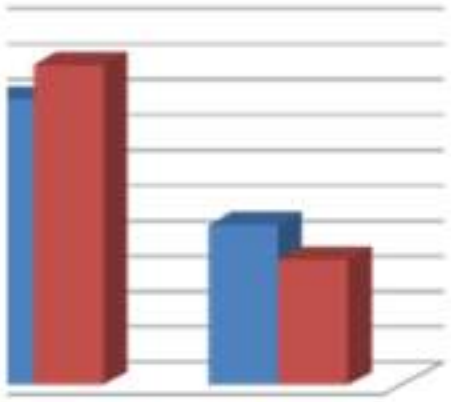

Figure No. 1: Indication of surgery in both groups

Table No. 1: SSI in both groupsn=124

SSI	N=62	N=62	P-valve
	Group-A	Group-B	
Yes	19 (30.6%)	37 (59.7%)	0.001
No	43 (69.4%)	25 (40.3%)	
Total	62 (100%)	62 (100%)	

DISCUSSION

NICE's latest surgical site infection prevention and treatment guidelines addresses suturing and surgical site infections for the first time. This is the first time that sutures are recommended over staples for closing the skin post-cesarean section to prevent wound dehiscence in postpartum mothers. However, sutures have little evidence to support use over staples in other surgeries.
Different closure procedures affect surgical site infections differently based on the anatomical location. In craniofacial surgery, suture and staple groups had comparable infection rates (2 and 3%)[12]. Two meta-analyses comparing staples and sutures in orthopedic procedures found conflicting results on surgical site infection risks[13]. An revised meta-analysis indicated no significant difference in SSI risk between staples and sutures[14]. Cochrane review data on coronary artery bypass surgery showed comparable findings[15].
In addition to skin staples, drape fusion, hernia mesh fusion, and intestinal anastomosis may be employed in surgery.[16,17] Nowadays, most skin staples are stainless steel, although absorbable ones were used sometimes. Animal studies showed low inflammation with absorbable staples.[18] Another author found that skin staplers are only faster in elective breast and abdominal surgeries[19]. In the staples and suture groups, the mean closure time was 80 and 242 seconds, respectively. Suturing and stapling cause comparable wound infections. In the beginning and during removal, staples hurt more. [20] Some research found that staples are less uncomfortable than sutures after six weeks.[21] We found that the suture group had a closure time nearly three

times longer than the staples group (126.774±32.78 seconds vs. 459.677±60.43 seconds, p value <0.0001). Stapling may be seven times faster than stitching.[22,23] Prolene or nylon sutures scar face better than staples in cosmetic surgery.[24] For abdominal procedures, sutures were more cosmetically pleasing.[25] Cosmetic appearance and patient satisfaction with suture and staples may be the same at six weeks in elective cesarean sections.[19] Sutures were more cosmetic than staples for emergency cesarean sections. Staples lengthen hospital stays.[25,26] According to a metaanalysis by Smith et al., skin staples in orthopedic surgery are linked to greater infection rates. In hip and knee surgery, staples are not advised.[13] Another research found comparable findings for orthopedic surgery wound infection. A research found SSI in 19.6% of patients in group A and 37.7% in group B (P= 0.001). In one research, prolene suture and staples groups had 61.2% and 38.8% (p value 0.024) surgical site infections (SSIs)[11]. Since sutures and staples have pros and downsides, the contradictory evidence may be justified. Metal staples may be less irritative and more infection-resistant than least reactogenic sutures[27]. Staples are recommended in emergencies because they close skin quicker, saving 5.5 to 8 minutes. Staples may cause staple track development, hair follicle damage, perspiration and sebaceous gland damage, bacterial migration into the wound bed, and pain during removal. Tight skin closure that retains dermal structure may avoid surgical site infection, since the patient's fetoplasm is the main source of infection. Intracutaneous sutures tighten the skin without harming it. Patients may find absorbable sutures more pleasant since they may remain in the wound without removal. Additionally, sutures cost just 20% of staples[28]. All suture materials are alien to human tissue and may promote inflammation, compromising wound healing and increasing infection risk[29]. Surgeons choose staples for midline incision closure, despite potential hazards and benefits.

CONCLUSION

We found that skin staples cause less wound infection than sutures in clean elective surgeries. Staples resemble skin quicker than stitches. Well-designed randomized controlled studies with large sample numbers are required to corroborate this since surgeons need better evidence for decision-making. Future studies should address obesity and other postoperative complications risk factors.

Author's Contribution:

Concept & Design of Study:	Shumaila Naseer
Drafting:	Tariq Hayat Khan, Ayaz Gul
Data Analysis:	Nida Mumtaz
Revisiting Critically:	Shumaila Naseer, Tariq Hayat Khan
Final Approval of version:	Shumaila Naseer

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Ethical Approval: No.998/LRH/MTI dated 02.11.2020

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Original Article

The Status of Hepatitis B Vaccination Among Hemodialysis Patients at a Tertiary Care Hospital

Shad Muhammad, Arbab Muhammad Ali and Muhammad Ikram

ABSTRACT

Objective: T**o** ascertain the immunization status for hepatitis B in patients with chronic renal disease who are reliant on dialysis.

Study Design: A cross-sectional study

Place and Duration of Study: This study was conducted at the Nephrology, department. Peshawar's Lady Reading Hospital, from July 1, 2021, to December 31, 2021.

Methods: Those receiving hemodialysis for chronic renal disease were included. The anti-HBS antibody titer in the patients' blood after three or four doses of the 20 microgram hepatitis B vaccine was used to validate the patients' hepatitis B vaccination status. A cut-off value of ≥10 IU/L was applied to the anti-HBS antibody titer.

Results: 109 patients in all were enrolled. The patients' ages varied from 20 to 60. The patients' average age was 49.80 ± 5.245 years. The male to female ratio was 1.6:1. Of the patients, 81 (74.3%) got three doses of the vaccine, while 28 (25.7%) received four doses. 56 patients (51.4%) had vaccination records.

Conclusion: CKD patients are less likely to develop ≥10IU/L of anti-HBS antibodies after hepatitis vaccination. Patients who receive vaccination in the early course of the disease are more likely to develop better response.

Key Words: Chronic Kidney Disease, HBV vaccination, Hemodialysis

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INTRODUCTION

Because the kidneys play a critical role in eliminating harmful metabolic products—the buildup of which might have detrimental consequences on human health—maintaining renal function is essential to overall wellbeing.[1] A patient with chronic kidney disease (CKD) has a glomerular filtration rate (GFR) of less than 60 mL/min per 1.73 m2, a structural change in the renal parenchyma, and a loss of renal function that lasts longer than three months.[2] Renal transplantation and peritoneal dialysis are additional options, even though hemodialysis is mostly provided in clinical settings as renal replacement treatment for patients with chronic kidney disease.[3] Hepatitis B virus (HBV) infection is a major worldwide health hazard, with 150 million people living with its chronic carrier condition. Due to the fact that dialyzed patients are more susceptible to blood and its products than the general population is, as well as the risk of contaminated hemodialysis equipment and supplies, the incidence of HBV is significantly higher in this group.[4] HBV prevalence in CKD patients on hemodialysis has been shown to vary from 1.2 to 6.6%. According to current standards, hepatitis B immunization is advised for all patients with chronic kidney disease who are reliant on dialysis since it not only protects against hepatitis B but also improves patient survival. Despite the fact that chronic kidney disease (CKD) is an immuno-compromised condition, there is currently a lack of good immunization against HBV among CKD patients, especially in underdeveloped nations.[5] Amjad et al. observed that 19.9% of CKD patients who were on dialysis had received an HBV vaccination.[6] A different research by Guimaraes et al, found that 59.2% of dialysis-dependent CKD patients had received an HBV vaccination.[7] Patients with chronic renal disease have a relatively high prevalence of HBV infection. There is relatively little information on the frequency of HBV vaccinations in CKD patients receiving dialysis, despite current recommendations recommending immunization against HBV in all CKD patients. Furthermore, as no local research has been done on this topic recently, the findings of studies done on other groups cannot be extrapolated to our community. Consequently, I intended to ascertain the hepatitis B vaccination status among dialysis-dependent chronic kidney disease (CKD) patients based on the prevalence of HBV

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vaccinations in our community. The findings of my research will provide our local health officials up-to-date data on HBV vaccination rates among CKD patients, which will be useful for future planning.

METHODS

A cross-sectional study conducted at Peshawar's Lady Reading Hospital's nephrology department from July 1 to December 31, 2021. Sample size was calculated using the WHO sample size computation and the estimated frequency of hepatitis B vaccinations (p = 19.9%). 7.5% error, 95% confidence. Sequential sampling without probability. This study covered all 20–60-year-old dialysis patients. Patients with HIV, immunosuppressive medicines, blood dyscrasias, liver or renal illness, or congenital or acquired immunodeficiency problems. Cancer and transplants were excluded.

Both the LRH research department and ethics committee approved the recruitment of 109 eligible patients. Each patient provided informed consent, ensuring anonymity and no risk from this investigation. Age, gender, stadiometer height, and weighing scale weight in kilograms were recorded. After a comprehensive abdomen and general physical exam, the patient's medical history, dialysis dependence, CKD cause, and duration were noted. The patient's medical history was examined to ascertain their hepatitis B vaccination status, including dosages and time since immunization. Patients who got an HBV vaccination or had clear records were documented. The serum anti-HBs antibody titer was tested using ELISA to determine hepatitis B vaccination status. ELISA analysis was performed at the hospital laboratory within 30 minutes of sample collection to detect anti-HBs antibody titer. The operational criteria (serum anti-HBs antibody titer > 10 IU/L) were used to gather data on hepatitis B vaccination status. IBM-SPSS 22 was used to analyze the data.

RESULTS

Patients in this study had a mean age of 49.80 ± 5.245 years, weight of 45.22 ± 7.101 kg, BMI of 21.381 ± 1.020, and disease duration of 22.061 ± 2.511. A total of 56 (51.3%) patients with anti-HBs antibody titers ≥10micrograms were confirmed vaccinated, as shown in Table 1. Table 2 shows immunization status by gender, age, BMI, vaccine doses, and sickness duration.

Table No.1: Patients Demographics

		Frequency	%tage
Gender	Male	68	62.4
	Female	41	37.6
Age	30Y or >	74	67.9
	<30 Y	35	32.1
BMI (kg/m2)	20 kg/m2 or below	48	44
	More than 20 kg/m2	61	56
VACCINE DOSES	03 Doses	81	74.3
	04 Doses	28	25.7
DISEASE DURATION	24 months or more	77	70.6
	Less than 24 months	32	29.4
VACCINATION STATUS	Vaccinated	56	51.4
	Unvaccinated	53	48.6

Table No. 2: Results according to gender, age, BMI, vaccination dose and disease duration

	Gender		Age (yrs)		BMI (kg/m2)		Vaccine Doses		Disease Duration (Months)	
N=109	Male(68)	Female (41)	≥ 40 years (74)	< 40 years (109)	≥ 20 (48)	< 20 (61)	03 doses (81)	04 doses (28)	≥ 24 months (77)	< 24 months (32)
Vaccinated	37	19	35	21	27	29	39	17	32	24
(56, 51.4%)	(54.4%)	(46.3%)	(47.3%)	(60%)	(56.2%)	(47.5%)	(48.1%)	(60.7%)	(41.5%)	(75.0%)
Unvaccinated	31	22	39	14	21	32	42	11	45	08
(53, 48.6%)	(45.6%)	(53.7%)	(52.7%)	(40%)	(43.8%)	(52.5%)	(51.9%)	(39.3%)	(58.5%)	(25.0%)
p value	0.414		0.215		0.366		0.251		0.001	

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DISCUSSION

Among CKD patients who had HBV immunization, 56 (51.3%) had anti-HBS antibody titers ≥10 micrograms. A minimum of 10 micrograms of anti-HBS antibody is suggested for hepatitis B prevention. No significant connection was found between HBV vaccination response and gender, age, BMI, or vaccine doses. Though more individuals who got 04 doses of anti-HBV vaccination developed antibodies than those who received 03 doses, this response was not statistically significant (p = 251). Duration of sickness correlated with vaccination response (p = 0.001). Low response may be linked to immune system weakening as sickness duration increases.[8] Hepatitis B vaccination rates in our country are low despite nephrology groups and the CDC's advice. Patients' low socioeconomic position may explain this.CKD patients' hepatitis B virus vaccination status is little investigated, however several studies have examined vaccine response in CKD

patients. An early 1990s UK survey found that just 5% of dialysis units consistently immunized patients.[9] Vaccination rates in the US rose from 47% to 56% between 1997 and 2002.[10] Our findings indicated 51.3% HBV-vaccinated patients. No local data was available to compare our findings. Compared to our findings, several emerging nations have superior immunization levels. Brazil had over 60% of CKD patients immunized against HBV, with 15% of them incompletely.[11] Our findings are concerning since CKD patients are high-risk populations and vaccination is the best strategy to avoid HBV infection, coupled with segregation of HBV patients and their equipment and general infection management.[5] This low immunization rate suggests that nephrologists and dialysis clinics seldom follow guidelines. The US Renal Data System 2011 Annual Data Report found that men started hemodialysis more than females in 2009. Maric also found that diabetic males are more likely to acquire CKD. We found similar results. Gender did not affect CKD patients' hepatitis B vaccination. As in earlier trials, most of our CKD patients were over 40. The mean age of CKD patients in India was 51 years, whereas in China it was 63.6 years.[12, 13] We found no significant connection between vaccination status and patient age or CKD duration. While older age has been linked to reduced vaccination rates in the general population, we did not find any data on CKD patients' hepatitis B vaccination status.

In the UK, author found that most CKD patients are poor[14].HBV vaccination rate was substantially linked with socioeconomic status in our research; lower socioeconomic class patients had lower immunization rates. Author found comparable findings in the overall population.[15] Lower- and lower-middle-class patients may not be able to afford hepatitis B vaccine or understand its importance.

CONCLUSION

Vaccination status (in terms of titer response to HBV vaccine, i.e. ≥10 IU/L) among chronic kidney disease patients is low. Compared to the conventional 03 doses, the response is better in patients who receive 04 doses. Patients in the early course of the disease are likely to show better response to HBV vaccines.

Author's Contribution:

Concept & Design of Study:	Shad Muhammad
Drafting:	Arbab Muhammad Ali, Muhammad Ikram
Data Analysis:	Muhammad Ikram
Revisiting Critically:	Shad Muhammad, Arbab Muhammad Ali
Final Approval of version:	Shad Muhammad

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Original Article

Frequency of Inflammatory Bowel Disease in Patients who Underwent Colonoscopy for Lower Gastrointestinal Bleeding

Dilaram Khan[1], Inayat Ullah[2], Mohammad Sohail[1] and Aamir Ghaffoor[1]

ABSTRACT

Objective: To determine the frequency of inflammatory bowel disease in patients undergoing colonoscopy for lower gastrointestinal (GI) bleeding.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Gastrointestinal Diseases, Lady Reading Hospital Peshawar from 1st June 2023 till 30th November 2023.

