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Original Article

Editorial

BEYOND THE BOOKS: PRIORITIZING EMOTIONAL INTELLIGENCE IN MEDICAL STUDENTS

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The ever-evolving paradigms of medical education internationally have been defined by community requirements and global standardizations. Healthcare academia strides in the direction of evolving educational paradigms and professional excellence. In our country, the healthcare academia has witnessed an exponential increase in the institutions, introduction of integrated curricula and relevant faculty developments.[1]

Our institutes have an intake of students with very diverse backgrounds. The student diversity includes varied social backgrounds, geographical backdrop, and emotional developments. However recently the healthcare landscape is defining a profile for the yield of doctors in the country. Universities and policy makers have realized the need for soft skills like critical thinking, professionalism, emotional intelligence & leadership.[2]

Patient doctor interaction is the point where all the professional training and societal expectations converge. For an effective patient doctor interaction, the inculcation of elements like professionalism and emotional intelligence is paramount. One of the cardinal features of a safe, professional doctor is emotional intelligence which needs to be categorically considered, defined, trained and assessed during undergraduate studies.[3]

Emotional Intelligence (EI) training is crucial for undergraduate medical students for several compelling reasons. Firstly, medical practitioners often encounter emotionally charged situations, such as delivering difficult diagnoses or dealing with patients' emotional distress. Developing EI enables students to better understand and manage their own emotions, enhancing their ability to provide compassionate and patient-centered care. The healthcare services of Pakistan are fast tracking towards patient autonomy and patient centered approach. Considering such times when the patient can truly steer his/her own healthcare decisions, the use of emotional intelligence will enable the doctor to win the patient's trust.[4,5]

Furthermore, medical errors can have dire consequences. EI enhances self-awareness and self-regulation, reducing the likelihood of burnout and stress-related mistakes. It also encourages ethical decision-making, ensuring that students uphold the highest standards of professionalism and ethics in their practice. EI training fosters effective communication skills, a cornerstone of the medical profession. It equips students with the capacity to empathize, listen actively, and build trust with patients and colleagues, resulting in improved doctor-patient relationships and teamwork.[6]

The rationale of EI training empowering undergraduate medical students with essential skills to navigate the emotional complexities of healthcare, communicate effectively, and provide safe,

compassionate, and ethical care to patients, ultimately improving both patient outcomes and the well-being of future healthcare professionals.[7]

Just like any other profession, it has been established that emotional intelligence (EI) is a vital soft skill for doctors that profoundly impacts their effectiveness in patient care and professional success. Doctors with high EI possess a keen understanding of their emotions and those of their patients. This enables them to establish trust, show empathy, and communicate with sensitivity, leading to improved doctor-patient relationships and patient satisfaction.[8]

EI also helps doctors manage stress, cope with challenging situations, and prevent burnout, contributing to their overall well-being and long-term career satisfaction. It aids in conflict resolution, teamwork, and collaboration with colleagues, enhancing the quality of care in healthcare settings.[9]

In essence, EI equips doctors with the emotional and interpersonal skills necessary to provide patient-centered care, maintain their well-being, foster positive working relationships, and uphold the highest ethical standards in their medical practice. It is an indispensable tool that enhances the overall quality of healthcare delivery.[10]

Emotional Intelligence is divided into four major components of Self-Awareness, Self-Management (self-regulation and motivation), Social Awareness (empathy) and Relationship Management (social skills).[11]

Training undergraduate medical students in the four components of Emotional Intelligence (EI) should involve a combination of didactic instruction, experiential learning, and reflective exercises. All these four components should be individually and methodically handled for training purposes. For self-awareness, the students should be encouraged to maintain an emotional journal for reflection of feelings about the patient doctor interaction.[12]

Medical professionals often face high levels of stress and burnout. EI skills like self-regulation and stress management will help students cope with the emotional demands of the profession, reducing the risk of burnout and improving mental health. For this, a more holistic approach may be adopted at our medical colleges for the development of self-regulation by organizing workshops. These workshops can range from stress management to conflict resolution techniques trainings.[6]

Finally, for relationship management, the cardinal move will be to formally introduce communication skills training. Effective communication is at the heart of medical practice. EI training shall enhance students' ability to listen actively, convey empathy, and communicate complex medical information in a way that patients can understand and trust. This should be structured in a manner of spiralling over the years, as it requires constant development.[13] Ethical decision-making scenarios should be placed in the curriculum to bring into ethical considerations of patient care. These scenarios for ethical decision-making will help students recognize and manage their emotions and biases, thus dealing with ethical dilemmas in patient care.[14]

Throughout these training methods, it's essential to provide feedback, encourage self-reflection, and promote continuous improvement in each component of EI. A holistic approach to EI training will prepare medical students to excel in patient care and interpersonal interactions throughout their careers.[15]

No teaching or training is worth its weight without assessments. Assessing the effectiveness of Emotional Intelligence (EI)

training in medical undergraduate students involves evaluating their abilities in various EI components and their application in clinical and professional settings. For this, certain techniques which individual medical colleges can consider adopting, based on their resources are Self-Assessment Surveys, Objective Structured Clinical Examinations (OSCEs), 360-degree Feedback, Reflective Journals, simulation exercises and portfolio management. Ethical dilemma analysis is a very interesting adoptable technique. The students are presented with ethical dilemmas in patient care and evaluation of their decision-making process, considering both clinical knowledge and EI principles, is done.[16]

The affiliating Universities in Pakistan are in the process of developing, implementing and improving formal training in leadership, professionalism and ethics. EI training should also be an explicit part of the module which is spiral and revisited multiple times over 5 years. EI training will equip future healthcare professionals with the skills to provide more compassionate and patient-centered care. It will help them understand and respond to patients' emotions, fostering better doctor-patient relationships and improving overall healthcare outcomes.[17]

The action of the time is to incorporate EI into the medical undergraduate curriculum. It should be an ongoing process that is continually reinforced throughout a student's medical education through the spiral of soft skills development. Prioritizing EI will guarantee that future medical professionals to not only clinically competent but also emotionally and socially adept, for effective patient-doctor interactions.

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Original Article

EFFECTIVENESS OF AUTOLOGOUS RECTUS SHEATH SLING ABDOMINAL PROCEDURE FOR UTERO-VAGINAL PROLAPSE

Shazia Abid[1], Adila Ashraf [2]

ABSTRACT

Background: Uterovaginal prolapse is one of the most common presentations among women attending gynecological OPD. Various conservative procedures have been reported in the past, each with advantages and disadvantages.The objective of this study is to assess the effectiveness of autologous rectus sheath sling abdominal procedure for uterovaginal prolapsed

Material and Methods: The current study was a retrospective observational study carried out at the gynecology department, Indus Hospital Lahore. Consecutive sampling was done to include all patients who had this surgery during 2018-2022. After the surgery, follow up was started from day 10th of surgery, the second follow up was at 1 month after surgery and the last was after 6 months to assess complications of the procedure and effectiveness of procedure. Data were analyzed using SPSS 24.

Results: In the current study, a total 30 patients were enrolled. The mean age of the patients was 30 (4.12) years. Based on the degree of prolapse, the first degree of prolapse was observed in 18 (60%) patients while the second degree of prolapse was observed in 12 (40%) patients. The success rate was observed in 100% of patients (n=30) immediately post-operatively and 2 patients got pregnant after the surgery and delivered normally in the same hospital without any difficulty and with the maintenance of the effectiveness of surgery. Two patients developed first degree uterovaginal prolapse after surgery and were initially having 2nd degree prolapse. Severe blood loss and visceral organ injury were not observed in any enrolled patients while post operative fever and recurrence were observed in 2 (6.67%) and 2 (6.67%) patients respectively.

Conclusion: The use of an autologous rectus sheath as a sling in uterine conservation surgery for uterovaginal prolapse is an efficient, safe and cost-efficient approach, especially for younger women needing uterine conservation surgery.

Key Words: Surgery, Pregnant, Prolapse

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INTRODUCTION

Uterovaginal prolapse is one of the most common presentations among women attending gynecological OPD. Prevalence of pelvic organ prolapse (POP) among young to middle-aged women in Pakistan and worldwide, shows similar risk factors, morbidity and complications.[1,2]

In Pakistan, the prevalence of utero-vaginal prolapse is about 1.7%.[3] Malnutrition, low socioeconomic position and unskilled birth attendants are all contributing factors to this

high incidence in Pakistan. Young women are more likely to have uterovaginal prolapse, therefore surgical therapy should address both the patient's symptoms and her ability to conceive.[4-6] Various conservative procedures have been reported in the past, each with advantages and disadvantages.[4]

Previously, the females with uterovaginal prolapse were treated with ring pessary[7,8] or had been treated with traditional surgical treatment which is either vaginal hysterectomy or Manchester repair but both surgical options are complicated requiring prolonged surgical time and higher surgical expertise especially when the female wants to preserve her fertility in a childbearing age.[9] The evolution in the surgical treatment of uterovaginal prolapse has resulted in the introduction of modern approaches for uterine conservation with minimal risk of complications or reoccurrence.[10]

We have a wide range of treatment options for them starting from conservative (non-surgical) options and surgical treatments with or without the conservation of the uterus. Lifestyle changes, pelvic floor exercises and the use of pessaries help these women for some or complete symptomatic relief. If these are not helpful then some conservative surgical procedures for correction of uterovaginal prolapse needs to be opted in young women and for those who are desiring fertility.[6,11-13] Manchester repair was the most commonly performed conservative procedure especially in women with cervical lengthening in the past[14] and many women suffered from menopausal symptoms if they underwent a hysterectomy for their complaints.

The invention of different abdominal sling operations is used for this purpose with their advantages and disadvantages.[15,16] Mesh sling repairs are being used with good results but recently number of the surgeries of most mesh repairs are decreased because of its long-term complications and compelling us to move towards the use of autologous tissue. As they are less time consuming, less invasive and cost effective too. All the studies that had been done up till now using rectus sheath slings are with small sample sizes. So, a large, multicentric study is planned to see the effectiveness of an autologous rectus sheath sling for the correction of uterovaginal prolapsed.[5,6,11,12,17]

The objective of this study is to evaluate the effectiveness of this procedure then it would be in top rank among all surgeries performed for UV prolapse in young females.

MATERIAL AND METHODS

The current study was a retrospective observational study carried out at the gynecology department, Indus Hospital Lahore, free of cost tertiary care hospital. The sample size of this study includes all patients who had this surgery during 2018-2022. All the enrolled patients will be followed from 10th post-operative day till 6 months after surgery. The inclusion criteria of the current study include all the patients in the reproductive age group for whom this procedure was done for uterovaginal prolapse whether they completed their family or not and wanted to conserve their uterus and for whom hysterectomy was not a suitable option because of young age group while the exclusion criteria were old age/menopausal women. All the patients who fulfilled the inclusion criteria were included in this study during the above-mentioned period. These selected patients then were booked for abdominal surgery in which a rectus sheath sling was stitched on the back of the uterus medial to the uterosacral ligament with or without plication of round ligament and Moscowitz suture. After the surgery, the follow up was started from the day 10th of surgery, the second follow up was 1 month after surgery and the last was after 6 months to assess complications of the procedure and effectiveness of the procedure in terms of her subjective relief of symptoms as well as on exam and was documented in a proforma. The record was also maintained for all those

females who get pregnant after the procedure and follow up of these was extended till delivery. Data were analyzed using SPSS 24. Continuous variables like age were reported as Mean (SD) or Median (IQR). Categorical variables like the success of the procedure were represented as frequencies and percentages.

RESULTS

In the current study, total 30 patients were enrolled. The mean age of the patients was 30(4.12) years. Based on age distribution, 20 (66.67%) patients were in the age of 18-30 years whereas 10 (33.33%) patients were observed in the age group 31-42 years. (Figure 1) Based on pre-operative presenting complaints, mass in the vagina was observed in 20 (66.67%) patients, vaginal discharge in 6 (20%) patients and backache was observed in 4 (13.33%) patients. (Figure 2) Based on the degree of prolapse, the first degree of prolapse was observed in 18 (60%) patients while the second degree of prolapse was observed in 12 (40%) patients using POP-Q classification. (Figure 3) No complications were observed intra-operatively. Minimum blood loss was observed during the operation. The success rate was observed in 100% of patients (n=30) immediately post-operatively and 2 patients got pregnant after the surgery and delivered normally in the same hospital without any difficulty and with the maintenance of the effectiveness of surgery. Two patients developed first degree uterovaginal prolapse after surgery and were initially having 2nd degree prolapse. Severe blood loss and visceral organ injury were not observed but post operative fever and recurrence were in 2 (6.67%) and 2(6.67%) patients respectively. (Table 1)

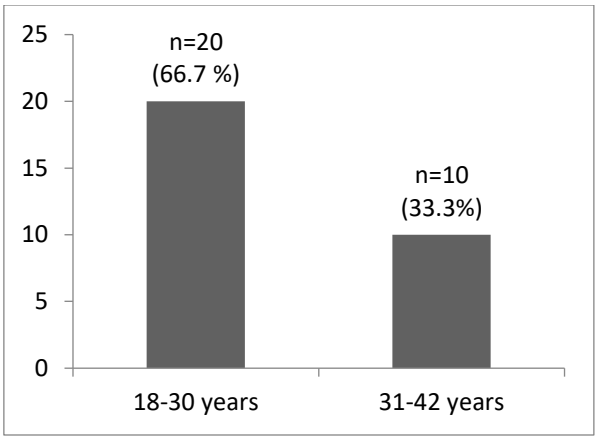

Figure 1: Age wise distribution of participants

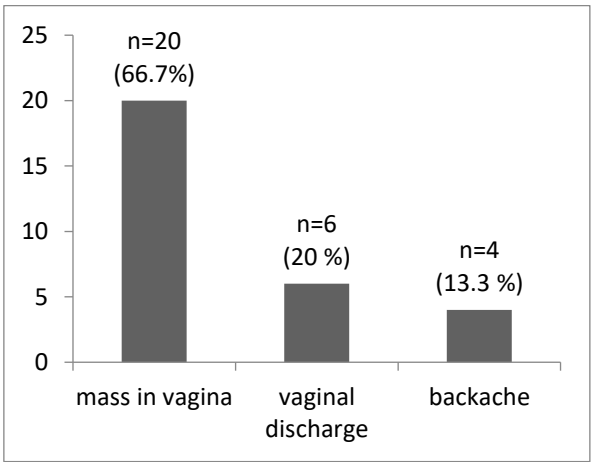

Figure 2: Distribution of participants based on pre-operative complaints

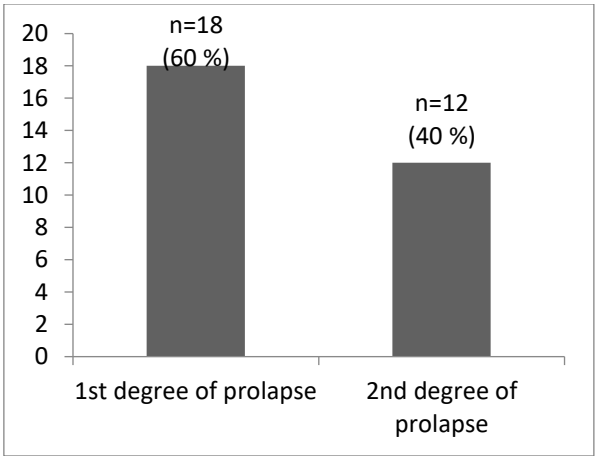

Figure 3: Distribution of participants based on the degree of prolapse.

Table 1: Post operative success rate and complications

Parameters	Frequency (%)
Success rate	30 (100%)
Visceral organ injury	00 (00%)
Severe blood loss	00 (00%)
Recurrence	2 (6.67%)
Post operative fever	2 (6.67%)

DISCUSSION

Pelvic organ prolapse (POP) treatment is especially difficult in younger patients. Currently, several novel treatment options for POP that preserve the uterus are being researched. In this

study, we make an effort to evaluate how well one of these methods works in our area of the world. As a woman gets older, POP is one of the most prevalent symptoms she may experience.[18]

In the current study, total 30 patients were enrolled. The mean age (SD) of the patients was 30(4.12) years. Based on age distribution, 66.67% of patients were in the age of 18-30 years whereas 33.33% of patients were observed in the age group 31-42 years. Based on pre-operative presenting complaints, mass in the vagina was observed in 66.67% of patients, vaginal discharge in 20% of patients and backache was observed in 13.33% of patients. Based on the degree of prolapse, the first degree of prolapse was observed in 60% of patients while the second degree of prolapse was observed in 40% of patients using POP-Q classification. No complications were observed intra-operatively. Minimum blood loss was observed during the operation. The success rate was observed in 100% of patients post-operatively. Severe blood loss and visceral organ injury were not observed in any enrolled patients while post operative fever and recurrence were observed in 2 (6.67%) and 2(6.67%) patients respectively. Another study carried out by Saima Iqbal et al. reported comparable results to our study. They enrolled 18 patients in their study. The mean age of the patients in their study was 32 (4.12) years. Except for a few patients who experienced dragging pain that lasted a mean of roughly one month, all patients had a favorable outcome from the treatment. There were no intraoperative or postoperative problems. The surgery resulted in a very small amount of blood loss. Up until this point in the post-operative follow-up phase, there have been no bowel issues.[11] Other previous studies also reported comparable results with our findings [5, 17]. Another study done by Saima Zulfiqar et al. also reported comparable results to our study. They enrolled 20 patients in their study. Eleven (55%) of the patients in the study were between the ages of 21 and 30 and nine (45%) were under the age of 40. In terms of patient parity, 9 (45%) patients had para 1, 6 (30%) had para 2 and 5 (25%) had para 3. Fifteen (75%) of the patients in this study reported experiencing a mass in the vagina, three (16%) reported experiencing back pain and two (9%) reported having vaginal discharge. Out of 20, 9 (45%) patients were cured, while 11 (55%) patients had utero-vaginal prolapse to some degree. Ninety-five percent of patients were satisfied with the surgery since their symptoms had been resolved. There were no difficulties throughout the operation. Little blood was lost throughout the surgery. In the post-operative period, one patient experienced a fever, which was treated with antipyretics and antibiotics. At the postoperative follow-up, there were no bowel issues. After surgery, there was no extended hospital stay. Nineteen individuals (95%) who underwent the procedure were successful. Recurrence occurred in one patient, who had a history of intermittent constipation and a chronic cough.[19] Another study also reported consistent results with our study.[6] Even though abdominal Sacro hysteropexy has a high success rate of 95%, numerous studies[20-22] reveal that women still need reoperations within the first year of the treatment. Infection and mesh erosion complications also

happened. This surgery requires less time. It is a simple process that typically takes 30 minutes. It loses less blood and has no bladder damage risk. Since it is a simple method, residents may implement it with little training.[23]

CONCLUSION

The use of an autologous rectus sheath as a sling in uterine conservation surgery for uterovaginal prolapse is an efficient, safe and cost-efficient approach, especially for younger women needing uterine conservation surgery. This method may be used in limited resource environments, resulting in a minimal hospital stay with no chance of recurrence.

