ESCULAPIO

JOURNAL OF SERVICES INSTITUTE OF MEDICAL SCIENCES, LAHORE.

VOLUME 19 OCTOBER - DECEMBER 2023 ISSUE 04

PUBLISHED BY

ESCULAPIO OFFICE, GYNAE UNIT - I, SERVICES HOSPITAL LAHORE
PHONE: 042-99204879, WWW.ESCULAPIO.PK

ONLINE EDITION
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9- ROSE CENTRE, KABIR STREET, URDU BAZAR LAHORE
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Artificial Intelligence (AI) Revolution in Research: Transforming Data into Discovery

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DOI: https://doi.org/10.51273/esc23.251319426

Introduction

Artificial Intelligence (AI) has emerged as a transformative force in the dominion of research, reshaping the landscape across diverse fields. AI refers to the simulation of human intelligence by a system or a machine. It implies a vast term that encompasses machine learning and deep learning.[1] AI is based on 'intelligence' which refers to cognitive capacity of an individual to plan learn and interpret. Secondly 'techne', a more wide-ranging ability to solve problems using technological objects. Although the intelligence remains the same, measured by intelligence quotient (IQ), it is the change in techne that leads to amplification of intelligence.[2]

Use of AI in healthcare and biomedical sciences is based on development of algorithms. This requires a sound knowledge of programming languages, advanced mathematics and statistics. In healthcare AI cannot be used fairly if these skills are lacking. However visual and no code programming tools are available now which simplify the process. Free data science tools make it easy to use for clinicians, researchers and health journalists.[3]

It is playing a pivotal role in augmenting the capabilities of researchers, offering unprecedented opportunities and insights. One of the primary contributions of AI in research lies in data analysis and interpretation. Machine learning algorithms excel in identifying patterns, correlations, and trends within vast datasets, allowing researchers to derive meaningful conclusions and hypotheses1. In the field of medical research, AI contributes to diagnostic accuracy, drug discovery, and personalized medicine. Generative AI methods can create designs, such as small-molecule drugs and proteins, by analyzing diverse data modalities, including images and sequences.[4]

They can analyze genetic data, predict disease outcomes, and recommend tailored treatment plans. Additionally, AI's ability to process and analyze images has proven invaluable in fields such as radiology and pathology. AI has the potential to dramatically affect nearly all aspects of oncology-from enhancing diagnosis to personalizing treatment and discovering novel anticancer drugs.[5] As we navigate this era of technological innovation, the synergy between AI and research holds immense promise for expanding the boundaries of knowledge and addressing complex challenges across disciplines. In healthcare, AI is even being used to enhance empathetic awareness, communication skills, health coaching; therapeutic interventions, clinical knowledge and healthcare quality assessment.[6]

Despite these advancements, the biggest challenge is regulation of data. Many countries have the regulatory bodies like the European Union has General Data Protection Regulation (GDPR). The AI systems need to be fed with diverse, non-discriminating and fair data. Accountability is one major issue. Keeping the outcomes abreast with social and ethical norms another.[7] Regulatory issues raised by Ganapathy include feeding accurate data initially. Maintaining adequate privacy policy especially protecting disabled and mentally challenged. Although a regulatory body by name of Digital Information In Healthcare Security Act (DISHA) exists, what would be the legal and ethical aspects if a physician decides to nullify the AI decision?[8]

Ethical considerations and the responsible deployment of AI in research are critical. Striking a balance between the potential benefits and ethical implications ensures that AI continues to enhance research endeavors while respecting privacy, bias mitigation, and societal well-being. There is need for curricula development and healthcare professional education, implementation of AI applications to

enhance health and wellbeing of the healthcare workforce. The use of AI reporting guidelines that address potential sources of bias specific to studies involving AI interventions has the potential to improve the quality of AI studies.[9] This will help scientists throughout the scientific process and the central issues that remain despite such advances. Both developers and users of AI tools need a better understanding of such approaches as challenges posed by poor data quality and stewardship remain. Concurrently the question that needs to be answered is, the continuous exposure of healthcare professionals to new technology, upon which they depend for diagnosis and decision making, is it going to diminish the skills of the healthcare workers?[10]

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Artificial Intelligence and Research: Innovation or Intrusion?

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DOI: https://doi.org/10.51273/esc23.251319427

In the realm of medical research, the integration of Artificial Intelligence (AI) has sparked a debate that is as invigorating as it is polarizing. With increasing use of Artificial intelligence in research, the question arising more on the depth and nature of AI involvement in research. Is AI an innovative force projected to propel medical research into uncharted territories of discovery, or is it an intrusion, undermining the essence of human-centric scientific inquiry?

In Favor of AI in Research

The efficiency and speed of AI in processing vast amounts of data are unmatched. Researchers are now able to analyze complex datasets more rapidly, accelerating the pace of medical discoveries. This proficiency of quickly identifying patterns with in research data can motivate researchers to work on more complex problems. Taking example from a recent study where AI was used to identify genetic variations associated with Alzheimer's disease, we can agree that AI can help converging the researchers' focus on complex problem solving leading to breakthrough in research and development of new drugs/treatments.[1]

Moreover, AI minimizes human error in data analysis. This precision enhances the reliability of research findings, making strides towards more accurate and effective medical interventions, as evidenced by a study in The Lancet where AI-assisted analysis of mammograms improved cancer detection rates [2]. Moreover, a report from National Institute of Health mentions about the cost-effectiveness of AI in research which can be useful in low resource research settings.[3]

The Other Side of the Coin

However, these advancements do not come without their caveats. Despite the rapid advancements in AI, one fundamental limitation is lack of human creativity and intuition. These are essential skills at the times of hypothesis development, and large, complex data interpretation. AI, in its current state, cannot replicate these uniquely human attributes, as discussed in a paper published in Science.[4]

Further, an important aspect is the lack of addressing the minorities in the generative AI as AI will most likely present the most generalizable facts, suppressing the voices of the minorities.[5] Not to forego is the need of defining a context in qualitative research. It is still unclear whether AI is able to understand the context of the research and may not be able to provide the reflexivity that a qualitative research demands.

Ethical issues related to use of AI in research include data privacy, informed consent, and the potential misuse of AI-generated research findings. These raise significant moral questions, as outlined in the UNESCO Recommendation on the Ethics of Artificial Intelligence.[5] The potential for AI to perpetuate biases present in the data or algorithms is another concern. These biases can lead to skewed research outcomes, which could have detrimental effects when applied in a medical context, as illustrated by a study in Nature Medicine where an AI algorithm used for risk assessment exhibited racial bias.[6]

Moreover, we cannot deny the risk of job displacements due to the reliance on AI in research with AI systems potentially replacing human researchers in certain roles. This scenario raises concerns about the devaluation of human expertise and the loss of nuanced understanding that comes from human-led research, as addressed in a report by the World Economic Forum.[7]

Finding the Balance

The crux of the debate lies in finding a balance. AI should be viewed as a tool that augments human capabilities in research rather than a replacement for human researchers. The challenge is to harness AI's

potential while acknowledging and addressing its limitations and ethical implications. The path forward involves a collaborative approach where AI and human researchers work in tandem, each playing to their strengths.

This approach ensures that AI's efficiency and data processing capabilities are coupled with the critical, creative, and ethical oversight that only human researchers can provide. For example, a recent project at Stanford University successfully combined AI and human expertise to develop a new diagnostic tool for lung cancer, showcasing the synergy possible through collaboration.[8]

Conclusion

In conclusion, the use of AI in medical research is neither a straightforward boon nor an outright bane. It presents a complex landscape of extraordinary potential tempered by significant challenges. As the medical research community continues to navigate this terrain, it is imperative to foster an environment where innovation is balanced with introspection, and technological advancement goes hand in hand with ethical responsibility and human insight.

The future of medical research is not about choosing between AI and human researchers; it's about integrating the two to drive forward a new era of discovery and understanding, ultimately leading to improved healthcare outcomes and patient well-being.

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Original Article

Faculty Need Assessment for online Teaching Skill in Local Medical and Dental Institutes

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Abstract

Objective: To evaluate the expertise of educators at Rashid Latif Medical and Dental College in an effort to maximize the potential of online learning and aimed to identify the gaps, highlighting areas that needed improvement and open the door for specialized training and support with an emphasis on teaching, learning, and evaluation apps.

Materials and Methods: The study was conducted at the Rashid Latif Medical and Dental College faculty members were gathered using a cross-sectional quantitative approach and circulating e-questionnaire to collect information on demographics, proficiency with educational apps, and satisfaction with IT department services. The gathered data was examined using descriptive statistics such as frequency, percentages, means, and standard deviation.

Results: The response rate from faculty members was 63%, with a total of 79 participants included in the study. The results indicated variations in tech-savviness among participants, with some apps being less familiar to faculty members. Google Forms emerged as the most widely app. Gender and age-related differences were observed in tech-savviness levels, with women generally exhibiting better levels of tech expertise. Faculty felt the need to improve IT related services and organizing tech workshops relevant to teaching.

Conclusion: This study unlocks valuable insights into faculty members' proficiency in using online teaching, learning, and assessment apps in education. The results emphasize the need for targeted training to enhance faculty members' online teaching skills. Institutions can utilize these findings to allocate resources for faculty development to improve medical education

Key words: Faculty, Need Assessment, Online teaching, online teaching skills

How to cite: *Yaseen S, Saeed A, Iqrar S, Faryal, Hasan A. Faculty Need Assessment for Online Teaching Skill in Local Medical and Dental Institutes. Esculapio - JSIMS 2023;19(04):380-384.*

DOI: https://doi.org/10.51273/esc23.25131941

Introduction

The COVID-19 pandemic has had a tremendous impact on how education is delivered, resulting in a significant growth in the use of online instructional methods. This shift has put new expectations on faculty members in medical and dental schools, who must now be proficient in creating, developing, and executing online courses. If these faculty members are not properly trained and engaged, they may be unable to effectively achieve the targeted learning results for their students. Incorporating technology into professional development has a number of advantages, including improved access to educational content via various devices and the ability to interact with content instantaneously via feedback choices. While learning management systems and e-learning teaching and learning tools are specifically created for educational

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Submission Date: 16-08-2023
1st Revision Date: 06-09-2023
Acceptance Date: 12-12-2023

environments, faculty members can also integrate regularly used technologies into their work. However, using numerous technologies without sufficient planning and leadership can result in a lack of intended faculty learning outcomes, or even dissuade faculty members from adopting them.[1-4]

The development of distance learning courses and programs is based on sound pedagogical principles. The design and creation of distance education courses and programs are based on established instructional principles. The primary objective of developing these courses and programs is to establish favorable learning conditions and enhance communication in a virtual classroom setting [5,6]In particular, it is proposed address to the educational technology learning needs of faculty, as their capacity will influence perceptions, acceptance, and adoption of these innovations.[7] The shift towards online education has become more prevalent in recent years, particularly in light of the COVID-19 pandemic. This has placed a significant demand on educators to adapt their teaching skills to an online environment. The objective of study was to assess the current level of proficiency among the faculty members of Rashid Latif medical and dental college in using online teaching, learning and assessment apps. The findings of this research will provide valuable insights into the areas where faculty members need further training and support to effectively deliver online medical and dental education. This research will also serve as a valuable resource for academic administrators, who can use the information to allocate resources for the development of online teaching skills among their faculty members.

Material and Method

This research is based on cross sectional quantitative approach used to assess the current level of proficiency among the faculty members of Rashid Latif medical and dental college in using online teaching, learning and assessment apps. Convenient sampling was employed and faculty of this institute was study population. Faculty members with designation of assistant professors or above were included. Faculty who had never been engaged in online teaching and learning activities were excluded from study. After seeking ethical approval from institutional review board of institute and E-Questionnaire for data collection was circulated among the participants who consented to be included in this research. E-Questionnaire is a survey comprised of demographic domain, proficiency about teaching, learning and assessment apps and service provision by IT department. A 5 point Likert scale is used to assess the proficiency level of the faculty members (tech-savviness). Different levels of proficiency include, master (I frequently use it and don't need help), expert, (I use, but need new ideas), proficient (I sometime use and am comfortable; I need help), advance beginner(I know about it but don't want to use), and novice (I don't know what this is). This scale inquired about different teaching learning and assessment apps including E-mails, Presentations (PowerPoint), Microsoft word, Google Form, Google classroom, Google meet, Google slides, Zoom, Skype, WebEx meet, Google workplace, Kahoot, Socrative, Mentimeter and poll everywhere and revealed not only which teaching apps faculty is already using, but also what the instructors want to use and what they need help with. Satisfaction level with Services provision of IT department of institute was assessed on Likert scale of agreement. Link of survey was shared with all faculty members of RLMC and RLDC. All formalities to collect the response of collecting data from e questionnaire were fulfilled and throughout the data gathering process, participant confidentiality and data protection were protected. The collected data was analyzed with descriptive statistics using the Statistical Package for the Social Sciences (SPSS, version 25.0 for Microsoft Windows 10). The p value less than 0.05 will be considered significant. The values were expressed as percentages of each response over the designed scale. Frequency distributions were calculated to examine the distribution of responses for each variable like gender, experience and status of CMT. Mean and standard deviation were calculated for age. Cross-tabulations were performed to explore the relationships between variables like certificate in medical education and tech-savviness enabling the identification of any notable associations.

Results

The Response rate from faculty was 63% (n=79 out of 125). Demographic statistics included age, experience, gender and status of certification in medical education or health professions education.

This research includes 79 participants, with the majority being female at 54(68.4%) and the remaining being male at 25(31.6%). Highest representation from Rashid Latif Medical College Lahore at 42(53.2%). A large portion of the participants, 35.4%, fall within the age range of 36 to 45 years. Out of 46 participants with more than a decade of experience, highest no. of participants (32%) fall within age group 55-66 years. Out of 79, 49.4 %(n=39) certified in health professions education and 13.9%(n=11) were enrolled in certification in health professions education. Rest were not certified. The teaching experience of the 79 participants in the study varied widely. Results indicated that 1.3% had less than 1 year of experience, 6.3% had more than 1 year of experience, 32.9% had more than 5 years of experience, and the majority (59.5%) had over 10 years of teaching experience. These findings emphasize the wealth of expertise and diverse backgrounds among the participants. The dataset reflected a diverse age range from 26 to 69 years. The average age of the participants was calculated to be 47.49, with a standard deviation of 11.316, suggesting considerable variability in age among the sample. These findings indicate a heterogeneous participant composition, reflecting a wide range of experiences and perspectives. To assess participants' comprehension of popular tools such as Kahoot, Manti Meters, Socrative, Polls Everywhere, and Google Forms, a Likert scale was employed. Participants were queried about their expertise in employing software and tools for delivering online curriculum content thereby obtaining valuable insights. Among the various apps evaluated, Manti Meters and Polls Everywhere emerged as areas where the majority of participants displayed limited familiarity, 60% were not well versed with these apps. Conversely, a substantial portion, accounting for 75% of participants, showcased a robust understanding of Socrative, Kahoot, and Google Forms. Notably, Google Forms emerged as the most widely utilized app, preferred by educators across the study's cohort. Impressively, a staggering 93% of participants demonstrated a commendable understanding of Google Forms, attesting to its prominence in the educational landscape. These findings highlight the importance of targeted training in less familiar apps and the popularity of Google Forms as an effective assessment tool in teaching. Some intriguing results are found when the tech-savviness levels of males and females are compared. It is clear from the dataset of 79 people that women are more prevalent at the "Master" skill level, with 16.67% of them falling into this category. Males made up only 12% of the same category, in contrast. However, when it came to the "Expert" competency level, men made up 28% of the population while women made up 27.78%. These findings imply that women generally exhibit better levels of tech expertise than men, with women performing especially well in the "Master" category. The dataset analysis demonstrates significant gender variations in the "Novice" performance level. In the sample, women make up about 14.81 % of the total population, while men make up about 12%. These results show people of both genders. Enrolling in certification in medical education showcases an individual's commitment to personal growth and professional development. Moreover, the level of tech-savviness reflects a dedication to refining one's skills and staying up-to-date in an ever-evolving technological landscape. (Table no 2). Among 79 participants, total enrolled and certified in medical education were 50/ 79 (63.3%) and not certified were 29/79 (36.7%). Within the group of certified faculty members, 18% (9 out of 50) were classified at the "Master" level, and 34% (17 out of 50) were classified at the "Expert" level. This indicates that a significant proportion of certified faculty members achieved higher levels of proficiency, with a larger representation at the "Expert" level compared to the "Master" level. Among the faculty members who were not certified, 10.3% (3 out of 29) were classified at the "Master" level, and 17% (5 out of 29) were classified at the "Expert" level. In summary, the results demonstrate that certified faculty members had a higher percentage of individuals at both the "Master" and "Expert" levels compared to those who were not certified. This suggests that certification in the field is associated with a greater likelihood of achieving higher levels of proficiency in teaching.

The analysis of tech-savviness across different age groups provided insightful observations. Among individuals **aged 26 to 35,** the highest frequency was observed in the "**Novice" level**, with 3 individuals (27.27%), followed by the same number of individuals (27.27%) in the "Advance Beginner" level. In the age group **of 36 to 45,** the highest frequency of tech-savviness level is observed in the **"Expert" level**, with 11 individuals, or 39.29% of the total. Moving to age group of **46 to 55,** the highest

frequency of proficiency is observed in the **"Advance Beginner"** level, with 6 individuals, or 33.33% of the total in this age group. Among those aged **56 to 65**, the highest frequency of tech-savviness is observed in the "**Proficient**" level, with 4 individuals, or 23.53% of the total in this age group. Lastly, in **the 66** and above age group, the highest frequency was observed in the "**Advance Beginner**"

Table 1: *Frequency of level of proficiency among male and female faculty members.*

		Techsavviness					Total
		No-vice	Advance beginner	Profi-cient	Expert	Master	
Gender	female	8	12	10	15	9	54
	male	3	5	7	7	3	25
Total		11	17	17	22	12	79

Table 2: *Frequency of techsavviness among certified faculty members.*

		Techsavviness					Total
		Novice	Advance Beginner	Proficient	Expert	Master	
Medical Education Certification	enrolled	3	2	2	3	1	11
	No	4	8	9	5	3	29
	yes	4	7	6	14	8	39
Total		11	17	17	22	12	79

Table 3: *Frequency to techsavviness among different age group.*

		Techsavviness					Total
		Novice	Advance beginner	Proficient	Expert	Master	
Age	26 - 35	3	3	2	2	1	11
	36 - 45	4	4	3	11	6	28
	46 - 55	1	6	6	3	2	18
	56 - 65	3	4	4	5	1	17
	66 and above	0	0	2	1	2	5
Total		11	17	17	22	12	79

level, with 2 individuals (40%).. Age group 36 to 45, highest no. of people in master level among all age group that is 6 individuals, representing 7.59% of the total. (Table no.3) (fig. no 1) In our study only 16.5% participant are satisfied with internet speed provided by IT department. 59.5% are not satisfied with internet provided by IT department and other 24% participant are not confirmed maybe they use personal internet. Only 38% are satisfied with service provision of IT department, 27.8% are not satisfied and 34.2% are not confirmed. According to study, 43% participants reported that IT department doesn't hold any it related training workshop. 36% are unaware if such activity is happening. 86% of participants stated that the IT department of the institute should organize workshops to enhance the relevant expertise of faculty members.

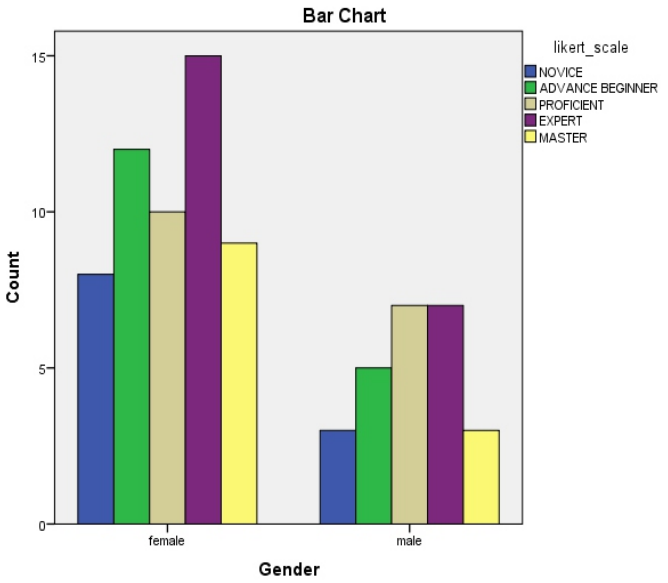

Fig-1: *Frequency to techsavviness among different age group.*

Discussion

The results of this study provide valuable insights into the faculty's readiness for online education and highlight areas where additional training and support are needed.[8] Demographic analysis revealed that a majority of the participants were female (68.4%), aligning with the gender composition of the faculty of institute. Notably, Rashid Latif Medical College Lahore had the highest representation, indicating a significant engagement in the study from this institution. The age distribution among participants showed that a considerable proportion (35.4%) fell within the 36-45-year age range. This suggests that faculty members in this age group may have had more exposure to technology during their education and professional development. On the other hand, participants with over a decade of experience were predominantly in the 55-66-year age group (32%),

indicating a potential need for additional support in adapting to the demands of online teaching and learning. This might be due to a reason that new technologies are evolving each day.[9]

Regarding certification in health professions education, approximately half of the participants (49.4%) were already certified, while 13.9% were enrolled in certification programs. This reflects a positive trend towards professional development in online teaching skills among the faculty. The certification ensures that the faculty is interested in learning about the latest teaching methods and techniques and want to get equipped with new knowledge.[10] Analysis of proficiency levels in using teaching apps provided valuable insights into the faculty's technological skills. While email, presentations (PowerPoint), and Microsoft Word were widely used and familiar among the faculty, there were variations in the familiarity and usage of more advanced apps like Google Classroom, Zoom, and other interactive platforms. A lot of new apps are being developed and launched each day and to keep up with most is next to impossible.[10]

The assessment of faculty satisfaction with IT department services serves as valuable feedback for improvement and addressing any concerns raised. This feedback enables the IT department to enhance their services and better support faculty members. Overall finding highlight that Tailored training initiatives should consider the diverse needs of faculty members based on age, experience, and certification status. Addressing these specific areas of improvement will ensure the quality and effectiveness of online education, benefiting both faculty and students alike.

Conclusion

In conclusion, this study evaluated the faculty's ability and identified areas in which local dentistry and medical schools needed to improve their online teaching capabilities. The participants' age, experience, gender, and level of certification were all varied. Although there was a wide spectrum of skill in using instructional apps, there were several areas that need further training and assistance. The outcomes highlighted the value of specialized faculty development programs to improve online teaching abilities. Additionally, it was determined that training workshops to increase competency in less well-known apps and improving IT department's services were crucial for faculty development.

Conflict of interest None

Self-funded study None

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Comparison of Antibiotic Coated Vicryl Vs Non-Coated Vicryl in Abdominal Fascial Closure After Laparotomy in Children

Muhammad Adeel Ashiq,[1] Ghulam Mustafa,[2] Mahboob Ahmad Bhutta,[3] Asim Raza,[4] Anum Asif,[5] Ali Imran[6]

Abstract

Objective: To compare the outcome of antibiotic-coated vicryl versus non-coated vicryl in abdominal fascial closure after laparotomy in children regarding surgical site infections in contaminated wounds.

Material and Method: This randomized control study (NCT06129773) was conducted for one year at The Children's Hospital and University of Child Health Sciences, Lahore. According to the operational criteria, 100 patients were included in the research and randomly divided into two groups (50 patients in each Group). All patients were assessed for surgical site infection on the 3rd, 7th, and 30th postoperative days using the Southampton wound grading system. The student's t-test and Chi-square tests were applied in SPSS version 24 to interpret the associations between different variables. A P-value of <0.05 was considered significant.

Results: Both groups have similar demographic parameters like age and weight distribution. The mean age of the children in abdominal fascial closure with antibiotic-coated vicryl was 64.09±50.14 months, while in non-coated vicryl was 64.26± 53.45 months (p-value of 0.164). There was a male predominance in the study population, with 70 % males and 30 % females. The total surgical site infection (SSI) incidence following laparotomy was 37%. Surgical site infections occurred in 22% of patients in abdominal fascial closure with antibiotic-coated vicryl and 52% in the non-coated vicryl Group (p-value: 0.002). The hospital stay in the antibiotic-coated vicryl Group was significantly shorter than non-coated group. (4.20 versus 8.24 days. P-value: 0.001).

Conclusion: The results of our study concluded that antibiotic-coated vicryl is superior to uncoated vicryl for abdominal fascial closure after laparotomy in contaminated wounds in children.

Keywords: Triclosan coated vicryl, Vicryl plus, surgical site infection, uncoated vicryl

How to cite: *Ashiq MA, Mustafa G, Bhutta MA, Raza A, Asif A, Imran A. Comparison of Antibiotic Coated Vicryl Vs Non-Coated Vicryl in Abdominal Fascial Closure After Laparotomy in Children. Esculapio - JSIMS 2023;19(04):385-389.*

DOI: https://doi.org/10.51273/esc23.25131942

Introduction

Surgical site infections continue to be the most prevalent complication following laparotomy. Despite the availability of established preventative strategies, the global incidence of SSIs is estimated to range from 3 to 20%.[1,2] According to the Centers for Disease Control and Prevention (CDC), surgical site infections occur 30 days after surgery, except for implant procedures, which require a year of follow-up before being declared infection-free. The frequency of infected wounds after laparotomy ranges between 3% and 20 %.[3] SSI is also responsible for a longer hospital stay, more intensive care unit admissions, hospital readmissions following surgery, dramatically increased expenditures, and delays in adjuvant systemic therapy.[4] To reduce surgical site infection, problems with adequate antiseptic preparations and basic measures must be addressed. Two of the most important parts of surgical site infection prevention are intraoperative tissue handling and prophylactic antibiotics.[5]

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Submission Date: 11-08-2023
1st Revision Date: 28-08-2023
Acceptance Date: 11-12-2023

Effective and persistent antisepsis of the skin, meticulous surgical technique, appropriate antibiotic prophylaxis, and the development of techniques to reduce wound contamination appear to be the most important variables in minimizing the incidence of surgical site infection.[6] Type of suture material and its effect on wound infection is a long-debated topic among surgeons. Consequently, the type of suture used to close the incision substantially affects the incidence of SSI. Suture materials have been categorized according to their monofilament and poly filament compositions. One of the main contributors of wound infections is contaminated suture material. The occurrence of foreign substances in a wound amplifies its vulnerability to infection. Researchers have been researching an antibacterial suture for many years. To prevent bacteria from adhering to the suture material in surgical incisions, a triclosan-coated polyglactin 910 sutures with antibacterial activity was manufactured. Numerous animal studies have proven the antibacterial effectiveness of triclosan-coated polyglactin 910 sutures. Ford et al. reported that postoperative infection and pain is also reduced by triclosan-coated polyglactin sutures in pediatric age group.[7] Triclosan coated sutures successfully eliminate germs associated with surgical site infections and prevent the colonization of suture material in both in vitro and in vivo trials, with one research demonstrating a 66% reduction in bacterial colonization .[8]

Material and Methods

This randomized control trial (NCT06129773) was conducted at Pediatric Surgery Department, The Children's Hospital and University of Child Health Sciences, Lahore. After approval from the ethical review committee of the hospital, all patients who were recommended surgical procedures due to pneumoperitoneum or perforated organs were included in the study. The study was carried out between 1st September 2021 to 30th August 2022. Children of both genders having ages between 0 and 15 years and with Pneumoperitoneum / perforated viscus were included in this study. Malnourished children, aged above 15 years, clean surgeries, Low Hemoglobin level were excluded from the study. Each Group will have 50 patients. Group-A patients underwent antibiotic-coated vicryl, while Group-B patients experienced non-coated vicryl in abdominal fascial closure. The outcome of antibiotic-coated vicryl versus antibiotic non-coated vicryl in closure of abdominal fascia after laparotomy in children regarding surgical site infections were evaluated. According to the Southampton wound scoring system, all patients were examined on 3rd, 7th and 30th postoperative days for surgical site infection. The data was collected and was entered in SPSS software version 24.0, and data was analyzed statistically. Quantitative variables like age, hospital stay, etc were presented as a mean and standard deviation. Qualitative variables like surgical site infection were presented as frequency and percentages. The student t-test was applied for quantitative variables, and the Chi-square test was applied to estimate the relationship between qualitative variables. P-value of < 0.05 was considered significant.

Results

In Group A, the average age of the children in abdominal fascial closure with antibiotic coated vicryl was 64.09 ± 50.14 months, while non-coated vicryl (Group B) had a mean age of 64.26± 53.45months, with a p-value of 0.164. This study has male predominance in the study population, with 70 % males and 30 % females. This pattern was also observed in both groups, with 35 males and 15 females in each Group. The p-value was 1.000, indicating that there was no significant difference between the two groups in terms of the distribution of gender. The study included facial abdominal closure after laparotomy for a variety of pediatric diseases. The most common diagnosis perforated appendix (66%), necrotizing enterocolitis (22%), traumatic perforation (5%), post reversal (3%) and Hirschsprung disease (2%). In terms of SSI after laparotomy, the overall rate was 37%. Group A had a 22% rate of surgical site infection while SSI occurred in 52 % of the cases in Group B, with a value of 0.002 as shown in Table 1. This reflects a decreased rate of SSI in group A, where the facial abdominal closure after laparotomy was done with the antibiotic-coated vicryl. Southampton score was used to assess the SSI and its severity of both groups of facial closure. Most SSIs were of 4A (16 patients) and 4B[(11)].

Table 1: *Shows surgical site infection.*

		SSI		Total	p-value
		Yes	No		
Group	Group A (Antibiotic coated vicryl)	11 22.0 %	39 78.0%	50 100.0%	
	Group B (non-coated vicryl)	26 52.0%	24 48.0%	50 100.0%	0.002
Total		37 37.0%	63 73.%	100 100.0%	

Table 2: *Shows comparison of SSI in Southampton score*

Southampton score	0	2A	3A	3B	4A	4B	5	P-value
Antibiotic coatedvicryl	39	0	1	1	3	5	1	
	78.0%	0.0%	2.0%	2.0%	6.0%	10.0%	2.0%	0.036
Non coated vicryl	23	1	3	1	13	6	3	
	46.0%	2.0%	6.0%	2.0%	26.0%	12.0%	6.0%	
Total	62	1	4	2	16	11	4	100
	62.0%	1.0%	4.0%	2.0%	16.0%	11.0%	4.0%	100.0%

When compared between the groups, the SSI was greater in Group A; only three patients had 4A compared to 13 patients in Group B. Similarly, grade 4B SSI was less in Group A (5 vs. 6). The fact that p-value of 0.036 indicated that antibiotic-coated vicryl had considerably less SSI than the non-coated vicryl. Burst abdomen (Southampton score 5) occurred in only one patient in the antibiotic coated vicryl Group compared to three burst abdomens with uncoated vicryl as shown in Table 2. Regarding postoperative hospital stay, Group A had a mean stay of 4.20± 4.11 days and Group B had a mean stay of 8.24±4.07 days, with a p-value of 0.001 indicating significant difference in the two groups in the term of postoperative hospital stay **(Table-3)**. Patients were examined and followed in the outpatient department after discharge. On the 30th postoperative day, SSI had resolved in most patients, except for one patient in the antibiotic-coated vicryl Group and two patients in the non-coated vicryl Group who had minor erythema and swelling around the wound (Southampton score 1A). These patients had Burst abdomen (Southampton score 5) which were managed successfully by closure via tension relieving sutures.

Discussion

SSI continues to be a big load for healthcare system; thus, more research is needed to develop new and novel strategies to reduce it. Our research aimed to see how efficiently antibiotic-coated vicryl prevented surgical site infection in contaminated wounds. Suture material, particularly braided stitches, serves as a nidus for several bacteria, which then form a biofilm layer over the sutures, which is resistant to the immunological response of host and is largely resistant to antibiotics. Therefore, sutures are coated with antibacterial substances like triclosan to avoid forming a biofilm on their surfaces.[9] Both groups shared similar demographic features in our study, including age and gender distribution. Contaminated wounds were only included in the study, and clean and clean contaminated wounds were excluded. The frequency of postoperative wound infections is mostly linked to the contaminated and filthy wound infection rate. We aim to analyze wound infection rates only in contaminated cases to assess SSI rates in high-risk patients with contaminated wounds and to compare SSI between antibiotic-coated vicryl to noncoated vicryl in Abdominal Fascial Closure after Laparotomy in Children. In the current study, the overall rate of SSI was 37%. The fact that only contaminated and dirty wounds were included in the study likely explains the high rate of SSI in our study. This SSI rate is consistent with the study of Luitel et al. study who reported a rate of SSI of up to 45.2 % in contaminated and dirty wounds.[10] Similarly, Naik and colleagues showed in their study that the rate of SSI in contaminated wounds was up to 13% to 20% and 40% in dirty wounds.[11] When the rate of SSI was compared between the groups in our study, we found that Group A had a 22% rate of surgical site infection, whereas Group B had a 52% rate of SSI (pvalue:0.002). This reflected a lower rate of SSI in group A when the facial and abdominal closure after laparotomy was performed with antibiotic-coated vicryl. It was noticed by Arslan et al. that the overall occurrence of SSI was 15.8% (n=28), out of which 9(10.5%) patients were from the antibiotic-coated Group (p=0.04419) whereas 19 (20.8%) patients were from the control group.[12] Rasi et al. noticed a considerably lower incidence of SSIs (4 patients; 4.3%) in the antibiotic-coated Vicryl group compared to the non-coated Vicryl group (12 patients; 13.2 percent). Therefore, they determined that antibiotic-coated sutures improve wound healing.

Table 3: *Shows a comparison in terms of hospital stay*

Group	N	Mean	STD. deviation	P-value
Antibiotic coatedvicryl (group A)	50	4.20	4.11	0.001
Non coated vicryl (group B)	50	8.24	4.07	
Total	100	8.22	4.07	

Rasi et al. noticed a considerably lower incidence of SSIs (4 patients; 4.3%) in the antibiotic-coated Vicryl group compared to the non-coated Vicryl group (12 patients; 13.2 percent). Therefore, they determined that antibiotic-coated sutures improve wound healing.[13] In contrast, in a randomized controlled trial, Baracs et al. showed no significant difference in the incidence of infection between coated and uncoated vicryl sutures.[14] In our study, we only included cases of contaminated and dirty wounds and found a significant decrease in the rate of SSI with antibiotic-coated sutures. In contaminated and dirty wounds, antibiotic-coated sutures are effective in the prevention of SSI as antibiotic-coated sutures don't allow bacteria to adhere to the suture. Nakamura et al. also found a low rate of SSI with antibiotic-coated vicryl in the closure of 51 abdominal fascia after laparotomy. They concluded that abdominal fascial closure with antibiotic-coated vicryl is not only effective in the prevention of SSI in clean and clean contaminated wounds but also in contaminated and dirty wounds as well.[15] In severe cases of surgical site infection, wound dehiscence and burst abdomen can occur (Southampton score:5). The total rate of burst abdomen in our study was 8%. One patient (2%) in the antibiotic-coated Vicryl group and three patients (6%) in the non-coated Vicryl group had a burst abdomen. These cases were reexplored, and closure with tension sutures was done. Similarly, in the study of Arslan et al., wound dehiscence was seen in a total 7.3% of patients: from which 5.5% of cases were in the study(antibiotic) group, whereas 11.6% of cases were in the control group (p=0.116)[12]. This indicates that surgical site infections relate to prolonged treatment, re-exploration, and significant morbidity. To rescue patients from serious morbidities, every effort should be taken to limit the risk of SSI by addressing every modifiable factor (suture material, etc.)[13] SSIs are a major cause of patients' prolonged hospital stays. In our study, the hospital stay was considerably shorter in the antibiotics-coated Vicryl group than in the non-coated Group. (4.20 versus 8.24 days. P value 0.001). In the antibiotic-coated Group, the shorter stay was due to the decreased surgical site infection rate. It is a well-established fact that surgical site infections not only increase morbidity and mortality of the patient but also increase the length of the hospital stay and the expense of treatment. Agrawal et al. Found shorter hospital stay in the antibiotic-coated suture group. They emphasized that it is especially important in underdeveloped countries with a very high rate of surgical site infections. He noted that although the cost of the antibiotic-coated suture is higher than the non-coated sutures, but the shorter hospital stay due to the low incidence of the SSI will ultimately make up for the cost of the suture and result in an overall lower cost for the patient treatment.[16] When the patient developed an SSI, the stitches were removed for improved wound drainage, the wound culture was sent, antibiotics were started based on the culture, and a dry-to-wet gauze dressing was applied for better wound healing. After discharge, patients were examined and followed in the outpatient department. On the 30th postoperative day, the majority of patients' wound infections had resolved, except for one patient in the antibiotic-coated Vicryl group and two patients in the non-coated Vicryl group who had minor erythema and swelling around the wound.

Conclusion

Based on our findings from this study, it is concluded that antibiotic-coated vicryl is superior to non-coated vicryl in the surgical site infection prevention. Our study also shows that antibiotic-coated stitches have a role in reducing Surgical site infections in all types of wounds, including contaminated and dirty ones. It has also been noted that antibiotic-coated sutures result in shorter hospital stays due to a lower incidence of SSI. However, additional studies should be done to define clearly the role of antibiotic-coated sutures and its indications in surgery

Conflict of Interest: *None*

Source of Funding: *None*

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Authors Contribution

MAA,: Conceptualization of Project
MAA, GA, MAB: Data Collection
MAA, GA, MAB: Literature Search
MAA, GA, MAB: Statistical Analysis
AR, AA, AI : Drafting, Revision
MAA, GA: Writing of Manuscript

Comparison of Short Term and Long Term Antibiotic Prophylaxis in Elective Lower Segment Cesarean Section

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Abstract

Objectives: To compare efficacy of short term and long term antibiotic prophylaxis in terms of wound infection in patients undergoing elective LSCS.

Methods: A comparative study was conducted in Department of obstetrics and Gynecology, Allied Hospital, Faisal Abad. Study duration was one year from January 1, 2012 to December 31 2012. A total 626 patients (313 in every group) were enrolled in the study. Group A received single dose of 3rd generation cephalosporin (cefriaxone) preoperatively as intravevous infusion 30 min before incision. Group B was given two doses ceftriaxone 12 hrly for 24hrs followed by 1st generation cephalosporin (cephradine) 500mg 8 hours by oral antibiotic therapy for 5 days. Efficacy was compared between two group using chi-square test of independence. Data analysis was done on SPSS version 10.

Results: A total of 65 out of 313(20.9%) patients showed fever/wound infection in group A and 64/343 (20.4%) patients had fever /wound infection in group B. In Group A ,37 patients began showing fever/wound infection during hospital stay and 28 patients had fever/wound infection after discharge from hospital . In Group B, 35 patients had wound infection during four days of hospital stay and 29 had wound infection after discharge.

Conclusion: The short term and long term prophylaxis were equally effective in reducing morbidity, assessed by postoperative temperature and wound infection.

Keywords: Elective LSCS, short term antibiotic, long term antibiotic

How to cite: *Afzal R, Jabeen S, Batool A, Afzal R, Sadaqat A. Comparison of Short Term and Long Term Antibiotic Prophylaxis in Elective Lower Segment Cesarean Section. Esculapio - JSIMS 2023;19(04):390-393.*

DOI: https://doi.org/10.51273/esc23.25131943

Introduction

Surgical site infections (SSI) after a cesarean section (CS) can occur in approximately 3-20% of cases. The infection rate can vary based on several factors including the cleanliness of the operating room, the health of the patient, and the effectiveness of infection control measures.[1] More than one in five (21%) pregnancies globally are now delivered via CS, according to recent data from the World Health Orga-nisation (WHO). This number is anticipated to increase over the following ten years, with caesarean delivery of nearly a third (29%) of all babies anticipated by 2030.[2] With the increasing rate of caesarian birth in most developed countries, postpartum infectious mor-bidity will become a more alarming issue. The important area of concern is that prophylactic measures must be adopted for decreasing post-partum infectious morbidity. Several strategies are employed to reduce the risk of SSI after a CS, such as pre-operative antibiotic prophylaxis, proper sterilization of surgical instruments, maintaining aseptic techniques during the procedure, and ensuring a clean and controlled surgical environment.[3] Additional measures to prevent infection include the use of sterile gloves and drapes, appropriate hand hygiene by healthcare providers, timely removal of sutures or staples, and patient education on wound care post-operatively. It is important for healthcare providers to closely monitor patients after a CS for signs of infection, such as fever, increased pain, redness, swelling,

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Submission Date: 08-09-2023
1st Revision Date: 28-09-2023
Acceptance Date: 13-12-2023

discharge from wound or malodorous lochia. Any suspected infection should be promptly evaluated and treated with appropriate antibiotics.

While efforts are made to prevent SSIs, it is crucial for healthcare providers to have proactive infection control practices in place to minimize the risk of post-operative infections after a CS. Only two studies, one from the United States and one from China, directly address the costs of antimicrobial prophylaxis in elective CS.[4,5] According to the American study, there was a 2% overall cost per CS cost reduc-tion. In contrast, the Chinese study revealed that the use of antibiotic prophylaxis increased the cost of each caesarean surgery by 12%.

This means that in order to prevent an extended hospital stay, a prophylactic antibiotic regimen should be chosen so that it both lowers the cost of CS by reducing the number of days spent in the hospital and does not outweigh the cost of antibiotic treatment.