Methods: One hundred and twenty-one patients were included in this study Patients of both gender and age more than 18 years with lower GI bleeding were included while patients with hemodynamic instability, patient with past history of colonoscopy for bleeding per rectum and those not willing for study were excluded. Baseline demographic information's of patients were taken and baseline complete blood count and prothrombin time were done, informed consent was taken. Every patient was stabilized hemodynamically, bowel was prepare using 2 litres of Poly Ethylene Glycol given 8 hours before the procedure and patients were kept on liquid diet from 24 hours before the colonoscopy, conscious sedation with midazolam and nalbuphine given and colonoscopy was performed using a flexible colonoscope.

Results: Age ranged from 18 to 60 years with mean age of 41.958±6.83 years. Seventy-five (62%) patients were male and 46 (38%) were female. Pain in the abdomen was the most the frequently occurring complaint in addition to rectal bleeding which was present in 34 (28.9%) diarrhoea in 30(24.79%), fever in 10 (8.26%) and constipation in 4 (3.30%) patients. Inflammatory bowel disease was found in 14% of patients.

Conclusion: Lower GI bleeding represents a common problem, and inflammatory bowel disease is among the leading causes of Lower GI bleeding.

Key Words: Lower GI bleeding, Colonoscopy, Inflammatory bowel disease

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INTRODUCTION

Inflammatory bowel disease(IBD) is an autoimmune disorder in which recurrent inflammatory bouts occur in gastrointestinal tract because of an abnormal immunolgical response to gut microflora.[1] IBD is of two types i.e. Ulcerative colitis and Crohn's disease. In ulcerative colitis diffuse inflammation of the colon mucosa occurs and most commonly affects the rectum which is called proctitis, but it may involve the sigmoid (procto-sigmoiditis), extends beyond the sigmoid (distal ulcerative colitis), or can involve the entire colon up to the cecum (pan-colitis).[2] Crohn's disease causes inflammation of all the layers of the Gastrointestinal tract (GIT) called trans-mural inflammation , can involve any part of the digestive tract, mainly affecting the last part of ileum and colon. Both types of IBD are classified by extent and location. Crohn's disease also is classified by phenotype- inflammatory, structuring, or penetrating.[2,3]

The diagnosis of IBD needs a combination of clinical history, physical findings, laboratory markers, imaging studies, and endoscopic findings and biopsies.[4] Changes in the blood include microcytic anemia, leukocytosis, and thrombocytosis, raised ESR and CRP .[5] Gastrointestinal bleeding is bleeding which occurs within the Gut from mouth to anus and is divided upper and lower GI bleeding on the basis of origin.[6] Bleeding which occurs proximal to the ligament of Treitz is called upper GI bleeds, and bleeding distal to this ligament are lower GI bleeds.[7]

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This classification into these two is important as helps in the further assessment and ultimate treatment of the patient.[7] Hreinsson et al[8] have shown in a study that frequency of IBD was 13% in patients who underwent endoscopy for lower GI bleeding. In Pakistan, colonoscopy is done for diagnosis of lower GI bleeding but very limited studies are available in our local set up regarding lower GI bleeding. So, this study was designed to study the frequency of IBD in patients undergoing colonoscopy for lower GI bleeding in our local set up.

METHODS

This cross-sectional study consisting of 121 patients was done in the Gastroenterology unit of MTI- Lady reading hospital, Peshawar from 1st June 2023 to 30th November 2023 using non-probability consecutive sampling technique. Approval was given by ethical committee of the hospital. Patients of both genders having age more than 18 years and complaining of lower GI bleeding were enrolled in this study while Patients with hemodynamic instability, and those not willing for the study were excluded. Baseline demographic information's of patients (age, gender and duration of complaints) were taken and baseline complete blood count and prothrombin time were done, and informed consent was taken from patients. Patients were hemodynamically stabilized, preparation of the bowel done using 2 litres of Poly Ethylene Glycol given 8 hours prior to the procedure and patients were kept on liquid for 24 hours before the colonoscopy whenever possible. Conscious sedation given with midazolam and nalbuphine and colonoscopy was performed. In case of acute emergency, only sigmoidoscopy was done after giving two enemas 30 minutes before the procedure. During the colonoscopy, the patient was laid on left lateral position and standard flexible colonoscope was used. Colonoscopy findings were noted, IBD was confirmed colonoscopically and minimum of four biopsy specimen were taken from each patient for histological confirmation. Data regarding inflammatory bowel disease was noted. Data was analyzed by using SPSS-23. Post stratification Chi square test was applied, $p \leq 0.05$ was considered statistically significant.

RESULTS

There were 75 (62%) males and 46 (38%) females with a male to female ratio of 1.60: and mean age was 41.958±6.83 years, the majority of the patients were in the age range of 40-60 (Table 1). In addition to bleeding per rectum, 34 (28.09%) patients were complaining of pain in abdomen, 30 (24.79%) diarrhea, 10 (8.26%) fever and 4 (3.30%) of constipation (Table 2). Inflammatory bowel disease was noted in 14% patients, where all of 17 (14) patients were having ulcerative colitis while none of them was diagnosed with Crohn's disease (Table 3). Stratification of inflammatory bowel disease with respect to age, gender and duration of complaints are shown in Tables 4-5 respectively.

Table No.1: Age wise distribution of patients (n=121)

Age (Years)	No.	%
18-40	50	41
40-60	71	58
Above 60	-	-

Table No.2: Other symptoms present along with rectal bleeding (n=121)

Symptoms	No.	%
Pain abdomen	34	28.09
Diarrhea	30	24.79
Fever	10	8.26
Constipation	4	3.30

Table No.3: Frequency of inflammatory bowel disease (n=121)

Inflammatory bowel disease	No.	%
Yes	17	14.0
No	104	86.0

Table No.4: Stratification of inflammatory bowel disease with respect to age

Age (years)	Inflammatory bowel disease		P value
	Yes	No	
18-40	5 (11.9%)	37 (88.1%)	0.621
>40	12 (15.2%)	67 (84.8%)	

Table No.5: Stratification of inflammatory bowel disease with respect to gender

Gender	Inflammatory bowel disease		P value
	Yes	No	
Male	7 (9.3%)	68 (90.7%)	**0.057**
Female	10 (21.7%)	36 (78.3%)	

DISCUSSION

Lower GI bleeding is a frequent cause of referrals to Gastroenterology Centers[9] all over the globe, and same is the clinical situations in our country and local set up as well. Male patients predominated in our study, 62% were male, and the rest were female. Our study results are comparable to the study done by Deeb et al[10] in Egypt, where 68.0% of the patients with lower GI bleed were male. Similarly, a study carried out in India by Bhadauria et al[11] showed a male to female ratio of 2.16:1 in patients who presented with lower gastrointestinal bleeding.

The mean age of patients in our study was 41.958±6.83 years. The same were the results of the study done by Mandhan et al[12] where majority of the patients were in the young age. In this study, abdominal pain was the commonest presenting complaint reported in 34 (28.09%), diarrhea in 30 (24.79%), fever 10(8.26%) and constipation in 4 (3.3%.) patients. These results of our study were very same to a study done in the Egypt[10]

whre pain in the abdomen and loose motions were commonest complaints. Similarly, a study done by Arvola et al[13] also noted that anemia, pain in the abdomen and diarrhea were the most common presentations in children who presented with Lower gastrointestinal bleeding. In a study done by an author loose motions, vomiting and pain in the abdomen were the most common symptoms among patients presenting with lower gastrointestinal bleeding. In a study done by Zahmatkeshan et al[14] in Iran showed that pyrexia, pain abdomen, and loose stools were the commonest presentations accompanying bloody stool. We found 64.2% of the cases were having anemia at the time of admission. These findings are compatible to another study where 61% of the cases with Lower GI bleeding had pallor.[10] Pallor has been noted to be a common finding among children having chronic blood loss.

In this study, colonoscopy findings were suggestive of inflammatory bowel disease in 14% of patients. The same were the results in the study done by Hreinsson et al[8] which showed that frequency of inflammatory bowel disease was 13% in patients who did endoscopic examination of the colon for lower GI bleeding. In a study from Egypt[10] same findings were noted with polyp being the commonest colonoscopy finding present in 44% whereas results from another study by Clarke et al[9] showed that polyps were present only in 10% of the patients. Greater frequencies of polyps (75%) on colonoscopic examination among patients having Lower GI bleeding was shown by Mandhan.[12] Another author noted that polys were present in 53% while studies from many other regions of the globe identified polyps to be the most common cause among children with Lower GI bleeding. Deeb et al[10] in Egypt also showed that juvenile polyps to be the most frequently occurring finding which were hamartomatous and responsible for upto 90% of all kinds of polyps noted among children.[15] The diagnosis of inflammatory bowel disease depends mainly on the combination of clinical presentations, laboratory markers, radiological studies, colonoscopy, and histopathological examination. However, sometimes the colonoscpic findings are non-specific and usually occur because of some other etiologies. In addition to differentiate between the two types of IBD and for knowing the extent of the disease, other etiologies of colon inflammation needs to be ruled out. This is of special importance as the treatment for ulcerative colitis or Crohn's disease may worsen other conditions, particularly colonic infection. Infectious agents causing colonic inflammations are very similar inflammatory bowel disease on colonoscopy. Common infections agents like Clostridium difficile (CD) and Escherichia coli (E coli) must be win now out before colonoscopy. Yersinia spp. Can cause abdominal pain in the lower quadrant and pyrexia, where imaging is showing ileitis and is usually similar to acute inflammation of the appendix. Salmonella, Actinomyces, and E. coli infections can cause enteritis and particularly ileitis which are similar to IBD presentations.[16] Intestinal TB can also cause ulcer, and stricture formation in the terminal ileum and ileocecal valve.

Cytomegalovirus(CMV) can cause ulcerations of the GI tract where ulcers are usually "punched-out" in appearance but biopsies are necessary to differentiate between the two. However, many individuals with inflammatory bowel disease will have CMV infection at the same time, so colonoscopy inspection is mandatory to rule out concomitant Cytomegalovirus infection which is causing bowel inflammation, but sometimes it can be very challenging to establish whether Cytomegalovirus is just a passerby or an active participant in inflammation in these patients.[17]

Though it is very rare but vasculitis can also cause bowel inflammation, especially the small Gut. SLE, polyarthritis nodosa, Henoch-Schönlein purpura(HSP), and Behçet's disease may all cause colonic inflammation just like IBD. The gastrointestinal tract is affected by Polyarteritis nodosa in up to 65% of patients and can cause symptoms of bowel ischemia.[18] Behçet's disease usually cause ulcers in the small and large intestines with normal intervening mucosa and these are usually confused with Crohn disease. However, the ulcerations in Behçet's disease are usually less in number, are larger, deeper, and rounder as compared to those which occur in IBD.[19]

Ischemia can cause erythema,edema, erosion and ulcerations which are similar to those of inflammatory disease. Ischemic colitis usually cause dusky necrotic colitis which occur in segments, having a demarcation between diseased and normal colon and usually affect the left colon. A detailed history and accuracy of symptoms can differentiate between IBD and ischemic colitis.[20,21] diverticulosis causing segmental colitis is also very difficult to differentiate from inflammatory bowel disease. Segmental colitis of diverticulosis most commonly affects the left sided colon, especially the sigmoid colon. While rectum and the rest of the colon are spared most of the time .Edema, erythema, erosions, and ulcers, often with sparing of the diverticularorifices are the main endoscopic findings.[22] Since the colonoscopic and biopsy features overlap with the inflammatory bowel disease, the diagnosis is usually challenging, but Segmetal colitis associated diverticulosis is mainly found in old age patients.[23] similarly NSAIDs can cause bowel inflammation and proper history and examination is needed to differentiate it from IBD.

CONCLUSION

Lower GI bleeding is a common problem with a vast differential diagnosis. Inflammatory bowel disease is among the leading causes of Lower GI bleeding. So thorough history, physical exam, and utilization of endoscopic and radiographic adjunct are crucial in identification of the etiology of the bleeding. Endoscopic examination of the colon is a beneficial and safe procedure in patients who present with lower GI bleeding.

Author's Contribution:

Concept & Design of Study:	Dilaram Khan
Drafting:	Inayat Ullah, Mohammad Sohail
Data Analysis:	Mohammad Sohail, Aamir Ghaffoor
Revisiting Critically:	Dilaram Khan, Inayat Ullah
Final Approval of version:	Dilaram Khan

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Original Article

Developmental Profile as a Predictor of Behavior Phenotype in Down Syndrome Children

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ABSTRACT

Objective: To study the Emerging Down Syndrome Behavioral Phenotype from infancy to Early Childhood and to see Developmental Profile as a Predictor of this Behavior phenotype in Down Syndrome Children.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Development and Behavioral pediatrics, University of Child Health science, Children's hospital Lahore and duration of study was 6 months from 1st January 2023 to 30th June 2023.

Methods: It was a Cross-sectional study. Data was collected from Department of Development and Behavioral pediatrics, University of Child Health science, Children's hospital Lahore and duration of study was 6 months. A sample of 42 Children having age 1-5 years was collected through purposive sampling technique.

Results: In breakup of PEEP and SDQ tools, Cognition age of 9 (19%) patients was profound, 23 (48%) severe, 9 (19%) moderate and 7(15%) was mild delay. Socialization age of 4 (8%) patients was profound, 11 (23%) severe, 13 (27%) moderate, 11(23%) mild and 9 (19%) patients were age appropriate. Self-help age of 7(15%) patients was profound, 12 (25%) severe, 13 (27%) moderate, 10 (21%) was mild delayed and 6 (13%) patients were patients were age appropriate. Motor age of 8(17%) patients was profound, 13 (27%) severe, 15 (31%) moderate, 8 (17%) was mild delay and 4 (8%) patients were age appropriate. Expressive Llanguage age of 19 (40%) patients was profound, 22 (46%) severe,5 (10%) moderate 1(2%) was mild delay and 1 (2%) patients were age appropriate.

Conclusion: Specific Behavioral Phenotype (BF) in children with Down Syndrome (DS) is consistent with relative strength in sociability, non-verbal abilities, receptive language, implicit memory skills and visuo spatial processing and relative weakness in gross & fine motor skills, verbal communication, visuo motor, cognitive functioning and motor planning.

Key Words: Down syndrome (DS) Behavior Phenotype (BP), Development Profile (DP), Portage Early Education Plan (PEEP)

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INTRODUCTION

Down syndrome (DS), trisomy 21, is the most common genetic disorder, with an estimated incidence of 1 in 700 live births[1]. Out of all genetic disorders, a lot of research has been done on Down syndrome. Development is typical in infancy, slows down in next two years amid delayed rate of brain myelination.

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The Down syndrome (DS) behavior phenotype has been described as having relative strengths in non-verbal receptive skills and sociability & relative weakness in cognition expressive language and motor planning[2]. The most constant and typical features of DS are intellectual disability and craniofacial dysmorphism[3], with a variety of organ involvement and systemic diseases[4]. By definition behavioral phenotype refers to observable characteristics that occur more often in individuals with a specific genetic syndrome than individuals without that syndrome[5]. Characters that are not observable are called endo-phenotype and include thoughts, emotions and motivational states. Behavior phenotype in children with DS has typical characteristics and is explained in domains of his/her cognition/intellect, socialization, speech and language communication, self-help and motor skills which are collectively called as developmental profile[5] .

