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EDITORIAL

THE NATIONAL DILEMMA: BRAIN DRAIN OF DOCTORS

Brain drain is the phenomenon of emigration of highly skilled and qualified professionals from one country to another mostly well-developed country. The outcome is the scarcity of qualified professionals in the native country which then undermines the progress of that particular country in long run. During this era of economic growth, the majority of developing countries like Greece, Iran, Nigeria, India, and Taiwan are the worst victims of brain drains. Pakistan is also facing this grave issue as the migration rate of highly skilled professionals augmented more than 60% from 1992 to 2000 as per UNESCO Report. Healthcare is no exception to this global phenomenon of brain drain. Statistics document that 2.7 million Pakistanis have left Pakistan in the last five years to find better work opportunities. According to a survey of Gallup-Pakistan, more than two-thirds of Pakistan's adult population including doctors have the desire to visit abroad in search of a better future. The worst scenario of this survey is that more than half have no desire to return at all. The lacunae created by this avoidable brain drain is obviously a drastic decline in public service, poor health of the nation and, poor overall progress in the society besides a bad reputation to the current Government. This perspective is focused on the insights of brain drain of doctors from Pakistan and strategies of reverting brain drain into brain gain.

For a professional group of people like the doctor community, a decision to move abroad is not only difficult and painful but also emotional. In the theory of Stages of Moral Development by Laurence Kohlberg, Consequentialism constitutes the stages of obedience and self-interest. Many factors are in the interplay if we look at this phenomenon, which includes the career, family, culture, finances, and state. If we over-simplify it in terms of person and state, the following is rational discourse.

Every doctor who graduates or specializes is invariably enthusiastic with the spirit of nationalism and service to humanity. However, what makes him take this drastic decision is not something which is a knee jerk and self-centered as is commonly propagated by vested interests. This "obedient" doctor is actually made to leave Pakistan by many acts of omission and commission by the state and healthcare system. Notable among them is a poor service structure, poor career progression, political interference at workplace and postings, lack of security, lack of research funding, and obviously low remunerations for the gigantic burden and stress when compared with the international counterparts. This when compared with the West and USA with good salaries, better quality of life, advance technologies, no political influence, equal job opportunities and career progression obviously invokes self-interest which is natural and understandable. The situation is as there one is running to burn the calories acquired through excessive eating while over here one would have to run after the food to get the calories for a meager living. This condition is being exploited by rich countries like Ireland, the UK, the USA, and the Middle East who lure this intellectual segment of our society into their countries for serving their nations, which can be summarized as PUSH and PULL Phenomenon. One school of thought is favoring the doctor's brain drain as a source of remittances for the country but statistics are negating this concept from a broader perspective.

A way forward approach for long-term benefit should be applied in the best interest of this country. The Government is better advised to take cognizance of this great national tragedy in making. She cannot pretend to be indifferent if it really is caring for the masses because furthering one's career is a basic human right enshrined in the constitution. When there is a justification for it, nobody can put the blame on this affected segment of society. It is the right time to take all stakeholders in Health-related matters on board and into confidence. Heeding to the famous idiom "A stitch in times saves nine" it takes a vision and initiative on the part of the government to take the necessary remedial steps before it is too late. A successful Chinese approach to cope with Taiwan's brain drain and revert it into brain gain can be implemented as a role model by the current government. Moreover, a doctor's community living abroad is also requested to consider their homeland as a priority for the uplift of healthcare provisions. Both stakeholders (Government and doctor's community) should indulge in constructive dialogue for a better solution and uplift of healthcare infrastructure and services in Pakistan. On the principles of Deontology, we sincerely hope that duty begets duty. Let us doctors be allowed to put our effort into the building of a healthier nation and let the Government perform its role to make these health providers be mentally and physically healthy by discharging its duty to ensure a respectable place in the society for them.

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COVID-19 AND PREVENTIVE MEASURES FOR LIBRARIES IN PAKISTAN: A COMMENTARY

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ABSTRACT

Objective: The prime aim of this study is to review the preventive measures for libraries in current pandemic of COVID-19 in the world and suggest special safety procedures for libraries in Pakistan.

Material and Methods: Content analysis approach was used to review the available web literature about the current position of libraries during and after COVID-19. Efforts were made to comment the preventive measures adopted by various library associations and leading libraries of the world.

Results: Being a social entity, libraries in Pakistan need to adopt the COVID-19 precautionary measures as in practice in the world libraries. The library practitioners in our country have to follow the same Standard Operating Procedures (SOP) in libraries for safety of their users as operated by the international library communities. Library staff and patrons should be trained to safeguard the lives of the society. The various library associations of the country should have to come forward and work for the survival of our libraries in this difficult time through awareness campaign on social media and WhatsApp groups. Online training sessions can also be arranged for the COVID-19 literacy of the library staff and library clientele.

Conclusion: The adoption of COVID-19 precautionary measures in libraries will result into a better library culture. These practices will control the spread of this contagious virus to ensure a safe and healthy Pakistan.

Keyword: Corona Virus-Libraries, COVID-19-Pakistan, COVID-19 -Libraries, Libraries-Pakistan, Corona-Preventive Measures..

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INTRODUCTION

The city of Wuhan, Hubei province of central Asia was reported as the origin of this contagious Corona Virus Disease (COVID-19) in December 2019. COVID-19 belongs to a newly discovered family of virus that causes infectious diseases. It has medical, psychological, financial, social and religious effects on millions of people around 213 countries and territories of the world. As per worldometer updates about COVID-19 published on May 23, 2020, United States of America is on the top of the list of the most affected zones of the globe followed by Russia and Brazil. Pakistan is at serial No.19 of this international report with 52437 confirmed Corona cases with 1102 deaths[1]. Pakistan tested its first Coronavirus-positive case on February 26th–a young man who returned from Iran after pilgrimage[2]. Most of the countries have decided to relax the lockdown or planning to do so, that will result into a continuous rise in number of infected cases. The highest per day increase was observed on May 19, 2020- over 105,000 new registered cases as reported by World Health Organization (WHO) on 20th May 2020[3]. The total number of infected people has crossed the figure of five million. Although COVID-19 is a deadly virus but recovery response rate is also very estimable.

Libraries, being a part of global world-were also badly affected by this emerging virus. Various library associations and organizations of the world have been trying their best to combat the effects of COVID-19. International Federation of Library Association and Institutions (IFLA) are regularly updating the Librarians community and information providers about the current pandemic. IFLA has given the key resources for libraries in responding to the Coronavirus pandemic. As per IFLA update May 22-2020, the librarians around the world should follow the following instructions[4].

Understanding COVID-19, its spread and libraries. It is the prime responsibility of the information providers to understand the basics of this epidemic disease including common symptoms of Corona virus and preventive measures. The people of older age with chronic respiratory diseases, cancer, diabetes and cardiovascular diseases

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are more likely exposed to this contagious disease. Fever, shortness of breath, dry cough, tiredness, aches and pains, running nose, nausea and diarrhea are the common symptoms of patients of COVID-19. To be well informed about the spread of corona is the best preventive measure against this widely dispersing disease. This virus is primarily spreading through dews of salvia or liquid from the nose when an infected coughs and sneezes. WHO search pages, Massive Open Online Courses (MOOCs) on corona, WHOs WhatsApp alerts and other sources can be consulted to acquire trustworthy information. Librarians in Pakistan can update his/her level of awareness from the web site of Government of Pakistan designed for COVID-19[5].

Libraries around the world are being closed by their respective Governments across 213 countries on the world map just after corona pandemic. All facets of libraries including schools, colleges and universities, special, medical, public, juvenile and even national libraries were badly affected by this worldwide pandemic. These libraries have closed the doors for all sorts of services for their clientele. As per education survey report of finance Department, Government of Pakistan (2018-19), there is a total 262 thousand educational institutions working under the umbrella of Government of Pakistan, with a library and information center[6]. These libraries have also stopped their services for the safety and health care of their patrons.

Adoption of different approaches. Pakistani libraries are also facing very hard situation due to the present-day international epidemic. Drawing on the experience around the world, libraries and librarians in Pakistan are finding themselves in the situations: Starting to re-think about the gradual reopening of the libraries under the Standard Operating Procedure (S0Ps) framed by the Ministry of Health, Government of Pakistan with modifications in library policies as per current corona circumstances.

Limits on number of people using the libraries at any one time, enforcing preventing measures like one-way sanitizer installed walk through gate, furniture with venerable space with reading room and toilets closed approach should be adopted. This system will help in ensuring social distancing. The public library of Macao-China has introduced ticketing system to restrict number of users in the library[7]. The national library of Serbia has permitted only five users to enter the reading room of the library at a time[8]. Some school libraries in Geneva have also allowed one pupil to enter the library[9]. Here in Pakistan, libraries and librarians can adopt a measurable strategy for ensuring safety of the library users. A regular and orderly availability of hydroalcoholic gel bottles will have to be placed both at the entrance of the information Centre/ library, at the reception counter and circulation desk, on the reading table, in the washrooms and with the computer gadgets. It should be ensured that each user has disinfected their hands before coming inside the library

Spraying periodically on the furniture, shelves, and gates of the library to ensure safety of their users. The importance of high standards of hygiene should be inculcated among the library staff and users. It should be ensured that all people have washed their hands frequently. Provision of gloves and face masks and hand sanitizers (potentially next to the equipment such as laptop, printer, computer etc.), bins for tissues or other contaminated material (pedal bins) should made possible.

Initiating click-and-collect or drive-through services to safeguard access to learning material without human interactions. The click- and-collect as well as reproduction of valuable materials is offered by National Library of the Netherlands[10]. Vancouver Public Library has applied mobile libraries or busier central library systems in France[11]. In order to allow access to library resources without human contact, remote lockers concept has been introduced by Librarians in Korea[12].

Provision of training and safety kits should be given to library personnel for safety measures of staff and library users. Unlimited renewal, waving off of the fines, provision of digital services to library users can also be used as safety measure for the library users as in Macao, Hong Kong (China) and Geneva, Switzerland[13]. Try to implement e-lending, e-learning or support to remote teaching.

Try to promote online services and resources to minimize number of visits to library. Appointment-only policy should be adopted for library services such as reprographic, scanning and printing as proposed by library policy makers in West Virginia. Limitation of time in the library can also provide more opportunities to library visit as suggested by Czech Library Council. Hong Kong and Shanghai –China also plan to re-open the libraries for no more than one hour followed by short break[14].

People with mild symptoms should be instructed to self-isolate and contact a COVID-19 information Centre for advice on testing and referral. People with sore throat, cough or difficulty in breathing should be referred to doctor for attention.

Staff and library patrons should be encouraged to take time at home rather coming to the library, if he/she is feeling ill. The regular employees and library users should be ensured to respect rules and SOPs around social distancing.

Ensuring that staff and users are encouraged to take time to recover if they are feeling ill, rather than coming to the library. Providing pages with useful links to reliable information for users on their websites and promoting media literacy faced with potential misinformation online.

Corona virus survives for longer time on steel, iron,

plastics and for less long on paper, cardboard or copper. It is estimated to date that SARS-CoV-2 remains viable: 3 hours in the air in the form of aerosols (particles at 5 m), 7/24 hours for cardboard, 48 hours for textiles, 3-5 days for metals, paper and glass, 4-5 days for wood, 3-9 days for plastics[15]. The returned books should be quarantine for a specific period to reduce the risk of virus infection with regular hygienic measures of the library equipment and material. The quarantine period should be ensured as per following details (French Library Association)[16].

Minimum of 3-day quarantine for paper documents without plastic material. Minimum of 10-day quarantine for paper documents with laminated blankets

10-day quarantine with impregnated with ethanol at 70%, followed by a quarantine of 3-day for plastic documents (CDs, DVDs, Cases, etc.) before re-entering into circulation.

A dedicated quarantine space/room/store should be reserved for the incoming documents with a surety that the room should be declared as no go area for general public. The furniture and other material placed inside the reserved room will be sprayed with ethanol or isopropanol preferably alcoholic products meeting the virus-killing standard NF EN 14476 at morning and evening at least once in a day. Individual protective measures at libraries are also very important for combating corona virus contagious disease. Wear overalls (made of cotton, washable at 60 degree centigrade) and wash it on daily basis or use disposable one designed for medical practitioners. Use cotton non-medical grade masks (washable at 60 degree centigrade)

Try to follow the SOPs of public health such as washing hand for at least 20 seconds, usage of cotton towels. Use these towels to close the tap and open the door. These practices will avoid risk of contact contamination. Disinfect floors/surfaces, keep doors open; Restrict and define the number of people that have meal together with social distancing;

Provide regular updates about COVID-19 to the general public through library website, social media and WhatsApp groups. Promote media and digital literacy to get reliable information about various online resources and latest updates on corona. Ensure that all human ware of the library should be made capable to work remotely and services can be provided virtually.

CONCLUSION

As libraries are social entities dealing people of different ages, it should be re-opened after proper preparation. It is the legal responsibility of the library executives to ensure all possible measures as per framed rules of Government of Pakistan. The human resources working in the library should be trained enough to follow SOPs. In first phase, libraries should gradually resume its services. Pakistan Library Association (PLA) and other sub associations should have to play their timely role to protect their professional colleagues through online trainings and social media platforms.

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ORIGINAL ARTICLE

KNOWLEDGE AND ATTITUDES REGARDING CARE OF GERIATRIC PATIENTS AMONG NURSES IN PESHAWAR, KHYBER PAKHTUNKHWA

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ABSTRACT

Objectives: To assess the knowledge and attitude about care of elderly patients among nurses working in public sector hospitals in Peshawar.

Materials & Methods: A descriptive cross sectional study on nurses caring old age patients was conducted at Hayatabad Medical Complex, Lady Reading Hospital, and Khyber Teaching Hospital, Peshawar Khyber Pakhtunkhwa, Pakistan. The total period of the research work was 6 months. Generally, 282 nurses were included in the research using simple random sample method. Information was collected using an adopted, validated questionnaire.

Results: Overall, 282 nurses included in the study. More than half (56%) participants were female and 54% participants were from age group less than 30 years. The nurses working in different units of three tertiary care hospitals had average knowledge (60.6%) regarding the care of old age patients. They possess favorable attitude towards the care of old age patents.

Conclusion: Nurses working in three tertiary care government hospitals had overall average knowledge regarding the care of old age patients and they possess favorable attitude towards the care of old age patients.

Key Words: Nurses, Geriatric, Knowledge, Attitude, Tertiary Care Hospitals, Nursing Care.

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INTRODUCTION

Advancing in age is a vital part of the complete human societies multiplying biologic and physiologic variations that marks in disintegration of biological actions in aged people identified as the elderly field of life. This domain usually starts after fourth decade and continues till deaths. During this time human being changes physically and physiologically[1]. Geriatrics refers to the field of medicine which focuses on the health and care of old age people. This care usually based on prevention of diseases, caring of diseases, rehabilitation and disability in older people[2]. The proportion of older population is getting rise with time due to the decline in mortality rate of different diseases. This decline is due to the good survival rate of the population with sustainable prevention of different disease and good care. Worldwide; there are approximately 650 million people live with age 60 years and above[3,4].

With the passage of time and with effective measure the number of older age increases. There is one out of ten persons more than 60 years of age. If this ratio continues, the number is expected to be one out of five people and so on one out of three people in 2051[5]. As the people become aged, the disease pattern as compared to young people totally changed. Studies revealed that the most common health related problem linked with age is pain in legs and joints reported in 43.4% people[7] dental and chewing problems was reported in 42% people followed by decrease visual acuity (57%), hearing loss (15.4%), hypertension (14%), diarrhea and dermatological disorders (12%), cardiac diseases (9%), diabetes mellitus (8.1%), asthma (6%) and urological complication (5.6%)[8] Limited physical activity cause many health related problems in old age people, also the body immune system become weak which may also leads to many disease[9] Majority of the diseases in geriatric patients are due to the change in life style, emotional impact, social circumstances, nutrition and psychosocial health[10,11].

In older age all the people need help in maintain their living state healthy. The only way to prolong the life expectancy is to care in the last decade of life. The care may in the form of prevention, treatment, life style changes, exercise, nutrition and emotionally or psycho-

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logical support[12]. The continue care of people are met in different places. Some people are provided old age care in their home; many people received old age care in residential settings, also some people get the care in hospitals[11,12] Majority of people receive the old age care in old age houses and nursing homes the trends of family are changes in the new era. Now a day's people are preferring nuclear families that's why the families become smaller and the burden of old age people are increasing on different nursing homes and hospitals[13]. Nurses associate a leading part in provision of health care and prevention of diseases, they deliver health services to all communities, disables, and ill patients as well as elderly sick people, hence, they require to be provided an appropriate training for adult old caring. It is investigated that negative attitude of nurses towards the patient and lack of knowledge might interrupt hopes of elderly individuals and impact provision geriatric nursing care[14]. The quality of care is not possible without good knowledge and positive practices. Providing holistic and quality care, the nurses should have adequate knowledge regarding the geriatric and they should have positive attitude towards the geriatric. Positive attitude always leads to positive outcome in health care system and the positive attitudes have positive impact on the care of geriatric patients[15]. Significantly, it has been reported in the last 30 years, health professional specifically nurses have misinterpreted perceptions about elderly patients and that nurses inclined to have insignificant attention to care for old people and they favored to care for pediatric and adult patients. Majority of the nurses have shown their interest to care for elderly patients has decreased[16] The field of Gerontology may be used as a channel of nursing training in the while caring the old age patients[17]. The nurse's knowledge and attitude regarding the care of old age people is very necessary. This study was designed to evaluate the knowledge and attitude of the nurses towards the care of aged people.

MATERIALS AND METHODS

A descriptive analytical study was conducted in three governments tertiary care hospital of Peshawar, Khyber Pakhtunkhwa. The study was carried out in LRH Medical Teaching Institute (MTI), KTH and HMC Peshawar, Khyber Pakhtunkhwa, Pakistan. All these three hospitals are government tertiary care hospitals located at the center of Khyber Pakhtunkhwa. All these hospitals cover 80% of population of the KPK province and consider a hub for all the government sectors hospitals. Participants who fulfilled the inclusion criteria have been selected from different departments of these hospitals. The participants were taken through Simple Random Sampling technique for current study. There was enough nursing staff working in these three hospitals that were easily accessed through Simple Random Sampling. Initially the list of nursing staff working in all these three hospitals was collected. After that 288 nursing staff fulfills the inclusion criteria were selected through lottery method from different units of hospitals. Inclusion criteria, nurses, they had been performing duty in different wards for more than six months and giving direct care to the adult aged patients. Exclusion criteria, staff nurses they had not been providing nursing care directly to geriatric patients and had less experience than six month. The research topic was approved by the graduate committee of INS, KMU. After graduate committee the study was approved by Khyber Medical University's Advance Study Research Board (ASRB) committee. Ethical clearance was granted from Ethics Review board of the KMU, Peshawar. Permission was granted from nursing directors of LRH, KTH and HMC before data collection.

Consent forms were signed from all the participants before filling the questionnaire. The participants were assured that the findings of the study will never affect the job of participants, also there will be no benefit or harm in participating in the study. The data were collected using adopted questionnaire. The validity and reliability was checked by (Cronbach's alpha = 0.87) in adopted questionnaire. The questionnaire is consisting of three sections. Section "A" covered demographic data. The second section "B" was consisted of 25 questions based on knowledge of nurses regarding caring Geriatric Patients. The knowledge section of questionnaire consists of 25 questions and each correct answer will be given one mark. The knowledge of the participants will be categorized as:

- Excellent Knowledge: Greater than 80%
- Good knowledge: 70 -80%
- Average Knowledge: 60-70%
- Poor knowledge: Less than 50%.

In section "C" there were 14 questions regarding the attitude of the nursing caring geriatric patients. For analysis of data SPSS (version 24) was used. Frequencies and percentages were calculated for all categorical variables including variables regarding knowledge and practices of nursing staff caring geriatric patients.

RESULTS

Overall included participants in this study were 288 in which six participants quit to take part in the study. All the participants were nursing staff caring old age people working in different units of LRH, KTH and HMC Peshawar, Khyber Pakhtunkhwa. The mean age of the participants is 31.41 years. The participants were asked regarding the qualification and it was found that around half (50%) of the participants were having FA/F.Sc qualification, followed by graduation 25%, matric and master 11.7% respectively. 29% participants were working in medical unit followed by 27% in surgical unit, 25.5% emergency and 18.4% in intensive care unit. Less than half (45.7%) nursing staff had diploma in nursing. Similarly, 35.8% had BS in Nursing, 15.6% has post RN and only 2.8% participants had master

in nursing. Majority (81%) nursing staff has 2-5 years' experience while 18.8% had less than 2 years' experience, shown in the results. Majority (171) of nursing staff caring old age patients had average knowledge, followed by 29.8% of nursing staff have poor knowledge and 8.5% nursing staff have good knowledge. Only 1.1% nurses had excellent knowledge regarding the care of geriatric patients (Table 2). More than half (51.8%) participants had favorable attitude, 17.7% participants had neutral attitude while 30.5% participants had unfavorable attitude (Table 7).

Table 1: Demographic Profile of the study population, (N=282).

		Frequency	Percent	Valid Percent	Cumulative Percent
Age of the Participants	< than 30 years	152	53.9	53.9	53.9
	30-40 years	118	41.8	41.8	95.7
	41-50 years	10	3.5	3.5	99.3
	> than 50 years	2	0.7	0.7	100.0
	Total	282	100.0	100.0	
Gender of Participants	Male	124	44.0	44.0	44.0
	Female	158	56.0	56.0	100.0
	Total	282	100.0	100.0	
Qualification of the Participants	Matric	33	11.7	11.7	11.7
	F.Sc / FA	143	50.7	50.7	62.4
	Graduation	73	25.9	25.9	88.3
	Master	33	11.7	11.7	100.0
	Total	282	100.0	100.0	
Working Unit of the Participants	Medical	82	29.1	29.1	29.1
	Surgical Ward	76	27.0	27.0	56.0
	ICU/CU	52	18.4	18.4	74.5
	Emergency	72	25.5	25.5	100.0
	Total	282	100.0	100.0	
Professional Qualification of the Participants	Diploma in Nursing	129	45.7	45.7	45.7
	BSN	101	35.8	35.8	81.6
	Post RN	44	15.6	15.6	97.2
	MSN	8	2.8	2.8	100.0
	Total	282	100	100.0	
Professional Experience of the Participants	< than 1 year	53	18	18.8	18.8
	2 - 5 years	229	81	81.2	100.0
	Total	282	100	100.0	

Table 2: Knowledge of Nurses regarding care of Geriatric Patients (N=282).

Level of Knowledge	Number	Percentage
Poor Knowledge	84	29.8%
Average Knowledge	171	60.6%
Good Knowledge	24	8.5%
Excellent Knowledge	3	1.1%

Table 3: Knowledge of Nurses regarding care of Geriatric Patients (N=282).

Level of Attitude	Number	Percentage
Unfavorable Attitude	86	30.5%
Neutral Attitude	50	17.7%
Favorable Attitude	146	51.8%

DISCUSSION

In the current study majority of the nurses were female while majority of the participants were from the age group 30 – 40 years old. Half of the participants had FA/F. Sc. Similarly, majority of the participants were working medical and surgical units. More than half of the participants were from rural area. In the same context a study conducted in India, 77% study participants were from age group 19- 23 years old, 95% participants were female. 54% participants were from urban area[18]. Likewise, one other study also estimate majority of the participants were female, while their means age was 31 years. In Pakistan 66% population resides in rural area, health care professional like nurses mostly engage in nursing field from the rural areas[19]. On average the female nurses are

more in health department as compared to male nurses. The trend of nursing is much more prevalent in females. The ratio of male to female nurses is 1:19[20,21]. The current study revealed that more than half (60%) nurse had average knowledge regarding the care of old age patient. However, in other study conducted in India regarding the knowledge of nurses about the old age care. The knowledge score of the participants regarding the care of old age people has been reported 45.37%[22]. A study conducted in Greece identified lack of knowledge of nurses regarding the care of old age patients. The mean score of nurses knowledge was identified as 57%[23]. In the same context, a study conducted on Greek nurses to identify the knowledge of nurses regarding the care of old age people revealed that the nurses had good knowledge regarding the care of old age people, also the study showed positive attitude of nurses towards the care of old age people[24]. Addition to the knowledge, in the current study more than half of the participants responded that old age people needs physical, biological, physiological, functional, and psychological assessment. 69% nurses reported that psychosocial and functional assessment is the key assessment for assessing geriatric patients[25]. The nurses were asked regarding the reduction of unfamiliar environmental anxiety of elderly patients. In the current study majority of study participants responded that anxiety of the old age people regarding hospital environment could be reduced by orienting them with the hospital and explain all the diagnostic procedures and their relatives. Likewise, a study reported that 95% nurses respond that anxiety due to hospital in old age people can be reduced by maintaining a calm, unhurried, confident manner while interacting with client[26]. The literature also support that orientation to the environment, social support, support from the health care provider, and unhurried can reduce the hospital related anxiety in old age patients[27-28].

CONCLUSION

The study revealed that the nurses had average knowledge regarding the care of old age patients in terms of nutrition requirement, blood pressure monitoring, hydration management, anxiety control, urination and sleep pattern monitoring. In addition, the nurses had favorable attitude towards the care of old age patients.

RECOMMENDATIONS

Area of improvement in Nurse's education has been identified. There is need to improve nurse's knowledge regarding care of geriatric patients. There is need of proper strategies to improve the nurse's knowledge regarding and attitude towards the care of old age patients

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Ali A: Study conception and design and manuscript writing.

Khan MI: Contributed to the concept of questionnaire and helping data.

Ali S: Data interpretation and overall supervision.

Muhammad D: Critical review of the manuscript.

Naeema: Data analysis and final draft Proof reading.

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

ORIGINAL ARTICLE

A CORRELATIONAL STUDY OF HOPELESSNESS AND SUICIDAL INTENT IN PATIENTS PRESENTING TO ACCIDENT AND EMERGENCY DEPARTMENT OF A TERTIARY CARE HOSPITAL AFTER ATTEMPTED SUICIDE

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ABSTRACT

Objective: To find the level of hopelessness and suicidal intent in patients presenting to Accident and Emergency department of a tertiary care hospital after attempting suicide and determining a correlation between the two.

Material and Methods: A prospective study from 1st Jan 2020 to 30th June 2020 was carried out at Khyber Teaching hospital of Peshawar, Pakistan. Consenting patients who were brought to the A&E after attempted suicide during the study duration were included in the study and were evaluated by using Beck Hopelessness Scale, and Beck Suicidal Intent Scale along with a semi structured proforma for interview. Data were analyzed using SPSS, descriptive statistics and correlation coefficient were used.

Results: A total of 102 patients were assessed. Majority were females (n=63, 61.8%), and were less than 45 years (n=88, 86.2%). Twenty-six (25.4%) had a family history of suicide and 31 (30.3%) have attempted suicide in the past. The most common mode of committing suicide was through the use of organophosphates (n=72, 70.6%). A total of 40 (39.2%) were already diagnosed cases of psychiatric illness. Moderate hopelessness was reported in 46 (45.1%) cases with a mean hopelessness score of 9.64+4.3. Majority (n=71, 69.6%) had medium suicidal intent with a mean score of 25.14+4.4, which when correlated with hopelessness score, significant positive correlation (rho: 0.540, P<0.000) was found.

Conclusion: There is a predominance of female gender in those committing suicide. A sizable amount of the sample showed moderate hopelessness while medium suicidal intent was found in the majority of the sample.

Key words: Deliberate self-harm, suicide attempt, hopelessness, tertiary care hospital.

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INTRODUCTION

Suicidal behavior and suicidality can be conceptualized as a continuum ranging from suicidal ideation to suicide attempts and completed suicide. The prevalence of suicide in developing countries has been estimated to be 0.4%[1]. Attempted suicide is an act of intentional self-injury, irrespective of apparent purposes of the act and are considered to be major public health concerns globally[2,3]. It is well acknowledged that a previous suicide attempt is the single most important risk factor for suicide in the general population[4]. Suicidal attempts account for a significant number of Accident & Emergency (A&E) Department visits and represent a major public and mental health problem in Pakistan[5].

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The prevalence, characteristics, and methods of suicidal behavior vary widely between different communities, in different demographic groups and time[6]. According to WHO World Mental Health Surveys 2008, the Global annual prevalence of self- reported suicide attempt is approximately 4 per 1000 adults. In 2012, the estimated global suicide rate was 15 per 100,000 adults (18 years and above). WHO report on suicide prevention in 2014 revealed suicide as the second leading cause of death in 15-29 years age group. Most of the low and middle-income countries including Pakistan, India and Bangladesh lack a comprehensive death registration system.[7] Apart from psychiatric disorders, bereavement, interpersonal problems and socioeconomic factors have been reported to be important predictors of attempted suicide[8]. One in three persons with a previous psychiatric diagnosis experienced suicide attempt, deliberate self-harm or psychiatric illness within the first year of bereavement. The risk of

suicide, deliberate self-harm and psychiatric illness is high after the loss of a close relative, especially in susceptible and generally highest after loss of a child, in younger persons, and after sudden loss by suicide, homicide or accident.[9] A recent study of people who attempted suicide in India showed that 86% of the attempts were isolated impulsive acts following triggers, the most common of which was interpersonal disputes (71%)[10]. In this study, 67% of patients had a mental health condition, the most common being alcohol use disorder, followed by depression, and personality disorders.

In the view of our local situation and under the preview of the global burden, this study, as a possible tip of an iceberg at the district level, aimed to assess the socio-demographic factors, hopelessness and suicidal intent of patients referred to A&E of a tertiary care hospital of Peshawar.

MATERIAL AND METHODS

A prospective study was conducted at the Accident & Emergency Department of Khyber Teaching Hospital, Peshawar. The study was approved by the ethical committee of Khyber teaching Hospital. The patients who attempted suicide, presented to A&E, of both gender and of any age were included in the study. Informed consent was obtained from the individuals.

This study was conducted from 1st Jan 2020 to 30th June 2020 (six months). Among 113 patients who presented to A&E to have attempted suicide suicide, a total of 102 consenting patients were assessed. Those who refused to give informed consent or hemodynamically unstable were excluded from the study. The evaluation was done by Beck Hopelessness Scale, and Beck Suicidal Intent Scale along with a self-structured proforma for interview. The data were analyzed by using SPSS.

Analysis of the basic variables were carried out using descriptive statistics for percentages and frequencies. Spearman's test was used to assess the correlation between Beck's Hopelessness Scale (BHS) and Beck's Suicidal Intent Scale (BSIS).

Beck's Hopelessness Scale (BHS) is a 20-item self-report instrument that assesses the positive and negative attitudes about the future during the past week as perceived by the patients. The total score ranges from 0 to 20 (0-3: Minimal, 4-8: Mild, 9-14: Moderate, and 15-20: Severe). The internal reliability of this scale ranges from 0.87 to 0.93[11]. One-week test-retest reliability is 0.69. The concurrent validity is well established across a wide variety of samples[12].

Beck's Suicidal Intent Scale is an interviewer administered measure of seriousness of the intent to commit suicide among suicide attempters[13]. It contains 20 items to be scored on a 3-point Likert scale. Score is calculated from first 15 items, ranging from 0 to 30 (15-19: Low intent, 20-28: Medium intent, and 29 or more: High intent). The internal reliability of the scale is 0.95 while inter-rater reliability ranges from 0.81 to 0.95.

RESULTS

Among the 102 individuals, majority were females (n=63, 61.7%) and were married (n=67, 65.6%). Majority of the participants were in age group of 21 to 45 years (n=55, 53.9%). A total of 40 (39.2%) were already having a diagnosed psychiatric issue with 15 of them having depressive disorder. All the details are given in Table 1.

Twenty-six (25.4%) had a family history of suicide and suicidal attempts in first and second-degree relatives. Almost one third (n=31, 30.3%) had a past history of suicidal attempt. A total of 56 (54.9%) attempted suicide suicide after an inter personal conflict with 32 of them had a conflict with the in-laws, 13 with the spouse, 7 with parents and 4 with others.

Figure 1 shows a pie chart describing the methods of committing suicide, according to which 72 (70.6%) attempted suicide suicide using organophosphate compounds, followed by 11 (10.8%) using prescription tablets, 7 (6.9%) using firearms, 5 (4.9%) each using hanging and cutting their wrist/forearm and 2 (1.9%) while jumping from a height.

A total of 35 (34.3%) persons who attempted suicide suicide showed mild hopelessness while 46 (45.1%) showed moderate and 21 (20.6%) showed severe degree of hopelessness. The mean score for the hopelessness was 9.64±4.3. A total of 5 (4.9%) persons who attempted suicide suicide showed low suicidal intent while 71 (69.6%) showed medium and 26 (25.5%) showed high suicidal intent. The mean score for the suicidal intent was 25.14±4.4. Results of correlation showed highly significant positive and moderate correlation between Hopelessness and suicidal intent (rho: 0.540, $P<0.000$).

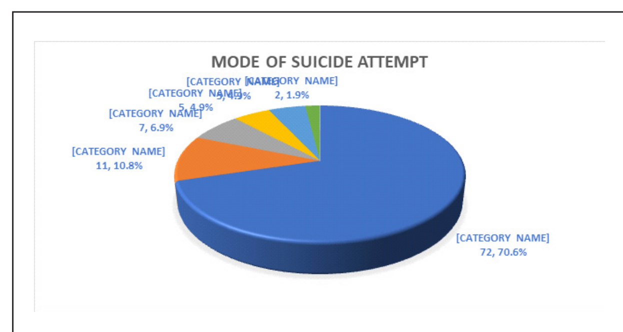

Fig 1: Methods of committing suicide (n=102)

Table 1: Basic details of the study

S. No	Variables		Frequency (%)
1	Gender	Male	39 (38.2%)
		Female	63 (61.8%)
2	Age Group	10 to 20 years	33 (32.4%)
		21 to 45 years	55 (53.9%)
		46 to 65 years	8 (7.8%)
		Above 65 years	6 (5.9%)
3	Marital Status	Married	67 (65.7%)
		Single/engaged	15 (14.7%)
		Divorced/separated	19 (18.6%)
		Widow/widower	1 (1.0%)
4	Already diagnosed psychiatric comorbidity*	Depressive disorder	15 (14.8%)
		Substance Use	10 (9.8%)
		Personality disorder	11 (10.7%)
		Psychosis (including Schizophrenia)	3 (2.9%)
		Acute stress reaction	1 (1.0%)
		No existing psychiatric diagnosis	62 (60.8%)

Table 2: Correlation between hopelessness and suicidal intent

S. No	Measures	I (p-value)	II (p-value)
I	Hopelessness	-	-
II	Suicidal Intent	0.540* (.000)	-

DISCUSSION

In our study, majority of the suicide attempters were in their middle ages and there was more female predominance which is consistent with other studies[6,14,15]. In this study, the majority were married, which is similar to the findings in another study[16]. There were fewer patients with severe hopelessness in this study than those with mild and moderate hopelessness. Hopelessness prevents a person to think about future positively resulting in expecting the worse outcome and also predicts the ultimate suicide. Hopelessness and suicidal intent have a positive correlation. Hopelessness rather than depression is a determinant of suicidal intent[17, 18]. There were a fewer patients with high suicidal intent than compared moderate suicidal intent. High suicidal intent has been associated with high lethality[17]. In this study, Interpersonal conflicts, criticism, scolding, and quarrels have represented 55% of the subjects as a cause for their attempt. The same findings of more of Interpersonal conflicts than psychiatric morbidity have been reported in other many studies[19,20]. Thirty one percent of the subjects had past history of suicide attempt which is similar to the finding in few studies[21]. 20.5% of the subjects had a family history of suicide in their 1st and 2nd relatives which is similar to the findings by Salian et al[22]. As widely known in this study also, organophosphorus poisoning was the predominant mode of attempt represented 71%, in the form of insecticides, rodenticides and tablet poisoning. The same trend was found in other local studies[14, 23, 24]. Psychiatric comorbidities including substance use were found in around 39% of the individuals. This trend of psychiatric morbidity around 20- 30% was also found in other studies[22]. Contrary to the above findings around 50-60%, morbidity was reported in other studies[24]. The patients perceiving suicide attempt and reasons behind it as major problem had significantly higher mean suicidal intent score. This indicates that worse the perception of the situation at hand disastrous can be the consequences.

LIMITATIONS

This study is confounded by its limitations. The sample size is small and the study population also confined to A&E of one tertiary care hospital. Although hospital-based data on suicide attempts may not give the true picture of the community, but this may serve as the tip of the iceberg.

CONCLUSION

There is a predominance of female gender in those committing suicide. A sizable amount of the sample showed moderate hopelessness while medium suicidal intent was found in the majority of the sample. There is a highly significant positive and moderate correlation between Hopelessness and suicidal intent. The presence of already existing psychiatric diagnosis suggests the need of effective treatment of psychiatric comorbidities through social, educational and community level program that may have long term impact on preventing suicidal attempts.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Khan I: Conceptualization, drafting, critical review

Ayub S: Data compilation, manuscript writting

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

ORIGINAL ARTICLE

EFFECTIVENESS OF TRADITIONAL MEDICINE REGIMES IN TREATING DUODENAL ULCER WITH HELICOBACTER PYLORI

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ABSTRACT

Objectives: This randomized controlled trial was performed to examine the effectiveness of Helicobacter pylori max regime, a traditional medicine preparation, among duodenal ulcer patients with Helicobacter pylori infection.

Material & Methods: The intervention group (n = 42) used Helicobacter pylori max regimen and the control group (n = 43) used Omeprazole, Amoxicillin and Clarithromycin (OAC) regimen.

Results: The number of patients having type A pain relief in intervention group (33.3%) was higher than that in control group (23.3%) ($p > 0.05$). There were 59.5% patients in the intervention group not having Helicobacter Pylori after treatment, which was lower than that of control group (69.8%) ($p > 0.05$). The rate of complete healing in the HP max group reached 68.2%, equivalent to the rate of complete healing in the patients using OAC (71.1%) ($p > 0.05$). No serious adverse effects were observed in these two groups.

Conclusion: These findings depicted the potential of HP max in clinical settings in order to reduce the burden of duodenal ulcers with H. pylori infection.