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Conflict of interest: None

AUTHOR'S CONTRIBUTION

SA: Idea conceived, Supervision and review critically
AA: Data collection and manuscript writing

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Original Article

INFLUENCE OF COVID 19 ON KNOWLEDGE AND PRACTICES OF STUDENTS AND EMPLOYEES REGARDING INFECTIOUS DISEASES AT A PRIVATE MEDICAL COLLEGE

Hajra Mansoor[1], Hunniya Bint-e-Riaz[2], Iqra Pervaiz[3], Jaweria Asif[4], Fatima Azam[5], Zainab Omer[6]

ABSTRACT

Background: The coronavirus pandemic with its rapid transmission and multiple variants wreaked havoc on the health and socioeconomic infrastructure of countries. The struggle to control the spread was a massive problem not only for people at the individual level but for governments while imposing restrictions as well. This descriptive study, hence, aims to evaluate knowledge, attitude and practices during covid-19 and apply it to other impending infectious diseases.

Material and Methods: In this descriptive cross-sectional study an online questionnaire consisting of 17 items broadly addressing awareness regarding the viral variants, understanding of and adherence to protocols as well as knowledge about vaccines was administered to 335 students and employees of CMH Lahore Medical College from January, 2022 to March, 2022. Participants were selected by nonprobability convenient sampling.

Results: The results showed that out of 335 responses, 275 (82.1%) were student responses and the remaining 60 (17.9%) were responses from the employees. The results showed that although 47.5% of employees did not consider the new variants to cause more severe illness but about 85% were motivated enough to continue practicing personal protection and adhere to the control measures.

Conclusion: With the results gathered by our study, it is believed that although attitudes towards control measures have improved individuals still need to practice adherence to preventive strategies set by governments for not only corona virus variants but for other transmissible diseases as well to reduce the risk of future pandemics.

Key Words: Viral diseases, Pandemic, Knowledge, Covid-19

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INTRODUCTION

COVID-19 began in Wuhan, China in December 2019, developing into a pandemic that adversely affected the socioeconomic and health infrastructure of countries.[1] The government hastened to impose preventive strategies to halt the increase in infectivity rates and the collapse of the health authorities.[2]

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The measures included personal protection like hand washing, use of sanitizers wearing face masks in public, social distancing and mass protection like travel bans, lockdowns and quarantine.[3] As the virus continues to have disastrous effects, recent statistics reveal that SARS-Cov-2 infected over 260 million people worldwide with over 5 million mortalities since its discovery.[4] With the inability to eradicate the virus, countries witnessed its mutations and the presence of other communicable viruses which aggravate the burden on health resources. Human factors and conditions like global warming impact the reproduction, or spread of

pathogens, as well as the presence and number of their vectors.[5] This in turn affects the severity of the disease, determines its outbreak and risks of a pandemic with the emergence of new and resistant variants.[6] Similarly, the discovery of the highly transmissible variant, omicron, created unease, uncertainty and further disruption. With the increased prevalence of the variant, the health authorities imposed restrictions to prevent medical management from crumbling.[7] However, with each new wave, the sensitivity, fear and adherence to precautionary measures of the general population started to decline.[8] Adolescents and the elderly particularly have been found to have potentially low compliance with preventive measures directed at combating the spread of diseases by viruses.[9] Others however developed 'behavioral fatigue' with a loss of motivation to adhere to the protocols and a perception that the new pathogen will not be eradicated, rather, it will become endemic to permanently establish itself in humans alongside the other seasonal coronaviruses and microorganisms that cause relatively mild disease.[10] Certain sociodemographic characteristics, such as female sex, better education and occupation have also been associated with greater adherence to prevention against microorganisms, whereas individuals from other demographic backgrounds may lack the mental and physical capacity for conformity due to their occupation or economic concerns.[11] Another particular challenge for health authorities in managing the public's response to COVID protocols is the misleading information from unreliable resources and conspiracy beliefs that manipulate people into believing that COVID is propaganda by a certain group of individuals.[12] COVID 19 since the beginning and with the emergence of new strains is a stronghold of conspiracy theories, because it is difficult to understand especially for those who are oblivious to medical science which includes a large fraction of the population of Pakistan.[13] The basic aim of the study is to evaluate knowledge, attitude and practices regarding preventive strategies for infectious disease control like covid 19 on people working in medical institutes so that we can have an idea of how to deal with pandemic fatigue to apply them to the emerging and re-emerging variants.

MATERIAL AND METHODS

This descriptive cross-sectional research with non-probability convenient sampling was conducted amongst the undergraduate students of CMH-Lahore Medical College and Institute of Dentistry from January 2022 to March 2022. Undergraduate students from MBBS, BDS, AHS and AFNS together with employees including faculty and supporting staff participated. Anyone not working at CMH Lahore Medical College was excluded. A sample size of 335 participants was used which was calculated from Rao Soft. The tolerable margin of error was kept at 5%. A 17-item self-administered questionnaire was used. Interviews were conducted for supporting staff and they were well explained in simple local language about the terminologies in a lecture before filling out the questionnaire. The pilot study was carried out to check the feasibility and relevancy of the study. Cronbach alpha was found to be 0.72. Informed consent was taken from all participants before data collection. The questionnaire contained statements used to assess the subject regarding awareness and adherence to WHO preventive strategies for COVID-19. The statements were categorized as follows: Awareness of COVID-19 & WHO-recommended preventions, knowledge of vaccines and view on future strains. All data gathered was entered into and analyzed by SPSS version 20. Data was presented in the form of percentages and frequency.

RESULTS

Table-1: Demographic Profile

Attributes	n(%)
Gender	
Males	132(39.4%)
Females	203(60.6%)
Age	
Group 1(below 25 years)	279(83.3%)
Group 2 (above 25 years)	56(16.7%)
Employee Category	
Faculty	37(11%)
Administrative Staff	11(3.3%)
Supporting Staff	12(3.6%)
Students	275(82.1%)
Field of Work	
MBBS	223(66.6%)
BDS	60(17.9%)
Allied health sciences	24(7.2%)
Nursing	28(8.4%)

Table-2: Responses of the individuals

Factors	n(%)
1)Wearing face masks while in the institution or contact with people Yes No	287(85.7%) 48(14.3%)
2) Frequency of hand washing being more than 4 to 5 times a day Yes No	249(74.3%) 86(25.7%)
3)Keeping a hand sanitizer and using it after touching stuff Yes No	190(56.7%) 145(43.3%)
4)Covering the nose with tissue during coughing and sneezing Yes No	293(87.5%) 42(12.5%)
5)Suspected cases of Covid-19 should be quarantined Yes No	276(82.4%) 59(17.6%)
6) Booster Doses are usually very effective against future strains of Covid-19 Yes No	241(71.9%) 94(28.1%)
7)future strains are very dangerous and can cause severe illness Yes No	176(52.5%) 159(47.5%)
8)Practicing social distancing in the workplace Yes No	183(54.6%) 152(45.4%)

DISCUSSION

Already present literature reveals that outbreaks like COVID-19 are imminent due to environmental and climatic changes and hence our study supports this view by observing the behavioral patterns regarding strategies for prevention of a pandemic.[14] The educational status of participants was considered as previous studies suggest that well educated people tend to believe less in rumors and generally use an authentic source of information to follow which corresponds to the results in this study.[15]

This study also reported that approximately 52.5% of participants believed that newer strains are more virulent and are associated with higher levels of morbidity and mortality. This is a mixed trend among the masses because various strains of COVID-19 had various levels of virulence associated with it such as delta strain; strains that emerged later during the pandemic caused the more severe illness but omicron was associated with mild symptoms.[16] Shaping this perception is also a fact that previous epidemics in the world were not completely eradicated but the morbidity associated with them had considerably declined as seen in influenza variants.[17]

About 80% of people included in our study believed in the efficacy of boosters and have got vaccinations done which is a very positive behavior because according to studies an increased level of efficacy of vaccinations for other diseases including smallpox, measles, and mumps is seen which is shown by previously done researches.[18] The discontinuation of vaccines such as the smallpox vaccine results in waning population immunity resulting in the resurgence of monkeypox. There is a need for strict surveillance and case detection to understand the changing epidemiology of resurging diseases. This is of extreme importance because the psychological, behavioral and epidemiological factors determine the responses of vaccines towards combating the spread of diseases.[19]

As far as the behavioral trends of participants were considered some students, many faculty

members and a few of the administrative staff, about 52%, thought that future strains of COVID can cause serious illness possibly because people who had already recovered from COVID caused by other strains got reinfected with the delta strain which caused several deaths in India and UK demonstrated by a recent study.[20] The remaining percentage of participants, however, did not think so and are quite optimistic so people need strict adherence to simple protocols and modifications in social and public behavior to reduce the transmission of SARS-CoV-2.[21]

About half the people found practicing social distancing a bit difficult to adhere to although they believed it to break the chain of virus transmission but did not comply with it because of the crisis observed during the lockdown together with the economic and psychological problems arising with it as Pakistani economy reported GDP's negative growth (-0.05) for the first time over the last 60 years in 2020, which caused massive financial crisis.[22] The majority of people were not obeying government restrictions which are in congruence with pandemic fatigue theory[23] and the attitude regarding the efficacy of booster was also quite discouraging particularly because of the reinfection occurring after getting the two shots of vaccine as observed in past studies.[24] Our findings are of utmost value empirically since with the emergence of new rapidly transmissible diseases like the monkeypox virus globally for which the case fatality rate for the Central African clade was 10.6% versus 3.6% for the West African clade, it has become crucial to adopt these preventive strategies as a lifestyle.[25] Primary care records of 17,278,392 adults were pseudonymously linked to 10,926 COVID-19-related deaths so this rise in lethal transmissible infections due to population growth, increased urbanization and environmental factors should be taken into account at the individual level and also by the governments.[26] Hence, to avoid instances of a future burden on healthcare services by other infectious diseases as occurred during COVID, governments and health authorities should take into consideration the trends of adherence to previous preventive strategies put into place as shown by this recent study and past studies.

The limitation of this study was that it was conducted at single center only which gave the views of limited people related only to healthcare so a study that caters to the general population would provide better insight. A larger sample size can also help determine the behavioral patterns of the masses better. Data collection during the pandemic was also a challenge due to limited interaction with the participants which also led to difficulty in interviewing participants of lower educational status.

CONCLUSION

Medical students and employees of CMH Lahore have demonstrated positive behavior in following COVID-19 preventive strategies and with regards to booster doses of vaccination but they did not feel comfortable with the idea of prolongation of disease interval. Hence, this fatigability could be kept in view in implementing preventive strategies for future pandemics.

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AUTHOR'S CONTRIBUTION

HM: Data collection, manuscript writing, editing and final drafting.
HBR: Data collection, data analysis, manuscript writing and final drafting.
IP: Data collection and manuscript writing.
JA: Data collection and manuscript writing.
FA: Data collection and manuscript writing.
ZO: Overall supervision, final drafting, revision and final approval of the manuscript.

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Original Article

PATIENT ACCEPTABILITY AND SATISFACTION FOR TELEMEDICINE IN COVID-19

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ABSTRACT

Background: The emergence of COVID-19 back in 2020 quickly caused a global crisis unparalleled in modern history which made humanity spring into action with the will to fight back, with social distancing being one of the biggest weapons. This measure, then, breathed a new life back into telemedicine, with the idea in mind that a computer virus is the only infection that telemedicine can transmit. While there has been much research on telemedicine in pre-COVID times, we saw only a limited amount of research set during the pandemic when, particularly, its use skyrocketed, which puts much emphasis on the need for our research.

Material and Methods: It was a descriptive cross-sectional study with a total sample size was 224, non-probability convenient sampling technique was used. Data was collected over six months, from the Telemedicine clinic of the University of Peshawar using questionnaires named TUQ (Telehealth Usability Questionnaire) and TSQ (Telehealth Satisfaction Questionnaire), analyzed using SPSS version 22 for Windows and presented in the form of a histogram, pie charts, bar charts and frequency tables.

Results: The data revealed that a large number of patients, 157 out of 224, which is 70% were well satisfied upon using the services. The results of acceptability were no different, as 90.2% of participants, 202 out of 224, agreed to the system being usable and acceptable, partly or strongly.

Conclusion: This was a very strong result that suggested telemedicine potentially being the future. But our research targeted mostly literate people while the literacy rate in Pakistan is 62.3%. Furthermore, telemedicine is found to be great for stable OPD patients only but not for critical patients like those in the ICU.

Key Words: Telemedicine, Intensive Care Unit, Patient Satisfaction

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INTRODUCTION

Late in December 2019, in Wuhan (China), an outbreak of Pneumonia appeared with no apparent causes.[1] In about two months it became a pandemic and infected 106 people in 19 other countries and killed 213 people in China.[1] Different laboratories determined that a new coronavirus (SARS-CoV-2), the World Health Organization, named this disease coronavirus disease 2019 (COVID-19) and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[2] This pandemic SARS infected about 8,000 people worldwide with nearly 800 deaths at the start and a death rate of around 10%. Whereas MERS-COV infected over 857 people causing 334 deaths, with a mortality

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rate of 35%**.** There are some overlapping and discrete aspects of the pathology and pathogenesis of those SARS-CoV-2.[3] A minimal percentage of respiratory infections is caused by Human SARS-CoV-2 annually. This new virus was named COVID-19 which started in the seafood market in China.[4] Coronaviruses (SARS-CoV-2) single-stranded RNA viruses. According to a genomic study, bats were found to be the primary source of this virus transmission which produced severe acute respiratory symptoms in humans. However, the mode of its transmission to humans is not clear.[5,6]

Telemedicine is the use the modern technology like computers, video, phone, and messaging) by a medical professional to diagnose and treat patients in a remote location[7,8]

The concept of it is to provide health services and information through electronic information and communication technology is known as telehealth.[9] It allows communication between patient and doctor through this electronic communication system and provides care, counsel, recommendations, prompts, education, intervention, monitoring and remote admissions. The term "telemedicine" is occasionally used interchangeably or, in a more constrained meaning, to refer to clinical services that are provided remotely, such as diagnosis and monitoring. Telehealth can help close the gap when it is difficult to access healthcare in far-flung areas due to transportation issues, sudden changes due to outbreaks, or pandemics, funding issues, insufficient staff, or other factors in addition to offering distance learning, meetings, supervision, and presentations between practitioners, online information and health data management, and healthcare system integration. Since computer viruses are the only infection that may be acquired when using TM, nearly all large corporations and health plans provide some kind of coverage for TM services to promote the TM methodology.[10]

To help people deal with their routine activities and stay connected, Telecommunication infrastructure and its allied services are playing an important role. There has been an enormous increase in the use of information technology to meet the demands of online jobs, entertainment and other aspects.[11] The recent Pandemic has proved that the telecommunication industry is the leading facilitator of yield in accession to connectivity.

This technology facilitates those who face hurdles in approaching acceptable care due to financial or geographic compulsions. Telehealth can be instrumental in enhancing the efficacy and convenience of healthcare.[12]

Telemedicine is a great alternative to mental health treatment. Many patients can now receive treatment from healthcare professionals without the need for in-person presence. Additionally, patients can enrol in step-by-step training services catered to their particular ailment, complete a series of self-tests, and email their symptoms to doctors[13]

Patients might not be aware of their access to TM and may not be aware of how to use it. To remove these hurdles, Health plans, employers, hospital systems, and media outlets should work together. Now more than ever before due to the COVID-19 pandemic, in-office consultations present a threat to the lives of healthcare workers.[14]

Telemedicine is undeniably a potentially useful tool in managing pandemics and its development is the need of the hour. Telemedicine can not only be used to provide rare health services to remote areas of the country but also decrease person-to-person contact and save the lives of patients and healthcare workers. This study aims to focus on acceptability and satisfaction in teleconsultation.

The aim of this study is to evaluate the acceptability of telemedicine as an alternative to outpatient services in COVID-19 patients and find the satisfaction of symptomatic COVID-19 patients in teleconsultation.

MATERIAL AND METHODS

It was a descriptive cross-sectional study and was conducted at the University of Peshawar including those consulting telemedicine

settings. Data was collected over 06 months from January 2022 to June 2022. According to the WHO sample size calculator, taking statistics of the prevalence of patient satisfaction, Cochran's formula was used. The sample size was calculated using a 95% Confidence interval and a 5% Margin of error.

$n = Z^2 pq/e^2$ after putting a Prevalence of 84% from a study conducted in Philadelphia[15], the calculated sample size was 224 and a simple convenient sampling technique was used to collect data from participants in the University of Peshawar, who used telemedicine in the pandemic of COVID-19.

Patients above the age of 25 years attending the telemedicine centre of the University of Peshawar were included. Patients not willing to participate were excluded. Data collection was through Questionnaires named TSQ and TUQ (Telehealth satisfaction questionnaire & telehealth utility questionnaire.[16] (TSQ) designed based on patients' responses was used to assess the level of satisfaction as follows:

1-1.5= Poor
1.6-2.5= Fair
2.6-3.5= Good
3.6-4.0= Excellent

The extent to consider telemedicine to be appropriate based on cost-effectiveness, technical quality, convenience, accessibility, ethicality and self-efficacy.

Scale [16] (TUQ) for assessing acceptability of patients using telemedicine was used as follows:

1-3= Disagree
3-5= Partly agreed
5-7= Strongly agreed

Data collection was started after obtaining ethical approval from the ethical review board. The educational status of the patient was taken into account and the team was trained to assist the patients in filling out these questionnaires. Data was analyzed through SPSS (Statistical Package for Social Science) version 22, using tables and charts for frequencies and percentages.

RESULTS

A total of 224 participants were involved in this study, among them 118 were males (53%) and 106 were females (47%).