In cognition domain of development, children with DS have mild to severe delay with the profile of relative strength and weakness. They tend to have difficulties

more in understanding & following commands impaired memory, learning & self-care but they are good in non-verbal abilities and visually stored memory[6].

As regards to Speech and Language domain of development children with DS have better receptive than expressive skills in the verbal domain[7]. Receptive vocabulary can be considered as a relative strength. The understood more than they can speak. As for the expressive domain, children with DS have been found weak in phonology, grammar and syntax, while their intentional use of communication and gestures, and their social use of communication generally seem to be in line with their mental age[8]. A pattern of strengths and weaknesses has been observed in the nonverbal domain as well. In terms of social development children with DS are relatively strong and often described as charming affectionate, outgoing, cheerful, happy and sociable. Motor functioning demonstrates specific motor impairments in a number of fine and gross motor tasks (i.e., balance, posture, strength, and flexibility), as well as motor planning (i.e., praxis), although CA-level performance has been observed in specific skills including, running speed, agility, and visual-motor control. Conductive Hearing impairment negatively impacts language development[9].

This research will help in establishing the developmental profile in early childhood can be used as a predictor of Behavior Phenotype (Strengths and weakness) in children with Down syndrome.

METHODS

It was a Cross-sectional study. Data was collected from Department of Development and Behavioral pediatrics, University of Child Health science, Children's hospital Lahore and duration of study was 6 months. A sample of 42 Children having age 1-5 years was collected through purposive sampling technique. PEEP (Portage Early Educational Plan) Guide was administered to determine developmental Delay in 5 domains of development (Cognition, Self Help, Socialization, Motor and Speech). Strength and Difficulties Questionnaire (SDQ) was incorporated to exclude children with DS having behaviors related to pervasive development disorders. Demographic Questionnaire including Age, Gender, Family Size, Education, income etc. was also administered.

RESULTS

Data was analyzed using SPSS 25.0. Demographic and socio-economic data of our research shows that, 36 (75%) patients were male and 12 (25%) patients were female. 13 (27.1%) patients were belonging to nuclear family system and 35 (72.9%) patients were belonging to joint family system. 30 (62.5%) parents of patients have low socio-economic status, 16 (33.3%) parents of patients have middle socio-economic status and 2 (4.2%) parents of patients have high socio-economic status. 40% father and 44% mothers of patients were un-educated.

Figure 1 shows that, in breakup of PEEP and SDQ tools, Cognition age of 9 (19%) patients was profound, 23 (48%) severe, 9 (19%) moderate and 7(15%) was mild delay. Socialization age of 4 (8%) patients was profound, 11 (23%) severe, 13 (27%) moderate, 11(23%) mild and 9 (19%) patients were age appropriate. Self-help age of 7(15%) patients was profound, 12 (25%) severe, 13 (27%) moderate, 10 (21%) was mild delayed and 6 (13%) patients were age appropriate. Motor age of 8(17%) patients was profound, 13 (27%) severe, 15 (31%) moderate, 8 (17%) was mild delay and 4 (8%) patients were age appropriate. Expressive Language age of 19 (40%) patients was profound, 22 (46%) severe, 5 (10%) moderate 1(2%) was mild delay and 1 (2%) patients were age appropriate.

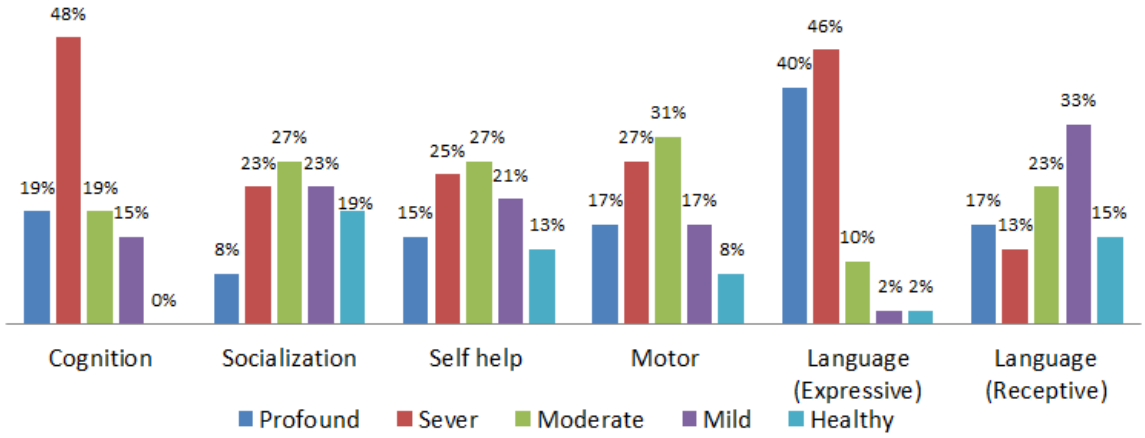
Table 1: this table shows, throwing 34 (71%), Teasing 5 (10%), Screming 32 (67%), Selfdirected 16 (33%), and Directed toward others 34 (71%). Table 2: shows that average age of patients was 35.79 months, Cognition age was 16.61 months, Socialzation age was 27.43 months, Fine Motor and Self-Help age was 21.96 months, Gross Motor age was 21.13 months, Receptive language age was 28.18 months and Expressive language age of Down syndrom (DS) patients was 12.73 months. Table 3: shows that there was a significant difference between choronoligcal age and socialization age, choronoligcal age and self-help age, choronoligcal age and Gross Motor age, choronoligcal age and Receptive Language age, choronoligcal age and Expressive Language age of DS patients.

Table No.1 : Secondery Behaviuoral problems

Behaviors of individuals	Yes	No
Throwing	34 (71%)	14 (29%)
Teasing	5 (10%)	43 (90%)
Screaming	32 (67%)	16 (33%)
Self-directed	16 (33%)	32 (67%)
Directed toward others	34 (71%)	14 (29%)

Table No.2: Paired sample statistics

Age	Mean	Std. Deviation
Chronological age of patients	35.79	15.12
Cognition age	16.61	11.19
Socialization age	27.43	11.97
Fine Motor and Self-Help age	21.96	13.31
Gross Motor age	21.13	13.15
Receptive Language age	28.18	9.13
Expressive Language age	12.73	10.20



Figurer No.1: Cognition age, socialization age, self-help age, Motor age and language age of patients

Table No.3: Output of Paired sample t-test

Variables	Paired Differences		T	p-value
	Mean	SD		
Chronological age - Cognition age	19.18	10.958	12.124	<0.005
Chronological age -Socialization age	8.37	10.623	5.460	<0.005
Chronological age - Fine Motor and Self-Help age	13.83	11.360	8.435	<0.005
Chronological age – Gross Motor age	14.66	9.664	10.509	<0.005
Chronological age – Receptive Language age	23.07	9.160	17.447	<0.005
Chronological age - Expressive Language age	23.07	11.810	13.532	<0.005

DISCUSSION

Specific Behavioral Phenotype (BF) consistent in children with Down Syndrome (DS) presented relative strength in sociability, non-verbal abilities, receptive language, implicit memory skills and visuo spatial processing and relative weakness in gross & fine motor skills, visuo motor, cognitive functioning, expressive language, communication and motor planning. This BF is clearly related to the development profile (DP) of the child and early development of typical behavioral characters (BC). We measured the DP & BC through PEEP and SDQ tool was incorporated to exclude children with pervasive development disorders and found PEEP as predictor of typical emerging BF in DS children.

Previous studies have reported this specific behavioral phenotype in children above 5 years[10]. This study was shaped to see this BF through developmental & behavioral assessments of children with DS before 6 years. Description and results of the research is viewing behavioral phenotypes from a developmental perspective. It seemed that this particular phenotype appears in early years of development and then emerge slowly before five years of age.

The Expressive Language (EL) was assessed through child's spontaneous answers, spoken responses to questions and multi word sentences. The expressive language words were all centrally processed, requiring the child to respond to an auditory input. Expression was in line with comprehension and auditory processing and mechanical motor skills. Expressive Language (EL) skills were recorded on parents information and direct conversation with the child and noted according to number of intelligible words, 2 or 3 words speech and sentence formation these findings are agreement with previous studies [11, 12].

A specific cognitive profile was observed in children with (DS) showing difficulties in intelligible and comprehensive language and spoken memory challenges, and relatively stronger non-verbal abilities and visual memory skills. They are better in receptive than expressive skills in the verbal domains, meaning thereby that these children understood more words than they are able to speak. Receptive Vocabulary (RV) is relatively better, but the depth and breadth of their RV is weak. DS children have been found weak on phonology, grammar and syntax but their social cues and gestures are generally according to their mental age. Low cognition has been ascribed due to deficits in verbal processing, large differences in expressive and receptive language domains and smaller size of intelligible spoken words. Our study showed cognitive age as 16.61 months while other study[13] showed it as 18.22 months.

The communication domain involved receptive and expressive language. In communication competence, non- verbal joint attention and gestural language are better whereas non-verbal requesting behavior showed deficits in children with DS. In receptive language

child's verbal input is determined as the small item questions they can understand better like pointing and simple commands but complex items involving multi tasks in one command were difficult to perceive. In our study Receptive and Expressive language of patients were 28.18 and 12.73 months respectively while previous study[13] showed that Receptive and Expressive language as 22.11 and 19.33 months respectively.

The Gross Motor (GM) functions were assessed as at what age child developed head control, turning sides, and prone to spine, sitting, crawling, standing in a manner to know progress in cephalocaudal and proximodistal motor development. In preschool children GM skills like running, hopping, jumping, climbing up & down stairs and tricycle riding. ("Pedals tricycle or other three-wheeled vehicle for at least six feet") were noted as their age of development. Our study showed Gross Motor age as 21.13 months while older study[13] showed it as 18.22 months.

The Fine Motor (FM) and Self Help skills involved bilateral and unilateral hand functioning. Bilateral items included closing zip, opening book and turning pages, buttoning/unbuttoning, lacing shoes, sharpening pencils, wearing socks & shirts, use of cloth clips, folding, and cutting etc. Unilateral items included eating with sticks, use of spoon and forks, holding feeder, bridging with blocks, marking tower of blocks, use of peg board, etc. Our study showed Fine Motor age as 21.96 months while older study[13] showed it as 20.83 months

The Socialization Domain assessed through functioning in peer relationships (PR), play and entertainment hours, and adapting skills. For toddlers, PR items involve like "laughs or smiles appropriately in response to positive statements. For preschool children dimensions like "participates in at least one game or activity with others", and coping skills involve items like "says 'please' when asking for something". Age equivalent scores for the Down syndrome group in this study on Play and Leisure Time socialization averaged 27.43 months, in contrast to the previous study[13] the (PR) area domain showed average age equivalent scores of 20.17 months. Positive emotions signals & smile frequencies were also found high.

In this context two marked differences were noted in individuals with Down syndrome. It was small at early developmental ages as regards to difference between expressive and receptive language, which averaged only 2.5 months. Whereas, it was large with an average of 20 months in older children with Down syndrome. That small dissociations early in development can result in increasingly larger differences over time is consistent with dynamic systems theory in those small starting state differences can evolve considerably larger as development becomes increasingly complex and differentiated[14,15.]

The Visual Reception measures were taken from visually stored memory. Children were exposed to various objects in different forms and shapes which involved oculomotor nerves and central visual pathways in localizing single and multiples points on surface through visual tracking[16].

CONCLUSION

In the light of new understanding of development in genetic syndromes and as a part of larger movement towards studying BF particularly in children with DS, it has become possible now to focus on weaker areas of BF like expressive language and motor skills before they become areas of pronounced weakness. Areas of relative strength may be taken as" gateway in" to polish areas of weakness to prevent future delays by early identification of areas of strength & weakness through developmental profile in toddler years taking as potential windows of opportunity to address weaker areas of BF is in toddler age group before they become pronounce in preschool years.

Visuospatial aspects of visual recognition memory, visual motor integration and visual imitation as areas of strength in children with DS are useful sub domains to enhance cognition level in these children.

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Original Article

Chest Pain Management

Chest Pain Management Using Prehospital Point-of-Care Troponin and Paramedic Risk Assessment

Feras Almarshad[1] and Ghulam Mustafa[2]

ABSTRACT

Objective: To evaluate the prehospital point-of-care troponin testing and paramedic risk stratification within existing chest pain care pathways reveals promising reliability and validity, suggesting their potential as valuable tools in enhancing early cardiac assessment and improving patient outcomes.

Study Design: Prospective study

Place and Duration of Study: This study was conducted at the Department of Medicine, Nishtar Medical University, Multan, from February 2021 to January 2022.

Methods: Study included 400 consecutive patients experiencing acute chest pain categorized as emergencies. All patients were transported to the hospital via ambulance for subsequent medical care. Positive TnT test prehospital and at the time of hospital admission were compared. Main variables of study were values of troponin test in myocardial infarction associated chest pain patients at hospital and during emergency travelling and previous history coronary artery disease, myocardial infarction and risk factors like diabetes, smoking and hypertension.

Results: Myocardial infarction was positive in 32.0% in chest pain patients. Prehospital troponin was positive in 33 (8.3%) patients. Troponin test was positive in 53.8% patients at admission. The sensitivity for prehospital troponin to myocardial infarction was 18.0% and the sensitivity to myocardial infarction for in-hospital troponin was 74.2% with specificity 96.3% and 55.9%, respectively. ($p<0.001$).

Conclusion: In regions where patient transport times are brief, the point-of-care rapid Troponin T (TnT) test reveals only a minority of individuals experiencing chest associated, prehospital TnT test positive outcome emerges as an objective indicator for a more adverse prognosis in those with suspected heart attacks.

Key Words: Point of care, Chest Pain, Myocardial infarction, Troponin test, Prehospital

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INTRODUCTION

Acute chest pain represents 10% of ambulance attendances and is linked to significant healthcare costs and resource utilization[1]. Existing guidelines advise transporting most patients to emergency departments for further assessment due to the presence of chest pain in many serious diagnoses; however, approximately 50% of these patients are ultimately discharged without a specific diagnosis[2]. Recent studies indicate that risk stratification in coronary artery disease can be made safely by paramedic staff by testing point-of-care troponin level, leading to a reduction in emergency department length of stay[3,4].

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While health outcome studies evaluating this strategy are still emerging, prehospital risk stratification and point-of-care troponin testing may be non inferior to existing care processes in terms of early major adverse cardiac events[5]. Studies conducted to date have primarily utilized conventional troponin assays, but the emergence of point-of-care, high-sensitivity troponin (hsTn) assays may become more prevalent in the near future[6].

However, the potential widespread availability of hsTn assays poses challenges due to significant infrastructure costs linked to outfitting ambulances with point-of-care testing devices and TnT cartridges[7,8]. Additionally, uncertainties persist regarding whether implementing a prehospital risk stratification and point-of-care troponin model would ultimately lead to net cost savings, considering the associated paramedic training expenses[9,10].

The present study aimed to investigate paramedic risk assessment, in conjunction with point-of-care troponin testing that may help optimize resource allocation by directing patients to the most appropriate level of care.