Antibiotic prophylaxis is used in clean procedures to reduce the incidence of surgical site infection. This incidence is used as a measure of quality of care in hospitals.[6] Around 30 -90% of antibiotic prophylaxis is inappropriate because either it is given at wrong time or continued for a long period.[7]

Wound infection was defined as partial or total dehiscence or the presence of purulent discharge from the wound with localized swelling, warmth and tenderness with or without microbiological evidence. Postoperative fever was defined by temperature of greater than 38°C at least 4 h apart on two or more occasions, excluding the first 24h after caesarean section.[8]

Rationale of my study is to see the effect of short term prophylaxis vs long term prophylaxis in elective LSCS in preventing wound infection and fever. If efficacy of short term anti-biotic prophylaxis is found to be equal to long term antibiotic prophylaxis then this may help to establish a proper protocol for prophylactic antibiotic and will decrease treatment cost, hospital stay, patients' risk of drug toxicity and emergence of resistant bacterial strains.

Material and Methods

A comparative study was conducted in Department of obstetrics and Gynecology, Allied Hospital, Faisalabad. Study duration was one year from January 1, 2012 to December 31 2012. A total 626 patients (313 in every group) were enrolled in the study. Group A received single dose of 3rd generation cephalosporin (cefriaxone) preoperatively as intravevous infusion 30 min before incision. Group B was given two doses ceftriaxone 12 hrly for 24hrs followed by 1st generation cephalosporin (cephradine) 500 mg oral antibiotic therapy for 5 days. The size of sample was calculated by software formula recommended by CPSP.

Prevalence p1=2%7
Prevalence p2=9%7
Power of study=90%
Level of significance=0.01
Sample size = 626 (313 per group)

Consecutive non probability sampling technique was used in data collection. Based on inclusion criteria pregnant females admitted for elective LSCS, patients with negative hepatic viral marker screening and patients with operative time less than 45 mins were selected. Patients with systemic illness i.e anemia, diabetes, hypertension, anti HCV +ve, Patients with preterm pre-labor rupture of membranes and pre-labor rupture of membranes, obesity and corticosteroid use were excluded.

Informed consent was obtained for all newly admitted patients who met the inclusion criteria. After the college ethics committee gave its approval and after explaining the process, risks, and advantages to them, they were then chosen to be part of the research. Confounding variables were limited by following the exclusion criteria strictly.

Group A received single dose of 3rd generation cephalosporin (cefriaxone) preoperatively as intravenous infusion 30 min before incision. Group B was given two doses ceftriaxone 12 hrly for 24hrs followed by 1st generation cephalosporin (cephradine) 500mg 8 hours by oral antibiotic the-rapy for 5 days.

In post-operative period, 4hrly temperature record was kept for 4 days and wound was examined for signs of wound infection as per operational definition on daily basis till 4th post op day. Patients with no fever or wound infection were discharged after 4th post op day and followed on phone for symptoms of wound infection till 7th post op day. On 7th post op day patients were called for removal of stitches.

A questionnaire was completed for each patient containing age, date of admission, date of operation, prophylactic antibiotic given, wound condition and date of discharge.

Entry and analysis of data was done on SPSS version 10. Descriptive statistics was calculated for all variables. Mean and standard variation was calculated for quantitative variables like age. Frequency and percentage was calculated for all qualitative variables like wound

infection and chi-square test of independence was applied to compare two groups.

Results

During the study period of one year total 626 patients were included in this study (313 in each group A and B as described in methods). In group A and group B mean age was 28.91±3.7 and 28.15±4.9, respectively. (Table 1). In group A, 31.2% and group B , 35.3% were para 1-2, in group A , 53.3% and group B 51.0% were para 3-4. Para 5 or more belonged to 15.5% from group A and 13.7% from group B. A total number of 65 out of 313 (20.9%) patients showed fever/wound infection in group A and 64/313 (20.4%) patients had fever/ wound infection in group B. In Group A, 37 patients began showing fever/wound infection during hospital stay and 28patients had fever/wound infection after discharge from hospital. In Group B, 35 patients had wound infection during four days of hospital stay and 29 had wound infection after discharge.

Discussion

Cesarean birth is a common surgical procedure worldwide, with a WHO recommendation of 5-15%. Infectious morbidity, such as surgical site infection and endomyometritis, complicates 3-15% of cesarean deliveries. In 2009-2010, 23% of surgical site infections were nosocomial.[2,9]

When compared to vaginal delivery, the risk of infection after an elective CS is multiplied by ten. A large no of infectious complications can occur after caesarian birth that includes, endomyometritis, urinary tract infection, pelvic abscess, septic shock, septic pelvic thrombophlebitis, necrotizing fasciitis, and pneumonia other than wound infections. Antibiotic prophylaxis may lower endometritis by 62% and superficial wound infection by 38% following elective CS, accor-ding to a Swedish study.[13]

Table 1: *Distribution of wound infection in different age groups post elective LSCS*

Age	Group A	Group B
Less than 20 years	28(9%)	35(11.1%)
21-30 years	203(65%)	196(62.7%)
31- 40 years	48(15.2%)	51(16.3%)
More than 41 years	34(10.8)%	31(9.9%)

Table 2: *Frequency of fever/wound infection during and after discharge post elective LSCS*

Fever +Wound infection			
Admitted Patients	Group A	Group B	P-value
	37	35	>.05
Post discharge from hospital	28	29	>.05

The American College of Obstetricians and Gynecologists (ACOG) recommends that a single antibiotic dose, preferably first-generation cephalosporin, be given before the surgical incision except for cases where the woman is already receiving appropriate antibiotic treatment. In addition, a single antibiotic dose is as efficient as a number of doses and lowers the cost.[10] One of the debatable issue now a days is the choice, route and duration of prophylactic antibiotic. First-generation cephalosporins are the first choice for prophylaxis during caesarean delivery, according to the American College of Obstetricians and Gynaecologists (ACOG; 2018), the Infectious Diseases Society of America (2013), and the Canadian Society of Obstetrics and Gynaecology (2017).[11] We studied single dose of 3rd generation cephalopsporin (ceftriaxone) in group A preoperatively as intravevous infusion 30 min before incision. Group B was given two doses ceftriaxone 12 hrly for 24hrs followed by 1st generation cephalosporin (cephradine) 500 mg 8 hours by oral antibiotic therapy for 5 days. A total number of 65 out of 326 (19.9%) patients showed fever/wound infection in group A and 64/343 (19.6%) patients had fever / wound infection in group B. My result is similar to a study con-ducted by Westen. Six women (6.7%) in the intervention group (n = 89) and nine (10.3%) in the control group (n=87) had wound infections, respectively (difference 3.60; 95% CI 4.65 to 11.85); p = 0.40). Thus, it was demonstrated that in low-resource nations, a single dose of prophylactic ampicillin and metronidazole is just as effective at preventing post-csection infectious mor-bidity as a multi-day regimen. Without raising the risk of maternal infection, the reduced requirement for pro-phylactic antibiotics will result in cost savings.[12] This study in the Region Örebro County health care system demonstrates that even in situations, where postoperative infections are uncommon, antibiotic prophylaxis in elec-tive caesarean sections is cost-effective as it reduces hos-pital stay.[13] There is also no proof that using prophylactic antibiotics increases the danger of developing antibiotic resistance, hence their use in this medical setting is justified because it would result in reduced pain for the women undergoing elective caesarean sections.[14] In a similar study conducted in Department of Obstetrics and Gynaecology of the Federal Medical Centre, Keffi, Nigeria the rate of fever/wound infection in single dose antibiotic prophylaxis was 18.4% and in multiple dose

was 18.5%.[8] Another study similar to ours divided the preoperative patients of cesarean section into three groups. Group A received single dose of cefuroxime 2g, group B received cefuroxime pre operatively and for three days following cesarean and group C received antibiotics only post operatively. Group A had the shortest postoperative hospital stay and lowest hospitalisation expenditure.[15]

Conclusion

The short term and long term prophylaxis were equally effective in reducing morbidity, assessed by postoperative temperature and wound infection. So we should make recommendations regarding use of single dose antibiotic prophylaxis in order to reduce cost.

Conflict of Interest *None*
Funding Source *None*

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Authors Contribution

RA, SJ: Conceptualization of Project
RA: Data Collection
AB: Literature Search
RA: Statistical Analysis
AS: Drafting, Revision
RA: Writing of Manuscript

Gender-Based Violence in Medical Students; An Analytical Cross-Sectional Survey

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Abstract

Objective: To establish the frequency and types of violence experienced by medical students, as well as to evaluate their degree of knowledge regarding gender-based violence (GBV).

Materials and Methods: This analytical cross-sectional study was conducted from 04th June to 24th August 2023. The sample size was 208 with a 95% Confidence Interval. Data was collected from medical students in educational institutions by convenience sampling. The questionnaire consisted of sociodemographic data, and awareness of gender-based Violence. Data obtained were entered and analysed using a statistical package for social sciences (SPSS) version 21. Chi-square test was used to compare awareness of Violence and sociodemographic data. p-value ≤0.05 will be considered significant.

Results: The mean age of respondents was 22.05 years with standard deviation 1.35 years. There were 91 males and 117 females. In medical students, 207 (99.5%) were aware of gender-based violence and considered it illegal but only 113(54.3%) knew how to report it. In medical students, 120 (57.7%) were aware of cyberbullying laws. Regarding factors responsible for violence low levels of education, societal norms and lack of women empowerment were perceived to be among the top three causes. In respondents, 64(30.8%) had experienced gender-based violence. Females had 2.14 times increased chances of facing violence. (p-value 0.016).

Conclusion: Gender-based violence is a prevailing public health concern that is significantly impacting the well-being of medical students. Females are more likely to face violence. Low levels of education, societal norms and lack of women empowerment are perceived as the main factors for gender-based violence.

Keywords: Gender-based violence, medical students, awareness

How to cite: *Manzoor I, Nasir M, Tariq ZB, Younis I, Shahid SS. Gender-Based Violence in Medical Students; An Analytical Cross-Sectional Survey. Esculapio - JSIMS 2023;19(04):394-398.*

DOI: https://doi.org/10.51273/esc23.25131944

Introduction

Gender-based violence (GBV) is officially defined by the United Nations' Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) as encompassing actions that have the potential to inflict physical, sexual, or psychological harm or suffering upon women.[1] This includes various forms of oppression, as well as the subjective denial of freedom, whether experienced publicly or privately within familial or communal settings. Extensive global evidence substantiates the prevalence of gender-based violence, which encompasses acts targeting women and men alike.[2] Globally, the issue of GBV poses a significant threat to both public health and human rights. According to the World Health Organisation (WHO), 35% of women throughout the world have been victims of physical, sexual, or both types of violence over their lifetimes.[3] Nearly a third of women, or 736 million, have been victims of either type of abuse by an intimate partner at some point in their lives. The incidence of GBV ranges from 16.3% in East Asia to 65.64% in Central sub-Saharan Africa. The women of South East Asia are the most likely to be infected. This region shows a frequency of 37.7%.[3,4] In addition, according to the European Union Agency for Fundamental Rights, one in ten European women have been the victims of sexual assault,

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Submission Date: 25-08-2023
1st Revision Date: 11-10-2023
Acceptance Date: 15-12-2023

and this includes incidents that occurred before the age of 15 as well as those that occurred after the age of 15.5 Violence against women and girls may take place everywhere, including workplaces and even educational institutions. According to the findings of the research conducted by a number of different writers, gender-based violence is an ongoing problem among college students.[6] However, educational institutions do not adequately address this problem, which highlights the need to raise awareness about Gender-Based Violence (GBV) among students.[7]

Violence against women and girls continues to be a pervasive and upsetting problem that plagues countries all over the world, putting at risk the physical security, mental health, and civil liberties of untold numbers of people. Previous studies have investigated the elements that influence gender-based violence awareness, therefore revealing essential insights into this multidimensional problem. Among the prominent factors, gender, age, degree of alignment with feminist movement ideals (FWMS), and socioeconomic position emerged as key drivers, which provided insight on the differing degrees of awareness among the various groups.[8] The high incidence of GBV may be attributed to a number of variables, some of which include individuals' unwillingness to disclose occurrences of GBV, fear of social stigma, fear of consequence, and fear of revenge.

Pakistan has a total population of 241.49 million people, with men accounting for 50.4% of the population and females comprising 49.6% of the population, which is almost half of Pakistan's total population. The seventh national census was conducted in 2023.9 According to the World Economic Forum's Global Gender Gap Index for the month of December 2019, Pakistan came in at position 151 out of 153 total nations. According to the data of the Pakistan Demographic and Health Survey 2017–2018, among women aged 15 to 49 years old, 28% have been the victims of physical violence, and 6% have been the victims of sexual assault.[10]

According to the published research, students are subjected to a variety of types of gender-based violence (GBV), including but not limited to bullying, abuse, harassment, antisocial conduct, and social undermining.[8] There is a dearth of information available in Pakistan about the prevalence of gender-based violence among medical students. Medical Students, as members of the healthcare team, have an important role to play in the future in the prevention and management of Gender-Based Violence (GBV). They are expected to be ready and fully embrace the necessary shift in behaviour to deal with Gender-Based Violence concerns in their practise when they become practising physicians. The purpose of this study is to ascertain the incidence of violence encountered by medical students as well as its various manifestations. The second objective is to determine the degree to which medical students are aware of Gender-Based Violence. The knowledge that is gained will provide us insight on the extent of the problem and the variables that are contributing to it, which will allow us to take steps for the control of the problem.

Material and Method

After approval from the Institutional Review Board, this analytical cross-sectional study was conducted after taking informed consent from 04th June 2023 to 24th August 2023. The sample size was calculated to be 208 with a 95% Confidence Interval and 5% margin of error. Data was collected from undergraduate medical students in educational institutions. Performa was self-designed by a literature search.[9-11] For data quality assurance questionnaire was pretested on 25 participants. Feedback was incorporated in the final questionnaire. The questionnaire consists of sociodemographic data, Awareness of gender based Violence. 208 questionnaires were filled through convenience sampling. All questionnaires will be reviewed for completeness and consistency.

Data obtained were entered and analysed using a statistical package for social sciences (SPSS) version 21. For quantitative variables mean and standard deviations were calculated. For qualitative variables frequency and percentages were calculated. Chi-square test was used to compare awareness of Violence and sociodemographic data. p-value ≤ 0.05 was considered significant.

Results

There were 208 participants in the study. The mean age was 22.05 years SD of 1.35 years. The sociodemographic characteristics of study participants are shown in Table 1. Out of the total participants, n=208, 64 (30.8%) experienced at least one form of violence. The most common form of Violence was verbal faced by 33 (15.9%), followed by Psychological violence by 28(13.5%). Digital Harassment was faced by 15 (7.2%), Physical violence faced by 11 (5.3%) and sexual harassment faced by 9 (4.3%) of medical students. Of the 64 respondents facing violence, (30.8%), males were perpetrators of violence in 54 (84.4%) cases while females were perpetrators in 10 (15.6%) cases of violence. Regarding the age of

Table 1: *Sociodemographic Characteristics of Study Participants n=208*

Variables	Frequency (n=208)	Percentage%
Gender		
Male	91	43.7
Female	117	56.3
Educational Background		
FSc.	186	89.4
A Levels	22	10.6
Residence		
Day Scholar	106	51
Hostellite	102	49
Mother's Education		
Intermediate or below	75	36.1
Bachelors	72	34.6
Masters	61	29.3
Father's Education		
Intermediate or below	47	22.6
Bachelors	65	31.3
Masters	96	46.2

Table 2: *Awareness and Perceptions of Medical Students Regarding Gender-based Violence (n=208)*

Variable	Frequency(n)	Percentage%
Know that Gender-based Violence Illegal		
Yes	207	99.5
No	1	0.5
Have knowledge that Males can be Victims of gender based violence		
Yes	192	92.3
No	16	7.7
GBV is a public health problem in Educational Institutions		
Yes	171	82.2
No	37	17.8
GBV is a Public Health problem in Health Sector		
Yes	182	87.5
No	26	12.5
Aware of how to Intervene if I witness Violence		
Yes	141	67.8
No	67	32.2
Aware of How to Report Violence		
Yes	113	54.3
No	95	45.7
Aware of Institutional Policy regarding Violence		
Yes	120	57.7
No	88	42.3
Aware of Cyberbullying Laws		
Yes	120	57.7
No	88	42.3
Perceptions of medical students for Factors Responsible for Violence		
Low level of Education	154	74
Societal Norms	138	66.3
Lack of women empowerment	108	51.9
Social Media influence	55	26.4
Religious Beliefs	55	26.4
Economic Burden	25	12

Table 3: *Bivariate analysis between Violence faced and Sociodemographic data*

Variables	Violence Faced (n=64)	Did not face Violence (n=144)	P - value
Gender			
Male	20 (21.5%)	73 (78.5%)	0.015
Female	44 (38.3%)	71 (61.7%)	
Educational Background			
Faculty of Science FSc.	58 (31.1%)	128 (68.9%)	0.70
A Levels	06 (27.3%)	16 (72.7%)	
Residence			
Day Scholar	31 (29.2%)	75 (70.8%)	0.62
Hostellite	33 (32.4%)	69 (67.6%)	
Mother's Education			
Intermediate or below	20 (26.4%)	55 (73.3%)	
Bachelors	22 (30.5%)	50 (69.4%)	0.49
Masters	22 (36.1%)	39 (63.9%)	
Father's Education			
Intermediate or below	16 (34.0%)	31 (66.0%)	
Bachelors	24 (36.9%)	41 (63.1%)	0.23
Masters	24 (25.0%)	72 (75.0%)	

Table 4: *Regression between gender and violence faced*

	Violence Faced (n=64)	Did not face Violence (n=144)	P-value	Adjusted Odds Ratio	95% Confidence Interval
Gender					
Female	20	73	0.016	2.14	1.15 to 3.98
Male	Reference	Reference			

perpetrators; 42 (65.6%) were aged less than 30 years while 22 (34.4%) were above the age of 30 years. Out of 64 participants who faced violence, 43 (67.2%) did not take any action and pretended that it never happened, 13(20.3%) of them told their family and friends, 5(7.8%) of them took help from supervisors and higher authorities and the remaining 3(4.6%) of them filed a report against perpetrators of gender-based violence. Awareness and Perceptions regarding gender-based violence in medical students is shown in Table 2. Bivariate analysis was done to see significance between Violence faced and Sociodemographic data as shown in Table 3. Gender was found to be significant on bivariate analysis. Binary logistic regression was applied as shown in Table 4. Females have 2.14 times increased chances of facing violence. 95% Confidence Interval 1.15 to 3.98.

Discussion

In this study, the aim was to determine the frequency of violence faced, and its forms experienced and assess the awareness of the medical students regarding Gender-Based Violence (GBV). In this study, it was found that 30.8% of medical students have faced GBV. In a survey conducted in universities of Northern Nigeria, the prevalence of GBV was found to be 58.8% which may be due to the reason that this study was done in Africa.[11] However, the prevalence of GBV among the women in the European Union is 33%[6]. The rates of gender-based violence range from 81% to 71% prevalence in Sweden, Denmark, France, Netherlands and Finland, to 32% to 24% in Portugal, Poland, Romania, and Bulgaria[12,13]. There is global variation in violence faced. This may be due to varying gender gap index between and within countries. It must be taken into account that different individuals have different thresholds and sensitivity for violence which could have led to differences in considering an act as GBV or not. The most common type of violence faced was verbal. This is supported by previous studies which show that verbal violence is fairly common in institutions.[14,15] The perpetrators of violence in the majority of the cases were males (84% of the cases). This finding is similar to the previous studies.[9,13,15] Females had 2.14 times higher chances of facing violence then males. This is supported by previous studies which show that females are at higher risk of facing violence.[10,16] Moreover, during the pandemic times intimate partner violence increased.

According to the findings, 99.5% of respondents share the opinion that GBV is illegal and 92.3% believe that males can be a victim of GBV. However, only 67.8% of the respondents were aware how to intervene GBV and 54.3% knew how to report a GBV case. This shows that medical students are aware about GBV but only half of them know how to report violence if they experience it. These findings are similar to previous studies which show that there is awareness that violence is illegal but it is underreported.[17,18] The most popular causative/risk factor for GBV among the respondents was "low levels of education" 74%, followed by "societal norms" 66.3%. Hence it can be said that the educational status of the society plays an important role in the "make or break" of GBV. GBV is a prevalent issue among societies having low percentages of educated individuals.[19] Secondly, the societal norms of Pakistan and many other countries favour male dominance in households and workplaces. Educational institutes (including medical schools) are no exception to this.[20]

It is imperative that steps be taken to promote gender equality and enhance the agency of female students, particularly with regard to the prevention and resolution of conflicts involving violence.[21,22] This issue requires intervention at the community level through activities that promote awareness of GBV and its forms and advocate gender equality in society. This may be done either directly by making it a part of the educational curriculum or indirectly through the internet media. Regardless of how it is done, these activities need to take place. The study has certain limitations, such as, the survey was conducted only in one medical college. The strengths of the study are in-depth study on different variables related to gender-based violence in students. Long-term measures are required on a much larger scale to uproot this issue from the homes, educational institutions and workplaces and make these places safe for any person, no matter what gender they belong to for achieving gender equality for sustainable developmental goals.

Conclusion

Gender-based violence is a prevailing public health concern that is significantly impacting the well-being of medical students. Females are more likely to face violence. Low levels of education, societal norms and lack of women empowerment are perceived as the main factors for gender-based violence.

Source of Funding: *None*

Conflict of Interest: *None*

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Authors Contribution

MN: Conceptualization of Project
ZBT: Data Collection
SSS: Literature Search
SSS: Statistical Analysis
ZBT: Drafting, Revision
IM, IY: Writing of Manuscript

Zinc Supplementation Versus Placebo for Bronchiolitis Management in Children: A Comparative Study

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Abstract

Objective: To evaluate the efficacy of zinc supplementation compared to a placebo in augmenting standard therapy for the management of bronchiolitis in pediatric patients.

Material and Methods: In this 12-month single-blind randomized controlled trial at the at the Children's Hospital and University of Child Health Sciences 102 children (2-23 months) with acute bronchiolitis were collected through non-probability conveniently sampling technique and equally divided into case and control groups. Each group received either 1% zinc sulfate solution or placebo alongside standard therapy. Progress, monitored for up to 120 hours of hospital stay, was analyzed using SPSS v26, adhering to a 95% confidence level and a 5% margin of error.

Results: In infants with acute bronchiolitis, zinc sulfate led to faster improvements. At 24 and 48 hours, they exhibited fewer symptoms of cough and wheezing than the control group, a trend supported by statistical significance (p=0.000). Moreover, beyond 48 hours, they showed higher oxygen saturation levels and had shorter hospital stays (average 2.37 vs. 3.33 days), illustrating zinc's potential in enhancing recovery from acute bronchiolitis.

Conclusion: Recent findings suggest zinc sulfate could be a promising adjunct treatment for children with acute bronchiolitis, reducing symptom severity and hospital stay duration without adverse effects. Further research is needed to establish optimal dosage and treatment duration, particularly for critically ill pediatric populations.

Keywords: Bronchiolitis, Oxygen saturation, Pediatrics, Respiratory tract infections, Zinc sulfate.

How to cite: *Arshad AH, Rathore AW, Awan AN. Zinc Supplementation Versus Placebo for Bronchiolitis Management in Children: A Comparative Study. Esculapio - JSIMS 2023;19(04):399-403.*

DOI: https://doi.org/10.51273/esc23.25131945

Introduction

Historically, acute bronchiolitis has been a predominant agent behind hospitalizations linked to lower respiratory tract infections, particularly in infants.[1] In the USA, the annual hospitalizations due to acute bronchiolitis ranged from 50,000 to 80,000 cases, with the respiratory syncytial virus identified as the primary causative agent.[2-4] The symptomatic presentation of acute bronchiolitis tachypnea, fever, and wheezing often mirrored that of viral pneumonia, thus necessitating differential diagnostic approaches.[2,5] The therapeutic interventions traditionally employed centered on supportive care including oxygen and fluid therapy, coupled with the administration of anti-pyretics.[6,7] Despite the introduction of newer strategies such as nebulization with various agents and the use of intravenous corticosteroids, a consensus on the optimal therapeutic regimen remained elusive.[8,9] Furthermore, although antibiotics were sometimes prescribed to forestall secondary infections, the evidential basis supporting their efficacy was not robust.[2,6] Within this therapeutic landscape, researchers turned their attention to zinc supplementation, a strategy grounded on zinc's known anti-inflammatory and antioxidant capabilities.[10,11] It was understood that

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Submission Date: 18-09-2023
1st Revision Date: 08-10-2023
Acceptance Date: 10-12-2023

zinc played a crucial role in immune development and protection against infections, facilitating normal growth and tissue repair among other biological functions.[5,12] In the preceding years, studies embarked on exploring the potential benefits of zinc supplementation in the management of respiratory tract infections yielded discordant results.[7,13] While some demonstrated substantial improvements in the signs and symptoms experienced by patients receiving zinc supplementation,[6,9] others reported no significant differences compared to placebo controls.[8,14]

It was within this dichotomy of results that the current study was conceived, intending to delineate the efficacy of zinc supplementation compared to a placebo in ameliorating symptoms such as dyspnea, fever, and tachypnea in a pediatric cohort aged between 2 to 23 months grappling with acute bronchiolitis.[9,15] The study was propelled not only by the conflicting narratives presented in preceding research but also by the notable scarcity of data examining this aspect within the Pakistani population.[6,16] An underlying objective was to cast a wider net in capturing data, encompassing personal attributes such as diet, type of respiratory infection, age, gender, and birth weight to offer a nuanced perspective and a richer analytical ground.

By orchestrating this focused study, the aim was[15,17] to potentially unearth a robust therapeutic avenue that could enhance the existing treatment protocols for acute bronchiolitis in Pakistani children, facilitating a faster recovery and improving their overall health outcome.[17,18] Moreover, if validated, this research could position zinc supplementation as a pivotal adjunct therapy in the standard treatment of acute bronchiolitis, fostering a globally healthier pediatric population.

Material and Methods

This single-blind randomized controlled trial spanned a duration of twelve months and was executed at the at the Children's Hospital and University of Child Health Sciences. A total of 102 children having age group between 2 and 23 months, exhibiting clinical manifestations of acute bronchiolitis, constituted the study population[19,20]. Employing a non-probability convenient sampling technique, participants were apportioned evenly into case and control groups through random number tables, each harboring 51 participants.[21] The determination of this sample size adhered to a 95% confidence level and a 5% margin of error, as guided by the formula available at https://clincalc.com/stats/ samplesize. aspx.[22] Upon receipt of the ethical board certificate and obtaining written consents from the parents, data harvesting commenced in the pediatric medicine ward of the Children's Hospital and Institute of Child Health in Lahore. It encapsulated a meticulous documentation of demographic attributes and preceding medical narratives. Therapeutically, one faction received a 1% zinc sulfate solution (20mg/5ml) administered orally, compared to the other group which was tendered a placebo comprised of 5%-100% glucose water accentuated with oral flavoring, ensuring parity in the general attributes such as appearance, smell, color, and taste between the active and placebo interventions.[23,24]

Over the span of the hospitalization, each patient's progress was reported at a series of intervals: upon admission and then following at 24-hour increments until reaching the 120-hour mark, utilizing a prefabricated Performa to inscribe the findings.[23]

The analytical apparatus used for data assessment was the SPSS v26. The synthesis of numerical data embraced a representation through mean±SD, whereas categorical data found a voice through frequency distribution and percentage illustrations. Within this analytical framework, independent sample t-tests and chi-square tests piloted the between-group analyses, steering towards a significance delineation earmarked at a P-value ≤ 0.05.

Results

Table 1 illustrates the gender distribution among the 102 participants in a bronchiolitis study. Overall, there is a near-balanced gender representation with males constituting 52.0% and females 48.0%. In the case group of 51 participants, males were slightly more predominant at 54.9%, compared to 45.1% females. Conversely, the control group had a marginally higher female participation at 51.0%, against 49.0% males, maintaining a balanced gender distribution essential for reliable study outcomes. Table also delineates the mean and standard deviation of key attributes such as age, symptom duration, cough duration, and hemoglobin levels for the 102 participants, both overall and divided into case and control groups. The table reveals a balanced distribution across both groups, laying a solid groundwork for the comparative analysis in the study. At the 24-hour mark, a significant difference was observed in the instances of cough and wheezing between the two groups, with control groups registering higher occurrences (Cough:

Case - 25, Control - 42, p=0.000; Wheezing: Case - 25, Control - 45, p=0.000). This trend was noticeable at the 48-hour interval as well, where the control group continued to have a higher number of cases presenting with these symptoms (Cough: Control - 32, p=0.017; Wheezing: Control - 27, p=0.000). (Table-2) As time progressed, the frequency of most symptoms decreased substantially in both groups, reaching zero for several symptoms at the 72-hour, 96 hours and 120 hours. Notably, symptoms such as rhinorrhea and fever were non-existent in both groups at the 72-hour mark, indicating a substantial decline in symptom prevalence over time (Rhinorrhea: 72 hours p=1.0; Fever: 72 hours p=0.041).

Table 1: *Demographics of Participants in the Bronchiolitis Study (Overall and by Study Group)*

Attributes	Case	Control	Overall
Gender			
• Male	28 (54.9%)	25(49%)	53(52%)
• Female	23(45.1%)	26(51%)	49(48%)
Age (Months)	8.24±4.26	8.59±4.07	8.41±4.15
Duration of symptoms (days)	1.98±0.65	2.16±0.61	2.07±0.63
Duration of cough (days)	2.06±0.65	2.04±0.77	2.05±0.71
Hemoglobin level (g/dl)	11.39±0.27	11.37±0.26	11.38±0.27

Table 3: *Oxygen Saturation Levels and Hospital Stay Duration Post-Treatment*

Parameters	Study Group	Mean	Std. Deviation	P-Value
Oxygen Saturation 24 Hours After Treatment (%)	Case	95.2941	0.83172	0.286
	Control	95.4902	1.00742	
Oxygen Saturation 48 Hours After Treatment (%)	Case	96.3922	1.32783	0.005
	Control	95.7647	0.78964	
Oxygen Saturation 72 Hours After Treatment (%)	Case	96.8039	0.91694	0.000
	Control	96.1961	0.44809	
Oxygen Saturation 96 Hours After Treatment (%)	Case	97.3333	0.47610	0.000
	Control	97.0196	0.14003	
Oxygen Saturation 120 Hours After Treatment (%)	Case	97.4706	0.50410	0.003
	Control	97.1961	0.40098	
Duration of Hospital Stay (days)	Case	2.373	.5987	0.000
	Control	3.33	1.0708	

Table 2: *Clinical Manifestations Post-Treatment (24 to 120 Hours)*

Manifestations	24 hours (P-value)	48 hours (P-value)	72 hours (P-value)	96 hours (P-value)	120 hours (P-value)
Rhinorrhea	Case: 7 Control: 8 (.780)	Case: 4 Control: 2 (.400)	Case: 0 Control: 0 (1)	—	—
Cough	Case: 25 Control: 42 (.000)	Case: 20 Control: 32 (.017)	Case: 8 Control: 16 (.062)	Case: 0 Control: 2 (.153)	Case: 0 Control: 0 (1)
Fever	Case: 15 Control: 19 (.401)	Case: 8 Control: 12 (.318)	Case: 0 Control: 4 (.041)	Case: 0 Control: 0 (1)	—
Tachypnea	Case: 10 Control: 18 (.046)	Case: 7 Control: 10 (.425)	Case: 0 Control: 6 (.012)	Case: 0 Control: 0 (1)	—
Dyspnea	Case: 0 Control: 1 (.315)	Case: 0 Control: 0 (1)	—	—	—
Nasal flaring	Case: 5 Control: 8 (.373)	Case: 0 Control: 4 (.041)	Case: 0 Control: 0 (1)	—	—
Subcostal retraction	Case: 6 Control: 5 (.750)	Case: 0 Control: 3 (.079)	Case: 0 Control: 2 (.153)	—	—
Intercostal retraction	Case: 8 Control: 6 (.565)	Case: 1 Control: 4 (.169)	Case: 0 Control: 0 (1)	—	—
Cyanosis	Case: 0 Control: 0 (1)	—	—	—	—
Wheezing	Case: 25 Control: 45 (.000)	Case: 9 Control: 27 (.000)	Case: 0 Control: 17 (.000)	Case: 0 Control: 0 (1)	—
Fine crackles	Case: 4 Control: 4 (1)	Case: 3 Control: 2 (.647)	Case: 0 Control: 0 (1)	—	—

(Table-2) Initially, oxygen saturation was found comparative in both groups. However, the case group demonstrated a consistent, statistically significant improvement in oxygen levels from the 48-hour mark, and experienced shorter hospital stays (2.37 days vs. 3.33 days in the control group), showcasing the potential effectiveness of the supplementation used in the case group. (Table-3)

Discussion

This study delves into the profound impact of zinc sulfate in alleviating symptoms of acute bronchiolitis in children, revealing some striking results when compared to a placebo-controlled group. Children receiving zinc sulfate showed a remarkable recovery rate of 94.1% within just 72 hours of beginning treatment, a significant leap from the 66.67% observed in the placebo group. This wasn't the only noteworthy outcome; the average hospital stay for those treated with zinc sulfate was notably shorter, averaging 2.3 days in comparison to the placebo group's 3.33 days. This reduction in hospitalization time is a testament to the potential of zinc sulfate in enhancing the recovery process. Children treated with zinc sulfate showed considerable improvement in clinical symptoms like cough, wheezing, and tachypnea, and experienced better oxygen saturation levels. These findings are more than statistics; they represent real improvements in the health and well-being of young patients. The exploration of zinc's efficacy in treating respiratory conditions is not new domain; numerous studies have conducted studies this, yielding a spectrum of conclusions. Some studies echo our findings[11,18,25] highlighting zinc's role in not just improving clinical symptoms but also in reducing the duration of hospital stays. However, the scientific narrative is not singular. Research papers like those by authors[8,14] challenge this notion, finding no significant link between zinc supplementation and faster clinical recovery or shorter hospital stays. This dichotomy underscores the complexity and nuanced nature of medical research in understanding zinc's true impact. Current study stands out, offering compelling evidence of the benefits of zinc sulfate supplementation. By demonstrating higher recovery rates and reduced hospitalization times, it calls for more extensive research to validate these promising results. The study enriches the ongoing discourse on zinc supplementation, suggesting its potential as a valuable support in enhancing the recovery for children battling acute bronchiolitis. The hope is that future research, encompassing larger and more diverse groups of children, will shed further light on this topic, helping to paint a clearer picture of zinc's role in pediatric respiratory health.

Conclusion

This study, along with supporting literature, suggests that zinc sulphate may be an effective supplementary treatment in managing acute bronchiolitis in children. It appears to reduce the severity of the illness and shorten hospital stays, without any reported side effects. However, more research is needed to determine the best dosages and treatment lengths, particularly in severely ill pediatric patients, to maximize the therapeutic benefits of zinc sulphate in bronchiolitis management.

Conflict of Interest *None*

Funding source *None*

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Authors Contribution

AHA: Conceptualization of Project
AHA: Data Collection
AWR: Literature Search
ANA: Statistical Analysis
AWR: Drafting, Revision
ANA: Writing of Manuscript

Early Biochemical Changes in the Development of Nephropathy in Type II Diabetics

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Abstract

Objectives: To detect the early biochemical changes showing the development of diabetic nephropathy in type II diabetics and to recommend some measures to slow down these changes.

Materials and Methods: It was cross-sectional analytical study and was conducted through nonprobability convenient sampling. It comprised of 50 recently diagnosed (within 2 years) patients of type II diabetes mellitus and 50 healthy subjects. Alcoholics, pregnant ladies and individuals having serious infection or disease or having neoplasia were not included in the study. Random blood glucose, blood urea, serum creatinine, urinary albumin and urinary creatinine were estimated and albumin to creatinine ratio (ACR) mg/g was calculated.

Results: Mean values of random plasma glucose level, serum creatinine, urine albumin, urine creatinine and ACR in diabetic group when compared with those of healthy group showed significant P values (≤0.05).

Conclusion: In our setup due to a lack of regular health care type II DM is coincidently diagnosed and it is very difficult to assess the exact duration of the disease and type II diabetics develop nephropathy due to continuous high plasma glucose levels.

Keywords: Diabetes Mellitus, Nephropathy, Albumin Creatinine Ratio

How to cite: *Siddiqui RA, Akram S, Fatima E, Mustansar M. Khan HA, Liaqat S. Early Biochemical Changes in the Development of Nephropathy in Type II Diabetics. Esculapio - JSIMS 2023;19(04):404-407.*

DOI: https://doi.org/10.51273/esc23.25131946

Introduction

Type II Diabetes Mellitus is a disease of miscellaneous causes marked by hyperglycemia, due to flaws in the action or secretion of insulin, or both.[1] The sufferers of diabetes mellitus on our planet as estimated in 2017 were 451 million (age 18–99 years). These figures were expected to increase to 693 million by 2045.[2] Diabetes type II causes destruction, loss of function and failure of different organs, especially blood vessels, heart, nerves and kidneys.[3]

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Submission Date: 07-09-2023
1st Revision Date: 27-09-2023
Acceptance Date: 12-12-2023

Diabetes is said to be linked with complications of microvascular nature such as nephropathy, neuropathy and retinopathy. These complications rout to kidney damage.[4] Diabetic nephropathy (DN) is a clinical diagnosis and its presentation can have diversity in patients of type II diabetes mellitus. In the initial phase, it is marked by glomerular hyperfiltration followed by albuminuria (microalbuminuria/macroalbuminuria), hypertension, and gradual loss of glomerular filtration rate (GFR) that results to end-stage nephropathy.[5]

The rate and incidence of diabetic nephropathy are not so much clear in type II diabetes mellitus mainly due to the highly inconsistent inception age and difficulty in explaining the inception time. There are marked racial variations. In epidemiology of diabetic nephropathy the racial variations are high which can be explained partially by the differences in dietary habits, smoking, environmental factors and health care services. The danger of the development and progression of diabetic nephropathy lies mainly in poor glycemic and blood pressure control, obesity, dyslipidemia and lack of exercise.[6] The duration of T2DM and genetic susceptibility

are also important factors. The majority of individuals who develop DN are sufferers of T2DM because it accounts for 90% of diabetes worldwide.[7] Diabetic nephropathy is a major cause of end-stage kidney disease (ESKD) throughout the world and it is linked to an increase in cardiovascular (CV) risk. Diabetic nephropathy increases morbidity and mortality in people living with diabetes. Risk factors for DN are chronic hyperglycemia and high blood pressure. The renin-angiotensin-aldosterone system blockade improves glomerular function and CV risk in these patients.[8]

In diabetic nephropathy, there is a gradual loss of kidney function which occurs in the time range of months and years as per the National Kidney Foundation. Kidney diseases are defined as shown in the table below.[9]

Stages	Description	GFR (ml / Min / 1.73 m^2)
1	Renal Damage + Normal GFR	≥ 90
2	Renal Damage + Mildly Decreased GFR	60-89
3	Moderately Decreased GFR	30-59
4	Severely Decreased GFR	15-29
5	Renal Failure	< 15

In diabetes type II, high level of blood glucose accelerates the activation of Beta and Delta types of protein kinase C in the cortex of kidneys. This process activates the nuclear factor Kappa Light Chain Enhancer of activated B cells and causes interleukin II release[6] as well as release of the Tumor Necrosis Factor (TNF) Alpha by the mesangial and endothelial cells.[10] The molecular mechanisms which are involved in renal damage in diabetes describe the pathogenesis of proinflammatory molecules and mechanisms related to the development and progression of DN. The potential utility of agents has been discussed that target inflammatory-related factors or pathways, including inflammatory cytokines, oxidative stress or pro-inflammatory pathways such as Signal transducers and activator of transcription (STAT/JAK) or Nuclear Factor-kB.[11] One of the studies has highlighted the importance of one of these inflammatory processes, the 17th immune response, in the pathogenesis of diabetic renal injury. So according to current information there is involvement of Th17/IL-17A in diabetes and diabetes-induced end-organ, with special attention to the kidney.[12] Microalbuminuria is an initial symbol of diabetic nephropathy. For screening purpose assessment of microalbuminuria is performed as a routine by clinicians but the renal damage may be there without microalbuminuria. It is important to adopt different methods for early assessment of diabetic nephropathy. This may allow earlier diagnosis and treatment, which minimize diabetic nephropathy or turn down the development of diabetic nephropathy.[13]

Materials and Methods

This study was according to the Helsinki Declaration, approved by the ethics committee of the institution and was performed on the newly diagnosed patients of type II diabetes mellitus.

The study was performed in the Department of Biochemistry Sheikh Zayed Hospital Lahore and patients were taken from the Department of Medicine, Nephrology and Diabetic Clinic.

The biomarkers used for the detection of kidney disease include serum creatinine, creatinine clearance (eGFR), and microalbuminuria. In microalbuminuria, an abnormally high amount of albumin is excreted in urine falling in the range of 30-299 mg/g creatinine. To detect increased excretion of urinary proteins, the urinary albumin to creatinine ratio (ACR) in mg/g is calculated.

This was a Cross-sectional Analytical study. The study was done through nonprobability convenient sampling. The clinical examination and the lab values of the study parameters were recorded on the designed proforma. The total sampling was one hundred individuals between the age of 35-75 years comprising an equal number of males and females. Group 1 comprised of 50 healthy individuals and Group 2 having 50 patients of type II diabetes mellitus diagnosed for the last 2 years. Individuals on steroids or anti-oxidant drugs were not included in the study. Similarly alcoholics, pregnant ladies and individuals with active infection, serious disease and neoplasia were also excluded from the study. After consent 5 ml of the venous blood was drawn for biochemical analysis. A wide-mouth bottle was used for the collection of urine samples. Random plasma glucose, blood urea, serum creatinine, urinary albumin and creatinine (spot) tests were performed on all the participants. Creatinine clearance (e-GFR) was calculated from serum creatinine by using CG (Cockcroft and Gault) formula. The urinary albumin to creatinine ratio was calculated in mg/g. The tests were performed in the biochemistry lab of Sheikh Zayed Hospital Lahore on the Beckman Coulter AU 480 Auto analyzer. SPSS 24.0 was used for data entry and analysis. Simple frequencies were drawn. The biochemical parameter of group 1 and 2 were compared and p-values < 0.05 were considered as significant. The P value was calculated by 2 Tail T Test.