Key words: duodenal ulcer, helicobacter pylori, HP max

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INTRODUCTION

Duodenal ulcer is a common disease in the world and in Vietnam[1-3]. This disease is caused by an imbalance between ulcers (acid-pepsin, Helicobacter pylori, etc.) and protective factors (mucilage, mucosa barrier, etc.)[4,5]. Treating duodenal ulceration should be based on the pathophysiology of this disease. To date, three allopathic medication regimes are mostly used to treat duodenal ulcer including Omeprazole, Amoxicillin and Clarithromycin (OAC)[6,7]. In Vietnam, along with western medicine, traditional medicine has been encouraged and paid special attention by the Ministry of Health to treat duodenal ulcer[8]. In traditional medicine, herbs such as Ampelopsis cantoniensis, Ardisia silvestris, and Oldenlandia eapitellata Kuntze are shown to be effective in gastric-duodenal ulcer treatment[9,10]. In this study, we produced a medicine entitled HP max which included all these three herbs as ingredients. This product has been tested for toxicity and pharmacological effects such as anti-inflammatory, pain relief, acids neutralization, wound healing and eradication of HP on experimental animals, which indicated that HP max products had high safety and good therapeutic effects[11-13]. To demonstrate the effectiveness of HP max in the clinical setting, this study aims to evaluate the pain relief, ulceration healing and eradication of H. pylori (Helicobacter pylori) in patients with duodenal ulcer treated with HP max regimes.

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MATERIALS AND METHODS

This randomized controlled trial was performed at the Department of Internal Gastroenterology - 108 Central Military Hospital and the Hospital of Traditional Medicine - Ministry of Public Security. Patients were eligible for this study if they 1) were confirmedly diagnosed with duodenal ulcer via clinical examination and endoscopic procedure, and 2) had H. pylori (+). They were randomly divided into 2 groups: the intervention group (n = 42) received HP max drug, and the control group (n = 43) received OAC regimes. Patients were diagnosed by using EVIS 160 and 180 endoscopes (Olympus - Japan) at the Department of Internal Medicine - Central Hospital 108 or Endoscopic Room - Hospital of Traditional Medicine - Ministry of Public Security. Histopathological procedures were performed at the Department of Disease Surgery - Central Hospital 108. The protocol of this study was approved by the institutional review board of Hospital of Traditional Medicine - Ministry of Public Security.

HP max medications: The intervention group received HPmax capsules. This drug (including 280mg Ampelopsis cantoniensis, 170mg Ardisia silvestris, and 110mg Oldenlandia eapitellata Kuntze per capsule) was manufactured by Vietnam Natural Products Joint Stock Company VINACOM on modern technology lines, which met basic standards certified by Drug Administration

of Vietnam. One package contained 24 capsules. Patients took twice daily 3 capsules each after meal in 30 days.

The OAC regimen: The control group received Omeprazole 20 mg: 2 tablets / day (01 tablet at 9.00 a.m and 01 tablet at 21.00) x 30 days; Amoxycillin 500 mg: 2 capsules/ time x 2 times/ day x 14 days; and Clarithromycin 500 mg: 1 tablet/ time x 2 times / day x 14 days.

Subjective symptoms (pain, belch, pyrosis) were evaluated before treatment (T0), after first week (T1), second week (T2), third week (T3), and 4th week (T4). Patients having pain relief at T1 were classified "Type A", while those relieving pain at T2, T3 were categorized as "Type B", and "Type C" at T4. Conditions of ulcers were evaluated after four weeks of treatment, including ulcer healing (type A); miniature ulcers (type B); and ulcer retention (type C). The eradication rate of HP after treatment was assessed including: H. pylori (-) and H.pylori (+).

Stata 12.0 was used to analyze data. Chi-squared test was used to examine the difference between intervention and control groups in the effectiveness of each regime. P-value of less than 0.05 was considered statistically significant.

RESULTS

Among 85 patients, most of them showed pain during hunger (60.0%). The proportion of heartburn, nausea and vomiting and slow digestion were 100%, 16.5% and 69.4%, respectively. The differences in these clinical symptoms between both arms were not statistically significant (p>0.05).

Results of endoscopic procedure are shown in Table 2. Most of ulcers position was frontside of duodenum (89.4%). The majority of patients had one ulcer (95.3%). Most of ulcer had 0.5-1.0 cm of diameter (82.0%). The differences between both arms were not statistically significant (p>0.05).

After treatment, Table 3 reveals that no difference between both arms was found regarding time of pain relief, ulcer conditions and H.pylori positivity (p>0.05).

Table 4 shows that in both groups, minority of patients suffered adverse effects such as nausea, anorexia, diarrhea or headache. The differences between both arms were not statistically significant (p>0.05).

Table 1: Clinical symptoms of patients before treatment

Clinical symptoms	Intervention	Control	Total	p-value
	(Using HP max) n=42	(Using OAC) n=43	n=85	
	n (%)	n (%)	n (%)	
Epigastric pain	42 (100.0)	43 (100.0)	85 (100.0)	>0.05
Pain in hunger	25 (59.5)	26 (60.5)	51 (60.0)	
Pain on a full stomach	2 (4.8)	2 (4.6)	4 (4.8)	
Pain on a full stomach and in hunger	15 (35.7)	15 (34.9)	30 (35.2)	
Heartburn	42 (100.0)	43 (100.0)	85 (100.0)	>0.05
Nausea and vomiting	7 (16.7)	7 (16.3)	14 (16.5)	>0.05
Slow digestion	28 (66.7)	31 (72.0)	59 (69.4)	>0.05

Table 2: Endoscopic characteristics in patients before treatment

Characteristics of endoscopy	Intervention	Control	Total	p-value
	(Using HPmax) n=42	(Using OAC) n=43	n=85	
	n (%)	n (%)	n (%)	
Position of ulcers	42 (100.0)	43 (100.0)	85 (100.0)	>0.05
Frontside of duodenum	38 (90.4)	38 (88.4)	76 (89.4)	
Backside of duodenum	2 (4.8)	3 (6.9)	5 (5.9)	
Both sides	2 (4.8)	2 (4.7)	4 (4.7)	
Number of ulcers				
One	40 (95.2)	41 (95.3)	81 (95.3)	>0.05
Two	2(4.8)	2 (4.7)	4 (4.7)	
Size of ulcer (Diameter)				
0.5 – 1.0 cm	36 (81.8)	37 (82.2)	73 (82.0)	>0.05
1.1 -1.5 cm	7 (15.9)	7 (15.6)	14 (15.7)	
> 1.5 cm	1 (2.3)	1 (2.2)	2 (2.3)	

Table 3: Effectiveness of treatment between both groups after treatment.

Characteristics	Intervention	Control	p-value
	(Using HP-max) n=42	(Using OAC) n=43	
	n (%)	n (%)	
Time of pain relief			> 0.05
Type A (= < 7 days)	14 (33.3)	10 (23.3)	
Type B (8 – 21 days)	26 (61.9)	26 (60.4)	
Type C (> 21 days)	2 (4.8)	7 (16.3)	
Ulcer conditions			
Type A (scar healing)	30 (68.2)	32 (71.1)	> 0.05
Type B (miniature)	12 (27.3)	11 (24.4)	
Type C (intact keeping)	2 (4.5)	2 (4.5)	
H.pylori positive			
Negative	25 (59.5)	30 (69.8)	> 0.05
Positive	17 (40.5)	13 (30.2)	

Table 4: Unexpected side effects after treatment in 2 groups.

Characteristics	Intervention	Control	p-value
	(Using HPmax) n=42	(Using OAC) n=43	
	n (%)	n (%)	
Nausea	2 (4.8)	2 (4.6)	>0.05
Anorexia	1 (2.4)	1 (2.3)	>0.05
Diarrhea	1 (2.4)	1 (2.3)	>0.05
Headache	1 (2.4)	1 (2.3)	>0.05

DISCUSSION

The position of duodenal ulcer can be in anterior wall, posterior wall or both walls. In our study, the duodenal ulcer in anterior wall accounts for the highest percentage for both groups. Results of the study also showed that there was no difference in the image characteristics of endoscopy between both groups, which was consistent with research results of other domestic and foreign researchers[14,15]. Acid and H.pylori are two important factors that cause gastric-duodenal ulcers[16,17]. Studies have shown that H. pylori is a major cause of changing the internal stable balance between somatostatin, gastrin and acid[18]. In our study, over 85 patients had duodenal ulcers of H.pylori (+) and there were no significant differences in the level of H. pylori infection between two groups. These findings suggested similarity of both groups regarding clinical and paraclinical characteristics. In this study, the goal of treating ulcers was to reduce ulcer factors, enhancing mucosal protection and eradicating H. pylori. Therefore, treatment of duodenal ulcers should be based on the pathophysiology of gastric-duodenal ulcers. Studies worldwide recommended that patients with duodenal ulcers with infected H. pylori should use 3-drug regimens including a proton pump inhibitor (PPI) and two antibiotics. The common regime used was OAC regimen (Omeprazole + Amoxiciliin + Clarithromycin: OAC)[1-15].

After treatment, findings of this study indicated that the number of patients with "Type A" pain relief (33.3%) in the intervention group was higher than the control group but the difference was not statistically significant. This result suggested that HP max was an effective drug that reduces pain symptoms, which was equivalent to OAC regimen in treating duodenal ulcers. This is consistent with other studies in Vietnam. For example, a prior study showed that ampelope regimen also had a rapid analgesic effect for patients with duodenal ulcers compared to other western medicine regimens[19]. Results also indicated that there was no difference in the rate of scar healing between two groups. Moreover, the rate of H. pylori eradication in intervention and control groups were 59.5% and 69.8%, respectively but the difference was not significant (with $p > 0.05$). HP max medicine was shown to be effective in eradicating H. pylori in vitro, but the rate of eradication depends on the concentration of drug used[20]. Regarding adverse effects, both HP max and OAC regimens had some manifestations: nausea, loss of appetite, fluid loss and headache; but without serious complications, no patient had to stop taking the drug. Unwanted manifestations occur briefly and do not need any treatment. These findings depicted the potential of HP max in clinical settings in order to reduce the burden of duodenal ulcers with H. pylori infection.

Limitations of this study included the small sample size and short period of follow-up. Moreover, information about acceptability of patients is lacking, requiring further studies to understand this issue.

CONCLUSION

These findings depicted the potential of HP max in clinical settings in order to reduce the burden of duodenal ulcers with H.pylori infection. Further studies should be conducted to measure the acceptability of this regime in patients with duodenal ulcers.

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Following authors have made substantial contributions to the manuscript as under

Tuyen PB: Concept, supervision, data collection, Statistical analysis and manuscript writing

Hoa PT: Concept, data collection and manuscript writing

Huyen TT: Statistical analysis, data collection and manuscript writing.

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

ORIGINAL ARTICLE

SPECTRUM OF MORPHOLOGICAL CHANGES IN ERYTHEMA MULTIFORME

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ABSTRACT

Objective: To evaluate the spectrum of morphological changes seen on histological examination of Erythema multiforme in a local population.

Material and methods: This descriptive study was conducted at Pathology Department of Pakistan Institute of Medical Sciences, Islamabad from January 2015 to January 2018. Out of 44 cases diagnosed with Erythema multiforme, 34 cases were included in the study according to inclusion/exclusion criteria. The cases having history of history of Stevens-Johnson syndrome and toxic epidermal necrolysis were excluded from the study. The microscpic features including epidermal changes and dermal changes were studied and recorded. All data was entered into SPSS version 24. Frequencies of various histopathological changes were calculated.

Results: The common histological feature shown in all 34 cases (100%) was perivascular inflammation, while the least common features were scab formation and ulceration (17.6% each). 2nd highest histological feature was hyperkeratosis and granulation tissue each (94.1%). There were 12 (35%) males and 22 (65%) females. The range of age in the present study was between 11 and 70 years. Eight (23.5%) patients were in the age group of 11 to 19 years and 22 (64.7%) were in the age range group of 40 to 70 years.

Conclusion: Microscopic features are varied but distinct which help in arriving at an accurate diagnosis of Erythema Multiforme. The most common histological feature is perivascular inflammation with interface inflammatory infiltrate. Other features include hyperkeratosis, granulation tissue formation, mucinous degeneration and acanthosis.

Key words: Erythema Multiforme, diagnosis, differential, keratinocytes, keratosis, blister, granulation tissue, inflammation.

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INTRODUCTION

Erythema multiforme (EM) is an uncommon condition involving the skin, mucous membranes or sometimes both[1]. The epidemiologic data available for Erythema multiforme is very much limited. The reason being the acute nature of the disease. In addition there is no recognized classification system. According to Samim et al. prevalence of erythema multiforme is less than 1%[2]. It is a self-limiting, acute, immune-mediated disorder. It is associated with hypersensitivity reactions to viruses and drugs. Among the viral infections, the herpes simplex virus is of primary type. In Erythema multiforme, there is the appearance of typical target-like lesions on the skin[3]. These lesions are less than 3 cm in greatest dimension and are characterized by at least three zones of somewhat different colours. These typical target lesions are considered as the hallmark for Erythema multiforme diagnosis. Erythema multiforme can also present with atypical targets lesions. The atypical lesions present as raised lesions usually have only two zones of colour change[4,5]. Whenever there is bullae formation in the centre of either the typical or atypical lesions of Erythema multiforme, it is a marker of epidermal involvement[6]. If the rash involves only skin, it is termed as Erythema multiforme minor, and if mucosal membranes are affected, it is called Erythema multiforme major[7,8]. Erythema multiforme was considered as a spectrum which includes Erythema multiforme minor, Erythema multiforme major, Stevens-Johnson syndrome(SIS) and toxic epidermal necrolysis(TEN)[9]. But later Bastuji-Barin et al. presented another grouping and describe Erythema multiforme

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as a separate entity from TEN/SJS with distinct etiology, pathogenesis and clinical features[10]. Many causes of Erythema multiforme have been identified; out of which infectious etiology is most common[2], including Herpes Simplex Virus (HSV), Herpes Labialis, Mycoplasma pneumonia and Fungal infections[7,11,12]. Other cause include drugs like Sertraline[13], alendronate sodium[1], Infliximab[14], Herbal drugs[15], Barbiturates, NSAIDs, and Penicillins[3,16,17]. There are numerous disorders that may clinically present with skin or mucosal lesions that resemble with the manifestations of Erythema multiforme. That is why there is a long list of differential diagnosis which needs to be excluded from the erythema multiforme e.g. pemphigus vulgaris, paraneoplastic pemphigus, mucosal bullous pemphigoid, and linear IgA dermatosis. In addition, primary herpetic infection, other viral diseases such as hand-foot-mouth disease, erosive lichen planus, fixed drug eruption, lupus erythematosus, urticaria, cutaneous vasculitis, and some neutrophilic dermatoses have to be considered in the differential diagnosis of Erythema multiforme[3,8,18].

For diagnostic confirmation of Erythema multiforme and to differentiate it from other related disorders, clinical information is certainly the most important tool. However, other essential tools include histopathology, immunofluorescence and serological studies[7,19]. Immunofluorescence and electron microscopy are expensive diagnostic modalities. Pakistan is a developing country, where it is not possible to have immunofluorescence and electron microscopy in each and every laboratory center of Pakistan, therefore the reliance of diagnosing Erythema multiforme stays much on clinical correlation and accurate identification of histopathological features. Erythema multiforme presents with a wide spectrum of histological changes. A practicing histopathologist must be aware of theses varied histological features. In view of this rationale, the current study will focus on spectrum and frequency of these histological changes.

MATERIAL AND METHODS

This retrospective descriptive study was conducted at Pathology Department, Pakistan Institute of Medical Sciences, Islamabad from January 2015 to January 2018. A total of 34 out of 44 cases of Erythema multiforme fulfilled the inclusion/exclusion criteria. Skin biopsies of all age groups and both sexes were included in the study. The cases with autolysed tissue and cases having a history of Stevens-Johnson syndrome and toxic epidermal necrolysis were excluded from the study. The Non-probability purposive sampling technique was used. The blocks and slides of these cases were retrived from the hospital record. All the relevant information regarding the age, gender and date of procedure were retrieved from the hospital record management system and noted in the patient proforma sheet. The gross descriptive details i.e. measurements, weight and color were noted from the available biopsy reports. The slides were prepared from the tissue block in cases having the tissue blocks only or the cases in which the slides were broken or were of bad quality. The prepared slides were stained with Hematoxylin and Eosin (H&E). The criteria for microscopic morphology included epidermal and dermal changes. The epidermal changes studied during the research were hyperkeratosis, epidermal necrosis, scab formation, acanthosis, hemorrhage and ulceration. The dermal changes were categorized as perivascular inflammation, granulation tissue, mucinous degeneration of collagen and fibrin thrombi. All the microscopic findings were registered in the proforma. Cases were reviewed by two histopathologists, and the final diagnosis was rendered after consensus. All data was entered into SPSS version 24. Frequencies of various histopathological changes were calculated.

RESULTS

The most common histological feature shown in all 34 cases (100%) was perivascular inflammation, while the least common features were scab formation and ulceration (17.6% each) (Table 1). There were 12 (35%) males and 22 (65%) females. The most common age group was between 40 to 70 years with a total of 22 patients in the said group (65%) (Figure 1). Photomicrographs showed features of perivascular inflammation, acanthosis, hyperkeratosis and granulation tissue (figure 2 and 3).

Table 1: Frequency of different morphological features in the patients of Erythema Multiforme.

Morphological features	Present	Percentage
Perivascular inflammation	34	%100.0
Hyperkeratosis	32	%94.1
Granulation tissue	32	%94.1
Mucinous degeneration	27	%79.4
Acanthosis	21	%61.8
Epidermal necrosis	16	%47.1
Fibrin thrombi	17	%50.0
Hemorrhage	11	%32.4
Scab formation	6	%17.6
Ulceration	6	%17.6

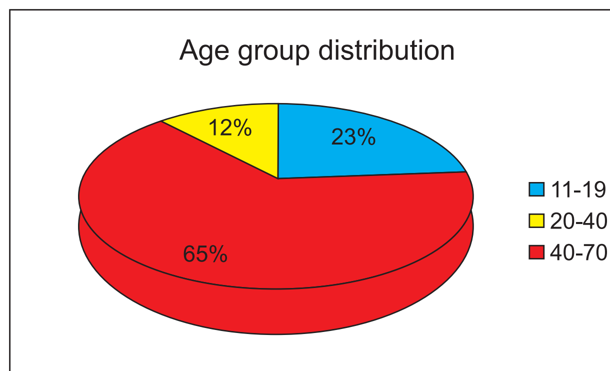

Fig 1: Age group distribution among patients of Erythema multiforme.

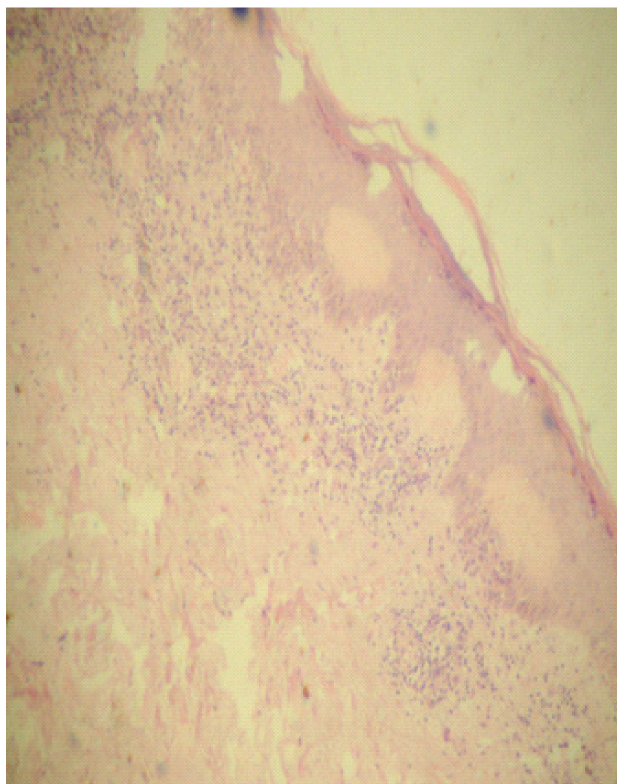

Fig 2: Photomicrograph of Erythema Multiforme, H & E, 10 x magnification.

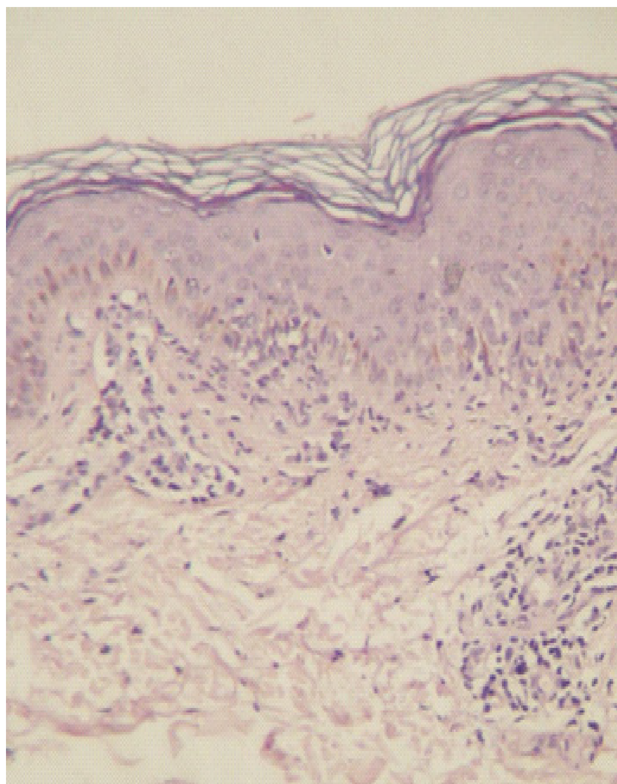

Fig 3: Photomicrograph of Erythema Multiforme, H & E, 20 x magnification.

DISCUSSION

Perivascular inflammation was the most prominent histological feature in all cases in our study. In addition to the perivascular inflammation, the interface dermatitis was also seen in 16 cases having epidermal necrosis as well. Most of the cutaneous inflammatory diseases present with perivascular dermatitis, however, the interface dermatitis narrows down the wide range of differential diagnosis for cutaneous inflammatory diseases. In interface dermatitis, there is a lymphocytic inflammatory response at the dermoepidermal junction, which ultimately leads to the apoptosis of keratinocytes. The death of the keratinocytes give rise to vacuolizations in the basement membrane, eventually leading to the formation of clefts. The top most important differential diagnoses of perivascular dermatitis with interface dermatitis with basement membrane vacuolizations are erythema multiforme, drug rash, pityriasis lichenoides[20,21].

In most of the cases, the inflammatory infiltrate comprised of lymphocytes and histiocytes. In addition to the lymphohistiocytic infiltration, nine cases were showing an appreciable number of neutrophils. There was predominance of eosinophils in 4 cases. In our opinion, the reason for the predominance of eosinophils in the 4 cases was due to drug hypersensitivity. However, it could not be confirmed as the history of the patients was not available. Presence of eosinophils in drug-related Erythema multiforme is also documented by other studies[22,23]. The Erythema multiforme caused by the Herpes virus usually do not show eosinophils[24]. Absence of eosinophils in most of the cases show that Erythema multiforme could be due HSV and not due to drugs. According to some authors, they have divided the histological features of Erythema multiforme into predominantly inflammatory pattern and predominantly necrotic pattern. It is seen in one of the studies that the nature of HSV induced Erythema multiforme was predominantly inflammatory, while the drug-induced Erythema multiforme was having predominantly necrotic pattern[25].

The second most common histological features were the hyperkeratosis and granulation tissue. Both of these features were present in 32 (94%) cases. The hyperkeratosis was in the form of orthokeratosis. As a part and parcel of immune-mediated situations, the immune cells play a vital role in the formation of granulation tissue. Mostly the macrophages and neutrophils are involved in granulation tissue formation[26].

The mucinous degeneration was seen in 27 (79 %) cases. In case of Erythema multiforme the blister formation shows hydropic degeneration and infiltration of mononuclear cells, especially the lymphocytes in the epidermis. There are also degenerative changes in the basal cell and keratin layer[21,27]. Acanthosis was present in 21 cases (62%) in our study. Buchner et al in his famous study,

found acanthosis in 76% out of total 25 cases[28]. The epidermal necrosis was seen in 16 cases (47%) (see table 1). A pattern of full-thickness epidermal necrosis was seen in 4 out of 16 cases having the epidermal necrosis. While the remaining 12 cases showed the epidermal necrosis which was limited to the lower 1/3rd layer of epidermis including the basal layer with interface dermatitis. The magnitude of having the epidermal necrosis may correlate with the age of the lesion. However, one point was noted that the lesion having limited epidermal necrosis showed stratum corneum with an intact basket woven appearance. These changes in the epidermis were also observed by bedi et al[29].

Papillary edema and hemorrhage were seen in 11 (32%) cases, which is ccontrary to a study done by Bedi et al in which it was present in all the cases[30]. This could be attributed to damage of the dermal blood vessels by the inflammatory infiltrate. The blood vessels are damaged by the inflammatory cells. They become leaky and show extravasation of red blood cells and plasma fluid to leak out leading to edema. It was observed that those cases in which there was papillary edema the severity of the epidermal necrosis was more. The logical reason for this increased amount of necrosis is that the epidermis does not have its own blood supply and it gets its nutrition and oxygen from the blood vessels in the dermis. So edema creates a barrier between the dermal blood vessels and the epidermis, which ultimately hampers the process of diffusion[7,28].

The fibrin thrombi were seen in 15 (44%) cases, which was also noticed by other studies.6 Scab formation was present only in 6 (18 %) cases and it was consistent with Lozada et al[30]. Ulceration was observed in 6 (18 %) cases. The ulceration is a common feature of the Erythema multiforme minor and is usually found in the oral mucosa. The lesion has an erythematous plaque-like appearance. Sometimes the lesions have active epithelial necrosis and may progress to superficial ulcerations. These ulcerations may have erosions with irregular edges[6,31].

The range of age in the present study was between 11 and 70 years. The age range is in accordance with the study done by Howland WWet al according to which the range of patients was between 10 and 70 years[32]. Nearly the same results are also published by Cretu et al[33]. Of these cases, 22 (65%) patients were in the 20 to 39 years' group. According to Cretu et al. the peak incidence in their retrospective study was also seen in the same age group[33]. Erythema multiforme is usually seen in the 3rd and 4th decade of life, but it can be present in children and adolescents[1,4,6,34]. Regarding gender, 65% of our cases were male and 35% were females. It was in contrast with Weintraub et al where 66.7% were females and 33.3% were males[4]. However other studies either mentioned that there is no gender predilection[1], or there was male predominance as highlighted by Shabahang et al and Sanchis et al respectively[11,35].

LIMITATION OF STUDY

Our study did not include immunofluorescence, electron microscopy and extensive clinical data, because of logistics issue. We hope further studies should be focused to overcome these limitations.

CONCLUSION

Microscopic features are varied but distinct which help in arriving at an accurate diagnosis of Erythema Multiforme. The most common histological feature is perivascular inflammation with interface inflammatory infiltrate. Other features include hyperkeratosis, granulation tissue formation, mucinous degeneration and acanthosis.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Khan P:	Main idea, Practical work (Sample collection, preparation & microscopy)
Mudassar M:	Literature review, Discussion
Baloch FA:	Statistical analysis, Literature search, Conclusion
Waqas M:	Critical review of manuscript
Khan A:	Bibliography

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

ORIGINAL ARTICLE

ASSESSING THE MYCOLOGICAL SPECTRUM OF INFECTIONS OVER A COURSE OF THREE YEARS

Aftab Ahmad Khan, Rizwan Uppal, Gul E Rehan, Hina Zaib, Farhat Khurshid, Khurshid Ahmad

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ABSTRACT

Objective: To determine the spectrum of fungal isolates in superficial as well as deep seated infections in samples received from Federal Capital and Rawalpindi.

Material and Methods: It is a cross sectional study conducted over duration of three years at Department of Microbiology, Islamabad Diagnostic Center. The samples included specimens, collected from superficial and deep seated tissues/fluids.

Results: Skin (n=71) and nail (n=22) samples were the most common specimens from superficial body sites. In deep seated specimen's sputum/oral cavity samples and body fluids comprised of predominant samples, contributing 46.6% and 18.3% respectively. Overall out of total 60 positive cultures for deep seated infections 53.3% were positive for Candida and 23.3% for Aspergillus. Whereas the isolates found in superficial infections comprised mostly of Aspergillus (42.7%) and Epidermophyton (28.1%).

Conclusion: In different geographical locations, fungal infections and their spectrum vary considerably and in cases with high probability and clinical suspicion of fungal infection, mycological workup for the exact diagnosis is direly needed.

Key words: Fungal isolates, superficial infections, Candida.

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INTRODUCTION

Human beings live in amicable harmony with the microorganisms that surround them. Infections only emerge when the concentration of pathogens reaches an exceptionally high density or the human defense system is damaged. Etiology of infectious diseases includes bacteria, viruses, parasites, fungi, prions, worms and helminthes.

Due to the emergence of effective strategies to control bacterial infections in patients, fungi have become the most hazardous pathogens now. In patients admitted in Intensive Care Units, yeasts and molds are now among the 10 most frequently isolated pathogens. In approximately 7% of all patients with neutropenia febrile episodes are due to invasive fungal infections[1]. Whereas, in general population, fungal infections are reportedly affecting 3%-5% of people[2].

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The geographic location and climate clearly affects the prevalence and pattern of fungal isolates. The hot and humid climate in our region erroneously favors fungal growth in the environment[3]. Fungal infections comprise a significant health problem in our country. A major percentage of these infections are undiagnosed due to inadequate mycological diagnostic facilities[4]. The exact burden of fungal infection in Pakistan is not known, however fungal keratitis has an estimated rate of 44/100,000. After reviewing published data from Pakistan reporting fungal infections, it was found out that Pakistan has probably a high rate of unreported life-threatening fungal infections[5].

Cutaneous fungal infections are superficial infections typically affect skin, hair, and nails. Most commonly, these fungal infections are caused by dermatophytes (fungal organisms that causetinea) and non-dermatophyte fungi and yeast (Candida species). Three dermatophyte genera that are identified in U.S are Microsporum, Epidermophyton, and Trichophyton. Among them approximately 80% of dermatophytic infections are caused by Trichophyton6. As the airways are constantly exposed to environmental fungi, the most common ones isolated in chronic respiratory diseases are Candida albicans and Aspergillus spp. Out of these, various species of Aspergillus have the greatest pathogenic potential[7,8,9]. During reproductive

ages among women, Vulvovaginal candidiasis is a common fungal infection and studies have shown that different species of Candida are among the most common etiological agent of vaginitis[9,10,11].

In critically ill patients, invasive fungal infections are a leading cause of mortality and morbidity. Despite the advent of recent, more effective and less toxic antifungal agents, death rates from invasive fungal infections remain high[7,8]. In hospitals in the USA, Candida has emerged as the fourth leading bloodstream isolate, surpassing many bacterial pathogens[9].

Proper identification and treatment of fungal skin infections is a growing health concern. That is why, continuous surveillance of fungal isolates may lead to a better understanding about fungi and their pathogenic potentials ultimately leading to improvement in infection control practices[4,10,11]. Our study was conducted in order to look for the latest patterns of fungal isolates in our set-up as an effort of updating the clinicians.

MATERIAL AND METHODS

The study was conducted over a course of three years (Aug'2016- Aug'2019) at Islamabad Diagnostic Center (IDC). Permission was taken from Institutional Ethical Committee. All clinical samples for fungal culture received at IDC were included in the study. A total of 375 clinical specimens were part of the study. Skin, hair, nails were collected from patients who were having a clinical suspicion of superficial fungal infections. Whereas, samples like respiratory fluids, body fluids and tissues were collected from patients, who were suspected of having deep seated fungal infections.

The proper collection of relevant clinical material was done as per following recommendations.

Skin scrapings: The skin was cleaned thoroughly with 70% ethanol. A disposable sterile scalpel was used to scrape across the inflamed margin of the lesion into the apparently healthy tissue.

Skin stripping: A water-proof transparent vinyl tape was firmly applied to the affected area and then peeled off. This tape was then applied to a sterile glass slide for transport to the laboratory

Nail: Friable material was removed from under the nails. Clippings were also taken from the distal border of the nail with scissors or nail clippers.

Hair: Infected hair was removed by plucking with epilating forceps.

Sputum: Purulent sample were obtained if pulmonary fungal infection was suspected.

CSF: blood and other body fluids: They were collected with precautions so as to avoid skin yeast contamination.

Sample Storage & Transportation: The skin, hair and nail were allowed to dry to prevent the over growth of saprophytic bacteria for which a black paper packet was used for storing and transporting[12]. Clinical material was inoculated on Sabouraud's dextrose agar (SDA) (Oxoid, UK), containing chloramphenicol and cycloheximide and placed in incubator at 22∘C and evaluated daily for any fungal growth. Species identification was done through colony morphology and microscopic examination of fungal isolates by cellophane tape mount method[13]. The slides were then examined by the consultant microbiologist.

Data was collected with standardized forms and transferred daily to a server. The descriptive data was analyzed using SPSS version 25.0.

RESULTS

Total of 375 patients were included in our study. Out of them 156 were positive for fungal isolates (41%). These patients comprise of 63 male (40%) and 93 (60%) females (figure.1). 144 patients (92%) were adults (>17 age) and rest were children (figure.2).

Out of the total 156 positive cultures, 96 samples were from superficial sites while 60 samples were from deep seated locations. Overall the isolates found in superficial infections comprised mostly of Aspergillus (42.7%) and Epidermophyton (28.1%). Candida and Trichophyton were positive in 8.3% each where as Penicillium was detected in 6.6% samples.

In superficial infections most of the samples received were those of nails (n=71) and skin (n=22), making percentages of 74% and 23% respectively. Out of 71 positive isolates of nail 33(46.4%) were positive for tAspergillus, 20(28%) for Epidermophyton, 5(07%) for Penicillium and Trycophyton 4(5.6%) for Candida. The 22 positive skin samples were also showing significant yield for Aspergillus 8(36.6%) and 6(27.2%) for Epidermophyton. Three patients were found positive for Trichophyton (13.6%) (Table.1). Identification of the strains was done on the basis of distinctive morphological and growth patterns.

In deep seated samples, sputum/ oral cavity samples and fluids made significant percentages of specimen (i.e. 46.6% and 18.3% of patients respectively). Out of 28 samples of sputum, majority of them i.e. 19/28 (67.8%) were showing positivity for Candida. 8 out of 11 samples of body fluid were positive for aspergillus (72.7%) and 2 (18.1%) for Candida. Out of the 8 samples of bronchioalveolar lavage (BAL), most of them were showing growth of Candida (62.5%) see Table.2 for details.

Table 1: Site wise distribution of superficial infections.

Superficial Infections	Aspergillus	Aspergillus and candida	Aspergillus and epidermidis	Bipolarisspp	Candida	Epidermophyton	Epidermophyton and penicillium	Penicillium	Rhizopus	Trichophyton	Aspergillus and trichophyton	Total
Ear	-	-	-	-	1	-	-	-	-	-	-	1
Hair	-	-	-	-	1	1	-	-	-	-	-	2
Nail	33	-	1	1	4	20	1	5	1	5	-	71
Skin	8	1	-	-	2	6	-	1	-	3	1	22
Total	41	1	1	1	8	27	1	6	1	8	1	96

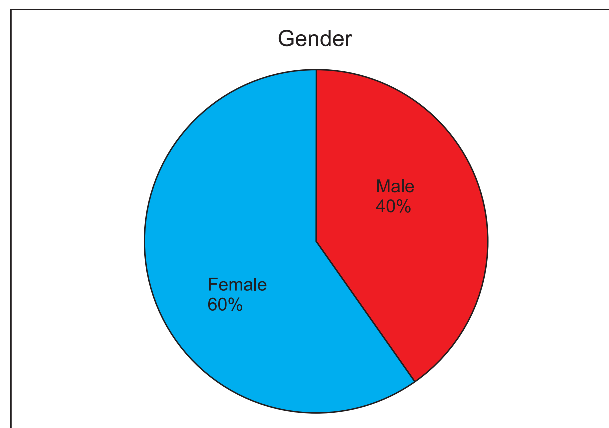

Fig 1: Gender distribution among positive isolates.

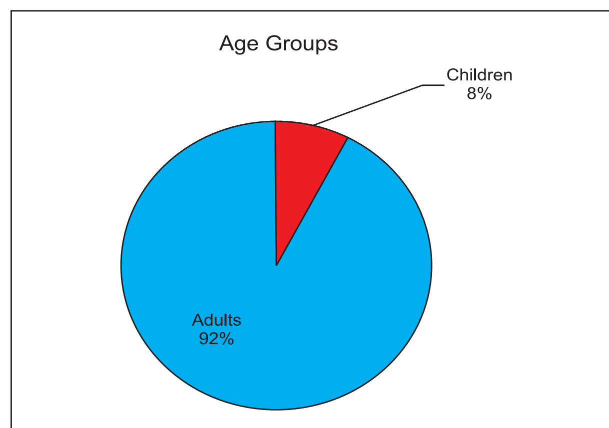

Fig 2: Age wise distribution in positive isolates.

DISCUSSION

Nowadays, fungal infections are among the most difficult diseases to be managed in human beings[14]. Early accurate diagnosis allows prompt initiation of antifungal therapy, however if it is delayed or unavailable, it may lead to serious outcomes and is always challenging especially in under resourced settings[15,16] like ours.

Superficial fungal infections are important because of their frequency, global distribution, person to person transmission, and morbidity[17,18]. Invasive fungal infection involve blood or invade into organ tissue and are also referred to as deep, deep-seated, disseminated, and systemic fungal infection[19]. Although superficial infections account for much of the global prevalence of fungal infections[20], invasive fungal infections are associated with high morbidity and mortality[21]. Many factors have contributed to the emergence of invasive fungal infections, e.g. HIV infection, patients receiving immunosuppressive treatment, indwelling prostheses, diabetes mellitus, burns, patients taking broad-spectrum antibiotics and individuals with frequent nosocomial exposure.

In the past few years, fungal diseases caused almost over 1.6 million deaths annually and over one billion people suffer from severe fungal diseases worldwide.

Nearly a billion people are estimated to have superficial fungal infections, and more than 150 million people have serious fungal diseases, which have significant morbidity or mortality[16,22,23]. Recent global estimates suggest 3,000,000 cases of chronic pulmonary aspergillosis, 223,100 cases of cryptococcal meningitis, 700,000 cases of invasive candidiasis, over 500,000 cases of Pneumocystis jirovecii pneumonia, 250,000 cases of invasive aspergillosis, 100,000 cases of disseminated histoplasmosis, and 1,000,000 cases of fungal keratitis occurring annually[24].

Candida, Aspergillus, and Cryptococcus are among the most common fungal pathogens that cause life-threatening infections across the world each year 25 and goes in parallel with our study which also shows a significant prevalence of fungal infections, both deep seated and superficial especially due to Candida and Aspergillus.