METHODS

The Prospective study was conducted at department of Medicine, Nishtar Medical University, Multan, from

February 2021 to January 2022. Total 400 consecutive patients experiencing acute chest pain categorized as emergencies were included. All patients were transported to the hospital via ambulance for subsequent medical care. The protocol approved by the hospital Board. Study protocol involved the collection of 5 mL of blood for the rapid Troponin T (TnT) test after obtaining verbal informed consent from the patient. The blood collection took place either in the patient's home or in the ambulance. Subsequently, a second TnT test was conducted upon the patient's arrival at the hospital. All patients in the study were administered 500 mg of intravenous aspirin and received nitroglycerin sublingually during ambulance transport. Upon hospital admission, a 12-lead electrocardiogram was promptly conducted, and concurrent assessments of creatine kinase were carried out. Subsequent serial measurements were left to the discretion of the attending physician, who was informed of the troponin T (TnT) test results.

Positive TnT test prehospital and at the time of hospital admission were compared. In patients of chest pain MI incidence was noted and mentioned with positive and negative TnT prehospital test were recorded.

MI diagnosis was based on a significant rise in creatine kinase activity (more than twice the upper limit of normal), along with a creatine kinase MB increase of over 6%, concurrent ST elevations on electrocardiogram or as per World Health Organization criteria for typical clinical findings. For diagnosis of Coronary artery disease coronary angiography was performed. Presence of ST elevation above 1mm and 2 mm on limb lead and precordial lead was labeled as myocardial ischemia.

A device for whole blood rapid assay, utilizing Boehringer Mannheim's TnT (troponin T) test was applied for measurement of TnT levels. After heparinization of 150 ml whole blood, plasma and cellular fraction was separated. Plasma containing TnT, is diffused to the detection zone. Cardio specific gold-labeled antibodies and biotinylated antibodies are involved. These antibodies are specific to different epitopes (distinct regions) of Troponin T. A red line appears in the reading zone within 20 minutes. This red line serves as an indicator of the presence of serum TnT in the sample.

The data were presented as median or mean (SD) as appropriate. Statistical analyses employed Student's t-test and Fisher test with a significance threshold of $P < 0.05$. Sensitivity and specificity were calculated as percentages of true positives and true negatives, respectively, relative to total relevant cases.

RESULTS

Overall, 400 patients were included in this study with mean age 62.71±6.01 years. There were 209 (52.3%) males and 191 (47.7%) females. The distribution of hypertension, CAD, smoking, previous MI, dyslipidemia, diabetes mellitus and family history were shown in table 1.

Myocardial infarction was positive in 128 (32.0%) chest pain patients. Prehospital troponin was positive in 33 (8.3%) patients. Troponin test was positive in 215 (53.8%) patients at admission. The sensitivity for prehospital troponin to myocardial infarction was (18.0%) and the sensitivity to myocardial infarction for in-hospital troponin was (74.2%) with specificity (96.3%) and (55.9%), respectively. ($p<0.001$). (Table. 2).

Table No.1: Demographic and baseline characteristics of the study patients

Variable	Presence
Age (years)	62.71±6.01
Sex	
Male	209 (52.3)
Female	191 (47.7)
Previous myocardial infarction	146 (36.5)
Coronary artery disease	243 (60.8)
Hypertension	273 (68.3)
Diabetes mellitus	153 (38.3)
Smokers	70 (17.5)
Dyslipidemia	117 (29.3)
Family history	103 (25.8)
N (%), Mean ± S.D	

Table No.2: Association of myocardial infarction with troponin test at prehospital and in-hospital

Troponin result	Myocardial infarction		p-value
	Positive 128 (32.0%)	Negative 272 (68.0%)	
Prehospital test			
Positive, 33 (8.3%)	23 (18.0%)	10 (3.7%)	<0.001
Negative, 367 (91.7%)	105 (82.0%)	262 (96.3%)	
Sensitivity= TP/(TP+FN)=23/(23+105)*100=18.0% Specificity= TN/(TN+FP)=262/(262+10)*100=96.3%			
At hospital test			
Positive, 215 (53.8%)	95 (74.2%)	120 (44.1%)	<0.001
Negative, 185 (46.2%)	33 (25.8%)	152 (55.9%)	
Sensitivity= TP/(TP+FN)=95/(95+33)*100=74.2% Specificity= TN/(TN+FP)=152/(152+120)*100=55.9%			

DISCUSSION

The investigation examined whether pre-hospital TnT detection matches the established sensitivity and specificity for identifying acute myocardial infarction associated chest pain, as seen in emergency departments. The study revealed the practical form of conducting rapid TnT tests in ambulances, identification of point of care on positive TnT only a small fraction of acute myocardial infarction cases, displaying significantly lower sensitivity compared to TnT tests upon hospital admission.

The prehospital Troponin T (TnT) test's diminished sensitivity may be attributed to the brief time interval between the commencement of chest pain and the initial TnT test in the majority of the examined patients. TnT levels can elevate within 1 hour after the onset of chest pain. The sensitivity for MI remains about 50% until 3-4 hours after onset of pain.

The sensitivity for prehospital troponin to myocardial infarction was 18.0% and the sensitivity to myocardial infarction for in-hospital troponin was 74.2%. In another study, sensitivity of the rapid TnT test for acute MI was 33% in patients experiencing chest pain for less than 2 hours, and it notably increased to 86% for those with chest pain persisting for more than 8 hours.

Another study reported 18% sensitivity of prehospital TnT test and 98% in hospital for chest pain patients who were diagnosed with acute myocardial infarction later on. It was also concluded that positive prehospital Troponin T (TnT) test result serves as an objective indicator, suggesting a more unfavorable prognosis for individuals presenting with suspected acute chest pain.

Studies conducted by van Dongen et al[11] and Jungbauer et al[15] reported that utilization of a point-of-care (POC) troponin T measurement, specifically the Roche Cobas h232 assay with a detection range of 40–2,000 ng/L (values below 40 ng/L reported as <40 ng/L), allows ambulance paramedics to swiftly calculate an on-site HEART score, potentially leading to a reassessment of the need for immediate transportation to the Emergency Department. The within-series coefficient of variation for this assay is 9.3% in the low concentration range (40–200 ng/L), demonstrating excellent sensitivity correlation between final results and rapid TnT.[12]

Rasmussen et al[13] reported that performing pre-hospital point-of-care troponin measurements offers multiple potential advantages, as it enables the early detection of acute coronary syndrome (ACS) and facilitates the identification of high-risk patients prior to their arrival at the hospital. In another study Stopyra et al[14] reported that the prehospital point-of-care (POC) i-STAT cardiac troponin (cTn) measurement in patients transported with acute chest pain has shown a high specificity for myocardial infarction (MI), indicating its potential usefulness in confirming MI.

In two previous studies conducted by Kemper et al[15] and Sörensen et al[16] concluded that point-of-care testing has become a practical reality in prehospital care, with cardiac troponin T (cTnT) offering crucial information that aids EMS personnel in decision-making, preventing the underestimation of serious pathologies. It serves as an alert trigger for various potentially severe conditions, guiding emergency medical professionals in determining the most effective strategies to be pursued.

Elevated levels of cardiac troponin T (cTnT) have been linked to higher hospital mortality rates, while troponinemia is associated with increased morbidity and the occurrence of serious adverse events in both cardiovascular and non cardiovascular diseases; however, limited research has investigated the impact of prehospital troponin levels in identifying early mortality in patients without acute coronary syndrome[17,18].

CONCLUSION

In regions where patient transport times are brief, the point-of-care rapid Troponin T (TnT) test reveals only a minority of individuals experiencing chest associated, prehospital TnT test positive outcome emerges as an objective indicator for a more adverse prognosis in those with suspected heart attacks.

Limitations: The study may not account for all possible confounding variables that could influence the relationship between prehospital troponin testing, paramedic risk assessment, and chest pain management. Factors such as comorbidities, medications, and socio-economic status could impact the outcomes.

Practical Implications: Paramedics can use prehospital point-of-care troponin testing and risk assessment tools to identify patients at a higher risk of adverse cardiac events early in the care process. This early identification allows for quicker and more focused intervention for those at higher risk, potentially reducing the time to definitive treatment.

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Original Article

Risk Factors for Epidural Anesthesia Blockade Failure in Cesarean Section

Epidural Anesthesia Blockade Failure in C-Section

Abid Haleem Khattak, Muhammad Sheharyar Ashraf, Amjid Ali, Jawad Hameed, Samar Naeem and Kashaf Noor

ABSTRACT

Objective: To identify and assess the risk factors associated with epidural failure during cesarean section anesthesia.
Study Design: Prospective study
Place and Duration of Study: This study was conducted at the Anesthesia, Lady Reading Hospital, Peshawar November 2022 to October, 2023.
Methods: A total of 400 patients were included in the study. In 2022, at Lady reading Hospital, Peshawar. Data of patients who had cesarean sections with epidural anesthesia (EA) and catheterization were collected. EA failure was identified as the need for intravenous anesthetics during the cesarean section, resulting in conversion to general anesthesia (GA).
Results: Most of the epidural failure patients 82.5% was applied method of loss of resistance to air. Further, catheter depth, resident, obstetric anesthesiologist, emergency surgery, rupture of membrane and parity in epidural failure and non-failure patients were almost equal, ($p>0.050$). Whereas, the mean waiting time in epidural failure patients was less than the non-failure patients as13.23±2.19 minutes and 15.22±3.38 minutes, respectively.
Conclusion: Patients who have a previous epidural catheterization, experience inadequate waiting time, and are younger in age may face a higher risk of epidural analgesia (EA) failure. Specifically, the risk of EA failure increases by 2.6-fold for individuals with a previous epidural catheterization compared to those without catheterization history.
Key Words: Epidural Anesthesia, Risk Factors, Blockade Failure, Cesarean Section, Catheter Depth

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INTRODUCTION

Epidural anesthesia is favored technique of regional anesthesia for cesarean section in pregnant women due to the challenges associated with difficulty in airway management and the potential systemic effects of general anesthesia (GA) on both the fetus and uterine tone[1]. Epidural anesthesia (EA) offers the advantage of prolonging anesthesia duration through the administration of additional local anesthetics[2]. In patients who require pain control care after surgery use of catheter is effective, techniques such as programmed epidural bolus and epidural morphine can provide sufficient analgesia[3].

In contrast, spinal anesthesia (SA) may require supplemental approaches like nerve blocks or intravenous patient-controlled analgesia for extended pain control post-operatively[4]. It's worth noting that EA, particularly in cesarean sections, has a higher average failure rate ranging from 13.4% to 22.1%, compared to the lower range of 0.9% to 2.5% observed with SA[5]. Risk factors of epidural failure include prolonged labor, BMI, cesarean section urgency, labor analgesic breakthrough, maternal height and top ups of analgesics.[6].

Risk factors of procedure, such as anesthesia administered by non-obstetric anesthesiologists, the use of air for loss of resistance, and the flexibility of the catheter, have been identified[7,8]. In cases where epidural analgesia (EA) fails, necessitating some extra IV anesthesia for sedation to attain a sufficient level of anesthesia or even requiring a conversion to general anesthesia (GA) with endotracheal intubation, potential hazards arise, particularly during sedation or GA conversion due to the possibility of encountering difficult airways[9,10].

Despite the widespread use of epidural anesthesia for C-sections, there is a paucity of comprehensive studies specifically focused on the risk factors associated with blockade failure in this population. Filling this research gap will contribute to the field of obstetric anesthesia

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and perioperative care, guiding clinicians in refining their practices for better patient outcomes.

METHODS

The study conducted at Lady Reading Hospital in Peshawar from November 2022 to October, 2023. Study approved by Ethical committee and consent form patients was obtained. This study included patients who underwent c-section with epidural anesthesia and catheterization in the operating room, excluding those with specific criteria such as alternative epidural anesthetics, trainees with limited experience, short time intervals between anesthesia and incision, history of uncertain neuraxial anesthesia, history of spine abnormalities and surgical intervention, change from labor analgesia in epidural, and a history of spine surgery or abnormalities. The retrospective analysis involved dividing the 400 enrolled participants into two groups: those with epidural failure and those without.

Epidural anesthesia and with cauterization was performed with 18-gauge needle and a 20-gauge catheter by positioning the patient in the right and lateral position. Following the loss of resistance (via air or saline), a catheter of 20-gauge was inserted into the epidural space, and testing dose of 3–5 mL was given. Subsequently, checks for signs of intrathecal and intravascular injections were conducted, and if none were observed, catheter was fixed. Mixture of anesthesia contain Sodium bicarbonate 2.8g, lidocaine 400 mg, epinephrine 0.1mg and fentanyl 100 mcg totally 15-24 ml was administered through the catheter into the epidural space. Anesthesia induction time was recorded. Following preparation for cesarean section, surgeons initiated the surgery after confirming pinprick sensation. In patients of blockade failure, the decision to continue with EA or switch to general anesthesia (GA) was determined based on the anesthesiologist's expertise.

SPSS version 27 was used for data analysis. Test of significance were t-test and chi square test and p value below 0.05 was taken as significant.

RESULTS

Out of 400 patients, 63 (15.8%) patients had epidural failure. (Figure. I). The mean age and BMI of epidural failure patients was 39.02±11.69 years and 28.57±3.82 kg/m^2. There were 37 (58.7%) epidural failure patients who had previous epidural analgesia than the non-failure patients 147 (43.6%), (p=0.027). The most common puncture site in epidural failure patients was L3-4, 48 (76.2%). Most of the epidural failure patients 52 (82.5%) was applied method of loss of resistance to air. Further, catheter depth, resident, obstetric anesthesiologist, emergency surgery, rupture of membrane and parity in epidural failure and non-failure patients were almost equal, (p>0.050). Whereas, the mean waiting time in epidural failure patients was less than the non-failure patients as13.23±2.19 minutes and 15.22±3.38 minutes, respectively. (Table. I).

Table No.1: Association of baseline characteristics according to epidural outcome

Characteristic	Epidural failure		p-value
	Yes 63 (15.8%)	No 337 (84.2%)	
Age (years)	39.02±11.69	39.16±11.80	0.929
BMI (kg/m^2)	28.57±3.82	28.40±3.13	0.713
Previous epidural analgesia	37 (58.7)	147 (43.6)	0.027
Puncture site			
L2-3	13 (20.6)	43 (12.8)	0.186
L3-4	48 (76.2)	273 (81.0)	
L4-5	2 (3.2)	21 (6.2)	
Loss of resistance methods			
Air	52 (82.5)	293 (86.9)	0.352
Saline	11 (17.5)	44 (13.1)	
Catheter depth(cm)	5.26±1.18	5.32±1.91	0.697
Resident	46 (73.0)	272 (80.7)	0.165
Obstetric anesthesiologist	8 (12.7)	61 (18.1)	0.298
Emergency surgery	26 (41.3)	149 (44.2)	0.666
Rupture of membrane	10 (15.9)	51 (15.1)	0.8881
Parity			
Nulliparous	23 (36.5)	152 (45.1)	0.207
Parous	40 (63.5)	185 (54.9)	
Waiting time (minute)	13.23±2.19	15.22±3.38	<0.001
N (%), Mean ± S.D			

Figure No.1: Distribution of epidural failure among the study patients

DISCUSSION

In this study, we investigated the factors contributing to the failure of converting labor analgesia to cesarean delivery anesthesia, identifying key risk factors such as procedures conducted by trainees, parturients with elevated BMI, and the utilization of air for the loss of resistance test, as reported in prior studies[11]. The mean age and BMI of epidural failure patients was 39.02±11.69 years and 28.57±3.82 kg/m^2 and there was no significant difference among epidural failure and non failures.