According to the data, out of the total 224,118 (53%) were males and 106 (47%) were females.

Table-1: Relationship of Waiting time with satisfaction level

		Frequency	Percent
Satisfaction level Response	Poor	13	5.8
	Fair	109	48.7
	Good	79	35.3
	Excellent	23	10.3
	Total	224	100.0

Table-2: Explanation of treatment by a specialist

		Frequency	Percent
Response By specialist	Poor	11	4.9
	Fair	60	26.8
	Good	115	51.3
	Excellent	38	17.0
	Total	224	100.0

With regards to the question of the behaviour of the specialist during the interaction, 53 or 23.7% thought it to be excellent, 96 or 42.9% good, 67 or 29.9% fair and 8 or 3.6% poor. A good majority of 73% of the patients described the overall experience as good and excellent, with 56% or 126 patients calling it good and 17% or 38, excellent.

For 9 patients or 4%, the experience was poor and for 51 patients or 23%, it was fair.

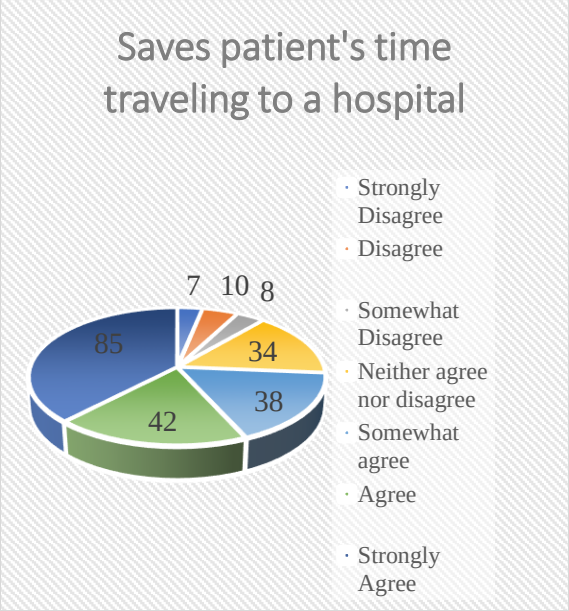

Figure-1: TUQ-Analysis for travelling time to Hospital

About the question of the saving of travel time for the patient to reach some hospital instead, a total of 74% of the participants agreed at some level, 38% of which were in strong agreement while 19% and 17% agreed and somewhat agreed respectively. A total of 25% disagreed and 15% were indecisive.

Table-3: Simplicity of the system

	Frequency	Percent
Strongly Disagree	13	5.8
Disagree	14	6.3
Somewhat Disagree	23	10.3
Neither agree nor disagree	53	23.7
Somewhat agree	43	19.2
Agree	24	10.7
Strongly Agree	54	24.1
Total	224	100.0

In reply to the question of productivity, 16.1% stated that they could not become productive quicker using the system and disagreed in varying degrees whereas 63.8% of patients felt otherwise and agreed on different levels. When asked about interaction with the system,20.1% neither agreed nor disagreed while 18.3% of patients were of the view that the interaction with the system was not good and disagreed on. varying degrees while 59.4% agreed on different levels

It was sought if the system was designed for the patient and whether it could do what patients required it to. Those who disagreed on different levels were 9.7% to the design of it being so while 44.2% agreed to it on varying levels. On the question of patient expressiveness, 57% agreed on different levels, a total of 29% disagreed on different degrees and 15% neither agreed nor disagreed

The patients were asked about the level of comfort between clinicians and patients. A majority of 60% in total felt comfortable and so, agreed on different levels. 21% in total disagreed on different levels.18% neither agreed nor disagreed. When asked about commitment to using the system again,66% agreed,18.1% disagreed and 15% were indecisive.

DISCUSSION

This study was conducted by using a validated Telehealth satisfaction questionnaire (TSQ)[16,17] The results showed that the majority of the participants were highly satisfied with the new technology of healthcare; telemedicine. Out of the total 224 people who participated, 157 people which is 70% fell in the category of "good" and "excellent" when it came to labeling their experience with telemedicine.

The study results are consistent with the study done in Santa Catarina Brazil for assessing the satisfaction of patients with the use of telemedicine on a total number of 564 patients, The collected data were quantified and underwent statistical analysis, which showed a clear perception of the improvement in the quality of service by both patients and healthcare professionals.[18] In this study a total of 102 patients which is 45.6%, said that they had to wait less to get their appointment through telemedicine. Compare this to the 55% of patients in the Brazilian study who said they had to wait 1 day to get their appointments (1 day being the least time of waiting in their

study) through telemedicine while before telemedicine, only 16% of patients said that they had to wait for 1 day to get their appointments, rest of them said they had to wait even longer.

So overall, telemedicine saves patients' time. The participants of our study and the patient's Brazilian study were both stable enough to wait for the appointment to get done and for results to arrive, unlike the patients in ICU who require constant monitoring and direct physical presence as they are on the verge of death and their families trying hard to keep their sanity.[19]

Overall, telemedicine can be a great source of online healthcare in the future but for minor health consultations like those of stable patients in OPD. The satisfaction level of illiterate people specifically needs to be evaluated and doctor's preference for telemedicine rather than direct physical practice of medicine should also be a point of focus to discover to label telemedicine fully suitable for future implementation.

This study further aimed to assess the level of acceptance of telemedicine services during the pandemic situation. The results indicate that an overwhelming majority found this system acceptable. These findings are somewhat in close agreement with a study conducted in Australia which used a modified version of the telehealth acceptability survey.[20] According to the results of the Australian study 128 respondents, one fifth showed a constant disagreement with the usage and acceptance of the telehealth services. The remaining four fifth which is a great majority found this system acceptable at varying levels although they expressed concerns regarding a few variables.[20]

The level of acceptability was evaluated based on several variables. Regarding the simplicity and ease to use and understand this system more than half the participants agreed to accept it at different levels. It was discovered that 55% of the total liked this system and found it simple to use, similarly, 54 % of the participants agreed to be accepting of this at some level about the feasibility with the usage and understanding of the system. Several other studies have reported that according to patients the healthcare outcomes in video visits were no different than in-person visits and so are consistent with our study. When assessed for the level of acceptance regarding the commitment to use this system again in future and the overall satisfaction of the users by using Telehealth, it was revealed that 66.5% intend to do so and agreed at a certain level, 18.1% disagreed at a certain level while 15% were neutral. These findings are not consistent with the cluster studies conducted in South Australia where two clusters were randomized, cluster 2 shows almost complete dissatisfaction with the use of telemedicine services while 70% of the participants of group 1 indicate dissatisfaction. Overall, 48% of the respondents would prefer to use this system in future.[21] The differences in the results might be because these clusters particularly group 2 do not have a good assess to technology and they are not so educated or are mostly poor. Another survey conducted on the high-risk obstetrical patients with the support of the Northwell Health system shows a more positive result as compared to our study.[22]

A survey conducted in Pakistan involving health care professionals showed that a total of 52.2% of participants showed agreement with using telemedicine.[23]

The higher acceptability rate as evident from our results quite clearly states that telemedicine is an emerging field and can be regarded as an acceptable medium of healthcare delivery across the country. Thus, it can be concluded that telemedicine cannot be considered as a complete alternative to conventional in-person visits but can be viewed as a complement to it which would benefit a lot, particularly in emergencies such as in times of pandemic.

CONCLUSION

The study results were very strongly in favour of telemedicine suggesting it to be potentially the future of medical consultation & treatment. This study also concluded that

people were very satisfied with the introduction of telemedicine services and their utility. Future research on the perception of physicians regarding the consultation process is needed and targeting the illiterate population could complement our work.

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AUTHOR'S CONTRIBUTION

RA: Topic selection and writing of article
AM: Writing, data collection and statistical analysis
SI: Writing, data collection and analysis
MHA: Writing, data collection and statistical analysis
TS: Writing, data collection and statistical analysis
R: Writing and data collection

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Original Article

PREDICTORS AND IN-HOSPITAL MORTALITY OF SLOW FLOW/NO-REFLOW AFTER PERCUTANEOUS CORONARY INTERVENTION IN PATIENTS WITH ST-ELEVATION MYOCARDIAL INFARCTION

Mohsin Shah[1], Muhammad Mohsin[2], Khawar Naeem Satti[3], Moin Uddin Shah[4]

ABSTRACT

Background: To detect the frequency of slow flow/no-reflow in patients with ST-elevation myocardial infarction (STEMI) after the primary percutaneous coronary intervention (P-PCI), determine its association with various clinical, echocardiographic & angiographic factors and detect in-hospital mortality in these patients.

Material and Methods: It was a descriptive, cross-sectional study in which 153 STEMI patients were included by convenient sampling at the Rawalpindi Institute of Cardiology. After approval from the Hospital's ethics committee, the study was conducted from March 2022 to August 2022. After obtaining informed written consent, all the patients underwent P-PCI. The statistical analysis was done with the Statistical Package for the Social Sciences version 25.

Results: Slow flow/no-reflow occurred in 19(12.4%) patients. It had a significant association with age groups (p-value = 0.03), prior myocardial infarction (MI) (p-value = 0.000), time to treatment initiation (p-value = 0.000), Killip class (p-value = 0.000), MI type (p-value = 0.036), target lesion length (p-value = 0.000), occlusion site (p-value = 0.004) and thrombus grade (p-value = 0.031). Out of 153 patients, 13(8.5%) patients died with 8(61.5%) of them with slow/no-reflow.

Conclusion: Slow flow/no-reflow is a frequent complication (12.4%) in patients who underwent P-PCI for STEMI. Its significant predictors are advanced age, prior MI, longer time to treatment initiation, higher Killip class, anterior wall MI, longer target lesions, proximal occlusion site and high thrombus burden. The in-hospital mortality is much higher in these patients.

Key Words: ST Elevation Myocardial Infarction, Patients, Coronary artery disease

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INTRODUCTION

Coronary artery disease (CAD) affects 126 million people annually worldwide, with an estimated 9 million deaths in 2017. This figure is projected to increase to 23.6 million by 2030.[1] In addition, it is also a significant financial burden for countries. The financial cost attributed to CVD was US$863 billion globally, which will rise to > US$1 trillion by 2030.[1] ST elevation myocardial infarction (STEMI) is a common clinical manifestation of CAD responsible for a major proportion of cardiovascular mortality, morbidity, and disability.[2]

Treatment in STEMI aims to achieve adequate and early revascularization of the

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ischemic coronary artery. The primary treatment option, P-PCI, restores coronary blood flow with a high success rate. But in some cases, the phenomenon of slow flow or no-reflow occurs.[3] No reflow is characterized by hypoperfusion of the myocardial tissue. However, the epicardial coronary arteries are patent, provided that other hypoperfusion causes, such as spasm, thrombus, dissection, and residual stenosis, have been ruled out. Slow reflow is defined as less decrease in coronary blood flow.[4] This is attributed to failure to attain reperfusion in the ischemic myocardium resulting from microvascular obstruction. No reflow/slow-flow pathogenesis involves ischemic reperfusion injury, endothelial swelling, myocardial edema, capillary obstruction, inflammation, oxygen-free radical generation, calcium overload, and distal coronary embolization.[5,6] The Thrombolysis in Myocardial Infarction (TIMI) flow grade determines coronary reperfusion achieved after P-PCI, with TIMI grade 3 showing complete reperfusion.[7] TIMI grade 0-1 indicate no reflow and TIMI grade 2 shows slow flow. The lesser the TIMI grade flow, the higher the chances of cardiovascular deaths and major adverse cardiovascular events (MACE).[8]

Despite the advances in Interventional Cardiology, no-flow/slow reflow occur in some patients after P-PCI, with the reported cases ranging from 12%-32.8%. According to the literature, various factors predispose to slow/no-reflow, such as gender, age, Killip class, hypertension, diabetes mellitus, creatinine, peak creatine kinase, blood glucose, C reactive protein, initial TIMI grade, delay in initiating treatment, lesion length and thrombus burden.[9,10]

Various clinical, echocardiographic, and angiographic parameters are linked to no reflow/slow flow, but the association of no-reflow/slow flow with various risk factors has not been fully established. Identifying predictors of this phenomenon will help interventional cardiologists guide and modify interventional strategies to prevent slow flow/no-reflow and improve outcomes.

MATERIAL AND METHODS

It was a descriptive, cross-sectional study in which a nonprobability convenient sampling technique included 153 patients presenting with STEMI at the Rawalpindi Institute of Cardiology, Rawalpindi. After approval from the Hospital's ethics committee, the study was conducted from March 2022 to August 2022. After obtaining informed written consent, the patient's details were noted on a Proforma. The clinical manifestations, electrocardiogram (ECG), elevated cardiac markers (Troponin and Creatine kinase), and coronary angiography confirmed the diagnosis of STEMI. Oral aspirin, clopidogrel, and intravenous heparin were administered in all patients before P-PCI. All the patients underwent P-PCI within 24 hours of symptoms using a standard radial approach. The exclusion criteria were the patients with severe kidney or liver disease, hematological disorders, previous coronary artery bypass grafting (CABG) or Unsuccessful P-PCI, time to treatment initiation > 24 hours, or those who received fibrinolytic treatment/glycoprotein IIb/IIIa inhibitors before undergoing PCI. TIMI flow grade 3 indicated complete reperfusion, grade 0-1 no-reflow, and TIMI grade 2 showed slow flow. Patients with normal flow were included in one group and those with slow/no-reflow were allocated to another group. The relation of various clinical, echocardiographic, and angiographic factors was compared between the two groups. The factors evaluated in our study were patient age, gender, time to initiation of treatment, Killip class, diabetes mellitus (DM), smoking, hypertension (HTN), hyperlipidemia, obesity, prior myocardial infarction (MI), family history of CAD, type of MI, coronary artery involved, target lesion length, site of lesion, number of diseased vessels, initial TIMI flow grade,

thrombus grade and left ventricular ejection fraction (LVEF).

The results were based on statistical analysis with the Statistical Package for the Social Sciences (SPSS) version 25. Quantitative variables such as age were presented as mean & standard deviation and qualitative variables including gender, Hypertension and diabetes were shown using frequency & percentage. A Pearson Chi-square test determined the relation of various variables between patients with slow/no-reflow and normal flow. A significant p value was ≤ 0.05.

RESULTS

Patients had a mean age of 52.64±10.30, ranging from 20 to 77 years.

Out of 153 patients, slow flow/no-reflow occurred in 19(12.4%) patients and 134(87.6%) patients had normal flow.

Thirteen patients (68.4%) developed no-reflow and 6(31.6%) had slow flow. The relation of slow/no-reflow with various risk factors showed statistically significant results for age groups, time to treatment initiation, Killip class and prior MI. Patients with advanced age are prone to experience slow flow/no-reflow. The greater the time to treatment initiation, the higher the chances of slow flow/no-reflow. Higher Killip classes (III and IV) and previous MI episodes are associated with the phenomena. Table 1 shows these results.

Table 1: Association of Slow Flow/No-Reflow with Various Risk Factors

Parameter	Slow/No-Reflow	Normal Flow	Total	Chi-Square Statistic	p-value
Age groups				26.445	**0.03***
<30	0	2	2		
30-40	0	16	16		
41-50	2	45	47		
51-60	5	49	54		
61-70	10	18	28		
71-80	2	4	6		
Total	19	134	153		
Gender				1.967	0.579
Male	14	113	127		
Female	5	21	26		
Total	19	134	153		
Time to treatment initiation				66.370	**0.000***
<3 hours	0	32	32		
<6 hours	4	60	64		
<9 hours	5	26	31		
<12 hours	4	11	15		
<15 hours	4	2	6		
< 18 hours	1	2	3		
< 21 hours	1	1	2		
Total	19	134	153		
Killip class				57.274	**0.000***
I	2	84	90		
II	4	38	42		
III	8	10	15		
IV	5	2	6		
Total	19	134	153		
Hypertension				1.971	0.578
Nonhypertensive	13	80	93		
Hypertensive	6	54	60		
Total	19	134	150		
Diabetes mellitus				1.604	0.658
Nondiabetic	14	100	114		
Diabetic	5	34	39		
Total	19	134	153		
Smoking				2.110	0.550

Nonsmoker	12	101	113		
Smoker	7	33	40		
Total	19	134	153		
Hyperlipidemia					
Absent	15	114	129	6.707	0.08
Present	4	20	24		
Total	19	134	153		
Obesity					
Nonobese	19	122	141		
Obese	0	12	12	1.846	0.605
Total	19	134	153		
Prior MI					
Absent	12	126	138		
Present	7	8	15	33.467	**0.000***
Total	19	134	153		
Family History of CAD					
Present	15	127	142		
Absent	4	7	11	7.187	0.06
Total	19	134	153		

***Statistically Significant**

The relation of slow flow or no-reflow with echocardiographic and angiographic parameters was also determined. It significantly correlates with the type of MI, target lesion length, occlusion site, and thrombus grade. Anterior wall MI and high thrombus burden were related to a high frequency of slow or no-reflow. The phenomenon was more common in patients with diffuse target lesions followed by tubular lesions (Table 2).

Table 2: Association of Slow Flow/No-Reflow with Echocardiographic and Angiographic Parameters

Parameter	Slow/No-Reflow	Normal Flow	Total	Chi-Square Statistic	p-value
Type of MI					
Anterior	14	63	77		
Lateral	3	12	15	13.497	**0.036***
Inferior	2	59	61		
Total	19	134	153		
Coronary artery involved					
Left anterior descending (LAD)	10	76	86		
Left circumflex artery (LCX)	2	20	22	5.265	0.510
Right coronary artery (RCA)	7	38	45		
Total	19	134	153		
Number of diseased vessels					
Single vessel disease (SVD)	9	72	81		
Double vessel disease (DVD)	8	44	52	3.348	0.764
Triple vessel disease (TVD)	2	18	20		
Total	19	134	153		
Target lesion length					
Focal (<10 mm)	5	104	109		
Tubular (10-20 mm)	6	26	30	47.111	**0.000***
Diffuse (>20 mm)	8	6	14		

Total	19	134	153		
Site of occlusion					
Proximal	9	19	28	18.981	**0.004***
Mid	3	55	58		
Distal	7	60	67		
Total	19	134	153		
Initial TIMI flow grade					
TIMI flow grade 0-2	18	117	135	8.012	0.533
TIMI flow grade 3	1	7	18		
Total	19	134	153		
Thrombus grade					
Low	2	65	67	26.704 **0.031***	
High	17	69	86		
Total	19	134	153		
LVEF					
20%-29%	0	6	6	7.314	0.604
30%-39%	7	55	62		
40%-49%	8	61	69		
50%-59%	4	12	16		
Total	19	134	153		

***Statistically Significant**

Out of 153 patients, 13(8.5%) patients died with 8(61.5%) patients with slow flow/no-reflow group and 5(38.5%) patients with normal flow. The rest of 140(91.5%) patients were discharged, 11(7.85%) with slow flow/no-reflow and 129(92.15%) with normal flow. The p-value was statistically significant (0.000).