Results

Table No: 1& 2 show the distribution of subjects according to gender and age in the present study. The biochemical tests for random blood glucose, blood urea, serum creatinine, urinary albumin and creatinine were conducted on healthy subjects and patients having diabetes mellitus type II for about 2 years. The results of these 2 groups were compared with each other. The results of these groups are shown in the table. Group 1 – Healthy Subjects Group 2 – Type II Diabetes Mellitus with Nephropathy. In Groups 1 and 2, the P values for age, blood urea and eGFR were non-significant. However the P values for random blood glucose level, S/creatinine and urine albumin creatinine ratio were significant. The parameters serum creatinine, urine albumin, urine creatinine and albumin creatinine ratio indicate early diabetic nephropathy.

Table 1: *Group 1: Age & sex distribution in Healthy Subjects*

Age in years	Males N=25		Females N=25	
	No	%	No	%
40-45	8	32	9	36
46-50	1	4	5	20
51-55	5	20	3	12
56-60	6	24	3	12
61and above	5	20	5	20

Table 2: *Group 2: Age & sex distribution in type II diabetics*

Age in years	Males N=25		Females N=25	
	No	%	No	%
40-45	7	28	13	52
46-50	6	24	6	24
51-55	5	20	1	4
56-60	5	20	2	8
61and above	2	8	3	12

Table 3: *Comparison of Statistics of Group 1 and 2.*

	Group 1 (n= 50)	Group 2 (n= 50)		
Variable	Mean±SD	Mean±SD	P-Value	Significant
Age (Years)	49.6 ± 7.7	51.5±10.9	0.316	NS
Random Plasma Glucose (mg/dl)	118.4±8.5	253 ± 24.3	0.001	S
Blood Urea (mg/dl)	26.7±4.9	26.8 ± 5.3	0.822	NS
Serum Creatinine (mg/dl)	0.87±0.15	0.89±0.15	0.001	S
Urine Albumin (mg/dl)	1 ± 0.0	1.14±0.35	0.001	S
Urine Creatinine (mg/dl)	104.5±11.2	90.6±26.9	0.001	S
Albumin Creatinine ratio (mg/g)	9.7 ± 1.1	13.7 ± 5.1	0.001	S
e GFR	116 ± 18.2	77.7±17.1	0.275	NS

Discussion

This study was performed on 50 type II diabetics diagnosed within 2 years duration. A control sample of 50 healthy subjects was selected for comparison. Both male and female individuals in the age group of 35-75 years were included. There was no significant difference in age between the two groups as shown in the Table. The duration of DM in patients with diabetic nephropathy was 2 years. This criterion has got a likeness with the study conducted by Selvi V S et al (2015).[14] The random plasma glucose level in group 2 was determined to be significantly higher than that of group 1 (healthy controls) (p-value < 0.001) (Table). It shows that, usually, there is poor glycemic control in complicated cases of DM. Kashinakunti SV (2016) and Raghavani PH, Sirajwala H (2014) observed much the same results in their studies.[15,16] The median level of blood urea in group 1 (healthy controls) was found to be nonsignificant than that of group 2. The median level of serum creatinine in groups 1 and 2 showed a significant difference (P value 0.001). These differences have also been reported by Oluba OM and Festuso.[17] The median urine albumin level in groups 1 and 2 showed a significant difference (P value 0.04). Similarly, the mean values for urine creatinine and albumin creatinine ratio were also significantly different. Tarig Karar et al[18] also described that early markers of diabetic nephropathy are microalbuminuria and urinary albumin creatinine ratio. Microalbuminuria is taken as the gold standard for the diagnosis of diabetic nephropathy. However, it cannot catch almost half of the patients of early diabetic nephropathy.[19] The estimated Glomerular Filtration Rate (eGFR) in the present study was non-significant (P value 0.275) as compared to the healthy group. According to Kidney Disease Improving the Global Outcome Work Group (KDIGO) guidelines, the patients who have albuminuria but normal eGFR are in stages I & II and those who have albuminuria and low eGFR are in stages III, IV & V of kidney disease.[20]

Conclusion

In our setup, due to lack of regular health monitoring patients of type II DM are accidentally diagnosed and it is very difficult to determine the exact duration of the disease. Type II diabetics develop nephropathy due to persistent high plasma glucose levels. Regular monitoring and maintenance of the aforesaid parameters and healthy changes in lifestyle can delay nephropathy.

Conflict of interest: *None*
Funding source: *None*

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Authors Contribution

RAS: Conceptualization of Project
HAK: Data Collection
SA: Literature Search
SL: Statistical Analysis
EF: Drafting, Revision
MM: Writing of Manuscript

Comparison of Serum Hepcidin Levels Between Anaemic and Non-anaemic Obese Young Adults

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Abstract

Objective: To compare the levels of serum hepcidin between anaemic and non-anaemic obese adults aged between 18 and 40 years.

Material and Methods: The comparative cross-sectional study was conducted at Department of Physiology, King Edward Medical University, Lahore during July 2017 to June 2018. A sample size of 82 subjects (41 in each group) was calculated. After approval from the ethical review committee and taking informed consent, 82 volunteers fulfilling the criteria were recruited in this comparative cross-sectional study. Personal biodata and anthropometric measurements were recorded. Haemoglobin and hepcidin levels were estimated. Based on presence of anaemia, volunteers were divided into 2 groups of 41 participants each: anaemic obese and non-anaemic obese. Comparison of these two groups and statistical analysis of the data was done using SPSS (Version 23).

Results: On comparison of anaemic obese and non-anaemic obese groups, no significant difference was found in hepcidin levels between two groups. On comparison of serum hepcidin levels with respect to grades of obesity, hepcidin levels were found significantly high in anaemic obese group as compared to non-anaemic obese group at BMI greater than 40. On comparison of serum hepcidin levels between two groups with respect to gender, anaemic obese females have low hepcidin levels than non-anaemic obese females while anaemic obese males have higher hepcidin levels than non-anaemic obese males.

Conclusion: At higher BMIs, presence of higher hepcidin levels in anaemic obese group shows its probable role in development of anaemia in the presence of morbid obesity but no such correlation could be established at lower BMIs. Moreover, presence of low levels of hepcidin in anaemic obese females hints towards the nutritional cause of anaemia in anaemic obese females rather than inflammation and hepcidin.

Keywords: Obesity, Anaemia, Hepcidin, Haemoglobin, Iron Deficiency

How to cite: *Bilal A, Naseem R, Shafiq A, Imaan N, Tahira S, Jawed S. Comparison of Serum Hepcidin Levels Between Anaemic and Non-anaemic Obese Young Adults. Esculapio -JSIMS 2023;19(04):408-413.*

DOI: https://doi.org/10.51273/esc23.25131947

Introduction

Anaemia is a sign of underlying deficiency or disease and is characterized by decreased red blood cells (RBCs) count or haemoglobin (Hb) level. It leads to insufficient supply of oxygen required to meet the physiological needs of the body. A careful estimate shows that approximately 2 billion people of the world are affected by anaemia.[1] Among various underlying deficiencies and diseases, the deficiency of iron (Fe) is the most prevalent cause of anaemia throughout the globe.[2] The proportion of iron deficiency may vary in different areas and between different population groups. Total body iron is reduced in case of absolute iron deficiency; and insufficient iron is available for the intended use in functional iron deficiency. Iron deficiency anaemia (IDA) results from decreased availability of iron needed

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Submission Date: 15-10-2023
1st Revision Date: 05-11-2023
Acceptance Date: 15-12-2023

for erythropoiesis. The underlying reasons for IDA include poor dietary intake of iron, decreased iron absorption, and increased blood loss.[3]

Many medical conditions such as obesity, diabetes mellitus (DM), cancer, heart failure, lung disease, acquired immunodeficiency syndrome (AIDS), rheumatoid arthritis (RA), inflammatory bowel disease (IBD) and severe trauma are known to cause inflammation and thus anaemia of inflammation (AI). AI is the second most common type of anaemia. The etiology of AI has been associated with hepcidin induced changes in the metabolism of Fe; and these alterations lead to decreased absorption of Fe in the gastrointestinal (GI) tract, and trapping of Fe in the macrophages.[4] The hepcidin, Ferroportin (FPN), and interleukin-6 (IL-6) interact to cause Fe sequestration in the environment of inflammation.[5]

There is a close connection between iron metabolism disorders and being overweight or obese. The obese subjects present higher rates of iron-restricted erythropoiesis, elevated levels of plasma pro-inflammatory cytokines and acute phase reactants that can result in anaemia.[6] Obesity stimulates leptin which in turn affects hepcidin in a manner that ultimately downregulates absorption of Fe and results in ID in obese adults.[7]

Hepcidin is a hormone that controls the metabolism of Fe. The hepcidin antimicrobial peptide (HAMP) gene located on long arm of human chromosome number 19 encodes a pre-hepcidin molecule of 84 amino acid residues. This molecule goes through proteolytic cleavage and gives a biologically inactive pro-hepcidin molecule of 60 amino acid residues. Subsequently, it is cleaved by the enzyme and results in a biologically active hepcidin molecule of 25 amino acid residues.[8] It is released from hepatocytes, adipocytes, cardiomyocytes, pancreatic beta cells, macrophages, and kidney in response to inflammation or iron overload, whereas anaemia and hypoxia significantly suppress its expression. It is a regulatory peptide hormone for the homeostasis of iron in the body. It regulates Fe absorption from intestine, and release from iron storage sites. The hepcidin binds with Ferroportin-1 on macrophages' surface and causes its internalization and degradation. This inhibits Fe absorption from duodenal enterocytes; release from hepatocytes and macrophages; and results in functional ID in the body.[8]

Hepcidin has a potential role in different types of anaemia especially in AI where its concentration increases up to 100-fold. It has been described in relation to different disorders of iron metabolism particularly haemochromatosis and anaemia of chronic disease (ACD).[10] The cytokines such as IL-6 and IL-1β, and the transcription factors such as the Stat^3, C/EBPα, and p53 bring about the effects of inflammation on growing RBCs. IL-6 enhances the signaling of JAK/Stat that promotes phosphorylation of Stat^3 and binding with promoter of hepcidin. IL-1β induces hepcidin expression via the BMP/SMAD and C/EBPα signaling pathways. The damage of hepatocytes by endoplasmic reticulum stress or oxidation enhances C/EBPα or activity of Stat^3 and leads to increased expression of hepcidin.[11] The over expression of hepcidin in overweight and obese individuals is associated with subclinical inflammation that can reduce absorption and fortification effects of iron. Therefore, a combination of nutritional and functional ID results in a low iron status in overweight individuals. Billions of people throughout the world suffer from obesity and anaemia as a direct consequence of overnutrition and undernutrition respectively. Hepcidin is the link between both contrasting poles. Many studies have hypothesized that obesity poses a greater risk of ID in all age groups of both genders. In overweight and obese subjects, the higher prevalence of ID has been associated with intake of unhealthy/iron deficient diet, and increased demand of iron due to higher body mass index (BMI) and larger blood volume.[12] The discovery of existence of chronic and low-grade inflammatory state in obesity has shifted the paradigm about possible mechanisms of ID in obese subjects.[13]

Several studies have estimated serum hepcidin level, compared between obese and non-obese population; and proposed that elevated levels of serum hepcidin are responsible for higher prevalence of ID in obese.[14] Moreover, the weight loss associated with decline in serum hepcidin level leads to significant improvement in Hb levels.[15] But it is still controversial if elevated levels of serum hepcidin are also associated with anaemia in obese people as in patients with other chronic disorders. In view of this evidence, the current study was specifically designed to compare the serum hepcidin levels between anaemic and non-anaemic obese young adults of Lahore, Pakistan.

Materials and Methods

The comparative cross-sectional study was conducted at Department of Physiology, King Edward Medical University, Lahore. during July 2017 to June 2018. A sample size of 82 subjects (41 in each group) was

calculated. The patients were enrolled in the study by using non-probability purposive sampling technique. The present study involved human subjects; therefore, ethical clearance of the study was received from Ethics Review Committee of King Edward Medical University (KEMU), Lahore via letter No. 274/RC/ KEMU dated April 04, 2017. After briefing the partici-pants about aims and benefits of the study and obtaining informed consent, subjects with BMI ≥ 30 kg/m^2 and age between 18 and 40 years were recruited in the study. The participants with a history of acute or chronic infection, malignancy, major surgery within previous month, iron supplementation and active pregnancy were excluded[16]. The included subjects were interviewed, and personal biodata and demographic data such as age, sex were collected on case report proforma. The height (in centimeters) in standing position was measured by using a wall fixed stadiometer; and the body weight (in kilograms) wearing light indoor clothing and without shoes was measured by using a beam balance. BMI was calculated using the formula as follows:

$$\text{BMI} = \frac{\text{Weight (in kg)}}{\text{Height (in meters)}^2}$$

10mL venous blood was drawn from any prominent vein on the forearm or dorsum of hand under aseptic measures. Then, the blood specimen was poured into two different pre-labeled vials. The vial with clot activator was allowed for coagulation at 22-26ºC (room temperature) for 60 minutes. Then, for the separation of serum, the clotted blood was centrifuged at 5000 RPM for 10 minutes; and poured into an Eppendorf tube for subsequent estimation of hepcidin. Hb was estimated using Sysmex KX-21 automated hematology analyzer. After estimation of haemoglobin levels, the participants were subsequently divided into two distinct groups, each consisting of 41 participants, based on their haemoglobin levels: a group of anaemic obese young adults (case group) and a group of non-anaemic obese young adults (control group). The male subjects with haemoglobin levels less than 13.0 g/dL and female subjects with haemoglobin levels less than 12.0 g/dL were included in the group of anaemic obese young adults. The male subjects with haemoglobin levels more than 13.0 g/dL and female subjects with haemoglobin levels more than 12.0 g/dL were included in the group of non-anaemic obese young adults. The serum levels of human hepcidin were determined using solid phase enzyme linked immunosorbent assay (ELISA) method. SPSS (Statistical Package for Social Sciences) Version 23 was used for statistical analysis of the data. The numerical variables were presented as mean ± standard deviation; and the categorical variables as frequency (percentage). The comparison between groups i.e., anaemic obese and non-anaemic obese was performed by using chi square test or Man Whitney U test. The p-value less than or equal to 0.05 was considered statistically significant.

Results:

The study included 82 obese individuals, distributed into two groups based on Hb level. Group 1 contained 41 anaemic obese subjects and Group II contained 41 non-anaemic obese subjects. There were 19 (46.3%) males among anaemic while 27 (65.9%) males in non-anaemic group. The difference for gender distribution was not significant between anaemic and non-anaemic groups (p-value 0.119). The mean age for the anaemic group was 21.85±3.64 years and median age was 21 years. The mean age for the non-anaemic group was 22.34±4.17 years and median age was 22 years. The difference for mean and median age was not significant between anaemic and non-anaemic groups (p-value 0.586).

As the two groups were selected from a pool of obese people, the mean BMI was above 30.0 kg/m^2 in both groups. The median BMI for anaemic group was 31.7 (30.5 – 34.0) and that for non-anaemic group was 32.0 (30.8 – 34.0). Again, the difference for mean BMI was not significant between anaemic and non-anaemic groups (p-value 0.463).

The obese people were distributed into two comparison groups based on anaemia. The anaemic group had an average hemoglobin level of 11.86±0.77 g/dl, and that for the non-anaemic group was 15.56±0.83 g/dl. Both groups had male and female population with different criteria. Still the difference for mean Hb was highly significant between anaemic and non-anaemic groups as it should have been (p-value<0.001).

The main parameter under comparison was the serum hepcidin levels between anaemic obese and non-anaemic obese subjects. Here, the hepcidin levels were skewed in both groups and the non-anaemic group had two extremely high values, but lower median level as compared to anaemic group. The mean level in anaemic group was 8.54±4.78 ng/mL and the median level was 9.02(4.33 – 10.43) ng/mL and in non-anaemic group the mean level was 9.31±6.17 and median level was 7.19 (4.38 – 12.28) ng/mL. However, the difference was insignificant between anaemic and non-anaemic

obese groups with p-value 0.809. (Table 1, Figure 1)

After all these comparisons, serum hepcidin was explored between two groups by gender and obesity grades.

Table 1: *Distribution of serum hepcidin levels and its comparison between anaemic and non-anaemic obese groups*

Serum Hepcidin (in ng/mL)	Group	
	Anaemic	Non-Anaemic
Mean	8.54	9.31
Standard Deviation	4.78	6.17
25th Percentile	4.33	4.38
Median	9.02	7.19
75th Percentile	10.43	12.28
Man Whitney U = 814.5, Z = 0.241 , P-value = 0.809		

It was observed that in non-anaemic group the hepcidin level in females was relatively higher than their counterparts in anaemic group and for males it was in reverse order. When compared with respect to obesity grades, it was clear that the subjects with grade-III obesity (BMI more than 40kg/m^2), the anaemic group had higher hepcidin levels as compared to counterparts in non-anaemic group. For subjects with grade-II obesity (BMI more than 35kg/m^2 and less than 40kg/m^2), the non-anaemic group had relatively high hepcidin level as compared to anaemic group. However, no difference was seen between anaemic and non-anaemic subjects with grade-I obesity (BMI more than 30kg/m^2 and less than 35kg/m^2). (Figure 1)

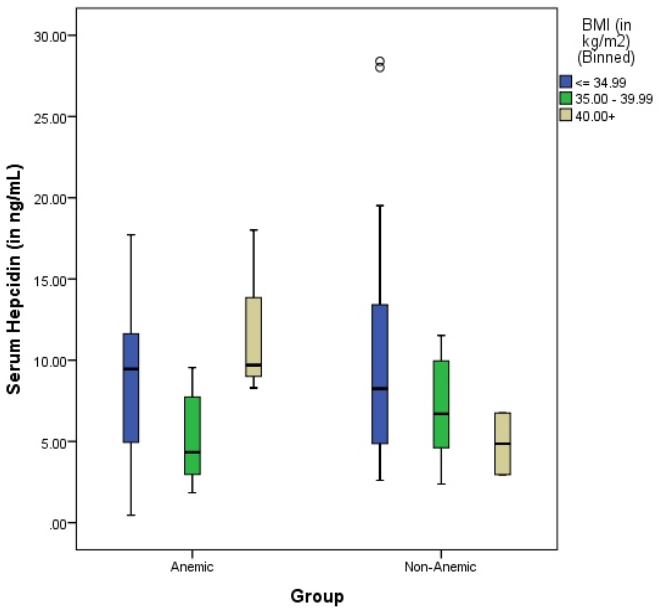
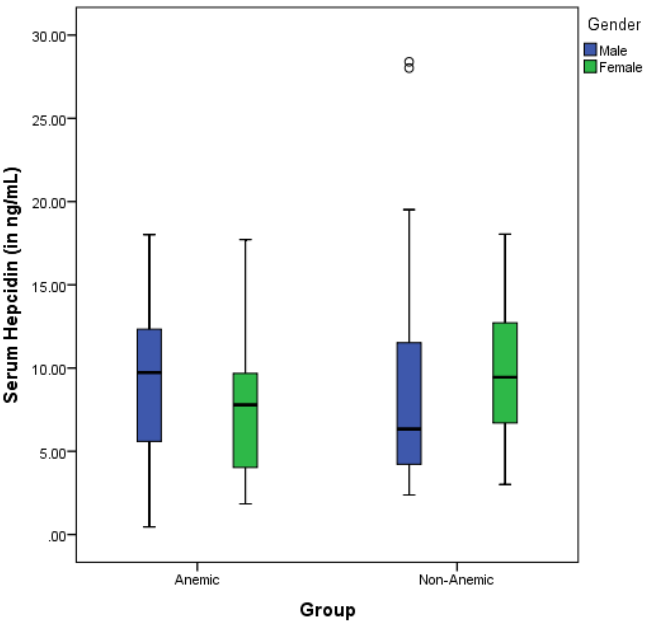


Fig-1: *Hepcidin level comparison between anaemic and non-anaemic with reference to gender and obesity status*



Then correlation analysis was carried out to see which of the variables were associated with hepcidin level irrespective of groups. It was observed that the age had a weak and negative correlation with p-value 0.079. BMI had a significant and negative correlation with a p-value 0.003. All other variables had no significant association with hepcidin (Table 2).

Finally, a multiple linear regression analysis was carried out to see the effect of various variables on hepcidin. The backward method removed age, gender and hemoglobin from analysis and left BMI as significant contributor towards hepcidin level with p-values 0.021. It was determined that with one unit increase in BMI, the average hepcidin level is supposed to decrease by 0.41 ng/mL keeping other factors constant.

Table 2: *Correlation analysis presenting association of various variables with hepcidin levels.*

Variable in relation	Serum hepcidin (in ng/mL)	p-value
Age (in years)	-0.195	0.079
BMI (in kg/m^2)	-0.324**	0.003
Hb (in g/dL)	0.028	0.802

Discussion

Anaemia has shown significant effects on both quality and length of patient's life; therefore, it is necessary to know the underlying causes and treat accordingly. There are various nutritional deficiencies and medical condi-

tions that may lead to the occurrence of different types of anaemia. The deficiency of Fe is the commonest reason for iron deficiency anaemia, but many studies also suggest a possible connection between obesity and iron deficiency anaemia and hepcidin is hypothesized to be one of the missing links in this connection. Inflammatory stimulation[4] increases the production of hepcidin but its production decreases in severe iron deficiency, even in the environment of inflammation, to ensure maximum absorption of iron.[17] Thus, the estimation of serum hepcidin is an important tool to differentiate between iron deficiency and anaemia of chronic disease; and to know about the response ability to oral administration of iron. In view of the literature, the current study was designed to compare the levels of serum hepcidin in anaemic obese subjects versus non-anaemic obese subjects. A total of 82 obese adults of both sexes having BMI $\geq 30 kg/m^2$ were included in the study. All participants were subjected to the measurements of anthropometric parameters, haemoglobin levels and serum hepcidin levels. Nazif et al. reported higher levels of hepcidin in obese adolescents than of non-obese adolescents. Serum hepcidin level showed positive correlation with BMI; and negative correlation with serum iron levels in obese group. It had been concluded that hepcidin was a significant modulator of anaemia in obese adolescents.[18] Similarly, Sanad et al. reported higher serum hepcidin in anaemic obese children; and lower in anaemic non-obese children than of control group. It had been concluded that obesity had increased the levels of serum hepcidin; and was associated with diminished response to iron treatment in children with iron deficiency anaemia.[19] Opposite to this evidence, Przybyszewska et al. reported higher hepcidin levels in non-anaemic obese than of anaemic obese and non-obese control group. Moreover, serum hepcidin revealed positive correlation with body fat in both anaemic and non-anaemic obese individuals.[20] Similarly, Vyas et al. reported that the level of serum hepcidin was significantly lower in anaemic group than of control group; and concluded that serum hepcidin can be used as a diagnostic marker for anaemia[21] In the present study, hepcidin levels were not different between anaemic and non-anaemic obese groups and serum hepcidin showed negative correlation with BMI.

Conclusion

This study was designed to compare the levels of serum hepcidin between anaemic obese and non-anaemic obese young adults to establish a correlation between serum hepcidin levels and anaemia in obesity, but no such correlation was found. However, in the presence of morbid obesity (BMI greater than $40 kg/m^2$), hepcidin levels were found elevated in anaemic obese subjects. From this observation, it can be concluded that the role of hepcidin in the development of anaemia in obesity is present only in morbid obesity, most probably because of the presence of an underlying systemic inflammation. One of the striking conclusions that can be drawn from the results of this study is related to different mechanisms of anaemia in obesity in different genders. Male anaemic obese subjects contain relatively higher hepcidin levels as compared to male non-anaemic obese subjects while in females, hepcidin levels were found relatively lower in anaemic obese subjects as compared to non-anaemic obese subjects. This observation points towards the conclusion that mechanism of anaemia of obesity in female population has a more of nutritional basis than inflammation.

Conflict of Interest *None*

Funding Source *None*

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To Assess the Correlation Between Neutrophil to Lymphocyte Ratio with hS-CRP as Inflammatory Marker in Patients with Chronic Kidney Disease

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Abstract

Objective: To assess the correlation between neutrophil-to-lymphocyte ratio with hs-CRP as an inflammatory marker in patients with chronic kidney disease

Material and Methods: This Study was Cross-sectional study and conducted in the Department of Medical Unit-4 Services Hospital, Lahore. Duration of this study was 6 months after Synopsis approval. 115 patients with CKD (by operational definition) with peripheral edema were included in the study. A blood sample was then collected using a 5cc BD syringe under aseptic conditions. All samples were stored in a vial containing Ringer's solution. Then all samples were sent to the hospital laboratory for hs-CRP and NLR assessment. Reports were assessed and hs-CRP and NLR

Result: In this study, the correlation coefficient showed a weak positive correlation between hs-CRP and NLR. i.e. r= 0.399, p-value=0.000. Stratification for age, sex, BMI and duration of CKD showed a significant positive correlation between NLR and hs-CRP.

Conclusion: Moderately positive correlation between NLR and hs-CRP. Both markers have the potential to exclude persistent subclinical problems and may also perform risk stratification for CKD patients.

Keywords: Neutrophil to lymphocyte ratio, hs-CRP Chronic kidney disease.

How to cite: *Abid MA, Farooq H, Qibtia M, Farooq H, Mehmood T, Khizar K. Esculapio - JSIMS 2023;19(04):414-418.*

DOI: https://doi.org/10.51273/esc23.25131948

Introduction

Chronic kidney disease (CKD) is a long-term kidney disease; therefore, it differs from acute kidney disease in that the reduction in kidney function must be present for more than 3 months. CKD is an internationally recognized public health problem affecting 5-10% of the world's population.[1] Guidelines define CKD as kidney damage or a reduced glomerular filtration rate (GFR) of less than 60mL/min/1.73m^2 for at least 3 months.[2] Chronic inflammation is a common comorbid condition in CKD and especially in dialysis patients. A number of interventions have been shown to be safe and effective in well-designed clinical trials.[3] Although a number of markers have been established to measure systemic inflammation, additional markers are still required. Recently, the N/L neutrophil to lymphocyte count ratio has been investigated as a new measure of inflammation in various populations and has been shown to have prognostic and predictive values, particularly in patients with systemic inflammation.[4-5] In various cancer patients, the N/L ratio has been found to be a cost-effective biomarker for risk stratification of recurrence and mortality.[4] In cardiovascular studies, it has also been found to be a predictor of mortality in various patient groups, such as myocardial infarction and heart failure.[5] There are several studies on the N/L ratio and its relationship to other inflammatory markers in CKD patients.[6-7] One study showed that the correlation value was positive but very weak, i.e. r=0.264, p=0.002.8. Another study also showed a slightly higher positive correlation value, but also very weak, i.e. r=0.333, p= 0.01.9 The rationale for this study is to assess the correlation between NLR and hs-CRP as an inflammatory marker in CKD patients. NLR is a good indicator of the inflammatory markers,

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Submission Date: 07-09-2023
1st Revision Date: 02-10-2023
Acceptance Date: 07-12-2023

i.e. hs-CRP. However, the literature has shown that there is a very weak correlation between NLR and hs-CRP. However, if there is a strong relationship, it will be a useful surrogate for hs-CRP to detect inflammation in CKD patients. Determination of NLR is a relatively inexpensive and time-efficient method of assessing inflammation. However, there is no local evidence in this regard. So we want to do this study so that we can achieve a local data and we can plan to screen CKD patients for inflammation to prevent the consequences of inflammation, especially to prevent cardiovascular events. Cardiovascular disease is a leading cause of morbidity, disability, and hospitalization, particularly among older adults.[24] Previous reports have emphasized that inflammation plays a key role in the development and progression of atherosclerosis.[8-9] Inflammatory cells actually contribute to the initiation and disruption of atherosclerotic lesions, which subsequently lead to acute coronary syndrome and other cardiovascular events due to instability or rupture of the atherosclerotic plaque.[10,11] Carotid intima-media thickness, a well-established marker of subclinical atherosclerosis, is a risk factor for cardiovascular disease and can be used to predict cardiovascular events.[12] To date, NLR provides information on the inflammatory state including the effects of neutrophil elevation, secondary to acute inflammation, along with lymphocyte depletion, secondary to stress-induced lymphocyte redistribution to lymphoid organs, as well as lymphocyte apoptosis.[15]

Material and Methods

A cross-sectional study was conducted in the Department of Medical Unit-4 Services Hospital, Lahore. Six months after the approval of Synopsis. A sample size of 115 patients is calculated with 5% type I error, 10% type II error and the expected value of the correlation coefficient is taken, i.e. r=0.333 between NLR and hs-CRP in CKD patients.[9] Non-probably consecutive sampling. Patients aged 16-70 years of any gender with CKD (by operational definition) with peripheral edema. Patients with active infection or inflammation (ESR>20 mm/H), atherosclerotic vascular disease, hepatitis B and C (scientific report) Impaired hepatic feature (AST>40IU, ALT>40IU), autoimmune diseases, contemporary malignancy or records of malignancy (medical report) Sufferers with diabetes mellitus (BSR>186mg/dl) Patients underwent hemodialysis (scientific document) a total of one hundred fifteen patients according to inclusion criteria were enrolled from medical OPD of Services Hospital Lahore. Knowledgeable consent turned into received. Demographic statistics (inclusive of name, age, gender, duration of CKD) was recorded. Then blood samples were drawn with the aid of 5cc BD syringe under aseptic conditions. All samples have been stored in a vial containing ringer's lactate solution. Then all samples were dispatched to the laboratory of the health center for assessment of hs-CRP and NLR. Reviews have been assessed and ranges of hs-CRP and NLR was noted (as in line with operational definition), all the statistics were ollected on a in particular designed Performa. All the collected data was entered and analyzed into SPSS version 21. Quantitative variables like age, duration of CKD, BMI, hs-CRP and NLR were presented as SD. Qualitative variables like gender become offered as frequency and percent. Pearson's correlation coefficient turned into calculated between hs-CRP and NLR. P value ≤ 0.05 turned into taken as variable. Statistics changed into stratified for age, gender, duration of CKD and BMI to manipulate impact modifiers. Submit-stratification, Pearson's correlation coefficient changed into calculated between hs-CRP and NLR for each stratum. P-value less than or equal to 0.05 was taken as vast.

Results

Suggested average age of patients was 45.70±13 (62 years). Minimum and maximum age of patients changed into 20 and 70 years respectively. Amongst sufferers 67(58.3%) were male and 48(41.7%) were girl. BMI of 32(27.8%) was ordinary, 42(36.5%) sufferers were previously obese and 41(35.7%) patients were currently obese. Imply period of CKD became 9.30±1.77. Imply cost for NLR become 2.12±0.35. Minimal and maximum NLR turned into 1.70 and 3.20 respectively **(Table-1)**. Mean value for hs-CRP become 1.92 ±0.50. Minimum and maximum hs-CRP became 1.30 and 3.20 respectively **(Table-2)**. Correlation coefficient shows considerable low positive correlation between NLR and hs. CRP level. i.e. r=0.399, p-value= 0.001 In all age companies besides patients inside the age organization 31-40 years had confirmed fantastic correlation among NLR and hs-CRP. Furthers details can be visible in. Among male and female patient's widespread linear correlation become visible among NLR and hs-CRP stages. i.e. r(Male)= 0.367, p-value=0.002 & r= 0.433, p-value =0.002. Patients with regular BMI had positive slight correlation between NLR and hs-CRP, previously obese and currently obese patients had advantageous low correlation among NLR and hs-CRP sufferers.

Patients with CKD period 7-9 months for them correlation between NLR and hsCRP became slight and for sufferers whose length of CKD turned into 10-12 months amongst them correlation among NLR and hs-CRP became moderate. i.e. r (7-9 Months)=0.366, p.value= 0.003 & r (10-12 months) =0.450, p-vlaue=0.001. Correlation Coefficient (r)=0.399, p-value=0.0007: Correlation between NLR & hs-CRP stratified for age of patients.**(Table-3)**.

Table 1: *Descriptive statistics for NLR*

N	**115**
Mean	2.12
SD	0.35
Min	1.70
Max	3.20

Table 2: *Descriptive statistics for hs-CRP*

N	**115**
Mean	1.92
SD	0.50
Min	1.30
Max	3.20

Table 3: *Correlation between NLR and hs-CRP stratified for age*

		NLR			
		20-30 Years	**31-40 Years**	**41-50 Years**	**>50 Years**
hs-CRP	r	0.524	0.261	0.499	0.527
	p-value	0.021	0.179	0.011	0.000

Table 4: *Correlation between NLR and hs-CRP stratified for BMI .*

		NLR		
		Normal	**Overweight**	**Obese**
hs-CRP	R	0.577	0.294	0.394
	p-value	0.001	0.059	0.011

Discussion

NLR has been checked in both medical and surgical floor patients it's far a prognostic marker of morbidity and mortality for numerous situations. It was these days associated with all-cause mortality in hemodialysis sufferers.[23] Reddan et al were the first to mention its feasible use as a biomarker in hemodialysis,[7] So the relationship between NLR and various other inflammatory biomarkers in patients on hemodialysis was determined in a cross-sectional analysis.[21]

NLR is a extensively utilized biomarker of systemic inflammation, which may be extracted easily from CBC has validated to be related to CKD and CKD sufferers has been shown to posses a low-grade inflammatory fame. A hundred and one NLR changed into discovered multiplied in patients now not simplest receiving hemodialysis but also in predialysis term.[22]

On this observe, correlation coefficient showed susceptible fine correlation among hs-CRP and NLR. i.e. r= 0.399, p-cost=0.000. Okyay GU in his study confirmed that the cost of correlation changed into despite the fact that tremendous, however very susceptible i.e. r=0.264, p=zero.002.8 any other examine by way of Ahbap E also showed a bit higher cost of positive correlation, but additionally very vulnerable i.e. r=0.333, p=0.01.9 Although consequences of this have a look at is regular with the results of Okyay GU and Ahbap E however correlation coefficient in this look at become higher in comparison to each research. These days in 2017 Jérôme Pineault in his study said that NLR was positively correlated with CRP. i.e. r = 0.45, P < .001.10 Correlation coefficient reported by Jérôme Pineault a bit higher as compared to this study. Ahbap et al. reported that patients with higher CRP levels > three mg/d had higher NLR and PLR degrees compared to sufferers with lower CRP degrees *NLR (three.7±0.2 vs. 2.7 ± 0.2, p< .01) and PLR one hundred fifty.7±6.9 vs. 111.eight ± 7.zero, p <0.001).9 Results of this study is up to some extent is in line with the findings of Ahbap et al.

In a study by Turkmen et al., NLR >3.5 became observed associated with increased stage of TNF-α however now not with CRP and IL-6 in sufferers with ESRD.[7] Findings of Turkmen et al. totally contradicts the effects of this take a look at as on this examine susceptible but high quality correlation was seen among hs-CRP and NLR. Stratification of age, gender, BMI and length of CKD changed into performed to manipulate these impact modifiers variables Stratification of a lot of these variables confirmed a close relationship among NLR and hs-CRP. Research have now not finished stratification for these variables. As outcomes of this have a look at have generated neighborhood significance for both of these variables and showed moderate fine correlation for every variable. It can be stated that both of those markers can be easily and successfully be used for detection of infection in CKD sufferers. Detection of increase in NLR is pretty cheap and time saving (quick) technique for assessment of inflammation. There are a few

researches showed approximately N/L ratio and its comparison with other inflammatory markers in patients with CKD. Considering N/L ratio can tell us whole results of blood sample in CKD patients. Some inflammatory markers (CRP and fibrinogen), but not all, are measured in routine clinical practice to estimate the likelihood of the presence of atherosclerotic lesions. In this regard, increasing evidence has shown that white blood cell counts and subtypes are reliable markers of inflammation.[13] Specifically, NLR, a rapid and simple method for assessing inflammatory status calculated as the ratio of absolute neutrophil count to absolute lymphocyte count, has recently been investigated as a novel predictor of cardiovascular risk.[14]

To date, NLR provides information on the inflammatory state[25] including the effects of neutrophil elevation, secondary to acute inflammation, along with lymphocyte depletion, secondary to stress induced lymphocyte redistribution to lymphoid organs, as well as lymphocyte apoptosis.[15] In fact, lymphopenia has been shown to develop secondary to stress-related cortisol release in patients with myocardial infarction.[16] In this regard, there was a close relationship between altered NLR and worsening prognosis of cardiovascular, metabolic, and inflammatory diseases. The aim of this study was therefore to evaluate the relationship between NLR and carotid atherosclerotic plaques, assessed by carotid doppler.[17-20]

Conclusion

Consequences of this research by the look had shown superb correlation between NLR and hs-CRP. With each of those markers have the capacity to rule out the continuous subclinical problems as well as can do hazard stratification for patients with CKD.

Conflict of Interest *None*

Source of Funding *None*

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Authors Contribution

MAB, HF: Conceptualization of Project
HF,TM, KK: Data Collection
MQ: Drafting, Revision
MAB, HF: Writing of Manuscript

Factors Associated with Delay in CA Breast Diagnosis in Mayo Hospital, Lahore

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Abstract

Objective: This study was designed to determine the frequency and factors responsible for delayed diagnosis of breast cancer at tertiary care hospital, Lahore.

Material and Methods: This was a cross-sectional study with non-probability purposive sampling conducted at the Oncology department of tertiary care hospital, Lahore, among 200 adult women (>18 years) with confirmed breast cancer through biopsy technique. Data was gathered through a pre-tested questionnaire and analyzed using the SPSS version 23, p-value <0.05 was taken as significant.

Results: Delay can be categorized into two broad categories, i.e. delay in consultation (patient delay) and diagnosis delay (system delay).Only seven patients reported in time. Patient delay was observed in 12(6.2%) cases, system delay was reported by 4(2.1%) patients and combined delay (patient and system) was 177(91.7%). The most frequent reasons for the delay in a patient's diagnosis were embarrassment to conduct a breast examination (74%) and lack of information (73%). Other factors included: not interested in treatment (59%), financial limitations (53.5%), competing life priorities (48%), fear of cancer diagnosis/treatment (45%), fear of cancer (45%), appointment delay (20%), fear of medication (10%) and false negative diagnostic test (2.5%). Financial limitations, competing life priorities, no interest in treatment, skin changes, and family history of Breast cancer were significantly related to delays.

Conclusion: Delayed presentation was observed in 193 (96.5%) of patients, which is quite high. Health education sessions and health system improvement are required to address significant factors.

Keywords: Diagnosis delay, System delay, Patient delay, breast cancer.

How to cite: Altaf A, Hameed R, Khan S, Razzaq A, Ali A, Tahir Z. *Factors associated with Delay in CA breast Diagnosis in Mayo Hospital, Lahore. Esculapio - JSIMS 2023;19(04):419-424.*

DOI: https://doi.org/10.51273/esc23.25131949

Introduction

Cancer is a cluster of diseases that can occur in any organ or tissue, characterized by aberrant growth of cells exceeding the usual boundaries and invading adjacent tissues. Cancer is the second chief cause of demise worldwide.[1]

Breast cancer has become an important health challenge.

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Submission Date: 28-10-2023
1st Revision Date: 12-11-2023
Acceptance Date: 13-12-2023

The topmost type of cancer in females is breast cancer. The number of Brest Cancer cases in females is far more than Lung Cancer in males. Approximately, 2.26 million cases were reported in the year 2020. Although it is perceived as a disease of the developed world, but more than half of diagnosed cancer cases and two thirds of death claims due to cancer are from the underdeveloped countries.[2,3]

The prevalence of Breast Cancer (BC) is on the rise in Pakistan, and it is expected that one in nine women has a chance to develop it. According to a prediction model across 42 low- and middle-income countries (LMIC) in a recent study, age-standardized breast cancer incidence, mortality and disability adjusted life years DALYs rate will be 76, 52 and 1679 per 100,000 population from 2020-2050 which will be the highest in Asia.[4,5] High

mortality due to breast cancer can be reduced through early diagnosis and prompt treatment. However, delayed presentation to health care and delayed initiation of treatment has been observed in LMIC. Delays have been observed from the appearance of symptoms to medical consultation to disease diagnosis and treatment. Early diagnosis is directly associated with a better prognosis.[5,6,7]

Scientific studies have proved that global delay more than three months leads towards shorter survival. Global delay for breast cancer can be divided into two categories:

(1) Patient delay (PD): Time period between symptom onset to first medical checkup

(2) System delay (SD): Time period between first medical checkup to treatment

About 69.9% of Pakistani women present at a medical facility with stage III or IV disease and delay of approximately 6 months have been observed.[6-8] For patient delay, old age, low education, marital status, socioeconomic conditions, other life priorities, lack of awareness, cancer stigma, history of benign cancer disease were found significant factors in different studies. Denial, search of alternate medications and fear are also associated factors.[4,6,8,9]

Poor health care system, health care assessment, long waiting queues for appointments, lack of diagnostic facilities, false negative biopsies and lack of screening through mammograms, rural residence, old age and illiteracy are main factors for system delay.[4,6,7,9] According to literature search, System delay has not been well elaborated, especially in Pakistan.[9,10]

Hence, this study has been formulated to find out the frequency and factors of various types of delays in Breast Cancer diagnosis at tertiary care hospital, Lahore. This insight will provide information to policymakers, Government officials and Health care providers to provide better access to screening programs, health care delivery services and patient awareness for better outcomes.