Previous data published in Pakistan show that most of superficial infections are due to dermatophytes[11,26]. However, recently non-dermatophytes have emerged as an important cause of onychomycosis here as well as in India, Sri Lanka, Brazil and Argentina[27]. Our study is also revealing non dermatophytes (predominantly Aspergillus) as the predominant pathogen in skin, nail and hair specimens.

A study conducted in Iran had reported that fungal isolates in deep seated infections are mostly Candida followed by Aspergillus[28]. The same spectrum of fungi was isolated from our samples of deep seated infections as well.

There is limited knowledge about the global incidence of fungal diseases because of lack of regular national surveillance systems, poor clinician suspicion, diagnostic tests, and well-designed research studies[29,30].

CONCLUSION

Superficial and deep fungal infections are quite prevalent in our set up, most likely due to the climatic conditions, unhygienic circumstances, use of contaminated tools and compromised immunity. In case of the slightest clinical suspicion, mycological etiology must be worked up on. Thus, the assessment of pattern of fungal isolates is important for the clinicians to diagnose and treat the patients accordingly.

RECOMMENDATIONS

However, more studies, with larger sample sizes are required for a better approach to study the epidemiology of fungal infections nationwide. Mycological assessment should be done without delay on the basis of clinical doubt.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Khan AA: Concept, study design, manuscript writing, facilitation of the reagent and materials.

Uppal R: Study design, Facilitation of the reagent and materials, critical review.

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ORIGINAL ARTICLE

TRENDS AND PERCEPTIONS OF SOCIAL MEDIA AS A LEARNING TOOL IN HEALTHCARE PROFESSIONALS

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ABSTRACT

Introduction: Social media is an excellent platform both for sharing knowledge, information exchange and communication for the healthcare professionals. The new trends in social media have created a variety of opportunity for them both for learning and professional purposes.

Objectives: To conduct a survey regarding proportion of healthcare professionals utilizing social media for their academic and professional purposes

Material and Methods: This was a questionnaire based survey. In this study, 750 healthcare professionals were approached through different social media platforms as well as in hard form. The healthcare professionals were categorized into medical students, house officers, medical officers, post graduate residents and consultants. Out of these 750 healthcare professional, 512 filled the questionnaire, response rate was 68.3%.

Results: Among 512 participants, 309 (60.4%) were males and 203 (39.6%) were females. Post graduate residents contributed as the maximum participants 199 (38.9%) followed by medical students 93(18.2%). Among them, 125 (24.4%), 214 (41.8%), 101 (19.7%), 34 (6.6%) and 38 (7.4%) were using social media for 1-2 hours, 3-4 hours, 5-6 hours, 7-8 hours and >8 hours respectively. Maximum participants 369 (71.7%) were using WhatsApp along with other apps, followed by YouTube which was the most preferred App. Among them, 350 (68.4%) participants agreed that using social media was helpful for professional purposes, 335 (65.4%) recommended using social media for the professional purposes.

Conclusion: Majority of healthcare professionals utilize social media as professional and learning tool in their academic activities. WhatsApp and YouTube are the two most common modalities of social media utilized by healthcare professionals in this study. Majority of participants recommended using social media for professional purposes.

Abbreviation: HCPs: Healthcare professionals, PMDC: Pakistan Medical and Dental Council.

Key words: Healthcare professionals (HCPs), social media, social media apps

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INTRODUCTION

The use of social media is not a new concept. The development of World Wide Web created a lot of opportunities for sharing and updating knowledge. Social media have the potential to effect medical education in a variety of ways. Social media which is referred to as web 2.0 or "social media networking" gives a wider opportunity of active participation to individuals[1].

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Different individuals have different purpose of using social media. Social media keeps variety of features which serves the individuals and community in different ways. It includes social networks, videos and photos sharing sites, wikis, blogs and other networking apps like WhatsApp[2, 3].

Studies show that in the United States, adults proportion using social media has increased from 8% to 72% since 2005[4,1]. Between 2015 and 2016, both internet and social media users increased by 46% and 31% respectively. However, there are significant regional differences as well. It was concluded in 2012 that face book users exceeded one billion people across the globe[5,6]. In 2016, face book was declared as dominating social sphere with 1590 million active accounts, users were gravitating towards apps for networking like WhatsApp (one billion) and face book messenger (800 millions) apps while among

other platforms, Instagram, Twitter and LinkedIn continued to experience growth[7,8]. It was also estimated in 2013 that each day 100 million active twitter users sent approximately 65 million tweets and two billion videos were shared on YouTube[5]. The use of social media is prevalent among all ages and all professions. Pakistan is a country with low internet penetration having internet penetration of lower than the World average (23.8%)[9].

According to many studies, professional social networks are not widely disseminated among health care environment especially doctors and the reason seems to be the established pattern of their decision-making in patient care[10,11]. Literature review of four papers concluded that by 2011 among 1559 Korean emergency physicians, 13.07% (209) had joined face book, while 1.6% of US and 1.7% of Australian emergency physicians had joined twitter[12,13]. A study found that among the limited number of doctors utilizing social media, 44.1% were using it for professional networking and 29.1% for professional development by obtaining or disseminating research evidence[14]. A survey conducted on 40,000 physicians by social media site Quantia MD concluded that more than 90% of the physicians were using social media for personal activities while 65% were using it for professional activities[15]. However it is worth noted that the use of social media is increasing among healthcare professionals. A study conducted by Jadoon NA et al. concluded that in Lahore Pakistan, about 61% of the medical students were using the internet for academic and professional activities while 55.1% of them were using healthcare websites for flourishing their medical knowledge[9].

The use of the internet and social media are increasing among healthcare professionals in Pakistan. As most of the medical students, doctors use social media for their professional purposes. There are new trends among them to use social media for research purposes, challenges in their medical practice, listen to experts on social media, engage with the public, develop a professional network, augment personal awareness and medical news and discoveries, consult colleagues regarding patient care, promote health behavior and search new opportunities and jobs. However, there is limited local data available regarding the use of social media as a learning tool in our healthcare professionals.

This study will provide a base for the future research projects on social media as a learning tool in healthcare professionals. Therefore this study was conducted to determine the proportion of healthcare professionals utilizing social media for their academic and professional purposes in our setup.

MATERIAL AND METHODS

A questionnaire based study was conducted in Khyber Teaching Hospital Peshawar from February 2020 to April 2020. In this study, 750 doctors of different cadres and categories were approached. All those doctors and medical students currently enrolled/registered with KTH/KMC were included in the study. While the allied health staff like nurses and paramedics were not included in this study. Data was collected on a pre-designed questionnaire, which was validated after interviewing 30 HCPs on a pilot questionnaire. For effective analysis, HCPs were stratified into five groups' i.e. medical students, house officers, medical officers, post-graduate residents and consultants. Seven hundred and fifty HCPs were approached through different social media platforms as well as in hard form. Among them, 512 (68.3%) responded and filled the questionnaire. Data was collected on Microsoft Excel and then analyzed through SPSS 22. Mean and standard deviation were calculated for numerical variables. Frequencies and percentages were calculated for categorical variables.

RESULTS

Among 750 HCPs, 512 (68.3%) aged 18-60 years responded. Mean age was 28.69 years (± 5.96 SD). Among 512 participants, 309 (60.4%) were males and 203 (39.6%) were females.

These 512 participants were further divided into five groups on the basis of their designations. Among them medical students were 93 (18.2%), house officers 87 (17%), medical officers 74 (14.5%), post-graduate residents 199 (38.9%) and consultants were 59 (11.5%). In medical students 40 (43%) were males and 53 (57%) were females. Among house officers, 50 (57.4%) were males and remaining 37 (42.6%) were female professionals. In the medical officer stratum 45 (60%) were males and 29 (40%) were females. Among post-graduate residents (TMOs), 132 (66.3%) were males and 67 (33.7%) were females. Fifty nine consultants participated in this study. Among them 42 (71.2%) were males and remaining 17(28.8%) were females (Table 1).

Among 512 HCPs, 125 (24.4%) were using social media for 1 to 2 hours, 214 (41.8%) for 3-4 hours, 101 (19.7%) for 5-6 hours, 34 (6.6%) for 7-8 hours and 38 (7.4%) of the healthcare professionals were using it for more than 8 hours daily (in 24 hours). Majority of medical students (39.8%), house officers (33.4%), medical officers

(40.5%), PGR's (47.3%) and consultants (40.7%) were using social media for 3 to 4 hours daily (in 24 hours) while the majority of the healthcare professionals were minimally using social media for >8 hours in 24 hours (Table 2).

One hundred and twenty four (24.3%) healthcare professionals were using a single app, 143 (28%) were using two social media apps, 170 (33.2%) three social media apps and 75 (14.65%) four social media apps for professionals purposes. YouTube was mostly used (8.8%), followed by WhatsApp (7%) and then followed by face book (6.3%) as a single App. While using more than two social media apps daily, 369 (71.7%) HCPs were using WhatsApp, 362 (70.2%) HCPs YouTube, 332 (64.5%) face book, 51 (9.9%) twitter, 17 (3.3%) LinkedIn, 17 (3.3%) Medscape and 14 (2.7%) were using Zoom webinar along with other apps (Table 3). YouTube was the most preferred App by health professionals 178 (34.8%), followed by WhatsApp 168 (32.8%), Face Book 132 (25.8%), Twitter 22 (4.3%) and then LinkedIn 12 (2.3%) see Table 4 for details.

Medical students were more interested in using YouTube 32 (34.4%) followed by Face book 29 (31.2%) and WhatsApp 26 (28%). The most preferred App for house officers was YouTube 37 (42.5%), face book 23 (26.4%) and WhatsApp 19 (22%). Twenty five (33.8%) medical officers preferred WhatsApp, 24 (32.4%) YouTube, 20 (27%) preferred Face book. Among PGR, 74 (37.2%), 70 (35.2%), 43 (21.6%) and 9 (4.5%) preferred WhatsApp, YouTube, Face book and Twitter respectively. Twenty four (40.7%) consultants preferred WhatsApp, 17 (29%) preferred Facebook, 15 (25.4%) YouTube and 2 (3.4%) preferred usage of LinkedIn for professional purposes (Table 5). The perception of healthcare professionals regarding use of social media is presented in Table 7.

Table 1: Designation-wise distribution of participants.

Designation of participants	Gender Wise Distribution	Frequency (%)
Medical students	Male 40 (43%)	93 (18.2)
	Female 53 (57%)	
House officers	Male 50 (57.4%)	87 (17.0)
	Female 37 (42.6%)	
Medical officers	Male 45 (60%)	74 (14.5)
	Female 29 (40%)	
Post-graduate Residents	Male 132 (66.3%)	199 (38.9)
	Female67 (33.7%)	
Consultants	Male 42 (71.2%)	59 (11.5)
	Female17 (28.8%)	
Total		512 (100)

DISCUSSION

In this study, most of the participants 389 (76%) had ages between 25-45 years, which is consistent with the study conducted by Hazzam J, in which 71% of the participants had ages between 25-45 years.17 He also concluded that WhatsApp was the common app used by 65% of the healthcare professionals while in our study WhatsApp was the common one used by 71% of the participants along with other apps. These results are consistent with the results of our study.

In our study 70% of healthcare professionals were using YouTube for professional purposes. Similar results were also reported by Donzalez DDJ from Spain reported that 73% of the physicians were using YouTube for professional purposes[18]. This statement is further supported by similar results in a study conducted by Macdonald J from New Zealand[19]. In this study, 12.7 (65%) of the healthcare professionals recommended the use of social media for professional purposes which is consistent with the results reported by Wheeler CK[20]. Wheeler et al. concluded that majority of the physicians recommended use of social media for professional purposes. Our study is documenting that HCPs were preferably using at least one favorite app daily for learning and professional purposes. Same results were reported by Wallace S and Marfin M[21, 22]. Another study conducted by Wagner JP concluded that the male participants were more (62%) in comparison to females and this finding is also consistent with our study[23]. Our

Table 2: Time spent on social media by the respondents.

Time spent on social media in 24 hours	Status of the Respondents						Total
	Healthcare Professionals (As a whole)	Medical students	House officers	Medical officers	PGR's	Consultants	
	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	
1-2 Hours	125 (24.4)	12 (12.9)	14 (16)	21 (28.4)	55 (27.6)	23 (39)	125
3-4 Hours	214 (41.8)	37 (39.8)	29 (33.4)	30 (40.5)	94 (47.3)	24 (40.7)	214
5-6 Hours	101 (19.7)	20 (21.5)	27 (31)	13 (17.6)	32 (16)	9 (15.3)	101
7-8 Hours	34 (6.6)	10 (10.7)	9 (10.4)	4 (5.4)	9 (4.5)	2 (3.4)	34
>8 Hours	38 (7.4)	14 (15.1)	8 (9.2)	6 (8.1)	9 4.6	1 (1.6)	38
Total	512 (100)	93 (100)	87 (100)	74 (100)	199 (100)	59 (100)	512

Table 3: Proportion of HCPs utilizing commonly used social media apps.

Type of social media	Percentages %
WhatsApp	71.7%
YouTube	70.2%
Face book	64.5%
Twitter	9.9%
LinkedIn	3.3%
Medscape	3.3%

Table 4: Social media App's preference by Healthcare professionals.

Social media app	HCPs	HCPs (Gender wise)	
	Freq (%)	Male	Females
		Freq (%)	Freq (%)
Face book	132 (25.8)	95 (30.7)	37 (18.3)
YouTube	178 (34.8)	91 (29.5)	87 (42.8)
WhatsApp	168 (32.8)	96 (31.0)	72 (35.5)
Linked-in	12(2.3)	10 (3.2)	2 (1.0)
Twitter	22 (4.3)	17 (5.6)	5 (2.4)
Total	512 (100)	309 (100)	203 (100)

Table 5: Social media App's preference and designation-wise response by the Respondents.

Status of the responders	Social media App					Total
	Face book	YouTube	WhatsApp	Linked-in	Twitter	
Medical students	29 (31.2%)	32 (34.4%)	26 (28%)	01 (0.12%)	05 (6.28%)	93 (100%)
House officers	23 (26.4%)	37 (42.5%)	19 (22%)	02 (2.3%)	06 (6.8%)	87 (100%)
Medical officers	20 (27%)	24 (32.4%)	25 (33.8%)	04 (5.4%)	01 (1.4%)	74 (100%)
PGR's	43 (21.6%)	70 (35.2%)	74 (37.2%)	03 (1.5%)	09 (4.5%)	199 (100%)
Consultants	17 (29%)	15 (25.4%)	24 (40.7%)	02 (3.4%)	01 (1.5%)	59 (100%)
Total	132 (25.8%)	178 (34.8%)	168 (32.8%)	12 (2.3%)	22 (4.3%)	512 (100%)

Table 6: Perceptions of healthcare professionals regarding use of social media.

Perceptions of healthcare professionals	Responses of healthcare professionals				TOTAL
	Strongly Disagree	Disagree	Agree	Strongly Agree	
	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)
Use of social media helped Healthcare professionals a lot in their last examination	41 (8)	137 (26.8)	236 (46.1)	98 (19.1)	512 (100)
Social media is preferred over books for learning purposes by Healthcare professionals	128 (25)	192 (37.5)	167 (32.6)	25 (4.9)	512 (100)
Using social media is helpful for professional purposes	30 (5.9)	71 (13.9)	350 (68.4)	61 (11.9)	512 (100)
Use of social media is recommended for learning and professional purposes	28 (5.1)	86 (16.8)	335 (65.4)	65 (12.7)	512 (100)

study had more resident as participants among all HCPs while 9.9% and 3% of the participants were using twitter and LinkedIn respectively which are also consistent with Wagner JP[23]. The main limitations of this study were that only medical students and doctors of various categories from same institute were recruited. Pharmacists and allied health staff like nurses, paramedics were not included in this study. Another limitation was the exclusion of doctors aged >60 years. Health professionals were not asked whether they were using social media for personal uses or professional purposes. Most social media sites and apps like Wikipedia, mails, blogs, vlogs etc. were not included in options. Questions on patients and medical professional relation were not asked. A multicenter large scale validated study is required to overcome these shortcomings. On the basis of this study, it is recommended to conduct studies on the same topic in future with large sample size and to include allied health staff as well. Evaluation of communication of patients with Health care professionals is also recommended.

CONCLUSION

HCPs need new knowledge and experience for their career development and professional purposes. They need up-to-date knowledge and interaction with the colleagues and seniors to resolve problems related to their medical practice. Social media is an excellent platform for the HCPs both for learning and professional purposes. The efficient use of social media gives better and alternative ways of both learning and communication for the HCPs. This study concisely describes the trends and perceptions of HCPs by using social media as a learning tool.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Afridi I:	Study idea, concept, design and drafting
Haider I:	Study supervision, questionnaire development and critical revision
Khan D:	Statistical Analysis
Ahmad W:	Data collection, Bibliography
Khan OS:	Data collection, Bibliography

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

ORIGINAL ARTICLE

AWARENESS REGARDING DIABETES MELLITUS AND ITS MANAGEMENT AMONGST PATIENTS ADMITTED TO A TERTIARY CARE TEACHING HOSPITAL OF PAKISTAN

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ABSTRACT

Objectives: To find out awareness regarding Diabetes Mellitus and its management amongst patients admitted to a tertiary care teaching hospital of Peshawar

Material and Method: The study was conducted at Khyber Teaching Hospital and completed in 06 months' time. Non-Random Consecutive sampling technique was used for the collection of data. The survey was conducted as a cross-sectional study using questionnaires to guide the interview-based data collection from the patients. A pre tested questionnaire was used for data collection. Verbal consent was taken from the patients and data collected while respecting the anonymity of the individual participants. According to the recent data of prevalence of diabetes in Pakistan, the sample size was calculated to be 275 for the study. For the analysis of data SPSS version 23.0 was used. The Chi square test was used for significance testing of variables.

Results: A total of 275 interviews were conducted. Out of 275 who responded, 87.6% of the patients were suffering from Type 2 Diabetes Mellitus while 10.5% and 1.8% of the patients were suffering from Type 1 Diabetes Mellitus and Gestational Diabetes Mellitus respectively. Around 55% of the patients had poor knowledge about the disease. Almost 50.9% participants were unaware about the importance of regular glycemic monitoring, 27.3 % knew about HbA1c and its importance while 64.7% and 72.7% of the patient were unaware of recommended fasting and random blood glucose levels respectively. Approximately 48.7% of the participants were of the view that insulin is the end stage drug for diabetics and it in itself damages vital organs of the body.

Conclusion: The awareness of Diabetes and its complications is very low among the diabetic patients of Peshawar. Their awareness is crucial for us to control the increasing trends of the disease and its complications.

Key words: Awareness level, Diabetes Mellitus, Diabetic Patients.

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INTRODUCTION

Diabetes is a global health issue. The prevalence of type 1 and type 2 diabetes mellitus (DM) is increasing worldwide with rapid rising trends of type 2 diabetes, presumably because of increase in obesity and sedentary lifestyle[1]. It is a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas or by the ineffectiveness of the insulin produced. Such a deficiency results in increased concentrations of glucose in the blood, which in turn damages many of the body's systems, in particular the blood vessels and nerves[2].

Diabetes is a major cause of morbidity and mortality, though these outcomes are not due to the immediate effects of the disorder. They are instead related to the diseases that develop as a result of chronic diabetes mellitus[3].These include diseases of large blood vessels (macro-vascular disease, including coronary heart disease and peripheral arterial disease) and small blood vessels (micro-vascular disease, including retinal and renal vascular disease), as well as diseases of the nerves[3].

Diabetes mellitus has a worldwide prevalence with an estimated 422 million people affected by it in 2014, almost doubling from 4.7% in 1980 to 8.5% in the adult population[2]. In Pakistan, DM is becoming increasingly prevalent with 11.77% of the population having type II DM[4]. In Punjab, Sindh, Baluchistan and Khyber Pakhtunkhwa the prevalence is 12.14%, 16.2%, 13.35 and 9.2% respectively

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in males and 9.83%, 11.70%, 8.9% and 11.60% in females respectively. Males in urban areas are comparatively more affected[5].

Studies done in the country have shown that majority of the diabetic patients are not managing their disease well with their knowledge about the disease being partly responsible for the same,. There is a direct correlation between the diabetic control and patient's knowledge about the disease. Studies show inadequate knowledge about DM and its complications in majority of the affected individuals[-7].This unawareness is reflected in the inadequate control of the disease process leading to the complications of the disease[8]. Those in the rural areas are far less knowledgeable than the urban residents.

We aimed to do a survey of the inpatients in the Khyber Teaching Hospital (KTH) Peshawar in order to determine their awareness regarding the diabetes, its management and its potential long-term complications. Also we targeted to know the patients' familiarity with certain myths about the disease.

MATERIAL AND METHOD

The study was conducted at a selected tertiary care level hospital of District Peshawar, i.e. Khyber Teaching Hospital (KTH), after being reviewed and approved by the Committee for Ethical Review of Research involving Human Subjects of KTH. Non-Random Consecutive sampling technique was used for the collection of data and data collection was completed in 06 months' time i.e. from 1st August 2019 to 31st January, 2020. The survey was conducted as a cross-sectional study using a pre tested questionnaire to guide the interview-based data collection from the patients, which were selected by convenience sampling. The sample size was calculated using open Epi calculator, keeping confidence interval of 99%. Sample size calculated is 275 based on current prevalence of type 2 Diabetes Mellitus in Pakistan which is 11.77%. A total of 300 patients, suffering from Diabetes Mellitus, were approached during data collection. Only those which were unable to communicate, with decreased consciousness and those aged <13 years were excluded from the study (25 patients).

Verbal consent was taken from the patients before starting the interview-based data collection using questionnaires to guide. Data was collected while respecting the anonymity of the individual participants. All questions were asked in lay man language (local language, i.e. Pushto) instead of using medical terms. Google translator software was used for the translation of the questionnaires. The questions were asked directly from patients and his/her correct response was filled as aware. At the end of the interview, patients were counseled and educated regarding their disease. For the analysis of data SPSS version 23.0 was used. Calculations were done for frequencies, percentages, mean and Standard Deviation. Chi square test was used for significance testing of variables.

RESULTS

A total of 275 patients were approached for the interviews who responded to the whole questionnaire. Out of 275 who responded the questionnaire, 91 were male patients while 184 female patients participated with their mean age of 54.3 +13.5 (Table# 1).

Regarding awareness a detailed questionnaire was asked from the participants to assess their awareness level about the disease they are suffering from. The participants were assessed through the casual knowledge grading system used throughout Pakistan. This system ranks knowledge as 70% and above A-grade (excellent knowledge), 60-69% B-grade (good knowledge), 50-59% C-grade (sufficient knowledge) and 49% and below D-grade (poor knowledge) (Figure #1).

Education plays a vital role and increases the opportunities of awareness. As KTH is a government hospital, hence patients' presented are mostly with low socio-economic and educational background. When patient's awareness level was compared with the educational status it showed that by increasing the education status of the patient, we found statistical significant improvement in the awareness about the disease among the patients (Table# 2).

As DM is a chronic condition, increasing the duration of the illness can make a patient more prone to develop complications of the disease. The duration of the disease is an important factor that plays a role in increasing the understanding of an individual. When the participants' awareness level was compared to the duration of their illness, it showed a statically significant improvement in awareness level with increasing duration of their disease (Table # 3).

Patients were also assessed whether they knew about the complications of diabetes. Almost 50.9% of the participants were unaware about the diabetic complications while 49.1% were able to recall more than 3 diabetic complications. Patients were also assessed for the complication they themselves were suffering from at the time of the study. We found that approximately 30% of the participants were suffering from more than one diabetic complication, such as retinopathy and nephropathy. The awareness level of the patients was also compared with the number of complications patients were having (Table# 4).

Patients were also assessed about their knowledge of glycemic monitoring. This included whether they were checking their blood glucose at home and its importance (Table# 5).

Patients were also assessed for the awareness

about managing their disease and diabetic medications' modification during the month of Ramadan, the effect of exercise, dietary modifications on diabetic control and requirement of routine check-ups including foot care and eye examinations (Table#6).

When patients were assessed for the certain myths which are commonly used in our society, we found out that majority of the people considered them to be true. Regarding myth of insulin as last therapy or insulin damaging kidneys, 48.7% of the participants were aware of this myth and believed it to be true while 46.2% of the patients were unaware of it but were uncertain about their opinion; majority of them were of opinion that it can be true, 5.1% of the people were unaware of this myth and were unable to decide about its truthfulness.

There is another myth about insulin that once a patient is on insulin, he/she does not need any dietary modification for the glycemic control. Almost 65.8% of the participants were aware of this myth and believed it to be true while 34.2% of the patients were unaware of it but were of opinion that it can be true. Participants were also assessed about the myth which state that "There are two types of diabetes mellitus, one damages your bones only and the other is in your blood and affects every system of your body". A majority (76.0%) of the participants had heard of this myth but they believed it to be untrue.

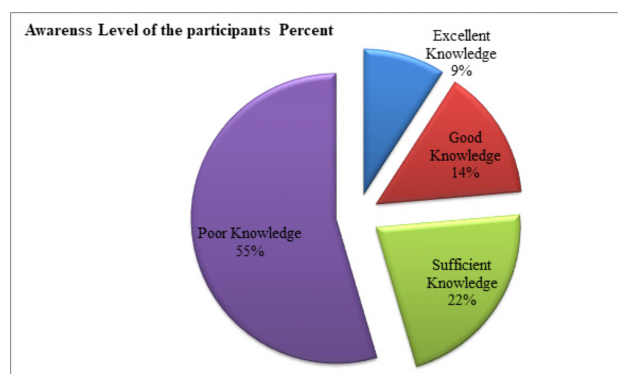

Fig 1: Awareness level of Participants.

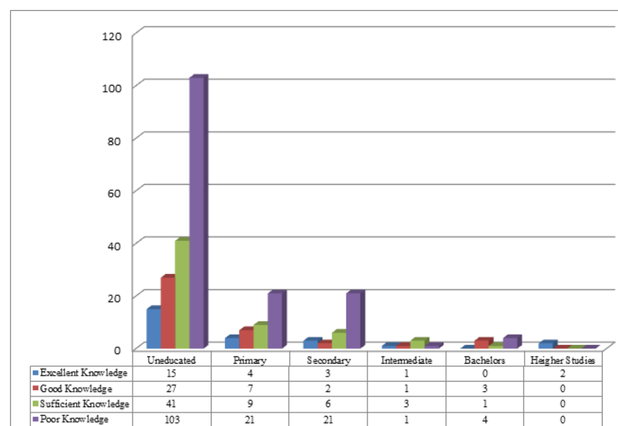

Fig 2: Relationship between educational status of the patients and their awareness

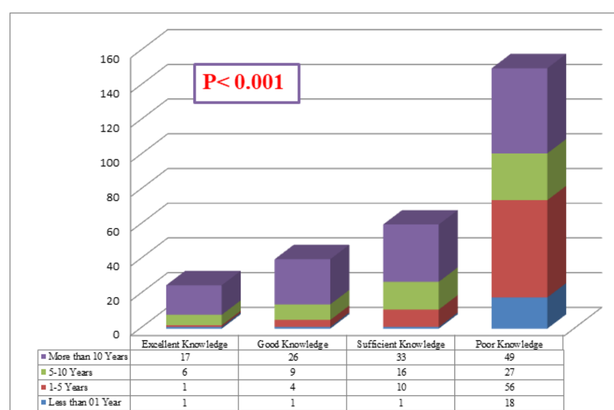

Fig 3: Statically significant improvement in awareness level with increasing duration of disease.

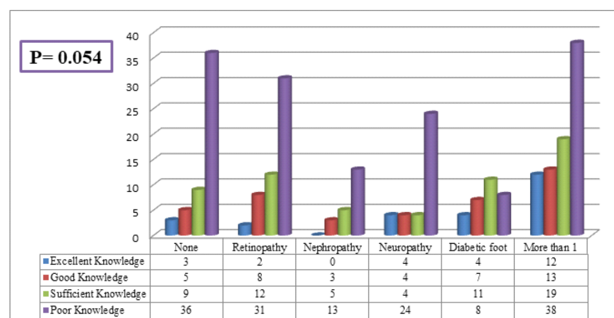

Fig 4: Statistical significant difference in the level of awareness of patients when the patients were affected from more than 01 complications of the disease.

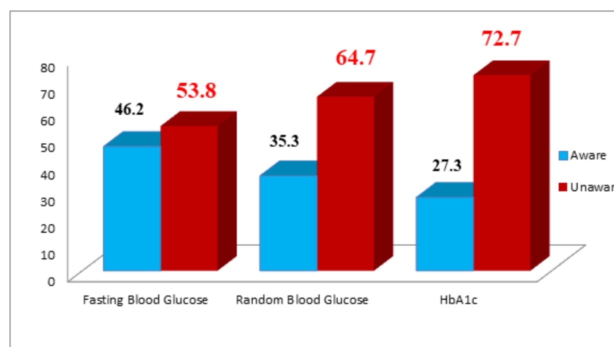

Fig 5: Awareness regarding Glycemic monitoring.

DISCUSSION

Multiple studies have reported that by increasing the understating of the disease, especially chronic illnesses, one can manage the disease more appropriately and rate of complications fall by improving the awareness level of patients[10]. We aimed this study to document the basic awareness level among the diabetic patients of Peshawar.

The results showed that the awareness level of the patients in our study was not up to the mark. Majority of the participants fell below sufficient knowledge level (55%). Similar results were found in a study conducted in

Table 1: Demographics of the participants.

	Frequency (n)	Percentage (%)
Gender of the participants		
Male	91	33.1
Female	184	66.9
Age of the participants		
Mean + S.D	13.5+ 54.3	
Type of Diabetes Mellitus Patient is suffering from		
Type 1 Diabetes Mellitus	29	10.5
Type 2 Diabetes Mellitus	241	87.6
Gestational Diabetes Mellitus	5	1.8
Duration Diabetes from which patient is suffering from in years		
Less than 01 Year	21	7.7
5-1 Years	71	25.8
10-5 Years	59	21.5
More than 10 Years	124	45.0
Family History of Diabetes Mellitus		
Yes	164	59.6
No	111	40.4
Diabetic Complication of participants themselves suffering from		
None	53	19.3
Retinopathy	53	19.3
Nephropathy	21	7.6
Neuropathy	36	13.1
Diabetic foot	30	10.9
More than 1	82	29.8
Diabetes Mellitus Treatment		
Life Style Changes	18	6.5
Oral drugs	88	32.0
Insulin	87	31.6
Insulin + Oral drugs	82	29.8

Table 2: Awareness regarding important variables for DM.

	Frequency (n)	Percentage (%)
Awareness about Hypoglycemic Symptoms		
Aware	161	58.5
Unaware	114	41.5
Awareness about managing Hypoglycemic Symptoms		
Aware	168	61.1
Unaware	107	38.9
Awareness about importance of foot care		
Aware	67	30.9
Unaware	159	69.1
Awareness about Glycemic control during Pregnancy		
Aware	13	4.7
Unaware	262	95.3
Awareness about effect of dietary modification for diabetic control		
Aware	181	65.8
Unaware	92	33.5
No comments	2	0.7
Awareness about effect of exercise for diabetic control		
Aware	181	65.8
Unaware	94	34.2
Awareness about managing the disease during Ramadan		
Aware	105	38.2
Unaware	170	61.8
Awareness about importance of Routine Medical Check-ups		
Aware	132	48.0
Unaware	143	52.0
Awareness about importance of Routine self-Check-up of feet		
Aware	91	33.1
Unaware	184	66.9
Awareness about importance of Routine Eye Check-ups		
Aware	100	36.4
Unaware	175	63.6

Quetta where it was observed that knowledge about diabetes; including awareness of complications of diabetes was poor[11]. Such results indicate that majority of the diabetic patients have not been educated about their disease by their physicians & other healthcare professionals. A few studies assessing the awareness levels of the healthcare professionals also have shown that even some of them don't have enough knowledge of diabetes, its complications and preventive strategies[12]. Many studies have been conducted to evaluate the awareness level in diabetic patients, but unfortunately the overall results are nearly the same[13,14]. The disease awareness is not only unsatisfactory in Pakistan but it's a global issue. Multiple studies in India, Singapore and Saudi Arabia reported inadequate education of the patients and general public about diabetes[15,16].

A similar study conducted in Malaysia states that the overall awareness levels of the patient was 81.9% along with the awareness about the risk factors of 69.6%. The study also reported that the patients with higher the educational status and income scored higher in the awareness levels[17]. Another study from India reported that the majority of the participants of their study had fair to good knowledge, they also stated that increasing the duration of the disease, increased the knowledge level of the patients[18]. Our study showed very similar results with statistically significant increase in awareness of the patients with increasing duration of the illness. Similar results were reported in Hong Kong[19].

In our study, approximately 51% of the participants were unaware of the complications of this lethal disease, while the remaining 49% were hardly able to enumerate more than three complications. A study conducted in Islamabad showed that the knowledge about complications of diabetes was not satisfactory. Only 32.4% female diabetics and 63% of male diabetics were aware of the complications [20]. Regarding the management of the disease when our participants were questioned about the target blood sugar levels majority were unaware of it. Only 35% of the patients knew about random blood glucose levels and were able to check them at home, while 72% of the patients were unaware of HbA1c, its importance and the measurement. Similar results were found in a study conducted in Turkey which showed that only 14.5% of the patients were able to check their plasma glucose levels by themselves and they were unaware about the significance of HbA1c[21].

It is extremely important to emphasize the fact that diabetes mellitus is incurable but controllable disease. Misunderstanding may cause the patients to be less cautious in taking preventive measures against the disease and its complications. In our study 60.4% of the patients believed in different myths regarding insulin while 89.4% of the population believed non-scientific myths regarding the disease itself to be true. This leads to misinterpretation of the disease, its complications and ultimately poor outcomes. A survey conducted in Karachi showed that more than 80% of respondents had misunderstandings about dietary management, similar to our study where approximately 65% of the participants were of the belief that once the patient is on insulin there is no role of dietary modification for the management of their illness[20].

A study conducted in Pakistan reported that 22.3% of diabetics had received diabetes education from their health care professionals. This was also observed during the survey that those patients who were frequently in touch with their physicians or had been counseled by a diabetes educator had some degree of awareness. This highlights the role of professional Diabetes Educators but unfortunately this approach is not being fully considered in Pakistan especially in public sectors.As stated above; the chronic lifelong disorders like diabetes can only be managed by proper education, counseling and use of rational treatment approaches by healthcare professionals to prevent short term and long-term complications. This will also decrease financial burdens, both for individuals and state as well, and decrease rates of morbidity and mortality.

A single center study on limited patients is the main limitation of this study. A large multicenter study across the country is the needed to find out the awareness level about diabetes mellitus.

We need to have national programs at basic health level to educate the patients about their disease at the start of diagnosis and there should be help available for them if they need any suggestion or guidance at any stage of their illness. The American Diabetes Association (ADA), clearly defined, the critical role of diabetes education in quality diabetes care. Courses like Diabetes Education and Self-Management for Ongoing and Newly Diagnosed Diabetes (DESMOND) or similar courses will help a lot.

CONCLUSION

Majority of the patients had poor or insufficient knowledge of Diabetes. Awareness of the public and in particular, patients is the need of the day to control the increasing trends of the disease in our community and prevent the long term mortality and morbidity associated with this disease.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Haroon M: Concept, data analysis and final Supervision

Khan HA: Questionnaire, Critical discussion and data interpretation.

Yousaf M: Data Collection and proofreading.

Ali MA: Statistical analysis and critical review.

Asad L: Literature review and database searching.

Tauqir W: Data Collection and proofreading.

Javeed E: Data Collection and proofreading.

Rana G: Literature review and database searching.

Afridi NR: Literature searching.

Umam S: Final drafting and proofreading.

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

ORIGINAL ARTICLE

EFFECTIVENESS OF COMBINATION THERAPY WITH SOFOSBUVIR AND DACLATASVIR IN HCV INFECTED PATIENTS

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ABSTRACT

Objective: To determine the effectiveness of combination therapy with Sofosbuvir and Daclatasvir in HCV infected patients

Material and Methods: This quasi experimental study spanning over six months from January 2019 till June 2019 was conducted in three tertiary care teaching hospitals of Khyber Pakhtunkhwa. A total of 255 RT-PCR confirmed genotype HCV infected patients were included. Combination therapy including standard dose Sofosbuvir (400mg) and Daclatasvir (60mg) regimen for 12 weeks was administered after recording baseline data. The SVR12 (sustained virologic response after 12 weeks) in these patients was observed by repeating the RT-PCR for HCV at 12 weeks after the completion of treatment.

Results: This study included 108(42.35 %) male and 147 (57.64 %) female with male to female ratio of 1: 1.36 and Mean age 42.23 ± 11.9 years. Among them 200 (78.4%) were treatment naïve and 55 (21.6%) were treatment experienced. A total of 249 patients (97.6%) achieved SVR12 responders and 06 patients (2.4%) failed to achieve SVR12 non-responders. This response to DAA treatment for HCV was clinically and statistically significant.

Conclusion: The standard three-month DAA therapy with Sofosbuvir and Daclatasvir for the treatment of HCV has better SVR12 when compared with conventional treatment.

Key Words: Sofosbuvir, Daclatasvir, Direct Acting Antiviral drugs (DAAs), Sustained Virologic Response (SVR12)

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INTRODUCTION

In the management of HCV infection modern technology with advanced testing and screening as well as latest treatment protocols have made the prevention and treatment of HCV related decompensated cirrhosis of liver a real possibility. HCV contributes far greater than that due to HBV in the overall 1.45 million deaths per year attributed to Viral Hepatitis[1]. When compared with HBV, its clinical course is particularly more chronic, has more chances of complications and carries an overall bad prognosis[2]. The higher rates of cirrhosis liver due to HCV therefore makes it important that in addition to measure aimed at prevention of new cases, effective treatment protocols are devised and implemented at earlier stages in those patients who have already been infected with HCV. In this way the disease burden of Cirrhosis liver can be lessened and a healthy society ensured. Globally HCV is prevalent at a rate 2.5%, while in Pakistan the figures are worse marking up to 6.4%. Worldwide, genotype 1 is the most prevalent (49.1%) followed by genotype 3 (17.9%)[3]. The Genotype 3a remains the most common (61.3%) genotype in Pakistan. When compared with other hepato-trophic viruses especially HBV, the lack of vaccine against HCV and its cumbersome therapy involving conventional interferon further complicates the management[4]. Following the discovery of HCV as a distinct hepatotropic virus in 1990's and the subsequent attempts at its successful treatment, Interferon α both in conventional and PEGylated forms along with the Guanosine nucleotide analog Ribavirin remained the cornerstone of treatment of the chronic HCV infection although with lesser sensitivity and specificity. Moreover, the adverse effect profiles like skin pigmentation, bone marrow depression and suicidal ideations related to this regimen made this treatment far from ideal. All this led to more research and clinical trials aimed at better therapeutic options. Ultimately the advent of directly acting antivirals (DAAs) since 2011 led to a paradigm shift in the treatment of HCV. The sequence of RNA gene for

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HCV has now been identified and specific targets there in are identified for therapeutic applications with better results with more sensitivity and specificity in the treatment approaches. Sustained Virologic Response (SVR) defined as the absence of detectable HCV RNA with an assay as sensitive as to detect less than 50 IU/ml six month after the treatment has now been set as gold standard in the management of HCV hepatitis and its complications. A desired value for such therapeutic approaches is set at SVR12 of 95% with these new DAA agents[5,6]. In fact SVR is directly related to prognosis and long-term complications in patients infected with chronic HCV. Historically the maximum SVR attained with interferon based therapy in combination with ribavirin was 45%. A recent study, however, reported mortality reduction of 62-84% with DAAs compared to interferon based therapy[7]. Likewise the 5-years risk of hepatocellular carcinoma (HCC) accordingly has been reduced from 9.3 to 2.9% with these novel drugs. This has also resulted in exponential reduction in risk of liver transplantation from 7.3 to 0.2% in patients with cirrhosis[7,8].