DISCUSSION

Slow flow/no-reflow is common after P-PCI and is associated with worse outcomes of higher mortality and left ventricular dysfunction.[11] In our study, out of a total of 153 patients, 12.4% of patients developed no-reflow/slow flow. In other studies, slow flow/no-reflow occurred in 15.7%, 18%, 22.2%, and 25.9% of the patients.[12-15] Slow flow/no-reflow occurred in 38.9% and 31.3% of the patients in two other studies, respectively.[11,16] Its frequency was much greater in two other studies in Pakistan. In a study by Farahe et al., 25% of the patients developed the phenomenon, whereas, in the other study, the frequency of slow flow/no-reflow was 31.4%.[17,18]

Our results showed a significant association between increased age with slow flow/no reflow. Literature has also reported a significant relation between age with slow/no-reflow, with a greater percentage of older patients developing this phenomenon.[12, 14-16] Other studies done in Pakistan revealed a significant relationship of age with the phenomenon.[17,18] Our study found no significant association of gender with slow flow/no-reflow, similar to two other studies.[16,19] Conversely, Elakabawi et al. and Nizami et al. revealed its association with the female gender.[14,18] In our study, slow flow/no-reflow had no relationship with diabetes mellitus, smoking, hypertension, hyperlipidemia, obesity, and a family history of CAD. The phenomenon was only associated with prior MI episodes. Kakar et al. revealed that prior MI episodes were significantly correlated with slow/no-reflow.[13] A study did not link slow/no-reflow with risk factors.[16] In a study by Elakabawi et al., no significant association was seen with any risk factors except smoking.[14] Farahe et al. and Rajesh et al. found a significant link between slow flow/no-reflow with diabetes mellitus.[17,20]

Our study revealed a significant relation between slow flow/no-reflow and anterior wall MI, similar to the studies by Kakar et

al. and Alidoosti et al.[13,16] On the other hand, no association was seen by Zhang et al.[21] Our study showed no relation between slow flow/no-reflow and coronary artery involved whereas, Alidoosti et al. and Nizami et al. found significant results with LAD involvement common in slow flow/no-reflow.[16,18] No significant relationship between the coronary artery and slow flow/no-reflow was observed.[13,14] Our study showed a significant correlation between target lesion length, lesion site, thrombus grade, Killip class & time to treatment interval and slow/no-reflow. The phenomenon is associated with longer lengths of target lesions.[15,16] In contrast, a study showed no relation between the two.[22] Kakar et al. and Rajesh et al. have demonstrated its relation with the site of lesion, with more cases in patients with proximal lesions[13,20,] whereas other studies found no association.[14,16] A statistically higher proportion of patients with high thrombus burden developed slow/no-reflow than patients having low thrombus burden in various studies.[13,14,16,17] In studies by Kakar et al., Elakabawi et al., and Sabin et al., slow flow/no-reflow was related to the high Killip class.[13-15] A significant association was seen between slow flow/no-reflow and longer time to treatment interval.[15,18,19] Soeda et al. and Kakar et al. found no association between the two parameters.[11,13] There was no association of the phenomenon with TIMI flow. Similar results were reported by Kakar et al.[13] In contrast, Nizami et al. reported a correlation of the phenomena with initial low TIMI flow.[18] Similarly, in other studies, most patients with an initial low TIMI flow developed slow/no reflow.[14,15,19] Conversely, an initial higher TIMI flow was associated with a high frequency of slow/no-reflow in another study.[16]

There was no relation between slow/no-reflow and the number of diseased vessels. A similar finding was observed in several other studies.[13,14,16] Our results showed no link of the phenomenon with LVEF. In contrast, Kumar et al. and Farahe et al. revealed statistically significant results with LVEF.[10,17]

In our study, 8.5% of in-hospital deaths occurred after P-PCI, 61.5% of these patients had slow/no-reflow, and 38.5% had normal flow. The results were statistically significant. Rajesh et al. also reported that slow flow/no-reflow was linked with increased in-hospital deaths.[20] A study revealed a higher prevalence of deaths and MACE at 30 days in patients with slow/no-reflow.[14] The limitations of this study are that prognosis of patients with slow flow or no flow was only reported in terms of in-hospital mortality. Loss of follow-up is the limitation of our study. Other prognostic parameters such as 30-day mortality, MACE, and LVEF were not determined.

CONCLUSION

Slow flow/no-reflow is a frequent complication (12.4%) in patients who underwent P-PCI for STEMI. Its significant predictors are advanced age, prior MI episodes, longer time to treatment initiation, higher Killip class, anterior wall MI, longer target lesions, proximal occlusion site, and high thrombus burden. The in-hospital mortality is much higher in these patients.

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Conflict of interest: None

AUTHOR'S CONTRIBUTION

MS: Conception of idea and manuscript writing
MM: Data collection and analysis
KNS: Data collection and analysis
MUS: Manuscript writing

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Original Article

PREVALENCE OF HYPERTENSION IN ADULT POPULATION IN RELATION TO PROFESSION IN THE UNIVERSITY OF PESHAWAR

Jehan Hussan[1], Hayat Muhammad Khan[1],Waqar Mehmood[2], Samra Rahim[2], Muhammad Sannan[2], Nabeel Ahmad[2], Faryal Nosheen[2]

ABSTRACT

Background: Hypertension is one of the most common chronic diseases in the current era. Though many factors favor hypertension, many causes are not known yet. Hypertension in the adult population is on the rise and various factors need to be assessed about the profession. This research article has assessed the prevalence of Hypertension with relevance to the profession.

Material and Methods: It was a cross-sectional analytical study conducted on workers in different departments of University of Peshawar. A total of 260 participants were selected through non-probability convenience sampling. Data was collected using a questionnaire, which was then analyzed on SPSS version 22. Chi-square was used for observing any relationship between hypertension with different professions. P value less than 0.05 was taken as significant.

Results: The mean age of the participants was 42 years with S.D of 8.76 years. Out of these 86.5% were males and 13.3 % were females. Prevalence of Hypertension among the overall participants was 23.8% (62), for males was 24.88% and for females it was 17.14%. The highest prevalence among our subjects was in bankers (42.8%) and lowest among laborers (20%). 79% mentioned that they developed Hypertension while working in their respective professions. Hypertension was not significantly associated with any profession with a chi square value of 4.3 and p value of 0.633.

Conclusion: The prevalence of Hypertension among the participants was 23.8% . The findings proved that a relationship exists between hypertension and jobs strain. However, no statistical difference was seen between hyperyension and occupation.

Key Words: Hypertension, Professional stress, Population

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INTRODUCTION

Hypertension is the commonest cardiovascular disorder and is becoming a global pandemic. About 1 billion people are suffering from Hypertension globally.[1] Internationally, an estimated 32 percent of the world's population suffers from Hypertension.[2] Only 32.3% of the total hypertensive patients have controlled their Blood pressure with medication.[3] Hypertension is a condition characterized by abnormally elevated blood pressure. Uncontrolled high blood pressure for a long

time results in complications. It can lead to stroke and myocardial infarction. Deaths resulting from stroke and myocardial infarction account for 51% and 45%, respectively.[4] Raised blood pressure also adversely affects the kidneys and retina, leading to renal failure and blindness. The majority of the total stroke cases are a consequence of untreated Hypertension.[5]

About 62.3 percent increase in deaths caused by Hypertension has been reported from 1990 to 2013.[6] World Health Organization predicts around 1.28 billion adults are found hypertensive by and mostly in middle and lower-income countries.[7] Complications of Hypertension continue to cause significant morbidity and mortality worldwide, largely due to inadequate strategies for the prevention, diagnosis and control of Hypertension in an ageing worldwide population.[8] All countries and regions in Asia face the growing problem of non-communicable diseases (NCDs), of which Hypertension and CVD are a significant part.[9] In Pakistan, a survey showed 46.2%, the prevalence of Hypertension of which 24.9% had self-reported Hypertension and 21.3% were newly diagnosed hypertensive. The prevalence of Hypertension in urban and rural areas was 44.3% and 46.8%, respectively.[10] Both Modifiable and non-modifiable risk factors are responsible for high blood pressure in Pakistan.[11] Hypertension is reported as the most frequent cardiovascular condition in the hospital population of Peshawar.[12]

The environment has a significant association with Hypertension, as proposed by different researchers.[13] Meanwhile occupational stress and psychological health was proven to influence hypertension.[14]

The main aim of this study was to determine the prevalence and relationship of Hypertension in different occupations in the University of Peshawar. Knowledge generated will give insight about determinants of hypertension related with occupation.

MATERIAL AND METHODS

A cross-sectional analytical study was conducted on teachers, policemen, shopkeepers, laborers, barbers and bankers working in different occupational Settings at the University of Peshawar from April 2021 to September 2021. A sample size of 260 was calculated according to the WHO formula $n=Z^2PQ/d^2$ with a previous prevalence of 21%[10], Margin of error was 5% with a 95% Confidence level.The sampling technique used was a non-probability convenience sampling technique. After institutional review board approval and informed consent data was collected by using a semi-structured questionnaire developed through literature search. People working in the professions mentioned above above 30 years of age and willing to participate were included. People with other diseases that might cause their Hypertension were excluded from the study. Data was analyzed through Statistical Package for Social Science (SPSS) version 22. Chi-square was used for finding an association of Hypertension with different professions, and p value less than 0.05 was taken as significant.

RESULTS

260 study subjects above 30 years (with a mean age 42 S.D 8.765) from multiple professions inside the University of Peshawar were interviewed for the research. Out of these, 86.5% were male and 13.3 % were female. Most participants (82.7%) were married and 17.3% were unmarried. The statistical analysis of our results showed that the prevalence of Hypertension among the subjects was 23.8% (62) on the whole, with 24.88% prevalence among male subjects and 17.14% among female subjects. The highest prevalence among our subjects was in bankers (42.8%) and the lowest among labors (20%). When asked, 53.22% of the participants agreed to their profession was the cause of their high blood pressure. There was no association of any

profession with Hypertension and the P value was insignificant ie. 0.633 (Table 3).

Table-1: Participation suffering from Hypertension

Hypertension status	Frequency	Percent
Yes	62	23.8
No	198	76.2
Total	260	100.0

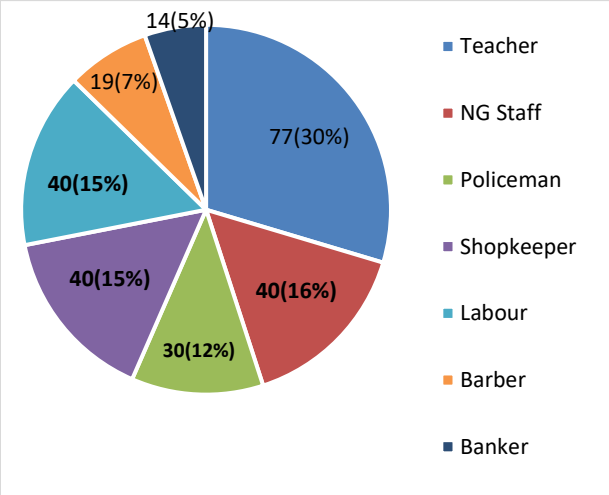

Figure 1: Profession of Participants

Table-2: Opinion of participants on whether their profession was a cause of Hypertension

Participants suffering from Hypertentsion		Is profession a cause of Hypertention?		Total
		Yes	No	
Profession	Teacher	6 (37.5%)	10 (62.5%)	16
	Non governamental staff	5 (45.4%)	6 (54.54%)	11
	Policeman	6 (75%)	2 (25%)	8
	Shopkeeper	4 (50%)	4 (50%)	8
	Labour	4 (50%)	4 (50%)	8
	Barber	2 (30%)	3 (60%)	5
	Banker	6 (100%)	0 (0%)	6
		33 (53.2%)	29 (46.77%)	62

Table-3: Bivariate analysis between participant suffering from hypertension & profession of participants

Participant suffering from Hypertension	Profession of participants							Total	Chi Square P-Value
	Teacher	Non govt. Staff	Policeman	Shopkeeper	Labour	Barber	Banker		
Yes	16	11	8	8	8	5	6	62	0.633
No	61	29	22	32	32	14	8	198	
Total	77	40	30	40	40	19	14	260	

DISCUSSION

This study showed the prevalence of Hypertension to be 23.8% on the whole while the global prevalence is considered 31%,[7] a bit higher than our findings. Hypertension is a highly prevalent disease in Pakistan, with a prevalence of 46.2% in adults above 45 years of age, [10] almost 22% more than our prevalence (23.8%). In our study, hypertension prevalence was slightly different for males and females. Of

the 225 males, 24.88 % were hypertensives, while out of the total 35 females, 17.4% were hypertensive. Lower prevalence in women might be because all women in our study were teachers and were more aware of the disease and its risk factors. And these factors could have helped them in adopting healthy lifestyles. An international study also showed women were far less likely to be hypertensive than men (12% vs. 27%).[15] Prevalence of Hypertension is highest among bankers and least in laborers related to high-stress levels and low physical exertion among the bankers. Also, most of the time is spent sitting with less exertion. At the same time, laborers have physical exertion and exercise on a daily basis. It is compatible with another study done in Bangladesh showing that fourth of the bankers were having hypertension.[16] Stressful jobs are associated with Hypertension as in another study at US, a community-based cohort of blacks, higher perceived stress over time was associated with an increased risk of developing Hypertension.[17] High stress always leads to different diseases in the long run including Hypertension. Another study at Indonesia stated that Age, salt consumption, and stress were the risk factors for Hypertension. The most dominant factor affecting the incidence of Hypertension was stress. Therefore, stress managements are required to reduce stress experienced by people apart from consuming low-sodium food.[18] Some of the limitations were that the university had a lot of departments and a lot different professions. Still, we couldn't cover all of them because of our small sample size and the interventions of the Covid-19 pandemic. Also, we couldn't find equal number of participants for all professions and same percentage of both genders in each profession to make our results a true representation of the actual problem of Hypertension.

CONCLUSION

A high percentage of people working in various professions suffer from Hypertension. According to the participants ' opinion, the main factor causing Hypertension is job strain. There was no association between Hypertension and different professions.

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AUTHOR'S CONTRIBUTION

JH: Proposal development and drafting
HMK: Data analysis
WM: Data collection and analysis
SR: Data entry and analysis
MS: Manuscript writing
NA: Manuscript writing
FN: Literature review and conception of idea

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Original Article

PROPHYLACTIC EFFECT OF CITRULLUS LANATUS & CURCURBITA PEPO SEEDS EXTRACT VERSUS DUTASTERIDE ON HORMONAL PARAMETERS IN BENIGN PROSTATIC HYPERPLASIA RATS

Bisma Fatima Aslam[1], Saadia Shahzad Alam[2], Mariyam Iftikhar Piracha[3], Tehreem Zulfiqar[4], Sadaf Jabbar[5], Maryam Mansoor[6]

ABSTRACT

Background: Benign Prostatic Hyperplasia (BPH) is the most common benign neoplasm and is a possible cause of urinary obstruction in elderly males.The current study evaluated the Prophylactic effect of Citrullus lanatus and Curcurbita Pepo seeds extract versus Dutasteride on hormonal parameters in BPH rats.

Material and Methods: Over the 29-day research period, 42 healthy adult male albino rats were divided into 6 groups of 7 animals, except group 1, each received daily testosterone 3mg/kg s.c and medications as per designated groups for initial 14 days for BPH induction & from 15-29 days for maintenance. Group 1 was normal healthy control & 2 was disease control. Other groups were group 3 (3mg/kg Testosterone s.c + 0.5mg/kg dutasteride p.o), group 4 (3mg/kg Testosterone + 2g/kg Methanolic Extract of Citrullus Lanatus Seeds, MECLS p.o), group 5 (3mg/kg Testosterone s.c + 5g/kg Petroleum Ether Extract of Curcurbuta Pepo Seeds, PECPS p.o) & group 6 (3mg/kg Testosterone s.c + 1g/kg MECLS p. o+2.5g/kg PECPS p.o). Their blood samples were taken on d 0, 14 and 29 days for testosterone and PSA estimation by ELISA technique.

Results: Prophylactic combination of 1g/kg Methanolic Extract of Citrullus Lanatus Seeds & 2.5g/kg Petroleum Ether Extract of Curcurbuta Pepo Seeds produced significant improvement in serum PSA & testosterone equivalent to Dutasteride. The individual herbs 2g/kg MECLS & 5 g/kg PECPS produced gradual similar improvement over a prolonged duration (29 days) without any side effects.

Conclusions: This suggests MECLS+PECPS to be equivalently effective & safe as Dutasteride in the prophylaxis of the BPH murine model.

Key Words: Benign prostatic hyperplasia, urine output, Dutasteride, serum PSA and testosterone.