Material & Methods

It was a cross-sectional study using non-probability purposive sampling conducted among women presenting in Oncology department of a teriary care hospital, Lahore, for Breast Cancer. The sample size was 200 women, by taking an expected percentage of delayed presentation of breast cancer patients as 39.01%[11]. After permission from the ethical review committee of the Institute of Public Health, Lahore through letter No. 53/ERC/IPH and informed consent from partici-pants, a semi-structure questionnaire was utilized for data collection. All women age > 18 years and confirmed breast cancer through biopsy (reports were available with her) presenting at the oncology department for Breast Cancer at tertiary care hospital, Lahore were included except women who refused to consent, women with no histological evidence of invasive breast cancer, noncancerous lumps, women with psychiatric illness or amnesia and critically ill women who were unable to communicate. The first part of the questionnaire consisted of socioeconomic characteristics such as age, education, marital status, employment, family income and residential location (rural-urban). The second part comprised of disease related information such as breast cancer detection method, family history of breast cancer and first clinical presentation (Lump, breast pain, nipple discharge, skin changes, bone pain, backache, ulcer over breast, weight loss and change in breast shape). The third part included delay or in time arrival at hospital, if delay then type of delay (Patient delay/System delay/ both) and details of factors resulting in delayed presentation of patient. Patient delay factors were lack of information, embarrassment, no interest in treatment due to poor prognosis, competing life priorities, financial constrains and use of alternative medications. System delay factors were appointment delay, fear of medication, false negative diagnostic test and negative physical beast examination Data was entered and analyzed using SPSS version 23 and p-value ≤ 0.05 was taken as statistically significant.

Results

Among 200 participants, only 7(3.5%) patients presented on time and 193 (96.5%) reported late. The mean age of the patients was 48.95±10.68 years; the minimum age was 22 years and the maximum was 77 years. About 98(49%) of patients were from urban areas and 102(51%) were from rural areas. A major proportion of participants, 151(75.5%) were illiterate whereas 138(69%) patients had monthly family income less than twenty thousand. About 148(74%) women were married, 13(6.5%) were unmarried and 39 (19.5%) were widows; 183(91.5%) were unemployed. Breast cancer was 100% self-detected through self breast examination. As far as medical history was concerned, 197 (98.5%) had lumps, 167 (83.5%) observed skin changes, 170 (85%) had breast ulcer, 160(80%) had breast pain and only 81(40.5%) had nipple discharge. Bone pain and arm pain were observed

in 29 (14.5%) and 75 (37.5%) women, respectively. About 48 (24%) women had a history of hormonal contraception, and 14(7%) women had a history of using HRT. Approximately 169 (84.5%) women had a history of breastfeeding and 127 (63.5%) women had a family history of breast cancer.

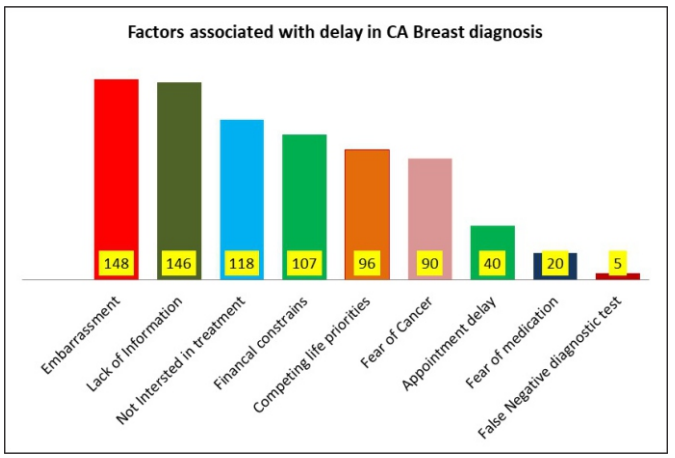

Fig 1: *Factors associated with delay in Breast Cancer*

Table 1: *Inferential statistics regarding patient presentation*

Variable	Within Time	Delay	p-value
	Mean±SD	Mean±SD	
Consultation time in months (Patient related)	2.77±0.66	13.79±9.49	0.000*
Diagnosis time in months (System related)	3.44±2.55	11.17±7.70	0.003*
Total Delay in months	6.22±1.92	24.97±16.54	0.000*

Variables		Mean	SD	p-Value
Patient Related				
Financial Constraints	Yes	15.4	11.66	0.000*
	No	10.88	5.45	
Competing life priorities	Yes	11.36	9.19	0.006*
	No	15.0	9.58	
Not interested in Treatment		11.35	7.65	0.000*
		16.09	11.24	
System Related				
Financial Constraints	Yes	12.69	9.47	0.000*
	No	8.68	4.08	

**P-value <0.05 significant: Test Applied: t-test*

Diagnosis

Table 2: *Patient delay in relation to various variables (n=200)*

Variable		Patient presentation: Within Time		Patient presentation: Delayed		p-value	Remarks
Financial Constraints	Yes	2	1.87%	105	98.13%	0.05	Significant
	No	7	7.53%	86	92.47%		
Skin Change	Yes	5	2.99%	162	97.01%	0.02	Significant
	No	4	12.12%	29	87.88%		
Breastfeeding	Yes	5	3%	164	97%	0.331	Insignificant
	No	2	6.5%	29	93.5%		
Family history of Breast Cancer	Yes	2	1.57%	125	98.43%	0.00	Significant
	No	7	9.59%	66	90.41%		

**P-value <0.05 significant. : Test Applied: chi-square*

Discussion

Breast cancer is the most prevalent malignancy among females worldwide. In Asia, Pakistan is among the top countries with the highest incidence and mortality associated with it.High mortality is directly linked with delayed presentation by patient or by health care services. Various factors are responsible for it. Hence, this study has been formulated.[4,5,6]

Among 200 participants, only 7(3.5%) patients presented on time and 193(96.5%) reported late. Late presentation was patient delay, system delay or both, while the cut-off value was marked for ≥ 3 months. A study suggested a cut-off value of 3 months for patient delay and 1 month for system delay, however research reported that for developed countries, the median delay was 9-61 days, but it is more in under-developed and developing countries such as it was observed 7.5 months and 13 months for Libya and Uganda respectively. An average of 11.6 months delay was observed in Tunisia. In different Pakistani studies, delay more than three months and up to 12 months have been reported. System delay has not been much investigated in the Asian context.[6,12,13] A delay of > 3 months was observed in 88.8%, 50.5% in Pakistan and Ethiopia respectively. In the current study, if the cut-off value is lowered to one month, then there would be 100% delay as no patient reported or diagnosed at a health care facility within a month due to poor health seeking behavior by patients and over-burdened health care delivery system.

A delay of 95% by Talpur et al., and 89% by Gulzar et al., 70%,& 72 % by Maghous et al. and 66% by Baig et al. were reported in different studies.[4,11,15,16,19]

In this study, the mean age of study participants was 48.95±10.68 years. The age of study participants ranges between 22 and 77 years. A study conducted in Iran by Talpur AA reported the mean age of patients was 43.5 ± 10.38 which reflected that comparatively there is breast cancer presentation at younger age in Iranian patients.[14] In another study, peak incidence was seen between 31–45 years of age. In different studies conducted in Pakistan, Morocco, Malaysia and Iraq reflected mean age of the participants were of 45.38, 49.5±11.6, 49.5±11.6, 26.52 ± 6.90, 34.0±11.2,48.3 ± 10 and 49.6 ± 114 years respectively. All these studies revealed that the occurrence of breast carcinoma is increasing in the young population. A recently published local study reported that 65.6% of the women were of 40 years of age.[15-20]

In the current study, factors associated with patient delay were embarrassment 148(74%), lack of information 146(73%), Not interested in treatment 118(59%) financial constrains 107(53%), competing life priorities 96(48%) fear of cancer 90(45%). For system delay, the main factors were appointment delay 40(20%), fear of medication 20(10%) and false diagnostic test 5(2.5%). According to Rahool et al., Sindh about 21.8% reported delay due to embarrassment. It was also reported in other studies conducted in Syria, Pakistan.[4,9,10] In a study in Malaysia, about 38.1% of women were embarrassed due to breast examination.[19] Although shyness and embarrassment were observed in different countries, but it was a main concern in our study. It can be justified as there are sociocultural differences globally. Lack of information was reported in 77.2%,55.2%,55.4% and 41% of women in Pakistan and Ethiopia.[8,18,16,25] The results are quite comparable to this study. Lack of information, financial constrains and competing life priorities were the factors also reported in a study in Syria and Rabat, Morrocco.[9,14] A study conducted in Iraq concluded that lack of information was a significant factor for delayed presentation, with p value < 0.001.[20] There is low awareness about breast cancer, its symptoms and successful treatment among the population. The widespread misconception in the public is that if a person who is suffering from any kind of carcinoma has no or minimal chances of survival and there is no treatment that can cure cancer. So, the lack of information contributes to the late diagnosis of breast cancer and no interest in treatment, which land towards greater chances of mortality. Appointment delay was observed in 40(20%) patients. Scarcity of physicians leading to appointment delay is a significant contributing factor in system delay as quoted by Afaya et al. in a systemic review.[12] In this study, financial limitations constrains is a significant factor with p value of 0.00. Low socio-economic status is significantly associated with delay representing financial constrains with p value of 0.015, 0.027 and Odd's ratio of 8.11 respectively.[4,7,8] A study conducted by Gulzar et al., and Saleem et al., about 67.2% and 77.2% patients reported financial limitations respectively in seeking medical help with P < 0.001 and 0.03 respectively.[11,15,18] A study conducted in the USA among 1302 women cohort for ten years and in northern Pakistan and revealed financial limitations as a significant factor with Odd's ratio of 0.62 and 2.29.[21,22] Similar results were obtained from stud conducted in Iran by Dianatinasab et al., where income was significantly associated with delayed presentation with odd's ratio of 0.07 and 95% CI 0.008-0.63.[22] This indicates the significance of screening and free facilitation for the underprivileged population and not leaving them at the mercy of this heinous disease. Family History of Breast cancer is a contributing factor for patient delay with p value of 0.00. However, different studies revealed that patients with a family history arrived earlier at health facility as evident by studies conducted in Rabat with p value < 0.001, in the USA with OR 1.79 and a 5% CI 1.00-3.19, in Iran with OR = 3.82; 95% CI, 1.05-5.05.[15,22,24] This can be attributed that poor prognosis in family members made them realize that cancer is not a treatable disease. This myth needs to be addressed through community awareness, specially among caregivers of cancer patients. As this was a hos-pital based study with convenient purposive sampling, hence results cannot be generalized. Moreover, there is a possibility of recall bias, as patients either do not remember the exact date of symptom onset or underreport their delay to circumvent guilt. However, proper data collection by researcher and verification through medical laboratory reports were ensured. More studies from different oncology departments of hospitals need to be conducted

Conclusion

Delayed presentation was observed in 193(96.5%) of patients. Financial limitations, competing life priorities, no interest in treatment, skin changes and family history of Breast cancer were significantly connected with delays.

Conflict of Interest: None

Funding Source: None

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Authors Contribution

SK: Conceptualization of Project
AA: Data Collection
RH: Literature Search
AR: Statistical Analysis
AA, ZT: Drafting, Revision
SK: Writing of Manuscript

Correlation of Vitamin D and Calcium Levels and their Biochemical Importance in Diabetic Patients

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Abstract

Objective: The aim of study is to determine the correlation between vitamin D and calcium levels and their biochemical importance in diabetic patients.

Materials and Methods: A cross-sectional study compared vitamin D and calcium levels in 50 diabetic patients recruited from the University of Lahore Hospital. Selection criteria were age, sex, diabetes duration, and current and previous medication use. Each person who took part in the study gave their informed permission. We collected venous blood samples were examined for vitamin D, calcium levels and urine for uric acid level in accordance with standard laboratory techniques and commercially-available kits. SPSS 26.0 was used for the statistical analysis. Mention study design

Results: Diabetic patients exhibited significantly lower levels of both vitamin D (20.4±4.8) and calcium (9.2± 0.9) compared to the healthy control group ($p<0.001$). There was a significant positive correlation between vitamin D and calcium levels in diabetic patients ($r = 0.67$, $p < 0.001$). Diabetic patients also had higher uric acid levels (6.1±1.2) than healthy controls ($p<0.05$).

Conclusion: The conclusion shows that vitamin D and calcium levels are positively correlated in diabetic patients. There may be a connection between uric acid metabolism and the pathogenesis of diabetes, as evidenced by the higher uric acid levels in diabetic patients.

Keywords: Diabetes, Calcium, Vitamin D, Uric acid, Correlation, Biomarkers.

How to cite: *Yasin T, Khan M. Iqbal H, Azam H, Sukhera S, Arif HA. Correlation of Vitamin D and Calcium Levels and their Biochemical Importance in Diabetic Patients. Esculapio - JSIMS 2023;19(04):425-429.*

DOI: https://doi.org/10.51273/esc23.251319410

Introduction

Insulin resistance and high blood sugar levels are hallmarks of the metabolic condition known as diabetes mellitus. Beta cells in the pancreas generate insulin, which controls blood sugar by promoting the absorption of glucose by cells.[1] Type 1 is insulin-dependent diabetes mellitus (IDDM), which happens when pancreatic beta cells die and leave the body without enough insulin.[2]

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Submission Date: 02-08-2023
1st Revision Date: 04-09-2023
Acceptance Date: 02-08-2023

Type 2 diabetes is called non-insulindependent diabetes mellitus (NIDDM). Insulin-resistant is a sign of Type 2 diabetes. Type 3 is called "gestational diabetes," and it is caused by not being capable of managing glucose while pregnant.[2] The chronic hyperglycemia of diabetes is linked to long-term problems with the eyes, kidneys, nerves, and an increased risk of heart disease, neuropathy, and aging rapidly.[3] The main causes of diabetes mellitus include genetic disorders, the disease that causes damage to the pancreas, and excessive production of some hormones like growth hormones and glucocorticoids. Diabetes also occurs due to drugs, chemicals, and infections[4] (give examples). Long-term effects of diabetes, such as eyesight and nerve difficulties, cardiovascular disease, and hastened aging, have been linked to chronic hyperglycemia.[3] Type 2 diabetes is caused by genetic susceptibility, pancreatic injury, and hormonal irregularities.[4] Low vitamin D and calcium levels also affect

host immunity in inflammatory diseases.[5] Vitamin D has been associated to lowering the severity of chronic inflammatory syndromes by modifying cytokine production, and low vitamin D levels have been linked to metabolic syndrome, obesity, diabetes, and high blood pressure, among other cardio-metabolic disorders.[6] Type 1 diabetes is more likely to develop in those with low vitamin D levels, according to previous research.[7] Therefore, there is an indication that vitamin D supplementation alone may have the potential to prevent the onset of Type-1 diabetes.[8] Vitamin D deficiency is becoming increasingly common, affecting over 50% of adults, according to recent research.[9] Between a quarter and half of American adults may be deficient in vitamin D. In a multi-center study conducted in Iran, Heshmat et al. found that moderate-to-severe vitamin D deficiency affected 47.2% of those younger than 50, 45.7% of those between 50 and 60, and 44.2% of those older than 60.[10] Together, insulin resistance and impaired pancreatic -cell activity characterize diabetes mellitus.
Calcium is essential in many physiological processes, including bone and tooth mineralization, blood coagulation, muscle contraction, nerve transmission, and cellular communication.[11] Insulin secretion and glucose control in diabetes are influenced by calcium. Calcium levels inside the cell control Pancreatic beta-cell insulin production.[12] Low calcium homeostasis has been linked to insulin resistance and glucose irregularities.[13] Elevated blood calcium levels have been linked to an increased risk of developing type 2 diabetes in a number of large-scale cohort studies.[14,15] Another recent study using single-cell RNA sequencing found that calcium and other metal ion pathways are activated in the context of proliferative diabetic retinopathy in the mouse retina.[16] The activation of pancreatic beta-cells and sensitive organs, as well as indirect mechanisms involving the regulation of calcium hemostasis, have all been hypothesized to contribute to vitamin D's beneficial effect on insulin secretion and sensitivity in a number of studies.[17] This purpose of this study is to examine the correlation between vitamin D and calcium consumption and the development of diabetes in Pakistanis.

Material and Methods

Vitamin D and calcium levels were correlated in diabetes individuals using a cross-sectional study. Fifty patients with diabetes who met inclusion criteria for age, sex, duration of diabetes, and medications were recruited from the University of Lahore Hospital. The chosen individuals' medical records were examined for demographic information, medical history, and pertinent clinical and laboratory data. We collected venous blood using aseptic procedures and urine for uric acid level. Standard laboratory methods and commercially available kits were used to examine the blood samples for vitamin D, calcium, and uric acid biomarkers. Informed consensus was obtained, confidentiality was maintained, and participant safety was given priority, all following the standards of ethics for human research. SPSS version 26.0 was used for both data collection and analysis. Mean and standard deviation (SD) were used as descriptive statistics to summarize the data. The threshold of statistical significance used in tests of the hypotheses was $p<0.05$. Diabetic patients' vitamin D and calcium levels were compared using a correlation analysis.

Results

The study included 50 diabetic patients (25 males and 25 females) with an average age of 55 years (± 8.3 SD). The average duration of diabetes among the participants was 7.2 years (± 3.1 SD). Most patients were on oral antidiabetic medications (70%), while the rest managed their condition through diet and lifestyle modifications (Table 1). Table 2 presents the average vitamin D level in the diabetic patient group as 20.4 ng/mL (± 4.8 SD), and the mean calcium level as 9.2 mg/dL (± 0.9 SD). In contrast, the healthy control group had a mean uric acid level of 5.2 mg/dL (± 0.9 SD), which was notably lower than the diabetic patient group ($p < 0.05$). patient group. Table 3 shows the correlation among the variables under study. In diabetic patients, a significant positive correlation was found between vitamin D and calcium levels ($r=0.67$, $p<0.001$). This indicates that as vitamin D levels increase, calcium levels also tend to increase in individuals with diabetes. The below graph shows the direct relationship between vitamin D3 and calcium (Figure 1). It showed that if the value of vitamin D3 increases, calcium level also increases. There was a positive correlation between vitamin D3 and calcium.

Table 1: *Participant Characteristics*

Participant Characteristics	Diabetic Patients (n=50)
Age (years, mean ± SD)	55 ± 8.3
Gender (Male/Female)	25/25
Duration of Diabetes (years, mean ± SD)	7.2 ± 3.1
Medication	
Oral Antidiabetic Medication (%)	70
Diet and Lifestyle Modification (%)	30

Table 2: *Comparison of Vitamin D and Calcium Levels between Diabetic Patients and Healthy Control Group*

Biomarkers	Diabetic Patients (mean ± SD)	Healthy Control (mean ± SD)	p-value
Vitamin D (ng/mL)	20.4 ± 4.8	28.7 ± 5.2	<0.001*
Calcium (mg/dL)	9.2 ± 0.9	9.8 ± 0.7	<0.001*
Uric acid (mg/dl)	6.1 ± 1.2	5.2 ± 0.9	<0.05*

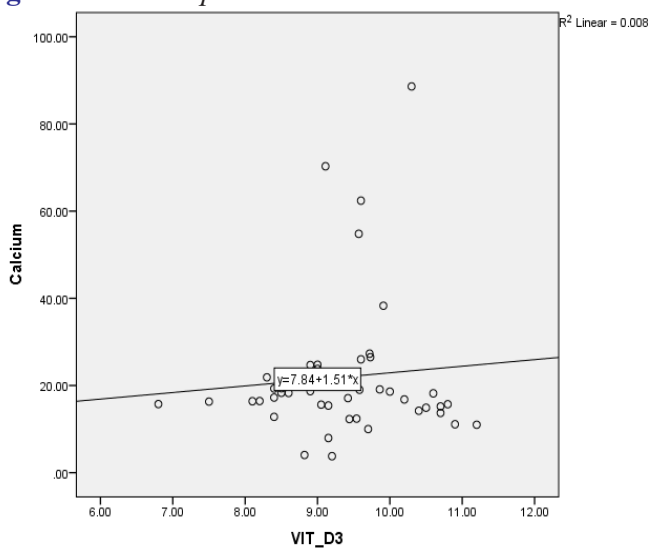
** Statistically significant distinction ($p < 0.05$) was observed when compared to the diabetic*

Table 3: *Correlation between vitamin D and calcium*

Biomarker	Vitamin D (ng/mL)	Calcium (mg/dL)
Vitamin D	1.00	0.67*
Calcium	0.67*	1.00

**Correlation is significant at the 0.05 level (2-tailed).*

Fig-1: *Relationship between vitamin D3 and calcium*



Discussion

In this cross-sectional study, we examined the correlation between vitamin D and calcium levels in individuals with diabetes. The findings revealed significantly lower vitamin D levels in diabetes patients compared to the controls. Our results align with previous studies that have also established a link between diabetes and low vitamin D levels give reference. Deficiencies in vitamin D have been associated with reduced insulin production and insulin resistance, both of which play crucial roles in the progression of diabetes due to their influence on calcium homeostasis.[18,19] Several variables, including less time spent in the sun, altered food, and metabolic changes, contribute to the low vitamin D levels seen in diabetics.[20]

The study also found that the average calcium levels of those with diabetes were considerably lower than those of healthy people. Muscle contraction, nerve impulse transmission, and bone health are just a few of the numerous physiological processes in which calcium plays a crucial part. Insulin signaling and glucose control may be disrupted by disturbances in calcium metabolism.[21] Calcium absorption and utilization may be affected by the link between decreased calcium levels and problems regulating parathyroid hormone (PTH).[22]

Vitamin D and calcium levels were shown to have a significant positive association in the research on people with diabetes. Calcium metabolism in diabetics may be affected by changes in vitamin D levels, as shown by the positive connection. It is well-established that vitamin D aids in the intestinal absorption of calcium. Individuals with diabetes have been shown to have lower calcium levels, which may be related to vitamin D deficiency-induced disruptions in calcium absorption. As a result, maximizing vitamin D levels in people with diabetes may positively affect maintaining adequate calcium levels and boosting overall metabolic health.[23]

The results also showed that the average uric acid levels of those with diabetes were much higher than those of the healthy people who served as a control group. High uric acid levels have been linked to insulin resistance and metabolic abnormalities in people with diabetes.[24] Diabetes-related problems, such as nephropathy and cardiovascular illnesses, may be exacerbated by hyperuricemia.[25] Therefore, keeping an eye on and controlling uric acid levels in people with diabetes may be crucial in improving their long-term health outcomes.

This study has some limitations, such as small sample size. Additional variables, such as food, exercise, and comorbidities, may have impacted the observed relationships, but these were not thoroughly analyzed in this research. Improving diabetes management and patient outcomes may be possible with the help of tailored therapies, and more research to address these constraints might pave the way.

Conclusion

This study highlights the potential biochemical significance of the observed correlation between vitamin D and calcium concentrations in people with diabetes. These results emphasize the need for careful monitoring and management of vitamin D and calcium levels in people with diabetes to improve their metabolic health. Elevated uric acid levels characterize Hyperuricemia,

and its connection to diabetes and its complications requires further study. The results of this study help to develop targeted interventions that improve the health of people with diabetes.

Conflict of Interest *None*

Funding Source *None*

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Authors Contribution

HAA: Conceptualization of Project
HA: Data Collection
HI, SS: Literature Search
TY: Statistical Analysis
MK: Drafting, Revision
TY: Writing of Manuscript

Original Article

OSAT (Objective Structured Assessment of Technical Skill) as a Formative Assessment Tool in Gynecology

Saira Yunus,[1] Asghar Naqi[2]

Abstract

Objective: To determine the impact of using Objective Structured Assessment of Technical Skill (OSAT) as a formative assessment tool on the learning curve of postgraduate trainees performing surgery in live setting.

Material and Method: It is a quantitative, quasi-experimental study conducted at Gynecology department of Services Institute of Medical Sciences from January 10, 2023 to September 30, 2023. Trainees were assessed in five OSAT encounters by faculty using standardized structured scoring sheet using global rating scale on a 5-point Likert scale. The data was analyzed using S.P.S.S version 22.0.

Results: Mean scores of trainees significantly improved with each OSAT encounter.

Conclusion: In conclusion, OSAT using the global rating scale in live setting, is validated by the fact that the scores improved with successive OSAT encounters

Keywords: OSAT (Objective Structured assessment of Technical Skills), WPBA, Formative assessment

How to cite: *Yunus S, Naqi A. OSAT (Objective Structured Assessment of Technical Skill) as a Formative Assessment Tool in Gynecology. Esculapio - JSIMS 2023;19(04):430-434.*

DOI: https://doi.org/10.51273/esc23.251319411

Introduction

Historically, postgraduate training in the surgical specialties is centered universally on apprenticeship model where the trainee acquires skills by working with experienced surgeons. Transformation of novice to expert is dependent on closely observing and imitating the seniors. The model although mainly reliant on the accessibility of mentors, however the patients seen and the procedures performed during training are also important.[1] Reduction in working hours of trainees further makes the traditional apprenticeship less efficient. The resulting decline in clinical skills require renewal of minimum standards and performance competencies. Furthermore, public awareness and use of social media require doctors to displays an ongoing commitment to learning and self-improvement.[2]

Competency based curricula, a model requiring trainees to acquire the desired competencies to fulfil the needs of society and patients was implemented by various accreditation authorities. Surgical competence involves amalgamation of knowledge, procedural skills, communication skills and decision making. Of these, dexterity or technical proficiency is considered to be of paramount importance among surgical trainees.[3] Although these core competences are well defined, no uniform assessment method exist to determine whether learner have achieved all core competencies prior to completion of residency. With rapidly evolving newer surgical techniques, skills acquirement and its assessment has become even more challenging.[4]

Objective assessment is fundamental because only direct observation and focused feedback can identify deficiencies in training and performance. Validity, acceptability and reliability of assessment methods is imperative. Different WPBA tools used in clinical settings are valued as they not only facilitate one to one training but also provide timely and targeted feedback. However, the most common difficulties associated with these WPBA are that they comprise of 'tick-box exercise' leading to impractical expectations and a lack of well-defined purpose.[5] Acceptable educational tools that aim

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Submission Date: 16-10-2023
1st Revision Date: 06-11-2023
Acceptance Date: 16-12-2023

at all levels of the Miller's pyramid is necessary to guarantee that trainees are assessed in settings as close to real clinical practice as possible. A valid test should foresee the learner's performance and assess technical skill in addition to knowledge. It should have construct validity or able to separate groups and it must have face validity or be as close to the real world as possible.[6]

An objective assessment tool like OSAT can fulfil this requirement. OSAT was first used as an assessment tool in Toronto in 1997 for assessing surgery residents which was later adopted by other specialties. Assessment using OSAT may be done using a specific checklist designed for a procedure or by using global rating scale. OSAT assessing residents on global rating scale was found to be more reliable in both the live and bench models, compared to checklist (Cronbach's alpha 0.33 and 0.61, respectively).[7] Comparing checklist with global rating scale, Regehr et al showed that using checklist as a marking tool has lower reliability and objectivity than the global rating scale.[8] Barbara Goff used OSATS using animal models to assess Obstetrics & Gynecology at the University of Washington in Seattle.[9] Its use is still in preliminary phases in different training programs in Europe and North America. OSAT was formally introduced by RCOG at all levels of training specialty training for Obstetrics and Gynecology in 2007.[10]

OSAT as an assessment tool have been studied on simulators or animals' models. Although using OSATS in simulator settings has the advantage of repetitive exercise without any risk to patients, however simulators can never imitate operative conditions. Due to lack of enough studies on the use of OSATS in real situation, the study is planned to determine the impact of using OSAT as a formative assessment tool on the learning curve of postgraduate trainees while performing abdominal hysterectomy in theatre (what they actually do).

Different WPBA tools such as DOPS and CBD has been introduced recently by college of Physicians & Surgeons Pakistan (CPSP) for formative assessment of trainees. Previously CPSP was assessing surgical competencies by using Logbook and TOACS.

The use of some objective tool for evaluation of surgical skills in the specialty of obstetrics and gynecology is urgently required. Such tool will not only facilitate the learning process through constructive feedback on performance but it can also be used to determine competency levels and to progress in learning curve. Finally, it can provide standard criteria to be used for formative and summative assessment.

This study was designed to determine the impact of using OSAT as a formative assessment tool on the learning curve of postgraduate trainees performing Abdominal Hysterectomy in live setting.

Material and Method

Study was conducted in Gynecology department of Services Institute of Medical Sciences. After approval of Institutional ethics board approval (Ref no.IRB/2023/1049/SIMS), this quantitative study (quasi-experimental) was conducted from January 10, 2023 to September 30, 2023. Obstetrics and gynecology training program is of four years. In first two years of training residents usually perform obstetrics procedures and in third and fourth year of training they perform under direct supervision different gynecological procedures including abdominal hysterectomy. Surgery is done under supervision of consultants (SRs & faculty).

An orientation session was conducted to explain and familiarize the supervisors and trainees to OSAT. Consultants supervising surgeries were trained in conducting OSAT as assessment tool using global rating scale. The assessment tool is adapted from Martin and colleagues.[7] Residents willing to participate were selected after obtaining informed consent on predesigned proforma. OSAT will be conducted using global rating scale on a 5-point Likert scale. Residents are assessed on their tissue and instrument handling, knowledge of instruments, use of assistants, flow and knowledge of procedure being performed. It was a quantitative, quasi-experimental. The paradigm used was post-positivism and non-probability convenient sampling was done. Gynecology residents usually perform around 8 to 10 abdominal hysterectomies by the end of their four-year training. Ten fourth year residents willing to participate in study were included. The residents were assessed in five OSAT encounters by faculty using standardized structured scoring sheet using global rating scale on a 5-point Likert scale. At the end of each encounter, Constructive feedback was given on each component. Trainees were encouraged to discuss in detail especially trainee's reflection of procedure, what went well, what could have gone better and agreeing on future learning plan using RCOG formative OSAT form. The data was analyzed using S.P.S.S version 22.0. OSAT scores of each trainee in each encounter were noted on standard checklist and mean value and standard deviation was calculated. The scores were compared using paired t-test. P-value of <0.05 was considered as statistically significant.

Results

Ten fourth year residents were included in the study. Each of the residents were observed in five OSAT encounters. After each encounter scoring was done on global rating scale and detailed feedback was given to each resident. Faculty members noticed that these OSAT resulted in improved performance of trainees because of discussion of strengths and weakness in formative feedback sessions. Feedback taken from faculty and trainees showed OSAT to be acceptable and feasible to both. Table-1 shows the mean OSAT score during follow-up. At baseline the mean score was 11.20± 2.28, which was improved to 15.40±4.28 on 2nd visit, 21.80 ±2.59 on 3rd visit, 24.20±3.03 on 4th visit and 27.80±1.79 on final visit. Table 2 showed that there was significant improvement observed in OSAT score at end of study period as compared to OSAT score at baseline ($p<0.05$).

Table 1: *Performance of Gynecology trainees at 5 OSAT encounters*

	OSAT 1	OSAT 2	OSAT 3	OSAT 4	OSAT 5
n	10	10	10	10	10
Mean	11.20	15.40	21.80	24.20	27.80
SD	2.15	4.03	2.44	2.86	1.69
Minimum	9	11	19	20	25
Maximum	15	22	25	28	29

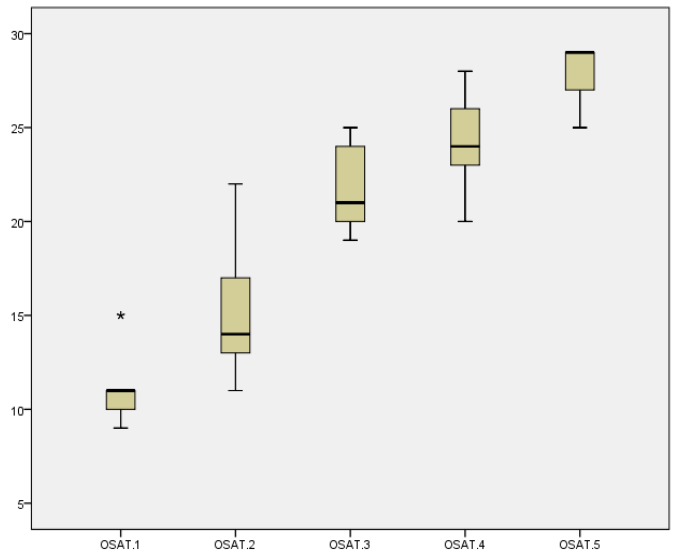

Fig 1: *Comparison graph of improvement in scores with each successive encounter (Repeated measures ANOVA: 660.080, p-value = 0.000)*

Table 2: *Comparison of Pre-OSAT and Post-OSAT performance of Gynecology trainees*

	Pre	After
n	10	10
OSAT	11.20±2.15	27.80±1.69
Mean difference	16.60	
Paired sample t-test value	28.562	
P-value	0.000	

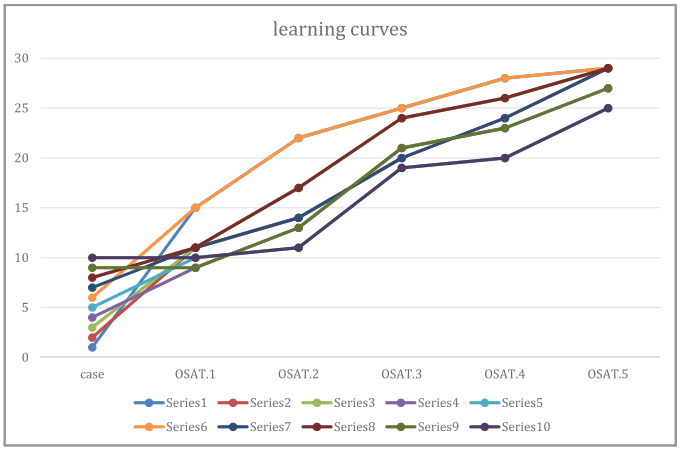

Fig-2: *Individual learning curve of PGRs*

Discussion

Competency Based Medical Education (CBME) has replaced the traditional medical education models both in undergraduate and postgraduate medical education. In conventional residency programs were designed on model which was time based, in which at the end of program trainees were expected to have attained desired competencies. However, in comparison, trainees are expected to achieve proficiency in a variety of perspectives and activities throughout the CBME.[11] Different studies have shown distinctive disadvantages of outcomes-focused approach to determine surgical competence. Moreover, if we want to produce self-motivated and lifelong learners, subjective and global assessment of competence is desired.[12]

The apprenticeship model however cannot be totally detached from surgical education, to improve outcome from this model effective methods of teaching and objective tools of assessment are required in addition to skilled mentors.[13]

Both global rating scores and procedure-based checklist has been used in different settings to determine effectiveness of OSAT. In this study the performance of residents was measured using global rating scores on a 5-point Likert scale. Scores showed significant improvement

with successive OSAT encounters (fig .1-p value=o.ooo). However, Reznick et al. used OSAT to assess surgical skills of residents comparing global rating scale and checklist. Analysis of variance revealed a significant effect of training for both the checklist score, $P < 0.001$, and the global score, $P < 0.001$.[8] A similar study conducted in University of Iowa to assess surgical skills of Orthopedic residents using global rating scale showed that global rating scale do not effectively assess the quality of surgical result. The study suggested a need to develop some new objective, reliable, and clinically relevant measures of the quality of the surgical result.[14]

In this study OSATS was found to be feasible and acceptable to both residents and supervisors. Most of the residents showed satisfaction and found it useful. Supervisors found it fundamental for our postgraduate trainees as it actually assess their surgical skills in real setting, however they found it time consuming and additional burden. H. Niitsu et al used the OSATS global rating scale at Hiroshima City Hospital in Japan to assess the surgical skills of trainees in the operation room. The study concluded that global rating scale of OSAT was feasible and effective as it can be easily done in real situation without any special preparations.[8]

The learning curves of residents can be used more effectively as an objective assessment tool to monitor their progress during training (Fig.2). Learning curves based on OSATS have the potential to recognize residents in need of more guidance so personalized guidance can be provided. Prior parameters used to assess surgical competency were the duration of surgery, the complication rate. However, duration of surgery and complication rate have shown to be crude and in- direct, as these indicators largely depend on the difficulty of the individual surgical case (e.g., the comorbidity of a patient) and the supervising surgeon.[15,16] The study shows the effectiveness of the new OSATS method and if used as a method of assessment it may overcome the barriers associated with other methods used. OSATS score increased significantly with each successive encounter. Feedback questionnaires from trainers and trainees used by Bodle and colleagues in UK proved that OSATS is valid and valuable.[17] Time specific feedback is essential to learn and improve surgical skills, emphasizing the need for technical skills curricula that give trainees the chance to work in a safe environment.

However, there are some limitations of this study as there are different assessors and the trainees are known to them so the scores could be biased. The assessors showed interest and satisfaction however they found it time consuming and additional burden to there already busy clinical routine. Implementation of CBME is associated with a number of challenges, including increased assessment burden and evaluator fatigue resulting from more frequent assessments of surgical trainees.

Conclusion

In conclusion, OSAT using the global rating scale in live setting, is validated by the fact that the scores improved with successive OSAT encounters. The study indicates it can be used as an effective formative assessment tool however further time and validation is required for broader acceptance as summative assessment tool. It will not only standardize assessments, however timely feedback after performance in real setting will encourage reflective practice.

Conflict of Interest *None*

Funding source *None*

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Authors Contribution

S, AN: Conceptualization of Project
S: Data Collection
S: Literature Search
S: Statistical Analysis
S, An: Drafting, Revision
S: Writing of Manuscript

Original Article

Non-adherence to Oral Diabetes Medication: Investigating the Role of Socioeconomic Factors and Their Influence on Treatment Compliance

Huda Abbas[1], Wajahat Hussain[2], Fahad Qaisar[3]

Abstract

Objective: To investigate association between socioeconomic factors and non-adherence to oral diabetes medication among adult patients with diabetes.

Material and Methods: This was a hospital-based cross-sectional analytical study conducted from January to July 2023 in outpatient department of Bahawal Victoria hospital Bahawalpur. Sample size calculated at anticipated population proportion of 54.4%, level confidence 95% and margin of error 5% was 375. Ethical approval was taken from institutional ethical review committee. Non-probability consecutive sampling method was used to recruit participants. Structured questionnaire was used for data collection. Data was analyzed by SPSS version 22.0. Medication adherence was measured using Morisky 8-Item Medication Adherence Scale (MMAS-8). Self-reported reasons for non-adherence were noted. Chi square test was used to see any statistically significant difference between groups and p-value <0.05 was considered significant.

Results: Mean age of patients was 55±12.37 years. Majority of study subjects 33.9% were between 51-60 years, 56.3% were male, 68.5% participants were currently married, 33.6% patients were doing private job and 48.0% participants had monthly family income of ≤50,000. Family history of diabetes mellitus was positive in 67.7% patients. Age of patients was significantly associated with adherence to anti-diabetic medications (p=0.007). Family history of diabetes mellitus was also significantly associated with adherence to anti-diabetic medications (p<0.001). Most frequent reason for skipping medicine was away from home in 41.6% patients.

Conclusion: Study revealed high frequency of non-compliance with diabetic treatment and counseling about significance of adhering to prescribed treatments is necessary.

Keywords: Diabetes medication, Non-adherence, Socioeconomic factors

How to cite: *Abbas H, Hussain W, Qaisar F. Non-adherence to Oral Diabetes Medication: Investigating the Role of Socioeconomic Factors and Their Influence on Treatment Compliance. Esculapio - JSIMS 2023;19(04):435-439.*

DOI: https://doi.org/10.51273/esc23.2513194112

Introduction

Diabetes is a significant global health challenge, characterized by chronic hyperglycemia resulting from defects in insulin secretion, insulin action, or both. According to the International Diabetes Federation (IDF), approximately 463 million people worldwide were living with diabetes in 2019, and this number is projected to rise to 578 million by 2030. The disease not only poses severe health risks, including cardiovascular complications, neuropathy, and retinopathy but also imposes a substantial economic burden on healthcare systems and societies. Effective management of diabetes through medication adherence is critical to achieving optimal disease control and reducing the risk of complications.[1-3]

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Submission Date: 15-09-2023
1st Revision Date: 29-09-2023
Acceptance Date: 05-12-2023

Adherence to diabetes medication is a cornerstone of successful diabetes management. Medication adherence refers to the extent to which patients take their prescribed medications as instructed by healthcare providers.[4] Proper adherence to diabetes medications, such as oral hypoglycemic agents and insulin, can help regulate blood glucose levels, prevent acute hyperglycemia and hypoglycemia episodes, and improve overall health outcomes. Non-adherence to medication is associated with poorer glycemic control, increased hospitalizations, higher healthcare costs, and a higher risk of diabetes-related complications.[5,6]

Non-adherence to diabetes medication remains a significant concern globally. Studies have reported varying rates of medication non-adherence, with some estimating rates as high as 50%.[7,8] The reasons for non-adherence are complex and multifactorial, encompassing patient-related factors, healthcare system factors, and medication-related factors. Despite the well-documented adverse consequences of non-adherence, addressing this issue remains challenging. To develop effective interventions, it is crucial to identify the specific factors contributing to medication non-adherence among individuals with diabetes.[9] While previous research has investigated various factors influencing medication adherence in diabetes, there is a significant gap in understanding the role of socioeconomic factors in contributing to non-adherence. Socioeconomic factors, including income, education, health insurance coverage, and social support, have been shown to influence health behaviors and healthcare access. However, their specific impact on medication adherence among individuals with diabetes has not been extensively explored. Addressing this gap will provide valuable insights into tailoring interventions to improve adherence in diverse populations.[10,11]

Socioeconomic disparities have been well-documented in diabetes management, with individuals from lower socioeconomic backgrounds experiencing higher rates of complications and poorer health outcomes. Examining the relationship between socioeconomic factors and medication adherence is crucial to understanding how these disparities arise and persist. Identifying potential modifiable factors associated with adherence will aid in developing targeted strategies to bridge the gap and promote equitable diabetes care.[12,13]

This research holds significant implications for diabetes management and healthcare policy. By gaining a comprehensive understanding of how socioeconomic factors influence medication adherence, healthcare providers and policymakers can design targeted interventions to improve adherence rates and ultimately enhance patient outcomes. Reducing non-adherence rates can lead to improved glycemic control, reduced healthcare costs, and a decrease in diabetes-related complications. Moreover, the findings of this study will contribute to the broader efforts to address health disparities and promote equitable access to diabetes care for all individuals, regardless of their socioeconomic background.