Studies by Bauer et al[12] and Grap et al[13] have consistently highlighted a correlation between age and the risk of epidural failure, with a noteworthy trend indicating that younger patients may face a higher likelihood of experiencing this complication. The literature consistently reports a positive association between younger age and the incidence of epidural failure, suggesting that age should be considered as a significant risk factor in assessing the effectiveness of epidural procedures.

Previous studies conducted by Kula et al[14] and Eley et al[15] have provided evidence suggesting that an elevated Body Mass Index (BMI) is associated with increased technical difficulties and a higher likelihood of failure in neuraxial anesthesia. Additionally, these studies have indicated that obese parturients face an elevated risk of extension failure to surgical anesthesia, highlighting the challenges and complications that obesity can introduce in the administration and effectiveness of anesthesia procedures during childbirth.

Most of the epidural failure patients 82.5% were applied method of loss of resistance to air as compare to saline 17.5%. Beilin et al[16] reported in their study that the loss of resistance to air, as opposed to saline, may elevate the risk of epidural failure, a conclusion supported by Shenouda et al[17], who also observed that air could potentially impact the spread of local anesthetic, leading to an incomplete "patchy block" and consequently an increased reliance on intraoperative intravenous anesthetics.

In this study epidural failure rate was higher 58.7% patients who experienced previous epidural analgesia than non failures. Shimada et al[18] in a study revealed notable inflammatory adhesions and changes in individuals with a history of epidural anesthesia (EA) utilizing an epidural scope, as puncture of the flavum ligament and congestion due to catheterization within the epidural space, ultimately causing disruptions in the proper spread of local anesthetic within the epidural compartment.

The mean waiting time in epidural failure patients was less than the non-failure patients as 13.23±2.19 minutes and 15.22±3.38 minutes, respectively. The administration of epidural anesthetics indicated a nearly identical trajectory before the 12-minute mark[19], implying that the primary cause of failure was predominantly attributed to insufficient waiting time for the lidocaine-bicarbonate-epinephrine-fentanyl combination to achieve surgical anesthesia at the T7 level[20].

CONCLUSION

Patients who have a previous epidural catheterization, experience inadequate waiting time, and are younger in age may face a higher risk of epidural analgesia (EA) failure. Specifically, the risk of EA failure increases by 2.6-fold for individuals with a previous epidural catheterization compared to those without catheterization history.

Author's Contribution:

Concept & Design of Study:	Abid Haleem Khattak
Drafting:	Muhammad Sheharyar Ashraf, Amjid Ali
Data Analysis:	Jawad Hameed, Samar Naeem, Kashaf Noor
Revisiting Critically:	Abid Haleem Khattak, Muhammad Sheharyar Ashraf
Final Approval of version:	Abid Haleem Khattak

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Original Article

Antiemetic Prophylaxis with Droperidol in Morphine-Based Intravenous Patient Controlled Analgesia

Muhammad Sheharyar Ashraf, Abid Haleem Khattak, Jawad Hameed, Amjid Ali, Kashaf Noor and Samar Naeem

ABSTRACT

Objective: To assess the antiemetic advantages and sedative impacts of droperidol when used in conjunction with morphine-based intravenous patient-controlled analgesia (IV-PCA).

Study Design: Cohort study

Place and Duration of Study: This study was conducted at the Lady Reading Hospital in Peshawar from December 2022 to November 2023.

Methods: Patients who underwent major surgery and utilized morphine-based IV-PCA experienced a primary outcome characterized by the rate of any postoperative nausea and/or vomiting (PONV) occurring within 72 hours after the surgical procedure.

Results: Nausea and vomiting between 0-12 hours after operation in Droperidol Group was 10.7% and 14.7% in control group. Nausea and vomiting between 12-36 hours after operation in Droperidol Group was 12.0% and 17.3% in control group. Nausea and vomiting between 36-60 hours after operation in Droperidol Group was 13.3% and 16.0% in control group. Nausea and vomiting between 60-72 hours after operation in Droperidol Group was 12.7% and 16.7% in control group.

Conclusion: Droperidol into intravenous patient-controlled analgesia (IV-PCA) regimens has demonstrated a notable reduction in the risk of postoperative nausea and vomiting (PONV).

Key Words: Droperidol, Morphine, Antiemetic prophylaxis, Patient controlled analgesia

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INTRODUCTION

Postoperative nausea and vomiting (PONV) emerges as a prevalent source of patient distress post-surgery, with reported rates ranging from 20% to 40%[1]. The multifactorial nature of PONV is evident, encompassing patient-related factors such as sex, smoking status, and a history of PONV[2], as well as surgery-related factors like the type of surgical procedure, and factors related to anesthesia including the use of volatile and opioids anesthetics. Incidence of PONV can vary around 80% in high risk patients[3].

PONV is often reported by surgical patients as a more challenging issue than postoperative pain, despite its typically self-limited nature[4]; however, vomiting can persist rarely in but it can contribute in serious complications, including pneumothorax, pulmonary aspiration, wound dehiscence and elevated intracranial pressure[5]. Moreover, PONV may extend the duration ICU stay and lead to unexpected hospitalization after ambulatory surgery. The treatment of PONV imposes a significant burden on healthcare economy[6].

IV-PCA proves to be a highly effective approach for alleviating postoperative acute pain; however, the prevalent use of opioids as the primary analgesic in IV-PCA is associated with a common adverse event[7], PONV, with reported rates ranging from 18 to 23%[8]. Notably, approximately twelve percent of surgical patients opt to discontinue IV-PCA prematurely due to the challenging nature of intractable PONV[9]. To address this issue, droperidol, a D2 receptor antagonist, is employed for its central action on the chemoreceptor trigger zone, serving as an antiemetic agent in the context of IV-PCA[10].

The antiemetic effectiveness of droperidol was proven in opioid-based IV-PCA; however, prior investigations exhibited methodological shortcomings, such as small patient samples (n < 1,000), inadequate adjustment for confounding factors, exclusive focus on female patients, and a narrow scope of surgical procedures[11]. Moreover, the majority of earlier studies relied on data dating back more than two decades, failing to capture the advancements in different surgical interventions and anesthetic related care, like multimodal analgesia and

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minimally invasive surgery that have occurred in recent years[12].

METHODS

The study conducted at Lady Reading Hospital in Peshawar from December 2022 to November 2023. Study approved by Ethical committee and consent form patients was obtained. Patients who underwent any surgical intervention under neuraxial or general anesthesia and were given opioid-based IV-PCA for pain management in post-operative time were enrolled. Patients < 20 years, switching droperidol, using non-morphine analgesics for IV-PCA were excluded. Patients were divided into control groups and droperidol group.

IV-PCA is contraindicated for patients unable to maintain consciousness, those with cognitive impairment, and those requiring intensive care and mechanical ventilation after 24 hours. It is initiated in the intensive care unit after anesthesia using an ambulatory infusion pump programmed for morphine sulfate delivery.

The infusion settings for the IV-PCA system encompass a loading dose range of 0 to 5.0 mL, a demand dose varying from 0.5 to 2.0 mL, a basal infusion rate spanning 0 to 1.5 mL per hour, and a lockout time set between 5 and 10 minutes. Additionally, antiemetic prophylaxis is implemented by incorporating droperidol at a concentration ranging from 0.025 to 0.075 mg/mL into the IV-PCA infusate.

The researcher assessed patients' responses every 12 hours, increasing frequency for inadequate analgesia or adverse events. PONV severity was categorized using a 4-point scale: no PONV, mild PONV (nausea without antiemetic), moderate PONV (nausea with antiemetic request), and severe PONV (nausea with vomiting requiring antiemetic treatment).

The main focus of the study was to assess the incidence of PONV within 72 hours as the primary outcome. Certified nurse regularly evaluated the pain intensity, sedation level and occurrence of PONV at 12-hour intervals during the 72-hour postoperative period at the institution.

Anesthesia was induced with 1–2 mg/kg propofol and 1–2 µg/kg fentanyl, using 0.6–1.0 mg/kg rocuronium for intubation. Maintenance involved sevoflurane or desflurane. Reversal agents like 2 mg/kg sugammadex were used for neuromuscular blockade. Spinal anesthesia utilized 6–15 mg bupivacaine without opioids. Combined neuraxial and general anesthesia included epidural ropivacaine (5 mg/mL) with or without fentanyl (2.5–5 µg/mL). Midazolam (2–5 mg) provided anxiolysis. Perioperative fluid management involved crystalloid fluids following practice guidelines.

RESULTS

Overall, 300 patients were included in this study both sex. They were two equal groups in this study as Droperidol, 150 (50.0%) and Control, 150 (50.0%). The distribution of demographics and baseline characteristics in Droperidol and Control group were almost equal, and the differences were statistically significant, (p>0.050). (Table 1).

Table No.1: Demographic and baseline characteristics of both the study groups

Characteristic	Group		p-value
	Droperidol	Control	
Age (years)	53.80±5.94	54.88±5.59	0.904
BMI (kg/m^2)	26.67±2.19	27.57±2.18	0.696
Sex			
Male	82 (54.7)	80 (53.3)	0.817
Female	68 (45.3)	70 (46.7)	
ASA status			
I	32 (21.3)	30 (20.0)	0.515
II	111 (74.0)	120 (80.0)	
III	7 (4.7)	0 (0.0)	
Smoking status	36 (24.0)	25 (16.7)	0.115
Previous PONV	12 (8.0)	21 (14.0)	0.097
Hypertension	45 (30.0)	39 (26.0)	0.654
Diabetes mellitus	46 (30.7)	42 (28.0)	0.612
Major depression	3 (2.0)	8 (5.3)	0.125
Malignancy	24 (16.0)	25 (16.7)	0.876
Hemoglobin (g/dL)	12.28±2.51	12.13±2.25	0.600
eGFR (mL/min/1.73 m^2)	98.22±3.09	98.71±3.46	0.187
Alanine aminotransferase (U/L)	19.21±2.38	19.02±2.24	0.479
Aspartate aminotransferase (U/L)	22.25±1.48	22.34±1.32	0.525
Type of anesthesia			
Neuraxial anesthesia	60 (40.0)	56 (37.3)	0.771
General Anesthesia	89 (59.3)	92 (61.3)	
Combined	1 (0.7)	2 (1.3)	
Mean ± S.D, N (%)			

Nausea and vomiting between 0-12 hours after operation in Droperidol Group was 16 (10.7%) and 22 (14.7%) in control group, (p=0.741). Nausea and vomiting between 12-36 hours after operation in Droperidol Group was 18 (12.0%) and 26 (17.3%) in control group, (p=0.462). Nausea and vomiting between 36-60 hours after operation in Droperidol Group was 20 (13.3%) and 24 (16.0%) in control group, (p=0.862). Whereas, nausea and vomiting between 60-72 hours after operation in Droperidol Group was 19 (12.7%)

and 25 (16.7%) in control group, (p=0.868). Further, the severity of nausea and vomiting in both the groups were almost equal, (p>0.050). (Table 2).

Table No.2: Distribution of nausea and vomiting of both the study groups

	Group		p-value
	Droperidol	Control	
POH 0–12	16 (10.7)	22 (14.7)	0.741
Mild	12 (75.0)	17 (77.3)	0.532
Moderate	3 (18.8)	4 (18.2)	
Severe	1 (6.2)	1 (4.5)	
POH 12-36	18 (12.0)	26 (17.3)	0.462
Mild	11 (61.1)	18 (69.2)	0.741
Moderate	5 (27.8)	4 (15.4)	
Severe	2 (11.1)	4 (15.4)	
POH 36-60	20 (13.3)	24 (16.0)	0.862
Mild	18 (90.0)	18 (75.0)	0.684
Moderate	1 (5.0)	4 (16.7)	
Severe	1 (5.0)	2 (8.3)	
POH 60-72	19 (12.7)	25 (16.7)	0.868
Mild	15 (78.9)	21 (84.0)	0.796
Moderate	2 (10.5)	4 (16.0)	
Severe	2 (10.5)	0 (0.0)	
N (%)			

DISCUSSION

The study revealed a significant reduction in the incidence of postoperative nausea and vomiting (PONV) with the addition of droperidol to morphine-based intravenous patient-controlled analgesia (IV-PCA). Subgroup analyses demonstrated that the droperidol effect was particularly notable in patients under 65 years of age, females, non-smokers, and those without a history of PONV.

In a study conducted by an author, it was observed that patients administered with droperidol exhibited significantly lower levels of nausea at the 12-hour mark, and within the first 24 hours, only 31% of these patients required prochlorperazine, compared to 59.3% of those not receiving droperidol. Additionally, the droperidol group showed a significantly higher number of patients experiencing sedation at the 24-hour mark. Similar findings were reported in another study that addition of droperidol significantly reduced PONV in morphine-based IV-PCA, especially in patients under 65, females, non-smokers, and those without a history of PONV.

Another study reported that the antiemetic impact of droperidol was notably effective within the first 36 hours post-surgery but diminished thereafter. Uda et al[13] conducted a study in which they proposed that the incorporation of droperidol into intravenous patient-controlled analgesia (IV-PCA) regimens resulted in a notable reduction in the incidence of postoperative nausea and vomiting (PONV) within the initial 36 hours following surgery. However, their findings indicated that the antiemetic efficacy of droperidol appeared to diminish beyond this specified time frame, suggesting a time-dependent attenuation of its preventive effects against PONV in the postoperative period.

In their study, Kuo et al[14] found that the inclusion of droperidol resulted in a notable decrease in both the frequency and intensity of postoperative nausea and vomiting (PONV) specifically on postoperative days 2 and 3, with no significant impact observed on day 1. Different droperidol regimens in IV-PCA, concluding that a 0.10 mg/mL dose demonstrated optimal antiemetic efficacy with minimal sedation risk. Combining their results with ours, it suggests that adding droperidol at 0.025–0.10 mg/mL to opioid-based IV-PCA is appropriate, considering the benefit-risk balance.

Tan et al[15] found that the addition of droperidol to intravenous patient-controlled analgesia (IV-PCA) effectively decreased the risk of postoperative nausea and vomiting (PONV) without causing an increase in opioid consumption or altering the level of sedation; nevertheless, they emphasized the necessity for supplementary prophylactic interventions to address the occurrence of late-onset PONV. Gan et al[16] conducted studies indicating a significant reduction in postoperative nausea and vomiting (PONV) over a 24-hour period when administering a perioperative 1.25 mg bolus of droperidol in patients utilizing patient-controlled analgesia (PCA).

CONCLUSION

The incorporation of droperidol into intravenous patient-controlled analgesia (IV-PCA) regimens has demonstrated a notable reduction in the risk of postoperative nausea and vomiting (PONV), while concurrently exhibiting no discernible impact on opioid consumption or the level of sedation. Despite these encouraging outcomes, it is important to acknowledge that the efficacy of droperidol may be limited to the prevention of immediate postoperative PONV, thereby suggesting a potential need for supplementary prophylactic interventions to address the occurrence of late-onset PONV.