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INTRODUCTION

Benign Prostatic Enlargement (BPE) is a likely diagnosis to describe the large prostate gland size. In contrast, BPH is the diagnosis relating to an increased number of smooth muscles and epithelial cells located in the transition zone of the gland.[1]

As the prostate enlarges, the gland squeezes the urethra. The bladder wall becomes thicker. Eventually, the bladder may weaken and lose the ability to empty, leaving some

urine in the bladder. The narrowing of the urethra and urinary retention—the inability to empty the bladder—cause many problems associated with benign prostatic hyperplasia.[2]
The incidence of BPH is increasing with age and affects 80 percent of men above their eighties.[4]
The etiology and pathophysiology of BPH are poorly understood. However, the testicular androgen i-e Dihydrotestosterone (DHT) is produced from testosterone in body tissue which is more effective in prostate development. Whereas DHT could be harmful in adulthood as it would be responsible for increased prostate growth.[5]
Alpha blockers and 5 alpha reductase inhibitors are the two medical treatment options. Administration of a 5 alpha reductase inhibitor (Dutasteride and Finasteride) causes prolonged inhibition of DHT. The patients are more prone to drug-related problems (DRPs), e.g. alpha blockers cause dizziness and orthostatic hypotension and 5 alpha reductase inhibitors responsible for sexual dysfunction and gynecomastia.[6]
Citrullus lanatus is a floral vine with flowers of both genders and many lengthy stems. The fruit is oval to round, mostly upto 20cm in size and not found in bunches.[7] The flattened seeds are smooth,varying in colour from yellow to brown or black. The seed oil constitutes glycosides of linoleic, oleic, palmitic and stearic acids as noticeable by its high fat content.[8] Curcurbita pepo is known as pepitas, paitha kaddu (urdu) or pumpkin with flat, dark green seeds.[9] The pumpkin seeds are good source of proteins, phytosterols, carbohydrates, essential fatty acids i-e oleic, linoleic, palmitic and stearic acids and minerals including selenium, zinc, calcium, copper, iron, manganese, phosphorous, magnesium and potassium & tocopherols and carotenoids (lutein and beta carotene).[10]
Scientific data exists on their therapeutic benefits in BPH. However, no comparative or prophylactic data as well as of their combined usage could be found, which lays the basis of our study.

The objectives of this study are formation of a rat model of benign prostatic hyperplasia by testosterone, assortment of the rats into different groups for prophylactic treatment with Citrallus lanatus, Curcurbita pepo seeds extract and Dutasteride– alone and in different combinations & Evaluation of biochemical parameters i.e, serum testosterone and PSA in different experimental groups at baseline, on day 14 after the BPH induction and after the completion of treatment on day 29.

MATERIAL AND METHODS

The study was carried out in an experimental research laboratory at Postgraduate Medical Institute (PGMI), Lahore, completed in 12 months after approval of the synopsis. Biochemical parameters were done at Biochemistry laboratories at Shaikh Zayed Hospital Lahore, respectively.
42 healthy albino male rats of 180-200 grams were purchased from Veterinary and Animal Sciences University, Lahore. Rats were housed and maintained in standard polypropylene cages at the PGMI Animal House at a controlled temperature (25±10c), humidity of 60-70% and appropriate lighting conditions.
Healthy control was included in group 1 and disease control in group 2. Other groups were group 3 (3mg/kg s.c Testosterone +0.5mg/kg p.o dutasteride), group 4 (3mg/kg s.c Testosterone + 2g/kg Methanolic Extract of Citrullus Lannatus Seeds p.o), group 5 (3mg/kg s.c Testosterone +5g/kg Petroleum Ether extract of Curcurbita Pepo Seeds p.o) & group 6 (3mg/kg s.c Testosterone + 1g/kg Methanolic Extract of Citrullus Lannatus Seeds p.o+ 2.5g/kg Petroleum Ether extract of Curcurbita Pepo Seeds p.o).
Healthy adult albino rats (male) of age 2 months having weight = 140-194 grams were

included and diseased rats were excluded from this study.

Simple random sampling was done by using the lottery method in this experimental design study. A sample size of 7 rats was estimated for each of the 6 groups by using 95% confidence level and 93% power with an expected mean testosterone level of 45,43,42,42 ng/ml (61) for healthy control, positive control, Citrullus lanatus seed extract and Curcurbuita pepo seed extract respectively. The sample size was calculated using power and precision 3.0 software with a 0.82 effect size with an Error SD of 1.5.

Injection of Testosterone propionate (Tesvot) 250mg/ml & tablets of Dutasteride (Galaxosmith) 0.5 mg were purchased from Clinix Pharmacy.

Biochemical kits for Specific mouse testosterone and PSA ELISA Kits for rats were purchased from Spinreact Company (Spain) & Bio Check, Inc. company, respectively.

Seeds of Citrullus lanatus and Curcurbita pepo were purchased from Hamdard Dawakhana, Lahore. The Methanolic Extract of Catullus Lanatus seed (MECLS) and Petroleum Ether Extract of Curcurbita Pepo seed (PECPS) were made in PCSIR, Lahore.

324g of Citrullus lanatus seeds were weighed and powdered. Percolation of the powdered sample was done in 800ml of Methanol for 48 hours, and the filtrate was concentrated using a rotary evaporator, diluted with corn oil, producing a 100mg/ml stock solution. The desired concentrations were given by insulin syringe.

Two hundred grams of Curcurbita Pepo ground seeds were defatted with petroleum ether in a Soxhlet-type extractor and then digested with 1.25% (v/v) H2SO4 and 1.25% (v/v) NaOH. The residues were heated at 1300°C for 2 hours, cooled in a desiccator and weighed.[12] The data was entered and analyzed using SPSS 23.0. Mean ± SEM was given for quantitative variables, i-e, serum testosterone and serum PSA.

As the data distribution was not normal for serum PSA and testosterone, nonparametric tests, including Wilcoxon Rank & Mann Witheny tests, were applied & deteriorated the differences among all groups & within pairs of individual groups. A p-value of < 0.05 was considered statistically significant.

RESULTS

At the end of the study, compared to the healthy control group, the DC group showed a 440% (p value <0.001) increase in testosterone level because of exogenous testosterone administration.

Within groups 2, 3, 5 & 6, a significant and gradual rise of serum testosterone levels of 195%, 38%, 112% and 29% was seen from baseline till the end of the study. Group 4 showed a gradual decline over the same period in serum testosterone level (9.3%). In comparison to the healthy control group, oral prophylactic treatment received by group 6(MECLS+PECPS), 5(PECPS), 4(MECLS) and 3(Dutasteride) showed a very highly significant decrease in serum testosterone levels ranging from 225, 160, 225 and 300% respectively.

Compared with the normal control group, the disease control exhibited elevated serum PSA levels of upto 50% & within itself 75% by the end of the study. The treatment groups (3-6) receiving oral prophylactic treatment for the whole study period showed 25% (p value <0.001) decrease in PSA levels in each vs DC group. A similar pattern was seen as compared to the healthy control group. However, within groups, from baseline to the point of BPH induction at day 14, there was a significant rise in serum PSA in groups & 6 of 9% & 66% respectively, followed by a decline of 18% in group 5 with no change in group 6 till the end of the study.

Table-1: Table presenting serum testosterone levels for 6 study groups

Serum testosterone	N	Base line (Mean± S.D)	Day 14 (Mean± S.D)	Day 28 (Mean± S.D)
Group 1	7	0.43±0.02	0.41±0.01	0.43±0.07
Group 2	7	0.73±0.37	2.21±0.49	2.16±0.57
Group 3	7	1.29±0.27	1.61±1.07	1.79±0.70
Group 4	7	1.50±0.29	1.31±0.38	1.06±0.73
Group 5	7	1.50±0.29	1.04±0.46	1.93±0.73
Group 6	7	1.86±0.85	1.33±0.36	1.31±0.38
Total	42	1.12±0.62	1.32±0.76	1.45±0.81
P Value (Anova)		<0.001	<0.001	<0.005

Table-2: Table presenting mean serum PSA level for six study groups (Serum PSA of animals on day 0,14,29)

Serum PSA	N	Base line (Mean± S.D)	Day 14 (Mean± S.D)	Day 28 (Mean± S.D)
Group 1	7	0.007±0.002	0.008±0.001	0.007±0.002
Group 2	7	0.008±0.001	0.012±0.002	0.014±0.002
Group 3	7	0.013±0.002	0.010±0.003	0.012±0.007
Group 4	7	0.012±0.002	0.010±0.004	0.009±0.001
Group 5	7	0.011±0.002	0.012±0.004	0.009±0.001
Group 6	7	0.009±0.003	0.015±0.002	0.009±0.001
Total	42	0.010±0.003	0.011±0.003	0.010±0.004
p-value (ANOVA)		<0.001	0.001	0.005

DISCUSSION

BPH is the most common noncancerous disease of the prostate in elderly men. It is described by excessive growth of the prostate and urinary symptoms i.e., frequency, urgency, nocturia, and dysuria, which badly affects the quality of life of an individual.

The development of BPH depends upon the presence of testicular androgens in growing age, which is dependent upon testosterone conversion into more potent Dihydrotestosterone (DHT).[13]

Alpha blockers and 5 alpha reductase inhibitors are the two medical treatment options available, of which alpha blockers are

less commonly used. Dutasteride and Finasteride are 5 alpha reductase inhibitors that cause quick and constant DHT inhibition and are the major current treatment for BPH.[14,15] Due to allopathic medication's side effects, the research trends have been inclined towards natural products. The plants studied for BPH treatment include *Saw palmetto*, African plum tree (*Pygeum africanum*) and rye pollen (*Secale cerale).*[16] Research has been conducted on the anti-prostatic hyperplastic activity of Citrullus lanatus and pumpkin seed, showing their therapeutic potential based upon the presence of certain antioxidant and fatty compounds.[17] However, there is a gap in knowledge to determine whether their anti BPH activity is more beneficial prophylactically, both singly and in combination, versus our standard drug i-e Dutasteride.

In our murine study, forty-two healthy male albino adult rats were segregated into six groups of seven animals. Except for healthy control, all groups received daily testosterone 3mg/kg s.c and medications as per group designation for initial 14 days for BPH induction & from 15-28 days for maintenance. Biochemical investigations (serum testosterone, PSA) were measured at baseline, day 14 and day 28.

The marked decline in testosterone levels was due to the overwhelming diminution of DHT due to each group's alpha reductase inhibiting activity not being counteracted by exogenous testosterone.[18.19] In comparison to the healthy control group, oral prophylactic treatment received by group 6 (MECLS+PECPS),5(PECPS),4(MECLS) & 3 (Dutasteride) showed very highly significant decreases in serum testosterone levels, respectively. Our results are not matchable to other studies where alpha reductase inhibition by different doses of MECLS[11] and Finasteride was the cause of the rise in serum testosterone levels. At the same time, we used a single dose of MECLS. Another research on the effect of different components of crushed pumpkin seeds but not extract on serum testosterone, prostate size, prostate binding proteins and histopathology of testis was evaluated, which was again different from our research.[12]

Compared with a normal control group, the disease control showed increased serum PSA levels at the end of the study. This was due to an increased concentration of DHT secondary to the unopposed administration of exogenous testosterone, resulting in increased secretion of PSA by prostatic epithelial cells.[20] However, within groups, from baseline to the point of BPH induction at day 14, there was a significant rise in serum PSA in groups 5 & 6 followed by a decline in group 5 with no change in group 6 till the end of the study. The reason for the initial rise by group 5 (PECPS) was not a direct effect but rather an indirect one through exogenous testosterone. However, the latter decline in serum PSA was due to 3 & 5-omega fatty acids, which have antioxidant & anti-inflammatory activity & beta-sitosterol, which binds to the prostate and reduces inflammation & secretions of the prostate.[21]

In contrast, the Dutasteride treated group 3 showed a 23% decrease in serum PSA at day 14 with almost no significant change at day 29, showing 5 alpha reductase inhibiting activity.[21]

Group 4 was the most different, which showed a consistent decline of up to 25% in serum PSA by day 29 due to polyphenolic compounds present in MECLS, resulting in prostatic cell death and reduced PSA secretion.[22] Therefore, MECLS & PECPS could be highly beneficial in treating prostatitis and prostatic cancer in addition to BPH.

No comparable study could be found on the combination effect of MECLS & PECPS on serum PSA. Earlier research was on the effect of watermelon seeds on sperm count and serum PSA[11] and that of a combination of saw

palmetto and oil of pumpkin seed on serum PSA, the volume of the prostate and maximal flow rate of urine, which were not comparable.[23]

CONCLUSION

Prophylactic combination treatment with 1g/kg Methanolic Extract of Citrullus Lanatus Seeds (MECLS) & 2.5g/kg Petroleum Ether extract of Curcurbita Pepo Seeds (PECPS) decreased serum PSA levels and testosterone levels equivalent to Dutasteride, the drug of choice for BPH.

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Conflict of interest: None

AUTHOR'S CONTRIBUTION

BFA: Conceptualization of project
SSA: Drafting, Revision
MIP: Writing of manuscript
TZ: Data collection
SJ: Literature search
MM: Statistical analysis

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Original Article

REASONS OF REFUSING COVID-19 VACCINATION AMONG ADULT POPULATION ATTENDING A TERTIARY CARE HOSPITAL OF LAHORE, PAKISTAN: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Despite widespread mass communication strategy, a considerable proportion of the adult population hesitates towards COVID-19 vaccination. This study aimed to describe reasons for refusing COVID-19 vaccination among adults attending a tertiary care hospital in Lahore, Pakistan.

Material and Methods: This descriptive, cross-sectional study was undertaken among patients and attendants presenting to OPDs of a Tertiary care hospital in Lahore from January through June 2022. Four hundred and thirteen unvaccinated individuals aged 18 years and above were interviewed about fear of complications, misconceptions, peer and family influences and vaccine administration issues. Pearson's Chi-squared test was used to examine the difference in proportions using SPSS version 25.

Results: Of 413 participants, 276 (66.8%) were males, and 76% were aged between 20-50 years, with one-third having completed primary school only. Despite higher awareness (83%) about COVID-19 vaccines, more than 50% of females showed concern about fear of long- term health effects. In contrast, according to males, non-immunization was due to family and peer influences (53%). More than half of the participants expressed doubt on predictive protection against COVID. We did not find any statistical association between fear of side effects, misconceptions, peer pressure and vaccination availability themes with age, gender, education and occupation ($p>0.05$).

Conclusion: There are still gaps in accessibility, coverage and acceptability of the COVID-19 vaccine and in addressing the concerns among men and women of low socioeconomic population strata in Lahore about its effectiveness, long-term effects and administration.

Key Words: COVID-19, Immunization, Vaccine hesitancy, Fear, Cross-sectional study

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INTRODUCTION

The COVID-19 pandemic has resulted in considerable morbidity and mortality globally. Health systems worldwide remain under enormous stress, especially in developing countries.[1] Several public health measures have been employed for its prevention and control, including active case finding, contact tracing, isolating symptomatic cases, placing asymptomatic individuals under quarantine and vaccination.[2] Amidst these measures, vaccination has proved to be the most effective strategy. A series of vaccines were developed, undergone speedy trials and approved for public consumption to target

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large populations, starting from high-risk individuals.[3] International organizations, governments and private companies joined hands and successfully massively produceseveral vaccines against COVID, such as Moderna, Pfizer, BioNTech, and Sino pharm. The next mammoth task of equitable distribution of COVID-19 vaccines is being governed by the COVAX initiative led by the World Health Organization (WHO), Global Alliance for Vaccination and Immunization (GAVI), UNICEF and other notable international organizations.[4]

COVID-19 vaccines have shown effectiveness in preventing severe forms of disease and reducing deaths from infection.[5] More than 13 billion doses have been administered to people to date around the world.[6] The proportion of fully or partially vaccinated population differs across the globe and varies even within regions in the same country. Since many reservations regarding vaccines exist, many people are suspicious about their efficacy, long-term side effects and reasons related to the socio-cultural environment. A major hurdle in vaccine success in preventing COVID-19 infection surge and repeated cycles of infection is the reduced coverage and refusal of newly developed vaccines. The uncertainty about its effects and the emergence of new variants are causing hesitancy in the public, where individuals are listening to conspiracy theories, and public health authorities are unable to communicate the right message to improve vaccine coverage.[5,6]

World Health Organization defines vaccine hesitancy as the refusal or delay in vaccine acceptance despite the availability of safe services.[7] This is a complex and multifactorial phenomenon that varies from place to place, over periods and gets affected by the type of vaccine as well. Myths, disbelief and rumours spread through social media are important in refusing the COVID-19 vaccine. This refusal is not limited to one country or region but is a global phenomenon. In the United Kingdom, a household survey of twelve thousand respondents showed vaccine hesitancy among 72% of the coloured population and 42% of South Asian respondents of Pakistani and Bangladeshi origin.[8]

To date, only 55% of the Pakistani population has received at least one dose of the COVID 19 vaccine, which is low compared to our neighbouring countries.[9] Apart from vaccine procurement issues and logistics at vaccine centres, there may be problems related to the perception of vaccine efficacy, religious beliefs, and peer pressures, which might contribute to low vaccine acceptance. A study conducted in a tertiary care hospital in the capital city of Pakistan enrolled 423 participants and reported that 47% of this urban population had reservations about the COVID-19 vaccine.[10] Another study in the urban slums of the same geographic area showed a moderate willingness to vaccinate against COVID-19. Therefore, the socio-cultural environment might play a great role in determining the refusal or acceptance of vaccination against COVID-19.[3] However, few studies have addressed the issue of examining factors that might lead to the refusal of the COVID-19 vaccine in our population. The existing study was designed to explore the factors associated with refusing the COVID-19 vaccine among the adult population presenting to a tertiary hospital in Lahore. We strived to examine sociodemographic profiles, knowledge, myths, beliefs and concerns about COVID-19 vaccines.

MATERIAL AND METHODS

This descriptive, cross-sectional study was conducted in Lahore's tertiary health care setting. After approval from the Ethical Research Board (ERB) of Allama Iqbal Medical College/Jinnah Hospital Lahore, men and women aged 18 years and above attending Jinnah Hospital Lahore, including patients and their attendants, were invited to participate in this study. Jinnah Hospital Lahore is an 1800 bedded

tertiary care teaching hospital, which is visited by individuals from all urban towns, surrounding semi-urban and rural areas. These visitors generally represent lower and middle socioeconomic classes of the population residing in Lahore city. Those individuals who were already immunized against COVID-19 (any vaccine brand; fully or partially vaccinated), those requiring emergency care, psychiatric illness were excluded. The sample size was calculated using Open Epi software at a 95% confidence level, taking the frequency of the anticipated factor as 50% (not refusing COVID 19 vaccination) with a precision of 5%. The estimated sample size was 375, to which we added 10% as an adjustment for non-response and missing data, yielding a sample size of 413 individuals. However, 453 individuals were invited to participate in this study, of which 34 refused, and six (06) subjects had missing data. Data was collected through an in-person interview using a pre-tested semi-structured questionnaire. These respondents were selected through a non-probability convenient sampling technique. The questionnaire comprises a set of questions asking sociodemographic characteristics, awareness about available vaccines, religious beliefs, misconceptions/myths, unavailability of vaccines, the influence of family members and peers for a decision on the vaccine, restrictions due to disability, fear of needles, overcrowding of vaccination centres. After obtaining informed verbal consent and explaining the aims of our study, ensuring the individual data confidentiality, a trained interviewer was interviewed in a separate place. Each interview took an average of 15-20 minutes. After completing every interview, the interview form was reviewed for missing entries and handed over to the supervisor. SPSS software version 25 was used to manage and analyze data. De-identifying names, addresses and contact details was done using a code file. Data were cleaned and checked for consistency before final analyses. Age (<20 years, 20-50 years and >50 years), monthly income (Pakistani Rupees), education (no schooling, completed primary and secondary or above education) and occupation (unemployed, skilled and unskilled workers) were categorized. The frequency and percentage of these categories were calculated separately for men and women. The difference of proportions was examined using Pearson's Chi-squared test with a value of p less than 0.05, which was considered statistically significant. A tornado chart was created to compare participants' responses on four themes (fear of complication/ long term health effects, Misconception about the COVID 19 vaccine, family and peer pressures, and immunization management issues) representing refusal of the COVID-19 vaccine. A logistic regression technique was also used to examine the association between sociodemographic characteristics and the four themes of refusal to immunization against COVID-19 and to adjust the confounding effect. Lower values of categories were taken as a reference for comparison. The odds ratio with a 95% confidence interval was used as a measure of association with a p-value of less than 0.05, which was considered statistically significant.