Materials and Method

This was a hospital-based cross-sectional analytical study conducted from January to July 2023 in outpatient department of Bahawal Victoria hospital Bahawalpur. The sample size calculated for the study at anticipated population proportion of 54.4% (Non adherence to anti-diabetic medication), level confidence 95% and margin of error 5% was 375. All participants were provided written informed consent before participation in the study and ethical approval was taken from institutional ethical review committee. The objectives and procedures of the study were briefed to the study subjects in their native language by the data collection team. Participation in the survey was voluntary, and participants were informed that refusal to participate would not affect the services provided to them. A non-probability consecutive sampling method was used to recruit eligible participants to the study. Adult with more equal to eighteen years of age with a confirmed physician diagnosis of type 2 diabetes mellitus and taking treatment during the study period were included in the study. Patients with mental impairment which may have limited their cognitive ability to participate in the study were excluded.

A structured questionnaire was used for data collection. Study subjects were interviewed through face-to-face interviews. During the data collection, random checks were carried out by the principal investigator to ensure the quality of data. All data were entered and analyzed by using a SPSS version 22.0. Medication adherence was measured using the Morisky 8-Item Medication Adherence Scale

(MMAS-8) questionnaire. Total scores on the MMAS-8 ranged between 0 and 8, with a score of more than 6 was labeled as adherence and <6 as non-adherence. The questionnaire contained information on socio-demographic characteristics (i.e., sex, age, marital status, monthly gross family income, and education), family history of diabetes and medication use. Self-reported reasons by the study subjects for non-adherence to anti-diabetic medication were also noted. Cross tabulation of socio-demographic variables and adherence to anti-diabetic medication was done and chi square test was used to see any statistically significant difference between the groups and p value less than 0.05 was taken as significant.

Results

This was a hospital-based cross-sectional analytical study conducted from January to July 2023 in outpatient department of Bahawal Victoria hospital Bahawalpur. The sample size calculated for the study at anticipated population proportion of 54.4% (Non adherence to anti-diabetic medication), level confidence 95% and margin of error 5% was 375. All participants were provided written informed consent before participation in the study and ethical approval was taken from institutional ethical review committee. The objectives and procedures of the study were briefed to the study subjects in their native language by the data collection team. Participation in the survey was voluntary, and participants were informed that refusal to participate would not affect the services provided to them. A non-probability

Table 1: *Socio-demographic characteristics of study subjects*

Variables		Frequency	Percentage
Age (Years)	≤30	23	6.1%
	31-40	51	13.6%
	41-50	83	22.1%
	51-60	127	33.9%
	≥ 61	91	24.3%
Gender	Male	211	53.3%
	Female	164	43.7%
Education	No formal education	65	17.3%
	Read and write	73	19.5%
	Upto Matric	87	23.2%
	Intermediate	109	29.1%
	Graduation and above	41	10.9%
Marital status	Single	07	01.9%
	Married	257	68.5%
	Divorced	93	24.8%
	Widowed	18	04.8%
Occupation	Government Employee	108	28.8%
	Private Job	126	33.6%
	Self employed	94	25.1%
	Retired	47	12.5%
Monthly Income	<50,000	180	48.0%
	50,000 - 1,00,000	123	32.8%
	>100.000	72	19.2%
Family H/o Diabetes	Yes	254	67.7%
	No	121	32.3%

Table- 2: *Socio-demographic characteristics of study subjects and adherence with medication*

Variables		Adherence with anti-diabetic medication Yes	No	p-value
Age (Years)	≤30	17 (06.9%)	06 (04.6%)	
	31-40	31 (12.6%)	20 (15.5%)	
	41-50	43 (17.5%)	40 (31.1%)	0.007
	51-60	96 (39.0%)	31 (24.0%)	
	≥ 61	59 (24.0%)	32 (24.8%)	
Total		246 (100%)	129 (100%)	
Gender	Male	113 (45.9%)	98 (76.0%)	
	Female	133 (54.1%)	31(24.0%)	<0.001
Total		246 (100%)	129 (100%)	
Education	No formal education	22 (08.9%)	43 (33.3%)	
	Read and write	44 (17.0%)	29 (22.5%)	
	Upto Matric	50 (20.3%)	37 (28.7%)	<0.001
	Intermediate	97 (39.4%)	12 (09.3%)	
	Graduation and above	33 (13.5%)	08 (06.2%)	
Total		246 (100%)	129 (100%)	
Marital status	Single	04 (01.6%)	03 (03.2%)	
	Married	189 (76.8%)	68 (52.7%)	<0.001
	Divorced	44 (17.9%)	49 (35.0%)	
	Widowed	09 (03.7%)	09 (07.0%)	
Total		246 (100%)	129 (100%)	
Occupation	Government Empl.	79 (32.1%)	29 (22.5%)	
	Private Job	83 (33.7%)	43 (33.3%)	
	Self employed	53 (21.6%)	41 (31.8%)	0.09
	Retired	31 (12.6%)	16 (12.4%)	
Total		246 (100%)	129 (100%)	
Monthly Income	<50,000	104 (42.3%)	76 (58.9%)	
	50,000 - 1,00,000	94 (38.2%)	29 (22.5%)	0.003
	>100.000	48 (19.5%)	24 (18.6%)	
Total		246 (100%)	129 (100%)	
Family H/o Diabetes	Yes	193 (78.5%)	61 (47.3%)	
	No	53 (21.5%)	68 (52.7%)	<0.001
Total		246 (100%)	129 (100%)	

Table-3: *Self-reported reasons for non-adherence to anti diabetic treatment regimen*

Variables	Frequency	Percentage
Skip medicine when away from home	156	41.6%
Skip medicine when symptoms are controlled	53	14.1%
Skip medicine when not feeling well	36	09.6%
Forget to take medicine	26	06.9%
Lack of money	30	08.0%
Medicine are not effective	24	06.4%
Side effects of medicine	23	06.1%
Multiple medicines	22	05.9%
Fear of stigma	6	01.6%
Total	375	100%

consecutive sampling method was used to recruit eligible participants to the study. Adult with more equal to eighteen years of age with a confirmed physician diagnosis of type 2 diabetes mellitus and taking treatment during the study period were included in the study. Patients with mental impairment which may have limited their cognitive ability to participate in the study were excluded.

A structured questionnaire was used for data collection. Study subjects were interviewed through face-to-face interviews. During the data collection, random checks were carried out by the principal investigator to ensure the quality of data. All data were entered and analyzed by using a SPSS version 22.0. Medication adherence was measured using the Morisky 8-Item Medication Adherence Scale (MMAS-8) questionnaire. Total scores on the MMAS-8 ranged between 0 and 8, with a score of more than 6 was labeled as adherence and <6 as non-adherence. The questionnaire contained information on socio-demographic characteristics (i.e., sex, age, marital status, monthly gross family income, and education), family history of diabetes and medication use. Self-reported reasons by the study subjects for non-adherence to anti-diabetic medication were also noted. Cross tabulation of socio-demographic variables and adherence to anti-diabetic medication was done and chi square test was used to see any statistically significant difference between the groups and p value less than 0.05 was taken as significant.

Discussion

This study showed that there was high frequency of non-adherence to anti-diabetic medication that is 65.6% in comparison with adherence to anti-diabetic medication. These results are consistent the findings of the study conducted by Aminde LN et al.[14] in which more than half of our study participants were non-adherent to their diabetic medication.

The study findings revealed that low medication adherence was significantly higher among older age group people which is in contrast to study by Rana et.al.[15] It may be due to fact that study was conducted in government sector tertiary care hospital and majority of study subjects were from low socioeconomic group and they are totally dependent on supply of medication from hospital. These findings are also in line with the results of studies that have reported that older patients were more compliant with diabetes medications.[16,17]

Patients with family history of diabetes had higher frequency of low medication adherence in this study, which is consistent with the findings of a previous study conducted in Pakistan.[18] A patient with a family history of diabetes are more knowledgeable about diabetes from their family members, receive more supportive behaviors resulting in increased motivation, and adherent to their diabetes medication which is in line with a previous study.[20]

The study findings revealed that self-reported reasons for non-compliance of diabetes mellitus treatment include away from home, skip medicines when symptoms are controlled and when not feeling well, forgetfulness to take medication, medicines are not effective, lack of funds, side effects of medicines, taking multiple medicines and fear of stigma. These findings are consistent with the results of study conducted Boshe BD et al.[21] in which the most frequent reason for non-adherence to anti-diabetic medication was skipping the medicines when away from home. The study might have sampling bias because the participants were not representative of the larger population of individuals with diabetes mellitus which limits the generalizability of the findings. The study employed cross-sectional design that cannot establish causal relationships between socioeconomic factors and medication non-adherence. Longitudinal or experimental designs would be more suitable for establishing causal links. The study focused solely on socioeconomic factors while other important determinants of medication non-adherence, such as cultural beliefs, health literacy, and patient-provider communication were not considered.

Longitudinal design to assess changes in medication

adherence and socioeconomic factors over time will be suitable for better understanding of causality. Collaboration with healthcare professionals to gain insights into the practical challenges patients face and potential strategies to enhance medication adherence will be helpful.

Conclusion

The study revealed high frequency of non-compliance with diabetic treatment regimens. It underscores the vital necessity of counseling patients about the critical significance of adhering to their prescribed treatments.

Conflict of Interest *None*

Source of Funding *None*

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Comparison of Intrathecal Dexmedetomedine with Dexamethasone as Adjuvant to Bupivacaine in Caesarian Section: A Double Blind Study

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Abstract

Objective: To compare the effects of dexmedetomidine versus dexamethasone as intrathecal additives in elective LSCS.

Material and Method: This double blind study was done in Services Hospital, Lahore after being approved from Institutional Review Board. Sixty parturients at term aged 18-40 years, were included in this study. Spinal anaesthesia was administered to all for caesarian section. 0.5% hyperbaric bupivacaine (10mg) was given to all patients. D group (n=30) was given dexamethasone 6mg as adjuvant. Dexmedetomedine (0.5 ml) 5µg was added in Group BD. Similar syringes were used for drugs to ensure blinding. Haemodynamic changes were measured. Pinprick method was used to assess the onset and duration of sensory block. Time to two segment sensory regre-ssion was documented. Modified Bromage scale assessed the onset and duration of motor block.

Results: The mean sensory block onset time was earlier with dexamethasone than Dexmedetomedine. Duration of analgesia and two segment sensory regression time and duration of motor block was significantly longer with dexmedetomidine (Table:2 & 3). Significant decrease in systolic and diastolic blood pressure was seen from baseline till uterine incision in both groups (Fig:B & C). Incidence of postoperative shivering, nausea and vomiting were significantly reduced with dexmedetomidine (Fig: D & E).

Conclusion: Dexmedetomidine is superior to dexamethasone in providing better sensory and motor block along with prolonged analgesia duration.

Keywords: Dexmedetomedine, Dexamethasone, Caesarian Section, Spinal Anaesthesia

How to cite: *Asad N, Azam M, Samreen A, Rehman A, Jahangir U. Comparison of Intrathecal Dexmedetomedine with Dexamethasone as Adjuvant to Bupivacaine in Caesarian Section: A Double Blind Study. Esculapio - JSIMS 2023;19(04):440-444*

DOI: https://doi.org/10.51273/esc23.251319413

Introduction

Spinal anaesthesia is commonly administered for lower segment Caesarian Section (LSCS). It avoids the risks of general anaesthesia such as maternal awareness, aspi-ration of gastric contents and difficult airway manage-ment.[1] The main advantage of spinal anaesthesia is ade-quacy of block, quick onset, decrease in failure rate, and cost-effectiveness.[2-6] The sensory block till the level of T4 is required for caesarian section. Hemodynamic changes which occur with this high level can lead to reduced uteroplacental perfusion. This is associated with maternal nausea, vomiting and fetal acidosis.[2-4] The change in hemodynamics can be minimized by decreasing the dose of local anaesthetic but this can limit the duration of spinal anaesthesia and postoperative analgesia.[2] Different drugs are used in combination with local anesthetics for intrathecal administration. This helps in reducing dose of local anaesthetic, prolongs duration of anesthesia, provides better analgesia and minimal maternal and neonatal side effects.[6-9] Better quality of spinal anaesthesia and analgesia is provided by addition of adjuvants. Various drugs are used as additives with bupivacaine. The most common are opioids, neostigmine, ketamine, midazolam, clonidine and magnesium.[10] Dexmedetomidine is alpha 2-adrenergic recep-

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Submission Date: 16-01-2023
1st Revision Date: 06-10-2023
Acceptance Date: 06-12-2023

tor agonist. It is added to bupivacaine as an adjuvant. It provides stability in hemodynamics, better intraoperative anaesthesia as well as postoperative analgesia in patients undergoing cesarean section.[6,9] The maternal/fetal index of 0.77 provides the safety for its use in cesarean section.[4] It blocks the somatic and visceral pain. Bi YH et al used dexmedetomidine with bupivacaine for caesarian section. They found better quality of sensory block and analgesia with this combination.[6] Dexamethasone (a steroid) has an anti-inflammatory reaction on the body. The analgesic property of dexamethasone is due to the local action on nerve fibers and the systemic effects.[5] They block transmission of nociceptive C - fibers and suppress the neural discharge.[7,11] Sharma A et al reported an effective prolonged sensory block in spinal anaesthesia with addition of intrathecal dexamethasone to bupivacaine in abdominal surgeries.[11] Research has been done using these two drugs as adjuvants separately. There are few studies available comparing dexmedetomedine with dexamethasone as adjuvant in spinal anaesthesia for caesarian section. Hence the aim of this study was to evaluate and compare the intrathecal effects of adding dexmedetomidine versus dexamethasone as an adjuvant to 0.5% hyperbaric bupivacaine in elective LSCS.

Material and Methods

This double blind study was done in Services Hospital, Lahore after being approved from Institutional Review Board. Patients aged 18-40 years with ASA grade I and II were included who agreed for elective caesarean section under subarachnoid block. Those who refused, had some bleeding disorder, had history of drug abuse, infection at site of injection and allergic to study drugs were excluded. Written informed consent was taken after a detailed explanation. 60 parturients were divided randomly by lottery method into two groups of 30 each. 10mg of 0.5% hyperbaric bupivacaine was given in group D with dexamethasone 6mg. In Group BD hyperbaric bupivacaine (10mg) was used with dexmedetomedine 5µg (0.5 ml). To ensure blinding, a third person prepared the drugs and used similar syringes. Baseline blood pressure and heart rate were recorded. Ringer's Lactate (15ml/kg) was given to preload the patients with 20G branula before administering spinal anaesthesia.

Spinal Anaesthesia was administered at the level of L3–4 to all parturients. A 25 G pencil point needle was used in sitting position. Free flow of CSF was confirmed and study drug was administered. Immediately patient was placed in supine position. A leftward tilt was given for prevention of aortocaval compression. Changes in heart rate, systolic blood pressure, diastolic pressure and mean arterial pressure were recorded at 2-minutes interval till the uterine incision. Hypotension was treated with Norepinephrine (SBP less than 90mmHg or decreased greater than 20% from baseline). Atropine (0.3-0.5mg) was given as treatment of bradycardia (HR less than 50/minute). A 23 G needle was used to assess the onset of loss of pin prick sensation. In the first 15 minutes, it was assessed every 2 minutes after the administration of the drug. Then for 2 hours assessment was done every 30 minutes. The sensory block duration was noted. Sensory regression time of two segments was observed. Modified Bromage Scale was used to record the onset and duration of motor block. (0-Able to move hip, knee and ankle. 1-Unable to move hip. Able to move knee and ankle. 2-Unable to move hip and knee. Able to move ankle. 3-Unable to move hip, knee and ankle). Ketamine injection (1mg/kg) was used as rescue analgesic.

Mean sensory block onset was taken to calculate the sample size. Group BD it was (6.46±1.35 min) and in Group B (7.43±2.23 min). The alpha error was 0.05 and power of study 80%.7 Analysis of the data was done in computer software SPSS (Statistical Package for Social Sciences) 24.0. Mean±Sd represented Quantitative variables. The sensory block onset, time of sensory regression, time to reach maximum height, analgesia duration, motor block onset, maximum motor block time and duration were compared with Independent sample T-test among groups. Frequency and percentages were used for representing qualitative variables. Hemodynamics till the incision of uterus was compared between groups with repeated measures ANOVA. Chi Square was used for analysis of categorical variables. $p < 0.05$ was considered significant.

Results

There was no discernible difference in demographic data (Table:1). The mean time of sensory block onset was earlier with dexamethasone (2.10±0.30) vs (2.57 ± 1.10 min) in Group BD (p=0.03). The mean time taken to reach maximum height of sensory block did not vary significantly (p= 0.67). In Group BD, time of regression of sensations was longer (142±26.92) minutes (P<0.05) while in group D it was (105±25.57) minutes (Table:2). Significantly prolonged analgesia time was seen in BD

group. The mean time difference of 310 minutes was noted (Table:2). Earlier time of onset in motor block was seen in D group but was not significant. The mean time to reach maximum motor block was earlier with dexamethasone (3.73±0.86) than dexmedetomidine (5.23±1.99) ($p<0.05$). There was increase in duration of motor block significantly with dexmedetomidine than dexamethasone. The mean times in two groups were (373.33±63.15) (148.50±31.10) respectively ($p=0.000$) (Table.3). Comparison of heart rate from baseline

Table 1: *Demographic Data*

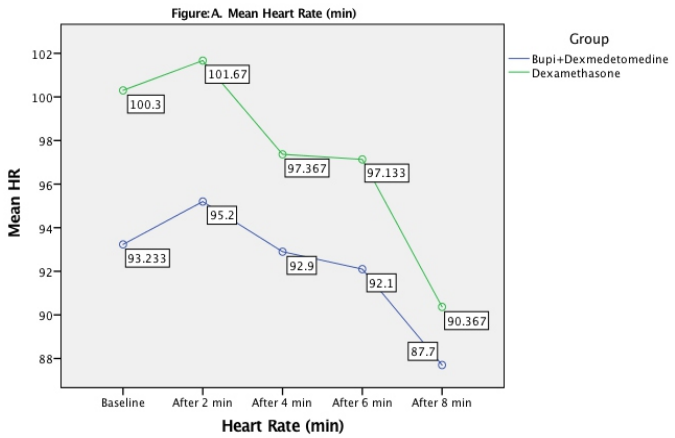
	Bupi + Dexmedetomidine (BD)	Bupi+ Dexamethasone (D)	P value
Age	26.57±4.56	28.67±4.56	0.07
Weight	73.37±11.6	72.33±10.80	0.72

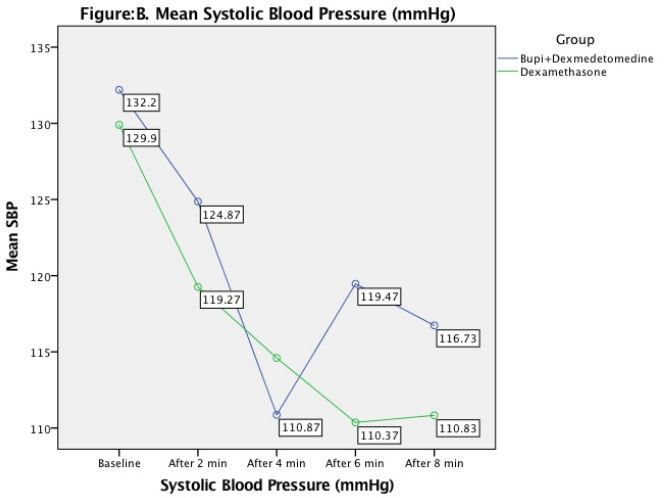
Table 2: *Characteristics of Sensory Block*

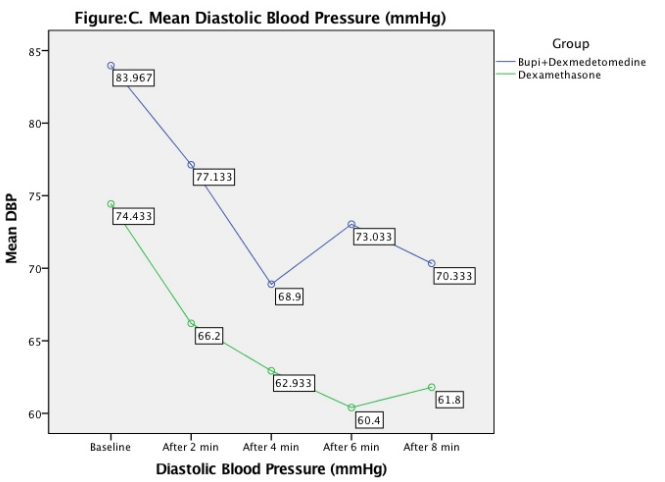
	Bupi + Dexmedeto-midine (BD)	Bupi + Dexametha-sone (D)	P value
Onset time (min)	2.57±1.10	2.10±0.30	0.03
Time to reach maximum height (min)	5.80±1.88	5.60±1.77	0.67
Duration of Block (min)	460±61.70	150±46.60	0.000
Time to two segment regression (min)	142±26.92	105±25.57	0.000

Table 3: *Characteristics of Motor Block*

	Bupi + Dexmedeto-midine (BD)	Bupi + Dexa-methasone (D)	P value
Onset time (min)	2.20 ±0.61	2.00±0.00	0.07
Time to reach maximum block (min)	5.23±1.99	3.73±0.86	0.00
Duration of Block (min)	373.33±63.15	148.50±31.10	0.00







till uterine incision showed a significant drop in both groups (Fig:A). In both groups, the decrease in systolic and diastolic blood pressure was significant from baseline till uterine incision (Fig: B & C).The incidence of hypotension was 33% with dexmedetomidine and phenylephrine had to be given.

The incidence of postoperative shivering was less with dexmedetomidine (97%) compared to dexamethasone (88%) ($P=0.04$) Nausea and vomiting was less significant in BD group as compared to D group ($p=0.02$). Six patients in dexamethasone group complained of vomiting.

Discussion

A major concern after caesarian section is postoperative pain relief. Mostly opioids are used as spinal adjuvants for effective and prolonged postoperative analgesia. The trend of using opioids is rapidly changing due to some of the side effects like vomiting, respiratory depression and pruritis.[10] Dexmedetomedine and dexamethasone have been used as additives to local anaes-

thetics. In spinal cord, activation of α2 –agonist receptors by dexmedetomidine cause inhibition of the release of nociceptive neurotransmitter substance P.[10,12] The hyperpolarization of dorsal horn neurons by intrathecal administration and decrease in the release of transmitters of C fibers are responsible for pain relief.[10] Intracellular movement of potassium is blocked which leads to pain relief. Both visceral and somatic pain is affected by the antinociceptive action of intrathecal α2 receptors.[12] Dexamethasone suppresses neural discharge from nociceptive C fibers. Thus it acts as anti-inflammatory and an analgesic. Intrathecal administration of dexamethasone may affect the intraspinal prostaglandin synthesis.[1]

The current study compared in spinal anaesthesia the effects of addition of dexmedetomidine and dexamethasone to bupivacaine. The findings of our study found dexmedetomidine more effective than dexamethasone in prolongation of duration of anaesthesia and postoperative analgesia. The mean time to reach maximum height in the two groups was not different. Dexmedetomedine 5 microgram increased the time to two segment regressions (142 ± 26.92 vs105 ± 25.57), duration of motor block (373.33 ± 63.15 vs 148.50 ± 31.10) and duration of pain relief (460±61.70 vs 150±46.60) compared to dexamethasone. This is in accordance with Abdelhady BS et al who compared Dexamethasone and Dexmedetomidine as analgesics when given intrathecally with bupivacaine in Caesarean Sections. The duration of postoperative analgesia between dexmedetomidine and dexamethasone was (418 ± 133min vs 190 ± 35) respectively. The motor block duration was greater with dexmedetomidine (324 minutes) than dexamethasone group (144 min) ($P < 0.001$).[1] Similar results were reported by El-Hamed Hassan AA et al. They compared \dexamethasone and dexmedetomidine with bupivacaine as intrathecal additives. Spinal anaesthesia was found to be significantly prolonged in duration with dexmedetomidine in comparison to dexamethasone. The time of sensory block regression was 359.50 ± 20.32 min with dexmedetomidine versus dexamethasone 199.75±18.22 min ($p<0.001$). Motor block regression time was 319.00±21.00 vs 170.00±20.00. Significantly prolonged analgesia with dexmedetomidine was seen as the time to request for analgesia was 293.50±15.57 compared to dexamethasone (178.40±19.26) ($p<0.001$).[7]

Comparable with our study results Elshahawy ME et al found increase in time of sensory block regression to L1 dermatome (p 0.001) with dexmedetomidine (295.08 ± 39.77) when compared to dexamethasone (208.80 ± 42.76). Spinal anaesthesia was given with these adjuvants in Emergency for Orthopedic Lower Limb Surgery. The motor block duration increased significantly with dexmedetomidine (229.2±35.4) vs (181.3±22.5) dexamethasone group ($p<0.001$).5 Noor El-Din et al determined the effect of intrathecal dexmedetomidine with fentanyl. These were used as adjuvants to bupivacaine in patients of Cesarean Section. In agreement to our results they also reported that dexmedetomedine was better in providing analgesia postoperatively. Also motor and sensory block duration was increased.[13]

Shahid A et al analyzed postoperative analgesia with intrathecal dexmedetomidine after Cesarean Section. They gave the report of increase in the time of onset of postoperative pain with dexmedetomidine (364.07 ± 35.58min). The postoperative analgesic requirement was in 51.7 % patients.[14] Ismaiel MAMAN et al studied the prevention of shivering comparing intrathecal dexamethasone with dexmedetomidine in cesarean section. Contrary to our results, they noted that dexamethasone was better than dexmedetomidine in prolonging the sensory block duration and analgesia. Statistically significant longer two segment regression time (minutes) was noted with dexamethasone (96.32±9.8) compared to (76.24±8.34) dexmedetomidine ($p<0.001$). The sensory block duration was prolonged in group B (dexamethasone) (161.83±7.00) compared to (124.50±6.72) group A (dexmedetomidine) ($p<0.001$). The time of rescue analgesia was prolonged with dexamethasone (198.21±21.22) compared to dexmedetomedine (174.44 ±16.3) ($p<0.001$). The difference in results could be due to the variation in dose of dexamethasone. We used 6mg while they used 8mg.[15] Small sample size is one limitation of our study. Another is that the sedation score was not evaluated. In future, different doses of these drugs can be compared along with assessment of sedation.

Conclusion

The results of our study conclude that dexmedetomidine provides better spinal anaesthesia along with postoperative analgesia as adjuvant with bupivacaine for intrathecal injection in comparison to dexamethasone.

Conflict of Interest *None*

Source of Funding *None*

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Perceived Stress and Satisfaction with Life Among Basic Sciences Medical Students: A Single Center Study

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Abstract

Objectives: The objective of this study was to measure the frequency of perceived stress and life satisfaction among basic sciences students as well as to determine the association between perceived stress and life satisfaction.

Materials and Methods: From June to September 2022, a cross-sectional study was conducted among basic sciences students of 1st and 2nd Professionals. The sampling was done through non-probability convenient sampling. From a target population of 1200, a sample size of 177 was calculated using Raosoft. Questionnaires which included the Perceived Stress Scale (PSS-10) and Satisfaction with Life Scale were distributed among the students. Descriptive analysis (frequencies ± SD) and correlation were analyzed using SPSS version 21.

Results: A significant negative correlation ®= -0.337; p= 0.000) was found between perceived stress and life satisfaction. Among the surveyed students, 70.3% (n=130) reported moderate perceived stress levels, and 31.4% (n=58) had moderate satisfaction levels based on the Satisfaction with Life Scale.

Conclusion: Perceived stress and life satisfaction correlated negatively with each other depicting that when perceived stress increases, satisfaction with life decreases. Overall, stress levels are greater than life satisfaction among medical students.

Keywords: Perceived stress, Life satisfaction, Medical students, SWLS scale, PSS-10.

How to cite: *Suleman A, Piracha A, Bokhari SAZ, Abid A. Perceived Stress and Satisfaction with Life Among Basic Sciences Medical Students: A Single Center Study. Esculapio - JSIMS 2023;19(04):445-448.*

DOI: https://doi.org/10.51273/esc23.251319414

Introduction

The medical field is known for its demanding nature, leading to mental health challenges among students. The rigorous coursework and exams lead to higher perceived stress levels as compared to other students and the general population. Perceived stress is an individual's overall perception of their stress levels.[1] Students in healthcare professions are seen to have a greater incidence of depression, anxiety, and psychological distress than their non-medical peers as a study has shown,[2] in addition to cognitive effects such as increased levels of depression, burnout and reduced well-being.[3] Medicine, a prestigious yet competitive field, requires students to find satisfaction and contentment for future success as practitioners. Life satisfaction has been defined as 'the extent to which a person optimistically analyzes the overall quality of his or her life as a whole'[(4)]. There are many factors that could predict students' life satisfaction; mental health is one very important factor among all of them. As proven through literature, individuals who have better mental health are more satisfied in life.[5] A study conducted by M.H.Sani in Saudi Arabia showed 71.9% stress levels among medical students.[8] In a similar research conducted in Pakistan, 22% students showed mild stress, 23% showed moderate & 16% showed severe stress.[5] In a study conducted by Michal Machul in Poland, in the Polish students' group, females reported lower life satisfaction than males. In the group of foreign students, males showed decreased life satisfaction than females.[9] Iram Fatima conducted research in

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Submission Date: 24-10-2023
1st Revision Date: 14-11-2023
Acceptance Date: 14-12-2023

Bahawalpur, Pakistan, where results showed that life satisfaction is linked with mental well-being.[11] The purpose of medical training is to bring about efficiency, knowledge, and skills required in a graduate to construct a quality healthcare system. Therefore, there is no doubt that the life satisfaction of medical students is vital and should be addressed.[6] Despite this, not much research has been conducted in Pakistan regarding these two variables. Therefore, we embarked on a journey to conduct a study with aims of finding correlation between perceived stress and life satisfaction among medical students.

Material and Methods

A cross sectional study was carried out from June to September 2022 amongst the basic sciences medical students of a university of Islamabad. From the target population of 1200, a sample size of 177 was calculated with confidence interval of 85% and margin of error of 5% using Raosoft Software. The sampling technique was non probability convenience sampling. The inclusion criteria included all the attending available students of Basic Sciences while the exclusion criteria included students that didn't give consent, were studying in fields other than the medical and were undergoing any psychiatric treatment. Questionnaires were used that included Perceived Stress Scale (10 questions with scores ranging from 1-4) and Satisfaction with Life Scale (5 questions with scores ranging from 1-7). Consent was taken after reassuring the students that their confidentiality will be maintained. Ethical approval was taken from the Ethical Review Committee of Foundation University School of Health Sciences. IBM SPSS Statistics version 21 was used to determine the Pearson correlation between perceived stress and satisfaction with life.

Results

Demographic analysis showed that`out of 185, 182 (98.4%) students belonged to the age group of 18-22 years, 1 (0.5%) was <18 years and 2 (1.1%) were <22 years old. 69 (37.3%) students were males and 116 (62.7%) were females. 101(54.6%) students were from 1st Professional year and 84 (45.4%) were from 2nd year.

Out of the 250 questionnaires distributed, 185 were completely filled and met the inclusion criteria, while 5 did not meet the inclusion criteria, and the remainder were either incorrect or incompletely filled. These 185 questionnaires were further analyzed for the study. As shown in table 1, 26 (14.0%) students reported low level of perceived stress, 130 (70.3%) students showed moderate level and 29 (15.7%) reported high levels of perceived stress. Table 3 Pearson's correlation was applied which came out to be negative with an 'r' value of –0.337 and 'p' value of 0.000. As shown in table 2, 5 students (2.7%) were extremely dissatisfied, 16 (8.6%) were moderately dissatisfied, 27 (14.6%) were slightly dissatisfied, 8 (4.3%) were neutral, 47 (25.4%) were slightly satisfied, 58 (31.4%) were moderately satisfied and 24 (13.0%) were extremely satisfied with life.

Table 1: *Shows the frequency and percentage of different levels of perceived stress among basic sciences medical students.*

Level of perceived stress (scores)	Frequency (%)
Low (0-13)	26 (14.0)
Moderate (14-26)	130 (70.3)
High (27-40)	29 (15.7)

Table 2: *Shows the frequency and percentages of different levels of satisfaction with life among basic sciences medical students*

Level of satisfaction with life (scores)	Frequency (%)
Extreme dissatisfaction (5-9)	5 (2.7)
Moderate dissatisfaction (10-14)	16 (8.6)
Slight dissatisfaction (15-19)	27 (14.6)
Neutral (20)	8 (4.3)
Slight satisfaction (21-25)	47 (25.4)
Moderate satisfaction (26-30)	58 (31.4)
Extreme satisfaction (31-35)	24 (13.0)

Table 3: *As shown in table 3, Pearson's correlation was applied which came out to be negative with an 'r' value of –0.337 and 'p' value of 0.000.*

	Total satisfaction with life	
Total perceived stress	r= -0.337	p = 0.000

P value < 0.05, Significant

Discussion

An increasing amount of attention is being given to mental health worldwide over the past decade. It is also a widely acknowledged fact that medical students are subjected to serious amounts of stress throughout their college years due to their hectic study and exam schedules. To become proficient practitioners who are able to treat their patients most efficiently, it is extremely crucial for each medical student to take care of their stress levels, and therefore, mental well-being. In this

study, we tried to address stress levels and life satisfaction among Basic Sciences Medical students. Demographic analysis showed that`out of 185, 182(98.4%) students belonged to the age group of 18-22 years, 1 (0.5%) was <18 years and 2(1.1%) were <22 years old. 69 (37.3%) students were males and 116 (62.7%) were females. 101(54.6%) students were from 1st Professional year and 84 (45.4%) were from 2nd year. The results of this study showed that 130 (70.3%) students were moderately stressed. This percentage is lower than a similar study conducted by Amany Edward Seedhom in Egypt where the levels of perceived stress among medical students were 88.9%.[7]

Another study conducted by M.H.Sani in Saudi Arabia[8] showed 71.9% stress levels among medical students. In a study conducted by Michal Machul in Poland using the PSS-10 scale, Polish students had greater stress levels in comparison to their foreign colleagues.[9]

In a research conducted by Babar T Sheikh in a medical university in Pakistan, more than 90% of the students mentioned that they have had bouts of stress while in college at least once.[10] In another research conducted in Pakistan, 22 % students showed mild stress, 23% showed moderate & 16% showed severe stress.[5] Regarding satisfaction with life, this study showed that 58 (31.4%) were moderately satisfied with life. In a study conducted by Michal Machul in Poland, in the Polish students' group, females reported lower life satisfaction than males. In the group of foreign students, males showed decreased life satisfaction than females.[9] Iram Fatima conducted research in Bahawalpur, Pakistan, where results showed that life satisfaction is linked with mental well-being.[11]

This study also showed that there is a significant negative correlation (r=-0.337, p=0.000) between perceived stress and satisfaction with life among medical students which means that excessive amounts of stress leads to decreased satisfaction with life. This is in accordance with several other studies, including one conducted in Pakistan where the spearman's correlation value for life satisfaction had a significantly negative correlation with stress.[12] Similarly, another research done in Pakistan by Furqan Ahmed Siddiqi showed a significant negative correlation between stress and life satisfaction.[13] However, not all studies showed a significant negative correlation; for example, one study conducted by Agnes Mary Khine Myint Oo in Myanmar showed that stress does not predict life satisfaction amongst medical students. The reason given for these results is that medical education in Myanmar is considered a separate life and although the students do experience stress during their academic hours, it does not affect their life as a whole.[6]

Sociodemographic factors aside, stress appears directly linked to the demanding workload in university and hospitals, coupled with the pressure to excel throughout a student's journey to becoming a doctor. This stress, negatively correlated with life satisfaction, stems from the hectic schedules of medical students, potentially impacting grades, concentration, and overall life satisfaction. This study was restricted to the evaluation of perceived stress and life satisfaction exclusively within the confines of Basic Sciences students. This constraint constitutes a limitation of our research.

Conclusion

The majority of basic sciences showed a high frequency of moderate stress on PSS and less than half of them showed moderate satisfaction on SWLS. Perceived Stress and Satisfaction with life have significant negative correlation such that if stress increases and satisfaction with life decreases.

Conflict of Interest: *None*

Funding Source: *None*

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Authors Contribution

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AS, AP, SAZB: Literature Search
AS, AP, SAZB: Statistical Analysis
AS, AP, SAZB: Drafting, Revision
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The Role of Perioperative Parameters on Predicting Acute Kidney Injury During Laparoscopic Abdominal Surgery

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Abstract

Objective: To assess role of intra-operative parameters in order to predict acute kidney injury (AKI) following laparoscopic abdominal & pelvic surgery.

Material & Methods: This single centred cohort study was conducted at surgical floor, Fatima Memorial hospital, Lahore between May 2020 to May 2022.80 patients underwent laparoscopic abdominal or pelvic surgery. Blood samples were taken for serum creatinine estimation before surgery, 8 hours, 24 hours and 72 hours after surgery. Urine output was measured 8 hours, 24 hours and 72 hours after surgery. Similarly, operation time, insufflation time and blood loss pre-operatively were also calculated.

Results: Of the 80 patients, 23 (28.7%) developed AKI. The mean age, blood pressure, BMI, glomerular filtration rate and type of surgical procedure was identical in both AKI &non-AKI groups. Operation time, inflation time and blood loss were significantly higher in AKI group than non-AKI group ($p<0.001$).

Conclusion: AKI is a transient but common condition that can arise after any laparoscopic abdominal surgery. Operation time, inflation time and blood loss can predict AKI perioperatively.

Key words: Laparoscopic abdominal surgery, Pneumoperitoneum, Acute kidney injury

How to cite: *Lodhi JK, Bukhari ST, Munaf A, Amjad S, Zubair M, Hameed F, Shoaib M. Esculapio - JSIMS 2023;19(04):449-452.*

DOI: https://doi.org/10.51273/esc23.251319415

Introduction

Since the advent of laparoscopy, abdominal surgery has been revolutionized. Its merits include smaller incision size, lesser pain postoperatively, early ambulation with faster recovery and return to routine activities and work.[1] For successful and effective laparoscopy, creation of pneumoperitoneum is first and vital step as better visualization and movement of laparoscopic instruments peroperatively is not possible without it. The commonly used gas to insufflate peritoneal cavity is carbon dioxide (Co_2). Certain physiological variations have been reported while creating pneumoperitoneum, namely the renal functions.[1] Many authors have shown conflicting reports while trying to establish relationship between CO_2 induced pneumoperitoneum and renal functional changes in animal models. Chiu and colleagues used well hydrated pigs and reported a 60% reduction in blood flow to kidney after 2 hours of CO_2 insufflation which returned to normal after desufflation.[2] Kirsch and associates showed in pigs that at a pressure of 15mmHg of pneumoperitoneum, Inferior vena cava (IVC) blood flow decreases and resultantly decreasing urine output and increasing serum creatinine.[3] On the contrary, Ali and Yavuz with associates showed that renal perfusion is preserved even after a pneumoperitoneum greater than 15mmHg.[4,5] According to Kidney Disease Improving Global Outcomes (KIDGO) criteria, AKI is defined as increase in serum creatinine ≥ 0.3mg/dl within 48 hours or urine volume < 0.5ml/kg/hour for 6 hours.[6] Data in this context is Pakistan is almost nil. No human study is available in Pakistani set up to validate these findings for laparoscopic abdominal surgery.

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Submission Date: 24-08-2023
1st Revision Date: 11-09-2023
Acceptance Date: 04-12-2023

Material & Methods

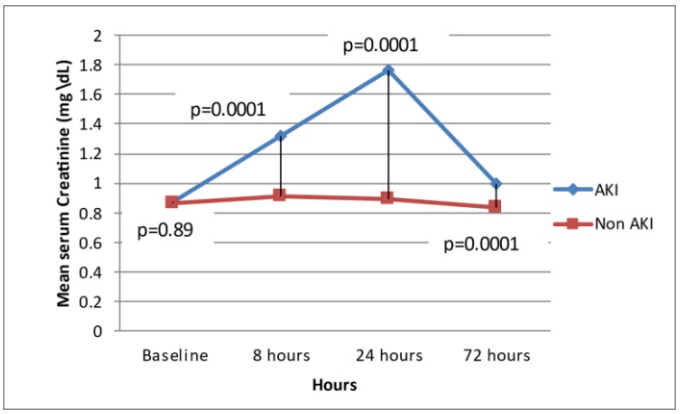
After approval from IRB, this single centred cohort study was conducted at Surgical floor, Fatima Memorial hospital, Lahore between May 2020 to May 2022. Sample size was 80. All patients above 18 years of age, with ASA status between I to III, who underwent laparoscopic abdominopelvic surgery for ≥ 2 hours were included in the study, as this time period was long enough to affect kidney physiology. Patients with pre-existing chronic kidney disease and those on NSAID therapy were excluded from the study as they could affect post-operative renal physiology. After taking informed consent, all patients underwent laparoscopic abdominal or pelvic surgery. Same anaesthetic agent with standard dose was used in all patients. Pneumoperitoneum was kept at 15 mmHg as a standard in all cases. Standard treatment was offered to all the patients post-operatively including IV fluids, IV antibiotics and analgesia. Blood samples were taken for serum creatinine estimation before surgery, 8 hours,24 hours and 72 hours after surgery. Urine output was measured 8 hours, 24 hours and 72 hours after surgery. Similarly, operation time, insufflation time and blood loss peroperatively were also calculated. All the data was recorded in structured proforma. AKI was assessed by following KIDGO criteria. Statistical analysis was performed on SPSS version 21. Descriptive statistics were computed and described as mean ± SD. Categorical variables were stated using frequency distribution. Paired samples were subjected to t test. P value of less than 0.05 was taken as significant.