The first DAA was a protease inhibitor (PI). When used in combination to interferon it improved SVR to 75% but adverse effects were troublesome. With the development of other DAAs, including NS5A and NS5B polymerase inhibitors, combination therapy of DAAs with or without ribavirin attained SVR of 95%. Further, these combinations were pan genotypic i.e. they were effective against all the genotypes of HCV and were better tolerated with fewer adverse effects[9-12]. Sofosbuvir which is basically a prodrug is a nucleotide analog inhibitor of Hepatitis C virus NS5B polymerase, the key enzyme mediating HCV RNA replication. In fact it is changed inside the hepatocytes into uridine analog 5'-triphosphate form (GS-461203) which mimics the natural cellular uridine nucleotide and is incorporated by the HCV RNA polymerase into the elongating RNA primer strand, resulting in chain termination. This active form of Sofosbuvir does not affect host DNA polymerase, RNA polymerase or mitochondrial DNA. Daclatasvir as compared was the first discovered inhibitor of the non-structural viral protein NS5A. It inhibits viral RNA replication and virion assembly. It may also inhibit phosphorylation of the NS4A and therefore prevents the formation and activation of the HCV replication complex. Since then, different combination therapies have been offered. One study showed the combination of two DAAs (NS5B inhibitor Sofosbuvir and NS5A inhibitor ledipasvir) curing more than 90% treatment-naïve HCV positive patients without cirrhosis[13,14]. In a study on combination therapy with Sofosbuvir and Daclatasvir by Ossama A, 96% patients of HCV infected with genotype 4 showed SVR after 12 weeks of treatment[15].

Limited studies have been done on the clinical outcomes of combination therapy of Sofosbuvir and Daclatasvir on genotype 3 of HCV in our country. This study is aimed to determine the efficacy of combination therapy of Sofosbuvir and Daclatasvir in HCV infected patients in term of SVR12 in the settings of Pakistan and especially the Khyber Pakhtunkhwa. Getting a local data about the efficacy of Sofosbuvir and Daclatasvir in HCV infected will help improve the therapeutic approaches and also in better counselling of HCV positive patients who are candidates for treatment.

MATERIAL AND METHODS

This Quasi experimental study was conducted at Departments of General Medicine, Lady Reading Hospital Peshawar, Khyber Teaching Hospital Peshawar and Mardan Medical Complex Mardan, from January 2019 to June 2019. Elaborative inclusion criteria were devised. Two fifty five (255) patients from a total of 270 patients in the age group of 18 to 70 years were enrolled. These patients already had third generation Enzyme Linked Immunosorbent Assay (ELISA) done which showed Anti HCV antibodies and their Liver Function Tests showed serum ALT levels higher than the upper limits. Quantitative RT-PCR was done to determine viral load which was followed by the Genotyping. The demographic data along with the addresses for the follow up as well as thorough clinical, laboratory and imaging assessment of all patients was recorded prior to the start of treatment.

At the initial inclusion into the study detailed medical history including history of any previous treatment for HCV was noted to ascertain whether they were treatment naïve or not. Patients showing clinical signs of decompensated liver cirrhosis were excluded. Baseline laboratory tests including Liver Function Tests (LFTs), Renal Function Tests (RFTs) with eGFR, Complete Blood Count, Alpha Fetoprotein were done routinely. Co infection with HBV was accordingly ruled out and pregnancy test in married female patients of child-bearing age was performed for exclusion from the study. Abdominal ultrasonography was done for determining echogenicity and nodularity of the liver with estimation of Portal vein diameter and any signs of splenomegaly. For the performance of HCV PCR blood samples were obtained from all patients, centrifuged, and then stored at - 20°C. A quantitative measurement serum load of HCV was performed by real time PCR (Cobas Ampliprep/Taqman HCV Monitor version2.0, with a detection limit of 15 IU/ml; Roche Diagnostic Systems, USA), and it was repeated at the end of treatment, and 12 weeks after completion of treatment to detect SVR 12. The Genotyping was only done initially at the start of the study which confirmed HCV genotype 3 as it is the most prevalent genotype in the country[4].

Strict exclusion criteria was enforced including patients with hepatitis B virus co-infection, advanced liver disease (decompensated cirrhosis) or HCC (hepatocellular carcinoma), eGFR $<$ 30ml/min, hemoglobin less than 8g/dl or platelet count less than 50,000/mm^3.

A written informed consent was obtained from the patient on a printed proforma and appropriate consultation and follow up incentives were provided to the patients including preferential checkup and laboratory facilitation.

Treatment eligible patients were given oral Sofosbuvir 400mg and oral Daclatasvir 60mg daily for 12 weeks. During treatment, they were closely monitored at regular follow up at week 2, week 4, week 8 and week12. This included both clinical evaluation and by needful laboratory studies including CBC, creatinine, AST, ALT and total bilirubin.

The end point of our study was detecting the percentage of patients with Hepatitis C (both treatment naıve patients and treatment experienced) who achieved Sustained Virologic Response (SVR) at follow up week 12 (SVR12). Viral load less than 50 IU/ml on RT PCR for HCV RNA after 12 weeks treatment was defined as SVR 12 responder. Values greater than this with signs of clinical deterioration were ascribed as failure to attain SVR12 and thus labelled as non-responders.

The subjective improvement in response to treatment was assessed using Likert scale for agreement to the sense of well-being (Qualitative) in addition to their reporting the major side effect. The data was collected and analyzed on SPSS version 22. P-value of less than 0.05 was set as statistically significant.

RESULTS

A total of 270 patients who presented with history of HCV Hepatitis, either self-presenting or cases of referral; 255 were included in the study and 15 were dropped out from the study based on exclusion criteria. Among these 15 patients, 12 were having decompensated liver cirrhosis, one lady was pregnant, one patient had HBV co-infection and one patient had eGFR less than 30ml/min.

Two patients lost during follow up were replaced with new cases based on inclusion criteria. This RT PCR confirmed HCV Hepatitis patients were enrolled from January 2019 to June 2019, hence with a sample size reduced to 255. Table 1 outlines the number and percentage of distribution of the gender in the study population. Among these 255 studied patients, 108 patients (42.35%) were male and 147 patients (57.64%) were female. Male to female ratio was thus 1: 1.36. Age of the patients ranged from 18 to 70 years. Mean age was 42.23±11.9 years. Based on the age, patients were divided into different age groups. Majority of the patients (80 patients, 31.4%) belonged to the age group 31-40 years, followed by 41-50 years age group (69 patients, 27.1%), 52 patients (20.4%) were in the age group 51-60 years, 32 patients (12.5%) in 21 to 30 years age group and 15 patients (5.9%) represented 61 to 70 year age group . Only 7 patients, (2.7%) were noted in the age group 18-20 years (Table 2).

Regarding the laboratory data, the study revealed a pre-treatment mean ALT of 47±3 U/L. On Abdominal ultrasonography 239 patients (93.7%) had normal liver echogenicity prior to treatment and 16 patients (6.3%) had hepatic fibrosis normal size liver and Grade 1 echogenicity. Among the study sample 200 patients (78.4%) were treatment naïve and 55 patients (21.6%) were treatment experienced with either Interferon or single DAAs or both but not in combination.

Table 3 presents the data regarding the main yield in this study i.e. the attainment of SVR12. It is evident from this table that at the conclusion of the study at 12 weeks among 255 patients who had received standard dose of Sofosbuvir and Daclatasvir for 12 weeks, 249 patients (97.6%) were responders i.e., attained SVR12, while 06 patients (2.4%) were non-responders i.e., didn't attain SVR12 Post-treatment mean ALT observed was 23±2 U/L. Among the six non-responders, 03 (50%) were male and 03(50%) were female. Only one non-responder patient was treatment naïve and rest (05 patients) had treatment experienced in the form of PEGylated interferons with Ribavirin for six months.

Using the Likert scale as the basis for Qualitative assessment for the sense of well-being after the completion of treatment it was found that a vast majority of patients; 225 (88%) patients were strongly agreeing to the benefit of treatment in that they were feeling better at the completion of treatment (Table 4)

Table 1: Gender distribution among the participants of the study

Participant's Gender	Representative Number	Percentage (%)
Male	108	42.35
Female	147	57.64
Total participants	255	100

Table 2: Age group distribution among the participants of the study

Age group (in years)	Total numbers in this group	Percentage (%)
18 to 20	07	2.7
21 to 30	32	12.5
31 to 40	80	31.4
41 to 50	69	27.1
51 to 60	52	20.4
61 to 70	15	5.9

Table 3: SVR12 status of the patients in the study at the conclusion of 3 month treatment

SVR12 status (n= 255)	Responders	Non Responders
Total number	249	06
Percentage (%)	97.6	2.4

Table 4: Likert scale for the sense of well-being after the completion of treatment

Likert scale	Number of patients	Percentage (%) (Approx.)
Strongly agree	225	88
Agree	19	7
Undecided	3	1.5
Disagree	3	1.5
Strongly disagree	5	2

DISCUSSION

Sofosbuvir in daily dose of 400 mg is a pan-genotype directly acting antiviral used for the treatment of HCV. It is a NS5B inhibitor that is taken once daily with fewer adverse effects and good compliance[16-18]. Daclatasvir is also effective against all HCV genotypes taken once daily. Unlike Interferons both are administered orally thus increasing their compliance by the patients and are easily tolerated with superior safety profile. There are very few drug interactions with concomitant medications via weak induction of cytochrome P450 enzymes. No dose adjustment is required for patients with compromised renal functions because of their hepatic metabolism; that's why high SVR rate has been observed for combination therapy of Sofosbuvir and Daclatasvir particularly against resistant cases of genotype 1 to 4[19, 20].

In our study 97.6% of patients achieved SVR12 (responders) with standard 12 weeks treatment with Sofosbuvir and Daclatasvir. All of them showed better tolerability and only 2.4 % patients did not attain SVR12 (non-responders). These results are significant comparing to similar results reported by Nelson DR in their ALLY-3 Phase III study for genotype 3 in which 90% treatment naïve and 86% treatment experienced patients with an overall 89% patients achieved SVR 12 with the standard regimen[21].

In our study both male and female patients showed equal response to treatment and no effect of gender on the outcome was observed (p-value = 0.703). In fact gender, age and baseline HCV RNA levels all had no effect on the SVR12. A significant association of response to treatment was observed with the underlying liver status (p value= 0.01). Patients with normal liver had better response to treatment compared to those who had features of fibrosis even without decompensation. On that account our study was confirmatory to similar association demonstrated by Nelson DR et al in their study[21]. Based on the results of our study better outcomes were also showed by patients who had received previous treatment with conventional interferon based therapy and then presented with relapse. This was consonant with the better response to standard regimen of Sofosbuvir plus Daclatasvir shown by Sulkowski MS[22]. Combination therapy with Sofosbuvir plus Daclatasvir for HCV was better tolerated vast majority of the patients in the study.

Based on this study the recommendation on this regimen for the treatment of HCV in Pakistan should be prioritized over the other treatment modalities available at the moment by the National Health authorities for the maximum benefit to the patients and public at large. A large multicentre national study is required to generalize the impact of outcome.

CONCLUSION

Combination therapy with Sofosbuvir and Daclatasvir for the treatment of HCV has better efficacy in term of SVR12. The regimen is equally effective for both treatment naïve and treatment experienced patients.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Uddin Z:	Conception of idea, overall supervision
Suleman S:	Data collection, drafting and data analysis
Shahzeb:	Compilation of data, manuscript writing.
Ullah I:	Questionnaire development and statistical analysis
Zia S:	Data interpretation and proofreading
Fida Z:	Data interpretation and proofreading

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

ORIGINAL ARTICLE

AWARENESS LEVEL OF DOCTORS REGARDING CORONA VIRUS INFECTION DISEASE (COVID-19)

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ABSTRACT

Objective: To assess the awareness level of medical doctors regarding COVID-19

Material and Methods: This cross-sectional study was conducted by Department of Medicine, Khyber Teaching Hospital Peshawar. A total of 283 medical doctors including dental/medical undergraduates of final year professionals, postgraduate residents and fellows participated in the study and filled an online validated questionnaire. The questionnaire comprised of questions about characteristics of study participants, origin and nature of COVID-19, clinical features and complications of COVID-19, diagnosis and management of COVID-19 and lastly about preventive measures against COVID-19. The results were stratified into tables on the basis of qualification of the study participants. Data was analyzed by SPSS 23 and presented in tables.

Results: Results of the survey indicate that doctors are generally aware about the different aspects of COVID-19. About 96.1% doctors were aware of bat origin of COVID-19; 49.5% were aware about animal to person and person to person mode of spread of corona virus; 83.4% were aware about droplet borne mode of transmission of coronavirus infection; 91.9% doctors knew about up to 2 weeks incubation period of COVID-19 and 97.2% of the participants were informed that COVID had been declared a pandemic by World Health Organization (WHO). Seventy-seven percent (77%) doctors were aware that dry cough is a common presentation of COVID-19 among the options of runny nose, body aches and pains and dry cough; 82% were aware that acute respiratory distress syndrome (ARDS) is the most lethal complication of COVID-19; 55.8% study participants were aware that COVID-19 was causing most of the daily mortalities in current COVID pandemic while 75.3% doctors were aware about 2% global fatality rate of COVID-19.

Most of the study respondents (97.2%) were informed about viral RNA PCR from nasopharyngeal swab as diagnostic modality for COVID-19; 87.6% doctors were aware about most common computed tomography (CT) chest findings of bilateral lung infiltrates and 89% respondents knew about supportive care as ultimate care for patients with COVID-19.

Majority of doctors (66.1%) were aware that social distancing was most important preventive measure against COVID-19, with frequent hand washing and use of face mask to follow respectively. Almost , 75.6% participants were aware that N95 mask was meant for use by staff taking nasopharyngeal swab from suspected COVID-19 patient and 94% of the doctors were aware about 20 seconds recommended duration of hand washing by World Health Organization.

Conclusion: Doctor's community is aware of different aspects of COVID-19 including epidemiology, clinical manifestations, diagnostics, complications and preventive measures effective against COVID-19.

Key Words: Awareness; Corona Virus Infection Disease (COVID-19); Coronavirus; Doctors

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INTRODUCTION

Corona Virus infection brought the whole world to a major halt in the start of year 2020. The disease which took birth in Wuhan City of China in late December 2019 soon became a worldwide pandemic that became difficult to control. It has since then affected individuals from all walks of life in one way or the other. As of 29th July 2020 there have been 16,899,285 confirmed cases of COVID-19, including 663,540 deaths, reported to World Health Organization (WHO)[1]. Of these, 276,288 cases have been reported in Pakistan with 5,892 deaths[2]. The doctor community has been the front line soldiers along with other health care professionals. They are not only been facing COVID-19, but have also been upfront the rapidly changing information, guidelines and protocols revolving around COVID-19.

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The purpose of this study was to assess the awareness level of doctor community regarding COVID-19. Due to the rapidly changing dynamics of COVID-19, it is difficult for the doctor community to keep abreast of all the updates; however the purpose of the study was to evaluate their knowledge about modes of transmission, clinical features, incubation period, diagnostic tools, treatment options and mortality. These are the aspects of COVID which the treating doctors come across. Well versed doctors can ultimately educate patients and their carers about prevention and control of COVID. A poor understanding of the disease among health care workers (HCWs) may result in delayed treatment and result in the rapid spread of the infection. Furthermore, if doctors are aware of preventive measures against COVID-19, and practice them, they would be able to keep themselves safe during patient interaction especially while performing procedures that require close proximity with patients for example during nasopharyngeal sampling for corona virus, nasopharyngeal intubation, and mechanical ventilation[3].

MATERIAL AND METHODS

This cross-sectional study was conducted by Department of Medicine, Khyber Teaching Hospital Peshawar and 283 doctors were included. These included respondents were male and female undergraduate medical and dental students of final year professionals, post-graduate trainees and fellows of Internal Medicine. Approval from Institutional Ethical Review Board was taken before initiating the study (IREB Approval Number: 798-ADR/KMC dated March 3, 2020). Informed consent was taken from all participants before including their responses in the study. The participants were requested to fill a pre-designed questionnaire between 04th March and 05th April, 2020. The questionnaire was formulated using 20 questions regarding awareness about different aspects of COVID-19. The questionnaire was validated both for face and content validity by 8 subject experts amongst faculty members from Department of General Medicine Khyber Medical College Peshawar. Pilot study was conducted on 10 participants who were 2nd year PG Residents from Department of General Medicine Khyber Teaching Hospital Peshawar for pilot study and these residents were then excluded from main study. Data was analyzed from the questionnaire using SPSS 23 and was presented in tables.

The responses were divided on the basis of qualification of respondents as follows: undergraduate medical and dental students, post-graduate trainees and responses from fellows. Questions had been asked about the number of suspected and confirmed COVID cases that respondents had come across, origin, spread, transmission, incubation period, symptomatology, complications, diagnostic tools, treatment options, preventive measures, latest advances and fatality of COVID-19. Responses were stratified on the basis of qualification of respondents.

RESULTS

Characteristics of the study participants are outlined in Table 1. A total of 283 doctors participated in the study. Of these, 189 (66.8%) were males and 94 (33.2%) were females. Almost 10.6% of the respondents aged up to 25 years; 48.4% aged between 26-35 years; 15.5% aged between 36-45 years and 25.4% aged more than 45 years. Respondents were stratified into undergraduate medical and dental students (47.7%), postgraduate trainees (15.2%) and fellows who had qualified exit exams (37.1%). Approximately 82.7% of the respondents had come across up to 25 suspected COVID cases; 9.2% of the respondents had come across 26-50 suspected COVID cases; 4.6% had seen 51-100 suspected cases while 3.5% had seen more than 100 COVID suspects. Eight percent (8%) of the participants had seen up to 10 confirmed COVID cases; 5.7% had seen 11-20 confirmed cases, whereas 5.3% had seen more than 20 confirmed cases of COVID-19. The knowledge of respondents about origin and nature of COVID-19 stratified on the basis of qualification is discussed in Table 2. About 96.1% of the respondents marked 'bat' as the animal origin of COVID whereas 3.9% opted for other options. Nearly 49.5% of the respondents opted for animal to person and person to person spread of the disease whereas 44.5% opted for only person to person spread and 83.4% participants committed for droplet borne mode of transmission of COVID. Approximately 91.9% chose up to 2 weeks duration for incubation period option and 97.2% of the doctors were aware that COVID has achieved the status of pandemic by WHO.

Knowledge about symptomatology, complications and outcome of COVID-19 are outlined in Table 3. About 4.9% respondents picked runny nose as the most common presentation of COVID; 18% opted for body aches and pains; and 77% favored dry cough as the common presentation of COVID. Approximately 82% of the doctors opted for acute respiratory distress syndrome (ARDS) as the most common complication of COVID; whereas 15.9% chose acute respiratory failure as the most common complication. The question asked about currently most lethal disease was tricky; as per WHO globally, tuberculosis is the most lethal disease, but amidst the COVID pandemic, COVID had become the most lethal disease, causing greater fatalities on daily basis than tuberculosis. Nearly 55.8% doctors opted for COVID as most lethal disease, whereas 26.9% voted for tuberculosis. As much as 75.3% of the respondents opted for 2% fatality rate of COVID whereas 15.5% opted for 5% fatality rate.

Table 4 highlights the knowledge of different strata of doctors about diagnosis and management of COVID-19.

Almost 97.2% of the doctors were aware that PCR for viral RNA from nasopharyngeal swab was the diagnostic modality for COVID-19. Approximately 87.6% marked bilateral lung infiltrates as most common CT scan findings while 89% of the doctors agreed that supportive care was mainstay of therapy for COVID-19 patients.

Table 5 outlines the knowledge of doctors about different preventive measures for COVID-19. Almost 66.1% of the doctors marked keeping social distance as the most important preventive measure against COVID. However 26.5% doctors opted for frequent hand washing

Table 1: Characteristics of study participants

Variable	Category	Number (n)	Percentage (%)
Gender	Male	189	66.8
	Female	94	33.2
Age (Years)	Up to 25	30	10.6
	26-35	137	48.4
	36-45	44	15.5
	>45	72	25.4
Qualification	MBBS/MD/BDS	135	47.7
	FCPS Trainee/Postgrad. Diploma/MS Students	43	15.2
	FCPS/American Board/FRCP/FRCS	105	37.1
Suspected cases came across	0-25	234	82.7
	26-50	26	9.2
	51-100	13	4.6
	>100	10	3.5
Confirmed cases came across	0-10	252	89.0
	11-20	16	5.7
	>20	15	5.3

Table 2: Knowledge about origin and nature of COVID-19 based on qualification

Variable	Qualification						Total	
	MBBS/MD/BDS		FCPS Trainee/ Postgrad. Diploma/ MS Students		FCPS/American Board/ FRCP/FRCS			
	n	%	n	%	n	%	n	%
Animal origin								
Bat	134	47.3	36	12.7	102	36.0	272	96.1
Other	1	0.4	7	2.5	3	1.1	11	3.9
Spread how								
Animal to person spread	1	0.4	0	0.0	0	0.0	1	0.4
Person to person spread	64	22.6	18	6.4	44	15.5	126	44.5
Person to animal spread	0	0.0	1	0.4	1	0.4	2	0.7
Animal to person and person to animal spread	8	2.8	1	0.4	5	1.8	14	4.9
Animal to person and person to person spread	62	21.9	23	8.1	55	19.4	140	49.5
Transmission mode								
Air-borne	25	8.8	2	0.7	16	5.7	43	15.2
Droplet-borne	108	38.2	40	14.1	88	31.1	236	83.4
Vertical transmission	2	0.7	1	0.4	1	0.4	4	1.4
Incubation period								
Less than a week	7	2.5	2	0.7	2	0.7	11	3.9
1 week	3	1.1	2	0.7	4	1.4	9	3.2
Up to 2 weeks	124	43.8	38	13.4	98	34.6	260	91.9
3 weeks	1	0.4	0	0.0	0	0.0	1	0.4
4 weeks	0	0.0	1	0.4	1	0.4	2	0.7
WHO Status								
Epidemic	2	0.7	0	0.0	3	1.1	5	1.8
Endemic	0	0.0	1	0.4	1	0.4	2	0.7
Pandemic	132	46.6	42	14.8	101	35.7	275	97.2
Sporadic	1	0.4	0	0.0	0	0.0	1	0.4

Table 3: Knowledge about the symptoms, complications and outcome of COVID-19 based on qualification

Variable	Qualification						Total	
	MBBS/MD/BDS		FCPS Trainee/Postgrad. Diploma/MS Students		FCPS/American Board/FRCP/FRCS			
	n	%	n	%	n	%	n	%
Symptoms								
Runny nose	6	2.1	4	1.4	4	1.4	14	4.9
Body aches and pains	16	5.7	7	2.5	28	9.9	51	18.0
Dry cough	113	39.9	32	11.3	73	25.8	218	77.0
Complications								
Septic shock	1	0.4	0	0.0	0	0.0	1	0.4
Acute respiratory failure	24	8.5	6	2.1	15	5.3	45	15.9
Acute cardiac injury	0	0.0	1	0.4	1	0.4	2	0.7
Secondary infection	2	0.7	1	0.4	0	0.0	3	1.1
Acute respiratory distress syndrome (ARDS)	108	38.2	35	12.4	89	31.4	232	82.0
Lethal disease								
Dengue fever	4	1.4	4	1.4	5	1.8	13	4.6
HIV / AIDS	5	1.8	1	0.4	11	3.9	17	6.0
COVID -19	79	27.9	28	9.9	51	18.0	158	55.8
Tuberculosis	36	12.7	10	3.5	30	10.6	76	26.9
Middle East Respiratory Syndrome (MERS)	11	3.9	0	0.0	8	2.8	19	6.7
Fatality rate (%)								
2	101	35.7	33	11.7	79	27.9	213	75.3
5	20	7.1	4	1.4	20	7.1	44	15.5
10	11	3.9	3	1.1	5	1.8	19	6.7
35	3	1.1	1	0.4	0	0.0	4	1.4
40	0	0.0	2	0.7	1	0.4	3	1.1

Table 4: Knowledge about the diagnosis and management of COVID-19 based on qualification

Variable	Qualification						Total	
	MBBS/MD/BDS		FCPS Trainee/Postgrad. Diploma/MS Students		MBBS/MD/BDS			
	n	%	n	%	n	%	n	%
Diagnostic method								
Viral RNA PCR from nasopharyngeal swab	132	46.6	40	14.1	103	36.4	275	97.2
Quantitative CRP	0	0.0	0	0.0	1	0.4	1	0.4
Chest X ray for bilateral lung infiltrates	1	0.4	3	1.1	1	0.4	5	1.8
Salivary lymphocytes	2	0.7	0	0.0	0	0.0	2	0.7
CT findings								
Lung cavitation	12	4.2	2	0.7	4	1.4	18	6.4
Pleural effusions	6	2.1	2	0.7	3	1.1	11	3.9
Discrete pulmonary nodules	3	1.1	2	0.7	1	0.4	6	2.1
Bilateral lung infiltrates	114	40.3	37	13.1	97	34.3	248	87.6
Treatment								
IV fluids	0	0.0	1	0.4	0	0.0	1	0.4
Supportive care	117	41.3	35	12.4	100	35.3	252	89.0
IV Antibiotics	2	0.7	0	0.0	0	0.0	2	0.7
IV anti-virals	5	1.8	2	0.7	0	0.0	7	2.5
Immune therapy	11	3.9	5	1.8	5	1.8	21	7.4

Table 5: Knowledge about preventive measures for COVID-19 based on qualification

Variable	Qualification						Total	
	MBBS/MD/BDS		FCPS Trainee/Post-grad. Diploma/ MS Students		MBBS/MD/BDS			
	n	%	n	%	n	%	n	%
Preventive measures								
Wearing a face mask	6	2.1	0	0.0	11	3.9	17	6.0
Frequent hand washing with soap and water	41	14.5	13	4.6	21	7.4	75	26.5
Keeping social distance	88	31.1	29	10.2	70	24.7	187	66.1
Drinking boiled water	0	0.0	1	0.4	0	0.0	1	0.4
Avoiding eating and drinking together with ill people	0	0.0	0	0.0	3	1.1	3	1.1
N95 mask								
For general population use	6	2.1	3	1.1	3	1.1	12	4.2
For use by health care professionals while seeing non-COVID patients in the outpatients departments	23	8.1	7	2.5	10	3.5	40	14.1
For use by staff taking nasopharyngeal swab from suspected COVID-19 patient	100	35.3	29	10.2	85	30.0	214	75.6
COVID -19 patient in single isolation room	5	1.8	4	1.4	7	2.5	16	5.7
By phlebotomist taking blood from suspected COVID -19 patient	1	0.4	0	0.0	0	0.0	1	0.4
Hand washing duration (Seconds)								
5	0	0.0	1	0.4	0	0.0	1	0.4
10	4	1.4	1	0.4	1	0.4	6	2.1
15	4	1.4	2	0.7	0	0.0	6	2.1
20	124	43.8	38	13.4	104	36.7	266	94.0
25	3	1.1	1	0.4	0	0.0	4	1.4
Investigational drugs								
Ritonavir / lopinavir	27	9.5	11	3.9	20	7.1	58	20.5
Remdesivir	58	20.5	16	5.7	53	18.7	127	44.9
Interferon beta / ribavirin	4	1.4	1	0.4	3	1.1	8	2.8
Intravenous immunoglobulins	37	13.1	7	2.5	19	6.7	63	22.3
Favipiravir	7	2.5	5	1.8	7	2.5	19	6.7
None	2	0.7	3	1.1	3	1.1	8	2.8
Measures for prevention								
Chloroquine	54	19.1	16	5.7	29	10.2	99	35.0
Azithromycin	3	1.1	1	0.4	1	0.4	5	1.8
Vitamin C	27	9.5	4	1.4	11	3.9	42	14.8
Vitamin E	0	0.0	1	0.4	0	0.0	1	0.4
None of the above	51	18.0	21	7.4	64	22.6	136	48.1
Eye-shield								
To be used by the general population	0	0.0	1	0.4	0	0.0	1	0.4
A non-health care worker caring for suspected COVID patient	5	1.8	1	0.4	5	1.8	11	3.9
A suspected COVID patient	8	2.8	4	1.4	7	2.5	19	6.7
A confirmed COVID patient	17	6.0	6	2.1	20	7.1	43	15.2
A health care worker on duty at the triage	105	37.1	31	11.0	73	25.8	209	73.9

with soap and water as the most essential preventive measure against COVID. Approximately 75.6% of the participants agreed that N95 mask was indicated for use during sampling from nasopharyngeal swab from suspected COVID-19 patient. Another 14.1% of the participants opted for N95 use by health care professionals while seeing non-COVID patients in the outpatients departments. About 94% of the doctors were aware about 20 seconds duration of hand washing recommendation by WHO as a preventive measure against COVID-19. Almost 44.9% of the study population opted for Remdesivir as the novel drug showing efficacy against COVID whereas 22.3% marked intravenous immunoglobulins as potentially effective novel therapy. Nearly 35% of the participants opted for chloroquine as an effective drug for prevention against COVID; 1.8% favored azithromycin; another 14.8% chose vitamin C; 0.4% selected vitamin E; and 48.1% were aware that none of these options played any effective role in prevention against COVID. Almost 73.9% of the doctors were aware that eye shield is indicated for use by doctors on duty at triage.

Further details can be seen in the tables. Stratification of the results on the basis of qualification is also documented in the tables.

DISCUSSION

The present study is an attempt to assess the awareness level of doctors about different aspects related to COVID-19. This is one of the pioneer studies conducted in Khyber Pakhtunkhwa province of Pakistan regarding awareness among doctors about COVID-19. The survey was conducted in April and May 2020. Since then there has been a lot of progress regarding the pathogenesis and management of COVID-19 however some pertinent points in the clinical features diagnostics and prevention still remain the same and cannot be emphasized any less.

COVID-19 is a highly transmittable and pathogenic viral infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)[4]. The virus emerged in Wuhan, China in late December, 2019 and spread across the globe in no time. As per genomic studies SARS-CoV-2 is phylogenetically related to severe acute respiratory syndrome-like (SARS-like) bat viruses, therefore the possible primary reservoir could be in bats. Intermediate source of transfer to humans is not clearly understood however animal to human and human to human transfer are now known facts[5,6]. In our study, doctors from all strata were aware about origin of the virus in bats and its transmission from animals to humans and between humans.

The current study demonstrates that most of the doctors are aware about origin, transmission, clinical features, diagnostics, management and preventive measures against COVID-19. Majority of the undergraduate medical students, post graduate trainees and fellows were aware that Corona virus had origin in bats. The concept of transmission of virus from animal to person and person to person was also clear to many doctors. Almost all the doctors were aware of the 2 week incubation period. This can be compared to findings from a study conducted in Bangladesh about the awareness, knowledge and perceptions regarding COVID-19[7].

WHO announced COVID-19 outbreak as a pandemic on 11th March 2020[4,8].The virus was confirmed to have reached Pakistan on 26 February 2020, when a student in Karachi tested positive upon returning from Iran[9].

COVID-19 has a variety of presentations. Common presentations are fever, cough which is usually dry, associated with shortness of breath and body aches and pains[10,11]. The case definitions of COVID-19 have shown flexibility owing to the dynamics of clinical presentation[12]. Initially, only patients with history of travel to endemic areas or contact with people arriving from endemic areas were tested for coronavirus upon developing symptoms. As time progressed and the disease became widespread, people with no such contact history but with fever and cough or body aches and pains were also tested for COVID-19[13]. The disease has other non-respiratory presentations too. Case series report gastrointestinal symptoms in 2-40% of patients, and diarrhea can be the initial manifestation of infection[14]. Viral RNA has been detected in stool samples, sometimes at high levels[15]. This raises the possibility of oro-fecal transmission. Taste or olfactory disorders were noted in up to 53% of the cases in a small cohort from Italy and new anosmia has also been proposed as a criterion for testing, especially in young people with few other symptoms[10,16].

The study participants had varied response to the most common clinical presentation of COVID-19. Although most of the doctors were aware of dry cough as the common clinical presentation, a good number of doctors also opted for body aches and pains as the common presentation.

COVID-19 can lead to many complications, such as: venous thromboembolism, cardiovascular complications, acute liver and kidney injury, neurological complications, cytokine release syndrome, pediatric inflammatory multisystem syndrome and septic shock[17,18]. Acute respiratory distress syndrome has been reported in 8% of patients in case series[19]. It is a leading cause of mortality in patients with COVID-19. Most of the doctors were aware that it is the most lethal complication of COVID-19. Children can quickly progress to respiratory failure after contracting COVID-19 so need to be managed vigilantly[20].

Question asked about most lethal disease was tricky. While tuberculosis is the most lethal disease worldwide with daily increased number of deaths especially in parts of Africa and Asia, currently COVID-19 has taken over TB as the main culprit behind maximum number of daily deaths[4,5,21]. Doctors were aware of 2% fatality of

COVID-19; however some of them also opted for 5% fatality rate. Indeed COVID-19 reached 5% fatality in some parts of the world. At one time its fatality in Khyber Pakhtunkhwa province of Pakistan was also 5%[22].

Doctors had good level of awareness regarding the diagnostic modalities of COVID-19. They were aware of nasopharyngeal swab for coronavirus RNA as the ultimate diagnostic test. They were also aware that CT scan findings of bilateral lung infiltrates most favored COVID-19. Supportive treatment was the option marked by most of the doctors for COVID treatment modality. Questions related to diagnostics and management of COVID-19 revealed good awareness level of doctors, most likely attributed to the fact that doctors are directly involved in both diagnosis and management of COVID-19 patients.

Much has changed about the guidelines related to COVID-19 since its origin in December 2019. However some pertinent aspects of prevention against COVID-19 are still applicable. These include the use of face masks, maintaining social distance and frequent hand washing. Hand washing duration of 20 seconds has also been high- lighted in this pandemic. The concept of surgical face masks and specially designed N95 face masks became clear during the COVID crisis. Surgical masks are for use by the public and health care professionals (HCPs) during non COVID interactions[23]. N95 masks which filter 95% of the particles are to ensure safety during such patient encounters as taking nasopharyngeal swab for coronavirus RNA.[23]. The HCPs prone to splashes, droplets or sprays and splatters of blood or body fluids should wear N95 masks[24]. Gloves, face shields and goggles are other elements of personal protective equipment (PPE) for COVID-19. Doctors also seemed to be aware of use of face shields. Doctors in the current survey were usually aware of the different methods of protection against COVID-19.

Results of our study can be compared to a web based study from Abu Dhabi about knowledge and perceptions among HCPs[24]. There is a difference among questions asked in that survey, however the questions and responses regarding epidemiology and prevention are very much congruent to findings of our study.

Since the inception of COVID-19, many already known drugs and a multitude of investigational drugs have been tested for efficacy against COVID-19 however no single drug has been found effective against COVID-19 and the use of all these drugs is still a speculation. The use of chloroquine and hydroxychloroquine, azithromycin, vitamins C and E, anti-virals, immunosuppressive drugs, anti-neoplastic medications and monoclonal antibodies have all been tried in different patients of COVID-19[21,23,24]. Most of these drugs are still in different phases of different trials. It can be hoped that research will one day be able to establish confirmed treatment strategies for COVID-19.

Questions asked from participants were simple and basic. This could be one reason why most of the doctors gave correct answers that indicated their awareness level. A larger study with greater sample size and greater number of questions to judge deep learning and awareness among doctors about genomics, strains, vaccines, novel treatment therapies and management of COVID in special populations would better highlight the awareness status of doctors and would better stratify the awareness graph on the basis of qualification and clinical experience.

CONCLUSION

COVID-19 is one of the major pandemics that hit the world. All health care professionals including doctors have kept abreast with the rapidly changing dynamics of the disease and have shown openness to accept the reality of COVID-19. The doctor community has accepted the challenge of COVID-19 with courage and bravery and their practices have demonstrated that they are willing to combat COVID-19. Doctors from all strata have demonstrated good awareness about different aspects of COVID-19, including epidemiology, clinical features, diagnostics, complications and preventive measures against COVID. It is hoped that with continuing medical education, online resources and social media input, doctor community will continue to remain updated and aware about the future prospects this new disease is yet to bring.

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Following authors have made substantial contributions to the manuscript as under

Haider I:	Main Idea, questionnaire, content and face validity and critical review
Badshah A:	Literature review, discussion writing, formatting of article
Tajik I:	Statistical analysis, results compilation and final drafting
Khan Z:	Data Collection and proof-reading

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

ORIGINAL ARTICLE

FREQUENCY OF PULMONARY TUBERCULOSIS IN SEVERELY ACUTE MALNOURISHED CHILDREN AND ITS ASSOCIATION WITH INAPPROPRIATE FEEDING PRACTICES

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ABSTRACT

Objective: To determine the frequency of pulmonary Tuberculosis (TB) among severely malnourished children and its association with inappropriate feeding practices.

Materials and Methods: This cross-sectional study was conducted at the Nutritional Rehabilitation Unit/Stabilization Center (NRU/SC), Pediatric ward, Lady reading hospital Peshawar. A total of 222 (118 male and 104 females) severely malnourished In-patients, aged 2-59 months were enrolled and their demographics like age, gender, parent's literacy rate, family income and family type were studied. All enrolled patients were screened for TB using the National TB control Program and Pakistan Pediatric Association scoring chart. Socio-demographic characteristics, nutritional status, immunization status, and feeding practices of all the enrolled subjects were determined and analyzed.