RESULTS

Of 453 eligible individuals invited for the study, 34 (7.5%) refused to participate, and 413 completed the in-person interview. Data from six participants were not included in the final analysis due to missing entries on essential variables (Figure 1). Table 1 shows the sociodemographic characteristics of participants. Of 413 participants, 276 (66.8%) were males. Most men (77.5%) and women (80.3%) were aged 20-50. Among these, 7% of men versus 4% of women were below the age of 20 years, and 15% of men and women were 50 years or above. The monthly income of almost 80% of women and 47% of men was less than twenty thousand rupees, which

indicates that the lower-to-middle socioeconomic class of individuals were visiting the study area. About formal education, we found that one-fourth of men and one-third of women did not attend any school, whereas about one-third of men and women completed at least primary school. This difference in obtaining formal education comparing men and women was statistically significant ($p<0.005$). Similarly, there was a difference in employability, comparing men and women, such that about 94 (69%) women and 74 (16%) men were unemployed. Twenty-six men (46%) in this sample were unskilled workers. We found that more than 80% of men and women were aware of the availability of COVID-19 vaccination (Figure 2). About 30% of respondents also stated that one or more of their family members contracted COVID-19 infection, and around 75% had one or two doses of COVID-19 vaccination (Table 1). When asked why participants refused to be vaccinated despite a higher proportion of family members having opted for COVID-19 vaccination, 53% of women versus 45% of men feared that COVID-19 vaccination had long-term unknown health effects. About 50% of men and women showed concern that the vaccine would not give protection against the infection (Figure 2). There were several misconceptions about the COVID-19 vaccines. About 42% of men feared that this vaccine would induce infection and may result in death. One-third of men and women stated COVID-19 vaccination was a Western conspiracy in collaboration with government agencies to reduce the Muslim population (Figure 2). We found some vaccination program management issues stated by 20% of men and women. These factors include overcrowding at vaccination points, non availability of vaccines in a few centres and inaccessibility of vaccine centres (Figure 2).

This study found four refusals to COVID-19 vaccination themes: fear of complications and long-term health effects, misconceptions about COVID-19 vaccines, peers and family influences and immunization management issues. Table 2 shows results related to the association of these four refusal themes with age, sex, education and occupation. About 168 (80.8%) participants aged 20-50 years feared vaccine-related complications and long-term health effects. We found statistically significant differences in responses among different age groups (unadjusted p=0.04). Men expressed this fear more in men (70%) than women (28%), whereas one-third of those with primary education and unskilled workers stated this fear of COVID-19 vaccination related health effects. Unadjusted estimates found no statistically significant proportion difference among sex, education and occupational categories. Differences in responses to Misconceptions about COVID-19 vaccines were statistically significant regarding education (unadjusted, p=0.004) and occupation (unadjusted, p=0.01), with those who completed primary education and unskilled workers having more misconceptions about the vaccine (Table 2). Peers and family influences played a significant role among those with primary education compared to those without education. On the other hand, 76% of those men aged 20-50 showed concerns about vaccination administration issues such as overcrowding, shortages of vaccines and inaccessibility of vaccination centres (Table 2). Our adjusted estimates indicate that there is no statistically significant association between age, gender, occupational status and education with fear of complications /long–term health effects ($p>0.05$), with probability of refusing vaccination based on this theme higher in those aged 20-50 years (OR=1.97; 95% CI: 0.74-5.21;p=0.17); among men (OR=1.45;95% CI:0.79-2.65; p=0.22) and among unskilled workers (OR=1.28; 95% CI:0.65-2.48; p=0.95) (Table 3).

The adjusted estimates about misconceptions of COVID-19 vaccines and the likelihood of refusal of vaccine about

sociodemographic characteristics show that those aged 20-50 years, compared to other age groups, are three times more likely to refuse vaccine due to their misconceptions (OR=3.00; 95% CI:1.16-7.72) and this association was statistically significant (p=0.02). Similarly, those who completed primary education compared to those who did not attend formal school were 1.92 times (95% CI:1.02-3.60; p=0.04) more likely to refuse vaccination due to misconceptions about COVID-19 vaccines (Table 3). Regarding peers and family influences, men had fewer odds of refusing COVID-19 vaccination than women (OR: 0.42; 95% CI: 0.24-0.72; p=0.02) after adjusting for other socioeconomic factors and other themes (Table 3). Similarly, after adjustment, the odds of refusing COVID\ 19 vaccination due to peers and family influences were higher among those with secondary education (OR:2.07; 95% CI:1.16-3.71; p=0.01) and skilled workers (OR:1.88; 95% CI:1.03 3.43; p=0.01). We did not find any statistically significant difference in refusing COVID-19 vaccination due to immunization management issues, sex, educational status and occupation, except among those aged more than 50 years (OR:3.73; 95% CI:1.25-11.10; p=0.01) (Table3)

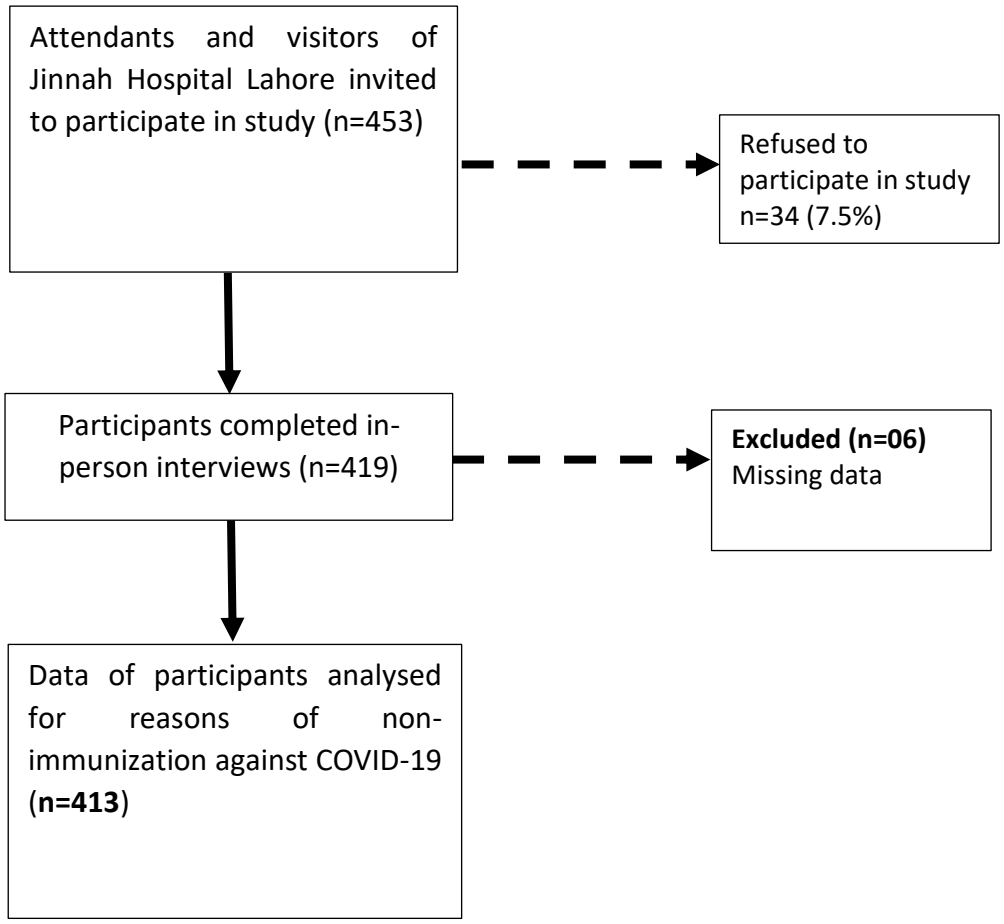

Figure-1: Flow of study participants for examining reasons for not immunizing against COVID-19 among the adult population presenting to a Tertiary Care Hospital in Lahore

Table-1. The sociodemographic characteristics of participants were examined to examine reasons for refusing to immunize against COVID-19 among the adult population presenting to a Tertiary Care Hospital in Lahore (n=413)

Characteristics	**Men** (n=276)		**Women** (n=137)		***p-value***
	Numbers	Percentage	Numbers	Percentage	
Age (years)					
Less than 20	20	7.2 %	06	4.4%	0.52
20-50	214	77.5%	110	80.3%	
More than 50	42	15.2%	21	15.3%	
Monthly Family Income (PKR)					
<20 K	131	47.5%	114	83.2%	<0.001
20 K-50 K	102	37.0%	17	12.4%	
>50 K	43	15.6%	06	4.4%	
Education					
No Schooling	74	26.8%	57	41.6%	0.005
Completed Primary School	110	39.9%	50	36.5%	
Secondary School or above	92	33.3%	30	21.9%	
Occupation					
Unemployed	43	15.6%	94	68.6%	<0.001
Unskilled worker	126	45.7%	24	17.5%	
Skilled Workers	107	38.8%	19	13.9%	
COVID-19 infection in family					0.53
Yes	93	33.7%	42	30.7%	
No	183	66.3%	95	69.3%	
COVID-19 vaccination in family					
Yes	216	78.3%	104	75.9%	0.59
No	60	21.7%	33	24.1%	

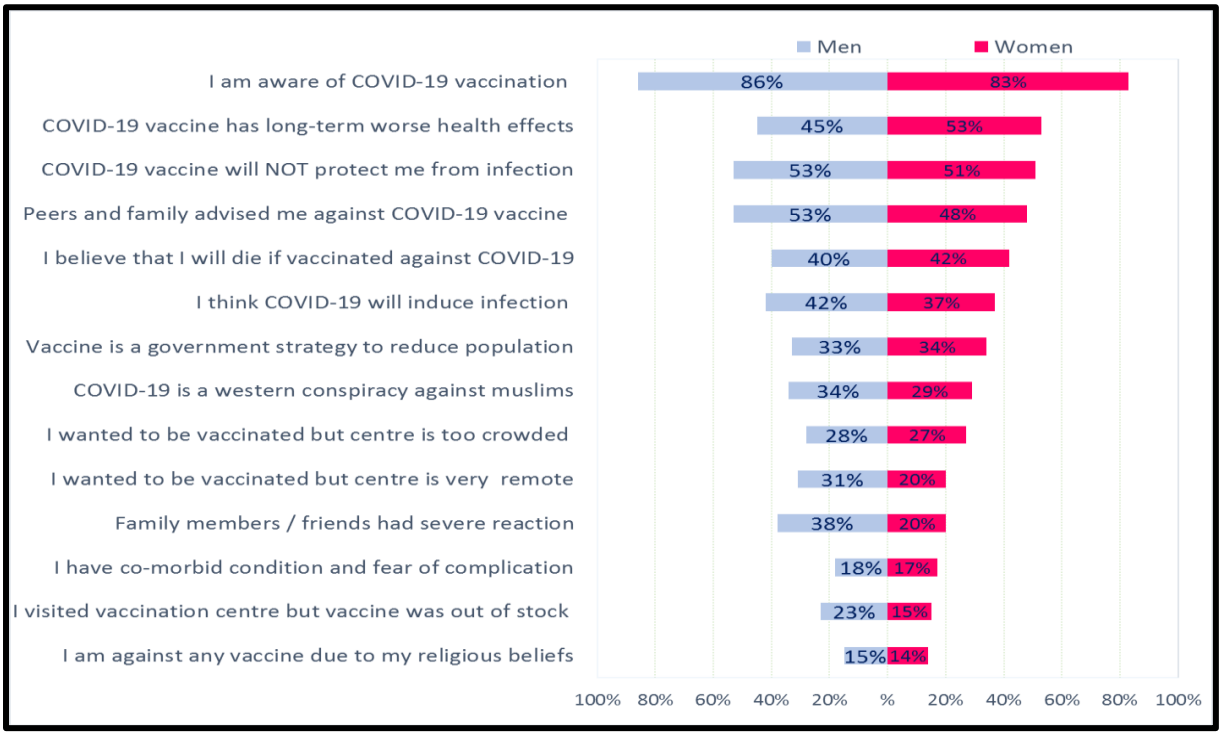

Figure-2: Reasons for not immunizing against COVID-19 among adult Population presenting to a Tertiary Care Hospital in Lahore (n=413

Table-2. Association between sociodemographic characteristics and the main themes of refusal to immunization against COVID-19 among adult Population presenting to a Tertiary Care Hospital in Lahore (n=413)

	Fear of complications/ long term health effects			***Misconceptions about COVID-19 vaccination***			***Peers and family influences***			***Immunization management issues***		
	Yes	***No***	***p***	**Yes**	***No***	***p***	**Yes**	***No***	***p***	**Yes**	***No***	***p***
	N (%)	**N (%)**		**N (%)**	**N (%)**		**N (%)**	**N (%)**		**N (%)**	**N (%)**	
Age (years)												
Less than 20	07 (3.4)	19 (9.3)	0.04	04 (3.0)	22 (7.9)	0.08	15 (7.3)	11 (5.3)	0.66	06 (5.2)	20 (6.7)	0.38
20-50	168 (80.8)	156 (76.1)		104 (78.2)	220 (78.6)		158 (77.1)	166 (79.8)		88 (75.9)	236 (79.5)	
More than 50	33 (15.9)	30 (14.6)		25 (18.8)	38 (13.6)		32 (15.6)	31 (14.9)		22 (19.0)	41 (13.8)	
Sex												
Women	62 (29.8)	75 (36.6)	0.14	39 (29.3)	98 (35.0)	0.25	73 (35.6)	64 (30.8)	0.29	40 (34.5)	97 (32.7)	0.72
Men	146 (70.2)	130 (63.4)		94 (70.7)	182 (65.0)		132 (64.4)	144 (69.2)		76 (65.5)	200 (67.3)	
Education												
No Schooling	58 (27.9)	73 (35.6)	0.21	35 (26.3)	96 (34.3)	0.004	53 (25.9)	78 (37.5)	0.01	40 (34.5)	91 (30.6)	0.64
Completed Primary School	83 (39.9)	77 (37.6)		67 (50.4)	93 (33.2)		81 (39.5)	79 (38.0)		41 (35.3)	119 (40.1)	
Secondary School or above	67 (32.2)	55 (26.8)		31 (23.3)	91 (32.5)		71 (34.6)	51 (24.5)		35 (30.2)	87 (29.3)	
Occupation												
Unemployed	59 (28.4)	78 (38.0)	0.07	31 (23.3)	106 (37.9)	0.01	61 (29.8)	76 (36.5)	0.20	37 (31.9)	100 (33.7)	0.94
Unskilled worker	77 (37.0)	73 (35.6)		56 (42.1)	94 (33.6)		74 (36.1)	76 (36.5)		43 (37.1)	107 (36.0)	
Skilled Workers	72 (34.6)	54 (26.3)		46 (34.6)	80 (28.6)		70 (34.1)	56 (26.9)		36 (31.0)	90 (30.3)	

Table-3. Adjusted Odds ratio and 95% confidence interval showing the association between refusal factors to COVID-19 immunization in adult Population presenting to a Tertiary Care Hospital in Lahore (n=413)

	Fear of complications/ long term health effects			***Misconceptions about COVID-19 vaccination***			***Peers and family influences***			***Immunization management issues***		
	Odds ratio	***95% CI***	***p***	**Odds ratio**	***95% CI***	***p***	**Odds ratio**	***95% CI***	***p***	**Odds ratio**	***95% CI***	***p***
Age												
Less than 20 years	**Reference**	**Reference**		**Reference**	**Reference**		**Reference**	**Reference**		**Reference**	**Reference**	
20-50 years	1.97	0.74 - 5.21	0.17	3.00	1.16-7.72	0.02	0.48	0.19-1.17	0.11	2.16	0.85 - 5.71	0.12
>50 years	2.74	0.85 - 8.84	0.09	1.59	0.52 – 4.90	0.42	0.77	0.25 - 2.01	0.52	3.73	1.25-11.10	0.01

Sex												
Women	**Reference**	**Reference**		**Reference**	**Reference**		**Reference**	**Reference**		**Reference**	**Reference**	
Men	1.45	0.79 - 2.65	0.22	1.47	0.78 - 2.76	0.23	0.42	0.24 - 0.72	0.02	0.71	0.42 - 1.19	0.20
Education												
No formal Schooling	**Reference**	**Reference**		**Reference**	**Reference**		**Reference**	**Reference**		**Reference**	**Reference**	
Primary School	0.92	0.51 – 1.66	0.77	1.92	1.02 - 3.60	0.04	1.51	0.89 - 2.51	0.12	0.72	0.44 - 1.19	0.20
Secondary School	1.53	0.77 – 3.01	0.22	1.05	0.53 - 2.12	0.88	2.07	1.16 - 3.71	0.01	0.88	0.50 - 1.53	0.65
Occupation												
Unemployed	**Reference**	**Reference**		**Reference**	**Reference**		**Reference**	**Reference**		**Reference**	**Reference**	
Unskilled workers	1.28	0.65-2.48	0.46	0.95	0.47 – 1.91	0.88	1.74	0.97-3.14	0.07	1.41	0.80 - 2.49	0.23
Skilled worker	1.00	0.50 - 1.98	0.99	1.67	0.82 – 3.40	0.15	1.88	1.03 - 3.43	0.04	0.95	0.53 - 1.70	0.85