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Original Article

Micro and Macrocytic Anemia – A Population Based Cross-Sectional Study

Micro and Macrocytic Anemia

Ayeshah Zaib-Un-Nisa[1], Iyad Naeem Muhammad[2], Sheikh Abdul Khaliq[3] and Agha Umer Draz Khan[4]

ABSTRACT

Objective: The main objective of current study was to determine age-standardized point prevalence of iron, folic-acid and vitamin B-12 deficiency anemia.

Study Design: A population based cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Pharmacy Practice, Hamdard University and University of Karachi from January-2023 and ended on April-2023.

Methods: Data collected from blood banks. Collected blood samples were analyzed by Hematology Analyzer, Sysmex XP-100 and XN–1000. Analysis of data was done by Statistical Package for Social Sciences version-22. Main outcome measures: Levels of hemoglobin, hematocrit, microcytosis, macrocytosis

Results: Among 8,134 patients and donors data; male 37% (N=3043) and female 63% (N=5091). Age range for the majority of population was 18-28 years. In female; hemoglobin and hematocrit were lower-than normal in 39% (N=1984) and 53% (N=2685) respectively; microcytosis found in 31% (N=1554) and macrocytosis in 7% (N=325). In male; hemoglobin and hematocrit were lower-than normal in 33% (N=994) and 34% (N=1048) respectively; microcytosis reported in 25% (N=739) and macrocytosis in 8% (N=223). In both genders; significant (p=0.0001) differences are noted in the mean values of RBC indices versus the mean value of standard.

Conclusion: Evaluation of data reveals that hypochromic-microcytic anemia highly prevailed in the society. Majority of such population is in between 18-28 years old. Mean values of RBC indices in both gender were significantly lower than standard.

Key Words: Anemia; prevalence; iron; folic-acid; vitamin B-12; microcytosis.

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INTRODUCTION

Anemia should not be underestimated; it may significantly increases the risk of cardiovascular diseases (CVD) and renal disease (RD) in hypertensive individuals.[1] Cardio-renal Anemia Syndrome (CRAS) patients when treated with iron supplements and erythropoietin; heart failure and kidney injury were addressed.[2] Similarly among children; iron deficiency anemia may retard their psychomotor development.[3]

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Among women; despite high prevalence of iron deficiency anemia, it is under-diagnosed and under-treated; which results in adverse health consequences pertaining to emotional and physical health.[4] Poor clinical prognosis also reported in patients of Acute Coronary Syndrome (ACS) having hemoglobin less than normal.[5]

According to the World Health Organization (WHO); the adult individual will be considered anemic; if hemoglobin levels is less than 13 g/dL in men and 12 g/dL in women.[6] However; based on unique apparatus; techniques employed and the characteristics of patient population; each laboratory must establish their own reference values.[7] Anemia is an important global health issue. Roughly one-third of people on the planet (32.9%) are anemic.[8] According to Global age-standardized point prevalence rate of anemia is 23,176.20 per 100,000 and years of healthy life lost due to disability (YLD) rates is 672.4per 100,000.[9] South Asia has the greatest frequency of age-standardized YLD from anemia (1358.2 per 100,000 people).[9] Anemia can be caused by inadequate erythropoesis by dietary deficiencies, inflammation, or hereditary hemoglobinopathies (thalassemia, sickle-cell-trait); or excessive erythrocyte loss (due to blood-loss, hemolysis, or both).[10] Anemia is usually

categorized according to the erythrocyte morphology (e.g. microcytic, macrocytic, normocytic); and/or underlying etiology (e.g. iron deficiency, inflammation and hemolysis).[10] Nutritional deficiencies and chronic illnesses are often the most frequent etiologies of anemia in children and young adults.[11]

The main objective of current study was to determine age-standardized point prevalence of iron, folic-acid and vitamin B12 deficiency anemia. For this purpose after collection of blood samples; hematological indices of individuals were determined along with demography of individuals.

METHODS

Design of Study, Place and Duration: The study design was population based cross-sectional. Study began on 15th January-2023 and Ended on 29th April-2023 in the city of Karachi.

Ethical Statement/Approval: Ethical approval of study has been taken before initiating study from Institutional Bioethical Committee (Reference No. IBC KU-300/2023), University of Karachi. Prior to initiating the study; all researchers ensured the maintenance of patient data confidentiality in compliance with the Declaration of Helsinki[12] and also taken written informed consent before data collection.

Data Collection Method: Data has been collected from the well know blood banks and blood transfusion centers of the Karachi city. Precision analysis technique was used for the determination of sample size of study.[13] The study includes around 8,134 patients and donors of blood from different centers; male 3043 (37%) and female 5091 (63%). Age range of population was neonatal (less than one month) to 95 years in both genders.

Procedure: After taken written informed consent; blood samples were collected through veni-puncture by professional staff into a 3mL vacutainers-tube with EDTA. Hemoglobin (Hb), hematocrit (Hct), mean-corpuscular-volume (MCV), mean-corpuscular-hemoglobin (MCH), mean-corpuscular-hemoglobin-concentration (MCHC) and red-blood-cell count (RBC) were determined by using Hematology Analyzer, Sysmex XP - 100 and XN – 1000.

Inclusion criteria: No co-morbidity in the selected subjects.

Exclusion criteria: Subjects having malignancy, infection, inflammation, any chronic disease that may affect the analyzing parameters, blood transfusion in last three months or received iron therapy.

Assessment of Data: The data for study was analyzed by SPSS (Statistical Package for Social Sciences) version-22. Descriptive (Frequency distribution, histograms) and inferential statistics (Student t-test) applied. Blood indices were compared by student t-test versus standard after keeping significance value of probability (p) <0.05.

RESULTS

Age range for the majority of population was 18-28 years. Among females, anemia is reported in 1984 (39%); 2685 (53%) has Hematocrit (Hct) value lower than normal; microcytosis reported in 1554 (31%) and macrocytosis in 325 (7%). (Table No. 1)

In male gender; anemia is reported in 994 (33%); 1048 (34%) has hematocrit value lower than normal; microcytosis reported in 739 (25%); macrocytosis in 223 (8%). (Table No. 2)

Descriptive statistical findings of total population for age and RBC (Red Blood Cells) indices mentioned in Table No. 3; however, in both genders significant differences are noted in the mean values of RBC indices versus the mean value of standard.[15] (Table 4)

Table No. 1: CBC* parmeters reporting Anemia in Female Gender

CBC* Parameters	Normal Range[15]	N (%)	Mean± SD
Hemoglobin	<11g/dL	1984 (39%)	9.27±1.48
	11-14.5g/dL	2887 (57%)	12.35± 0.89
	>14.5g/dL	220 (4%)	19.84± 4.77
Hematocrit	<34.5%	2685 (53%)	29.2±3.30
	34.5-45.4%	2251 (44%)	38.36± 2.55
	>45.4%	155 (3%)	63.33± 13.72
MCV (Mean Corpuscular Volume)	<78.1 fL	1554 (31%)	70.06± 6.48
	78.1-95.3 fL	3073 (62%)	85.19± 4.17
	>95.3 fL	325 (7%)	124.47 ±34.15
MCHC (Mean Corpuscular Hemoglobin Concentration)	<30.3 g/dL	815 (16%)	28.48± 1.88
	30.3-34.4 g/dL	3858 (78%)	32.27± 1.02
	>34.4 g/dL	279 (6%)	47.73± 15.28
MCH Mean Corpuscular Hemoglobin)	<25.3 pg	1761 (36%)	21.58± 2.97
	25.3-31.7 pg	2920 (59%)	27.95± 1.55
	>31.7 pg	271 (5%)	42.42± 11.02
RBC (Red Blood Cells) Count	<3.61 $x10^{12}$/Lit.	482 (10%)	3.101± 0.51
	3.61-5.2 $x10^{12}$/Lit.	3949 (80%)	4.41±0.39
	>5.2 $x10^{12}$/Lit.	521 (11%)	6.306± 1.56

*Complete blood Count

Table No. 2: CBC* parmeters reporting Anemia in Male Gender

CBC* Parameters	Normal Range[15]	N (%)	Mean± SD
Hemoglobin	<12.3 g/dL	994 (33%)	9.98±1.93
	12.3-16.6 g/dL	1855 (61%)	14.38±1.14
	>16.6 g/dL	194 (6%)	20.203±4.97
Hematocrit	<38.4%	1048 (34%)	32±5.45
	38.4-50.7%	1845 (61%)	43.88±3.05
	>50.7%	150 (5%)	63.88±15.96
MCV (Mean Corpuscular Volume)	<78.7 fL	739 (25%)	70.15±26.84
	78.7-96.3 fL	2010 (68%)	86.4±26.13
	>96.3 fL	223 (8%)	118.32±31.83
MCHC (Mean Corpuscular Hemoglobin Concentration)	<30 g/dL	217 (7%)	27.84±2.11
	30-35.5 g/dL	2661 (90%)	32.86±1.20
	>35.5 g/dL	94 (3%)	53.47±16.16
MCH Mean Corpuscular Hemoglobin)	<25.1 pg	647 (22%)	21.19±3.21
	25.1-31.6 pg	2027 (68%)	28.32±1.61
	>31.6 pg	298 (10%)	37.7±9.57
RBC (Red Blood Cells) Count	<4.25 x10^{12}/Lit.	509 (17%)	3.50±0.69
	4.25-6.02 x10^{12}/Lit.	2261 (76%)	5.04±0.43
	>6.02 x10^{12}/Lit.	202 (7%)	7.27±1.68

*Complete blood Count

Table No. 3: Descriptive statistics of total population for age and RBC (Red Blood Cells) indices

Parameters Mean±SD	Male	Female
Age (years)	31.57±20.58	31.98±16.92
Hemoglobin (g/dL)	13.34±3.28	11.51±3.76
Hematocrit (%)	40.85±9.25	36.15±8.01
MCH (pg)	27.71±5.71	26.48±5.91
MCHC (g/dL)	33.15±4.99	32.52±5.50
MCV (fL)	84.75±15.49	83.03±16.39
RBC (10^{12}/Lit) Count	4.93±1.07	4.49±0.97

Table No. 4: Statistical comparison of mean values of RBC indices versus the mean value of standard in both genders

CBC* Parameters	Gender	Mean of Standard[15]	Mean of Sample	p-value**
Hemoglobin (g/dL)	Male	14.45	13.34	p = 0.001
	Female	12.75	11.51	p = 0.0034
Hematocrit (%)	Male	44.55	40.85	p = 0.01
	Female	39.95	36.15	p = 0.015
MCH (pg)	Male	28.35	27.71	p = 0.01
	Female	28.5	26.48	p = 0.022
MCHC (g/dL)	Male	32.75	33.15	p = 0.0001
	Female	32.35	32.52	p = 0.028
MCV (fL)	Male	87.5	84.75	p = 0.001
	Female	86.7	83.03	p = 0.0122
RBC (10^{12}/Lit)	Male	5.13	4.93	p = 0.039
	Female	4.40	4.49	p = 0.01

*Complete blood Count; **p-value is significant at <0.05

DISCUSSION

Anemia remains a serious worldwide health issue especially in developing countries. The current study focused on the prevalence of anemia, its causative factors and available therapeutic options. According to the criteria set-forth by the largest private sector of JCI (Joint Commission International) accredited tertiary-care hospital of the city; anemia was reported in 39% (N=1984) female and 33% (N=994) male population. This indicates that high prevalence of anemia among females of reproductive age. Studies condcuted in different countries revealed that anemia is linked to higher rates of morbidity and mortality,[14] poor birth outcomes,[15] and delays in children's cognitive and behavioral development.[16]

Therefore, the World Health Organization recommends a daily 30–60 mg elemental iron supplementation for the women of reproductive age; while for infants and children (6 months to 12 years of age), WHO recommends consumption of fortified foods with folic acid, zinc, vitamin A as multiple micronutrients. Despite overall beneficial effects, there is limited adoption by high risk population.[17] Reasons could be poor socio-economic standing and poverty. Therefore, the 1,000 Days initiative has drawn the attention of numerous countries and efforts are required to increase intake of iron-rich foods.[18]

Microcytic, hypochromic anemia is a condition, where RBC size is less than normal and also decreased in red color.[19] In the current study; based upon MCV; microcytic anemia prevailed in both the genders; male 25% (N=739) and female 31% (N=1554), while hypochromic-microcytic anemia was found in 7% (N=217) male and 16% (N=815) female. In case of microcytosis; Iron deficiency anaemia (IDA), thalassemia and anaemia of chronic diseases (ACD) are the three basic diagnostic options.[24] The most common type of microcytic anaemia is iron deficiency anaemia.[20] Therefore, assessment is necessary by the findings of ferritin levels, serum iron, total iron binding capacity and haemoglobin. Fortunately in the findings of current study; normocytic condition was found in 62% (N=3073) female and 68% (N=2010) male, while normochromic condition was found in 78% (N=3858) female and 90% (N=2661) male. Normochromic-normocytic anemia is basically caused by nutritional deficiencies, renal insufficiency and hemolytic anaemia.[21] Current study found clinically small number of cases of normochromic-normocytic anemia, that is 8% (N=407) female and 8% (N=243) male.

Megaloblastic or Macrocytic anemia is usually caused by deficiencies of foilc-acid and/or vitamin B-12 (Cobalamin); in this situation, usually MCV is >100fL.[22] Deficiencies of folic-acid and/or vitamin B-12 may results in ineffective erythropoesis.[22] Megaloblastic anemia in the current study was found in 8% (N=223) male and 7% (N=325) female population. However, nonmegaloblatis macrocytic anemia also occurs due to other causes, such as abuse of ethanol, aplastic anemia, myelo-dysplastic syndrome, liver disease, hypothyroidism and drugs,[22] for differential diagnosis; folic acid and vitamin B-12 serum levels should be determined. Sometimes vitamin B-12 deficiency occurs due to positive antibodies to intrinsic factor; which confirms the diagnosis of pernicious anemia.[22]

The alarming situation is that; when mean values of RBC indices (Hb, Hct, MCV, MCH, MCHC, RBC count) in both gender were statistically compared with standard; indices were significantly lower than standard (Table No. 4); which concluded that most of the population in Karachi is either anemic or there is a need to develop new standards for the normal ranges of these indices.

Based upon findings of current study; it is highly recommended to follow international guidelines to resolve the issue. According to a recent comprehensive analysis, supplementing with just 10 mg/day of elemental iron can improve the levels of hemoglobin.[23] In another reference; 60 randomized controlled studies involving 27402 women from 30 different nations across all continents; overall risk of low-birth weight newborns among women taking daily iron supplements was reduced; mean birth weight of children whose mothers took iron during pregnancy was 30.81g higher. Daily iron supplementation of 8.88 gm decreased the risk of maternal anemia at term by 70% and the risk of iron deficiency at term by 57%. Supplementation of zinc with iron salts also tend to reduce anemia.[24] The role of vitamin B-12 and/or folic-acid for the treatment of megaloblastic anemia cannot be overlooked; it is found in literatures three injections of 1,000 mcg of vitamin B-12 and 5 mg of folic-acid daily rose Hb from 11.24 to 13.12 g/dL (p=0.001), MCV reduced from 95.50 to 89.64.[25] If anemia is induced due to chemotherapy; ethropoetin stimulating hormones (epoetin-alpha, darbepoetin-alpha) are highly recommended.[26]

CONCLUSION

Evaluation of data of more than 8,000 male and female population reveals that hypochromic-microcytic anemia highly prevalied in the society. Majority of such population is in between 18-28 years old. Mean values of RBC indices in both gender were significantly lower than standard.