Results: Amongst 222 patients, 82(36.9%) were diagnosed with TB. Among these, 58 patients (70.7%) were severely malnourished, indicating that malnutrition may be a risk factor for TB. Among these, only 2.4% were breastfed. Lower rate of breast feeding was significantly ($p<0.05$) associated with greater occurrence of TB. Majority (63.4%) of TB cases started complimentary feeding late as compared to the recommended age ($p<0.05$). Other characteristics like family type, illiteracy, poverty and lack of immunization had insignificant association with increased risk of TB

Conclusion: Malnutrition and inappropriate feeding practices increased the risk of developing Pulmonary Tuberculosis.

Keywords: Tuberculosis, Malnutrition, Breastfeeding, Severe Acute Malnutrition.

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INTRODUCTION

Breast milk is first and most appropriate nutrition for the infant [1]. Benefits of breast feeding includes financial, psycho-social, developmental and is a mean of prevention from infection and other diseases[1]. Colostrum is the immunological rather than nutritional component of breast milk as it contains over 250 immunologically active protein which include hormones, enzymes, immunoglobulins, signaling molecules, cytokines, inflammatory mediators and soluble receptors[2]. Studies have documented that the use of breast milk is associated with a decrease in the incidence and severity of infections[3]. It is a great source of Glucans, which acts as a substrate for the fermentation and colonization of commensal bacteria and prevents the binding of pathogens to the mucosal surface[4]. In breast milk, nucleotide content is higher as compared to cow milk or cow milk protein-based infant formula, and it plays a vital role in immune function[5]. Weak immune system of the baby is responsible for more than 80 different autoimmune diseases[2]. Protective factors of human milk contribute against infections by direct immunity and immune regulatory effects built on anti-inflammatory capacity[2]. Epidemiological studies in highly populated areas have found that bottle fed children had a 3 to 10 times higher risk of infectious disease as compared to breastfed children[6].

Malnutrition, human immune system and infectious diseases are linked together in a complex triangular association[7]. Malnutrition leads to malfunction of human defense mechanism and because of impaired immune system, body is more vulnerable to infectious diseases[7].

Among infectious diseases, Tuberculosis is one of

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the most common and is among top 10 causes of death worldwide (WHO report, 2018). Ten million peoples were infected by Tuberculosis in 2017, while 1.6 million people died of it (WHO report,2018). Among those 10 million infected people, 1 million were children and 230,000 TB affected children died of it (WHO report, 2018). Pakistan ranks 5th among the 30 countries having high TB burden.

WHO states that malnutrition is a significant risk factor for tuberculosis. In tuberculosis dominant countries, malnutrition contributes to 2.2 million deaths in under 5 years of age children. Tuberculosis is found among infants having suppressed cell mediated immunity as a result of malnutrition[4, 8]. NAIDS (Nutritionally Acquired Immune Deficiency Syndrome) is often found in children worldwide and is a major cause of tuberculosis[7]. There exists a bilateral interaction between malnutrition and TB, i.e., tuberculosis may be caused by malnutrition and vice versa[9]. Malnutrition is linked to the abnormal Cell Mediated Immunity, which is key against Tuberculosis infection[10]. In this study, we prospectively investigated both the frequency of tuberculosis and the relationship of inappropriate feeding practices on the occurrence of TB infection among severely acute malnourished children that were admitted in Nutritional Rehabilitation Unit / Stabilization Center, Lady Reading Hospital, Peshawar

MATERIAL AND METHODS

This cross-sectional study was conducted at the Nutritional Rehabilitation Unit/Stabilization Center (NRU/SC), Pediatric ward, Lady reading hospital Peshawar from August 14, 2018 to October 14, 2018. A total of 222 (118 male and 104 females) severely malnourished in-patients aged 2-59 months were enrolled and their demographics like age, gender, parent's literacy rate, family income and family type were recorded after informed consent from the parents. Patients are admitted based on the criteria of anthropometric measurements, i.e., weight, height/length, and Z-score (weight for height/length). Z-score was determined by using WHO Z-score table manually. Patients having Z-score of <-3SD and those having a Z-score of <-2SD with no appetite or medical complication were considered for admission in NRU/SC. Those patients having other chronic diseases and more than 5 years were excluded from the study.

Mothers of children were interviewed for family history, demographic and socio-economic data, infant feeding history, immunization status. Later, on the second day of admission, mothers were re-interviewed for Tuberculosis scoring using the NTP and PPA scoring chart for screening of TB in children. After admission, complete blood count, erythrocyte sedimentation rate and chest X-Ray was done. The degree of malnutrition was determined using WHO Z-score and those having Z-score of -2 to3SD to<-2SD were termed as moderately malnourished, while those with a Z-score of <3SD or having edema were termed as severely malnourished. Patients were diagnosed as TB and Non-TB patients based on TB scoring chart. If TB score was 7 or more, patient was diagnosed as Pulmonary Tuberculosis patient and less than 7 score was termed as Non-Tuberculosis patient. Patients having TB score of 5 or 6 were referred for further investigations.

STATISTICAL ANALYSIS

SPSS v16.0 was used for performing the statistical analysis. The significance level was set at 5% (α=0.05) or 95% CI were calculated. Means, standard deviations and significant differences were calculated. Frequency of Pulmonary Tuberculosis was measured. Two tailed Pearson correlation coefficient was performed to evaluate the P-value. Comparisons between different variables of socio-demographic characteristic, nutritional status, and feeding practices based on presence and absence of Tuberculosis were calculated.

RESULTS

According to TB scoring of the study population, 82 (36.9%) patients were having a TB score of 7 or more and they were diagnosed to be TB infected, 131 (59%) patients were having a TB score of (0-4) and were diagnosed as Non-TB, while 9 (4.1%) patients had TB score between 5-6. They were referred for further investigations for the confirmation of tuberculosis as show in table 1. According to the socio-demographic characteristics, parents' education, financial status, family status and age are all variables were insignificant for the development of tuberculosis as shown in the table 2. According to grades of nutritional status of the patients, severe malnutrition was more prevalent where TB was more prevalent than the moderate nutritional deficiency as shown in the figure as shown in table 3. When we looked at the feeding practices of patients, no breast-feeding was done to most 80 (97.6%) of TB patients while only 18 (12.9%) non-TB patients received no breast-feeding with (P<0.0001) as shown in the table 4.

Table 1: Frequency of Tuberculosis based on TB scoring chart (n=222).

Tuberculosis Scoring	Frequency (%)
Non-Tuberculosis (0-4)	131 (59%)
Possible tuberculosis (5-6) [needed further investigation]	09 (4.1%)
Confirm Tuberculosis (7 or more)	82 (36.9%)

Table 2: Socio-demographic characteristics of subjects (n=222).

Variable		Tuberculosis Mean ± S.D/ Frequency (%)		P-value
		Yes	No	
Father education	Illiterate	54 (65.8%)	102 (72.8%)	0.273
	Literate	28 (34.2%)	38 (27.2%)	
Mother education	Illiterate	78 (95.1%)	130 (92.85%)	0.505
	Literate	4 (4.9%)	10 (7.2%)	
Monthly income	Poor	54 (65.8%)	88 (62.8%)	0.655
	Satisfactory	28 (34.2%)	52 (37.2%)	
Family type	Joint	68 (82.9%)	106 (75.7%)	0.158
	Independent	14 (17.1%)	34 (24.3%)	
Age	1-6 months	6 (7.3%)	12 (8.5%)	0.155
	7-12 months	14 (17.0%)	38 (27.1%)	
	>12 months	62 (75.6%)	90 (64.2%)	

Table 3: Nutritional status of subjects(n=222).

Variable		Tuberculosis Mean ± S.D/ Frequency (%)		P-value
		Yes	No	
Grades of alnutrition	Moderate	18 (22.0%)	14 (10.0%)	0.014
	Severe	64 (78.0%)	126(90.0%)	

Table 4: Feeding practices of the subjects(n=222).

Variable		Tuberculosis Mean ± S.D/ Frequency (%)		P-value
		Yes	No	
Breast feeding	Yes	2 (2.4%)	122 (87.1%)	0.001
	No	80 (97.6%)	18 (12.9%)	
Exclusive Breastfeeding	Yes	0 (0%)	128 (91.4%)	0.001
	No	82 (100.0%)	12 (8.6%)	
Exclusive Breastfeeding in months	No EBF	82 (100%)	14 (10.0%)	0.001
	EBF for 1-3 months	0 (0%)	18 (12.8%)	
	EBF for 4-6 months	0 (0%)	66 (47.1%)	
	EBF for 7-12 months	0 (0%)	30 (21.4%)	
	EBF for >12 months	0 (0%)	12 (8.5%)	
Bottle feeding	Yes	80 (97.5%)	60 (42.8%)	0.001
	No	2 (2.5%)	80 (57.2%)	
Complimentary Feeding initiation	CF not started yet	12 (14.6%)	10 (7.1%)	0.711
	Early Initiation	4 (4.8%)	10 (7.1%)	
	CF at 6 Months	14 %17.0))	%30) 42)	
	Late Initiation	52 %63.4))	78 %55.8))	

DISCUSSION

The study revealed that among malnourished patients, over one third of patients were suffering from pulmonary Tuberculosis. Our results in the present study demonstrated that the chances of Tuberculosis increased with the severity of malnutrition. Another study also concluded that chances of Pulmonary Tuberculosis increases with increase in the severity of malnutrition[12]. Furthermore, it was noted that low frequency of proper breastfeeding (i.e., late initiation of breast feeding and exclusive breast feeding for more than 6 months) was associated with greater chances of Tuberculosis. The presence of antibodies and protective agents in breast milk protect body against Pulmonary tuberculosis infection[2,4,5]. Breast milk improves cell mediated immunity and it also helps in the maturation of T-cells enhances the body immune system specially the innate immune system which has a protective role against tuberculosis[4,7,11].

Moreover, from the results, characteristics like age, family type, parent's education, poverty level and immunization status had some non-significant impact on the occurrence of Tuberculosis. Annual report of National Tuberculosis control Program (NTP 2016) and the results of previous studies indicates that children aged between 12 months and 5 years of age are highly susceptible towards Tuberculosis infection, while the characteristics like illiteracy, poverty, overcrowding, malnutrition and lack of BCG vaccination also contribute towards higher chances of developing tuberculosis[4,8,9,13].

There are a few limitations to this study. First, all patients were enrolled in Nutritional Rehabilitation Unit/ Stabilization Center (NRU/SC). Secondly, age of the study patients was between 2 months and 5 years of age. Thus, study patient did not imitate all population of Tuberculosis patients, which limits generalization. Thirdly, confirmatory tests for Tuberculosis which include Gene X-pert test and histology were not performed in some patients (8 in number) whose TB score was 5-6 and further investigations were needed but not done because of non-availability of these facilities.

CONCLUSION

The severity of malnutrition increases the chances of Pulmonary Tuberculosis among children aged <5 years. Besides malnutrition, other characteristics like illiteracy, overcrowding, poverty and lack of vaccination also enhances the chances of Tuberculous infection. Other important findings include inappropriate feeding practices such as late initiation of breastfeeding and no exclusive breastfeeding for 6 months, which may lead to more chances of tuberculosis infection We need more prospective studies that evaluate the impact of how nutritional status influences increased Tuberculosis risk.

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Following authors have made substantial contributions to the manuscript as under

Khalil B:	Data Collection, analysis and introduction
Hussain M:	Concept ,study design facilitation for the study and correspondence
Taj W:	Data collection, discussion
Iqbal S:	Data collection, data analysis conclusion
Irshad M:	Methodology, data analysis, table and graphs
Jamal M:	Data Collection analysis and methodology
Ullah I:	References and final proof reading

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

ORIGINAL ARTICLE

FEMINIZING GENITOPLASTY IN CLASSIC CONGENITAL ADRENAL HYPERPLASIA- EXPERIENCE AT KHYBER TEACHING HOSPITAL, PESHAWAR

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ABSTRACT

Objective: The aim of the study is to determine the outcomes of single stage feminizing Genitoplasty in patients with Congenital Adrenal Hyperplasia (CAH) in terms of surgical complications, parents' satisfaction and their determinants.

Material & Methods: In this retrospective chart review, 32 patients who underwent single stage Genitoplasty at Khyber teaching hospital between January 2015 to January 2019 were included. Patients with common channel longer than 2.5 cm and those operated elsewhere were excluded. Parents were interviewed retrospectively and data was collected. Ethical approval was granted by IREB of the institute. Outcome was called ''successful'' in patients with no complication at follow up. Parents and surgeon's satisfaction with cosmesis was recorded from evaluated pre-and postoperative photographs and separately labelled as "satisfied" or "not satisfied". Data was analyzed using SPSS version 22.

Results: Mean age of the patients at surgery was 9.71 ± 1.72 months (6-18 months). Twenty-one (65.25%) patients were in age group 6 to 12 months while 11 (34.37%) were in age group 13 to 18 months. The mean operative time was 180.22+22.41 minutes. No flap ischemia (0.0%), vesicovagnial/veginorectal (0.0%) or surgical site infection (0.0%) was observed in any patient. Urinary incontinence was seen in 1 (3.12%) patient, while urinary tract infections were observed in 3 (9.37%) patients. Two patients (6.25%) had vaginal stenosis at follow up calibration. Parents were satisfied with cosmetic outcome in 30 (93.8%) cases and surgeon in 29 (90.62%) patients. Success rate was found higher (i.e. 90.47% and 100.0%) in younger age groups and lower CAH grades ($P<0.05$), respectively.

Conclusion: The early follow up of females with CAH receiving single stage feminizing Genitoplasty have shown promising results in terms of low complication rates and high satisfaction rates of parents.

Key words: Feminizing Genitoplasty; Congenital Adrenal Hyperplasia; Atypical Genitalia.

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INTRODUCTION

Classical Congenital Adrenal Hyperplasia (CAH) is an autosomal recessive condition resulting from defective cortisol synthesis pathway[1]. The term "classic'' is specific for the commonest variant of CAH in female patients where there is deficiency of 21-hydroxylase enzyme and serum level of 17-hydroxyprogesterone is elevated. The reported incidence of CAH is 1 per 10,000 to 1 per 15,000 live births[2,3]. A spectrum of ambiguity is observed in external genitalia of genetically females bearing 46XX chromosome in classical CAH[4]. In increasing order of ambiguity, clitoromegaly, fused urogenital conduit with single external opening, labial fusion, fused vagina & urethra that opens into common urogenital sinus and impalpable gonads are seen[5]. The gender and genital ambiguity is a psychosocial trauma to both parents and children[6].

As the children retain the potential for normal sexual activity and fertility in classical CAH, the treatment is directed to attain anatomical and psychological female gender and for this, children undergo feminizing Genitoplasty after detailed diagnostic assessment and counselling[7,8]. This treatment includes clitoroplasty, vaginoplasty, relocation of vaginal orifice to normal perineal position and parting of vagina and urethra[9,1].

All these corrective surgeries for treatment of genital ambiguity are technically demanding, with variable outcome and were therefore not always done in one stage[11,12]. Required surgical skills, education of child and family and precise timing of surgery are not studied yet. This study presents the surgical outcomes experienced by

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our department in terms of parent's satisfaction, complications and their determinants in patients with CAH who underwent single stage Genitoplasty.

MATERIAL AND METHODS

We enrolled all 32 female patients with CAH and atypical genitalia operated over a duration of 4 years between January 2015 and January 2019 at Khyber teaching hospital, Peshawar. Data was retrieved from files and follow up findings from charts documented at 3 weeks follow up meeting. Pre operatively, at initial encounter, patients were categorized into 5 grades of CAH severity according to Prader Scale; grade 1: clitoral hypertrophy, grade 2: clitoral hypertrophy, urethral and vaginal orifices present, but very near, grade 3: clitoral hypertrophy, single urogenital orifices, posterior fusion of labia majora: grade 4: penile clitoris, perineoscrotal hypospadias, complete fusion of the labia majora: grade 5: complete masculinization (normal looking male genitalia) but no palpable testis. All the patients had received a single stage genitoplasty (clitoroplasty, vaginoplasty or combined procedure). Record of operative procedure and post-operative examination for complications and cosmesis at three weeks were reviewed retrospectively. Parents' satisfaction with cosmesis labelled as ''satisfied'' or ''not satisfied'' evaluated from comparison of pre-operative and post-operative pictures was recorded. Surgeon's satisfaction was determined in a similar way. Complications were assessed at 3 weeks follow up recorded findings on clinical examination. Complications and parents' satisfaction were compared for the severity and age of Genitoplasty to know if they were the determinants of the outcome parameters. Success was labelled to those patients who had no complications of surgery. Data was analyzed using SPSS version 22. For age of patients and duration of study, mean and SD were calculated while for grades of CAH, patient satisfaction and outcomes frequency and percentages were calculated. For comparing of variables chi-square test was applied and P value of equal or less than 0.05 was taken as significant.

RESULTS

In our study, out of 32 patients, 5 (15.62%) patients underwent clitoroplasty, 7 (21.87%) patients underwent vaginoplasty and 20 (62.5%) patients underwent combined procedure (clitoroplasty and vaginoplasty). Parents and treating pediatricians were satisfied with cosmetic outcome in 30 (93.8%) and 29 (9.62%) patients, respectively. The mean operative time was 180.22+22.41 minutes. Surgical site infection, flap necrosis, urethral complications were not observed in any patient (0.0%) after surgery. Postoperatively, vaginal stenosis was found in 2 (6.25%) patients. Vesicovagnial and rectovaginal fistula were not observed in any patient (0.0%). Urinary incontinence was seen in 1 (3.12%) patient, while urinary tract infections were observed in 3 (9.37%) patients. Mean hospital stay was 5.92 ± 3.41 days. None of the patient required re-do surgery and there was no mortality (0.0%). Success rate was 81.25%.

Characteristics of patients with CAH are shown in Table 1. Stratification of success rate with effect modifier i.e. age and CAH grades are shown in table 2 and 3. Par-

Table 1: Characteristics of patients with CAH (n=32).

Parameters		No. of patients (%)
Age (Months)	Mean ± SD	9.71 ± 1.72
	6 -12	21 (65.62%)
	13 - 18	11 (34.37%)
Associated congenital disorders		0 (0.0%)
Past history of Genitoplasty		0 (0.0%)
Grades of CAH	Grade I	3 (9.37%)
	Grade II	6 (18.75%)
	Grade III	13 (40.62%)
	Grade IV	10 (31.25%)
	Grade V	0 (0.0%)

Table 2: Stratification of data (Success Rate) with age (n=32).

Age (Months)	Success rate	
	Yes n(%)	Non(%)
6-12 (n=21)	16 (76.19%)	5 (23.80%)
13-18 (n=11)	10 (90.90%)	1 (3.12%)
Total	26 (81.25%)	6 (18.75%)
p-value*	0.0003**	

Table 3: Stratification of data (Success Rate) with CAH grades (n=32).

Grades of CAH	Success rate	
	Yes n(%)	Non(%)
Grade I (n=3)	2 (66.67%)	1 (33.33%)
Grade II (n=6)	5 (83.33%)	1 (16.67%)
Grade III (n=13)	12 (92.30%)	1 (7.69%)
Grade IV (n=10)	7 (70.0%)	3 (30.0%)
Grade V (n=0)	0 (0.0%)	0 (0.0%)
Total	26 (81.25%)	6 (18.75%)
p-value*	0.0001**	

Table 4: Parents & Surgeon's satisfaction.

Parameters		No. of patients (%)
Parents' satisfaction	Yes	30 (93.8%)
	No	2 (6.25%)
Surgeons' satisfaction	Yes	29 (90.62%)
	No	3 (9.37%)

Table 5: Early Operative outcome of feminizing Genitoplasty.

Operative outcomes	No. of patients (%)
Mean duration of surgery (Mean ± SD)	180.22+22.41 minutes
Flaps ischemia	0 (0.0%)
Urinary dribbling/retention	1 (3.12%)
Urethral complications	0 (0.0%)
Vaginal stenosis	2 (6.25%)
Surgical site infection	0 (0.0%)
Urinary tract infections	3 (9.37%)
Vesicovagnial fistula	0 (0.0%)
Rectovaginal fistula	0 (0.0%)
Re-do surgery	0 (0.0%)
Successful outcome	26 (81.25%)

ents and surgeon satisfaction are shown in table 4.

DISCUSSION

This study conducted on the single stage Genitoplasty included 32 patients with CAH. In a study by Almasri J [13] et al, the mean age of patients was 2.7 6 4.7 years. Another study by Shoeir HM [14] et al, the observed mean age was 33 months in a range of 6 months to 8 years. majority of patients i.e. 35.7% in younger age group (< 1 year) in this study. In our study, we did not encounter any other congenital anatomic disorder in any patient and none of the patients had undergone surgery for genital reconstruction elsewhere. In our study, majority of patients i.e. 40.62% had grade III CAH, followed by grade IV (31.25%), grade II (18.75%) and grade I (9.37%). Shoeir HM [14] et al, in his study showed that majority of patients i.e. 57.1% were grade III. There was no patient (0.0%) with grade V in our study, however in a study by Shoeir HM [14] et al, 7.2% patients were with grade V.

The mean operative time was 180.22+22.41 minutes in ours study. In another study by Shoeir HM [14] et al, the mean operative time was 201 min (range: 175–235min). Surgical site infection, flap necrosis, urethral complications were not observed in any of our patient after surgery. However, in the study by Shoeir HM [14] et al, wound infection and flap ischemia were observed in 7.15 % and 7.15% patients, respectively. Postoperatively, vaginal stenosis was found in 2 (6.25%) patients, in our study. In a study by Almasri J [13] et al, the vaginal stenosis was significantly high i.e. 27% of patients developed vaginal stenosis. In another study by Shoeir HM [14] et al, vaginal stenosis was reported in 14.3% patients. Vesicovagnial and rectovaginal fistula were not observed in any patient in our study. Urinary incontinence was observed in 1 (3.12%) patient, while urinary tract infections were found in 3 (9.37%) patients in our study in contrast to the study by Shoeir HM. Mean hospital stay was 5.92 ± 3.41 days, in our study. No patient required re-do reconstruction and there was no mortality in our study. Success rate was 81.25% in our study.

In our study, parents and surgeon were satisfied with cosmetic outcome in 30 (93.8%) and 29 (9.62%) patients, respectively In a study by Almasri J [13] et al, the patients and surgeon satisfaction were 79.4% and 71.8%, respectively.

In our study, we stratified the success rate with age and concluded that success rate was higher i.e. 90.47% in younger age group (6-12 months) as compared to older age group (13-18 months) i.e. 63.63% . The results were statistically significant (p=0.0003). We also stratified the success rate with grades of CAH and observed that the success rate is more i.e. 100.0% in lower grade (grade I & II) and less i.e. 92.30% and 50.0% in higher grades (grade III & IV), respectively. The results were again statistically significant (p=0.0001).

It was a single center study based on experience of single surgeon with limited number of patients, which is one of limitations of the study. Further large scale studies are needed to triangulate these results.

CONCLUSION

The early follow up of females with CAH receiving single stage feminizing Genitoplasty have shown promising results in terms of low complication rates and high satisfaction rates by parents and pediatricians. Urinary tract infection is more frequent complication. Success rate was found to be higher in younger age groups and lower CAH grades in this study.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Rehman IU: Conception and design.

Ali S: Acquisition of data and critical review.

Uzair M: Analysis and interpretation of data.

Abdullah F: Acquisition of data and critical review.

Rehman FU: Final approval of version to be published.

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PHARMACOLOGICAL SCREENING OF HYPERICUM OBLONGIFOLIUM FOR ITS ANALGESIC EFFECT IN MICE

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ABSTRACT

Objective: The present study is aimed to determine the anti-nociceptive activity of crude methanol extract of Hypericum oblongifolium.

Material and Methods: In vivo acetic acid induced writhing test was used for anti-nociceptive effects in mice at 10, 20 and 30 mg/ kg body weight respectively intraperitoneally.

Results: The extract doses of 10, 20 and 30 mg/kg revealed significant inhibitory effect ($P < 0.001$) in acetic acid induced writhing test.

Conclusions: The methanol extract of medicinal plant Hypericum oblongifolium showed significant analgesic / anti-nociceptive effects in animal models and thus supports the traditional uses of the plant in painful conditions.

Key Words: Hypericum oblongifolium, Methanol extract, Anti-nociceptive activity.

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INTRODUCTION

American Pharmacopoeia (1820) contained more than six hundred drugs, and approximately 70 %, (more than four hundred) were from plant origin, while the eleventh edition of the same Pharmacopoeia (1936), contained about 45% drugs of plant origin[1].The Pharmacological effects of these herbal products, as evident from phytochemical studies, are due to active compounds in these plants. It has been established by W.H.O. that approximately 80% of the population is using these herbs as traditional medicines [2]. The International Association for the Study of Pain (IASP) has defined Pain as a disagreeable and disturbing experience due to tissue damage[3]. Pain is one of the most important symptoms. A large number of commercial preparations, like NSAIDs, are available, playing a vital role in relieving pain and inflammation. Their useful effects are due to inhibiting cyclooxygenase enzymes[4]. Cyclooxygenases act on Arachidonic acid and cause synthesis of Prostaglandins. Aspirin, Ibuprofen, Diclofenac and Naproxen are common examples of NSAIDs. Analgesics relieve painful symptoms only without treating the underlying cause[5]. But most of these compounds have adverse effects like dyspepsia, gastrointestinal bleeding, and peptic ulcer[6]. In order to avoid these adverse effects, a large number of medicinal plants are investigated for their potential analgesic activity. Some of these plants include Ligusticum porter, used in headache and Brickellia veronicaefolia used in arthritic pain[7]. Species of Mexican traditional folk medicinal plant genus Gnaphalium are still used for its beneficial effects in relief of lumbago, fevers, and other inflammatory conditions, and Amphipterygium adstringens is used as anti-inflammatory, analgesic, anti-pyretic and antibiotic[8].

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Hypericum oblongifolium, belongs to the family Hyperiaceae, is a shrub which grows at a height of approximately 5000-5500 ft, and is common in China and Indo-Pak regions. The flowers are yellow, having persistent-withering petals, bloom from June till September[10]. Phytochemical analysis of the flowers showed the presence of flavonoids, saponins and tannins in Hypericum oblongifolium[11]. Other active principles of the plant are Flavonols, Phenolic compounds and Essential oils[12]. One of the many analgesic ingredients of the medicinal plants is Flavonoids. These are compounds which cross the blood-brain barrier and affect the pain through different mechanisms in the central nervous system. These may act like opium alkaloids or GABA, or may act though their receptors. Another mechanism may be by inhibiting the enzymes involved in the process of inflammation[13]. Researches show that they may decrease the Calcium ion concentration in the cells, by inhibiting the activity of N-methyl-D-aspartate receptors. They may inhibit the

activity of the enzyme, responsible for synthesis of nitric oxide (NO) and prostaglandins, which are the mediators causing inflammation and pain[14]. The Flavonols have got astringent, anti-viral and anti-inflammatory activity[15] on one hand and sedative, diuretic, anti-inflammatory and anti-diarrheal activity on another hand[16].

This study is intended to determine the anti-nociceptive activity of crude methanol extract of Hypericum oblongifolium. If found effective, the results will be shared with local physicians to use it especially in cases where the traditional NSAIDs are contraindicated.

MATERIAL AND METHODS

ANIMALS

Mice weighing 20-25 gm were supplied by National Institute of Health Islamabad and kept in the animal house of Pharmacy department, university of Peshawar. They were used for analgesic studies. They were kept in groups in their cages, each having eight animals. Cages were having solid bases and saw dust beddings. Standard animal food and water supplied. They were kept in 12 hr light/dark cycle. Laboratory temperature was maintained at 22 ± 2° C.

PLANT MATERIAL

Hypericum oblongifolium, is a natural herb of the Hilly areas of Khyber Pakhtunkhwa, (NARAN, and GALLYAT areas). With the help of a Taxonomist, plant was identified and collected.

CHEMICALS/DRUGS

Aspirin (Acetyl salicylic acid) was obtained from Oval Pharmaceuticals, Lahore Pakistan, while disposable micro-syringes, Acetic acid, Saline (0.9% NaCl), Methanol, Chloroform, and Cotton were purchased from local market.

The aerial parts of the plant (flowers, leaves and stem) were cleaned and shed dried. After drying they were powdered in the electric rotator. A weighed amount (500 gm) of the dried powder was dissolved in 80% methyl alcohol at room temperature and was kept undisturbed for one week with daily shaking at different timings. The extract was filtered and was shifted to rotary evaporator and a semi-solid dark crude extract was obtained with 23% yield.

INTRAPERITONEAL ADMINISTRATION

Normal saline, Acetic acid, Aspirin, and extract of Hypericum oblongifolium were administered through intraperitoneal route to mice. The ventral surface (abdomen) of the animal was exposed, by holding the skin behind the neck firmly, putting the tail behind the little finger of the left hand. The needle was inserted directly into the peritoneum of the animal. The drugs / extracts were injected in the cavity with right hand.

EXPERIMENTAL PROCEDURES

ANALGESIC ACTIVITY

WRITHING TEST

Abdominal constrictions induced by acetic acid, the WRITHING TEST, in animals is the common model test for observation and assessment of peripheral analgesic effect[17, 18]. In this test, Acetic acid (1%) was used as a chemical stimulus to elicit painful sensation in the experimental animals. The animals (mice) were kept in different chambers and the abdominal constrictions were observed for 30 minutes post administration of acetic acid injected intra-peritoneal. A Writh or abdominal constriction is adoption of a peculiar position of animal with flat abdomen, depressed back and extended hind limbs. The adaptation of this posture, called writh or abdominal constriction is then followed by normal posture [19].

The extract of Hypericum oblongifolium was tested for analgesic activity in animal (Swiss mice) model of analgesia, i.e. Writhing test. Animals were exposed to a 12-hours light/dark cycles (lights on 0800). Experiments were performed during the light part. Before the start of the experimental procedure, food was withdrawn for 12 hours, but water was given. The animals were tested individually in two compartment box, so that two animals could be observed at a time.

DOSE PREPARATION

Acetic acid 1% saline. 0.1 ml of glacial acetic acid (100% extra pure) was diluted in 10 ml normal saline.

Aspirin solution (3mg/ml). 60 mg of Aspirin dissolved in 20 ml of normal saline.

Normal Saline. 0.9 % solution of Sodium chloride.

Hypericum oblongifolium Extract solution (5mg/ml). 50 mg of the Methanolic extract was dissolved in normal saline to make 10ml solution.

PROCEDURE

Acetic acid (1%) was given intraperitoneally to the animals. Animals were kept in observation chambers and the number of writhes in the 30 minutes period was counted. Animals were grouped into various treatment groups as follows;

Saline Control Group (n=6)

Each animal in this group received Saline (sodium chloride) 10 ml/kg body weight intraperitoneal.

Aspirin Group (n=18)

This group was having 3 sub-groups A, B, and C (n=6) and received Aspirin in 25mg /kg body wt, 50 mg / kg body wt, and 100mg /kg body wt respectively. Aspirin was given by intra peritoneal route 45 minutes prior to acetic acid administration.

Hypericum oblongifolium treatment Group (n=18)

This group was having 3 sub-groups each having 6 animals, and the dose schedule of Hypericum oblongifolium, was 10 mg/kg body wt, 20 mg/kg body wt, and 30 mg/kg body wt respectively. The extract was given through Intra-peritoneal route forty-five minutes prior to acetic acid administration. The percentage protection was obtained for the control as well as drug treatment groups with the help of the following formula.

% Protection = Mean Control group – Mean drug group divided by Mean Control group × 100

STATISTICAL ANALYSIS

The data collected, was expressed as means ± S.E.M. ANOVA with Dunnet post hoc test, applied to the data to check the significance

RESULTS

A. ANALGESIC ACTIVITY OF ASPIRIN

Table 1, shows that different doses of Aspirin, injected to mice, has significantly decreased that number of contractions, WRITHES

Percent protection.

Saline = zero percent

Aspirin (25mg/kg body weight) = 50.23%

Aspirin (50mg/kg body weight) = 71.87%

Aspirin (100mg/kg body weight) = 85.1%

Fig. 1 shows the analgesic activity produced by giving Aspirin, at different doses of 25, 50, and 100 mg per kg body weight. The column shows the number of writhes (MEAN ± SEM) of mice. Aspirin has significantly (***p< 0.001) decreased the number of acetic acid induced contractions and produced analgesic effects as compared to control group.

B. ANALGESIA PRODUCED BY HYPERICUM OBLONGIFOLIUM EXTRACT

Table 2 shows the percent protection of different doses of plant extract (Hypericum oblongifolium) on Acetic acid induced abdominal constriction/ writhes. Different doses of plant extract given to mice, has significantly decreased the number of contractions, WRITHES

Percent protection.

Saline = zero percent

Hypericum oblongifolium (10mg/kg body weight) = 8.65 %

Hypericum oblongifolium (20mg/kg body weight) = 52.64%

Hypericum oblongifolium (30mg/kg body weight) = 68.03%

Fig.2: Analgesia Produced By Hypericum Oblongifolium Extract

Fig. 2 shows the analgesic effect produced by administering plant extract, at doses of 10, 20, and 30 mg/kg body weight. The columns show the number of writhes, (MEAN ± SEM of mice).

The Plant extract has significantly (**p< 0.01) decreased the number of acetic acid induced writhes, and produced analgesic effects as compared to control group.

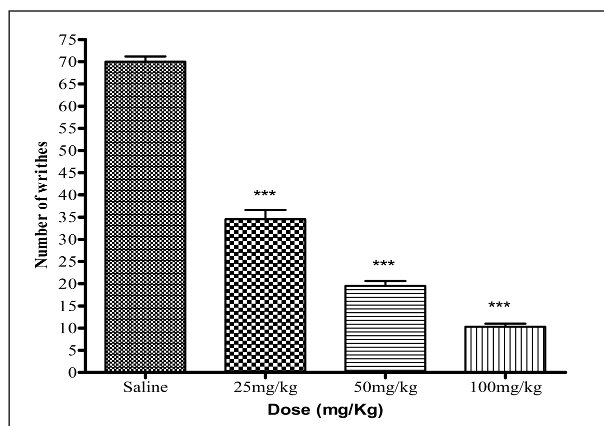

Fig 1: Analgesic effect of Aspirin

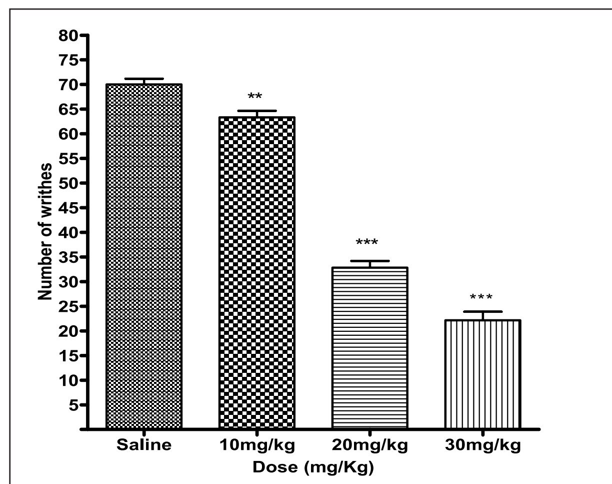

Fig 2: Analgesic effect of Hypericum oblongifolium extract

Table 1: Analgesic activity of Aspirin

No	Acetic acid	Saline	Aspirin 25mg/kg	Aspirin 50mg/kg	Aspirin 100mg/kg
1	66	66	36	18	12
2	67	68	42	23	10
3	70	71	38	18	8
4	72	74	28	20	11
5	68	69	30	16	9
6	73	72	33	22	12
Mean	69.33	70.0	34.5	19.5	10.33
+ SEM	1.15	1.18	2.13	1.09	0.67

Table 2: Analgesic activity of Hypericum oblongifolium extract

No	Acetic acid	Saline	H.oblongifolium 10mg/kg	H.oblongifolium 20mg/kg	H.oblongifolium 30mg/kg
1	66	66	60	38	20
2	67	68	60	35	21
3	70	71	62	30	19
4	72	74	68	32	30
5	68	69	64	29	24
6	73	72	66	33	19
Mean	69.33	70.0	63.33	32.83	22.16
+ SEM	1.15	1.18	1.22	1.35	1.74

DISCUSSION

The Analgesic activity of medicinal plant Hypericum oblogifolium was evaluated experimentally by using the standard Writhing test in mice.

Non-Steroidal Anti Inflammatory Drugs produce their analgesic and anti-inflammatory effects by inhibition of the enzyme cyclo-oxygenase[4]. It is stated that injection of a chemical substance Acetic acid in the peritoneum of the animal has resulted in liberation of the mediators of inflammation. These mediators are named as 5-Hydroxytryptamine, (also known as Serotonin), Histamine, Prostaglandins, Bradykinins, and substance P. These mediators, via exciting pain receptors cause pain[20, 21, 22]. It is proved that the major inflammatory mediators are Prostaglandins, and Bradykinins, and they act through cyclooxygenase pathway [23, 24, 25].

The medicinal plants have active principles like Flavonoids and Tannins which are responsible for prevention of synthesis of the inflammatory mediator prostaglandin[26]. The medicinal plant, Hypericum oblongifolium contain flavonoids and tannins[12] and it is possible that these two active principles of the plant may be responsible to inhibit the formation of the inflammatory mediators i.e. Prostaglandins and Bradykinins. A study of another member of this family i.e. Hypericum perforatum, has shown analgesic activity[27]. It is also proved that Luteolin and myricetin, which are flavonoid aglycones by nature, are present in the plant Hypericum oblongifolium [28], and they have proved analgesic [29], anti-inflammatory [30], and antipyretic activities [31].

The analgesic and anti-inflammatory properties of the plant may be either due to presence of these flavonoids or other active principles. They are responsible for inhibition of synthesis of these mediators which cause pain and inflammation. The present study has revealed that the plant has produced analgesia, and it is possible that the flavonoids and other active principles present in the plant have similar mechanism of action as that of commonly used analgesics. The exact mechanism of analgesia and anti-inflammatory effect, need further studies, but this study shows that the analgesic and anti-inflammatory effects of the plant may either be due to the presence of these active principles or some other mechanisms are involved which needs detail studies. However, the present study provides a scientific basis for other researchers to assess and screen these medicinal plants for possessing analgesic and anti-inflammatory activities.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Ali J: Data collection, Analysis, and proof reading.

Ali F: Data collection, manuscript writing, Methodology.

Khan A: Data collection, Manuscript writing, data analysis conclusion.

Junaid M: Manuscript waiting Methodology, data analysis table and graphs.