DISCUSSION

The COVID-19 pandemic has visibly impacted healthcare delivery systems worldwide and has affected economic growth and the socio-cultural environment, especially in developing countries.[11] Global alliances and concerted efforts of countries against this menace achieved an appreciable target of curtailing this huge public health problem; introducing the COVID 19 vaccine is the cornerstone strategy. However, immunization refusal is the major obstacle to attaining the ultimate goal of its elimination. Why many individuals refuse despite the availability and access to vaccines is sparsely investigated in our population. The current study aimed to examine the sociodemographic factors, perception of the vaccine and social or cultural factors of refusing the COVID-19 vaccine. We found that more than eighty percent of individuals were aware of vaccine availability against COVID, but half of these participants believed that vaccines would not protect them. We report that misconceptions about vaccines and the fear of long-term effects were the main factors related to refusal/ hesitancy in individuals aged between 20 to 50 years, while female subjects in skilled occupations and with secondary education tend to be influenced more by peers and family members to decide for COVID-19 vaccination. Similar findings were observed by Qasim *et al.*[12,] who reported that gender and literacy level influenced decision-making and acceptance of the vaccination.[12] Likewise, Ahamed *et al.* showed that the perceptions and fear of COVID vaccination differ in different age groups, including employment and marital status.[13] Health awareness and literacy has influenced the decision to accept newly implemented health\

intervention like vaccination.[12] However, our results indicated that refusal of COVID-19 vaccine was higher among those with high literacy and among skilled professionals. This variation may be explained that COVID-19 was a novel infection, with lots of conspiracies around and inconsistent data coming from various sources, which might result in mistrust of the COVID-19 vaccine. The speed by which new vaccines were developed and the way these were granted provisional approval, contrary to conventional drug or vaccine approval procedures, might have created doubts in the minds of many individuals in the community. Individuals with some education appeared to be more watchful of these novel vaccines. Our findings are consistent with the results of Arshad *et al.*[14] who reported a refusal rate of 48.9% in health care professionals owing to the fears of safety and efficacy.[14] Similarly, Rehman *et al.* observed a high refusal rate to booster doses of COVID vaccination among healthcare workers.[15] Few studies involving nursing and pharmacists have also reported hesitancy to COVID-19 vaccination, further supporting the current study's findings.[16,17] This finding may also be attributed to the fact that educated subjects are more exposed to e``lectronic and social media influence, which has proved to be a platform of infodemics, leading to the spread of Misconception and false information regarding vaccination.[18] Since the emergence of COVID-19 infection, much misinformation has been circulating, including conspiracy theories that the Western world is against developing countries and there may be a monetary gain associated with developing vaccines during the pandemic. These factors have also played a fundamental role in making refusal decisions by individuals against COVID-19 vaccination. In addition, a lack of trust in government officials and the public health care system may contribute to nonadherence to the vaccination program.[19] In summary, hesitancy towards COVID-19 vaccination in a population is multifactorial: fear of developing long term health effects, disbelief about vaccine efficacy, misconceptions and peer/family influences are major themes contributing to refusing COVID-19 vaccination. Public health measures such as raising awareness about the COVID-19 vaccine, addressing misconceptions and myths and communicating correct information about side effects using social media, mobile messages and opinion-makers on mainstream media would improve vaccination coverage. Health authorities can support vaccination campaigns by providing accessible vaccination centres and ensuring the availability of vaccines with trained health staff. Strengths of our study include its rigorous methodology and large sample size. The study's subjects represent the population living in various diverse settings. Moreover, in-person interviews were conducted using a standardized structured interview schedule. The identified themes of refusal are specific and provide sufficient information to public health authorities to target high-risk refusal individuals for communicating health education messages and developing health promotion campaigns in the community. A few limitations should be considered before interpreting the findings of this study: a cross-sectional design was used in which determining the association between independent and dependent variables may suffer from reverse causality. Furthermore, a larger sample size could have provided more precise estimates and improved external validity. Lastly, Mass media and social media communication addressing the identified factors may improve effective COVID-19 immunization campaigns. The government should facilitate the immunization drive by opening more accessible vaccine points to reduce overcrowding and ensure the availability of vaccines with trained health staff.

CONCLUSION

There are still gaps in accessibility, coverage and acceptability of the COVID-19 vaccine and in addressing the concerns among men and women of low socioeconomic population strata in Lahore. There are misconceptions

about vaccine effectiveness, its long-term effects and fear of death among those with comorbid conditions.

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AUTHOR'S CONTRIBUTION

SM: Conception and development of study proposal
SHE: Questionnaire Design
SAA: Data collection tool and testing
SAC: Data collection
SI: Data management and Data Analysis
MA: Manuscript writing
SB: Manuscript writing
MS: Manuscript Review

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Qualitative Research

FOOD LITERACY AND DIETARY BEHAVIOR: YOUTH PERSPECTIVE

Bushra Yasmeen

ABSTRACT

Background: Advancement in technology and globalization has changed the framework and meaning of food. Varied social, economic, environmental conditions and globalized practices reflected the skills and practices that how people understand food nutritional knowledge, perceptions, practices, and decision-making for healthy food choices to maintain health and well-being.

Material and Methods: By using qualitative research design, the study explored the concept of food literacy about the overall health understanding and practice. By using stratified random sampling, the sample was selected from the Institute of Social and Cultural Studies, University of the Punjab, Lahore. In-depth interviews were conducted.

Results: The study shows that students have healthy eating behaviour. It was difficult, especially living in hostels to acquire the nutritious foods and their use. Findings indicate that students have poor knowledge about nutrition. Due to time constraints, purchase available low-price food.

Conclusion: Poor cooking skills tend towards readymade food which affects food choices, selection and consumption. With the availability of spicy and fried foods at comparatively low prices students overlooked health and hygiene.

Key Words: Food, Knowledge, Dietary behaviours, Health

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INTRODUCTION

Advancement in technology and globalization has changed the framework and meaning of food. Human behaviour about food and its consumption is multidimensional. Social, cultural, economic, and environmental factors influence dietary behaviours.[1] The availability of a wide variety of ready-to-eat food and advertisements promote consumers' preferences. A variety of ready and processed food products are available causing obesity (a major health challenge such as coronary heart disease, stroke, cancer and type 2 diabetes) resulting in increased mortality.[2]

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To deal with the challenge, the WHO prioritised and emphasized food and nutrition plan to improve dietary behaviours through the "European Food and Nutrition Plan 2015-2020".[3]

Varied food systems around the globe reflect the skills and practices that how people understand and value it and develop a relationship with health and well-being. Those who intend to maintain health throughout life, engage themselves with the food systems.[4] Multiple factors (internal: nutrition knowledge, skill, self-efficacy, food decision; external: income, security, food system) influence/shape the individual's capabilities of decision making regarding food.[5] Preference and choices for fruits, vegetables, fast food or snakes determine dietary behaviour patterns and food literacy.[6] Participation enables people and provides support to achieve

sustainability of health following their social, cultural, economic, political and environmental conditions. Healthy food preferences and choices indicate high food literacy and dietary behaviours,[4] whereas the selection and consumption of fast food, snakes and confectionaries indicate low food literacy.[7] Understanding of food nutritional values and the competence to use the knowledge and information to enhance physical health and mental well-being.[7] Maarje P et al., (2018)[8] conducted a study on measurement of food literacy and healthy eating and concluded that "higher levels of food literacy were associated with more self-control, less impulsiveness and healthier food consumption".

Due to the participation of women in the workforce, dramatic changes occurred in the skills and practices of food preparation. Due to this reason, fast food outlets serve delivery at the doorstep. Prepared foods and pre-packed food at supermarkets are becoming more trendy than eating food prepared at home.[13] Studies indicate that poor skills in the preparation of food are considered a barrier to healthy diet behaviour.[9] The environment around individuals built perceptions where the cognitive and sensory experiences along with the appearance, flavor, taste and texture of food including price, quality, convenience, and availability. Food literacy, nutrition knowledge, and homemade food are becoming a challenge for health and well-being.[5] Studies indicate that "higher food literacy is related to better nutritional quality, health and well-being".[10,7] The developed countries focused their attention on public health programs on food literacy to create competencies for the selection, management, and preparation of food to enable them to shape the dietary behaviours to make healthful decisions for well-being in a way to adopt a potential strategy to facilitate healthy dietary behaviors.[11]

For food literacy, the explicit emphasis was on food proficiency and food skills to support individuals in preparing themselves to deal with multiple aspects of cooking, presentations/serving, nutritious value, and other social-psychological factors.[5]

Food and Nutrition Knowledge

Healthy food and nutrition knowledge protect and reduce the risk of diseases like diabetes, high blood pressure, strokes, and osteoporosis etc., A balanced diet increase energy level and maintain balance for the functioning of the body. Knowledge about fruits, vegetables, milk, eggs, meat, and grains promotes healthy eating. Barzegari, *et al* (2011)[12] study shows a significant positive correlation existed between nutrition knowledge and attitude; and food habits among male and female students. Another study by Labban (2015)[13] indicated that students who enrolled in the health related programs scored higher (41.23 ± 0.05) as compared with those who were enrolled in non-health-related programs (36.86 ± 0.28). The results support the notion of nutrition knowledge for health education campaigns launched to promote healthy eating. Colatruglio's (2015)[10] study indicated a relationship between food literacy with health outcomes. Results indicate that there is a lack of food literacy among students; and insufficient awareness of nutritious values and skills. Due to the lack of these; dietary habits are affected which ultimately becomes a cause of the growth of weight and obesity.

Perceptions about Food and Well-being

Poudel, B. P., & Sapkota (2016)[14] studies in Nepal indicated a direct relationship between the quality of food with eating behaviour and better health. On the other hand, some studies indicate that "inadequate consumption of vegetables and fruits, increased incidence of home dinners, powerless meal preparation abilities, and increased portion size".[15, 16] These studies highlighted that it is also possible that education in food literacy may be an effective strategy to improve students' awareness for safe dietary behaviour skills to help them in making better food choices.

Gender and Food Preparation/Cooking

Food preparation and cooking skills are very much connected with the food experiences. Learning at an early age seems to have a positive impact on cooking skills. Colatruglio's (2015)[10] study inferred that children learn food preparation and skills attitude all from 1st in home and with family after education and courses help to give food preparation knowledge. In literature, there are arguments on food literacy as it works as a protective shield for health and well-being.[17] Lucan (2012)[15] concluded that generally participants exhibited a good understanding of nutritional values for a healthful diet, but disagreed about the health values of some specific foods. Participants suggested increasing the education and modifications in the social environment that may lead to improvement in the meals and health improvement in the community.

Therefore, an effort was made to explore the understanding of the concept: food literacy covers the aspects of nutritional knowledge, cooking skills, food perceptions, and nourishing food value for well-being.

MATERIAL AND METHODS

Qualitative design was used to explore the understanding of the concepts and behaviours by using a semi-structured interview guide. By using systematic simple random sampling, data was collected from the Punjab University, Lahore. Among the Behavioural and Social Sciences Departments, the Institute of Social and Cultural Studies (ISCS) was selected where 1235(571-M & 664-F) undergraduate students were studying the subject of Sociology. Fourteen in-depth interviews were conducted (eight- females and six males) to explore:

- Students understand "food literacy" and "healthy diet";
- Nutrition knowledge;
- Perceptions about food and well-being;
- Food preparation/cooking skills; and
- Healthy eating practices in daily life.

RESULTS

UNDERSTANDING OF "FOOD LITERACY"

Students expressed that it is all about the standards of dietary guidelines provided by health professionals. The students expressed little about food literacy. They have said:

"Never studied about the details"

"Just know what electronic and print media are shown for the advertisement"

"Most of the time we were impressed by the face value of the products"

"Instead of nutritional value, prefer price/affordability, availability, convenience, colour, packing, choice, mood, etc"

"Never try to get information on the ecological factors"

"Just purchase according to hunger"

HEALTHY DIET/EATING:

Due to young age and lack of time, students do not bother much about healthy eating, expressed as follows:

"I tried to take a healthy diet according to my hunger; tried to include fruits and vegetables as they have plenty of minerals and vitamins".

"Healthy food strengthens our immune system and is a source of energy".

"I am careless about food whether it is balanced or not. I eat whatever ready food is available at the time of hunger".

"Due to multiple constraints such as lack of time, I ate whatever food was available. It is very rare to think about a healthy diet or eating".

"Always very busy, my eating habits are different from my peer group. I ate according to my affordability or purchasing power (family's socio-economic status)".

"Sometimes I missed the norms of balanced food I guess. I will make efforts to eat healthy meals. I ate food according to the hostel mess so never think about food - healthy or not".

"I am conscious about nourishments such as vegetables and fruits but find them expensive so prefer economical food like potato chips".

"It's very costly to buy organic food so buy chips".

FOOD AND NUTRITION KNOWLEDGE

It was generally an understanding among interviewees that "boxed foods" and "fast food" are "not beneficial" for health. Traditional and fresh food is much better than fast food as it has nourishing ingredients. Fast food especially fried food increases cholesterol levels. Fat, salt and sugar contents are no longer considered as sustenance nourishing contents.

"We have nutrition knowledge because of reading/studying such books about nutrition to gain some knowledge".

"My friend is a nutritionist who always discusses food and nutrition".

Most of the students do not know about the nutritional value of food. They were interested to know about it.

"For health, I realised its importance so thinking about joining a nutrition course. I thought this course would boost my knowledge".

"I read many books on health and balanced diet, therefore, try to follow it".

Some students (especially males) expressed about the portion sizes. They ate according to their appetite or hunger. One of them added, *"Just eat pretty much until you get whole".*

Students expressed the importance of food safety, hygiene practises and healthy/unhealthy food. They realized that such information is always helpful to maintain health.

PERCEPTIONS ABOUT FOOD AND WELL-BEING

Students' perceptions about food and well-being were more or less the same. Having primary knowledge that a nutritious diet/food is vital for health. Daily use of vegetables and fruits is helpful to maintain health. They expressed views:

"Yes, food has a direct relation with the health. Spicy food disturbs my stomach. Acidity disrupts my whole routine".

"My companions who never cooked, they always ready to eat the prepared meals. They never bothered about the quality of food. Ready meals attract them".

For the "quality and standards of hygiene during cooking" the students expressed views:

"I understand that food is directly linked with our health. No one denies the value of Healthy and hygienic food. Unhygienic food destroys the digestive system and causes ill health".

For dietary practices, most of the students ate three times a day. Few students do not take breakfast because wake up late; few are in a habit of improper lunch. Just take easily available eatables: pizza, burger, and sandwich. They had proper dinners with family or friends. In Pakistan, joint breakfast, lunch, and dinner are a common practice. Use of "paratha/Roti/ Nan/bread" with egg, and butter at breakfast; with chicken/mutton/fish curry and vegetables at lunch or dinner along with pickles, yoghurt and sweet dish.

GENDER AND FOOD PREPARATION/COOKING SKILLS

Food proficiency was considered to build confidence and encourage improved food arrangement practices that may have reliable effects. Data revealed different points of view of males/females regarding food literacy. Boys and young ones rarely engaged while cooking. These are the girls who mostly engage in such activities. Girls learn cooking skills and eating manners from their mothers.[24] Respondents expressed views as follows:

FEMALE STUDENTS

"I took part in cooking with my mother as I am the eldest one out of four children".

"I am living in a hostel; due to lack of interest, mostly rely on my companions for food".

"I don't know much about cooking food. So prefer prepared food".
"I am conscious about nutrition; therefore prefer to cook meals according to my desire and convenience".
"I prefer the availability of ready healthy food".

MALE STUDENTS

Due to a lack of interest in cooking, boys were found to be least interested in learning cooking skills. These skills generally, like other important life skills, are taught at home. These are mothers who transfer these skills to their children. Males prefer to learn from their wives or friends.
"I have learned cooking from my mother. I use the same recipes to get the same taste as my mother while cooking rice, some green vegetables and beans".
"There is a comparative nature of food arranged daily at home. It is very rare when I participate in such activities".
A boy stated, "I have never attempted to make food". Also, said he is exceptionally poor in it. Most of the time my sister cooks alone. I spend time outside the home with my friends playing cricket.
A male respondent said, *"I like to prepare/cook food. I enjoyed it. I prepare food for my friend. Males also cook delicious food".*
Another student said, "I help out my sister. Can make shakes for family and sometimes prepare breakfast like a boiled egg with a cup of tea".
One of the respondents said, "My parents are working so I prepare food for my younger ones".

HEALTHY EATING PRACTICE

Most of the students have learnt smart dieting, food, hygiene, and its importance from institutions, books and instructors. Less importance is given towards healthy food choices. Most respondents informed that "*A great need is required to create awareness about food literacy*" by using social media. For children, cartoons and videos may work to instigate interest in good food, bad food, healthy food, hygienic food, energy food etc.

DISCUSSION

The study described that females have a better understanding of food as they are substantially more associated with such activities as buying, cooking and planning a menu and its nourishment. While purchasing food products, they are in a habit of looking at the content/ingredients and are conscious regarding price/cost whereas males are observed least bothered about it. It is very rare to look at food ingredients while selecting during purchase whereas young girls are conscious about wellbeing and fitness whereas young men appear to be not aware and careless about their wellbeing.[17] They usually observe the outlook/packing that fascinates them.[18] It might be due to craving, taste, and likelihood.[18] It is observed that there is a significant gender difference in the selection of food such as choices, food nutrition, selection, and cooking skills because of awareness, information/knowledge, and capabilities enhanced due to kitchen work.[19] Poudel, B. P., & Sapkota, M. (2016)[14] found out that healthy food is quite expensive for students. They prefer to buy low price prepared food like chips defiantly not good for their health. Another study conducted in Nepal indicated students rarely prefer healthy eating. They thought that homemade food/vegetables and fresh fruits were better and healthy.