Limitations and Recommendations: Since mean values of RBC indices in both gender were significantly lower than standard; it is recommended to address anemia or there is a need to develop new standards for the normal ranges of these indices in this population. To enhance anaemia control and prognosis, currently reported factors should be further investigated to develop preventive as well as treatment strategies acoording to patient's needs.

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A Narrative Review

Interdisciplinary Collaboration in Pediatric Dentistry: Challenges and Opportunities – A Narrative Review

Mohammed Ali Habibullah

ABSTRACT

Objective: In navigating the landscape of pediatric dentistry, this review underscores the pivotal significance of interdisciplinary collaboration in ensuring comprehensive well-being for children. Despite challenges like communication barriers, the exploration of opportunities ranging from joint training programs to technological integration reveals promising avenues for improvement. Emphasising the imperative of collaboration for optimal pediatric care, the review advocates for sustained research, policy development, and initiatives to support a holistic approach, ultimately aiming to enhance overall health outcomes in this critical healthcare domain.

Key Words: Challenges, Dentistry, Interdisciplinary, Opportunities, Pediatrics

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INTRODUCTION

Pediatric dentistry plays a crucial role in promoting and maintaining the oral health of children from infancy through adolescence. Through the establishment of good oral hygiene habits and preventing dental issues, it contributes to overall well-being and quality of life. Children's oral health is linked to various aspects of their development, including speech, nutrition and social interactions.[1] Untreated dental problems in childhood can have long-term consequences, affecting not only the oral cavity but also impacting systemic health. Recognising the importance of early intervention and specialised care for children is fundamental to ensuring their overall health and a positive dental experience.[2]

Contemporary healthcare focuses on interdisciplinary collaboration as a means for comprehensive and patient-centric care. The understanding that health and well-being are multifaceted has established that no single discipline manages all aspects of a patient's needs.[3] Interdisciplinary collaboration is particularly relevant in pediatric care, where the health of a child is influenced by a complex interplay between biological, social and psychological factors. This leads to a more holistic approach that addresses the broader spectrum of child's health.[4]

The review aims to shed light on the challenges encountered in the collaboration between pediatric dentistry and other healthcare disciplines. Understanding these challenges is essential for devising strategies to overcome them and for promoting effective teamwork. The review aims to provide insights that can guide policymakers, educators, and healthcare professionals in fostering a collaborative environment optimising patient outcomes. The ultimate goal is promoting a model of care that considers the unique needs of pediatric patient.

METHODS

A comprehensive search was executed in October 2023 across multiple electronic databases, including PubMed, SCOPUS, EMBASE, COCHRANE Library, and Science Direct. The search strategy employed MeSH terms and keywords as “Interdisciplinary,” “Collaboration,” “Pediatric Dentistry”, "Challenges" and "Opportunities”. Beyond electronic searches, additional relevant articles were identified through manual searches of cross-references and textbooks. The inclusion criteria were set to encompass articles published in English from November 2000 to October 2023 that aligned with the study’s objectives. The process of article selection involved a thorough assessment of the inclusion and exclusion criteria, coupled with a quality evaluation of the studies. Initially, 345 articles were identified. After a preliminary review based on titles and abstracts, 67 articles were selected. Subsequent to a full-text evaluation, 21 articles were ultimately selected for inclusion in the review, fulfilling the study's specified criteria (Figure 1).

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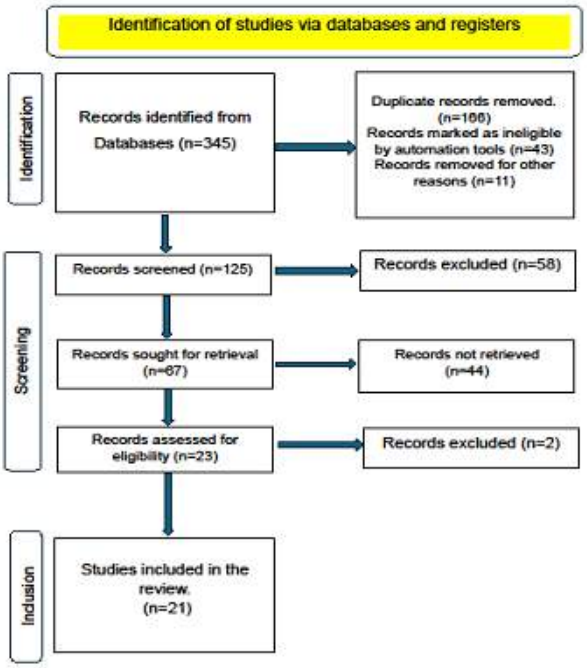

Figure No.1: Flowchart showing the step-by-step identification of the studies via databases

A brief overview of the selected articles included in this review is provided in Table 1.

Importance of Interdisciplinary Collaboration in Pediatric Dentistry

Holistic Patient Care

Addressing Oral Health in the Context of Overall Health: Pediatric patients often present with conditions that require collaboration between dental and medical professionals to ensure comprehensive understanding of their health status. Congenital disorders, developmental delays, or chronic illnesses may have oral manifestations that necessitate coordinated care. By addressing oral health within the broader context of a child's well-being, interdisciplinary collaboration contributes to early detection and intervention, promoting optimal health outcomes.[5]

Impact of Oral Health on Systemic Health in Pediatric Patients: Research increasingly demonstrates the intricate relationship between oral health and systemic health, especially in pediatric populations. Conditions such as periodontal disease have been linked to systemic issues like diabetes, cardiovascular and respiratory problems. Collaborative efforts ensure the treatment of oral conditions considers their broader impact on child's health, promoting not only a healthy smile but also overall well-being.[6]

Comprehensive Treatment Planning

Integration of Dental and Medical Care*:* Interdisciplinary collaboration allows for the integration of dentistry with medical care in the treatment planning process. Pediatric patients often require care beyond traditional dental procedures. Children with complex medical histories or special healthcare needs benefit from collaborative efforts to create cohesive and patient-centered treatment plans.[7] In pediatric dentistry this integration leads to early intervention and coordinated care significantly impacting a child's health trajectory.

Improved Outcomes for Pediatric Patients: Synergies between dental and medical expertise contribute to improved outcomes for pediatric patients. Collaborative treatment planning lead to better preventive measures, timely interventions, and overall enhanced patient care experiences. Leveraging the expertise of multiple healthcare professionals, pediatric dentistry can achieve more holistic and patient-focused outcomes as illustrated below (Figure 2), ultimately benefiting the well-being of the child.[8]

Table No.1: Overview of selected articles

Authors	Year/ Country	Area of interest	Conclusion
1.Ferraz NK et al.[2]	2014/Brazil	Clinical outcomes of untreated caries in preschool children	Early intervention/specialized care fundamental for positive dental experience.
2.Taha A et al[3]	2022/India	Interdisciplinary collaboration of Pediatricians & pedodontists for children's oral health	Emphasized position of pediatricians to deliver preventive oral care.
3.Cozza P et al[4]	2007/Italy	Mouth breathing, atypical swallow and otitis media.	Demonstrated reduction in nasal resistance and improved cognitive hearing after treatment with Rapid Maxillary Expansion.
4.Jones ML et al[5]	2012/USA	Interdisciplinary approach on pediatric feeding team for	Elaborated dental hygienist's role in interdisciplinary team.

		CWSHN	
5.Casamassimo PS et al[6]	2000/USA	The relation between systemic and oral health.	Need for physicians to be competent to identify oral abnormalities of concern affecting health, growth and development of children.
6.Powell V et al[7]	2012	Integration of Medical and Dental Care and Patient Data	Health information technology (HIT) aid isolated components of healthcare delivery to improve patient safety/quality of care.
7. Crall JJ. Et al[8]	2005/USA	Development and integration of oral health services for preschool-age children	Early establishment of dental homes, risk assessment, integration of dental/medical care components.
8.Gauger TL et al[9]	2018/USA	Integrative models between pediatric oral health and primary care providers	Collaboration offers varying services and levels of integration.
9.Winter J et al[10]	2019/Germany	Interdisciplinary prevention model for Early Childhood Caries (ECC)	Interdisciplinary team involving gynecologists, midwives, pediatricians, dentists, social services and health office for ECC prevention.
10.Cote CJ et al[11]	2006/USA	Monitoring and management of pediatric patients during/after sedation	Standardizing treatment protocols essential from both dental and medical perspectives
11.Fisher-Owens et al[12]	2007/USA	Conceptual model derived from population health and social epidemiology designed to analyze children's health.	Multilevel model correlating influence of individual, family and community on oral health outcomes.
12.Townsend et al[13]	2017/USA	Interdisciplinary approach to prepare general dentists to manage dental trauma	Combined case discussions and hospital trauma call shadowing for dental trauma management training.
13.Edelstein B et al[15]	2006 /USA	Policy implications of children presenting with dental emergencies to US Pediatric Dentistry programs	Demonstrated need for public policies to ensure timely, comprehensive dental care for vulnerable children.
14.Shah S. et al[16]	2018/Pakistan	Pediatric dentistry- Novel evolvements	Dentist's collaboration with other specialists to deliver oral care customized to child's specific needs.
15.Van Malsen J et al[17]	2017/Canada	Early establishment of Dental Homes (DH)	Substantiated the DH mode in improving children's oral health
16.Olson CA et al[18]	2018/USA	Growth/Evolution of pediatric telehealth	Proposed databases to aid development/facilitation of multicenter studies to establish value of telehealth in pediatric care.
17.Vertel N et al[19]	2017/Canada	Dental Services access for Children with Special Health Care Needs (CSHCN)	Importance of early referral to tertiary-care centres for CSHCN when beyond the skill/comfort level of dentist.
18.Olayiwola JN et al[20]	2014/USA	Care integration in Community Health Centers	Proposed practical guide for care integration, providing framework for strategy planning.

19.Hlongwa P et al[21]	2021/South Africa	Inter-professional collaboration (IPC) for cleft lip/palate management.	Strategies for IPC among Cleft Lip/Palate teams for patient-centered approach.
20.Mikołajewska et al[22]	2013/Poland	Interdisciplinary Therapy in Cornelia-de-Lange Syndrome	Interdisciplinary approach to manage Cornelia-de-Lange Syndrome. Need for more clinical research/guidelines.
21.Clark M[23]	2017/USA	Interdisciplinary oral health education curriculum	Discussed Smiles for Life curriculum designed to educate healthcare providers about oral disease. Support integration of oral health and primary care.

Figure No.2: Interdisciplinary Pediatric Dentistry Framework

Figure No.3: Seven Steps of Interdisciplinary Treatment Approach

An interdisciplinary treatment approach requires discrete yet definite approach to achieve successful outcomes (Figure 3)

Challenges in Interdisciplinary Collaboration
Communication Barriers

Between Dental and Medical Professionals: One significant challenge in interdisciplinary collaboration is communication barriers between dental and medical professionals. Differences in terminology, communication styles, and professional cultures can impede effective information exchange. This lack of seamless communication may lead to misunderstandings, treatment delays, or overlooking crucial aspects of a patient's health. Bridging this communication gap is essential for fostering a collaborative environment where information flows seamlessly, ensuring that all aspects of child's health, oral and systemic, are considered in the decision-making process.[9]

Amongst Interdisciplinary Team Members: Interdisciplinary care often involves professionals from various fields working together. However, effective collaboration requires effective communication amongst them. Coordinating efforts, sharing insights, and maintaining open lines of communication can be challenging, especially when team members come from diverse backgrounds with differing perspectives on patient care.[10] Establishing clear communication channels and promoting a culture of collaborative openness are key strategies to address this challenge.

Lack of Standardized Protocols

Variation in Treatment Approaches: In pediatric dentistry, the lack of standardised protocols and variation in treatment approaches among professionals can hinder collaborative efforts. Differing training backgrounds /philosophies may lead to divergent approaches to similar cases, potentially causing confusion and inconsistency in patient care. Standardising treatment protocols is essential for creating a unified approach that considers the best practices from both dental and medical perspectives.[11] This enhances efficiency, reduce the risk of errors, and

contribute to a cohesive and streamlined patient care process.

Need for Cohesive Guidelines in Pediatric Dental Care

The absence of cohesive guidelines specifically tailored to interdisciplinary pediatric dental care contributes to the challenge of ensuring consistent and evidence-based practices. Developing and implementing comprehensive guidelines and establishing standardised protocols promote a shared understanding of best practices and facilitate smoother collaboration.[12]

Professional Silos

Limited Understanding of Each Discipline's Role: Professional silos, where individuals have limited understanding of roles and expertise of professionals from other disciplines, poses a significant challenge. This lack of awareness results in missed opportunities for collaboration and a fragmented approach to patient care.[13] Educational initiatives and awareness campaigns that promote a better understanding of each discipline's contributions and capabilities help in fostering a collaborative mindset.

Overcoming Turf Issues for Effective Collaboration: Turf issues, such as professional territorialism or a reluctance to cede responsibilities, can hinder effective collaboration. Overcoming these challenges requires a cultural shift within healthcare settings, emphasising the shared goal of improving patient outcomes over individual professional interests.[14] A collaborative culture involves fostering mutual respect, recognising the value of each discipline's expertise, and encouraging a team-based approach.

Opportunities for Interdisciplinary Collaboration

Education and Training

Joint Training Programs for Dental and Medical Professionals: One significant opportunity for enhancing interdisciplinary collaboration lies in the development of joint training session. These programs facilitate a shared learning environment allowing professionals insights into each other's expertise, practices, and perspectives.

They can include interdisciplinary coursework, collaborative case studies, and shared clinical experiences, promoting a cohesive approach to patient care from both dental and medical perspective .[15]

Promoting Cross-disciplinary Understanding: Beyond formal education, ongoing initiatives can promote cross-disciplinary understanding. Workshops, seminars, and interdisciplinary conferences provide platforms for dental and medical professionals to engage in dialogue, share experiences, and develop a mutual appreciation for each other's roles.[16]

Integrated Patient Care Models

Establishing Pediatric Dental Homes: Pediatric dental homes provide a central hub for a child's oral health, where dental professionals coordinate and integrate care with other healthcare providers. They provide a focal point for preventive care, early intervention, and ongoing management, with dentists collaborating closely with other specialists to address the unique healthcare requirements of pediatric patients.[17]

Coordinated Care Delivery through Collaborative Clinics: Collaborative clinics bring together dental and medical professionals in a shared physical space provide a practical opportunity for coordinated care delivery. By offering integrated services, joint consultations, shared treatment planning, and seamless referrals between dental/medical specialists, healthcare professionals enhance communication, streamline workflows improving the overall patient experience.[11]

Technology Integration

Electronic Health Records for Seamless Information Sharing: Leveraging technology, particularly electronic health records (EHRs), offers a significant opportunity to overcome communication barriers and enhance information sharing. Integrated EHR systems allow dental and medical professionals to access and update patient information in real-time, ensuring all healthcare providers have a comprehensive view of a child's health history.[18]

Telehealth and Virtual Platforms for Interdisciplinary Consultations: The integration of telehealth and virtual platforms presents an innovative opportunity for interdisciplinary collaboration. These platforms enable remote consultations, collaborative case discussions, and real-time communication among healthcare professionals, regardless of their physical location.[18]. By embracing technology, professionals can overcome geographical barriers, improve accessibility to expertise, and foster interdisciplinary collaboration for routine/specialised care.