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

ORIGINAL ARTICLE

FREQUENCY OF HYPERTENSION AND ITS RELATIONSHIP WITH PHYSICAL ACTIVITY AND EATING PATTERN AMONG ADULT POPULATION OF DISTRICT PESHAWAR

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ABSTRACT

Objective: Hypertension is a chronic illness and affecting approximately 22 to 42 % of the adult population of both developed and developing countries. This cross-sectional study was conducted to find the frequency and to estimate the relationship of hypertension with food patterns and physical activity.

Material & Methods: In this study, a total of 500 adults age 19 to 65 years were selected from July to December 2017; among the five selected union councils of District Peshawar. A detailed proforma was structured to assess the dietary pattern and physical activity from the respondents regarding the different determinants of hypertension. An individual was considered hypertensive on having blood pressure beyond 140/ 90 mmHg. MS Word and SPSS softwares were used for data management and presentation.

Results: Results showed that 30.80% of the studied population was hypertensive. Among the study participants; 61.40% were males while 38.60% were females; 54.80% were married; 60.20% had a monthly income of less than Rs.15000; 44.20% were literate. Moreover, among hypertensive individuals, 61.04% used table salt in food; 44.81% prefer a high caloric/ sugar diet; 60.39% prefer meat; only 42.21% prefer vegetables; 59.09% lived a sedentary life, and only 33.12% did regular physical exercise.

Conclusion: Hypertension showed high prevalence among adult participants and was strongly related to food pattern and physical activity. Community-related control and preventive measures and lifestyle modifications are required to prevent hypertension and its consequences.

Key words: Hypertension (MeSH), Adults (MeSH), Salt (MeSH), Meat (MeSH), Vegetables (MeSH), Exercise (MeSH).

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INTRODUCTION

Nearly 1.2 billion world population has been affected by hypertension and is a major determinant of chronic diseases[1]. From 2000 to 2001, 6.9 million deaths worldwide deaths were attributed to high blood pressure or its associated complications i.e. strokes, ischemic heart disease, and other cardiovascular diseases[2]. Cardiovascular disease accounts for healthcare expenditure for the strategies of health education of communities, screening of populations, treatment, and prevention of complications of high blood pressure and if prevented and controlled then help in cost minimization of health sectors[3]. Hypertension is considered the most important and common chronic health concern as the leading contributor to worldwide mortality[4, 5]. According to the 2017 statistics of Korea, the rate of occurrence of hypertension has raised from 23% to 28% among females and 25-35% among the male population during a single decade i.e. from 2006 to 20156; and is causing significant health care costs[7].

Good eating behaviors help to acquire good health, physique, and development of mind and thus

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eventually prevent the occurrence of common food and nutrition-related problems and finally prevent the body against the development of chronic debilitating diseases and their complications[8]. Moreover, unhealthy eating behaviors, and their strong relationship with heart and blood diseases, results in high deaths and/ or their associated consequences9. Furthermore, the DASH diet is helpful and is effective in lowering both the systolic and diastolic blood pressure[10,11]. The DASH diet revealed that due to the high content of whole foods, fish, grains, vegetables, nuts, and fruits help to reduce blood pressure both in hypertensive individuals as well as among normotensive individuals[6,12].

In a study conducted by Wang et al., in 2011; revealed that hypertension showed an indirect relationship with consumption of diet having fruits, vegetables, nuts, eggs, and pork, etc.[13]; whereas a diet rich in fats, high energy, meat, and refined grains showed a strong positive relation with blood pressure[14,15,16].

Dietary modifications are associated with clinically meaningful lowering of blood pressure. Many controlled trials found that changes in the dietary patterns help a lot in the reduction of both systolic and diastolic blood pressure[3]. Many international studies have revealed a significant reduction of cardiovascular deaths by controlling the blood pressure effectively with diet or medicines. Moreover, high blood pressure and its consequences were less observed among the individuals who follow the Mediterranean diets[17].

Many national and international studies, found and revealed that hypertension incidence and prevalence rates were declining due to the changes in eating behavior of individuals i.e. consuming less salt and sugar, more fruits & vegetables, less dairy products, whole grains, and non-consumption of meat[1,18]. Modifiable lifestyle preventive measures like avoiding a sedentary lifestyle, tobacco smoking, etc. are important in order to control hypertension[19].

Current research statistics showed that those individuals who used to take more salt had high chances to be affected by hypertension in near future or more probably after 50 years of age[20]. Moreover, reduction of sodium intake from high to low quantity helps in lowering hypertension[12]. Many international studies revealed that physical exercise of mild to moderate and hard exercise is an effective strategy for controlling or preventing the incidence of hypertension[11,21,22]; and thus showed an indirect association of hypertension with strenuous physical exercise[23,24,25]. In Pakistan, being a third world country, all the important risk factors which showed a strong relationship with the non-communicable disease were prevalent i.e. high caloric food, fewer vegetables, high carbohydrates, high salt intake, strong family history, sedentary lifestyle, etc. This study was conducted to estimate the frequency and to estimate the relationship of hypertension with food patterns and physical activity among the adults, of Peshawar district.

MATERIAL & METHODS

A cross-sectional study among adults age 18 & above years was conducted by the Community Medicine, Department, Khyber Medical College, Peshawar, after ethical approval from the ethical review committee of the KTH/KMC; from July to December 2017.

A sample size of 500 adults both males and females were selected, through multistage probability sampling technique from the five union councils of district Peshawar i.e. Faqir Abad, Hassan Gari, Bhana Mari, Tehkal Payan-I, and Hayatabad-II; to estimate the prevalence of hypertension and its relationship with food patterns and physical activity. The questionnaire was used to collect information on direct and indirect determinants of hypertension.

The participant was considered hypertensive if the systolic and diastolic blood pressure was higher than 140 and 90 mmHg on assessment or if the subject was taking antihypertensive agents. MS Word and SPSS softwares were used for statistical purposes.

RESULTS

Among 500 participants, 31% were hypertensive, belonging to ages 18 and 70 years, and 307 were males and the rest female participants. Amongst male participants, hypertension was found in 2/3rd of participants as compared to female patients where it was found to be in 1/3rd. The results and major findings are shown in Tables 1, 2 and 3.

Table 1: Frequency & Percentage of Hypertension among the study participants

S. No	Findings	500	(%age)
1	Hypertension	154	30.80
2	No Hypertension	346	69.20
	Total	500	100

Table 2: Demographic Variables of Hypertension among the study participants

Demographics	Variables	HTN F (n=154) (%)	No HTN (n=346) (%)	Total F (n=500) (%)
Age Groups (in years)	18-27	15 (9.74)	86 (24.86)	101 (20.20)
	28-37	21 (13.64)	114 (32.95)	135 (27.0)
	38-47	47 (30.52)	64 (18.50)	111 (22.2)
	48-57	43 (27.92)	48 (13.87)	91 (18.20)
	48 & above	28 (18.18)	34 (9.83)	62 (12.40)
Gender Distribution	Male	113 (73.38)	194 (56.07)	307 (61.40)
	Female	41 (26.62)	152 (43.93)	193 (38.60)
Marital Status	Married	116 (75.32)	158 (45.66)	274 (54.80)
	Unmarried	38 (24.68)	188 (54.34)	226 (45.20)
Monthly Income	< 15000	58 (37.66)	243 (70.23)	301 (60.20)
	15000-30000	35 (22.73)	57 (16.47)	92 (18.40)
	30000-45000	32 (20.78)	27 (7.80)	59 (11.80)
	45000 & Above	29 (18.83)	19 (5.49)	48 (9.60)
Occupations	Labor	21 (13.64)	58 (16.76)	79 (15.80)
	Govt servants	48 (31.17)	38 (10.98)	86 (17.20)
	Housewife	53 (34.42)	90 (26.01)	143 (28.60)
	Students	14 (9.09)	81 (23.41)	95 (19)
	Others	18 (11.69)	79 (22.83)	97 (19.40)
Educational Status	Literate	96 (62.34)	125 (36.13)	221 (44.20)
	Illiterate	58 (37.66)	221 (63.87)	279 (55.80)
Nutritional Status	Underweight	42 (27.27)	65 (18.79)	107 (21.40)
	Normal	41 (26.62)	152 (43.93)	193 (38.60)

Table 3: Modifiable Variables of Hypertension among the study participants

Variables	Response	HTNF (n=154) (%)	No HTN (n=346) (%)	Percentage	P-Value
Use/ like table salt	Yes	94 (61.04)	217 (62.72)	331 (66.2)	0.3605**
	No	60 (38.96)	129 (37.28)	169 (33.8)	
Prefer too much salt	Yes	53 (34.42)	75 (21.68)	128 (25.6)	0.001 *
	No	101 (65.58)	271 (78.32)	372 (74.4)	
Use/ like sugar	Yes	69 (44.81)	207 (59.83)	276 (55.2)	0.0009 *
	No	85 (55.19)	139 (40.17)	224 (44.8)	
Prefer too much sugar/ High caloric food	Yes	51 (33.12)	64 (18.50)	115 (23)	0.00016 *
	No	103 (66.88)	282 (81.50)	385 (77)	
Prefer meat as food	Yes	93 (60.39)	161 (46.53)	254 (50.8)	0.002*
	No	61 (39.61)	185 (53.47)	246 (49.2)	
Prefer vegetables as food	Yes	65 (42.21)	93 (36.88)	158 (31.6)	0.0003 *
	No	89 (57.79)	253 (73.12)	342 (68.4)	
Living sedentary lifestyle	Yes	91 (59.09)	151 (43.64)	242 (48.4)	0.0007 *
	No	63 (40.91)	195 (56.36)	258 (51.6)	
Exercise regularly	Yes	51 (33.12)	75 (21.68)	126 (25.2)	0.0032*
	No	103 (66.88)	271 (78.32)	374 (74.8)	

DISCUSSION

In this study, the prevalence of hypertension estimated was approximately n=154 (30.80%), as was revealed and supported by international studies with 30% and 31.1% prevalence among the population-based studies [26, 27]. In our study approximately, 61.04% use table salt and 34.42% prefer too much salt; and too much salt preference showed significant results whereas table salt in the

diet showed no significant association with hypertensive individuals as was reported and supported by international studies of Sacks et al., 2001; Claas & Arnett, 2016; & Stamler et al., 2018; which showed that higher sodium chloride intake showed higher prevalence with hypertension [11,12,20].

Many international studies found and revealed an indirect association between vegetables and fruits intake and the incidence and prevalence of hypertension; as was supported and revealed by our study which also showed a significant relationship between vegetable intake and hypertension prevalence [18,28]. Ndanaku et al., 2016; Grossman et al., 2017; & Song et al., 2018; studies conducted internationally showed a strong positive relationship between high meat consumption and hypertension prevalence as was confirmed by our study results which showed that among 60.39% of individuals had a positive history of meat prevalence [1,6,29] (Table No. 3).

In our study, among the hypertensive individuals, approximately 44.81% had a history of high sugar and high caloric intake (33.12%) as compared to 55.19% who didn't prefer too much sugar or high caloric diet and showed a significant p-value of 0.0009 with 9.72 Chi-Square Test value. Thus our study results were consistent and supported the findings of international studies; which revealed a strong relationship between high caloric diet and DASH diet with hypertension prevalence [3,10,24]. In our study, among the hypertensive individuals, approximately 33.12% did regular physical exercise and 66.88% had a sedentary lifestyle and thus supported the findings of various international studies conducted by Bakker et al., 2018; Kokkinos et al., 2019; &Narayan et al., 2019 [22,30,31].

LIMITATIONS OF THE STUDY

Due to lack of resources a small sample size of 500 was collected from the communities of district Peshawar.

Time shortage, as students were present only for four months in field for data collection beside their busy schedule

CONCLUSIONS

It was concluded that the prevalence of hypertension showed moderate to high frequency among the study participants with range of one out of five individuals. The hypertension showed a significant relationship with pattern and type of food intake, preference for too much salt & sugar in food, and a sedentary lifestyle with less physical activity, and thus the population-based preventive strategies and lifestyle modifications strategies were needed to prevent and control hypertension and its consequences among the communities.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Ishtiaq M:	Principal Investigator; Concept; Data Analysis; and Manuscript Writing
Naeem M:	Data collection; Data Entry; & Critical Analysis
Hussain A:	Initial & Final Manuscript Drafting
Ijaz B:	Review and data collection
Irfan M:	Review and data collection
Mustafa A:	Bibliography; Data collection & Data Entry
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Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

ORIGINAL ARTICLE

CORRELATION OF BLOOD GLUCOSE LEVELS WITH DYSLIPIDEMIA AMONGST PATIENTS WITH TYPE 2 DIABETES MELLITUS

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ABSTRACT

Objective: To find out the correlation of blood glucose with serum triglycerides and serum cholesterol levels in patients having T2DM.

Material and methods: This cross sectional descriptive study was conducted from August to October 2019 in the medical out-patient department of Khyber teaching hospital Peshawar, which is a 1600 bedded tertiary care hospital in Khyber Pakhtunkhwa, a province of Pakistan. Patients with T2DM were categorized into two groups. Group A with HbA1c from 6.5-8% and group B with HbA1c of more than 8%. Fasting serum cholesterol and fasting serum triglycerides were correlated in these groups with the level of HbA1c. The data so collected, was analyzed through statistical package for social sciences, SPSS version 23, chi-square test was applied to find out the relationship between the 2 groups and p-value of 0.05 or less was considered significant for correlation.

Results: Amongst 319 patients with T2DM, 220 (68.96%) were females and the rest of 99 (31.04%) were males. Serum cholesterol was raised in 106 (33.22%) patients with T2DM. It was raised in 35.16% of patients in group A and in 32.45% in group B (p-value of 0.6). Serum triglycerides level was raised in 22.25% of patients with T2DM (with 23.07% in group A and in 21.92% of patients in group B) with a p-value of 0.8.

Conclusions: The levels of fasting serum cholesterol and fasting serum triglycerides were not having any significant correlation with the levels of glycosylated hemoglobin (and hence diabetic control) in our patients having Type 2 Diabetes Mellitus.

Key words: Serum Cholesterol, serum Triglycerides, Type 2 diabetes mellitus

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INTRODUCTION

Though Type 2 Diabetes Mellitus (T2DM), a heterogeneous group of disorders, usually occurs in adults but may occur in children and adolescents. Almost all patients with T2DM have to some extent insulin resistance[1,2]. T2DM results from complex interaction of both genetic and environmental factors[3]. The risk of developing T2DM, increases with increasing age[4,5], obesity[6,7] and lack of physical activity[5,8]. About 6% of the world population is suffering from T2DM[9]. Currently Pakistan stands at position 7 amongst the top ten countries having Type 2 Diabetes Mellitus patients[9]. Individuals having insulin resistance (metabolic syndrome) are at much higher risk for developing T2DM. These individuals usually have raised serum triglycerides and small dense low density lipoproteins (LDL), lower high density lipoproteins (HDL), raised blood pressure, central obesity[10-12], hyperuricemia, raised serum plasminogen activator inhibitor type 1 (PAI-1) and higher serum levels of pro-inflammatory cytokines e.g., IL-[6] and TNF-alpha. Elevated serum triglycerides have been claimed to elevate the serum glucose level[5]. It has further been observed that for lipid toxicity to develop hyper-triglyceridemia is essential, in other words lipotoxicity and glucotoxicity are interlinked and are essential for each other[13]. It has further been reported that diet rich in glucose cause prolonged elevation in serum triglycerides in patients with T2DM[14]. Correction of obesity and hyperglycemia, by exercise, diet modification and hypoglycemic agents is the main treatment of lipid abnormalities in diabetic patients[15,16].

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Several studies have shown the correlation of blood glucose with serum triglycerides and serum cholesterol level in patients with T2DM[5-6,17-19]. In up to 95% of cases such studies have been conducted on T2DM[5]. But studies of this kind have not been conducted in population of Peshawar region. Therefore in order to find out the correlation blood glucose with serum triglycerides and serum cholesterol level in patients with T2DM presenting to a tertiary care hospital of this province, we embarked on this study. This study will help us in understanding the relationship of dyslipidemias with diabetic control.

MATERIAL AND METHODS

After getting approval from the ethical committee of Khyber Teaching Hospital, Peshawar, this cross sectional descriptive study was conducted in medical out-patient department of Khyber Teaching Hospital Peshawar, from 10th august to 24th october 2019. A total 319 patients, having T2DM for more than two years, were included in the study.

Diabetes mellitus was diagnosed when fasting plasma glucose was equal to or more than 126 mg%, or random plasma glucose was equal to or more the 200 mg%, or HbA1c was more than 6.5%. Patients having history of T1DM or using insulin, below 15 years of age and those patients taking statins or fibrates, having comorbid conditions, blood disorders e.g. haemoglobinopathies, pregnant ladies and those who declined consent, were excluded from our study.

Upper limit of normal for serum cholesterol and serum triglycerides in our laboratory were 220 mg%, and 160 mg% respectively. In order to correlate the blood glucose level with fasting serum cholesterol and fasting serum triglycerides, we divided the patients into two groups, Group A with HbA1c between 6.5-8% (means fair control), and Group B with HbA1c level more than 8% (means poor control).

The data collected as per specially designed proforma, was entered & analyzed through statistical package for social sciences (SPSS version 23). The Chi-square and Pearson's R correlation tests were used for establishing statistical significance.

RESULTS

A total number of 1807 patients were assessed out of which 319 patients were having Type 2 Diabetes Mellitus, where males were 99 and females were 220. The mean age of the patients with T2DM was 55.07 +-9.78 years see table 1, 2 ,3 for details.

DISCUSSION

Out of 1809 patients who visited the out-patient department, 319(17%) patients had type 2 diabetes mellitus, this figure is slightly higher than the recently reported figure of 11.7%, in the same settings[18], reflecting an increase in the percentage of population suffering from T2DM. A similar study conducted few years ago, in the same province, revealed that the percentage of both female and male patients were equal 50/50%[19], but in our study the ratio of percentage of females to males was 68.96/31.04% roughly 3/1. The difference is probably because of more

Table 1: Demographics of the patients with T2DM

	Patient without T2DM	Patient with T2DM	p value
Frequency of the patients presenting to medical OPD with T2DM			
	1488	319	
Age wise distribution of the patient presenting to the medical OPD			
Mean + SD	47.18 + 16.42	55.07+ 9.78	0.000
Gender wise distribution of the patient presenting to the medical OPD			
Male	490	99	0.52
Female	998	220	
Total (n=1807)	1488	319	

Table 2: Correlation of Blood Sugar with lipid profile of the patients

Diabetic Status	Within normal limits	Elevated	Pearson's R
Correlation of cholesterol with diabetic status of the patient			
Group a (n = 91)	59 (64.83%)	32 (35.16%)	0.644
Group b (n = 228)	154 (67.54%)	74 (32.45%)	
Total (n = 319)	213 (66.77%)	106 (33.22%)	
Correlation of triglyceride with diabetic status of the patient			
Group a (n = 91)	70 (76.92%)	21 (23.07%)	0.825
Group b (n = 228)	178 (78.08%)	50 (21.92%)	
Total (n = 319)	248 (77.75%)	71 (22.25%)	

Table 3: Blood Sugar Levels with Lipid profile of patients

Mean + S.D	
HbA1C	8.62 +0.07
Serum Glucose Levels	229.90 + 91.09
Serum Cholesterol Levels	197.66 + 51.24
Serum Triglyceride Levels	194.29 +53.44

sedentary life style of female population in our culture.

Serum cholesterol was raised in 106 (33.22%) which is much lower than the 94% reported by another research conducted in another city of same province[19]. The reason is not clear but may be that with the passage of time most of the people have become aware about the metabolic abnormalities and have modified their life style and food habits to some extent and are taking medications.

On the other hand, Sheikh MA[20] has found high serum cholesterol in just 38% of the patients in his study, the figure is slightly higher than our finds. While going into further details, we observed that, though T2DM is in itself a risk factor for hypercholesterolemia, there was no significant statistically difference in the level of serum cholesterol whether the HbA1c was less than 8% or more than 8%, thus there was no correlation of serum cholesterol to blood glucose level.

In our study serum triglyceride was raised in 71 (22.25%) of our patients with T2DM, which is again much lower than the 78%[17] and 60% in a study conducted in Jamshoro/ Hyderabad[20]. We have further observed that hypertriglyceridemia was present in only 21 (23.07%) of patients in Group A (HbA1c from 6.5-8%) and was raised in 50 (21.92%) of patients in Group B (HbA1c more than 8%), reflecting no significant difference in the level of serum triglycerides whatever is the level of HbA1c.

However, both of these figures were much lower than a similar study in which hypertriglyceridemia was observed in 64% of patients with HbA1c less than 8%, and in 92% of patients with HbA1c level more than 8% by Ahmad N et al[19], though both the studies were conducted in the same province, but study population had varied life style.

This study, however, found no correlations between the level of dyslipidemia and diabetic control which is contrary to many studies done worldwide, but one of the reason is that it is limited to a single center and small sized population.

CONCLUSION

Our study has proved that serum cholesterol and serum triglyceride are having no correlation with glycemic control in T2DM. Further large scale and multicenter studies are needed for early interventions which could possibly circumvent health complications and harsh outcomes in later years of life.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Iqbal S: Study idea, concept

Yousaf M: Statistical Analysis

Asad L: Data collection

Iqbal MD: Material and methods

Iman N: Study supervision and critical revision

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

ORIGINAL ARTICLE

CROSS LANGUAGE VALIDATION OF URDU VERSION OF CLINICIAN-ADMINISTERED PTSD SCALE (CAPS-5)

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ABSTRACT

Objective: This study was aimed to assess the test-retest reliability of the Urdu translated version of CAPS-5 using the data of 140 survivors who experienced life threatening trauma in the previous month.

Material and Methods: The assessments were carried out at two different times, initial assessment (Time 1) was performed 01 month after trauma and the second assessment (Time 2) was done 15 days after initial administration. The data was collected from a public hospital, Pakistan Institute of Medical Sciences (PIMS) in the month of December 2018.

Result: Cross language and test re-test reliability were assessed, high stability in correlation and coefficient between two scores were seen in two different versions (English and Urdu) over in two different times.

Conclusion: Alpha reliability of 20 items of CAPS-5 .94- .92, and .93 to .62 for each symptom indicate satisfactory of Urdu version. However, the internal consistency is little higher than original English version .88 and test re-test reliability .83.

Key words: Test-retest Reliability, Cross Language Validation, PTSD, CAPS-5.

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NTRODUCTION

The Clinician-Administered PTSD Scale (CAPS) is a comprehensive diagnostic instrument generally used for the diagnosis and assessment of PTSD. It can be used by trained professionals, researchers, and clinicians, and it takes 45-60 minutes to administer. It is considered a good tool for assessment and diagnosis of PTSD[1]. The CAPS has some advantages over other instruments. Firstly, it is used for assessment of PTSD symptoms base on single severity scores. Secondly, it is also used to assess the intensity and frequency of PTSD symptoms. Finally, it is structured interview consists of highly standardized probing questions. The key advantage of CAPS-5 on other diagnostic tools is that, it assesses the intensity and frequency of PTSD symptoms on five-point rating scale, ranging from (0-4). It provides a comprehensive detail of PTSD symptoms and helps in administration and scoring through uniform and careful way by using rating scale.

The diagnostic criteria of CAPS-5, including criterion A, B, C, D, E, F and G. The criteria "A" was responsible for measurement and assessment of trauma. The first 20 items of the scale from B-1 to E-20, assessed the PTSD symptoms, while the other 10 items assess different functional symptoms such as onset and duration of symptoms, subjective distress and impairment global validity, global improvement, and dissociative subtype. The CAPS-5 items were rated from 0-4 severity level, labeled absent, mild, moderate, and extreme. The additional criteria of CAPS-5 relate to traumatic events, 1-8 and items no 10 responsible for traumatic events which assess the PTSD symptoms which may or may not be to current trauma. For this, rating scale definite, probable and unlike are used. Definite attributed to trauma index, probable means that the PTSD symptoms may or may not attribute to trauma, while unlike is responsible that PTSD symptoms are not attributed to the trauma index.

There is extensive literature that shows that translation of CAPS has been done in different languages, including Cambodian[2], Bosnian[3], Farsi[4,5], Croatian[6], Dutch[7], German[8], Japanese[9], Portuguese[10], Spanish[11], Swedish[12], Turkish[13]. It has been observed that different translation mostly used for non-English speaker. It has been realized to translate CAPS-5 should be translate into Urdu Language. The aim of the current study was to assess the test and retest reliability of the Urdu version of CAPS-5. For this purpose, total 140 sample of trauma survivors were taken from hospital.

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MATERIAL AND METHODS

The total study sample consists of 140 patients with a history of trauma age older than 18 years. They were bilingual consist of both male and female participants.Data was collected from out-door patients who had history of life threatening trauma. In the first phase the interview was taken from trauma survivors after one month of using both Urdu and English version of scale. In second phase CAPS-5 was administered after 15 days of initial administration. Mild and moderate trauma experienced individuals included whereas, individuals with history of a severe trauma were excluded. Statistically analysis was used for interpretation of data. The CAPS-5 was administered in four diverse setting such as English test, retest Urdu test, retest, English test, Urdu retest, Urdu test and English retest. The translation was done as mentioned in the next sections.

STEP- 1: FORWARD TRANSLATION

In this step four bilingual experts were invited for translation CAPS-5. They were requested to translate CAPS-5 PTSD scale from original English version to Urdu language. All experts were instructed to translate word by word item of a the scale from English to Urdu independently. They were also informed about the goal and objectives of translation.

STEP-II: REVIEWING THE FORWARD TRANSLATION

After forward translation, a committee of experts was formed in order to review the forward translation. They are requested to take part in review processes, discuss and make a valuable suggestion on forward translation. They were asked to compare the Urdu translation of the Clinician Administered PTSD Scale (CAPS-5) to original Version (English). Further, they were also asked to read the items carefully, and advise some valuable suggestions, recommendations about grammar, style and words.

STEP III: REVIEWING THE TRANSLATED VERSION THROUGH COMMUNITY SAMPLE

In this step, a focus group discussion (FGDs) was conducted at the community level. Two FGDs were arranged with each group consisting of 08 members. Total time for each FGDs was one hour and the participant were instructed to read all items carefully and provide feedback about clarity and understandability. After which changes suggested by both groups were incorporated with each other.

STEP IV: BACK TRANSLATION

In this step, Urdu version of CAPS-5 was translated into English. The translation processes were carried out by bilingual experts. They were not aware of the original English version. The purpose of back translation was to verify the translation. The same procedure was followed as adopted in forward translation. The back translation was examined by same committee members who had examined the forward translation.

STEP V: COMMITTEE APPROACH

A multi-disciplinary committee was formed, whose purpose was to evaluate wording style, grammar and content critically. They were asked to assess the back translation and Urdu translation of CAPS-5.

STEP VI: TEST THE PSYCHOMETRICS OF PRE-FINAL URDU VERSION

Urdu translated version of CAPS-5 was applied to bilingual individuals who had a history of mild and moderate trauma, and the data was collected after a month of trauma.

STEP VII. SUBMISSION TO DEVELOPER

After using the processes of translation adaptation, the final version of Urdu and back translation (English) were send back to author (National Centre for PTSD).

RESULT

The demographic characteristics of study population are presented in table 1. The cross-language validation, test re-test reliability and correlation between two scores were carried out in two different times, the gap between time-1 and time -2 was 15 days. High constancy was observed in correlation and coefficient between two scales over different times see table 2 and 3 for details.

Table 1: Demographic characteristics of the study variables (N=140).

Variables	N	%
Gender		
Male	70	50
Female	70	50
Marital Status		
Married	90	64.29
Unmarried	50	35.71
Age		
18-40 Year	91	65.00
41-55 Year	33	23.57
Above 55 Year	16	11.42
Education		
F.A/FSc	85	60.71
Graduation/Above	55	39.29
Profession		
Employed	66	47.14
Unemployed	74	52.85

Table 2: Alpha reliability of English and Urdu Versions (CAPS-5) at Time-1 and Time-2.

	Time 1		Time 2	
Scales	Urdu (n = 70)	English (n = 70)	Urdu (n = 70)	English (n = 70)
PTSD(20)	.91	.91	.92	.91
Intrusive Symptoms (5)	.92	.72	.76	.83
Avoidance Symptom (2)	.75	.62	.63	.71
Negative Cognition (7)	.91	.81	.82	.83
Hyper arousal (6)	.85	.77	.84	.81

Table 3: Test, retest reliability of English and Urdu Version of CAPS-5 and its sub-scales (N=140).

Scales	UU (n=35)	UE (n=35)	EE (n=35)	EU (n=35)
PTSD	.96**	.93**	.91**	.91**
Intrusive Symptoms	.85**	.83**	.68**	.72**
Avoidance Symptom	.73**	.77**	.72**	.62**
Negative Cognition	.90**	.91**	.75**	.81**
Hyper arousal	.91**	.94**	.82**	.75**

DISCUSSION

It has been realized that increasing the research publication in the area of traumatic stress and research being conducted in Urdu speaking area, it is important to provide a valid Urdu translated assessment tool in the field of psycho- traumatology. To the best of our information, this current study provides valid data on psychometric properties about Urdu translated CAPS-5 PTSD scale.

Alpha reliability of 20 items of CAPS-5 .94- .92, and .93 to .62 for each symptom indicate satisfactory results of Urdu version. However, the internal consistency is little higher than original English version .88 and test re-test reliability .83 which is obtained from two sample of military veterans (N=165)14. The original study was conducted on military veterans, while the current study the sample was taken of individual with a history of accidental trauma. It has been observed that there is growing exposure to trauma and the prevalence of PTSD in developed countries like US and UK, whereas, prevalence and exposure to trauma is more in developing countries like Pakistan15. Local Native psychologist realized to translate the CAPS-5 from original (English) to national language Urdu in order to administered Urdu version into local affected populations. The objective of present study was to translate CAPS-5 to locally used language which would help in assessing the PTSD symptoms in Pakistani society and culture. Though, the CAPS-5 PTSD scale had good test retest reliability across all individuals with a history of life threatening trauma. Cross-culturally reliable and valid tools may provide help in assessing the diverse issues of people throughout the world[16]. The findings of the current study is the link with previous study on CAPS translation in different languages. The past study about adaption of the translated in German language[8] provided structural support to an instrument. It has been found that CAPS-5 and its sub-scale has a reasonable equivalent across different nations and cultures.

The study had a number of limitations, firstly the scale was administered to accidental trauma of mild and moderate injury patients while ignoring the individuals with a severe history of injury. Secondly, the CAPS-5 was applied to the small sample of population with history of physical trauma. Thirdly we did not control the cultural and other physical and psychiatric disorders.

CONCLUSION

The study concluded that there was a high constancy in correlation and coefficient between two scales of clinician-administered PTSD Scale: CAPS-5 over two different times.

RECOMMENDATION

Further research is needed with a larger sample size and minimizing the confounding variables to further validate the scale.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Zaman S: Research design, data collection, data analysis and manuscript writing

Arouj K: Proof Reading, analysis and final approval

Irfan S: Editing manuscript, analysis and manu script writing.

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

ORIGINAL ARTICLE

FREQUENCY AND TYPES OF UROLOGICAL INJURIES IN GYNECOLOGY AND OBSTETRIC PRACTICE IN A TEACHING HOSPITAL

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ABSTRACT

Objective: To determine the frequency and types of iatrogenic urological tract injuries during obstetric and gynecological surgical procedures in a tertiary teaching hospital over a period of two years.

Material and Methods: The study was conducted at the Obstetrics and Gynecology unit of Khyber Teaching Hospital Peshawar from January 2017 to December 2018. Any patient undergoing a surgical procedure irrespective of the nature and time of surgery was included. The nature and type of the primary surgical procedure, anatomical site of injury, time of diagnosis, management and therapeutic success rate was determined. Injury was defined as entry into the urinary tract lumen, crushing, ligation or/and excision of the urinary tract, leakage of urine, post-operative hydronephrosis, or extravasation of contrast outside the urinary tract with or without renal damage that required surgical intervention.

Results: The frequency of iatrogenic injury to the urological tract in obstetrics emergency and elective procedures was 0.036% with urinary bladder the most frequently damaged viscera. No ureteric injury was recorded in obstetrical patients. In gynecological procedure only 0.45% injuries were recorded. All of the injuries were diagnosed and dealt with, during the same surgical session, with no patient requiring reoperation. Outcome of the management was satisfactory with no permanent urological tract damage and mortality.

Conclusion: Good knowledge of pelvic anatomy, meticulous care during technically difficult surgical procedures, involvement of urological surgeon in suspicious cases helped us to identify and treat urinary tract damage at the time of primary injury, with good outcome and minimal morbidity.

Key words: Gynecological and obstetric surgery, Urological tract injury.

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INTRODUCTION

Urinary and genital tracts of human beings are closely related to each other in both embryological and adult life[1]. This proximity increases the likelihood of urological injuries in pelvic surgeries[2]. There are certain risk factors which further increase this risk. These factors include previous surgery, pelvic infection, endometriosis, big fibroids and ovarian cysts distorting the pelvic anatomy and advanced malignancies[3]. However thorough knowledge of pelvic anatomy, fine surgical skills, meticulous techniques and keeping high index of suspicion could translate into lower risk of urological injuries and good peri-operative outcome[4]. Although risk of mortality is very low but morbidity is very high including prolonged operating time, risk of re-operation, loss of renal functions and poor quality of patient's life [5].

Appropriate preoperative evaluation to outline the course of ureters is required in technically difficult cases. These investigations include ultrasonography, IVP and ureteric catheterization. Intraoperative measures during abdominal hysterectomy are; appropriate operative approach giving maximum exposure, full examination of the disease in the pelvis and identification of pelvic landmark, adequate mobilization of the bladder in a downward and outward direction, operating close to the pathology, avoiding blind clamping of blood vessels. In complicated cases ureters should be identified in its course before dissection either by exposing their pathway and following them or by ureteric catheterization. When direct visualization is not possible, cystoscopy may be done[6].

Measures during vaginal hysterectomy are the ad-

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equate development of vesico-vaginal space, pushing the bladder out of the field, taking small bites of Para-cervical and parametrial tissue, avoiding double clamping of uterosacral ligaments and doing vaginal oophorectomy cautiously[7].

Urological tract injuries in obstetrics and gynecology are divided into 2 main types. Acute injury (laceration, ligation, partial and complete transection) is usually diagnosed intra-operatively. Chronic injury (VVF, uretero-vaginal fistula, ureter stricture) which is identified at a later stage. Very few patients present very late with hydro-nephrosis and non-functioning kidneys[8]. The incidence of urological tract injuries is variable, being very low in low risk patients and very high in complex surgeries as it also depends on type of surgery. Laparoscopic surgeries are associated with high risk of urological injuries than laparotomy. However, in expert hands the risk of bladder injury is now reduced in laparoscopy but that of ureteric injury is still high[9].

Medicolegal implications are not uncommon in surgery and allied. Therefore, early detection, repair and pre and post-surgery counseling should be done before performing complex surgeries[10]. Detection during surgery and immediate repair on table results in less morbidity and early recovery. It is wisely stated by Higgins who said, “The venial sin is injury to ureter but the moral sin is the failure of recognition”[11].

Injury to the surrounding structures during surgery is a common complication of all major surgeries. The aim of our study is to find out the frequency of urological tract injuries during gynecological and obstetrics procedures. Regular analysis of the complications occurring during and after operations is very important for clinical audit and for academic purposes. Clinical audit is about measuring the quality of care we provide against relevant standards. This study will not only do the audit of the complications of surgeries but will also help us to identify the factors causing these surgeries. This will further help us to set the priorities for improvement in clinical care.

MATERIAL AND METHODS

This was retrospective chart review carried out in Obstetrics and Gynaecology unit, Khyber Teaching Hospital from 1st January 2017 to 31st December 2018. Approval from ethical committee was obtained before the study. All patients undergoing major obstetrical, (caesarean section, forceps delivery) and gynecological procedures (total abdominal hysterectomy, vaginal hysterectomy, anterior colporrhaphy and posterior colpoperiniorrhaphy and laprotomy) in the above mentioned specified time period were included in the study. Patients undergoing minor procedures like EUA, D&C and debridement of wound were excluded from the study. The injury was defined as entry into the urinary tract lumen, crushing, ligation or/and excision of the urinary tract, leakage of urine, post-operative hydronephrosis or extravasation of contrast outside the urinary tract with or without renal damage. Retrospective analysis of case record of patients included in the study was carried out. Patients who have sustained injuries were identified. Data was collected on preformed proforma. Frequencies and percentages were calculated for nature of urological injury, time of diagnosis, methods of repair and outcome.

RESULTS

Total number of admissions in the study period were 22698. Age of the patients ranged from 25—60 years. Total number of gynecological procedures were 1097. Total number of obstetric procedures were 13847 of which 10 patients sustained urological tract injuries during study period. Injury to the urinary bladder, ureter and urethra were 0.27%, 0% and 0.18% respectively in gynecological surgeries. The incidence is much lower in obstetric procedures being 0.02%, 0% and 0.014% respectively. Fortunately, all of these injuries were identified on the operation table and primary repair was done. Bladder injuries were more than uretheral injuries. They were repaired on the table with vicryl 2/0 in two layers. Bladder was drained for 3 weeks. Three ways silastic catheter was inserted and continuous bladder wash was done till hematuria was stopped. Patients with primary repair were observed on daily basis till the time they got discharged. Apart from the routine examination, leakage of urine from wound, flank distension, unexplained fever, prolonged ileus and signs of sepsis were noted in cases with primary repair. No ureteric injuries were observed. Only four uretheral injuries were noted, 2 each in the gynecological and the obstetrical cases. They were repaired intra-operatively and fortunately, no side effects were noted. All repairs were performed successful.

Table 1: Total number of urinary tract injuries

		Bladder Injuries	Ureter Injuries	Urethral Injuries	
Total obstetric Surgeries	13847	3	0	2	5(3036%)
Total Gynecological surgeries	1097	3	0	2	5(0.45%)

Table 2: Frequency of urinary tract injuries in different obstetric and gynecological cases

Name of procedure	Number of procedures	Anatomical site of injury			Time of diagnosis	%
		Urinary Bladder	ureter	urethra		
Total abdominal hysterectomy	576	2	0	0	Primary surgery	0.347
Obstetric hysterectomies	44	1	0	0	Primary surgery	2.25
Vaginal hysterectomy	101	0	0	1	Primary surgery	0.9
Anterio-posterior colporraphy	155	0	0	1	Primary surgery	0.6
Laparotomy	221	1	0	0	Primary surgery	0.45
Caesarean section	3218	2	0	0	Primary surgery	0.06
Forceps delivery	295	0	0	1	Primary surgery	0.33
Vaginal delivery	10334	0	0	1	-	0.009

DISCUSSION

Khyber Teaching Hospital is one of the three tertiary teaching hospital of Peshawar, KPK. It is a referral center for treatment of difficult cases from all over KPK and neighbouring Afghanistan. The hospital has an open admission policy which results in admission of patients who are hemodynamically unstable, technically difficult cases, advanced malignancies and postoperative complication. It is also a teaching and training center for undergraduate and post graduate, so we did not encounter any difficulty in sample collection for the above-mentioned study.