It was reported that the respondents had few opportunities to improve food proficiency. Studies (Veer *et al* 2011; Vartanian et al 2008)[18,19] indicate that extrinsic environmental factors affect people's food intake without understanding/acceptance becomes a challenge for them to maintain a healthy diet plan given their health and well-being. To maintain health, the selection of food is central. It is based on an individual's cognitive effort and the level of proficiency keeping because of well-being. Literature identified three domains of health literacy that is functional (critical reading and

composing ability to understand data relevant to well-being), collaborative (understanding and communicating with medical care professionals), and vital (psychological skills for individual empowerment). Schulz and Nakamoto (2005)[20] conceptualized wellbeing proficiency in three dimensions: Descriptive information, All procedural details including the implementation and Pertinent decision skills having critical thoughts.

Therefore, it is important to practice food literacy in daily routine life for good health and a better society. Students need to learn and use the best knowledge and practices of food skills. Due to lack of time and poor cooking practices, the students prefer fast food which is available in packing or takeaway. Nowadays it is a common trend that people like to dine outside the home or prefer fast food.[21] Fast food and other unhealthy foods now prevail in society. Food indicates social values and culture however now the availability of fast food McDonald's, Italian pizza etc. transformed it all together - multicultural. The changing trend is alarming not only here in Pakistan but around the globe. Fast food and inexpensive junk food have increased multiple health risks such as obesity, high blood pressure, and diabetes. A study by Higgs and Thomas (2016)[21] indicates that for healthier eating, social eating norms interventions have to be encouraged.

Study findings indicate that due to poor knowledge about nutrition, students tend towards poor diet. Similar findings of Niazi *et al* (2012)[22] study and Colatruglio's (2015)[10] about food education exhibited that a "*significant spotlight on the youthful grown-up populace in demonstrate hatred for realizing that they do have an absence of food information and have unfortunate dietary propensities*". The unavailability of pure food, low price, spicy, and fried foods products generated multiple issues towards health, hygiene and well-being. Dyg et al., study (2014)[23] indicated that food education is a systematic way of coping with improving individual food competency and its relation to well-being. Therefore, food education is important as it plays a central role in health and well-being.

CONCLUSION

Among youth, the understanding of food literacy and nutrition knowledge is linked with affordability, lack of knowledge, and time. There is a great need to integrate food education and nutrition knowledge in all programs for awareness and increase food proficiencies. For health education, policies are required, its implementation and promotion. Multi-sectorial initiatives are required to introduce new ways of thinking about food and educating people about nutritional values to achieve the desired results regarding food literacy and healthy dietary behaviours – a step towards sustainability of well-being.

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AUTHOR'S CONTRIBUTION

BY: Conceptualization, Introduction, Review of Literature, Methodology, Data collection, Analysis, Referencing, manuscript writing.

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Review Article

C-REACTIVE PROTEIN

Naila Hamid[1], Muhammad Sohail Aslam[2]

ABSTRACT

C-reactive protein (CRP) is synthesized in the liver after macrophages and T-lymphocytes secrete interleukins. It is an acute phase protein, and the normal concentration ranges from 0.8 mg/L to 3 mg/L. It is used as a marker of inflammation. CRP levels are increased in infection,trauma, necrosis, malignancy, and allergic reactions. Patients having elevated CRP are at risk of suffering from diabetes, hypertension, and cardiovascular disease. CRP levels are reduced after exercise. COVID-19 positive patients also had increased CRP levels in Wuhan, China.

Key Words: C-reactive protein, Necrosis, CVID-19, Hypertension

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INTRODUCTION

C-reactive protein (CRP) is an inflammatory biomarker formed in the liver in reaction to interleukin secretion by macrophages and T-lymphocytes. Its normal serum CRP level is 0.8 – 3 mg/L; its level increases in patients having inflammation infection, necrosis, malignancy, and allergic conditions. Patients with higher CRP levels have an increased risk of developing diabetes, hypertension, and cardiovascular disease. Its levels are reduced after exercise.

History and genetic

In the plasma, the c-reactive protein is present as an annular pentameric protein.[1]Its discovery was made in 1939 by Tillet and Francis.[2] It is formed in the liver following the secretion of interleukin by macrophages and T cells.[3] It was first detected in patients' serum with acute inflammation,which reacted to pneumococcal cell membrane polysacrharide.

[4]The chromosome 1 (1Q 23.2)[5] contains the CRP gene. Its structure is composed of 5 monomers. Each has 224 amino acids.[6]Its molecular mass is 2.5106 da.[7]

Functions

The complement system is activated by binding CRP with bacterial cell membrane polysaccharides leading to the removal of recrotex, apoptive cells, bacteria, and phagocytosis by macrophages.[8]Secretion of IL-6 from macrophages[9] and adipocytes[10]causes the acute phase response in response to a number of acute and chronic inflammatory conditions,including bacterial, fungal, and viral infections, rheumatic fever, tissue injury, and necrosis.[11]Normal CRP levels is 0.8 – 3.0 mg/dL. CRP levels increase with age.[12]TNF-α and TGF-β can increase CRP. The highly suggestive level of serum CRP for inflammation due to bacterial infection is 100 – 500 mg/dL. When the inflammation subsides, serum CRP levels fall rapidly.[13]Secretion of CRP

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from liver cells is inhibited by interferon alpha and liver failure.[14,15]

Important Uses

For Diagnosis

Serum CRP acts as a marker of inflammation. Measurement of serum CRP is a useful indication of the disease progress and effectiveness of treatment.[16,17]As compared to erythrocyte sedimentation rate (ESR),serum CRP is a more accurate and sensitive indicator of the acute phase response.[18,19]

Cardiovascular disease

Individuals with higher levels of serum CRP have a higher risk of developing diabetes., hypertension, and cardiovascular disease.[20,21]Statins are useful in patients having increased CRP.[22,23]Exercise reduces CRP levels in patients with coronary artery disease.[24]It is a nonspecific indicator in patients having coronary artery disease.[25,26]

Fibrosis and inflammation

In patients with scleroderma, polymyositis, and systemic lupus erythematosus, serum CRP levels are not raised.[27,28]CRP levels are raised in Crohn's disease and inflammatory bowel disease (IBD). and ulcerative colitis.[29]Low risk of colon cancer is associated with low-grade inflammation.[30]

Obstructive sleep apnea

Obstructive sleep apnea (OSA) patients have increased IL-6 and OSAserum CRP levels, an effect thatis reduced by continuous positive airway pressure.[31]

Rheumatoid arthritis

Higher levels of CRP are associated with the severity of rheumatoid arthritis and its common comorbidities, such as metabolic syndrome, diabetes, cardiovascular disease,and interstitial lung disease.[32,33]

Viral infection

In patients of avian flu H7N9, serum CRP levels are higher than in patients with H1N1 influenza.[34]In Wuhan, China,patients had higher CRP levels during the COVID-19 epidemic.[35-37]

CONCLUSION

Measurement of serum CRP is useful in determining the disease progress or effectiveness of treatment.

AUTHOR'S CONTRIBUTION

NH: Conception of work and supervision
MSA: Drafting article and critical review

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Case Report

RETRO-PERITONEAL HEMORRHAGE POST CORONARY ANGIOGRAPHY: A CASE REPORT

Muhammad Awais Ahmad[1], Omair Farooq[2], Syeda Sadaf Kazmi[3], Muhammad Afzal Abbasi[4], Shameen Fatima Shoaib[5]

ABSTRACT

Background: Retro-peritoneal hemorrhage is an infrequent complication after percutaneous coronary angiography. It occurs when the transfemoral approach is used. Without early diagnosis and prompt treatment, it can lead to fetal consequences.

Case presentation: We report a case of a 44-year-old male who developed retro-peritoneal hemorrhage post coronary angiography and was successfully managed conservatively and was discharged.

Conclusion: Retro-peritoneal hemorrhage should be kept as a differential in patients who show signs of hypovolemic shock after coronary angiography. Non-contrast computed tomography (CT) scan of the abdomen and pelvis should be done for its diagnosis.

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INTRODUCTION

Coronary angiography is the benchmark investigation to determine the existence and degree of atherosclerotic coronary artery disease (CAD)[1]. The complications of this test range from short term minor complications to life threatening problems if not treated urgently[2]. Some of the complications of angiography include bleeding, hematoma, vascular damage or contrast related complications[1]. A rare bleeding complication of percutaneous coronary intervention is retro-peritoneal hemorrhage (RPH), which can occur as a result of femoral access or can occur spontaneously[3]. Retro-peritoneal hemorrhage is bleeding into the retro-peritoneal space, either occurring spontaneously or secondary to an injury or illness[4]. The documented incidence for RPH ranges from 0.15-6%[5]. RPH carries a mortality risk of 4 to 12%[6]. We report our experience of successfully managing a patient conservatively after developing retro-peritoneal hemorrhage post coronary angiography.

CASE PRESENTATION

A 44-year-old male, known hypertensive and smoker presented with the complaint of chest pain for five days which was CCS class III, shortness of breath for the same duration and was classified as NYHA class II, electrocardiography (ECG) of the patient showed anterior wall myocardial infarction (AWMI) (Figure 1).

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Figure 1: ECG depicting ST segment elevation in the anterior chest leads.

He was late for thrombolysis, so was managed conservatively and trans-thoracic echocardiography and coronary angiography were planned. The echocardiography showed severe left ventricle systolic dysfunction, 30- 35% ejection fraction (EF) and trace mitral regurgitation (MR) along with AWMI changes. During coronary angiography, the access was initially taken through the right radial artery but was shifted to the right femoral artery due to extreme tortuosity of the right subclavian artery and difficulty in engagement of the coronary arteries.

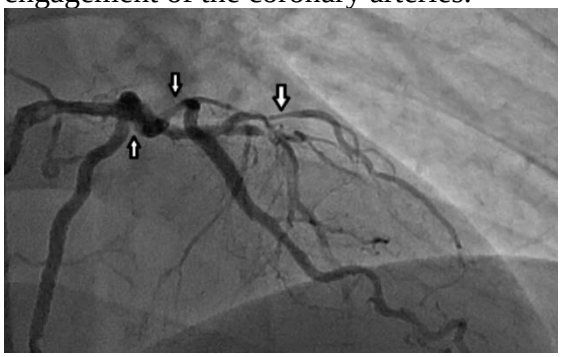

Figure 2: Coronary angiogram showing LMS haziness in distal shaft and bifurcation along with critical ostioproximal and mid-course stenosis of LAD.
LMS: left main stem; LAD: left anterior descending artery.

Moreover, the coronary angiography showed haziness in the distal shaft and bifurcation of the left main stem (LMS) along with stenosis in all three coronary arteries i.e left anterior descending (LAD) (Figure 2, 3), left circumflex (LCX) and right coronary artery (RCA). The diagnosis of triple vessel coronary artery disease (TVCAD) was made and coronary artery bypass grafting (CABG) was planned after surgical consultation.

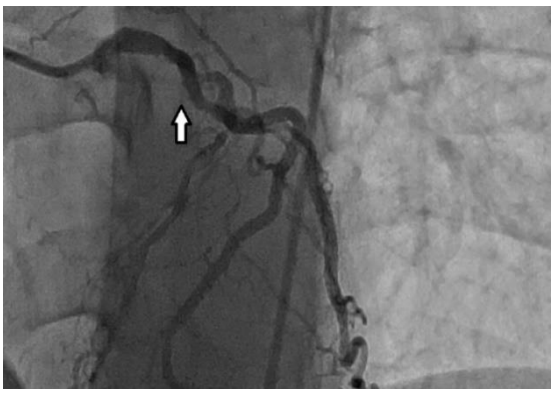

Figure 3: Coronary angiogram showing critical mid-course stenosis of LAD.
LAD: left anterior descending artery

The patient was shifted to the coronary care unit (CCU), where within 15 minutes he developed apprehension, profuse sweating and hypotension. Therefore, an initial differential of vasovagal shock, access site hemorrhage or retro-peritoneal hemorrhage was made. As the access site showed no significant sign of hemorrhage, the patient's resuscitation was started on intravenous (IV) fluids; however, as the EF of the patient was low i.e. 30-35%, a central venous catheter (CVC) was passed to check for fluid overload. The pressure of CVC was measured which was 3cm of H2O that favored hypovolemic shock. An urgent computerized tomography (CT) scan of the abdomen and pelvis was advised which revealed a large right sided retroperitoneal hematoma (Figure 4).

Henceforth, the patient was started on blood transfusions. The state of the patient improved significantly after fluid resuscitation and 2 pints of blood transfusion, after which he became vitally stable and was observed for 3 days. The retroperitoneal hemorrhage was successfully managed conservatively and the patient was discharged.

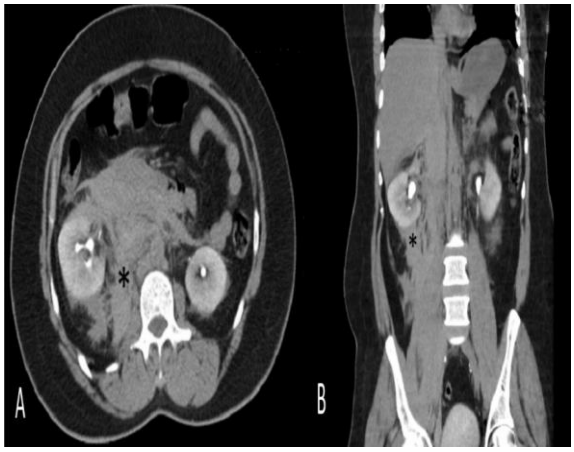

Figure-4: CT scan of the abdomen (A) axial and (B) coronal showing retroperitoneal hematoma in right perinephric, anterior pararenal space and surrounding the right kidney along its anteromedial and posterior aspects, being in contact with right psoas major muscle.
CT: computed tomography

DISCUSSION

Retro-peritoneal hemorrhage (RPH) following transfemoral catheterization is a widely acknowledged complication that can lead to substantial hematomas in the groin and retroperitoneal areas. Research suggests that factors that majorly influence the incidence of RPH are female gender, older age, chronic renal functional insufficiency (creatinine > 2mg/dl), low body surface area (below 1.8 m^2) a higher puncture point of the femoral artery and receiving an infusion of Glycoproteins IIb/IIIa inhibitors[7]. Understanding these risk factors can play a crucial role in identifying at-risk populations and improving management strategies.

The present study documented a case of a 44 years old male who suffered from hypovolemic shock as a result of RPH. Several studies have investigated the association between retroperitoneal hematoma after femoral catheterization and various clinicopathological variables like age, gender, hypertension and use of tobacco. Research conducted by Smith et al. analyzed a group of patients and found that males had a higher incidence of retro-peritoneal hematoma (70%) compared to females (30%)[7]. This gender disparity could be attributed to anatomical and physiological differences between males and females. However, another research reported a more balanced distribution of retro-peritoneal hematoma cases between genders[8]. Further research is required to establish a definitive association between gender and retro-peritoneal hematoma after femoral catheterization.

Age has been reported as another significant risk factor for the development of RPH following femoral catheterization. A study demonstrated an increased incidence of retroperitoneal hematoma with advancing age. The study revealed that patients aged 60 years or older were more prone to developing retroperitoneal hematoma as compared to younger individuals. These findings were consistent with Anderson's study, which also highlighted age as a risk factor[10]. Contrary to these findings, in the present case the patient belonged to the 4th decade of his life which is comparatively a younger age group. Nevertheless, vigilance and appropriate management should be exercised, particularly in older patients undergoing femoral catheterization

Hypertension has been identified as another potential contributing factor for RPH. It is documented that hypertension is significantly linked with a greater chance of developing RPH[11]. These results were also supported by another research which emphasized the importance of hypertension management in decreasing the risk of RPH following femoral catheterization[12].

Smoking is recognized as an alterable hazard for various medical complications, involving retro-peritoneal hematoma after femoral catheterization. A case-control study indicated that individuals who smoked had an increased probability of developing retro-peritoneal hematoma in comparison to those who did not smoke[13]. Additionally, Smoking cessation was also co-related with a reduced possibility of retroperitoneal hematoma recurrence in individuals who had previously

experienced it[14]. These results highlight the significance of implementing smoking cessation interventions among individuals who are at risk of RPH after femoral catheterization.

Recent research has reported that the incidence of RPH has radically declined as modern times have adopted a transradial approach rather than a femoral artery for percutaneous coronary intervention (PCI)[7]. Literature also suggests measures like Ultrasound-guided access, adhering to strict aseptic technique and maintaining sterility, the usage of vascular closure devices instead of manual compression after catheterization, pressure dressing and thorough patient assessment (medication history) can play a vital role in the avoidance of hemorrhagic incidences[15].

Treatment approaches for RPH are not supported by randomized trials and are primarily based on limited cohort series or individual case reports. Surgery is suggested only for a few patients, as most of the time these can be managed with blood transfusion and close hemodynamic monitoring. If a patient continues to be unstable despite intensive resuscitation efforts, endovascular techniques, such as transcatheter arterial embolization (TAE) or coil embolization, have demonstrated encouraging results in managing bleeding and minimizing the necessity for surgical intervention, reserving open surgery exclusively for situations where bleeding cannot be effectively managed[12].

In the presented case, the patient was managed conservatively with fluid resuscitation along with a blood transfusion. This management course is in concordance with another study in which 47% of the patients recovered completely with only blood transfusions while only 7% required surgical intervention. Additionally, a study documented three cases of RPH that were adequately managed with intravenous fluid administration and reversal of anticoagulation[16]. Kwok et al., have also reported that blood transfusion can be a successful management modality for RPH management[8]. Meanwhile, another research described two patients managed by balloon tamponade who showed enhanced blood flow whereas another patient with life-threatening RPH has also been satisfactorily treated via balloon occlusion and catheter delivery of thrombin[3].

Prompt recognition of symptoms and suitable management are crucial to optimize patient outcomes. It should be normal practice to suspect hemorrhage whenever a patient develops shock after catheterization and the importance of an early non- contrast computed tomography (CT) scan to rule out any bleeding from the femoral or iliac artery cannot be emphasized enough to decrease the death rate after RPH.

CONCLUSIONS

Retro-peritoneal hemorrhage is an uncommon sequela post coronary angiography. The risk increases in patients with increasing age, female gender, smoking and hypertension. An increased degree of scepticism is required to diagnose retro-peritoneal hemorrhage post coronary angiography. Non-contrast CT scan of the abdomen and pelvis is the best modality to diagnose RPH.

AUTHOR'S CONTRIBUTION

MAA: Case data collection and writing
OF: Conception and data collection
SSK: Case data collection and writing
MA: Primary cardiologist
SFS: Case data collection and writing

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