CASE STUDIES

Successful Examples of Interdisciplinary Collaboration in Pediatric Dentistry

Specific Programs or Initiatives

a. Children's Hospital Dental Center:

These are renowned for their commitment to providing an interdisciplinary approach to patient care, particularly for children with complex medical conditions or special needs. These centres understand the importance of collaboration between pediatric dentists, paediatricians, as well as other healthcare professionals, to ensure comprehensive and holistic care. Pediatric dentists work closely with paediatricians, nurses, speech therapists, nutritionists, and other specialists to develop a personalised care plan that considers the child's unique medical history and requirements. This collaborative approach ensures any potential interactions between dental treatments and the child's medical conditions or medications are carefully

considered. Additionally, the centres with specialised equipment and facilities, accommodate children with physical disabilities or sensory sensitivities, creating a welcoming and safe environment. They provide the highest quality of care, emphasising both oral health and overall well-being.[19]

b. Community Health Centers (CHC)

CHCs play a vital role in providing an interdisciplinary approach to patient care, serving individuals and families in underserved communities. These centres prioritise comprehensive healthcare by integrating medical and dental services under one roof. Patients, particularly children, benefit from this approach as they receive coordinated care to address not only immediate health concerns but also preventive measures and health education.[20]. By offering a one-stop solution for medical/dental care, CHCs improve access to healthcare services, promote continuity of care, and enhance overall health outcomes for their patients, especially those facing socioeconomic disparities.

c. Collaborative Care for Cleft Lip/Palate Patients

In pediatric dentistry, the interdisciplinary approach to managing cleft lip/palate patients exemplifies collaborative care. Teams comprising pediatric dentists, surgeons, speech therapists, and orthodontists work together to ensure improved surgical, dental, and speech outcomes. This collaboration underscores the necessity of early intervention and continuous, integrated care strategies, tailored to each patient's unique needs.[21]

d. Interdisciplinary Approach for Children with Syndromes

Similarly, in treating children with syndromes such as Down's or Autism Spectrum Disorders, an interdisciplinary team approach is vital. This method not only addresses dental needs but also significantly impacts the overall development and quality of life of these children. This patient-centered, collaborative approach demonstrates the profound benefits of a holistic healthcare model.[22]

Enhancing Pediatric Dental Care through Outcome Evaluation and Continuous Improvement

Evaluating Interdisciplinary Collaboration Outcomes: Outcome evaluation is crucial in assessing the effectiveness of multidisciplinary collaboration in pediatric dental care. Key metrics include patient health outcomes, patient/family satisfaction, and efficiency of care delivery. These metrics, along with feedback from stakeholders, are essential in measuring the success and impact of collaborative efforts.[23]

Continuous Improvement in Multidisciplinary Settings: Continuous improvement is essential for the advancement of pediatric dental care. Quality improvement initiatives stemming from outcome assessments such as new training programs, process optimisations, and technology integration enable dental care to evolve continually. This approach ensures that pediatric dentistry remains up-to-date with latest best practices and research, leading to enhanced care quality and better patient outcomes.[8]

Future Directions: Research is essential to comprehend the long-term impact of interdisciplinary pediatric dental care on both oral and systemic health outcomes. Knowledge gaps persist regarding the effectiveness of collaborative interventions and their influence on overall patient well-being. Further investigation is needed to identify best practices for communication within interdisciplinary teams and explore innovative technologies facilitating seamless communication and information sharing between dental and medical professionals. Closing these gaps is crucial for advancing evidence-based practices and optimising collaborative care in pediatric dentistry.

POLICY IMPLICATIONS

Advocacy for Integrated Healthcare Policies: Promoting interdisciplinary collaboration in pediatric dentistry necessitates strategic policy advocacy and support initiatives. Firstly, policies should endorse and incentivise joint training programs, fostering a collaborative mindset from the early stages of education. This approach aims for a shared understanding and appreciation of each discipline's role. Additionally, supporting policies that recognise and integrate oral health into broader healthcare frameworks ensures that oral health is seamlessly woven into the overall fabric of healthcare delivery. Moreover, financial incentives for collaborative clinics are crucial, encouraging the establishment and maintenance of integrated dental and medical services. Furthermore, advocating for research initiatives examining the economic benefits of interdisciplinary collaboration in pediatric dentistry reinforces the importance of collaborative models in not only improving patient outcomes but also overall efficiency and cost-effectiveness of healthcare systems.

CONCLUSION

The review has identified challenges like communication barriers and lack of standardised protocols in interdisciplinary collaboration in pediatric dentistry, while emphasising opportunities in education, integrated care models, and technology. Stressing the vital role of collaboration in providing optimal care for pediatric patients, it calls for continued research, policy development, and initiatives to support interdisciplinary approaches. The potential benefits, including enhanced overall health outcomes in children, underscore the

urgency of prioritising and fostering interdisciplinary collaboration in pediatric dentistry.

Author's Contribution:

Concept & Design of Study:	Mohammed Ali Habibullah
Drafting:	Mohammed Ali Habibullah
Data Analysis:	Mohammed Ali Habibullah
Revisiting Critically:	Mohammed Ali Habibullah
Final Approval of version:	Mohammed Ali Habibullah

Conflict of Interest: The study has no conflict of interest to declare by any author.

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Case Report

C1Q Nephropathy

C1Q Nephropathy, An Unusual Occurrence in a Middle-Aged South Asian Woman

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ABSTRACT

We present an interesting but rare occurrence of C1q nephropathy in a middle-aged South Asian woman with a history of edema and fatigue who responded well to steroids. C1q nephropathy is a glomerulopathy characterized by large amounts of C1q deposits in mesangium and is a diagnosis of exclusion after ruling out SLE, affecting a predominately pediatric population. Our case highlights the importance of lateral thinking while dealing with management and treatment outcomes in C1q nephropathy.

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BACKGROUND

C1q nephropathy was described by Jennette and Hipp in 1985. It is characterized by large amounts of mesangial Ig and complement deposition with the predominant appearance of C1q after the exclusion of systemic lupus erythematosus and mesangial-proliferative disease.[1-2] The pathogenesis is unclear. Incidence of C1q nephropathy varies in reports ranging from 0.2 to 16% with no gender differences and appears to be higher in children. Clinical presentation ranges from asymptomatic hematuria or proteinuria to frank nephrotic or nephritic syndrome in children and adults.[3] The disease pattern on biopsy may vary, but the core component of diagnosis remains C1q deposition with no features of SLE. Biopsies may range from no lesion in the kidney besides C1q deposition in the mesangium; those with features of FSGS may have associated mesangial proliferation, and mesangial hypercellularity may be seen with those presenting with proliferative glomerulonephritis.[4]

For the most part, though, it is considered steroid-resistant. Those with minimal change disease-like patterns may have greater remission rates, whereas those with FSGS patterns may be more prone to the development of end-stage renal disease.

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A large meta-analysis found that partial remission rates were 28% and complete was 49%. Some data shows complete and partial remission with steroids. However, cyclosporine and Cytoxan have also been used with steroids for remission. Relapses may also be common[5].

CASE PRESENTATION AND DISCUSSION

A 30-year-old female from Lahore came to the Nephrology clinic in May 2020, complaining of generalized body swelling for two weeks associated with fatigue, exertional dyspnea, and epigastric pain. Swelling is more pronounced in her lower limbs; her epigastric pain was mild, radiating, and not associated with nausea and vomiting. She was dyspneic about taking 10 to 20 steps but could carry out her daily activities without discomfort. All the symptoms were concordant in time. Her past medical and surgical history was unremarkable. Her family history and personal history are also unremarkable.

Her bp was 140/90 at the presentation, and the rest of the vitals were normal. A general physical examination showed periorbital puffiness and 2+ bilateral pitting edema up to the knees. On Respiratory examination, there was bilateral decreased air entry with normal vesicular sounds and a respiratory rate of 22 after minimal exertion.

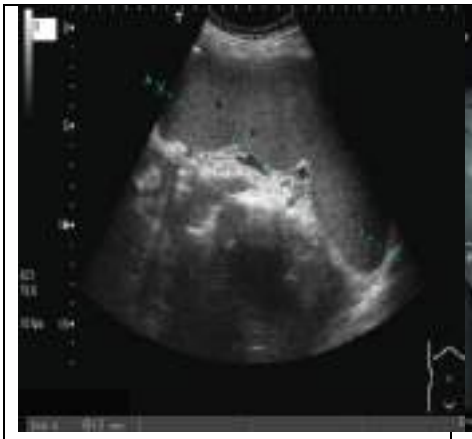
The rest of her systemic examination was normal. Ultrasound of the abdomen showed splenomegaly with a spleen size of 12.0cm. The splenic index was 60.

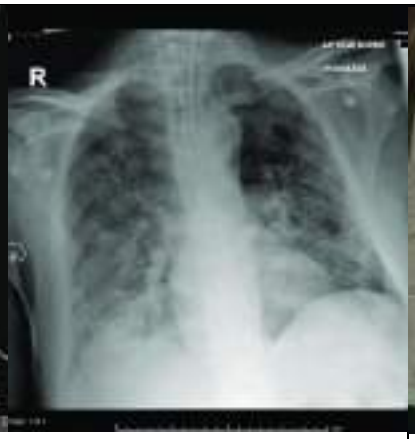
ECG at presentation was normal with no acute changes, and chest x-ray showed bilateral basal infiltrates, most likely pulmonary edema. (Figure 1)

At this stage, our differential diagnoses included the following:

- Membranous glomerulopathy
- Lupus nephritis
- Ascending urinary tract infection

Symptomatic treatment was begun at this stage with further directed investigations.





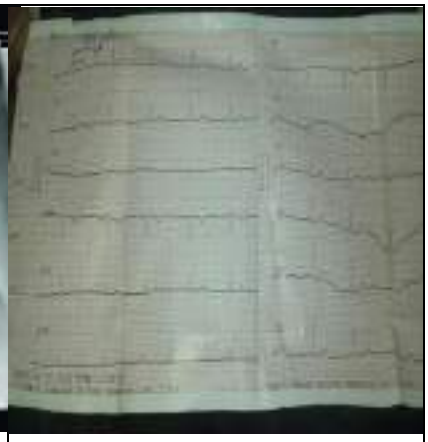


Figure 1: Ultrasound abdomen	**chest x-ray**	**ECG**

The following results of investigations done in the first week of June 2020 were found:

Investigation	Result	Normal Range
Complete Urine Examination a) Color b) Specific gravity c) pH d) glucose e) Ketones f) Proteins g) Hemoglobin h) Bilirubin i) Nitrite j) Leucocyte esterase k) Pus cells l) RBCs m) Epithelial cells n) Casts o) Organisms p) Yeast	 Yellow 1.030 5.0 nil nil ++ +++ nil negative nil 8-10 25-30 12-15 nil nil nil	
Spot urinary to creatinine ratio Spot Urinary Protein Spot urinary creatinine	3.18 mg/mg 99.7 mg/dL 31.4 mg/dL	<0.20 mg/mg <14.0 mg/dL
Serum urea	22mg/dL	10-50mg/dL
Serum Creatinine	1.2mg/dL	0.6-1.4mg/dL
Serum Sodium	129 mmol/dL	135-150mmol/dL
Serum Potassium	3.2 mmol/dL	3.5-4.5mmol/dL
Serum uric acid	4.4 mg/dL	2.6-6.0mg/dL
Lipid profile Cholesterol Triglycerides	 157 mg/dL 93mg/dL	 <200mg/dL <150mg/dL
ESR	23mm	<20mm
Hepatitis B Screening	Negative	
Hepatitis C screening	Negative	
Autoimmune profile a) ANA b) Pattern c) Estimated endpoint titer	 Positive Fine cytoplasmic Speckled 1/160	Pattern: Fine cytoplasmic speckled appearance associated with Anti synthetase syndrome,

d) ASMA	Negative	polymyositis,
e) AMA	Negative	dermatomyositis, limited
f) dsDNA	5.6 IU/ml	systemic sclerosis
g) RA Factor	Negative	DsDNA (<20.0 IU/ml)
Serum C3 Levels	0.4 g/L	0.8-1.6 g/L
Serum C4 Levels	0.24 g/L	0.1-0.4 g/L

Ultrasound KUB: Right and left kidney size normal. The bladder is normal. Bilateral pleural effusion, right-sided 40ml, left-sided 20ml.

Based on these investigations and her clinical picture, lupus nephritis was suspected. A renal biopsy was planned. A renal biopsy was scheduled for the 15th of June 2020.

In the interval week till the biopsy, she developed a generalized morbilliform rash associated with itching, initially thought to be perhaps a drug eruption. She was prescribed Kestine 10mg HS, and the rash settled in two days. No inciting factors were recognized. A CBC done showed platelets of 93x10. However, the rash was not purpuric or petechial; thus, urticaria was suspected due to the sudden nature and prompt response to antihistamines.

A renal biopsy was done, and the histopathology report is as follows:

Sections revealed the core of renal tissue consisting of cortical regions containing up to 10 glomeruli in a serial section. The glomeruli show increased cellularity with mild mesangial proliferation. Occasional segments show increased endothelial cells with few polymorphs. The glomerular capillary wall appears unremarkable. Few tubules show focal mild tubular atrophy. Occasionally, they have amorphous casts in lumina. Interstitium reveals a patchy sprinkling of mononuclear cells and eosinophils. Blood vessels appear unremarkable.

Her next follow-up was a month later. Clinically, her pedal edema and hypertension had resolved. Her dyspnea had improved, as had her fatigue. Based on her lab investigations, she had responded to the steroid therapy, and her lab parameters and clinical parameters had normalized to a great extent. The leucocytosis was secondary to the steroid therapy, and she had no signs or symptoms of any ongoing infection. A repeat chest x-ray done at this time also showed no pulmonary edema, and her furosemide was stopped.

Her next follow-up was in August 2020, during which she was clinically doing well with no complaints. Her lab parameters that were routinely done came back within the normal range, including her protein-to-creatinine ratio, which had further decreased significantly from 0.21 mg/mg to 0.11 mg/mg, which was now well within the normal range. She has received steroids now for 6 weeks, and it was tapered by 10mg per week. And she will be maintained on 10mg prednisolone daily once tapering is complete over 4 months. Urinary protein to creatinine ratio monitoring will continue. As we saw, though the most common presentation in the series published from Pakistan was minimal change disease, our patient, though presenting with nephrotic syndrome, had a pattern of proliferative glomerulonephritis. Beyond patterns, patterns of age groups affected by the disease in the South Asian population may be different and more centered around adults, and possibly responsiveness to therapy might also be different. In conclusion, larger reviews and studies from the communities' native countries would prove extremely beneficial in piecing together the jigsaw.

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