The incidence of bladder injury and urethral injury in gynecological surgery was 0.27% and 0.18% respectively in our study, whereas, there incidence in obstetrics procedures was 0.02% and 0.014% respectively. There was no ureteric injury in our study. This incidence is less than the reported incidence of 0.5--1.5% in literature[12,13]. Rashmi D and Sunil K quoted incidence of bladder injury and ureteric injuries to be 0.48% and 0.08% respectively[8]. Raut V reported higher incidence of bladder and ureteric injuries compared to our study. They found bladder and ureteric injuries in gynecological surgeries to be 1.23% and 0.11% respectively and in obstetric procedures they found it to be 0.67% and 0.33% respectively[11].

Most frequent injury in our study was bladder injury. Two bladder injuries were noted in 576 cases of TAH (0.347%). The reason was densely adherent bladder due to previous surgeries. Single bladder injury occurred in 221 cases of laparotomy (0.45%) where laparotomy was performed for tubo-ovarian mass with dense pelvic adhesions. This is low as compared to the incidence noted by Carley ME (0.58%) whereas results by Gilmour D are comparable to our study (0.26%)[12]. Thorough pre-operative assessment of patients, improved surgical techniques and thorough knowledge of urinary tract has resulted in decrease in incidence of urological injuries[13].

In obstetrics 1 bladder injury occurred in 44 obstetrics hysterectomies, making incidence of 2.25%. It favorably compares with results of other studies which showed bladder injury incidence to be 6.1% [14]. Indications for obstetrics hysterectomies in our study were rupture uterus, mishandled cases referred from periphery and PPH not responding to medicines and conservative surgical procedures. All these conditions are associated with distorted pelvic anatomy and intractable hemorrhage which make bladder more prone to injury. Only two bladder injuries were noticed in caesarean sections (0.06%). One of the injury was due to dense adhesions from previous 3 caesarean sections and while other injury was noticed in second stage caesarean section[15].

Not a single case of ureteric injury was noticed in our study. Ureteric injuries are commonly seen in difficult cases where pelvic anatomy is distorted. Such cases were thoroughly assessed before the surgery. Detailed diagnostic imaging was done before performing surgery and these cases were done first on list by senior most consultant. This could be the reason of no ureteric injury in our study. Moreover, ureteric injuries more commonly reported in literature occurred during laparoscopic surgeries16 but laparoscopic surgeries were not done during our study period.

Four urethral injuries were noticed in our study, 2(0.01%) in obstetrics and 2(0.18%) in Gynecology. In obstetrics 1(0.33%) injury was seen in forceps delivery and 1(0.99%) in normal vaginal delivery. In gynecology, 1 (0.9%) urethral injury occurred during vaginal hysterectomy and 1(0.6%) occurred in anterior colporrhaphy and posterior colpopereniorrhaphy. Forceps delivery is associated with high risk of genital tract injury. The incidence 1 in 295 (0.33%) is quite low. This may be due to improved surgical skills and better operative protocols. Another reason could be the increase in caesarean section rate in favor of instrumental vaginal delivery for safe obstetrics[17]. Urethral injuries in gynecological surgeries (0.18%) were due to scarred vagina from previous vaginal surgeries. It favorably compares with the results shown by Sahito RA [14].

The detailed retrospective analysis of the patient's record revealed that large abdominal masses, dense adhesions, history of previous surgeries, rupture uterus and massive intraperitoneal bleeding increased the risk of uro-

logical tract injuries. Similar predisposing factors are also reported by Daly JW and Rajasekar D[18,19].

A single center retrospective study is the main limitation of this study. Due to increase in the rate of caesarean section and increase in the use of minimally invasive surgery, the risk of urological tract injuries is also increased. Every unit should have their SOPs for management of such cases. Post graduate trainees should be properly trained and supervised in this respect.

CONCLUSIONS

Iatrogenic urological tract injuries, though less life threatening, but carry considerable morbidity. Injuries not detected in time will present with incontinence and fistulae which not only cause morbidity but will also badly affect the quality of patient's life. These injuries can be prevented by having meticulous anatomical knowledge and maintaining a high index of suspicion in complex surgeries.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Gillani S: Main Concept.

Akhtar Z: Data Collection & Drafting.

Ahmed S: Statistical analysis.

Bangash AG: Data Collection & Literature review.

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

ORIGINAL ARTICLE

OUTCOME OF BONE ALLOGRAFT IN ORTHOPAEDIC PATIENTS

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ABSTRACT

Objective: The objective of this study is to determine the outcome of bone allograft in orthopaedics patients.

Material and Methods: This descriptive case series was conducted in the Department of Orthopaedic and Trauma, Northwest General Hospital Peshawar from August 10, 2018 – February 10, 2019. Thirty-six patients were selected using non-probability consecutive sampling technique. Patients between ages 18-60 years, of either gender with confirmed diagnosis of structural bone defect requiring bone grafting were included. However, patients with metabolic bone disorders associated with poor bone healing, active infection at grafting site and terminally ill patients were excluded.

Results: Of the thirty-six patients included, there were 27 (75%) males and 9 (25%) females with a mean age of 38.4 ± 15.4 years. The most common diagnosis among the study patients was traumatic femur shaft defect, which comprised of 10 (27.8%) patients followed by traumatic tibial shaft defect with 6 (16.7%) patients and traumatic femoral subtrochanteric defects were in 5 (13.9%) patients. Other indications for allograft placement in our study population was femoral shaft defect after tumor resection (n = 4, 11.1%), neck of femur non-union (n = 3, 8.3%), tibial plateau fracture (n = 2, 5.6%), femoral subtrochanteric defect after tumor resection (n = 1, 2.8%). The most common surgical procedures included Dynamic Condylar Screw in 9 (25%) patients, external fixation in 8 (22.2%), plating in 7 (19.4%), 5 (13.9%) Interlocking Nail, 3 cases (8.3%) each of dynamic Hip Screw and scraping and one (2.8%) case of posterior spinal fixation. Postoperatively, infection was noted in 4 (11.1%) of cases, instability in 5 (13.9%) cases, non-union in 4 (11.1%) and tumor recurrence in 3 (8.3%) of patients.

Conclusion: Increase in treatment modalities (use of chemotherapy in combination with radiotherapy) leads to significant increase in complications associated with the use of structural allograft including infection and non-union. A great deal of effort is required to prevent these complications that adversely affect the survival of grafted tissue including infection, fracture, recurrence of disease and non-union.

Key words: Outcome, bone allograft, orthopaedic patients.

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INTRODUCTION

Orthopedics surgeons all across the world, face the challenge of reconstruction of bone defects. This challenge can be overcome, by enhancing and accelerating bone repair, which can be achieved with the use of different options like autograft, allograft and bone substitutes. Autografts have the advantage of best biological properties but are disadvantaged by restricted volume and donor site morbidity. As opposed to autografts, allografts have sufficient volume but their use is associated with increased risk of infection. Additionally, they do not have good osteogenic properties. Use of bone substitutes on the other hand, is very attractive for orthopods, but they have different indications for use[1,2,3].

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Worldwide, approximately 2.2 million bone grafting procedures are done annually. By avoiding complications associated with autograft like donor site morbidity, bone allograft has become an attractive alternative treatment modality and has been used widely. The main source of allograft is the osteoarthritic femoral head removed during total hip replacement. However, use of allograft has been associated with the potential of transmitting infectious diseases and can also cause an immuno-rejection reaction[4]. Primarily, rate of transmission of infectious organisms have been significantly reduced after serological testing of the allograft material for human immunodeficiency virus, hepatitis B and C, syphilis and human T-cell lymphotrophic virus (HTLV-1 and HTLV2). Further reduction is achieved through laboratory methods including processing of the allograft bone. Allograft bone in available both in freeze-dried and frozen forms. Freezing allograft bone at -80°C not only reduces the cellular degradation of the graft but also minimizes its immunogenicity. Freeze-dried allograft also resists degradation. Both frozen and freeze-dried allograft retain their osteoconductive characteristics, although freeze-drying reduces the mechanical and osteoinductive properties of the graft[3,5,6,7,8].

In a retrospective cohort study by Flierl et al[9], outcome of various types of bone grafts and graft substitutes were compared, it was determined in the study that allograft were slow to heal (mean time to healing: 416 days), with higher revision rates (47%), with 26% of new onset bone infections. In another study by Drampalos and associates[10], patients who underwent acetabular impaction allografting, non-union rate of 25% was reported. In a study by Bus et al[11], a retrospective review of bony defects treated with allograft, a total of 53% graft failures were reported, where 75% were due to graft non-union and 25% of the graft failures were due to infection[11].

Keeping this in mind, it is evident that there are considerable variations among different studies in terms of bony non-union rates, infection and treatment failure. This variability also indicates the need for further studies in clearly elucidating the role of bone allograft in various orthopaedic procedures. The rationale of study was, therefore, to determine the outcome of bone allograft used in various types of orthopaedic procedures. This will enhance the scientific evidence base and provide valuable information regarding the outcome of allograft in orthopaedic surgery.

MATERIAL & METHODS

This study was a descriptive case series conducted in department of orthopaedics and Trauma, Northwest General Hospital Peshawar between August 2018 till February 2019.

Thirty-six patients with 16% non-union rate were selected using non-probability consecutive sampling and treated with bone allograft. Patients between ages of 18-60 years and of both sexes with confirmed diagnosis of structural bone defect requiring bone grafting were included in the study. However, patients with pathological disorders associated with poor bone healing or increased fracture risk such as Hypoparathyroidism, Osteomalacia and Perthe's disease were excluded. In addition, active infection at the site of bony defect, terminally ill patients, those unfit for anaesthesia (American Society of Anaesthesiologist grade III and above) and pregnant patients were also excluded.

The study was commenced after approval was obtained from research and ethics board of the institute. Patients were selected from the outpatient department, emergency department as well as from inter-departmental referrals. Primary diagnosis was established after detailed clinical history and examination as well as appropriate laboratory and/or radiological investigations. The purpose and benefits of the procedure, the need for the use of bone allograft from the institutional bone bank and purpose of the study was explained to the patients and/or relatives to obtain an informed written consent. The data concerning the study was collected in a predesigned form.

All patients were assessed by a consultant orthopaedic surgeon (fellow of the CPSP with a minimum of five-year experience after fellowship). Clinical assessment and observations were made by the postgraduate trainee. Clinical and laboratory investigations were also used to exclude metabolic bone diseases such as Osteomalacia, Hypoparathyroidism, Renal failure and Perthe's disease. After establishing primary orthopaedic diagnosis, the need for bone allografting was established and the patients were included in the study. Bone allograft was used from our institutional bone bank where allograft is stored at -80 ºC with complete screening for hepatitis B (HBV) and C virus (HCV), human immunodeficiency virus (HIV), syphilis (VDRL) and a negative bacterial culture and sensitivity study. The most appropriate allograft was selected based on the recipient defect size and site. All surgical procedures were performed under general anaesthesia under care of consultant anaesthesiologist.

During the follow-up, patient was followed up at 6 weekly intervals for 18 weeks after allograft insertion and complete assessment was done by clinical history and examination as well as radiological evaluation for non-union, delayed union or osteomyelitis at the graft site. In order to avoid loss to follow-up, a 50% increase in the sampling population was done, so that to compensate for the risk of loss to follow-up. We also obtained mobile contact numbers of all patients and if the patient missed follow-up, we contacted the patient on phone and ensured clinical assessment. Patients who were found to have graft non-union were counselled regarding the need for repeat surgery while those with osteomyelitis were advised for debridement and treatment with broad-spectrum antibiotics.

Data was collected which included patient demographic details, such as age, gender, address, and date of admission as well as clinical details such as primary diagnosis and procedure performed, clinical assessment for union and osteomyelitis as well as classification into favourable and unfavourable outcome.

Our primary outcome measure was graft non-union and infection rates during the six-month follow-up period. Patients who were found to have complete union and no infection were labelled as having favourable outcome while those having non-union at the graft site, osteomyelitis or both were labelled as having unfavourable outcome.

All the information was entered and analysed in statistical software SPSS (version 21). Frequencies and percentages were calculated for categorical variables like gender, diagnosis, procedure, non-union and osteomyelitis. Mean $\pm$SD was calculated for continuous variables like age. Statistical significance was considered at $\leq$0.05. Percentages and frequencies were calculated for patients classified according to each outcome group. To test for association of various variables to favourable or

unfavourable outcome groups Chi-square test was used. A post-stratification chi-square test using gender and primary diagnosis was conducted to look for any confounding effects. All the results were presented as tables and graphs.

RESULTS

Of the 36 patients included, there were 27 (75%) males and 9 (25%) females in a ratio of 3:1 having mean age of 38.4 ± 15.4 years (Table 1). The minimum age was 15 years while maximum age was 67 years. There were 21 (58.3%) patients in the age group 40 years and below while there were 15 (41.7%) patients in the above 40 years' age group (table 1).

The most common diagnosis among the study patients was traumatic femur shaft defect with 10 (27.8%) patients followed by traumatic tibial shaft defect with 6 (16.7%) patients. Other indications for allograft use in our study population were defect after tumor resection, femur shaft (n = 4, 11.1%), femoral subtrochanteric defect (n = 1, 2.8%), tibial shaft (n = 1, 2.8%), humeral shaft (n = 1, 2.8%), and neck of femur non-union (n = 3, 8.3%), tibial plateau fracture (n = 2, 5.6%), traumatic humeral shaft defect (n = 1, 2.8%), spondylolisthesis (n = 1, 2.8%), and radial fracture non-union (n = 1, 2.8%). (Table 2)

The most common surgical procedures included Dynamic Condylar Screw in 9 (25%) patients, external fixation in 8 (22.2%), plating in 7 (19.4%), 5 (13.9%) Interlocking Nail; 3 (8.3%) cases each of Dynamic Hip Screw and Scraping; and one (2.8%) case of posterior spinal fixation.

Postoperatively, infection was noted in 4 (11.1%) of cases, instability in 5 (13.9%) cases, non-union in 4 (11.1%) and tumor recurrence in 3 (8.3%) of patients. (Table 3)

The mean length of stay in hospital was 1.4 ± 0.65 days with 24 patients (66.7%) staying for one day postoperatively.

The postoperative outcome was favourable in 20 (55.6%) patients and unfavourable in 16 (44.4%) cases (Table 2). There were 15 (75.0%) males in the favourable outcome group and 5 (25%) females. Similarly, there were 12 (75%) males in the unfavourable group while 4 (25%) females. There was no significant difference on chi-square analysis and the p-value was noted to be 0.999. (Table 4)

On chi-square analysis, no significant association was found between primary diagnosis and final outcome (p = 0.327). Similarly, no association was found for age groups and final outcome (p = 0.257).

Post-stratification chi-square test was applied for gender and age groups against the final outcome. No significant association was found for gender and age group stratification (p = 0.100).

Table 1: Age groups & Gender Distribution of Study Population.

Age & Gender	Frequency	Percent
Male	27	75.0
Female	9	25
40 years and less	21	58.3
> 40 years	15	41.7
Favourable outcome	20	55.56
Unfavourable outcome	16	44.44

Table 2: Distribution of Preoperative Clinical Diagnosis.

Clinical Diagnoses	Frequency	Percent
Neck of Femur Non-Union	3	8.33
Femur Shaft defect (Traumatic)	10	27.78
Femur Shaft defect (Tumor)	4	11.11
Femur Subtrochanteric Defect (Traumatic)	5	13.89
Femur Subtrochanteric Defect (Tumor)	1	2.78
Tibia Shaft Defect (Traumatic)	6	16.67
Tibia Shaft Defect (Tumor)	1	2.78
Tibial Plateau Fracture	2	5.56
Humerus Shaft Defect (Traumatic)	1	2.78
Humerus Shaft Defect (Tumor)	1	2.78
Spondylolisthesis	1	2.78
Radial Non Union	1	2.78

Table 3: Outcome for Gender & Age Groups.

Complication	Frequency	Percentage
Infection	4	11.1%
Fracture/Instability	5	13.9%
Non-union	4	11.1%
Recurrence/Relapse	3	8.3%

Table 4: Postoperative Complications and their Frequencies.

		Outcome		P value
Gender	Male Female	Favourable	Unfavourable	
		1 (2.88) [1.22]	2 (0.12) [28.46]	.000049
		92 (90.12) [0.04]	2 (3.88) [0.91]	
Age Groups	≤ 40 years	85 (82.45) [0.08]	1 (3.55) [1.83]	.000041
	41 years & above	8 (10.55) [0.61]	3 (0.45) [14.29]	

DISCUSSION

As shown by several studies, end results of allograft use are un predictable[14]. In a study by Dick et al, patients who underwent massive allograft surgery after receiving chemotherapy had complications estimated at about 60 % that included non-union (26%), pin and

plate fracture (11%), allograft fracture (7%), and infection (11%)[15]. Effective chemotherapy on the other hand, is highly associated with enhancing survival rates from 20 % to 58-80% after two years in patients with malignant bone tumours[16]. However, as we have shown in our study, chemotherapy can also adversely influence the end result of allograft placement.

Most of our patients were younger than 40 years of age, which is an important factor, because youth is attributed to better improvement and faster return to daily activities. In our study, rate of infection in patients with different diagnoses was without any significant difference. Similarly, an infection rate of 11% and 12-15 % have been reported by Dick et al and other reports respectively.

After allograft implantation, the most common complication that may occur is infection, which is quite difficult to treat and may ultimately lead to limb amputation particularly in case osteoarticular allograft is used. Though in our study, infection was not a frequent finding. Compromised immune system in patients with malignant bone tumors who received chemotherapy and radiotherapy, predisposed them to resistant infections.

Being a foreign body structural allograft creates suitable environment for the growth and nourishment of microorganisms[17]. In order to lower infection rate, in our study, allografts were prepared and packaged by trained orthopaedics assistants and skilled surgeons. In a similar study, Farfalli reported that infection was seen in 11% of patients[18]. Infection rates of 15 % and 16 % were reported in studies done by Jamshidi and bullen's et al respectively.1920 Menkin also reported that the risk of infection was 10% after the first year of implantation[21]. However, in a study by Nekouie no wound or bone infection was observed[22]. Therefore, any action in favour of preventing the occurrence of infection is highly preferred[23].

Allograft fractures after surgery is another complication of reconstructive surgery, particularly when gamma radiation is used in their preparation process, because this radiation makes the bone and its surrounding soft tissue extremely brittle[23]. In our study, we observed five allograft fractures (13.9%) and in two patients this occurred due to failure in properly protecting the allograft with a plate. The underlying cause of allograft fracture in the other cases was unknown. Fracture occurred in the proximal of the femur in two patients, proximal of the tibia in one, and distal of the femur in three. We found no significant difference for the primary diagnoses with regard to fracture rate. Similarly, in another study the fracture rate of osteoarticular allograft was reported at 17% during the first two years after surgery[24]. In another study, Donati et al reported that the rate of pin and plate fracture in patients that underwent limb salvage surgery for osteosarcoma was 4.9% In a study by Farfalli, three of 26 patients (11%) experienced incomplete allograft fracture[18,25]. Jamshidi reported a pin and plate fracture rate of 5%[19]. In this latter study done on patients who received osteoarticular allograft, pin and plate fracture occurred in 23% and bone graft fracture in 16% of cases. However, in patients who received bone allograft, pin and plate fracture occurred in 48% of cases and there was no graft fracture[19]. Bullens et al, reported an overall fracture rate of 13% and Menkin showed that allograft was associated with an increased risk of fracture (19%) after the third year following surgery[14,20]. It seems that the high incidence of pin and plate fracture in bone allograft recipients is due to the existence of only two points that connects the allograft to the patient's bone, causing the union to form slowly because of callus produced by the host bone. The fusion takes about a year and the callus will never find a natural configuration[26]. In most cases, the fragments become separated and the patient should have another surgery to correct the fracture using larger plate; and to facilitate the union, autogenous bone graft has to be used[27].

Only 4 cases (11.1%) of non-union were observed in our study, leading to autogenous grafting. Most of them were in the traumatic femoral shaft defect patients (P= 0.714). In a study by Farfalli, non-union was observed in 7% of patients[18]. Bullens et al reported that the overall rate of non-union was 65%[20]. Friedlaneder et al declared that using adjuvant chemotherapy with methotrexate and Adriamycin significantly postponed the formation of callus[28].

In massive surgeries for malignant tumours due to vast extended surgery, soft tissue injuries, and the removal of large amounts of muscle with the tumour, perfusion at the junction of the allograft to the recipient bone is largely impaired leading to non-union of the allograft[29].

Recurrence was seen in 3 patients (8.3%). Similarly, in a study by Farfalli, the allograft was removed in two cases out of 26 patients (7%) due to tumour recurrence[18]. Six patients (5.88%) had evidence of local recurrence: three of them were in the adjuvant chemotherapy group and the other three were in the chemo radiotherapy group. Similar to our study, this recurrence was observed in 3 patients (7%) in the study of Farfalli[18]. In Bullens' study, three patients (10%) from 32 patients who received allograft showed evidence of disease after local recurrence[20].

Two of our patients developed recurrence who were diagnosed cases of femoral shaft osteosarcoma. Similar to our study, Nekouie mentioned that during the average 27 months of follow-up, out of the 20 evaluated patients, two (10%) showed distant metastases, one in the lungs and thorax, and the other in the vertebral column[22]. In another similar study by Bullens that followed 32 structural allograft recipients after bone tumour excision with an average interval of five years and three months, our patients (12%) died of pulmonary metastases and the other 25 patients remained disease free[20].

Regarding the development of restriction in range of motion (30-60 degrees), the short and long term functional score was 47.8% in our study. Osteo-articular allograft can be used in limb reconstruction after bone tumour resection and it seems that complications including infection and non-union are relatively high in patients receiving chemotherapy and radiotherapy.

Ong et al conducted a study comparing outcome of biologic and synthetic grafts in the fixation of tibial plateau fractures concluded that diminished inflammatory response to biologic grafts, allows better recovery of long-term fixation compared to the synthetic one[30]. Although the autologous graft application is still considered as the gold standard in the TPF reconstruction, the limited size of harvested bone from iliac crest and the clinical complications of simultaneous secondary operation, along with cosmetic disfigurement of this procedure, have posed the attention toward the allogenic bone graft as an alternative supplementary[31,32,33]. Even so, allogenic graft also contains its own limitation, such as compromised osteo-inductive properties, the risk of disease transmission and immune rejection could finally affect the clinical outcome. Rationally, in case of comparable clinical outcome and complication rate of allograft autograft, application of allograft would be a more judicious option.

Lasanianos et al evaluated the use of freeze-dried-cancellous allograft in the management of impacted tibialplateau fractures. According to their study, freeze-drie-dallograft incorporated soundly in all cases within 12 weeks from surgery and no complications that could be correlatedto graft were recorded[34].

Limitations of our study were small sample size and experience of a single orthopaedic surgeon. Furthermore, this study has been conducted at a single institute.

In spite of several curable complications that occur in limb salvage surgeries, the preserved extremity is functionally and psychologically more effective for the patient rather than amputating the limb and using prostheses. Furthermore, limb reconstruction with bone allograft is an appropriate solution for a time and has a relatively significant recuperation rate and fewer complications compared with other treatment options.

CONCLUSION

Increase in treatment modalities (use of chemotherapy in combination with radiotherapy) lead to significant increase in complications associated with the use of structural allograft including infection and non-union. A great deal of effort is required to prevent these complications that adversely affect the survival of grafted tissue including, infection, fracture, recurrence of disease and non-union.

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Following authors have made substantial contributions to the manuscript as under

Raza W: Conception & design or study analysis & interpretation of data.

Qadir RI: Reviewing it critically for intellection content .

Sherzad P: Drafting the manuscript Acquisition of Data.

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

ORIGINAL ARTICLE

DIAGNOSTIC ACCURACY OF THE BELIN/AMBROSIO ENHANCED ECTASIA TOTAL DEVIATION DISPLAY (BAD-D) IN SCREENING KERATOCONUS TAKING TOMOGRAPHIC AND BIOMECHANICAL INDEX (TBI) AS THE GOLD STANDARD

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ABSTRACT

Objective: To find out the diagnostic accuracy of the Belin/ Ambrosio enhanced ectasia index test in keratoconus diagnosis

Material and methods: In this cross sectional study, both eyes of five hundred patients were included. Patients were included in a systematic random manner from amongst those coming to Amanat eye hospital Peshawar from July 2018 to June 2019 to get rid of their glasses or aiming remedy for corneal bulging. Amanat eye hospital is located at university road in Peshawar providing ocular diagnostic and treatment services. The tools used for the study were the Oculus Pentacam HR and the Corvis ST. The collected data was analyzed statistically using SPSS version 23.

Results: The mean BAD-D value was 3.08+/- 4.45 SD, the SEM was 0.14, 95% confidence interval (CI) of 2.80 to 3.35. The range was 0 to 40.21.The mean TBI value was 0.46+/_ 0.39 SD, SEM was 0.12 with a 95% CI of 0.22 to 0.70. The range of TBI was 0 to 1.00. For BAD-D, sensitivity was 75.6 per cent, specificity was 100 %, positive predictive value was 100% and the negative predictive value was 72.3%.

Conclusion: In terms of specificity and sensitivity, the current study showed acceptable diagnostic accuracy of BAD-D. It is recommended that its result should be interpreted along with other topographic, and tomographic parameters.

Key words: Corvis biomechanical index, Belin/Ambrosio enhanced ectasia total deviation display; Tomographic and biomechanical index.

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INTRODUCTION

In this era, diagnosing subclinical corneal ectasia has become increasingly important because of the introduction of new treatment options for refractive disorders such as laser in situ keratomileusis, photo refractive keratectomy, femto LASIK, and small incision lenticule extraction[1,2,3,4]. The importance of excluding the possibility of coexisting corneal ectatic states along with refractive error can be understood by the fact that there is a deterioration of vision due to increase in corneal bulging after corneal laser procedures in such cases[5]. The recent observation that in corneal ectasia, riboflavin dropping of the cornea followed by ultraviolet light therapy can halt the advancement of this ailment to more developed stages has further increased the significance of early ectasia detection[6,7]. Keratoconus usually involves both eyes of a patient in an asymmetric way, in which there is thinning and protrusion of the central and para central cornea showing up around pubescence[8]. Keratoconus patients generally present with variable amount of inadequate vision which cannot be corrected precisely with refraction. In fully developed cases, on clinical examination, there is irregular scissor reflex on retinoscopy because of oblique astigmatism and the distant direct ophthalmoscopy can elicit central oil droplet reflex. Yet, in

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the beginning stage, which is likewise called sub-clinical keratoconus, or forme fruste keratoconus, because of the unclear clinical picture, the diagnosis can be made with the assistance of screening tests which have high degree of diagnostic accuracy[9].

Nowadays, various devices are utilized for diagnosing keratoconus, incorporating corneal surface, shape and curvature measurements. They include the Orbscan II, the Oculus Pentacam , Galilei G4, and Sirius. The aforementioned instruments measure corneal shape, thickness, and rise of the front and back surfaces of the cornea. In the near past, it was observed that in keratoconus, the corneal response to biomechanical influences is altered before variations taking place in corneal thickness and shape[10]. Currently, the response of the corneal to biomechanical factors is studied with two devices, one is the Ocular Response Analyzer and the other is the Corvis. Pentacam HR[11] depends on Scheimpflug slit picture photography. It measures the corneal thickness in a harmless manner and uses a 475-nm monochromatic cut of light to enlighten the cornea and a 1.45-megapixel camera for photography. The camera rotates about the line of fixation of the eye during the scanning process. There are different scanning programs in Pentacam which include a 25-picture one second scan, a 50-picture two seconds scan, and a cornea fine 50 pictures in one second scan. Based on the information derived from these photos, the system computes a 3D model of the anterior segment of eye from up to 138,000 real elevation points. Another camera detects eye movements and necessary corrections are made thereafter.

The BAD-D[12] is a composite presentation of the height and thickness data of the cornea recorded by Pentacam ST. Deviation from the mean normal values are recorded in standard deviation as; deviation of the front and back corneal height (df and db respectively), thickness distribution (dp), thinnest value (dt) and superio-inferior relocation of the thinnest area with respect to the corneal apex (dy). The d values are calculated in such a way that a zero figure represents the average of the normal individuals and 1 shows one standard deviation towards the ailment. At the end a D value is determined dependent on a regression analysis that measures each parameter differently. If a value is underneath 1.6 from the population mean, it is colored white, yellow (dubious) when it is $\geq$1.6 SD from the mean and red (unhealthy) when more than 2.6 SD from the mean.

The blend of thickness and biomechanical response is another test which is named as tomographic and biomechanical index or TBI. The aim of the present study was to look at the diagnostic precision of BAD-D in keratoconus screening taking TBI as the gold standard[13].

MATERIAL AND METHODS

This cross sectional study included patients who visited Amanat eye clinic Peshawar during latter half of 2018 to first half of 2019. Amanat eye hospital Peshawar is a private eye care center having outpatient treatment service, diagnostic and surgical treatment facilities. There were two kinds of patients in this study; those who were keen to get rid of their glasses by opting a laser procedure or those who were instructed to have pentacam test because of the frequent changes in glasses and therefore thought of as candidate for riboflavin dropping therapy if found positive for corneal bulging. Those individuals with a history of some corneal laser therapy, or having evident clinical signs of keratoconus were not included. Both genders were included randomly within the age range of 5 to 50 years. Both eyes of 500 patients were included in the study making a total of one thousand cases. The devices used for screening were the Oculus Pentacam to investigate BAD-D and the Oculus Carvis ST for CBI and TBI. The study was carried out under the recommendations of the tenets of declaration of Helsinki.

RESULTS

In the current study, both eyes of 500 patients were recruited. The number of female and male patients was 182 and 318 with a percentage of 36.4 and 63.6 respectively. The age range of the patients was 5 to 49 years, with a mean and SD of 21.89+/-8.434 years, 95% CI for age was 21.15 to 22.63 with SE of 0.377years. The cut off range for BAD-D was 0.00 to 1.6 as normal, 1.7 to 3 as suspicious and more than 3 as diseased. For TBI, the cutoff normal range was 0.00 up to 0.25, suspicious range was 0.26 to 0.5 and diseases reference range was 0.51 to 1. The result of BAD-D is given in table 1. The mean BAD-D value was 3.080+/- 4.450 sd. The SE was 0.140, with a 95% CI of 2.805 to 3.356. The minimum BAD-D value was 0.00 and the maximum value was 40.21. The result of TBI is given in table 2. The mean TBI value was 0.465+/_ 0.392 SD. The SE was 0.124 with a 95% CI of 0.222 to 0.708. The minimum TBI value was 0.00 and the maximum value was 1.00.

DISCUSSION

In this study, we assessed the diagnostic value of BAD-D in corneal ectasia diagnosis by finding out their sensitivity, specificity and predictive values against TBI from the collected data. In the present study, the sensitivity and the specificity of BAD –D was 75.6% and 100% respectively. The positive and negative predictive value of BAD-D was 100% and 72.3% respectively.

Wang YM study results for the sensitivity of BAD-D in forme fruste keratoconus was 52.6% with a specificity of 80.3%[16]. Both the markers have lower

Table 1: BAD-D

No	Category	Frequency OD	Frequency OS	Total	Percentage
1	Normal	274	264	538	53.8
2	Suspicious	125	139	264	26.4
3	Diseased	101	97	198	19.8
Total		500	500	1000	100

Table 2: TBI

S. No	Category	Frequency OD	Frequency OS	Total	Percentage
1	Normal	192	197	389	38.9
2	Suspicious	114	113	227	22.7
3	Diseased	194	190	384	38.4
Total	Total	500	500	1000	100

Table 3: Evaluation of BAD-D by comparing it with TBI

s.no	BAD-D result	Disease present	Disease absent	Total	
1	Positive test (suspicious plus diseased)	a (true positive) 462	B (false positive) 0	a+b 462	Sensitivity=%75.6 Specificity=%100 Positive predictive value=%100 Negative predictive value=%72.3
2	Negative test	c (false negative) 149	d (true negative) 389	c+d 538	
3	Total	611	389	a+b+c+d 1000	

Table 4: Comparison of BAD-D with TBI for p value calculation

S no		BAD-D observed(expected)	TBI Observed(expected)	Total	P value (chi square test)=0.06
1	Normal	a 538 (463.5)	B 389 (463.5)	927	
2	Suspicious plus diseased	C 462 (536.5)	D 611 (536.5)	1073	
3	Total (observed)	1000	1000	2000	

values in their study than our study, the explanation being their comparison of just the forme fruste keratoconus with normal individuals whereas our study compares both subclinical and clinical ectasia cases with normal individuals. Subclinical cases have parameters nearer to the normal population than established ectasia cases; therefore, subclinical cases sensitivity and specificity results are less than those of established keratoconus cases.

Muftuoglu noted 60% sensitivity and 90% specificity of BAD-D for subclinical KC versus normal eyes[17]. Steinberg reported 69% sensitivity and 79% specificity for BAD-D when comparing subclinical keratoconus with normal subjects[18]. Ambrosio Jr R documented sensitivity and specificity of 87% and 92.1% respectively for BAD-D in his study before performing LASIK procedure[19]. Sedaqatl found a sensitivity and specificity of 100% for BAD-D, but he compared patients having frank keratoconus with normal population, in which the difference is more clear and pronounced[20]. This data show reasonable specificity of BAD-D, which indicate that its positive result is trustworthy. However, with a sensitivity of 75.6%, this study may highlight the chances of false negative results in early stage of subclinical ectasia. So, if a patient is labeled negative with BAD-D test and there is clinical suspicion of forme fruste keratoconus, the test should be interpreted in combination with other parameters measuring corneal thickness and curvature; and should also be correlated with clinical findings.

CONCLUSION

The current study showed acceptable diagnostic accuracy of BAD-D in terms of specificity (100%), and sensitivity (75.6%), which imply that if this test is used alone for keratoconus screening, some cases of subclinical keratoconus may be missed. So, the author recommends that its result should be interpreted in combination with clinical history, topographic and biomechanical parameters.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Hanan F:	Data Collection, Analysis, revision, desining and writing
Hussain M:	Analysis and revision
Shah Z:	revision
Asrar A:	revision
Qureshi S:	Data collection and revision

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

ORIGINAL ARTICLE

DESCEMET STRIPPING AUTOMATED ENDOTHELIAL KERATOPLASTY (DSAEK), VENTING VERSUS NON-VENTING INCISION - A REVIEW OF 21 CASES

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ABSTRACT

Objective: The purpose of this was study to analyze the advantages/disadvantages of venting versus non-venting incision in descemet stripping automated endothelial keratoplasty (DSAEK).

Material and Methods: This study was performed in the department of Ophthalmology, Khyber Teaching Hospital Peshawar, Pakistan from 1st Jan 2017 to April 2019. The charts of all patients were reviewed retrospectively. DSAEK was performed by a single surgeon, using a similar technique. Any complication either intra- or post-operative which happened, was recorded and managed either medically or by appropriate surgical means. At the end of the study the data was compiled and analyzed.

Results: Total 21 patients, 5 (23.80%) males and 16 (76.20%) females were included in this study. The mean age of the patients was 52.62±7.64 years. All patients had pseudophakic corneal edema/bullous keratopathy. Twenty (95.23%) out the total had posterior chamber intraocular lens and only 1 (4.7%) had anterior chamber intraocular lens. All patients had visual acuity of less than 5/60 (0.08). Mean value before DSAEK procedure was 0.0381 ± 0.01721. Best corrected visual acuity (BCVA) after DSAEK in venting cases was 6/24 (0.25) in one case (4.76%), 6/36 (0.16) in one case (4.76%), 6/60 (0.1) in four cases (19.04%) and 3/60 (0.05) in four cases (19.04%). Mean values after DSAEK in venting cases was 0.2810±0.19393 (p-value 0.004). BCVA after DSAEK in non-venting was 6/12 (0.5) in one case (4.76%), 6/18 (0.32) in one case (4.76%), 6/24 (0.25) in four cases (19.04%), 6/36 (0.16) in one case (4.76%) and 6/60 (0.1) in four cases (19.04%). Mean value after DSAEK in non-venting cases were 0.2164±0.12372 (p-value 0.001). P-values after DSAEK in venting versus non-venting cases were 0.001. Donor dislocation was seen in 4.76%, air induced pupillary glaucoma in 9.52% and partial donor non-attachment in 4.76% in the venting cases. Air induced pupillary glaucoma 4.76% and partial donor non-attachment in 4.76% are the only early post operative complication in non-venting cases.

Conclusion: DSAEK is a promising procedure for decompensated cornea which has damaged endothelium. The complications are more in venting than the non venting cases and similarly best corrected visual acuity remain good in non-venting cases.

Key-words: DSAEK (Descemet stripping automated endothelial keratoplasty), DSEK (descemet stripping endothelial keratoplasty), CME (cystoid macular edema), PKP (penetrating keratoplasty), PGF (primary graft failure).

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INTRODUCTION

Descemet stripping automated endothelial keratoplasty (DSAEK) is the procedure of choice for corneal decompensation due to endothelial dysfunction, as alternative to penetrating keratoplasty (PKP). In DSAEK, the disease endothelium is replaced with healthy donor endothelium, descemet membrane and part of the thin posterior corneal tissue[1].

One of the reports of American Academy of Ophthalmology 2009 states that DSAEK appears similar to PKP in term of graft clarity, visual acuity, surgical risk, complications rate and endothelial cell loss. However, it seems to be superior to PKP in term of early visual recovery, refractive stability, post-operative astigmatism, wound and suture related complications and intra-operative risk[2].

Some surgeons are using automated micro keratome for the preparation of donor endothelial graft, mounted on artificial anterior chamber. The procedure is known as DSAEK. Other surgeons

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are still using manual dissection for preparation of donor tissue mounted on artificial anterior chamber and the procedure is termed as DSEK (Descemet stripping endothelial keratoplasty)[3].