Results

A total of 80 patients were included in the study who underwent laparoscopic abdominal surgery. Out of these, AKI was found in twenty-three patients postoperatively. All the patients showed both rising serum creatinine levels and falling urine output measurements postoperatively. No statistical difference was found between AKI and non-AKI groups with regards to demographic and clinical parameters of the patient as shown in table 1. The serum creatinine and urine output both started to be affected 8 hours after surgery. The serum creatinine reached its peak 24 hours after surgery. However, it started to decline and return to normal after 72 hours. Similarly, urine output declined to a minimum 24 hours after surgery but returned to normal after 72 hours of surgery. These results are shown in Fig 1 & 2. Certain intraoperative parameters were calculated and measured retrospectively and then compared in both groups to denote any one of them in diagnosing and predicting AKI postoperatively. Our results are summarised in table 2.

Table 1: *Patient demographic and clinical characteristics*

Characteristics	AKI group (N=23)	Non-AKI group (N=57)	P value
Age (in years)	43.65± 6.56	41.98± 8.77	0.413
Gender (M: F)	4: 19	16:41	0.401
BMI (kg/m²)	29.61± 6.87	28.26± 5.96	0.365
Preoperative serum creatinine (mg/dL)	0.87± 0.20	0.86± 0.21	0.891
eGFR (ml/min/m²)	87.89± 21.86	93.43± 22.09	0.312
Pulse rate (beats/min)	80.87± 7.47	76.19± 7.45	0.481
Systolic blood pressure (mmHg)	128.17± 10.03	125.28±11.85	0.306
Diastolic blood pressure (mmHg)	75.65± 7.39	76.00± 9.42	0.875
ASA status			
I	8	35	0.301
II	9	17	
III	6	5	
Type of operation			
Abdominal	11	32	0.747
pelvic	9	20	
Abdominal-pelvic	3	5	



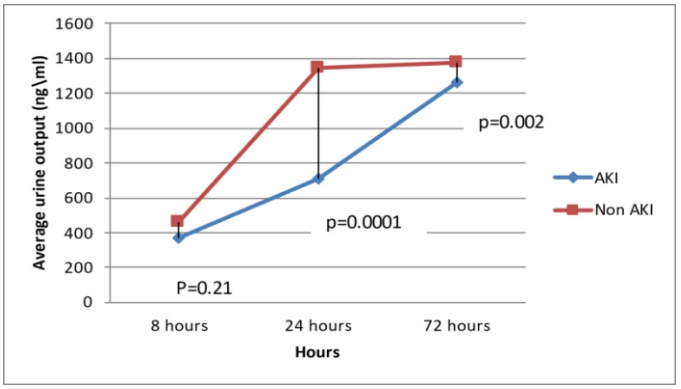


Figure 1. *Postoperative creatinine levels comparison at different time intervals*

Table 2: *Role of operativeparameters in predicting AKI*

Variable	AKI group	Non-AKI group	P value
Operation time(minutes)	191.52± 51.86	132.63±17.27	0.0001
Insufflation time(minutes)	165.22± 37.67	116.93±16.55	0.0001
Blood loss (ml)	158.04± 52.86	106.32±38.82	0.0001
Length of stay (days)	6.65± 2.12	3.05± 1.00	0.0001

Figure 2. *Postoperative urine output comparison at different time intervals*

Discussion

In recent years, laparoscopic surgery has gained popularity due to not only less operative stress response and improved clinical outcomes like length of stay in hospital, operation time, haemorrhage and analgesia requirement post-operatively, as compared to open surgical procedures.[7] Traditionally, 15mmHg was considered to be the standard intra-abdominal pressure[8]. Such pressure may disrupt biochemical and mechanical balance. The systems most affected by the raised intra-abdominal pressure are cardiovascular, pulmonary and renal systems. This fact has been proved by several published studies.[9,10] In healthy individuals, stress on these systems is well tolerated as they have good cardiopulmonary reserves. However, in an elderly or moribund patient with compromised reserve, role of laparoscopy becomes restricted. Since standardization of laparoscopy had been done, problem arises regarding the optimum pneumoperitoneum pressure maintenance. International guide lines recommend the use of "the lowest intra-abdominal pressure allowing adequate exposure of the operative field rather than a routine pressure"[11]. Recent studies show that during laparoscopic abdominal operations, better visualization and surgical manipulation is achieved by maintaining an intra-abdominal pressure of 15mmHg or more but it has the potential to compromise renal perfusion.[12]

Incidence of AKI in our study is 28.7% which is much higher than data published earlier as Sharma et al. and Abdullah et al. reported this incidence in bariatric procedures in the range of 2.3-2.9%.[13,14] It must be taken into consideration that they did not include urine output measurements in their study but we strictly followed KIDGO criteria which allowed us broader AKI detection. These previous studies also denote that patients having different types of laparoscopic abdominal surgery affect incidence of AKI. However, our results contradict this finding as our findings are also concurred by Srisawat et al. who found that different types of laparoscopic abdominal surgical procedures have no association with AKI[15]. Our study showed that operation time, CO_2 inflation time and blood loss has strong association with AKI (Table 2). It must be noted that intra-abdominal pressure was kept at a standard of 15mmHg in all these cases in both AKI and non-AKI groups. This fact correlates with previous study in pigs showing that intra-abdominal pressure higher than 20mmHg is associated with renal hypofuntioning.[16] In spite of the fact that an intra-abdominal pressure of 15 mmHg has less effect on AKI, it is strongly recommended for surgeons and anaesthesiologists to prevent prolonged CO_2 inflation by limiting its inflation time, thereby reducing risk of AKI in peri-operative period. Operation time was found to be significant in our study (p=0.0001). Shuto et al. contradict our report stating no association between operation time and AKI[16]. However, other authors concurred with our findings that an operation time of more than 210 minutes might increase of AKI from 0.8-4.4%[15]. We also found that peri-operative blood loss is also a significant indicator of AKI (p=0.0001). This finding is supported by Liu et al. who reported a strong independent relationship between peri-operative bleeding and AKI in patients undergoing cardiac bypass surgery[17]. They also reported blood transfusion to be a contributory factor in development of AKI and suggested to minimize its use to avoid AKI post-operatively. None of our patients needed blood transfusion, so this aspect of association between blood transfusion and development of AKI after laparoscopic abdominal surgery still remains to be unclear.

Conclusion

AKI is a transient but common condition that can arise after any laparoscopic abdominal surgery. Operation time, inflation time and blood loss can predict AKI perioperatively. Further studies with large randomized controlled trial using novel biomarkers for kidney injury is required to validate these findings.

Conflict of interest *None*

Funding source *None*

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Authors Contribution

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Frequency of Factors Leading to Obstetric Anal Sphincter Injury

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Abstract

Objective: Determining the frequency of predisposing factors for obstetric anal sphincter injury in Pakistani women in Shalamar Hospital, Lahore.

Material and Methods: A Cross Sectional study carried out in Obstetrics and Gynaecology department, Shalamar Hospital, Lahore from 2nd December 2020 to 30th June 2021. 136 women underwent spontaneous vaginal delivery were included in the study. Patients were evaluated and factors leading to obstetric anal sphincter injury were recorded on especially designed proforma.

Results: 18 to 40 years patients with mean age of 27.801±2.41 years and mean weight was 64.544±5.24 Kg. Factors predisposing to obstetric anal sphincter injury were primiparity 51.5%, gestational diabetes 5.1%, induction of labour 22.8%, episiotomy 71.3% and macrosomia in 16.2% of the cases.

Conclusion: we concluded that primiparity, episiotomy, birthweight of the neonate and head circumference of the neonate lead to the increased incidence of obstetric anal sphincter injury among Pakistani women.

Keywords: Vaginal delivery, Obstetric anal sphincter injury, Factors

How to cite: *Butt B, Hameed N, Mubeen S, Bashir R, Nazir A, Nawaz M. Frequency of Factors Leading to Obstetric Anal Sphincter Injury. Esculapio - JSIMS 2023;19(04):453-456.*

DOI: https://doi.org/10.51273/esc23.251319416

Introduction

Incidence of obstetric anal sphincter injury (OASI) is 5.9% of vaginal deliveries and is one of the grave obstetrical complications[1]. It is the most important cause of anal incontinence and also leads to fecal urgency, dyspareunia and perineal pain. This causes short term and long term morbidity.[2,3,4] The most severe symptom after OASI is fecal incontinence and the mean prevalence is reported to be 39% (15–61%) .[5] Accurate diagnosis and proper repair of the injury is essential otherwise persistence of the defect will lead to long term anorectal symptoms and will affect the quality of life of the individual.[6]

Many risk factors have been established for OASIS which includes prolonged second stage of labour, primiparity, large size baby and use of instruments in vaginal delivery.[7] However, operative vaginal delivery with forceps of rvacuum has a higher risk of maternal morbidity. There is an increased risk of OASI, blood loss, pain in the perineum and urinary retention.[8] Other risk factors are Asian population, episiotomy with midline incision, fetal macrosomia and occiput posterior position of fetal head[9,10]. However, other factors, like Medio lateral episiotomy, age, induction of labor, maternal weight and use of epidural analgesia, show variations between populations and studies.[7,8,11]

Mahad A et al found in their study that performing routine episiotomy increased the incidence of OASIS mainly due to the extension of episiotomy especially in midline episiotomies.[12] Joris F, et al. has also demonstrated that frequency of gestational diabetes was 6%, induction of labor 22%, episiotomy 45% in patients with obstetrical anal sphincter injury.[13] It is reported by many studies that during vaginal delivery, Asian women are at a higher risk of OASI. For example, it is reported in two studies that the incidence of OASI is 2-3 times higher in Asian ethnicity as compared to other races[8,10] No such a study had prior been done in Asian race and negligible women are included from pakistan in this study. A few studies

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Submission Date: 25-07-2023
1st Revision Date: 10-08-2023
Acceptance Date: 15-12-2023

have probed the factors leading to OASI, among Pakistani women undergoing vaginal delivery. Therefore, we urged to determine the frequency of factors leading to obstetric anal sphincter injury in our Pakistani population.

Materials and Methods

From 2nd December 2020 to 30th June 2021, a Cross Sectional Study was done in Department of Obstetrics and Gynaecology, Shalamar Hospital, Lahore. 136 sample size was calculated using WHO sample size software with frequency of diabetes in pregnancy 6%,[13] and margin of error 4% and Confidence interval 95% Non-probability consecutive sampling was done. Women age 18-40 years, Parity 0-4 and women undergoing Vaginal delivery unassisted with instruments were included in the study. Dai handled cases, Precipitate labour and Preterm deliveries (less than 37 weeks of gestation) were excluded from the study. 136 patients fulfilling the inclusion criteria were included in the study after permission from the ethical committee and Informed consent. Age, parity and weight on weighing scale was noted. Patients were evaluated and factors leading to obstetric anal sphincter injury were noted and recorded on especially designed proforma. Data analysis was done with statistical analysis program (IBM-SPSS version 23). Percentage and frequency was computed for categorical variables like primiparity, gestational diabetes, induction of labor, episiotomy and fetal macrosomia. Mean ± SD was used for quantitative variables like age and weight. Parity was presented as frequency. With regard to age, parity and weight stratification was done to see the effect of these variables on factors. Post stratification variables using the chi-square test, $p \leq 0.05$ was considered statistically significant.

Results

Factors predisposing to obstetric anal sphincter injury were primiparity 51.5%, gestational diabetes 5.1%, induction of labour 22.8%, episiotomy 71.3% and macrosomia was 16.2% as shown in Table-1

Table 1: *Percentage of OASIS with risk factors.*

	FREQUECY		
	Yes	No	Percentage of OASIS
Primiparous	70	66	51.5%
Gestational diabetes	7	129	5.1%
Induction of labour	31	105	22.8%
Episiotomy	97	39	71.3%
Macrosomia	22	114	16.2%

Table 2: *Stratification of primiparity predisposing to obstetric anal sphincter injury with respect to age, parity and weight.*

		Episiotomy		P value
		YES	NO	
AGE	18-30	93 (77.5%)	27 (22.5%)	0.00
	31-40	4 (25%)	12 (75%)	
weight	<70	93 (76.2%)	29(23.8%)	0.00
	>70	4 (28.6%)	10 (71.4%)	
parity	0-2	91 (78.4%)	25 (21.6%)	0.00
	3-4	6 (30%)	14 (70%)	

Table 3: *Stratification of episiotomy predisposing to obstetric anal sphincter injury with respect to age, parity and weight tables-III*

		Primiparity		P value
		YES	NO	
AGE	18-30	70 (58.3%)	50 (41.7%)	0.00
	31-40	0 (0%)	16 (100%)	
weight	<70	70 (57.4%)	52 (42.6%)	0.00
	>70	0 (0%)	14 (100%)	

Discussion

The current study examined the factors predisposing to obstetric anal sphincter injury amongst Pakistani women in Shalamar Hospital, Lahore. 51.5 % of the women were primiparous. Variations in race especially Asian ethnicity has been linked to OASI. It has been found in different researches that OASI is more common in Asian women, with an increased risk of 1.5–4.6 fold.[14] The perineal skin barrier of Asian women is weak and mobility of vaginal compartments is also relatively decreased as compared to white women. This may be a cause of increased susceptibility to tears and injury during vaginal delivery.[14] A study was carried out in Canada which reported Asian ethnicity to be an independent risk factor for OASI.I15 Certain anatomical changes such has a shorter perineal body was observed in Asian women which could explain the higher incidence of OASI in Asian women.16 Studies that have investigated the risk of OASI in patients getting a mediolateral episiotomy has shown conflicting results. However, those patients who were given midline episiotomy had an increased risk of OASI.[17,18] In the present study, the incidence of episiotomy (mediolateral) as 71.3%, which might be a major cause of the high OASI rate. Preira et all found in their study that there was no substantail difference between non-episiotomy and selective episiotomy regarding OASIS. No RCT was able to con-

firm a benefit of the non-performance of episiotomies in the non-episiotomy arm.[22] The link between epidural analgesia and OASI still needs to be investigated as there are different results in different studies.[18] A cohrt study was conducted in women who delivered beyond 24 weeks. Use of epidural analgesia during pregnancy was significantly high among the OASI group.[19] The frequency of malpositioning of the fetus may increase with epidural analgesia as it affects the internal rotation, hence increasing the risk of operative vaginal delivery.[22] Epidural analgesia has a vital role in providing women with a healthy environment during labour. Its effects may enable a laboring woman to avoid the improper use of force that may contribute to OASI. The epidural analgesia is thought to help the mother to push properly as guided by the care providers, which may result in the reduction of the risk OASI. However, many women with epidural anesthesia may need an assisted delivery with instruments due to a lack of pushing force, which might also explain why women with epidural analgesia had a relatively higher OASI rate. A randomized controlled trial is needed to see the effect of epidural analgesia on perineal injuries. The effect of maternal BMI on OASI still remains a topic of discussion.[19] Many studies have found that a higher maternal BMI protects form OASI[23-25] or is not associated with OASI.[24] In the current study, a higher maternal BMI was a protective factor for OASI for all the study population except for the subgroup that had women with primiparity.

Conclusion

In conclusion, the incidence of obstetric anal sphincter injury among Pakistani women was found to be signicantly measure. Primiparity, use of episiotomy, head circumference of the neonate and neonatal birthweight contributed to the higher incidence of obstetric anal sphincter injury among Pakistani women. Proper antenatal counseling and antenatal classes are mandatory to keep women prepared for labour and the possible complications.

Conflict of Interest *None*

Funding Source *None*

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Association of Helicobacter Pylori infection with Liver cirrhosis among Patients Presenting in a Tertiary Care Hospital of Lahore, Pakistan

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Abstract

Objective: To determine the association of H. pylori infection with liver cirrhosis among patients presenting in a tertiary care hospital of Lahore, Pakistan.

Material and Methods: This case control study was conducted at Medicine wards, Mayo Hospital, Lahore for six months.130 patients including 65 cases of liver cirrhosis (ultrasonography proven) and 65 healthy volunteers as controls were taken through non-probability consecutive sampling technique. A stool sample for Helicobacter Pylori antigen detection was taken from both cases and controls following standard sterile collection procedure. Samples were then submitted to the pathology laboratory. H. pylori antigen results were noted in a predesigned proforma. Data was analyzed using SPSS 24.0.Then the association of helicobacter pylori with liver cirrhosis was recorded by calculating taking odds ratio and taking it >1 as statistically significant.

Results: The minimum age recorded in our study was 20 years and maximum age noted was 70 years. Mean age + standard deviation were 44.32 ± 13.72 years. We had 66 (50.8%) male and 64(49.2%) female patients. Out of 65 cases, helicobacter pylori infection was found in 48(73.85%) while in 65 controls, helicobacter pylori infection was found in 29(44.62%) patients. Presence of helicobacter pylori was significantly associated with liver cirrhosis as odds ratio=3.51 and p-value = 0.001.

Conclusion: Helicobacter pylori infection was significantly associated with liver cirrhosis. Hence early diagnosis and treatment may decrease the complications.

Key words: Helicobacter Pylori Infection, Liver Cirrhosis, Association, Stool antigen

How to cite: *Ahmad M, Mumtaz SU, Siddique S, Fatima T, Islam A, Ali A. Association of Helicobacter Pylori infection with Liver cirrhosis among Patients Presenting in a Tertiary Care Hospital of Lahore, Pakistan. Esculapio - JSIMS 2023;19(04):457-460.*

DOI: https://doi.org/10.51273/esc23.251319417

Introduction

Helicobacter pylori are a rod shaped gram negative motile bacteria formally known as campylobacter pyloridis. It colonizes prepyloric gastric mucosa being catalase, oxidase, and urease positive vital for its colonization and survival.[1] It results in variety of gastric problems ranging from gastritis to lymphoma and adenocarcinoma.[2] Liver Cirrhosis is an irreversible disease as a result of liver fibrosis. Patients can end up in portal hypertensive gastropathy, hepatic encephalopathy, upper gastrointestinal bleed, hepatocellular carcinoma, spontaneous bacterial peritonitis, hepatorenal and hepatopulmonary syndromes and their life expectancy is markedly reduced.[3] Globally 4.4 billion population is affected with H. pylori-infection with male predominance.[4] It is estimated to be around 90% in developing and 40% in developed countries respectively. Major causes are poor health and hygiene and low socioeconomic status.[5-7] Africa has the highest prevalence of 70.1% whereas Switzerland lowest prevalence of 18.9%. Turkey has the highest prevalence of 77.2% in Western Asia whereas in Southern Asia, Pakistan and India has prevalence of 63.5% and Pakistan 81-90% respectively.[4]

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Submission Date: 01-09-2023
1st Revision Date: 20-09-2023
Acceptance Date: 10-11-2023

H pylori infection or reinfection is diagnosed by a variety of tests like fecal antigen test, urea breath test, or upper GI endoscopy.[8-9] The H. Pylori infection and liver cirrhosis have come under discussion in the literature but its association is poorly understood[10] and it still remains a matter of debate.[11] In one study it is postulated that H. pylori infection results in gastric and generalized inflammatory reaction as a consequence of increased proinflammatory cytokines like interleukin 1,2,4,6,8,10 and 17,INF- α and-β.[12] According to the WHO it may influence other organs resulting in liver dysfunction, ending in cirrhosis.[11] Similarly liver pathology in patients infected with hepatitis B and C viruses, and Non-B and C liver injury have confirmed H. pylori genome in the hepatocytes.[13] Another study demonstrated that H. pylori infection interferes steps of lipid absorption that may decrease high-density lipoprotein resulting in hepatocyte steatosis, and fibrosis.[14] However no strong direct association of H. Pylori with liver cirrhosis has been so for postulated in literature.[15] Therefore we carried out this study to see H. pylori association with liver cirrhosis.

Material and Methods

This case control study was conducted at Medicine department, Mayo Hospital, Lahore for six months. After institutional review board meeting, 130 patients (65 in each case and control group) were included by non-probability consecutive sampling technique. The 130 sample was estimated with 80% power of study, 5% level of significance taking helicobacter pylori infection in 70.2% of cirrhotic and 47.5% of non-cirrhotic patients.[16] Cases of aged 20-70 years with either gender (30 males and 35 females) with liver cirrhosis proven on ultrasonography. Similarly healthy adults of both genders (36 males and 29 females) aged 20-70 years with no evidence of liver cirrhosis on ultrasonography were taken as controls. Patients with prior gastric surgery, peptic ulcer on upper GI endoscopy, acute variceal bleed within last 15 days, recent antibiotics intake for H. pylori infection, previous or current primary or secondary hepatic malignancy as determined by history and medical records and patients not willing to participate in the study were excluded. Coarse nodular echo texture of liver on ultrasonography was taken as liver cirrhosis. Information regarding all the study variables was recorded in a structured proforma. A stool sample was taken from both cases and controls following standard sterile collection procedure. Samples were then submitted to the pathology laboratory for detection of H pylori antigen. The results were collected next day by the researcher himself. Results were also noted in the proforma and confidentiality of the data was ensured. H. pylori infection was managed (as per standard protocol). Data was analyzed with SPSS version 24.0. Quantitative variable like age, antigen value were summarized as mean and standard deviation. Qualitative variables like helicobacter pylori infection and gender were taken as frequency tables and percentages. The association was seen by calculating Odds ratio taking >1 as statistically significant. Stratified for age and gender was also done and chi-square test was applied taking p-value < 0.05 as significant.

Results

The minimum age recorded in our study was 20 years and maximum age noted was 70 years. Mean age + standard deviation were 44.32±13.72 years. We had 66 (50.8%) male and 64(49.2%) female patients. There were 72(55.4%) respondents with smoking > 5 pack years 58(44.6%) respondents with smoking < 5 pack years. Out of 65 cases, H. pylori infection was noted in 48(73.85%) while in 65 controls, it was only seen in 29(44.62%). We noted significant association of H. Pylori with liver cirrhosis as odds ratio was > 1 (OR = 3.51) and p-value was 0.001.

Table 1: *Descriptive Statistics.*

	Minimum	Maximum	Mean	Std. Deviation
Age	20	70	44.32	13.72
Duration	27	34	29.96	2.22

Table 2: *Presence of H Pylori in both study groups.*

Presence of H Pylori	Frequency	Percentage
Yes	77	59.2 %
No	53	40.8 %
Total	130	100.0

Table 3: *Comparison of Presence of H Pylori in cases and controls*

Study Group	Presence of H Pylori		Total	P-value	Odd Ratio
	Yes	No			
Cases	48	17	65		
Controls	29	36	65	0.001	3.51
Total	77	53	130		

Discussion

In our study, it was seen that H. Pylori infection was associated with liver cirrhosis. This has been supported

by a number of studies. In a 106 patients cohort study of hepatitis C patients there were 57 males with the age range 20-78 years and mean age, 52.9 years. Only 47(44.3%) patients had liver cirrhosis. H. Pylori infection was seen in 70.2% cirrhotic and 47.5% non-cirrhotic patients. In univariate as well as multivariate analyses, H. pylori infection (P=0.019, P=0.037 respectively; OR=2.42; 95% CI=1.06-5.53) was present and there was association with liver cirrhosis.[16] In a previous meta-analysis of 6135 cases, H. pylori infection and etiology were studied. It was present in 52.26% cases. Presence of H. pylori infection was different between cirrhotic and non-cirrhotic patients [(OR)=2.05, P< 0.0001]. It was greatest in patients of primary biliary cirrhosis (OR=1.75, P=0.147) followed by viral cirrhosis (OR=2.66, P<0.0001) and alcohol cirrhosis (OR=0.77, P<0.0001).[17] On the other hand Joanna and colleagues concluded that helicobacter pylori infection was more common in patients with viral cirrhosis followed by alcoholic or primary biliary cirrhosis.[18] Similarly Singh MP et. al in their study concluded same results.[19] Xu G and colleagues came to know that H. pylori infection was more common in non-alcoholic fatty liver disease.[20] On the other hand Ahmed et.al. Concluded that it was less common among liver cirrhotic patients.[21] Mohamed et al. concluded that it was associated with viral cirrhosis and is an important cause of acid peptic disease among patients of liver cirrhosis.[22] Being single centered with relatively small sample size and no duodenal biopsy on endoscopy were the major limitations to our study.

Conclusion

Helicobacter pylori infection is significantly associated with liver cirrhosis as evident by odds ratio > 1 (3.51) and p-value = 0.001. Hence early diagnosis and treatment may decrease the complications.

Conflict of interest *None*

Funding source *None*

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A Systematic Review of Chest Computed Tomography and Biomarkers with an Emphasis on Sensitivity and Specificity to Assess Diagnostic Accuracy and Prognostic Value in COVID-19

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Abstract

Objective: This systematic review seeks to assess the diagnostic accuracy of Chest Computed Tomography (CT) in detecting COVID-19 and evaluate the prognostic significance of key biomarkers, emphasizing sensitivity and specificity.

Material and Methods: A thorough literature search was conducted in PubMed, Scopus, and Web of Science for original research articles published from January 2020 to October 2022. Inclusion criteria comprised studies reporting on the diagnostic accuracy of Chest CT and the prognostic value of biomarkers in COVID-19 patients. Data extraction included study characteristics, participant demographics, and relevant diagnostic and prognostic metrics. Quality assessment tool, Newcastle-Ottawa Scale and QUADAS-2 tool were utilized to evaluate the risk of bias.

Results: Forty-four studies with 19,327 participants were included in this systematic review. The diagnostic sensitivity of chest computed tomography (CT) ranges from 0.73 to 0.99, indicating a generally high capacity of Chest CT to identify COVID-19 cases. However, specificity varies from 0.25 to 0.90, suggesting challenges in distinguishing COVID-19 from other respiratory conditions solely based on CT findings. D-Dimer emerges as a prominent biomarker with varying sensitivity (0.52 to 0.92) and specificity (0.22 to 0.75).

Conclusion: Systematic review emphasizes the need for contextual interpretation of CT chest to diagnose COVID-19. The blood biomarkers can be helpful in predicting disease severity, but cutoffs and significance need to be validated.

Keywords: COVID-19, SARS-CoV-2, Coronavirus, Novel Coronavirus, Diagnostic Accuracy.

How to cite: *Asif A, Ahmad MR, Amin M, Raza MD, Ghafoor BA. Hrct Chest and Inflammatory Biomarkers in Predicting Disease Course and Severity of Covid 19: A Systemic Review. Esculapio - JSIMS 2023;19(04):461-474*

DOI: https://doi.org/10.51273/esc23.251319418

Introduction

The global efforts to combat the COVID-19 pandemic prompted a continuous exploration of effective diagnostic and prognostic tools to enhance our understanding and management of the disease.[1] Among the various investigative approaches, Chest Computed Tomography (HRCT) emerged as a focus of research.[2] Several studies have investigated the potential of Chest CT scan as a diagnostic tool for COVID-19, particularly highlighting its sensitivity considering this imaging modality as a valuable primary screening tool, especially in regions heavily affected by the epidemic.[3] On the other hand, its role in detecting COVID-19 has been underscored at other places.[4] Despite the observed high sensitivity, concerns have been raised about the specificity of Chest CT, prompting questions about its widespread applicability in diverse epidemiological contexts.[5] Simultaneously, there has been a collective effort to

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Submission Date: 15-08-2023
1st Revision Date: 05-09-2023
Acceptance Date: 25-11-2023

identify reliable prognostic biomarkers capable of predicting disease severity in the early stages of COVID-19.6 Biomarkers such as D-Dimer, Lactate Dehydrogenase (LDH), Neutrophil count, Lymphocyte count, and Interleukin-6 (IL-6) among others have emerged as promising indicators for assessing disease progression and predicting adverse outcomes.[7,8]

This systematic review aims to present a comprehensive and critical analysis of the existing literature regarding the diagnostic accuracy of Chest CT in detecting COVID-19. Additionally, we explore the performance of key biomarkers in predicting disease severity, providing a nuanced understanding of their role in clinical decision-making. By synthesizing evidence from diverse studies, our goal is to contribute valuable insights into the utility and limitations of these diagnostic and prognostic tools. Such insights are crucial for guiding healthcare practitioners in decision-making processes and informing future research efforts to refine strategies in the aftermath of the pandemic.

Material and Methods

1. Formulation of Research Questions:

The systematic review aims to address two primary research questions:

- What is the diagnostic accuracy of Chest Computed Tomography (CT) in detecting COVID-19?
- What is the prognostic value of key biomarkers in predicting disease severity in COVID-19 patients?

In the context of a systematic review focusing on the diagnostic accuracy of Chest Computed Tomography (CT) in detecting COVID-19 and the prognostic significance of biomarkers, the PICO framework can be outlined as follows:

Population (P): Individuals with suspected or confirmed COVID-19.

Intervention (I): Diagnostic accuracy of Chest Computed Tomography (CT) for detecting COVID-19. Prognostic value of biomarkers (e.g., D-Dimer, Lactate Dehydrogenase, Neutrophil-to-Lymphocyte Ratio, Interleukin-6, C-reactive protein) in predicting disease severity in COVID-19 patients.

Comparison (C): For diagnostic accuracy: Comparison with reference standards such as RT-PCR. For prognostic biomarkers: Comparison of different biomarkers and their predictive value.

Outcome (O): Diagnostic accuracy outcomes, including sensitivity, specificity, positive predictive value, and negative predictive value of Chest CT. Prognostic outcomes, including the association between biomarker levels and disease severity or clinical outcomes in COVID-19 patients.

2. Search Strategy:

In this systematic review, an exhaustive exploration of the literature was carried out across electronic databases, including PubMed, Scopus, and Web of Science, to compile pertinent studies on the diagnostic accuracy of Chest Computed Tomography (CT) in detecting COVID-19 and the prognostic implications of specific biomarkers. The search strategy employed a blend of Medical Subject Headings (MeSH) terms and keywords, encompassing:

- COVID-19

  - Keywords: COVID-19, SARS-CoV-2, coronavirus, novel coronavirus

- Chest Computed Tomography (CT)

  - Keywords: chest CT, computed tomography, HRCT chest, radiographic imaging, imaging accuracy

- Diagnostic Accuracy

  - Keywords: diagnostic accuracy, sensitivity, specificity, diagnostic criteria

- Prognostic Biomarkers

  - Keywords: prognostic, predictive, biomarkers, D-Dimer, Lactate Dehydrogenase (LDH), Neutrophil-to-Lymphocyte Ratio (NLR), Neutrophil count, Lymphocyte count, Total leucocyte count (TLC) Differential Leucocyte count (DC), Interleukin-6 (IL-6), C-reactive protein (CRP).

The formulation of search queries involved the use of Boolean operators (AND, OR) to refine and enhance search precision. For example:

- (COVID-19 OR SARS-CoV-2) AND ("Tomography, X-Ray Computed" OR chest CT) AND ("Sensitivity and Specificity" OR diagnostic accuracy) AND (D-Dimer OR LDH OR NLR OR IL-6 OR CRP OR TLC OR DLC OR Creatinine OR Cardiac Troponin).

This approach ensured a thorough exploration of the literature, encompassing diverse aspects of diagnostic accuracy and prognostic biomarkers associated with COVID-19 and Chest CT."

3. Inclusion and Exclusion Criteria:

Studies were included based on the following criteria:

- Original research articles published in peer-reviewed journals.
- Studies reporting diagnostic accuracy of Chest CT for COVID-19 detection or the prognostic value of specific biomarkers in predicting disease severity.
- Studies published between January 2020 and the present to capture the evolving understanding of COVID-19.

Exclusion criteria:

- Non-English language publications.
- Review articles, case reports, and editorials.
- Studies with insufficient data on diagnostic accuracy or prognostic value.
- Preprints and studies without peer review, unpublished data

4. Study Selection:

Two independent reviewers (AA and MR) conducted the initial screening of titles and abstracts based on the inclusion and exclusion criteria. Full-text articles of potentially relevant studies were then assessed for eligibility We included studies of all designs that produce estimates of test accuracy or provide data from which estimates can be computed: cross-sectional studies, case-control designs and consecutive series of patients assessing the diagnostic accuracy of HRCT chest and routine laboratory testing as prognostic tests to determine disease severity of COVID-19. Discrepancies were resolved through consensus, and a third reviewer was consulted if needed.

5. Data Extraction:

Data were systematically extracted from selected studies using a standardized form. The following information was collected:

- Study characteristics: author, publication year, study design.
- Participant characteristics: sample size, demographics, clinical setting.
- Diagnostic accuracy of Chest CT: sensitivity, specificity, positive predictive value, negative predictive value, accuracy.
- Prognostic biomarkers: types, sensitivity, specificity, predictive values.

6. Quality Assessment:

The quality of included studies was assessed using relevant tools such as the QUADAS-2 tool for diagnostic accuracy studies and the Newcastle-Ottawa Scale for prognostic studies. This step aimed to evaluate the risk of bias and methodological quality of each study.

7. Data Synthesis and Analysis:

A narrative synthesis approach was employed to summarize findings from included studies. Diagnostic accuracy results were presented in tabular form, detailing sensitivity, specificity, and other relevant metrics. Prognostic biomarker data were synthesized to provide an overview of their association with disease severity.

8. Ethical Considerations:

As this systematic review involved the analysis of published data, ethical approval was not required. The review adhered to ethical guidelines, and data were handled in accordance with principles of confidentiality and privacy.

9. Reporting:

The systematic review adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure transparency and completeness in reporting.

10. Limitations:

Potential limitations of the review include the heterogeneity of study designs, populations, and methodologies across included studies. The evolving nature of the COVID-19 pandemic may also impact the generalizability of findings.

Results and Discussion

The sensitivity and specificity are frequently used to assess the diagnostic performance of a biomarker. Sensitivity is the capacity to identify a disease in patients where the disease is present (i.e., a true positive). In contrast, specificity is the capacity to rule out the disease in patients where the illness is truly absent. Because a biomarker might offer a diagnosis or estimate severity, the findings and discussion for sensitivity and specificities of HRCT and blood assays are tabulated and analyzed below.

Characteristics of Included Studies

Table 1: *Characteristics of included studies*

	Author	Study Design	Country	Cohort Size	Biomarkers studied / HRCT scan (if done)	Comments	NOS score
1.	Wang et al. 2020 [9]	Retrospective Cohort, single center	China	138	Neutrophil count, Lymphocyte count, LDH	Higher Neutrophil count, LDH and lower lymphocyte count are significantly correlated to severe critical cases	9
2.	Yang et al. 2020 [10]	Retrospective Cohort, multi center	China	149	Neutrophil count, Lymphocyte count, D-dimer, albumin, AST, creatinine, LDH, CRP, HRCT	CT scan cannot exclude the diagnosis of COVID-19 as some patients with COVID-19 can present with normal chest finding however high biomarkers levels can have diagnostic and prognostic prediction	6
3.	Zhou et al. 2020 [11]	Retrospective Cohort	China	191	Lymphocyte count, albumin, D-dimer, IL-6, creatinine,	Considered D-dimer > 4 g/mL could help clinicians to identify patients with poor prognosis at an early stage	7
4.	Diao et al. 2020 [12]	Retrospective Cohort	China	522	Lymphocyte count, IL-6	Reduction in T cell counts (<200 cells/cubic mm) and functionally exhausted T cells have poor prognosis in COVID-19 patients.	6
5.	Liu et al. 2020 [13]	Retrospective cohort, single center	China	40	Neutrophil count, Lymphocyte count, AST, LDH, creatinine, D-dimer, CRP	Higher degree of lymphopenia and proinflammatory cytokines are associated with COVID-19 disease severity.	8
6.	Feng et al. 2020 [14]	Retrospective cohort, single center	China	132	Lymphocyte count, Neutrophil count, CRP, IL-6, HRCT	Proposed CT scan as early screening could not satisfy every patient in COVID-19 outbreak and considered use of machine-learning algorithms to analyze clinical symptoms, biomarkers, and other clinical information as a good tool for diagnosis and early prediction of cases prognosis before further CT examination	7
7.	Qin et al. 2020 [15]	Retrospective cohort, single center	China	452	CRP, IL-6, Neutrophil count, Lymphocyte count	Compared inflammatory biomarkers levels in severe and non-severe COVID-19 cases	8
8.	Liu et al. 2020 [16]	Retrospective cohort, single center	China	140	IL-6, lymphocytes, neutrophils, AST, CRP, Creatinine, D-Dimer	Measured different biomarkers and correlated them with disease progression	6
9.	Wu et al. 2020 [17]	Retrospective cohort, single center	China	201	IL-6	Significantly correlated higher IL-6 (> 45 pg/ml) levels with disease severity	6
10.	Chen et al. 2020 [18]	Retrospective cohort, single center	China	99	IL-6	Considered high IL-6 levels one of the measures that may detect COVID-19 severity.	8
11.	Ji et al. 2020 [19]	Retrospective cohort, single center	China	33	CRP	Gives cutoff levels of CRP in COVID 19 patients with severe disease	7
12.	Etoga et al. 2020 [20]	Cross sectional single center	Came-roon	80	Cortisol	Observed higher levels of cortisol among COVID-19 cases who need further oxygen therapy as compared to cases with mild disease	9
13.	Ramezani et al. 2020 [21]	Cross sectional single center	Iran	30	Cortisol	This study significantly correlated higher levels of cortisol in non-survived patients of	6

14.	Li et al. 2020 [22]	Retrospective cohort, single center	China	132	CRP	This study recorded significant difference of CRP between mild and severe critical cases	7
15.	Tang et al. 2020 [23]	Retrospective cohort single center	China	183	D-Dimer	Recorded higher levels of D-Dimer among 16 non- survivor COVID-19 cases	6
16.	Zhang et al. 2020 [24]	Retrospective cohort single center	China	343	D-Dimer	They study considered D-dimer level on admission > 2.0 g/mL could effectively predict hospital mortality in patients with COVID-19	8
17.	Huang et al. 2020 [25]	Prospective cohort single center	China	41	IL-6, D-Dimer	Recorded higher levels of IL-6 and D-dimer among severe cases	7
18.	Cheng et al. 2020 [26]	Prospective cohort single center	China	701	Creatinine	They correlated high level of creatinine with severity and worse outcome in COVID-19 cases	8
19.	Luo et al. 2020 [27]	Retrospective cohort single center	China	35	LDH	Considered higher levels of LDH may indicate severity of the disease by their recorded levels of LDH in severe cases	6
20.	Li et al. 2020 [28]	Retrospective cohort single center	China	134	Lymphocyte count, Neutrophils count, D-Dimer, albumin, AST, Creatinine, IL-6, CRP	Reached cut off value for decrease in albumin levels with the progression of the disease even they considered it as an independent predictor (cut-off point: 35.1 g/L) of the risk of non survivors among critical COVID-19 cases	6
21.	Ferrari et al. 2020 [29]	Retrospective cohort single center	Italy	207	LDH	LDH higher level among COVID-19 cases and considered it may help in diagnosis of such cases	8
22.	Mo et al. 2020 [30]	Retrospective cohort single center	China	155	LDH	Recorded higher levels among complicated cases and correlated LDH biomarker with the development of the disease.	7
23.	Tao Ai, et al. 2020 [31]	Retrospective study	China	101	Chest CT	Chest CT has a high sensitivity for diagnosis of coronavirus disease 2019 (COVID-19). Chest CT may be considered as a primary tool for the current COVID-19 detection in epidemic areas.	6
24.	Kristof De Smet, et al. 2021 [32]	Retrospective secondary analysis	North America	197	Chest CT for SARS-CoV-2 Infection	Sensitivity in asymptomatic individuals was insufficient to justify its use as a first-line screening approach.	8
25.	Karimian, M. et al. 2020 [33]	Retrospective study	China	40 eligible studies with 4,183 patients	HRCT, Chest computed tomography	This study showed that HRCT in diagnosis of COVID-19.	7
26.	Lv, M. et al. 2020 [34]	Retrospective study	China	103 studies with 5,673 patients	Chest computed tomography	The sensitivity of chest HRCT in COVID-19 is 99%, suggesting that CT has the potential to be used as an assisting diagnostic tool.	9
27.	Huang, E. et al. 2020 [35]	Retrospective study	China	372	Computed tomography, RT-PCR	Results show high sensitivity, but poor specificity limits the routine use of chest CT as a primary tool for COVID-19 detection.	8

28.	Kim, H. et al. 2020 [36]	Retrospective study	China	217	CT and Reverse Transcriptase-Polymerase	The chest CT scans for the primary screening or diagnosis of coronavirus disease 2019 would not be beneficial in a low-prevalence region due to the substantial rate of false-positives. A cost-effectiveness analysis and assessment of practicability are warranted for chest CT in high-prevalence regions.	7
29.	Chang, T. et al. 2020 [37]	Retrospective study	Taiwan	189	Chest CT, Clinical characteristics and diagnostic challenges of pediatric COVID-19	The diagnosis is based mainly on typical ground glass opacities on chest CT and dominant is diagnosis of COVID-19.	6
30.	Hanif, et al. 2021 [38]	Descriptive study	Pakistan	94	HRCT Chest and RT-PCR	HRCT is not only superior in diagnosing COVID-19, but it is also prompt and commonly available. Thus, it is suggested that it may be implied as first line diagnostic test at least in time of pandemic.	7
31.	Guan et al. (2020) [39]	Cohort Study	China	109	D-Dimer	D-dimer levels much higher in those requiring ICU admission and invasive ventilation however statistical analysis not performed.	7
32.	Shi et al. (2020) [40]	Cohort Study	China	416	Cardiac Troponin	Significantly higher levels of hs-TnI in patients who require mechanical ventilation compared to those who do not	6
33.	Zhan et al. 2021 [41]	Cohort study	China	640	D-Dimer	D-dimer can predict severe and fatal cases of COVID-19 with moderate accuracy	8
34.	Ali et al. 2021 [42]	Cross-sectional study	Pakistan	70	HRCT Chest, PCR	High-resolution computed tomography (HRCT) is a reliable diagnostic approach in promptly detecting the COVID-19	7
35.	Abdelhady et al. 2022 [43]	Cross sectional study	Egypt	155	D-dimer, CRP, LDH, NLR and serum ferritin were assessed.	NLR with ferritin and LDH markers had higher degree of sensitivity and specificity in detecting adverse outcomes in COVID-19 patients.	7
36.	Butt et al. 2022 [44]	Retrospective cohort study	Pakistan	199	CORADS, CTSS, HRCT, RT-PCR	HRCT chest has high sensitivity and negative predictive value for diagnosis of COVID pneumonia on the basis of CORADS reporting scheme. However it has low specificity	6
37.	Milenkovic et al. 2022 [45]	Retrospective cohort	Serbia	318	D-Dimer, CRP, IL-6, PCT	IL-6 ≥ 74:98 pg/mL, CRP values ≥ 81 mg/L, procalcitonin ≥ 0:56 ng/mL, and D-dimer ≥ 760 ng/mL could effectively predict in-hospital mortality in COVID-19 patients.	6
38.	Gempeler et al. 2022 [46]	diagnostic test accuracy retrospective study	Colombia, UK, US	110	HRCT Chest, PCR, trauma	HRCT appears to be an additional screening tool that can easily detect PCR false negatives, which are reportedly highly frequent.	8
39.	Shim et al, 2022 [47]	Retrospective cohort study	Korea	210	HRCT, RDT, US as compared to RT-PCR	No significant difference between HRCT, RDT, US as compared to RT-PCR.	9
40.	Ebrahimzadeh et al, 2022 [48]	Retrospective	UK	51	Chest CT, SARS-CoV-2 infection	Chest CT is sensitive and moderately specific in diagnosing COVID-19. Thus, chest CT may have more utility for ruling out COVID-19 than for differentiating SARS-CoV-2	7

41.	Trujillo-Rodriguez et al. 2022 [49]	Prospective, multicenter	Spain	333	CRP, D-Dimer, LDH, IL-6, IL-8, IL-1β, TNF-α, (IFN-γ), macrophage inflammatory proteins 1α (MIP-1α) and β (MIP-1β), Interferon gamma-induced protein 10 (IP-10) and sCD25	LDH, D-dimers, neutrophil-lymphocyte ratio (NLR), and oral corticosteroids treatment were predictors of early discharge.	7
42.	Kashyapee et al, 2021[50]	Retrospective, cross-sectional study	India	1499	HRCT	HRCT is an excellent adjunct for initial diagnosis of COVID-19 pneumonia in both symptomatic and asymptomatic individuals in addition to the role of prognostic indicator for COVID-19 pneumonia.	6
43.	Pizzi et al, 2021 [51]	Retrospective study	Italy	120	HRCT	HRCT proved helpful in differentiating ground glass opacities of Covid-19 from Non-Covid-19 cases.	8
44.	Cho et al, 2021 [52]	Single-center retrospective cohort study	United States	158	D-Dimer	D-dimer levels are uniformly elevated in patients with COVID-19. Although standard predictive criteria failed to predict DVT, this analysis showed a D-dimer of less than 6494 ng/mL may exclude DVT.	6

Table 2: *Diagnostic accuracy of Chest Computed Tomography (CT) in detecting COVID-19*

	Author	Test Performance (Overall)			Comments
		Sensitivity (%)	Specificity (%)	Accuracy	
1.	Tao Ai, et al. 2020 [31]	0.97	0.25	Yes	Chest CT has a high sensitivity for diagnosis of coronavirus disease 2019 (COVID-19). Chest CT may be considered as a primary tool for the current COVID-19 detection in epidemic areas.
2.	Kristof De Smet, et al. 2021 [32]	0.89	0.73	Yes	Sensitivity in asymptomatic individuals was insufficient to justify its use as a first-line screening approach.
3.	Karimian, M. et al. 2020 [33]	0.95	---	Yes	This study showed that HRCT scan has little weakness in diagnosis of COVID-19.
4.	Lv, M. et al. 2020 [34]	0.99	---	Yes	The sensitivity of chest HRCT in COVID-19 is 99%, suggesting that CT has the potential to be used as an assisting diagnostic tool.
5.	Huang, E. et al. 2020 [35]	0.95	0.64	Yes	Results show high sensitivity, but poor specificity limits the routine use of chest CT as a primary tool for COVID-19 detection. Chest CT should only be arranged for individuals with certain clinical features in conjunction with RT-PCR tests.
6.	Kim, H. et al. 2020 [36]	0.94	0.37	Yes	The chest CT scans for the primary screening or diagnosis of COVID 19 would not be beneficial in a low-prevalence region due to the substantial rate of false-positives. A cost-effectiveness analysis and assessment of practicability are warranted for chest CT in high-prevalence regions.
7.	Chang, T. et al. 2020 [37]	0.93	---	Yes	The diagnosis is based mainly on typical ground glass opacities on chest CT and dominant is diagnosis of COVID-19.