Donor tissue complications that have been reported include inability to separate newly prepared donor tissue from the anterior layer, excessively thickened donor posterior lenticule, donor tissue perforation and inadvertent slipping of the tissue inside of the eye [2,3,4]. Price et al showed that the most frequent complication encountered in DSAEK is donor lenticule dislocation which can be resolved with repositioning of the graft and re-bubbling. The proposed causes of graft detachment include patient eye rubbing and poor donor tissue dissection technique[5]. There are reports on air induced pupillary block, primary graft failure and interface infection in early post operative period 6,7,8,9. In the late post operative period, the most important reported complications are secondary glaucoma and graft rejection[10,11,12,13].

The purpose of this study is to document the advantage and disadvantage of venting and non-venting incision in DSAEK procedure.

MATERIAL AND METHODS

This retrospective chart review was performed in the department of Ophthalmology, Khyber Teaching Hospital Peshawar, Pakistan from 1st Jan 2017 to April 2019. All these 21 cases of DSAEK were performed by a single surgeon. Informed written consent was obtained from all patients. Ethical approval of the study obtained from institutional review board (IRB) of Khyber Medical College, in accordance with the declaration of Helsinki. All patients who underwent DSAEK in our department were included in this study.

All the DSAEK procedures were performed using the similar technique. We received the precut DSAEK tissue and then endoglide was used to insert the donor tissue into anterior chamber. The unfolding of the donor tissue was performed by preplaced anterior chamber maintainer using balance salt solution.

Intra operative complications were those that happened during surgery in relation to DSAEK procedure. Early post-operative complications were defined as those that happened within 2 months of after surgery and late complications were those that happened after 2 months of surgery. Any complication either intra-operative or post-operative, which happened, was managed either medically, or by appropriate surgical means. SPSS version 17 was used to analyze the data. Categorical variables were represented in percentages and numeric variables as means with standard deviation. Patients having bullous keratopathy with posterior or anterior chamber intra-ocular lens implants as well as those with Fusch's endothelial dystrophies with cataract were included in this study. The patients having bullous keratopathy with posterior or anterior lens implants with stromal scaring were excluded from the study. Moreover, cases with excessive synechia and glaucoma vale implants or any active disease were also excluded.

RESULTS

Twenty-one patients were included in the study, which comprised 5 males (23.8%) and 16 females (76.2%). The mean age of these patients was 52.62+7.64 (table 1). All 21 patients had pseudophakic corneal edema/bullous keratopathy. 20 (95.23%) out the total had posterior chamber intraocular lens and only 1 (4.7%) had anterior chamber intraocular lens. Table 2 shows the record of visual acuity before and after DSAEK procedure. All 21 patients had VA less than 5/60 (0.08) with most of the patients having VA of CF-1m (0.04). The average VA before surgery was CF-1m (0.04). Mean value before DSAEK procedure was 0.0381 ± 0.01721. Best corrected visual acuity (BCVA) after DSAEK in venting cases was 6/24 (0.25) in one case (4.76%), 6/36 (0.16) in one case (4.76%), 6/60 (0.1) in four cases (19.04%) and 3/60 (0.05) in four cases (19.04%). Mean value after DSAEK in venting cases was 0.2810 ± 0.19393 (p-value 0.004). BCVA after DSAEK in non-venting was 6/12 (0.5) in one case (4.76%), 6/18 (0.32) in one case (4.76%), 6/24 (0.25) in four cases (19.04%), 6/36 (0.16) in one case (4.76%) and 6/60 (0.1) in four cases (19.04%). Mean value after DSAEK in non-venting cases was 0.2164 ± 0.12372 (p-value 0.001).

Table 3 shows a comparison of early complications in venting versus non-venting cases. Donor dislocation happened in one (4.76%) in venting and none in non-venting cases. Air-induced pupillary glaucoma in two (9.52%) in venting and one (4.76%) in non-venting cases. Partial donor non-attachment occurred in one (4.76%) in both venting and non-venting cases. Blood in interface and decentration happened in one (4.76%) in venting while no such complication has been recorded in non-venting cases. Epithelial ingrowth has not been occurred in any of the case.

A comparison of late complications in venting versus non-venting cases is shown in table 4. Edema and non-attachment after rebubbling in donor

dislocation happened in one (4.76%) venting case while no such complication was there in non-venting cases. Late secondary glaucoma occured only in one (4.76%) non-venting case. Cystoid macular edema and interface opacification occurred in venting cases in one (4.76%) and two (9.52%) respectively, while no such complications occurred in non-venting cases. Figure 1 shows loss of the endothelial cells at 27 months both in venting and non-venting cases which were 23.2%.

DISCUSSION

The DSAEK offers an effective and efficient alternation to traditional PKP for the treatment of corneal endothelial dysfunctions. The different complications of DSAEK are described in literature include pupillary block by air, donor dislocation, graft failure, secondary glaucoma and graft rejection. The potential causes of donor dislocation include the presence of interface viscous fluid or air, patient squeezing and eye rubbing[2-8]. There are complications with preparation, handling and insertion of donor lamellar tissue into the anterior chamber of the recipient [2,3]. Most of the reported complications are with automated dissection of the donor tissue but evidence is lacking about management of these complications.

Pupillary block by air is an important complication of DSAEK procedure. Infact, the reported incidence of pupillary block varies between 0.5% and 13% in different series [5,16,17,18,19]. This is due to the displacement of an excessively large air bubble. In our series, the air induced papillary glaucoma in venting was 9.52% and was 4.76% in non-venting

Table 1: Age & Gender distribution

Gender	Number	Age (range) in years	Mean in years
Male	5 (23.80%)	40-65	52.62 ± 7.64
Female	16 (76.20%)	40-65	
Total	21 (100%)		

Table 2: Record of Visual Acuity in DSAEK before and after surgery Total 21 cases

Visual Parameters														
		PL+ 0	HM 0	CF/1m 0.04	3/60 0.05	4/60 0.06	5/60 0.08	6/60 0.1	6/36 0.16	6/24 0.25	6/18 0.32	6/12 0.5	6/9	6/6	Mean in decimal
No of Patients	Before DSAEK	1 4.76%	2 9.52%	12 57.12%	4 19.04%	2 9.52%	0	0	0	0	0	0	0	0	0.0381±0.01721
	After DSAEK + BCVA in Venting cases	0	0	0	4 19.04%	0	0	4	1 4.76%	1 4.76%	0	0	0	0	0.2810±0.19393
	After DSAEK + BCVA in Non-venting cases	0	0	0	0	0	0	4 19.04%	1	4 19.04%	1 4.76%	1 4.76%			0.2164±0.12372
P-values before DSAEK/after DSAEK in Venting case										0.004					
P-values before DSAEK/after DSAEK in Non-Venting case										0.001					
P-value after DSAEK in venting/non-venting cases										0.001					

Table 3: Comparative early post operative complications in venting versus non-venting Total cases 21

Complications	Venting cases	Non-venting
Donor Dislocation	1 (4.76%)	0
Air induced Pupillary glaucoma	2 (9.52%)	1(4.76%)
Partial donor non-attachment	1 (4.76%)	1 (4.76%)
Blood in interface	1 (4.76%)	0
Decentration	1 (4.76%)	0
Epithelial ingrowth	0	0

Table 4: Comparative Late Post-operative complications in venting versus non-venting Total cases 21

Complications	Venting cases	Non-venting
Edema and non attachment after rebubbling in donor dislocation	1 (4.76%)	0
Late secondary glaucoma	0	1 (4.76%)
Cystoid macular edema	1 (4.76%)	0
Interface opacification	2 (9.52%)	0
Decentration	1 (4.76%)	0
Epithelial ingrowth	0	0

cases. Fewer glaucoma cases in non-venting cases show the overall good results of the non-venting cases. This complication can be prevented by placing a freely mobile air bubble and putting a drop of cycloplegic at the end of surgery as recommended by terry et al[13].

Donor dislocation is another complication and the rate varies from 0% to 82%, with an average dislocation rate of 14.5% 2. The graft dislocation may represent either fluid in the interface of an otherwise well positioned graft or complete dislocation into the anterior chamber [14]. In our series, the donor dislocation happened in 4.76% in venting cases while no such complication was there in non-venting case. It is interesting to note that the incidence of this complication is reduced with experience. Price reported a dislocation rate of 50% on the first 10 eyes undergoing DSAEK, which was reduced to 13% in the next 126 cases after changing the procedure to include face up position after surgery and smoothening of the corneal surface[5]. Other authors have shown the similar results that, with experience and time, the dislocation rate is reduced[10,12,13]. The results of dislocation management are also satisfactory with a success rate of 72.3% that is comparable with other published series [20].

The published studies showed rate of primary graft failure (PGF) from 0% to 29%, with an average PGF rate of 5% [2,19,21,22,23]. PGF has been linked with poor surgical technique and excessive iatrogenic intraoperative manipulation of DSAEK graft. In fact, some studies refer to this entity as iatrogenic PGF [10,13]. In our series, no case of PGF was recorded both in venting and non-venting cases.

Published reports on secondary glaucoma after DSAEK are between 0% and 15%, with an average of 3% [2,24]. In our series, the incident of secondary glaucoma was 4.76% in non-venting cases while no such complication was recorded in venting cases and the commonest cause of this late secondary glaucoma was topical corticosteroid.

Endothelial rejection is another long term complication which was 0% in our series up to the follow up period of 27 months. In different studies the endothelial rejection rate varies from 0% to 45%,average 10% in a follow up period ranging from 3 months to 24 months [12,18,28,29,30].

Epithelial ingrowths and interface hemorrhage are less common complications in our series and these are comparable with reported studies [3,35,36] while interface opacification occurred in 9.52% venting cases and no such complication was there in non-venting cases which are not comparable with the reported studies [3,35,36]. Among these, interface opacity is one of the important reasons for repeat endothelial keratoplasty as reported by Letko et al, following 1050 consecutive DSAEK cases in 5 years [37]. Interface fibrosis was also described histopathologically in failed DSAEK cases where PKP procedure was performed later on [38].

The incomplete stripping of DM as a cause of partial graft detachment in DSAEK has been reported [39]. In our series, partial donor detachment happened in 4.76% both in venting and non-venting cases and with time they attached completely. In both cases the graft was initially attached in more than two third areas.

Post operative cystoids macular edema developed in 4.76% venting cases and 0% in non-venting cases, which resolved with topical non-steroidal anti-inflammatory agent and sub-tenon triamcinolone acetonide injection. This is again comparable with the previous reports [3].

Late secondary donor failure due to chronic endothelial cell loss is a question in DSAEK procedure. The reported late graft failure varies between 0 and 45 % after 01 year with an average of 6% in first year [2]. In our series the study duration was up to 27 months and the endothelial cell loss was 23.2% both in venting and non-venting cases. Late graft failure was more in pseudophakic eye with AC IOLs than with PC IOL (11.7% versus 2.4%)[43]. Previous studies have also shown that endothelial cell loss (ECL) in DSAEK in Pseudophakic eyes with AC IOLs was higher and the graft failure was 16% up to 30 months follow up [43]. Therefore, DSAEK surgery in venting and non-venting cases with AC IOL remains controversial, considering the outcomes from different studies [44]. As the published report of DSAEK beyond 5 years are few in number, so long term graft clarity with DSAEK is yet to be determined [36,39,40].

The infection following DSAEK procedure, either in the form of interface kerit< itis and endophthalmitis in early post operative period or delayed keritits after 3 months is always serious and has already been reported in literature [22,45,46]. In our study, at the end of 27 months follow up, not a single case of infection was seen in both venting and non venting cases.

CONCLUSION

DSAEK is a promising alternate procedure to the traditional PKP. Like other corneal transplantation surgeries, the learning curve is steep and the potential for complications are significant in venting cases. Non-venting cases has less complication

rate and good best corrected visual acuity. However, long term follow up of more cases is needed for better understanding.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Shah Z: Study idea, concept, design and drafting

Hussain I: Study supervision and critical revision

Samar B : Data analysis and writing

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

ORIGINAL ARTICLE

SURGICAL SITE INFECTIONS IN PEDIATRIC POPULATION - AN EXPERIENCE AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: To determine the frequency of surgical site infections in children undergoing elective laparotomies.

Material and methods: This cross-sectional study was conducted in pediatric surgery unit of Khyber Teaching Hospital from 10th October 2019 to 20th March 2020. This study included a total of 112 patients. Data was collected regarding age, gender and operative time. Patients were observed clinically for development of infection and confirmed by culture from the laboratory. Collected data were analyzed using SPSS version 20. Statistical significance was accepted at a value $p<0.05$.

Results: Mean age of the patients was 3.5±2.4 years. Gender distribution showed female patients were 33.9% and male patients were 66.1%. Infection was recorded in a total of 25.9% (29 out of 112). Mean duration to develop infection was 4.8±0.9 days. Patients having age up to one year had wound infection rate of 9.6%, age 1 to 5 years had wound infection 72.3% and age above 5 years had 18.1% ($p=0.92$). Distribution of operative time showed that less than 30 min surgery had a zero percent infection, 30 to 60 min surgery had 13.8%, 60 to 120 min surgery had 44.8% and more 120 min surgery had 41.4% infection ($p=0.01$).

Conclusion: Percentage of surgical site infection for elective laparotomies is higher in our setup and longer duration of surgery is a risk factor for developing infection.

Key words: Surgical site infection, SSI, pediatric elective surgery, laparotomy

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INTRODUCTION

Surgical site infections (SSI) are defined as infection which develops within 30 days post operatively in that part of body where surgery has been perfromed[1]. SSI are most common health associated infection (HAI) and important cause of mortality and morbidity in post-operative patients including neonates and infants[2]. SSI has been reported as major factors of wound dehiscence[3], which has been shown to compose up to 11% of all of healthcare associated infections[1].

SSI presents with redness, edema and pain around the incision site and discharge of cloudy fluid or pus from the wound[4] resulting in delay in healing process. Other signs and symptoms related to specific types of SSIs depends on the organ involved. They can be superficial infections involving the skin only or more serious and can involve tissue under the skin, organs or implanted material. Center for disease control and prevention (CDC) guidelines classify the SSI into superficial incisional, deep incisional and organ/space abscess[5].

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Superficial SSIs involve the skin or subcutaneous tissue only and may present with pus discharging from the wound site. Pus can be taken for culture to find out infective micro-organism involved. Deep SSIs involve deep soft tissues (fascia and muscles). Organ or space SSIs involve any part of organ other than incision site and may present with pus coming from draining site[2,6].

SSIs can be prevented by giving pre-operative antibiotic prophylaxis prior to surgery with plain or antimicrobial soap, shaving hair from the incision site and following strict intra operative aseptic protocol[7,8].

SSIs results in increasing hospitalization and attribute to the increase cost per patient compared to non-infected patient having similar surgical procedure[9,10]. Variability of reports on SSI, makes it difficult to calculate the rate of SSI and recognize the possible risk factors in the pediatric surgery. This study was conducted to find out the rate of SSIs in elective laparotomies and different factors

which results SSIs in pediatric elective laparotomies.

MATERIAL AND METHODS

A cross sectional study was conducted in pediatric surgery unit of Khyber Teaching Hospital from 10th October 2019 to 20th March 2020. Sampling was done through non probability consecutive sampling technique. Sample size of 112 was calculated through WHO formula. Patients having age below 16 years and who underwent laparotomies on the elective list were included in the study. Patients who were operated in emergency and those having laparoscopic surgery were excluded from the study. Surgical site infection was observed clinically and then confirmed by culture & sensitivity. Operative time was recorded for each surgery and categorized for the development of wound infection. All patients received peri-operative antibiotics and were discharged from hospital after treating the infection with a culture sensitive antibiotic. Wound infection was classified as superficial incisional, deep incisional and organ abscess.

The data were collected by the researchers themselves. Statistical analysis was carried out using SPSS-20. Mean and standard deviation was calculated for numerical data like age, while frequency and percentages were calculated for categorical data like infection, age groups. Chi square test was used for categorical data by age and operative time.

RESULTS

A total of 112 patients data was analyzed and out of these, female patients were 33.9% (38 out of 112) and male patients were 66.1% (74 out of 112). Mean age of the patients was 3.5±2.4 years. Further age distribution showed 9.8% up to 1 year (11 out of 112), 71.4% from 1 to 5 years (80 out of 112) and 18.8% greater than 5 years (21 out of 112) see Fig 1. Infection was recorded in a total of 25.9% (29 out of 112). Mean duration to develop infection was 4.8±0.9 days. Further analysis showed that 6.9% patients developed infection on 3rd post-operative day, 34.5% patients developed infection on 5th post-operative day, 27.6% patients developed infection on 4th post-operative day, 17.2% patients on 6th post-operative day. Superficial incisional SSI were 41.4%, deep incisional 58.6% and organ space abscess 0%. Patients having age up to one year had wound infection rate of 9.6%, age 1 to 5 years had wound infection 72.3% and age above 5 years had 18.1% (p=0.92). Distribution of operative time showed that less than 30 minutes surgery had a zero percent infection, 30 to 60 minutes surgery had 13.8%, 60 to 120 minutes surgery had 44.8% and more 120 min surgery had 41.4% infection (p=0.01). Age and operative time was categorized as shown in table 1and 2.

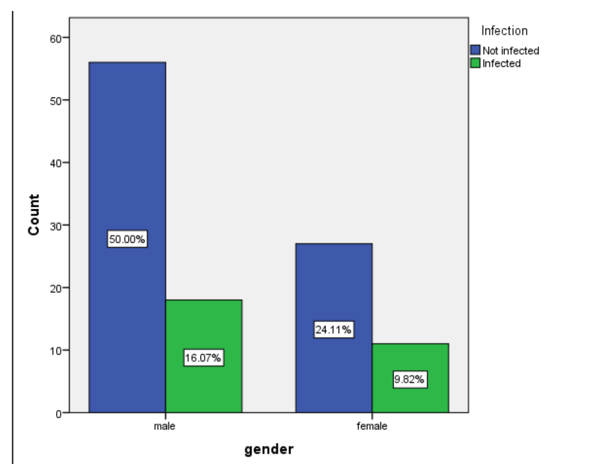

Fig 1: Gender distribution in relation to development of infection

Table 1: Age of the children and frequency of Infection

Age	Infection development		Total	P value
	No	Yes		
Upto 1 year	8 (72.7%)	3 (27.3%)	11(100.0%)	0.94
1-5 year	60 (75.0%)	20 (25.0%)	80 (100.0%)	
> 5 years	15 (71.4%)	6 (28.6%)	21 (100.0%)	
Total	83 (74.1%)	29 (25.9%)	112(100.0%)	

Table 2: Operative time and frequency of Infection

Operative time	Infection		Total	P value
	No	Yes		
< 30 min	12 (100.0%)	0 (0.0%)	12(100.0%)	0.01
30 to 60 min	27 (87.1%)	4 (12.9%)	31 (100.0%)	
60 to 120 min	27 (67.5%)	13 (32.5%)	40 (100.0%)	
> 120 min	17 (58.6%)	12 (41.4%)	29 (100.0%)	
Total	83 (74.1%)	29 (25.9%)	112(100.0%)	

DISCUSSION

One of the major cause of morbidity in surgical unit is surgical site infection. Infection rate varies from center to center and affected by variables such as type of surgery, operative time, wound status, and antibiotic coverage, etc. A study conducted in Japan reported infection rate of 1.2 % for elective surgeries and 4.5% for emergency surgeries. SSI reported in Netherland and UK are 6.6% and 5% respectively[11,12]. Wound infection rate of 14.8% has been reported by Tay M[13]. One of the study conducted locally in a teaching hospital, had reported infection rate in 33.8%[14] of surgeries. Emergency surgery has been reported to have high infection rates as compare to elective[15]. Our study included only the

laparotomies performed on elective list which were followed for development of SSI. Most of the elective laparotomies performed involved congenital anomalies like Hirschsprung disease and surgeries like which require long duration. one-fourth of patients developed infections in our study. Such a high rate of infections can be attributed to the overcrowded conditions leading to cross infection, longer duration of surgery and exclusion of laparoscopic surgeries from the study.

Analysis in the current study showed that most patients developed SSI on 5th post-operative day and the deep incisional infection was the most common, which usually required removal of stitches to drain the collection and obtain specimens for culture. Our findings are consistent with other researches that also reported that most infections develop in the 1st week after surgery.

Pediatric population was studied for the development of wound infections related to different ages. Neonates, infants and older children have been reported to have different percentages of infection rates. In a study conducted in Brazil, neonates, infant and older children have wound infection of 11.4%, 6.4% and 6.1% respectively[16]. High neonatal in these studies was infections due to large sample size and inclusion of all surgeries in the pediatric surgery unit. Another study, where patients with age less than one year, 1 – 4 years, 5 – 13 years and greater than 14 years, were reported to have infection rate of 1.8%, 1%, 1.1% and 1.2% respectively. In current study, age distribution was done in 3 groups and analyzed for the development of infections, age up to 1 year, 1 – 5 years and greater than 5 years.

Literature showed that infections are predominant is males[12]. Similar are the findings of the current study where the male percentage was 66.1% and although Infection rate was also high for male patients but the findings were not statistically significant ($p = > 0.05$).

In our study certain variables had been studied, to know the association of development of SSI. Duration of surgery was one the main factor strongly related to the development of SSI. Porras-Hernandez et al reported that duration of surgery longer than 2 hours has been significantly related to the development of SSI[17]. Another study conducted in India also reported operative duration longer than 1 hour strongly associated with the SSI[18]. Our analysis endorsed the finding in previous studies and clarify that operative duration of more than 2 hours is significant in development of wound infection. Small sample size and short duration of study were the main limitation in the current study.

CONCLUSION

Most of the elective surgeries were performed related to the congenital anomalies with longer duration of operation. Factors related to patients like age and gender had no statistical significance in development of SSI while longer duration of surgery is main determinant of SSI in electively performed laparotomies. On the basis of our study we recommend that SSI should be analyzed further in hospital including all peri-operative factors, which will help in implementing targeted approach to lessen the rate of SSI.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Imran M:	Study supervision and critical revision
Rehman FU:	Study idea, concept, design and drafting
Ali S:	Statistical Analysis
Saeed K:	Data collection

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

INSTRUCTIONS FOR AUTHORS

Manuscript Submission

The Journal of Medical Sciences follows the uniform requirements for manuscripts submitted to Biomedical Journals as approved by the International Committee of Medical journal Editors as updated in Oct. 2004 and available at www:icmje.org. Manuscripts are accepted for consideration if neither the article nor any of its contents has been or will be published or submitted elsewhere before appearing in Journal of Medical Sciences.

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3) use 12 size fonts.

4) Double space the manuscript.

5) Justify the margins

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7) No extra spaces between paragraphs.

8) Black text on white background only.

Title and Authors Name

The first page of the manuscript must give the title of the article that should be concise and descriptive. Also include on this page the name(s) of the author(s), highest academic degrees, the name of the department and institution in which the work was done, the institutional affiliation of each author, and the name and address of the author to whom reprint requests should be addressed.

Any grant/support that requires acknowledgement should be mentioned on this page. Abstract's word count and article (excluding references) word count should appear at the bottom of this page.

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Abstract must not exceed 250 words and the **article must not exceed 3000 words** (excluding references). Articles exceeding the word count or not conforming to "Instructions for authors" will be returned without processing. It is further emphasized that results must not be duplicated in text/tables/figures/graphs.

Key words

Three to 10 key words or short phrases should be added to the bottom of the abstract page. Terms from the Medical subject headings (MeSH) list of Index Medicus should be used.

Introduction, Material and Methods, Results, Discussion, Conclusion, Acknowledgments and references should all start on a separate page from page 03 onwards.

References

The total number of references in an original article must not exceed 40 while in the review articles maximum limit is 100. References must be written double-spaced and numbered as they are cited in the text.

The references must be written in Vancouver style. The style for all the types of references is given in the "Uniform requirements for manuscripts submitted to biomedical journals" at the website of International Committee of medical journal editors. **www.icmje.org**

List all authors when there are six or fewer. If there are more than six, list the first six followed by "et al".

Tables and Illustrations

Each of the tables and illustrations should be on a separate page, must have a title and be on a double space.

Figures should be professionally designed. Symbols, lettering and numbering should be clear and large enough to remain legible after the figure has been reduced to fit the width of a single column. The back of each figure should include the sequence number, the name of the author and the proper orientation (e.g. "top"). If photographs of patients are used, either the subjects should be unidentifiable or their pictures must be accompanied by written permission to use the figure. Duplication of results given in tables and into figures must be avoided.

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When reporting experiments on human subjects, indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (Institutional or regional) and with the Helsinki Declaration of 1975, as revised in 1983. Do not use patients names, initials, or hospital numbers especially in illustrative material. When reporting experiments on

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Except for units of measurements abbreviations are discouraged. The first time an abbreviation appears it should be preceded by the words for which it stands. However title and abstract must not contain any abbreviation.

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Describe statistical methods with enough detail to enable a knowledgeable reader with access to the original data to verify the reported results. When possible quantify findings and present them with appropriate indicators of measurements error or uncertainty (such as confidence intervals). Avoid relying solely on statistical hypothesis testing, such as the use of ρ values, which fails to convey important quantitative information. Discuss the eligibility of experimental subjects. Describe the methods for and success of any binding of observations. Report complications of treatment. Give numbers of observations. Report losses to observation (such as dropouts from a clinical trial). Specify any computer programs used.

Put a general description of methods in the Methods Section. When data is summarised in the Results Section, specify the statistical methods used to analyse it. Restrict tables and figures to those needed to explain the argument of the paper and to assess its support avoid non technical uses of technical terms in statistics, such as "random" (which implies a randomizing device) "normal" significant, "correlation", and sample.

Define statistical terms, abbreviations, and most symbols.

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Revised manuscripts are judged on the adequacy of responses to suggestions and criticisms made during the initial review. All accepted manuscripts are subject to editing for scientific accuracy and clarity by the office of the Editor. When the manuscripts is deemed fit for publication, letter of acceptance is issued to the author. No article is rejected unless similar comments are received from at least two reviewers.

FOR DETAILS, SEE OUR EDITORIAL POLICY IN THE NEXT SECTIONS

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Journal of Medical Sciences (KMC Peshawar pISSN 1997-3438)

ArticleTitle____

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C) I have not signed any right or interest in the article to any third party

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EDITORIAL POLICY

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

OVERVIEW

This document highlights the mission, objectives and editorial policy of JMS in regard to publication process by adhering to the guidelines by COPE (Committee in Publication Ethics) and ICMJE (International Committee of Medical Journals Editors). Each component of the editorial policy is explained in the next sections.

A MISSION OF JMS

To publish relevant, scientific and accessible material to help medical students and health professionals in their practice, teaching and learning, and career development

B OBJECTIVES OF JMS

a. To publish clinical, epidemiological, public health, educational, translational, and allied sciences research to enable the scientists, clinicians and researchers to learn about developments and innovations in these disciplines

b. To publish high quality descriptive and experimental research, review articles, editorials and case reports to enhance the understanding of scientific community regarding clinical practice and education

c. To provide a platform for scientific community in promoting their career development through publishing quality research

C EDITORIAL POLICY

1 Open access

JMS is an Open access scholarly literature source that is free of charge and often carries less restrictive copyright and licensing barriers than traditionally published works, for both the users and the authors. However, it complies with well- established peer review processes and tries to maintain high publishing standards.

2 Peer review process

The review process of JMS is following a "triage approach". Upon submission of a manuscript, either online or physical, the document undergoes a preliminary open (un-blinded) review in the office of the chief editor. The document is either accepted for further review, sent for revision back to the authors, or rejected at that time. Further review of JMS is following a blinded approach, where the article is sent to 2 reviewers, a local and international. During this process, all the relevant information about the authors and reviewers is kept confidential. However, we encourage to share reviewers' comments with co-reviewers of the same paper in a blinded manner, so reviewers can learn from each other in the review process. We also encourage the readers to send us the post publication reviews about a research work in the form of letters to the editors, which are then published and shared with the authors of relevant articles. The editorial board has the authority to retract an article if serious violation of credibility or quality of research is found after the article is published.

The journal is under no obligation to send submitted manuscripts for review, and under no obligation to follow reviewer recommendations, favourable or negative at all times. The editor of a journal is ultimately responsible for the selection of all its content, and editorial decisions may be taken by issues unrelated to the quality of a manuscript, such as suitability for the journal. An editor can reject any article at any time before publication, including after acceptance, if concerns arise about the integrity of the work.

3 Authorship

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

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

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

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4.3: The whole document should not be more than 3000 words (excluding references and appendices).

4.4: The number of figures and tables should not exceed 5 in the whole document.

4.5: The pictures and tables should be black and white in color.

4.6: Copied pictures and tables from other sources will not be entertained, unless a written approval from the original researcher and publisher is provided

5 *Institutional research and Ethics board (IREB) certificate*

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

6 *Conflict of interest*

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

7 *Confidentiality*

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

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

8.1: A specific page is allocated in the journal (both electronic and printed) that will be used for news related to corrections in articles published in previous journals.

8.2: The editor should also post a new article version in the journal with details of the changes from the original version and the date(s) on which the changes were made.

8.3: Previous electronic versions will prominently note that there are more recent versions of the article (that will be placed at the end of abstract). Similarly, the more recent version should be cited by the authors or others.

8.4: If the error is judged to be unintentional, and the underlying science appears valid, and the changed version of the paper survives further review and editorial scrutiny, then retraction with republication of the changed paper, with an explanation, allows full correction of that research paper.

8.5: If serious violation of credibility or quality of a research paper is found after the publication, the article has to be retracted after approval of at least 3 members of the editorial board in consultation with chief editor. The whole process will follow the guidelines presented by Committee on publication ethics (COPE).

8.6: The retracted article should clearly be notified on the website and the word "retracted" should be mentioned along the title of the article.

9 Correspondence

Correspondence for submitting an article in JMS will be through a corresponding author. The duties of a corresponding author have already been presented in a previous section. Correspondence regarding debating an article is given high value and a separate page for letters to the editors has been allocated. Derogatory and demeaning letters are screened and letters which promote debates and critique are encouraged to be published. However, correspondence about the articles published in the last 1 year will be included only.

10 Fee submission process

The editorial board in a recent meeting has fixed a fee of 7000/- Rs (Pakistani), for local authors and 250 $ (US) for international authors. The fee should be submitted at the time of submission of paper in the office of managing editor, and if the paper is rejected at any stage, and will be non-refundable.

11 Roles of editorial board, editors and members

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

11.1: The roles of the Editorial Board are:

11.1.1: To offer expertise in their specialist area

11.1.2: To review submitted manuscripts

11.1.3: To advise on journal policy and scope

11.1.4: To work with the Editor to ensure ongoing development of the journal

11.1.5: To identify topics for special issues of the journal or recommend a Conference which would promote the journal, which they might also help to organize and/or guest edit

11.1.6: To attract new and established authors and articles

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

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

11.2: The Patron is usually the Dean of the institute, and is overall incharge of the

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11.3: The Chief Editor:

11.3.1: The criteria for selection of Chief Editor are:

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iv. Senior research position with equivalent experience in research and scholarship
v. Enthusiasm to undertake the Editor role
vi. Preferably a diploma, master or doctoral degree in Education and Research. It is not necessary to fulfill all the criteria to become a chief editor.

11.3.2: The roles of Chief Editor are:

i. The key role of a journal`s chief editor is to promote scholarship in the specialist field associated with the journal, whilst also promoting the journal as the best journal to publish in. For any journal, the editor will need to encourage new and established authors to submit articles and set up a reliable panel of expert reviewers. Editors are also responsible for offering feedback to reviewers when required and ensure that any feedback to authors is constructive.
ii. An editor should also familiarize themselves with the Committee on Publication Ethics (COPE) 'Code of Conduct and Best Practice Guidelines for Journal Editors'.
iii. Depending on how the journal is managed and how it is structured, an Editor may have to make all the decisions regarding which articles to accept or reject for publication.

11.3.3: Managing editor:

The roles of manging editor are:

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

11.3.4: Executive editor:

The roles of executive editor are:

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

11.3.5: Section editors:

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

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

11.3.5: Editorial advisory board:

Editorial advisory board members consist of national and international senior academicians, researchers, clinicians and others to help the current ed-

itorial board in designing, implementing and evaluating policies regarding upgrading the quality of research work. These people also share best practices to help the editorial team to refine their research work.

12- Policy regarding recruitment and continuation of editorial board Policy for recruitment and continuation of the editorial board is based on the guidelines discussed in the previous section. The chief editor, managing editor and executive editors are recruited by the patron in-Chief. Members are then selected by them from amongst the faculty who have an aptitude for research, and their names are endorsed by the patron. The tenure of editorial board is decided by the Patron after a period of 3 years whether to continue or recruit a new team or member. The editorial advisory board members are recruited for indefinite period by the editorial team of JMS.

13 Plagiarism policy

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

14 Contact information

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

15 Journal funding

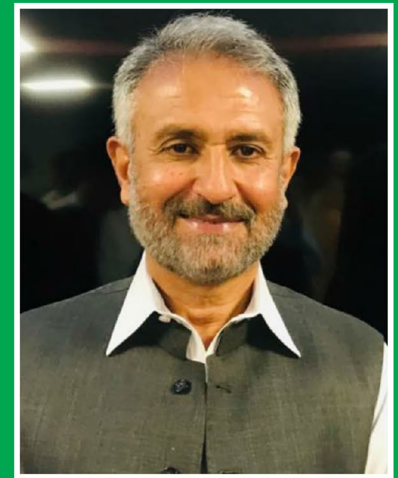
Main funding of the journal is from HEC, which provides funds once on yearly basis and it depends upon the category of HEC recognised journals. We also receive funding from our institute on need basis. Another source of funding is through research paper processing fee amounting to Rs: 7000/- or 250 US$ (for overseas researchers). We also receive funding through annual subscription by different national libraries amounting to 5000/- annual (500 US$ for overseas libraries).

REFERENCES

1. ICMJE recommendations
2. COPE guidelines
3. SCOPUS

This document is developed by including the recommendations of ICMJE (2019) and COPE guideline and in case of any conflict, lack of clarity and ambiguity, the recommendations of latest ICMJE recommendation and COPE will prevail.

HONORING THE LIVING LEGEND



What is meant to be yours, will always find its way and come to you, even if you do not want it" while assembling the jumbled words of that sentence I was reading them aloud and a smile spreads across my face. These words were a farewell note for me from a living legend.

A quick flashback of the past 2 years and I found myself in the same interview room taken away by the ambivalence to decide which unit I have to opt for my residency. Then there came a moment I went sure enough where I am supposed to be- 'Medical A ward Khyber Teaching Hospital' I chose, signed the document, and came out.

SO YES IT DID FIND ITS WAY: DESTINY.

Never thought all the two years training time would be a blink and there would be a day for the farewell note from him. This note states exactly the situation I began my postgraduate career within that interview room.

That was the destiny introducing me to a phenomenal persona, a master clinician, an incredible mentor and the King of Medicine in the North is what he deserves to be called.

I met him at the bedside for the very first time. A gentleman with a deep voice, expressive body language, bright eyes, well-composed personality, equally smart, impressive, and grounded.

It was the day when the summer break was called off. Two days before, all the chaos was about him coming back on Monday. The Special Monday they called it. The day arrived and so did he.

I was told by a senior to be ready for what I had not experienced ever in life- The drill. My loud clear voice for the first time was shaky and my limbs shivered in a month as hot and humid as August. A person who was used to rostrum, stages and the huge audience was experiencing goosebumps.

The round ended and he asks for my name and watches me intently and closely while I introduce myself and that very moment the destiny is blessing me with an emeritus.

A Physician is a diagnostician he always includes this sentence by default in our farewells for out-going batches. Yes indeed, he is an artistic Diagnostician. He could see what others couldn't think of. That's a cerebellar infarct he said while passing by a random patient who was lying on the bed just by the magical eye contact. Review the diagnosis of bed number 21 and she turns out to be vanishing white matter syndrome and hence the charisma that would drive any ones attention towards.

While beginning with the front lead in 1992 he as a Registrar had strived to inculcate high morals, became the chief editor of the of this journal, and worked hard to improve its quality, brought up the idea of OSCE and hence introduced the modern exam systems for undergraduates. He has dealt the largest in the province Department of Medicine with ensured regularity, standards, and quality. Representation of the Department at every level became a new norm in his era.

Let it be his service as the academic Director of PGMI KTH or the membership of Academic Council KMC, formulation, and implementation of policies were at its best. Evaluations, examinations, curricula, syllabi, name it and he had a hold on it like none else.

The fast forward mode and history witnessed him as the ICU supervisory in charge, Chairman college promotion committee, Chairman Pharmacy and therapeutics committee KTH and later put to the most responsible of the roles 'the Chairman and Head Department of Medicine'. While I type this he has trained and taught more than ten thousand undergraduates in the three decades of his selfless service. More than everything else he has directly influenced the training of around three hundred trainees of CPSP. He has mentored and helped develop new members of faculty. Countless alumni of Khyber Medical College have benefitted from his engagements as a scholar and teacher. He proved to be the soul who is gifted at explaining things multiple ways in an inordinately clear fashion to help students grasp concepts.

He has a very unique style of inclusiveness and impartiality in running the Department along with his intellectual and professional rigor which can be seen in new initiatives he introduced. During his tenure as the Chairman, the Department's wind energy and human performance became prominent and recognized.

As much as he is the author of scholarly body of papers and books that are the leading light for the new research directions, he has brought up the JMS to the level of where it stands today while featuring him in person.

Above all, that very emeritus is an ordinary man too. His companions have seen him in good and bad times, in different roles but equally acing them all. Always weighed with all the responsibilities himself, he accepted for others. Brave on inside with all the will to see the room for improvement in the work and to be better, kinder, and empathic human being. Brave on the outside to lead from front irrespective of personal cost.

He can see the whole person in a way nobody else would by truly listening with eyes, ears, and heart all at once. As if alone he was somewhere calm while the rest could only attempt to have a vision in fog. He showed us what he has learned in life the value of nature and simple things. All in all, exactly the right mixture of progenitor prowess coursing his thick veins that granted him such a boon. Nothing can come this close to the inspirational presence of an instructor like him in any mentee's life. His directions and diligence have inspired my inner confidence to climb like a tigress until I reach the pinnacle of my ambitions.

Right from the day, I experienced the worst of anxiety to the moment I am giving life to the feelings of an apprentice with a farewell note in my hand I had a mentor around with glistening eyes, lit guidance, unbiased self, and the one whose presence is no less than a massive shadow in a sunny forest.

LADIES AND GENTLEMEN!

I Present to you A first-class scholar, A person with caring temperament, A storyteller, A person with strong opinions, the King of Medicine in the North and hence an era, 'Professor Dr. Muhammad Humayun'. The one who has always gone above and beyond the expectations of a Professor that KTH would see in a lifetime.

Shumaila Javaid, Iqbal Haider

Department of Medicine, Khyber Teaching Hospital, Peshawar - Pakistan