8. Hanif, et al. 2021[38]	0.92	0.23	Yes	HRCT is not only superior in diagnosing COVID-19, but it is also prompt and commonly available. Thus, it is suggested that it may be implied as first line diagnostic test at least in time of pandemic.
9. Ali et al. 2021[42]	0.91	0.90	YES	High-resolution computed tomography (HRCT) is a reliable diagnostic approach in promptly detecting the COVID-19
10. Butt et al. 2022 [44]	0.99	0.37	Yes	HRCT chest has high sensitivity and negative predictive value for diagnosis of COVID pneumonia on the basis of CORADS reporting scheme. However, it has low specificity
11. Gempeler et al. 2022 [46]	0.91	0.73	YES	HRCT appears to be an additional screening tool that can easily detect PCR false negatives, which are reportedly highly frequent.
12. Shim et al, 2022 [47]	0.85	0.879	Yes	No significant difference between HRCT, RDT, US as compared to RT-PCR.
13. Ebrahimzadeh et al, 2022 [48]	0.91	0.56	Yes	Chest CT is sensitive and moderately specific in diagnosing COVID-19. Thus, chest CT may have more utility for ruling out COVID-19 than for differentiating SARS-CoV-2 infection from other causes of respiratory illness.
14. Kashyapee et al, 2021 [50]	0.73 (Asymptomatic) 0.71 (symptomatic	0.50 (Asymptomatic) 0.57 (symptomatic)	Yes	HRCT is an excellent adjunct for initial diagnosis of COVID-19 pneumonia in both symptomatic and asymptomatic individuals in addition to the role of prognostic indicator for COVID-19 pneumonia.
15. Pizzi et al, 2021 [51]	0.93	0.75	Yes	HRCT proved helpful in differentiating ground glass opacities of Covid-19 from Non-Covid-19 cases.

Table 3: *Prognostic value of biomarkers in predicting disease severity in COVID-19 patients*

Authors	Biomarkers	Sensitivity	Specificity	Comments
Tang et al. (2020) [23]	**D-Dimer**	0.77	0.61	Abnormal coagulation results with markedly elevated D -dimer (>12 µg/mL) are common in deaths with COVID-19
Zhou et al. (2020) [11]		0.52	0.6	D-dimer levels > 6 µ g/mL can help clinicians in identifying patients with poor prognosis at earlier stage
Guan et al. (2020) [39]		0.63 with	0.43 with	D-dimer levels much higher (>05 mg/L) in those requiring ICU admission and invasive ventilation however statistical analysis not performed.
Zhang et al. (2020) [24]		0.73	0.69	D-dimer on admission of >4.0 µg/mL could effectively predict in-hospital mortality in patients with COVID -19 and could be an early and helpful marker to improve management
Abdelhady et al. 2022 [43]		0.92	0.22	Role of D-Dimer is predictive in outcome of Covid-19.
Zhan et al. (2021) [41]		0.77	0.71	D-dimer can predict severe and fatal cases of COVID -19 with moderate accuracy. It also shows high sensitivity but relatively low specificity for detecting COVID-19 - related VTE events, indicating that it can be used to screen for patients with VT
Milenkovic et al. 2022 [45]		0.64	0.57	cutoff value of D -Dimer was 760 ng/ Ml. T his can effectively predict in hospital mortality in Covid-19 patients.
Trujillo-Rodriguez et al. 2022 [49]		0.69	0.75	D-dimers <698 ng/mL is associated with discharge during first week.

Cho et al, 2021 [52]		0.81	0.69	optimal D-dimer cutoff of 6494 ng/mL is helpful in determining the presence of deep vein thrombosis (DVT) in coronavirus disease-19 (COVID-19)-positive patients.
Abdelhady et al. 2022 [43]	**LDH**	0.79	0.47	NLR with ferritin and LDH markers had higher degree of sensitivity and specificity in detecting adverse outcomes in COVID-19 patients.
Luo et al. 2020 [27]		0.73	---	Higher LDH levels reported in severe patients.
Guan et al. 2020 [39]		0.58	0.47	Higher LDH >350 U/L levels present in majority of severe patients
Mo P et al. 2020 [30]		0.63	0.37	Higher LDH levels >625U/L present in majority of severe patients
Wang et al. 2020 [9]		0.43	0.21	Higher LDH > 400 U/L levels present in majority of severe patients
Trujillo-Rodriguez et al. 2022 [49]		0.69	0. 74	LDH <337 UI/L is associated with early discharge during first week.
Abdelhady et al. 2022 [43]	**Neutrophils/ NLR**	0.92	0.21	NLR can predict the adverse outcome (e.g., disease deterioration and shock) at cut-off 6.65, with 92% sensitivity and 20.7% specificity
Qin et al. 2020 [15]		0.67	0.32	Significantly higher in severe patients. Monitoring may aid in early screening of critical illness.
Wang et al. 2020 [9]		0.79	0.27	Severe patients had drastically lower WCC, checking low LC and high NC may help in early detection of disease progression.
Chen N et al. 2020 [18]		----	0.53	Surveillance of NC may reflect severity of lung abnormalities.
Trujillo-Rodriguez et al. 2022 [49]		0.69	0.74	NLR <4.76 is associated with discharge during first week.
Qin et al. 2020 [15]	**Lymphocytes**	0.88	----	Significantly higher in severe patients. Monitoring may aid in early screening of critical illness.
Wang et al. 2020 [9]		0.8	0.60	Severe patients had drastically lower WCC, checking low LC and high NC may help in early detection of disease progression.
Chen N et al. 2020 [18]		----	0.9	Surveillance of LC may reflect severity of lung abnormalities.
Qin et al. 2020 [15]	**Total leucocyte count (TLC)**	0.56	0.49	Significantly higher > 22000/microliter in severe patients. Monitoring may aid in early screening of critical illness
Wang et al. 2020 [9]		0.66	0.43	Severe patients had drastically lower WCC, checking low LC and high NC may help in early detection of disease progression.
Chen N et al. 2020 [18]		----	0.73	Surveillance of WCC may reflect severity of lung abnormalities.
Chen et al. 2020 [18]	**Interleukin-6**	0.61	0.34	Increased expression of IL-6 (72 ± 12 in serum is expected to predict the severity of COVID-19
Liu et al. (2020) [13]		0.36	0.24	Severity of COVID-19 could be predicted with baseline IL-6 levels
Diao et al (2020) [12]		0.86	----	Significantly higher baseline levels of IL-6 (167 mg/dl) in those requiring ICU compared to those who do not
Huang et al (2020) [25]		0.61	0.53	Significantly higher baseline levels of IL-6 in those requiring ICU compared to those who do not
Qin et al (2020) [15]		0.25	0.13	Significantly higher levels of IL-6 in severe and critical COVID-19. Surveillance may help in early screening of critical illness

Milenkovic et al. 2022 [45]		0.70	0.63	cutoff value of IL-6 for in-hospital death prediction was 74.98 pg/mL.
Abdelhady et al. 2022 [43]	**C-reactive protein**	0.89	0.21	Role of CRP (66.04 ± 44.89)is predictive in outcome of Covid-19.
Li H, et al. 2020 [22]		0.76	0. 56	Critically severe patients had significantly higher CRP than severe patients. (83.22 ± 32.21)
Liu et al. 2020 [13]		0.94	0.56	Significantly more patients in the severe group experienced higher CRP levels vs non-severe.
Qin et al. 2020 [15]		0.58	0.33	Higher levels of CRP (103.2—204 mg/dl) recorded in the severe group vs non-severe group are suggestive that CRP can be monitored to assess progression of disease.
Ji et al. 2020[19]		0.56	0.23	Stratifies patients by direct and indirect contact to Wuhan – does not assess severity
Wang et al. 2020 [9]		0.53	---	Greater CRP (>54.15) values are more prominent in critical group – indicating lung damage.
Milenkovic et al. 2022 [45]		0.67	0.60	cutoff value of CRP was 81 mg/L predictive of in hospital mortality.
Zhou et al. (2020) [11]	**Cardiac Troponin**	0.56	0.03	Significantly higher levels of hs-TnI in non-survivors compared to survivors
Shi et al. (2020) [40]		0.61	----	Significantly higher levels of hs-TnI in patients who require mechanical ventilation compared to those who do not
Cheng et al. 2020 [18]	**Creatinine**	0.39	0.77	Raised creatinine levels (> 4.5 md/dl) associated with poor outcome in COVID-19 infection.
Zhou et al. 2020 [11]		0.71	0.65	Serum creatinine on admission can effectively highlight kidney impairment in COVID 19 patients.

Diagnostic Accuracy of Chest CT in Detecting COVID-19

The diagnostic accuracy of Chest Computed Tomography (CT) in detecting COVID-19 is a subject of considerable interest, with varied findings across studies.

Several studies highlight the utility of Chest CT as a primary tool for COVID-19 detection, especially in epidemic areas where the prevalence is high.[8,34] However, concerns arise regarding the specificity of Chest CT, limiting its routine use as a standalone diagnostic tool.[35] In regions with lower prevalence, the substantial false-positive rate may impede the cost-effectiveness of Chest CT as a primary screening approach.[36]

The findings suggest a nuanced approach, advocating for the judicious use of Chest CT in conjunction with other diagnostic methods, such as RT-PCR tests, particularly for individuals with specific clinical features. This aligns with the recommendations of various studies.[35,36]

Prognostic Value of Biomarkers in Predicting Disease Severity

Table 3 presents the prognostic value of key biomarkers in predicting disease severity in COVID-19 patients. Notably, D-Dimer emerges as a prominent biomarker with varying sensitivity (0.52 to 0.92) and specificity (0.22 to 0.75). Elevated D-Dimer levels are consistently associated with adverse outcomes, including mortality, suggesting its role as a crucial prognostic indicator.[23,43]

Lactate Dehydrogenase (LDH) and Neutrophil-to-Lymphocyte Ratio (NLR) also exhibit prognostic significance, with varying sensitivity and specificity values. Higher LDH levels are consistently observed in severe cases, aligning with previous studies highlighting its association with adverse outcomes.[27,30]

NLR, a composite marker, stands out with a high sensitivity of 0.92, indicating its potential to predict adverse outcomes. The combination of NLR with other markers like ferritin and LDH enhances sensitivity and specificity, reinforcing its utility in assessing disease progression.[43]

Inflammatory markers such as Interleukin-6 (IL-6) and C-reactive protein (CRP) also show promise in predicting disease severity. IL-6 exhibits varying sensitivity (0.25 to 0.86) and specificity (0.13 to 0.75), emphasizing its potential as an early indicator of severe cases.[13,25] CRP, with a sensitivity range of 0.53 to 0.94, demonstrates its role in predicting adverse outcomes, aligning

with studies associating higher CRP levels with disease severity.[22,19]

Future Directions and Limitations

Navigating the complex terrain of COVID-19 diagnostics and prognostics underscores the need for future research to refine the integration of Chest CT with other diagnostic modalities. Addressing concerns about specificity, especially in regions with varying prevalence rates, necessitates tailored approaches to optimize the cost-effectiveness of Chest CT in COVID-19 detection.

In the realm of biomarkers, there is a compelling need for longitudinal studies that track the dynamics of these markers over the course of the disease. Understanding how biomarkers evolve could provide crucial insights into their utility in predicting disease progression and guiding timely interventions.

Despite the valuable contributions of existing studies, it is imperative to acknowledge the limitations inherent in the current body of evidence. The heterogeneity of study designs, patient populations, and methodologies across the included studies introduces potential sources of bias and may impact the generalizability of findings. Future research endeavors should strive for standardized methodologies, larger and more diverse cohorts, and collaboration across institutions to generate more robust and widely applicable conclusions.

Conclusion

In conclusion, this extended discussion seeks to unravel the complexities surrounding the diagnostic accuracy of Chest CT and the prognostic value of biomarkers in the context of COVID-19. The multifaceted nature of these diagnostic and prognostic tools necessitates a balanced and nuanced approach, considering both their strengths and limitations.

The interplay between sensitivity and specificity in Chest CT underscores the need for context-aware interpretation, especially in diverse epidemiological settings. Acknowledging the potential false positives and negatives becomes pivotal in guiding clinical decisions and resource allocation.

Similarly, the diverse landscape of biomarkers, each contributing uniquely to the prognostic puzzle, demands continued exploration. Future research endeavors should delve into the intricate dynamics of these markers, considering their potential in early identification of disease severity and subsequent clinical management.

As the global scientific community relentlessly pursues a deeper understanding of COVID-19, the findings from Chest CT and biomarker studies contribute valuable pieces to the evolving puzzle. Informed clinical decision-making, guided by a comprehensive understanding of these tools, is essential for optimizing patient care and navigating the dynamic landscape of the pandemic.

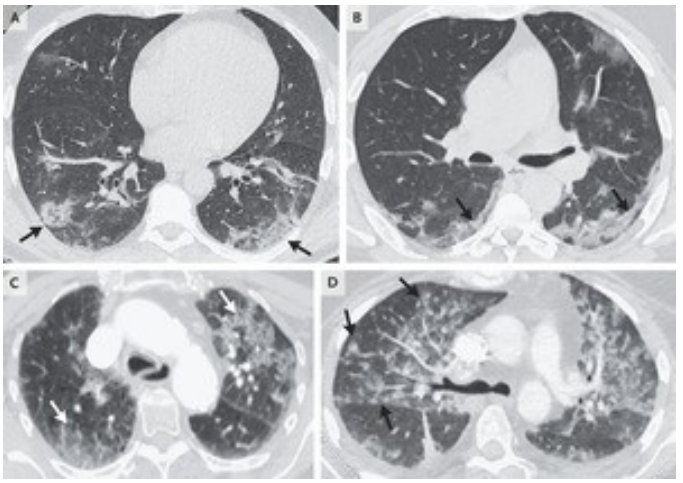

Figure 1: *Pattern of CT findings in Covid-19 patients.*[6]

Commonly reported CT findings of Covid-19 pneumonia include bilateral pulmonary opacities distributed in the peripheral lower lung and The opacities can be multifocal, are often rounded, and can have the reversed halo sign (Figure a and b), figure c shows pulmonary hemorrhage or edema, and figure d shows lobar or segmental consolidation or posterior confluent consolidation.

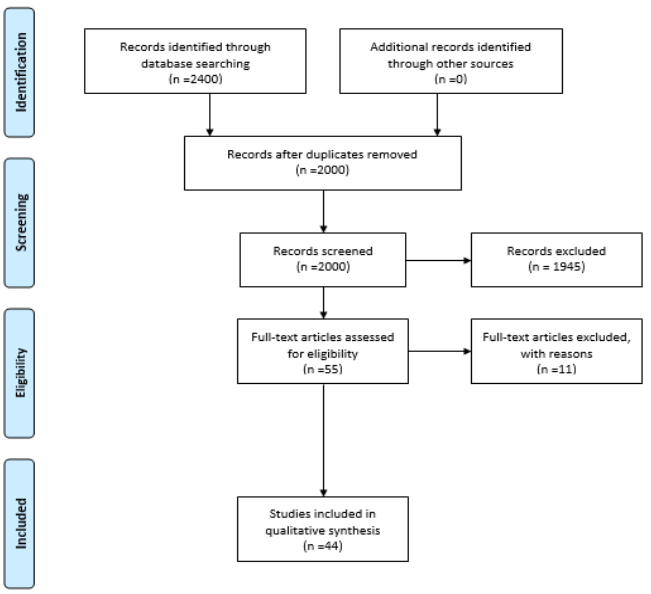

Figure 2: *Systematic review flow chart for literature refinement*

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Breastfeeding Practices and Their Association with Socio-Demographic Profile of Women Who Delivered Within Last One Year in Lahore, Pakistan

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Abstract

Objetive: To assess Breastfeeding practices and their association with sociodemographic profile of women who delivered within last one year in Lahore, Pakistan.

Materials and Methods: An analytical cross-sectional study was conducted in Akhtar Saeed Trust Teaching Hospital and Farooq Hospital Westwood branch Lahore from April 2022 to September 2022. A total of 210 record-based data of patients who delivered their babies in last one year in these hospitals were included. Nonprobability, convenience sampling technique was used. A self-structured questionnaire was used for data collection through phone calls. Data was entered and analyzed in SPSS version 23. Association between variables was assessed by applying chi-square test of significance and p-value of <0.05 was taken significant.

Results: Mean age of the participants was 28.86 ± 35 years. Out of total 210 study participants, the frequency of breastfeeding among women who delivered within last one year was 190(90%). Mothers who breastfeed their child shows significant association with provision of supplements to babies upon instruction by health care staff ($p=0.00$), not giving pre lacteal feed ($p=0.00$) and not using pacifiers ($p=0.00$)

Conclusion: Frequency of breastfeeding practices in the present study was optimal. Time of initiation breastfeeding after delivery, not giving pre lacteal feed, no use of pacifiers, mother's perception about recommendation of supplements to baby were strongly associated with maternal practice of breastfeeding.

Key words: Breastfeeding practices, infants, sociodemographic

How to cite: *Khan M, Faisel S, Manzoor I, Saif SB, Firdous S. Breastfeeding Practices and Their Association with Socio-Demographic Profile of Women Who Delivered Within Last One Year in Lahore, Pakistan. Esculapio - JSIMS 2023;19(03):268-272*

DOI: https://doi.org/10.51273/esc23.251319419

Introduction

Proper nutrition during the first thousand days of human existence is extremely important since it reflects general health state and reduces the probability of becoming prone to numerous chronic disorders.[1] According to the World Health Organization, newborns should only be breastfed for the first six months, after which supporting meals and nursing should be continued until they are two years old.[2] Worldwide prevalence of breastfeeding is only 41% among women those who started breastfeeding after one hour of delivery and only 42% of women provided exclusive breastfeeding to their children.[3] A study conducted in Australia shows 91% of women after delivery initiate breastfeeding.[4] Prevalence of exclusive breastfeeding is less in developed countries as working mothers cannot spare enough time while in developing countries the prevalence has increased to 37%5 Only 24-26% of neonates in South Asian nations such as Pakistan, Bangladesh, and India receive breast milk in the first 24 hours following birth.[6] In Pakistan, the percentage of breastfeeding is 77% for non-employed and 23% for employed women.[7] World Health Organization UNICEF Pakistan reports that only 34.3% mothers practice exclusive breastfeeding and 3.5% mothers are involved in early initiation of breastfeeding.[8] A study conducted in Lahore in 2017

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Submission Date: 22-08-2023
1st Revision Date: 05-09-2023
Acceptance Date: 05-12-2023

found that just 42% of newborns received colostrum as their primary dietary source. However, according to another study conducted at Jinnah Hospital Lahore, over 80% of mothers gave sole nursing, while 84% continued breastfeeding with complementary food.[9] Factors affecting breastfeeding practices include soreness of nipples, age of mothers, number of children, nighttime feeding, lack of knowledge among healthcare professionals, unhygienic measures, cultural credence, and lack of counseling.[10] The current study aimed to assess the breastfeeding practices and knowledge among women delivered within last one year at tertiary care hospitals in Lahore, Pakistan.

Materials and Methods

This study was carried out at Akhtar Saeed Trust Teaching Hospital, EME Sector, and Farooq Hospital, West Wood Branch, Lahore and included women from all socioeconomic backgrounds. This idea was conceived in April 2022 and got completed by September 2022. An Analytical Cross-sectional survey was the study design and it was conducted on record-based data of patients who delivered in these hospitals in last one year. Approval was taken from IRB and certificate was generated on 07-06-2022 with reference number M-22/85/CM. Before collecting data, the medical directors of the Farooq Hospital West Wood in Lahore and the Akhtar Saeed Trust Teaching Hospital in the EME Sector provided approval. Rao Soft calculator was used to estimate the sample size, at a confidence level of 95% and margin of error at 5% with prevalence of 38%, the sample size calculated was 210. Nonprobability, Convenience sampling technique was used to collect required sample. All women who gave birth in Akhtar Saeed Trust Teaching Hospital, and Farooq Hospital West Wood Lahore were included while women who were not willing to participate and women with still births and fetal loss were excluded. Data collection was done using a self-structured questionnaire. Data was collected through phone calls, which were retrieved from medical records. Pilot study conducted initially on 20 participants to make required changes in forms. Data was analyzed using SPSS (statistical package for social sciences) version 23. It was presented in the form of frequency tables and pie charts. Bivariate analysis was conducted to access the differences in breastfeeding practices with sociodemographic profile, women practices, and attitudes of health care professionals by applying chi square test of significance and p value was fixed at ≤0.05 to find out significant associations.

Results

The mean age of the participant's was 28.8±6.35 years. The frequency of breastfeeding practices among women

Table 1: *Sociodemographic status of the participant's (n=210)*

Characteristics	Frequency(n)	Percentage (%)
Age in years		
18-25	73	34.8
26-35	106	50.5
36-45	31	14.8
Education status		
Primary	47	22.4
Middle	44	21
Matric	33	15.7
Intermediate	30	14.3
Graduate	49	23.3
Post-Graduate	7	3.3
Occupation		
Unemployed	189	90.0
Employed	21	10.0
Family Type		
Nuclear	99	47.1
Joint	111	52.9
Age of last-born child		
Less than 3 months	51	24.3
3-6 months	102	48.6
7-12 months	57	27.1
Gender of last-born child		
Male	111	52.9
Female	99	47.1
Mode of Delivery		
C-Section	129	61.4
Vaginal	81	38.6
Place of birth		
Trust Hospital	95	45.2
Private Hospital	115	54.8
Breastfeeding Practices/breastfed their child		
Yes	190	90.5
No	20	9.5
Exclusive breastfeed		
Yes	68	35.8
No	122	64.2
Type of alternative milk used		
Formula milk	64	52.4
Cow milk	51	41.8
Buffalo milk	7	5.7
Use of pacifiers		
Yes	79	37.6
No	131	62.3

who delivered within last one year was 90% and 35% of mothers provided exclusive breastfeed to their last-born child. Women having age group of 26-35 years, intermediate education, less than or equal to three children, male gender, caesarean mode of delivery, time of initiation breastfeeding one day after delivery, pre lacteal feed not given to baby and those who received guidance by health care staff for exclusive breastfeeding showed higher rates of breastfeeding. Bivariate analysis shown in table 2 shows significant association with provision of supplements to babies upon instruction by health care staff (p=0.00), pre lacteal feed(p=0.00) and use of pacifiers(p=0.00).

Table 2: *Association between breast feeding practices, sociodemographic profile and attitudes of health care professionals.*

Variables	Breastfeed given	Breastfeed not given	Total	p-Value
Age of mother				
18-25	66(90.4%)	7(9.5%)	73	
26-35	98(92.4%)	8(7.5%)	106	0.35
36-45	26(83.8%)	5(16%)	31	
Education				
Primary	43(91.4%)	4(8.5%)	47	
Middle	40(90.9%)	4(9%)	44	
Matric	28(84.8%)	5(15.1%)	33	0.26
Intermediate	30(100%)	0(0%)	30	
Graduate	42(85.7%)	7(14.2%)	49	
Postgraduate	7(100%)	0(0%)	7	
Parity				
Less than or equal to 3	149(90.3%)	16(9.6%)	165	0.87
More than 3	41(91.1%)	4(8.8%)	45	
Age of last-born child(months)				
Less than 3	46(90.1%)	5(9.8%)	51	
3-6	94(92.1%)	8(7.8%)	102	0.65
7-12	50(87.7%)	79(12.2)	57	
Gender of baby				
Male	101(90.9%)	10(9.0%)	111	0.78
Female	89(89.8%)	10(10.1%)	99	
Mode of delivery				
Caesarean	114(88.3%)	15 (11.6%)	129	0.19
Vaginal	76(93.8%)	5 (6.2%)	81	
Pre-lacteal feed given to baby				
Yes	125(86.8%)	19(13.1%)	144	0.00
No	65(98.4%)	1(1.5%)	66	
Baby put on breast inside labor room				
Yes	83(91.2%)	8(8.8%)	91	0.70
No	107(89.9%)	12(10.1%)	119	
Trouble while breastfeeding in early hours after delivery				
Yes	64(90.1%)	7(9.9%)	71	0.90
No	126(90.6%)	13(9.4%)	139	
Received suggestion about feeding position				
Yes	89(92.7%)	7(7.3%)	96	0.31
No	101(88.6%)	13(11.4%)	114	
Received guidance by health care staff for exclusive breast feeding				
Yes	130(90.9%)	13(9.1%)	143	0.75
No	60(89.6%)	7(10.4%)	67	
Health care staff informed about WHO feeding policy				
Yes	68(89.4%)	8(10.6%)	76	0.70
No	122(91%)	12(9%)	134	
Receivedsupplies by Health care staff that promote breastmilk				
Yes	58(93.5%)	4(6.5%)	62	0.32
No	132(89.2%)	16(10.8%)	148	
Use of pacifiers				
Yes	65(82.2%)	14(17.7%)	79	0.00
No	123(95.3%)	6(4.6%)	129	
Mother's perceptions about recommendation of supplements to baby				
Inadequate milk supply	87(93.5%)	6(6.5%)	93	
Doctor's instruction	22(78.6%)	6(21.4%)	28	0.00
Difficulty in breastfeeding	6(54.5%)	5(45.5%)	11	
Health issues	10(83.3%)	2(16.7%)	12	
Mother's opinions about benefits of breastfeeding				
Easy to digest	95(90.5%)	10(9.5%)	105	
Prevent from diarrhea and infections	79(89.8%)	9(10.2%)	88	0.94
More convenient than formula milk	14(93.3%)	1(6.6%)	15	
Ensure child spacing	2(100%)	0(0%)	2	

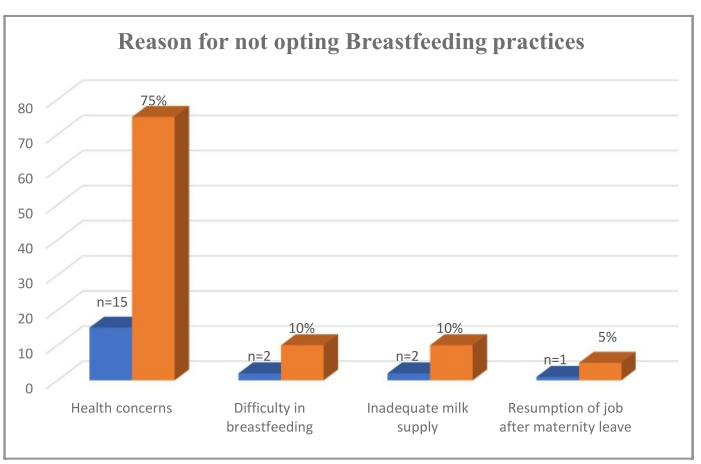

Figure1: *Reason for not opting Breastfeeding practices.*

Discussion

Breast-feeding is recognized as a public health priority world-wide, for the health of newborns and women. The World Health Organization recommends that infants should only be fed breast milk for the first six months of their lives, followed by supplementary foods until they are between one and two years old. The aim of this study was to establish the breastfeeding practices and their association with sociodemographic profile of women who delivered within last one year in Lahore. The frequency of breast-feeding practices among women who delivered within last one year was (n=190)90% in this study whereas in a similar study conducted in Dera Ghazi Khan the 93% of mothers breastfed their youngest child.[11] The present study showed that were 35.8% babies who were exclusively breastfeed whereas in another study conducted in Poland 57% of women exclusively breastfeed their infants.[12] This may be due to the fact that the woman in our study were less informed and less educated as compared to the women of Poland. In this study breast feeding was reported higher in the mothers who studied till intermediate as of them breast fed their child in contrast to a study conducted in Southern Punjab where the mothers who achieved more than middle school education were the highest to breastfeed their child.[13] It depicts that education plays a predominant role in informing public about advantages of breast feeding.

In this study, mothers with three or more children were more likely to breast feed their child which was similar to results of another study conducted in rural area of North India where significant association was found between breast feeding and increased parity.[14] It is therefore safe to deduce that mothers with subsequent pregnancies become more and more aware regarding the advantages of breast feeding their child.

Thirty-five mothers (48%) in the present study started breast feeding their child right after delivery. These results are similar to findings in a study conducted in India where initiation of breast feeding started immediately after birth was found in 40% of the cases.[15] The most prevalent cause cited in this survey for failure to breastfeed is related to maternal health concerns (75 percent) and poor milk production was used as an excuse by a minority of moms (10%). Contrary to these findings in a study conducted in India, the leading cause of breastfeeding failure was the perception by 41% of mothers that their breast milk was insufficient.[16] In this study 88.3% c-section females breast fed their children as compared to 93.8% who underwent vaginal delivery. In another similar study 42% mothers breast fed their child as compared to 28% of mothers who delivered via c-section.[17] This indicates that c-section was a hinderance for mothers in breastfeeding their children. In this study 98.45% of breastfed babies were not provided with prelacteal feed. However, a cross-sectional study conducted in Karaikal depicted that majority 75.6% of the mothers gave sole breastmilk and rest 24.4% introduced prelacteal food.[18] In this study, 90.6% of the breast-fed children did not face any trouble feeding in early hours after delivery. Similar results were observed in a cross-sectional study conducted in Denmark where 60% of the mothers faced no problems in breastfeeding their child.[19] In this study 89.4% mothers said that they were informed by the healthcare staff regarding WHO feeding policy whereas final outcome of a study conducted in India demonstrated that merely 15.60% mothers provided breastfeed to their children triumphantly in accordance with The Baby-friendly Hospital Initiative (BFHI), a global effort launched by World Health Organization to promote breastfeeding.[20] In this study, not using pacifiers as significantly associated (p-value 0.00) with breast feeding whereas in a previous study of United Kingdom, utilization of pacifiers, did not influence the prevalence or extent of exclusive and partial breastfeeding till four months of age in breastfeed infants who were full term and healthy.[21] In this study 50% mothers highlighted easy digestion of breast milk as the most important reason for motivating them to breast feed their child. In another study conducted in Shujabad, Pakistan 34% of mothers (n=17) named easy digestion to be a reason for breast feeding as compared to 58% who thought it prevents from diarrhea.[22] In this study inadequate milk supply was reported highest (93.5%) in breastfeeding mothers as a reason to give supplements to newborns. In another study conducted in Manitoba, Azad et al reported 27% of babies received supplements as the mothers thought milk supply was not sufficient.[23] The methods employed to acquire the data were uniform. First, the small participant population may have led to inadequate analysis is a weakness of this study. Secondly, because the participants' nursing habits were assessed using questionnaires filled out via phone interviews, this method is susceptible to social desirability bias, a problem that is frequently observed in questionnaire-based studies. All interviewers had extensive training prior to the start of the data collection process to reduce the captious verbal and nonverbal interaction and diminish the threat of social desirability bias.

Conclusion

In the current study, 90% of women breastfed their babies. Not giving pre lacteal feed, not using pacifiers and mother's opinion of the baby's supplement suggestion were all significantly associated with maternal practice of breastfeeding. Through community activities that support practical education, issues that affect breastfeeding should be addressed. Factors which influence breastfeeding should be addressed to the community through interventions which promote practical education.

Conflict of Interest: *None*

Source of Funding: *None*

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Original Article

Peter Pan Syndrome Among Students of Pakistani Universities: A Cross-sectional Study

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Abstract

Objective: The aim of the study was to investigate the presence of Peter pan Syndrome (PPS) among men and women in Pakistani universities and to examine the relationship between age and Peter Pan Syndrome.

Material and Methods: This was a cross-sectional study conducted at Hide here text from Editor from February 2023-June 2023. The sample size comprised of 352 students (age: 15-30 years old) from different universities of Lahore. Data was collected using google forms with questions from six different dimensions based on characteristics of the syndrome. Frequency percentages were calculated from descriptive data. The correlation between each question and the different demographic variables was then determined individually by using Pearson's correlation by using SPSS.

Results: The mean age of participants was found to be 20 years and standard deviation was 2.75. Dimension of belief systems led us to our results that Peter Pan Syndrome is not prevalent in Pakistani youth because 90.8% of the participants considered it necessary to keep positive attitude towards changing for the better and expanding the horizon of their knowledge. Answers to other questions in this dimension also supported the result. There was no significant correlation between gender and prevalence of Peter Pan Syndrome and a weak negative correlation of age with the prevalence of this Syndrome.

Conclusion: Current study found no statistically significant association between gender and the prevalence of PPS, Also, the prevalence of PPS was decreasing with advancing age among university students. The dimension of belief system and cognitive dimension also provided prominent evidence that PPS is not much prevalent among these students.

Keywords: Peter Pan Syndrome, Pakistan, University students, Belief systems

How to cite: *Ali S, N, Tauseef A, Ijaz F, Meral U, Zaheer S, Aftab RK. Peter Pan Syndrome Among Students Of Pakistani Univerities: A Cross-sectional Study. Esculapio - JSIMS 2023;19(04):480-486.*

DOI: https://doi.org/10.51273/esc23.251319420

Introduction

The transition to adulthood requires not only that the person grow physically from a biological point of view, but it is also important that individuals develop a perception of the realities of the world and acquire appropriate behavior towards the various responsibilities of adulthood along with the development of their own cognition and understanding.[1]

The term "Peter Pan Syndrome"(PPS) is used to describe people who grow physically but not mentally and therefore remain in childhood for the rest of their lives. People who suffer from PPS have difficulties in their social and professional relationships because of their carefree and childlike behavior. Quadrio has described PPS as difficulties due to the lack of responsibility and immature behavior.[2] Kiley used the character of Peter Pan to represent those people in real life who grow up physically but are unable to take their responsibilities because of their poor mental abilities (Kiley suggested the term).[3]

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Submission Date: 06-09-2023
1st Revision Date: 26-09-2023
Acceptance Date: 06-12-2023

Barrie's fictional character, Peter Pan, illustrates a boy who is hesitant to grow up and doubts his ability to develop according to his role in the community.[4] McIndoo highlights that "in today's society, reaching adulthood is the natural end of adolescence," while the harsh reality is that reaching a certain age does not ensure that the person will take on the responsibilities and obligations that come with that stage.[5]

The study by Kiley on PPS shows that people with PPS present with common symptoms, i.e., (A) emotional paralysis: PPS people are reluctant to show emotions or express in inappropriate ways (B) dilatoriness: they procrastinate and do not have set targets (C) social impotence: they cannot socialize properly and often feel alone in crowded places. They are unable to make real friends (D) magical thoughts (living in fantasy): they like to live in their delusional world and do not accept their mistakes (E) mother's calendar: when they interact with women, they view them as their mothers and want them to behave as one (F) father's calendar: they experience problems with men who are dominating because they themselves are narcissistic (G) sexual calendar: they have weak social relationships with opposite gender.[3] Current study for checking PPS in people was based on these symptoms. In recent years, many studies have been conducted to find that PPS is very widespread. Vietnamese students conducted a survey at their universities to investigate students' views of the syndrome.[6] A survey was also conducted on the prevalence of PPS in mountain climbers. It was found that hikers often view mountaineering as an escape from their duties and in this way neglect their social obligations.[7] One study also found that many husbands of adolescent wives commit morally wrong acts, such as alcohol abuse, to avoid responsibility for their household.[8] One of the main causes of anorexia in female patients was that they did not want to mature mentally and therefore preferred to keep their bodies small.[9]

Many studies have given a detailed review about the PPS. Children who grow under the supervision of strict and ruling parents are unable to manage and express emotions and fight with the social and academic systems set by society as they fail to adjust appropriately to the norms. This may be because they have spent a great part of their lives under environmental conditions not conducive to personal growth resulting in their inability to express themselves naturally.[10]

We should understand that not taking up your responsibilities is acceptable until a certain age after which persistence of such behavior comes under the roof of PPS. If an individual does not opt for one of the alternatives, it leads to development of many symptomatic behavior expressions discussed by many other researchers also.

Bruch describes PPS in anorexic patients, specifically girls. These females are anorexic and eat less to look younger. As a result, their regular menstrual cycle is not normal and so they pretend to be younger than their actual age, all to flee from duties that come with adulthood. These females suffer from PPS and show social and emotional anxiety.[11]

The children who receive limited attention from their parents and society in general, refuse to grow older. Their perception is that love for them will diminish even further if they grow old. For seeking attention of their parents and other people they act as if they are still innocent children even when they grow physically to become adults.

Another element of PPS is that sometimes adults come back to adolescence during a certain period of their life instead of children not growing to adults to run away from their responsibilities whenever they find themselves being cornered by the hardships of life.

Amanto etal in his study that developing friendships with the same sex in childhood and then stepping into adulthood with these same relations should be very precise.[12] If one does not care about his/her intersexual relationships, then this reflects poorly on his personal grooming and personality leading to PPS.

Mitchell and Masterson have also given similar views about PPS.[13] In today's world most people avoid growing up. They consider it a necessity for survival and fear working independently. They do not want to take life seriously and they resist to stand accountable for their deeds. Gradually, they find an easy way out of every situation.

A study done by Dalla et al on adolescent Navajo mothers and their male partners, PPS was thought to be more common in males than females.[8] So, keeping in view of these research findings, we conducted this survey to fill the gap created by the lack of research on Peter Pan syndrome in the Pakistani population. The main objective of the survey is to find out if the syndrome is more prevalent in men than in women. The main hypothesis we deduced was that there should be no relationship between gender and PPS; and the second hypothesis was that age should have a negative correlation with the PPS symptoms. PPS has also been recognized as a

problem in Western society. The aim of current study was to find out if this is also the case in Pakistani society.

Material and Method

This was a cross-sectional study conducted at Hide here text from Editor from February 2023-June 2023. The participants were students from different universities in Lahore. The participants were aged between 15 to 30 years. The sample size was 382, of which 50% (N=191) were female and 50% (N=191) were male. Sample size was calculated using the formula n=(Z^2×P×(1-P))/e^2 where confidence interval came out to be 95% which is equal to 1.96 and margin of error was 5%. All participants gave consent after being informed of the purpose of the survey. Individuals with various clinical conditions who were taking medications that interfered with their ability to perform their tasks (antidepressants, pain medications, and sedatives) and individuals with other mental illnesses or developmental disabilities such as autism were excluded from the study. Data was collected using Google forms, and informed consent was obtained. The questionnaire had two main sections. First, participants had to fill out the demographic information (age, college, gender, degree, year of study, residency status). Then in second section, six different dimensions of Peter Pan syndrome were presented, reflecting the strong features of the syndrome in the form of questions that participants were asked to answer. Cognitive dimension; Emotional dimension; Self-consciousness dimension; Spirit dimension and Social Dimension.[14] Response options consisted of a Likert scaling from "very frequently", "frequently", "occasionally" to "rarely" and "never". The dimension of worldviews and belief systems consisted of seven questions with "right" and "wrong" options.

The data from the questionnaire was analyzed by using SPSS version 26. Frequency percentages were calculated from descriptive data. The correlation between each question and the different demographic variables was then determined individually. Symmetric measures such as Pearson's constant R and Spearman's correlation were used. P-value less than 0.05 will be consider significant. Ethical guidelines were followed for this study and informed consent was obtained from all participants. The identity of the participants was not disclosed. The study was conducted following the declaration and approval of the Ethics Committee of (removed for blind peer review) Medical College.

Results

Table 1 shows the demographic information of the participants including age and gender which served as important variables for the study. Prevalence varied across age groups, with highest prevalence observed among age group 15-20. 66% of the participants were between 15 and 20 years old, 32.7% were between 21 and 25 years old, and 1.3% were between 26 and 30 years old. Table 2 shows the manifestation of Peter Pan Syndrome based on cognition, emotion , dimension of self-consciousness, spiritual and social dimensions. The findings in Table 2 show that 45.8% of students totally agreed and 36.9% of students agree with the view "Thinking that one must have big dreams in life". Majority of the students are emotionally challenged as they are unable to express their feelings (Very frequently=23.6%, Frequently= 32.5%). This is followed by lack of self-confidence (Very frequently= 22%, Frequently= 24.9%). 17% of the participants very frequently and 34.3% frequently are flattered by any praise that they receive. Table 3 shows the dimension that introduces results that indicate that certain traits of Peter Pan Syndrome pertaining to belief systems were not found in the youth. Major percentage of participants believe that it is important to set clear goals (79.1%) and work hard to maintain a stable source of income (69.6%). An important finding that shows that majority of the youth of Pakistan does not suffer from Peter Pan Syndrome is that they consider it necessary to keep a positive attitude towards learning (90.8%). Table 4 shows the Pearson's R value for each question. Correlations table was obtained which indi-

Table 1: *Demographics of study participants*

		N	%
Gender	Male	191	50.0
	Female	191	50.0
Age	15-20	252	66.0
	21-25	125	32.7
	26-30	5	1.3
Degree	MBBS	210	55.0
	BDS	8	2.1
	Others	164	42.9
Year of study	1	155	40.6
	2	123	32.2
	3	38	9.9
	4	32	8.4
	5	34	8.9
Residential status	day scholar	233	61.0
	hostellite	149	39.0

Table 2: *Cognitive Dimension and Emotional Dimension of PPS*

	very frequently	frequently	Occasio-nally	rarely	never
COGNITIVE DIMENSION					
Thinking that living for the day will be okay without thinking of tomorrow	12.8	22.0	36.1	17.5	11.5
Thinking that one must have big dreams in life	45.8	36.9	12.8	2.9	1.6
Thinking that the purpose of learning is unnecessary	7.3	8.1	16.5	22.3	45.8
Thinking that hurting and retaliating against others is common	10.7	20.7	22.0	20.9	25.7
Thinking about whatever happened, I always put myself first in any situation	16.2	24.1	31.4	17.0	11.3
EMOTIONAL DIMENSION					
It is difficult to control emotions and emotional explosions	19.9	22.5	25.9	23.0	8.6
It is challenging to express emotions with others	23.6	32.5	26.7	12.0	5.2
Lack of self confidence in decision making if there are no parents' agreement/consent	22.0	24.9	19.4	22.0	11.8
When no one besides me is sad, so I want someone by my side	16.5	19.6	18.6	22.8	22.5
Be unable to get along with others of the same age and sex	13.1	12.3	16.8	29.8	28.0
Self-Consciousness Dimension of PPS					
It is easy for me to get satisfied when others praise me	17.0	34.3	29.3	13.9	5.5
Highly appreciating my job and assuming that others job is unimportant	4.7	10.5	12.6	25.4	46.9
Do not listen to other people's views when there is some difference of opinion	7.3	13.4	17.5	29.6	32.2
I am not ashamed of being considered a child	14.7	22.3	21.5	17.0	24.6
I always turn to someone because I am afraid of facing sadness alone	11.5	14.7	16.8	25.9	31.2
SPIRIT DIMENSION					
Impulsive behavior and hard to control leading to extreme words and Actions	14.9	19.1	23.3	31.9	10.7
I do not want to care about the hard problems at present	10.7	23.6	22.8	25.9	17.0
It is easy to quit a job or to study when something goes wrong	9.7	14.7	23.8	25.7	26.2
I am lazy to do household chores or take care of myself	16.2	23.6	22.5	20.7	17.0
I am reluctant and unable to make decisions when needed	11.8	19.9	22.3	24.1	22.0
SOCIAL DIMENSION					
Telling a lie in relationships is normal	9.2	12.8	13.6	24.1	40.3
Blaming teachers (superiors) when something went wrong in studying (or working)	8.6	14.4	19.1	25.1	32.7
I want to fall in love quickly when meeting someone but after that, I want to break up	8.1	10.2	9.4	13.6	58.6
Saying something bad about my friends	5.0	7.3	9.2	30.6	47.9
Be willing to give upon relationship with friends if I do not like them anymore	12.6	13.4	19.4	24.9	29.8
Tormenting my family by acting like a child	8.9	11.8	12.0	20.4	46.9

Table 3: *Dimension of worldviews and belief systems*

	Right	Wrong
Setting clear goals and making life plans	79.1	20.9
Striving for a permanent job and promotion in the future	69.6	30.4
I need to express self-beliefs in life	75.1	24.9
Keeping high self-esteem always is important	81.2	18.8
Calculating productivity and efficiency (financial management, expenditure organization) is important	85.5	14.5
Dare to think, dare to act and dare to take risks	78.3	21.7
Being active and positive to learn more soft skills, computer skills and foreign languages are important	90.8	9.2

cated no significant correlation between gender and prevalence of Peter Pan Syndrome and a weak negative correlation of age with the prevalence of this Syndrome.

Discussion

The objectives for current study were to determine the prevalence of Peter Pan syndrome among men and women in Pakistani universities and to examine the relationship between age and PPS.

No significant correlation was found between PPS and gender. One explanation for the lack of gender differences in the current study could be the fact that the sample was university students, who tend to be younger

Table 4: *Relation of Peter Pan Syndrome with Age and Gender*

	Pearson's r value (gender)	Pearson's r value (age)
Thinking that living for the day will be okay without thinking of tomorrow	.007	-.038
Thinking that the purpose of learning is unnecessary	.112	-.074
Thinking about whatever happened, I always put myself first in any situation	.088	-.064
Be unable to get along with others of the same age and sex	.021	-.027
It is easy for me to get satisfied when others praise me	.081	-.025
Highly appreciating my job and assuming that others job is unimportant	.221	-.125
Do not listen to other people's views when there is some difference of opinion	.079	-.083
I always turn to someone because I am afraid of facing sadness alone	.056	-.031
It is easy to quit a job or to study when something goes wrong	.167	-.026
Telling a lie in relationships is normal	.240	-.044
Blaming teachers (superiors) when something went wrong in studying (or working)	.142	-.046
I want to fall in love quickly when meeting someone but after that, I want to break up	.212	-.123
Saying something bad about my friends	.222	-.047
Be willing to give upon relationship with friends if I do not like them anymore	. 161	-.065

and have not yet fully assumed adult responsibilities, such as employment and financial independence. As a result, gender inequalities may be more pronounced in PPS older groups who have already taken on more adult responsibilities. The hypothesis that manifestations of PPS should decrease with increasing age was also supported by the results. According to a survey conducted in a private medical college, students in the first year of study had higher stress levels than students in the final year of study.[15] This shows that with increasing age responsibilities increase and as students approach their professional life their stress levels increase. They are required to step out of their comfort zone and accept their duties, naturally increasing stress levels. Thus, it can be deduced that with age there is reduction of symptoms of PPS.

The data analysis on the cognitive dimension revealed that most students had big dreams and felt that living in the present was not enough and that they needed to worry about the future. They were aware of the importance of learning and in this way their futuristic approach towards life was highlighted.

According to the emotional dimension, people with Peter Pan syndrome should have a lack of emotional expression and low self-esteem. Such people hide their true feelings, which is considered hypocrisy, as they seem to be happy even though their soul is soaked in loneliness and despair. The true level of maturity is when a person can free himself from the shackles of his mind and give free rein to his emotions to do something productive, rather than bottling up his emotions. The results show that many students chose the "frequently" option when asked if it was challenging for them to express their emotions. This points towards the fact that they failed to develop emotional maturity and were frightened to confront their sentiments. This goes hand in hand with the PPS.[16] Moreover, most of the participants wanted parental approval before making decisions and were indecisive without their parents' guidance. Reliance on others for making decisions for you and people having the power to manipulate your actions is another sign of PPS.

People who suffer from PPS do not criticize themselves and their abilities. As a result, they have no room for improvement and are satisfied with what they have, with no signs of struggle or effort. Such people find it easy to be satisfied when someone praises them. Although most participants answered that they are often satisfied when praised by others, other variables in this dimension showed more neutral results, with almost equal numbers of participants choosing "often" and "never" for the variables, so no clear conclusion was possible.

Most prominent results were for the worldviews and belief systems dimension which indicated that PPS is not prevalent in the participants according to this dimension. Most students had clear goals and indicated that they wanted a permanent job and a promotion. This finding suggests that students had strong belief systems and the fundamentals of life were crystal clear to most participants. According to research carried out on students, it was found that those students who had firm faith system and cultural ties were academically more resilient.[17] They had exceptional abilities to deal with academic challenges and in this way with life challen-

ges as well.

One manifestation of PPS in college students is antisocial behavior. This means that people with this syndrome find it difficult to communicate and socialize, which is a core human trait. They stay in their own shell and show impulsive behavior. They are unable to make spontaneous and rational decisions and refuse to take responsibility due to their careless nature. Individuals with PPS oppose the socio-emotional selectivity theory which states that as humans grow older, they learn to prioritize important relationships considering the limited time and opportunities they have in life.[18] They isolate their future from the present and make reckless decisions. Our results showed mostly negative results for the social dimension, which means that this expression was not found in the participants. Students rarely blamed a teacher for a mistake, refused to lie in a relationship, and refused to say anything bad about their friends. These findings are at odds with Kiley's claims.[3]

The data analysis of current study shows that the students in the study were not restrained in decision making, were very enthusiastic about their work/studies, but were mostly lazy and rarely controlled their impulsive behaviors and struggled to control extreme words and actions, which is consistent with Kiley's study.[3]

This study also has some limitations. One limitation for the study could be that we chose a small sample, i.e., only the population of Lahore universities was asked to fill the consent form. Therefore, the sample size should be increased to get better results. Another limitation could be the age of the participants i.e. we selected only a narrow age range for the study. So, the age spectrum should also be widened to get better results. In addition, our study was a cross-sectional study that examined only a small population at a specific time point. To obtain accurate results, the study should be longitudinal, that is, the variables should be examined over a longer period rather than only at a specific point in time to observe life attitudes and behaviors related to Peter Pan syndrome.

Conclusion

Current study found no statistically significant association between gender and the prevalence of PPS, Also, the prevalence of PPS was decreasing with advancing age among university students. The dimension of belief system and cognitive dimension also provided prominent evidence that PPS is not much prevalent among these students. To address PPS in university students and help them transition to adulthood, this information will be helpful in developing interventions. In addition, the current study highlights the need for additional research to examine the origins and maintenance of PPS and its impact on social and academic functioning.

Conflict of Interest *None*

Funding Source *None*

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Percutaneous Tracheostomy in ICU of Lahore General Hospital. A Cross-Sectional Study

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Abstract

Objective: To determine the frequency of complications associated with percutaneous tracheostomy in ICU of Lahore general hospital.

Material and Methods: It was an observational cross-sectional study conducted in surgical ICU of Lahore general hospital, Lahore, Pakistan. It was conducted over the time period of 2 years starting from July, 2019 to June, 2021. Patients above 18 years and who underwent percutaneous tracheostomy during this time were included. After proper sedation and paralysis, percutaneous dilatational tracheostomy is performed using Smiths medical protex commercial tracheostomy set with Seldinger technique. Patient's characteristics along with complications of tracheostomy including blood loss, pneumothorax, sub cutaneous emphysema, infection and mortality were recorded and analyzed. Complications were expressed in frequency and percentage.

Results: Total 72 patients were included in this study. Acute respiratory distress syndrome (ARDS) was found in 38.9% patients being most frequent diagnosis at time of PDT. Severe bleeding >250 ml was observed in only one case at the time of procedure. One patient developed pneumothorax after 3 hours of procedure. 5.6% of the patients had developed stoma infection within 7 days. 23.6 % of the patients had mortality within 7 days due to other complications.

Conclusion: Percutaneous dilatational tracheostomy is a safe procedure for critically ill patients in ICU and holds low complications rate.

Keywords: Percutaneous, Tracheostomy, Infection, Bleeding, Complications

How to cite: *Saqib M, Kafle A, Rubab U, Hamza M, Jodat A, Saleem J. Percutaneous Tracheostomy in ICU of Lahore General Hospital. A Cross-Sectional Study. Esculapio - JSIMS 2023;19(04):487-490.*

DOI: https://doi.org/10.51273/esc23.251319421

Introduction

Tracheostomy is done to maintain the airway patency and to avoid the complications related to prolonged placement of endo-tracheal tube (ETT).[1] With development of recent advances in intensive care unit (ICU), number of patients with mechanical ventilation has increased, along with number of tracheostomies. Around 7% of patients who require mechanical ventilation require tracheostomy. Most common cause of tracheostomy is acute respiratory failure. Some of the other causes are: obstructed upper airway, anticipated prolong need of mechanical ventilation, failure of intubation and major traumas. Increasing number of tracheostomies is a potential economic burden for the health care system and cost effective method for tracheostomy should be evaluated and applied.[2]

Surgical tracheostomy (ST) and percutaneous dilatational tracheostomy (PDT) are two commonly practiced methods. ST are generally performed by surgical team in operating theater. In this method pretracheal tissue is dissected and tracheostomy tube is inserted inside trachea under direct vision.[3] In PDT pretracheal tissue

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Submission Date: 28-08-2023
1st Revision Date: 15-09-2023
Acceptance Date: 10-12-2023

is bluntly dissected with commercially available kits and tracheostomy tube is inserted in trachea using seldinger's technique. This methods are generally performed bedside in ICU by intensivist.[4]

Along with indications there are some contraindications for performing tracheostomy. Unstable patients, infection on the site of surgery, bleeding diatheses are some of them.[5] Early complication of tracheostomy includes bleeding, pneumothorax, hypoxia, subcutaneous emphysema, posterior tracheal wall puncture. Late complications includes surgical site infection, tracheal erosion to nearby structure, tracheal stenosis, dysphagia and hoarseness of voice.[6,7] Performing percutaneous tracheostomy need expertise and complications rate also differs among ICU's. Still majority of tracheostomies are performed by ENT surgeon in the operating room. Percutaneous tracheostomy is being recently performed in our hospital, we need to identify the incidence of possible complications to reduce morbidity and mortality. So, with this study we want to evaluate the safety of percutaneous tracheostomy in our ICU with available resource and expertise.

Materials and Methods

This cross-sectional study was conducted over 2 year's duration, starting from July, 2019 to June, 202 in surgical ICU of Lahore general hospital, Lahore, Pakistan. Permission from institutional ethical committee (IRB no: 00/077/2019) was taken prior conduction of this study. Proper written consent was taken from the immediate guardian or caregiver of patients.

Patients aged > 18 years, intubated and expected the need of prolonged mechanical ventilation were included. Those patients with deformities of anterior neck, who had previously undergone tracheostomy, patients having bleeding disorder, patients with platelets less than 75000/ml and having INR ≥ 1.5 were excluded.

All the tracheostomy were performed at bedside by intensivist. It was performed using Smiths medical protex commercial tracheostomy set. Before the procedure, patients were sedated and paralyzed with propofol and atracurum. Nalbhuphine 0.1mg/kg was given for anelgesia. Patients were made to lie on supine position with neck extended. Endo-tracheal tube was repositoned slight upward from the site of tracheostomy to be performed. Following all asceptic measures needle was inserted between 1st and 2nd tracheal ring which was confirmed with bronchoscope. Serial dilatation was made using dilators to widened stoma. Tracheostomy tube was inserted and fixed with suture and silicon band. After tracheostomy patients were attached with ventilator and routine treatments were provided.

Patients data including age, sex, weight, diagnosis, procedure time, complications like: intraprocedural bleed, pneumothorax, subcutaneous emphysema, mortality up to 7 days and infection of stoma were recorded. Bleeding from 30ml-100 ml was considerd as mild, 100ml-250ml as moderate and greater than 250ml as severe. Any pus discharge or erytherama > 1cm around the stoma was considered as stomal infection. All data were analyzed using SPSS ver.23.

Results

Total 72, percutaneous dilatational tracheostomy (PDT) were performed during this time period. Out of 72 patients, 42 (58.3%) were male and 30 (41.7%) were females. Minimum age of patient was 19 years and maximum was 74 years. Mean age of patients was 46.20 ± 13.24 years. Acute respiratory distress syndrome (ARDS) was the most common diagnosis at the time of tracheostomy comprising 28 (38.9%) and trauma was second commenest diagnosis 17(23.6%). Mean procedure time from skin incision to placement of tracheostomy tube was 17.26 ± 2.71 minutes.

Table 1: *Patients characteristics*

Male (n, %)	**42**	**58.3%**
Female (n,%)	30	41.7%
Age (mean ± SD)	46.20 ± 13.24 years	
Procedure time (mean±SD)	17.26 ± 2.71 minutes	
Diagnosis		
Acute respiratory distress syndrome (ARDS) (n,%)	28	38.9%
Guillain barre syndrome (GBS) (n,%)	8	11.1%
Trauma (n,%)	17	23.6%
Meningio-enchephlitis (n,%)	4	5.6%
Others (n,%)	15	20.8%

Table 2: *Observations related to tracheostomy (N= 72)*

		Numbers	**Percentage**
Blood loss	Mild (up to 100) ml	68	94.4 %
	Moderate (100-250) ml	3	4.2 %
	Severe (>250ml)	1	1.4 %
Pneumothorax		1	1.4 %
Surgical emphysema		0	0 %
Infection		4	5.6 %
7 days mortality (not related to PDT)		17	23.6 %

Out of 72 patients, moderate bleeding was observed in

3 (4.2%) and severe bleed was seen in 1 (1.4%) of patients. No patients deveoped surgical emphysema, but unfortunately one patient developed pneumothorax after tracheostomy. Infection of the stoma was noticed in 4 patients, which was 5.6 % of total patients who underwent PDT. Seventeen patients died within 7 day of tracheostomy. Death of the patients was due to other complications, not due to tracheostomy.

Discussion

Our study was conducted to look the safety of percutaneous tracheostomy performed by intensivist in intensive care unit. Many studies are conducted in this topic and investigators are sharing their experiences from many countries. They are evaluating the safety of the procedure in different population.[8,9] We found that percutaneous tracheostomy is a safe procedure when done by an intensivist in ICU among critically ill patients. Only one patient (1.4%), had bleeding which was greater than 250 ml. Bleeding was manageable and not life threatening. Incidence of pneumothorax was also observed in one patient, which was managed with chest tube insertion. Four patients 95 (5.6%) of patients had infection at the site of surgical tracheostomy which was not severe and managed with local dressing and antibiotics. Mean time for the procedure time was around 17.26 ± 2.71 minutes.

Similar articles also observed low complication rates in percutaneous tracheostomy, is less expensive and needs less time to perform. It is generally performed by an intensivist inside ICU, so risk of transferring the critically ill patients to operating room can be nullified[(9-11)]. Study by Vipin et.al. found similar incidence of bleeding among 4% of patients who underwent percutaneous tracheostomy.[12] Incidence of bleeding was 2.4 % in another study.[13] Another study found slight higher percentage of bleeding ranges from 7.8% of the patients undergone PDT which was higher than that of our findings.[14] The difference in bleeding may be due to difference in expertise and equipment's used. In an observational cohort study, patients who had PDT had low incidence of complications which were bleeding 0.8%, pneumothorax 0.8% and mortality of 13.7%, which were comparable to our results.[15] Time taken from the skin incision to placement of tube was 17.26 ± 2.71 minutes, which was comparatively higher than the other literature findings.[16] It may be due to expertise of performer and procedural delay. Study by Silvester et.al found rate of infection in PDT to be 4.44% which was similar to our findings 5.6%.[17] Mortality within 7 days from the date of procedure was 23.6 %. Mortality was due to various other reasons and was not related to tracheostomy procedure.

On the basis of findings of our study along with other similar studies, we could say that PDT is safe procedure and holds low complications. It could be beneficial to those patients who are not in the to transfer to operating room from ICU for surgical tracheostomy. This study had small sample size and results are the outcome of only one center. So, more similar studies should be conducted in other ICUs of Pakistan to draw generalized opinion.

Conclusion

With the findings of our study and evidence of literature, we could conclude that performing percutaneous dilational tracheostomy at bedside by an intensivist is a safe procedure.

Conflict of Interest *None*

Funding Source *None*

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Authors Contribution

MS: Conceptualization of Project
UR: Data Collection
AK: Literature Search
AJ: Statistical Analysis
AJ, MH: Drafting, Revision
MH: Writing of Manuscript

Violence Against Doctors on Duty in Sialkot

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Abstract

Objective: To get data about violence against doctors on duty in Sialkot.

Material and Method: It was a cross sectional study. Convenience sampling technique was adopted. Study duration was 2 months and 15 days from 1st June to 15th August 2023. Sample size was 200. Study centre was Sialkot medical college, Sialkot.. A questionnaire was served to 200 doctors on duty both in government as well as private hospitals of Sialkot. Data was collected. Statistical analysis was carried out by using SPSS 25.

Results: 200 physicians answered. According to these Responses, 39 (19.5%) and 62 (31%), respectively, from private and public hospitals experienced violence. A few doctors experienced violence more than once. Six doctors from private institutions and thirty (15%) from government hospitals reported having experienced physical violence. There was more abuse and violence in private hospitals. Compared to private hospitals, coworkers provided more assistance in government institutions. In private hospitals, security guards have rescued more times than in public ones. Only 14 (35.9%) doctors working in private practice notified the police, compared to 32 (51.6%) doctors employed by the government.

Conclusion: Doctors on duty are facing all types of violence. Physical violence is more in government hospitals. Abusing violence is more in private hospitals.

Keywords: Violence. Bullying. Verbal abuse. Physical violence

How to cite: *Asif M, Butt US, Mushtaq R, Ahsan Z, Chaudry S, Chaudry S. Violence Against Doctors on Duty in Sialkot Esculapio - JSIMS 2023;19(04):491-494.*

DOI: https://doi.org/10.51273/esc23.251319422

Introduction

Inflicting damage to the physique, mind or property of someone is called violence. There are many ways to classify violence. One way is, it may be homicidal, assault, robbery and rape.[1] Homicide means to kill someone by using force[2].To attack someone with an intention of inflicting force and causing hurt is called assault.[3] Everyone is exposed to violence regardless the age including children, adolescence and aged. Females are more exposed to face violence especially sexual one.[4] Violate means to cross the normal limits. Violence may also means not paying heed to the rights of some one. These rights belong either to physique or honour of a person.[5] Among different types of violence, physical violence leaves more effects although use of force against property, verbal violence and psychological violence also leave bad impacts upon human life.[6]

Violence against doctors has become a global issue. Throughout the world doctors are facing both verbal as well as physical form of violence. The World Medical Association has declared it a global emergency which not only effects doctors but also badly impacts the health care system in providing the suitable health care services.[7] Violence against doctors on duty is maximum in Morocco (70%) Thailand (54%). In Asian countries it is increasing up to 25%.[8] In Pakistan verbal violence is more (72.5%) as compared to physical violence(16.5%).[9] This study aims to gather current information on violence against doctors in various Sialkot health facilities.

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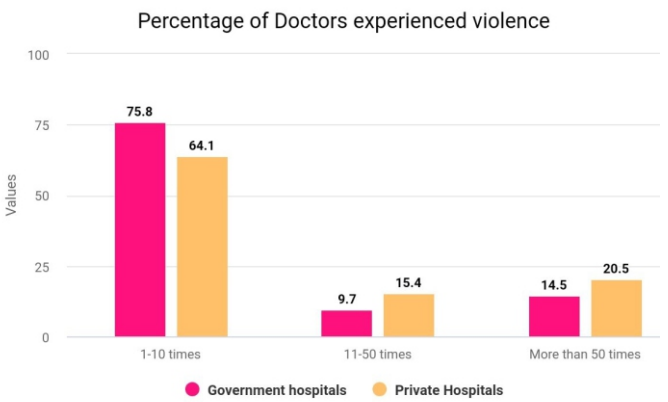
Submission Date: 20-10-2023
1st Revision Date: 25-10-2023
Acceptance Date: 04-01-2023

Material and Method

It was a cross sectional study. Study centre was Sialkot medical college, Sialkot. To collect the data convenience sampling technique was used. Any doctor who gave consent to participate in the study was selected irrespective of age, sex, experience and job place. Sample size was 200 doctors. Study duration was 2 months and 15 days. The questionnaire was presented on 1st June 2023. All responses were recollected till 15th of August 2023. A prior informed consent was taken from each sample.

A questionnaire was formulated. 200 doctors (100 from government hospitals and 100 from private hospitals in Sialkot were offered the questionnaire and requested to fill and return. Only on job doctors were included in the study. Data collected was analysed by using SPSS 25.

Frequencies and percentages were calculated. Tables were made to present data.

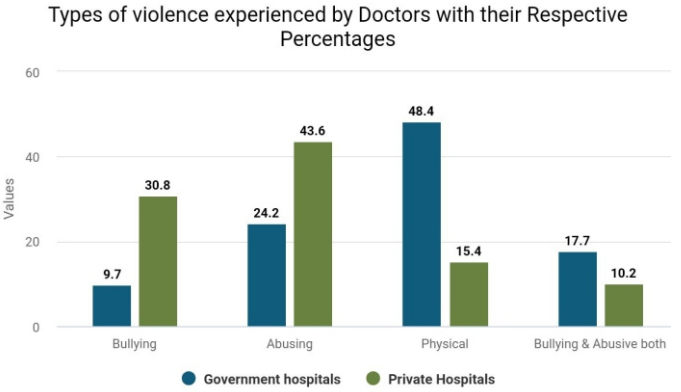


Results

Following results were obtained

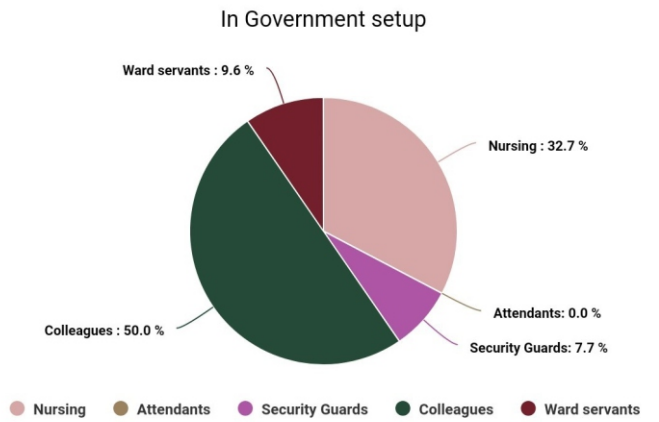
Showing working experience of respectable doctors below :

62 doctors from government sector and 39 from private sector claimed that they faced incidence of violence. According to these statistics,the percentage of Doctors



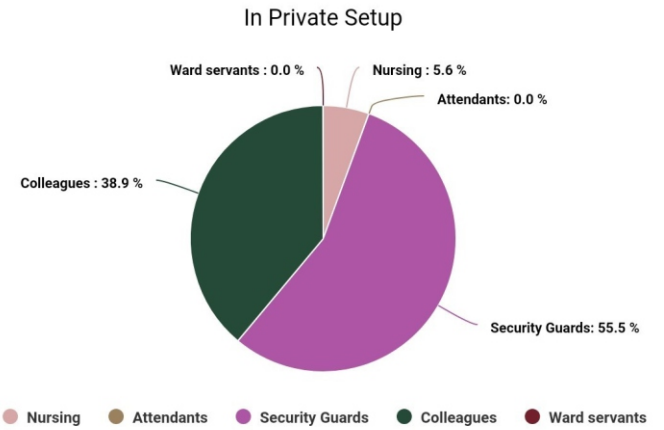
who experienced violence one times or multiple is shown below in graphical form.

Types of violence faced by Doctors in Government and



Private Setup with their Respective Percentages is shown below.

Among 100 government doctors who responded,62 faced violence incidences, out of which only 52 where



helped by people having different working status in hospital. Graphical representation of statistics shown.

Table 1: *Frequency of help provided, information to police, action taken and arrest of culprits*

	Government	Private
Hospital staff helped	32	26
Police informed	32	14
Helped by police	11	9
Action Taken	9	4
Culprit arrested	6	2

Among 100 Private institute Doctors who responded, 39 experienced violence incidences,out of which 36 were helped by people having different working status in hospital. Graphical representation of statistics shown.

In how many cases hospital staff and police helped. How many times police was informed, action taken and culprits arrested is shown in table no 5.

Bruises and abrasions were mainly seen among physical violence victims.

Discussion

According to results obtained through statistical analysis 200 doctors on job responded both from private as well as government hospitals. 47 doctors faced violence incidences from 1 to 10 times during their job in government hospitals. While 25 doctors said that they faced violence from 1 to 10 times in private hospitals. 6 doctors from government as well as private hospitals faced violence from 11 to 50 times. 9 doctors from government hospitals faced violence more than 50 times. While in private hospitals 8 doctors said they faced it more than 50 times. 68 % and 39 % doctors from government and private hospitals faced violence during their duty.

Type of violence faced in government hospitals maximum was physical one. 30 doctors from government hospitals claimed that they became victim of physical torture and only 6 doctors from private hospitals said faced physical torture. In a study carried out in Karachi, Physical violence was only 16.5 %.[10] Another study carried out in India has almost same results of 18.5% physical violence faced by health care worker in emergency department.[11] Abusing language was maximum in private hospitals. 17 doctors said they faced abusing language while 15 doctors from government hospitals faced abusing language. The least violence in government hospitals was bullying. A study carried out in Saudi Arabia indicated that oral violence was maximally seen i.e., 60.7 % and physical violence was only 8.3%[12]. A study collectively performed in Saudi Arabia and United Arab Emirates has resulted in that physical violence was seen in 20.9% and oral abusing was 75.6%[13].A study was carried out in Bangladesh, showed that physical violence was only 15.4% and other forms of violence constituted 84.6%[14]. 17% physical violence was reported in a research brought out in India but verbal violence was 67%[15]. In Egypt 58.2% oral violence against health workers was reported[16]. In Bahrain hospital verbal abuse was maximum i.e., 78% ,physical violence was 11% and sexual abuse was reported to be 3% in health care workers.[17] In Saudi Arabia 26 articles related to violence against health workers were selected to review. Among those 72% reports were about verbal violence and 18% were about physical violence18. In Malaysia, verbal violence against doctors was 70.6%, bullying was 29.4% and physical assault was 11%.[19]

With respect to help in government hospitals colleagues helped the doctors maximally. 26 doctors were helped by their colleagues in government and 14 in private hospitals. In government hospitals 17 doctors were helped by nursing staff while in private only 2 doctors were helped by nursing staff. In private hospitals security guards maximally helped the doctors. 20 doctors claimed the help of security guards in private hospitals but only 4 doctors claimed the same in government hospitals.

Information provision to the police was more in government hospitals 32 as compared to 14 only in private hospitals. Police helped 11 doctors in government and 9 doctors in private hospitals. Only 6 culprits were arrested in government and 2 in private hospitals were arrested. In a study only 8.5% reported the violence every time. Report to the police was only 9.5%.[20] In another study carried out in Pakistan, only 59.5% cases were reported. But they were reported mainly to the colleagues only.[21]

Conclusion

Although medical profession was deemed once a very noble and honourable profession yet it is losing its dignity. Incidences of violence against doctors are being taken place in the whole world. This study indicates more physical violence is being seen in government hospitals than private hospitals. Very few cases are reported to police. Very low percentage of culprits is being punished.

Conflict of Interest: *None*

Funding source: *None*

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Correlation Between Smartphone Overuse and Severity of Headache in Migraine Patients

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Abstract

Objectives: To find out the correlation between smartphone overuse and the severity of headache in migraine patients

Material & Methods: This study aimed to investigate the correlation between smartphone overuse and migraine severity. Precise definitions were provided for migraine and mobile phone use. A Cross-Sectional design was used; Data from 100 patients aged 20-45 years, meeting inclusion criteria was collected from Neurology Outdoor of Services Hospital Lahore from Match 13, 2021 to September 12, 2021. This data was collected via structured interviews, analysed using SPSS, and assessed using Pearson's Correlation coefficient.

Results: This study explored the link between smartphone overuse and migraine severity in 100 participants, predominantly aged 20 to 30 (81% female). The analysis indicated a weak positive correlation (R=0.2995) between smartphone use and headache intensity (VAS 7.04), offering insights into age and gender variations in this association.

Conclusions: On the basis of this study we conclude there is a correlation between Smartphone overuse and severity of headache in Migraine patients

Keywords: Migraine, Smartphones, overuse, severity

How to cite: *Aslam MA, Azeem GM. Farooq N, Waheed MB, Tariq A. Correlation Between Smartphone Overuse and Severity of Headache in Migraine Patients. Esculapio - JSIMS 2023;19(04):495-499.*

DOI: https://doi.org/10.51273/esc23.251319423

Introduction

Headaches are a prevalent ailment, affecting approximately 95% of the general population at some point in their lives.[1] Among primary headaches, migraine ranks as the second most common type and stands as a leading contributor to disability within the spectrum of neurological disorders worldwide.[2] Globally, migraine's prevalence is estimated to be approximately 14.4%, although various studies have reported rates spanning from 2.6% to 21.7%0.[3,4]

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Submission Date: 13-10-2023
1st Revision Date: 19-11-2023
Acceptance Date: 13-12-2023

A significant proportion of migraine sufferers identify specific triggers for their headaches, with 75.9% of patients reporting such triggers.[5,6] One potential modern trigger is smartphone usage, which exposes users to bright, flickering lights that pulsate several times per second. A growing body of research has associated exposure to bright and general light as a migraine trigger.[7] Notably, Hougaard et al. conducted experiments successfully provoking migraine attacks using bright and flickering lights.[8] Additionally, a study in Poland found that prolonged and frequent phone calls were linked to more frequent and prolonged headaches.[9] Furthermore, research by Demerci et al. concluded that headache complaints among their patients correlated with the extent of smartphone usage.[10] As smartphones emit blue light radiation and their backlights are generally flickering in nature, they can have a possible impact in worsening of headaches. With the increasing use of smart

phones in our personal and professional lives, the answer to this question is becoming more and more important.

The present research endeavours to investigate the correlation between heightened smartphone usage and migraine headaches in individuals seeking care at a tertiary hospital in Lahore.

Material & Methods

The primary aim of this study was to explore the potential correlation between smartphone overuse and the severity of headaches in individuals diagnosed with migraine. Our underlying hypothesis proposed a significant association between excessive smartphone usage and the intensity of headaches experienced by migraine sufferers. To ensure precision in our research, we provided operational definitions for key terms. Migraine was precisely defined as a primary headache condition diagnosed by a Consultant Neurologist, adhering to the published criteria outlined in the International Classification of Headache Disorders, 3rd edition (ICHD-3). Meanwhile, mobile phone use was quantified using the Problematic Mobile Phone Use (PMPU) scale, which generates values ranging from 26 (indicating minimal use) to 130 (indicating excessive use). Furthermore, the severity of migraine was gauged using the Visual Analogue Scale (VAS), which assigns values between 0 (indicating no pain) and 10 (representing the most severe pain). This scale was applied to the patient's three most recent migraine episodes, and the resulting values were averaged to derive a score between 0 and 10.

In terms of research design, this study adopted a Cross-Sectional approach. Data collection took place in an outdoor setting at the Department of Neurology, SIMS/ Services Hospital Lahore. The research spanned duration of six months, commencing from March 13, 2021, and concluding on September 12, 2021.

The sample size for this investigation comprised 100 patients. This sample size was calculated based on a 5% alpha error, 10% beta error, and an expected r value of 0.71513. Participants were selected using a Non-Probability Consecutive Sampling technique.

Inclusion criteria encompassed individuals of both genders, aged between 20 and 45, who had received a definitive diagnosis of migraine from a Consultant Neurologist based on the ICHD-3 criteria. Additionally, participants were required to own and actively use a smartphone and express a willingness to participate with informed consent.

Conversely, exclusion criteria were carefully designed to exclude individuals diagnosed with secondary headaches, those with co-existing psychiatric disorders, individuals currently undergoing prophylactic therapy for migraine, and those diagnosed with chronic migraine or medication overuse headaches. Data collection was initiated following the acquisition of informed consent from patients attending the Neurology outpatient department of SIMS/Services Hospital Lahore. Researchers conducted structured interviews with patients to complete the study questionnaire. This questionnaire covered a range of variables, including patterns of mobile phone usage, the degree of disability resulting from migraine headaches, and the perceived intensity of migraine episodes. To quantify smartphone use, the PMPU Scale was employed, producing scores spanning the entire spectrum. The intensity of pain experienced during migraine episodes was assessed through the VAS, with patients providing ratings for their three most recent episodes, and an average score was computed within the 0 to 10 range.

Subsequent to data collection, the dataset underwent rigorous analysis using SPSS Statistics for Windows version 20.0. Quantitative variables, such as age and VAS scores, were summarised using mean and standard deviation. Gender distribution was presented as frequency and percentage. To evaluate the degree of association between smartphone use and migraine headache severity, the Pearson's Correlation coefficient was calculated. This statistical approach allowed for a comprehensive exploration of the relationship between these variables within our carefully selected sample of migraine patients.

Results

In this study, a total of 100 cases meeting the specified inclusion and exclusion criteria were enrolled to explore the potential correlation between smartphone overuse and the severity of headaches experienced by individuals diagnosed with migraine. The age distribution analysis revealed that the majority of participants, specifically 81% (n=81), fell within the age range of 20 to 30 years, while 19% (n=19) were aged between 31 and 45 years. The mean age was calculated as 26.6 years, with a standard deviation of 4.76. Regarding gender distribution, the study found that 29% (n=29) of the participants were male, while the majority, comprising 71% (n=71), were female. In terms of the mean Visual Analogue Scale (VAS) scores, which quantified the intensity of headache

pain, the calculated mean was 7.04, with a standard deviation of 1.01. Additionally, the mean score for problematic mobile phone use (PMPU), a measure of smartphone usage patterns, was determined to be 82.49, with a standard deviation of 24.34 (Table-1).

Each participants problematic mobile phone use (PMPU) and their corresponding Visual Analogue Scale (VAS) scores were collected as a part of the study questionnaire and noted. Using the corresponding PMPU and VAS scores of each participant and using the mean and standard deviation of the PMPU and VAS we were able to find out the correlation between smartphone overuse and the severity of headaches in migraine patients which was the primary goal of the investigation. The correlation analysis revealed an r value of 0.2995, indicating a technically positive correlation. However, the strength of this correlation was found to be weak, as evidenced by an R2 (coefficient of determination) value of 0.0897. This result shows that there is a correlation between excessive use of mobile phone and severity of headaches in our study participants (higher PMPU scores corresponded with higher VAS scores in our study as determined by the positive r value of Pearson Correlation Coefficient)

These findings collectively provide insight into the relationship between smartphone usage patterns and the severity of migraine headaches, shedding light on the nuances of this association within different age and gender groups.

Table 1: *Correlation between smartphone overuse and severity of headache in migraine patients (n=100)*

PMPU		VAS	
Mean	SD	Mean	SD
82.49	24.34	7.04	1.01

Discussion

The ubiquitous integration of smartphones into daily life has fundamentally altered the way people communicate, access information, and navigate the modern world. With these devices serving as constant companions, the increased use of smartphones has inevitably shaped various aspects of our daily existence. Activities such as connecting with others, staying in touch with family and friends, and accessing the vast expanse of the internet are now seamlessly woven into the fabric of our lives through these portable devices. Given this pervasive influence, a pressing need has arisen to scrutinise the potential impact of smartphones on human health, which served as the impetus for our research. Our primary objective was to unravel the association between heightened smartphone usage and the occurrence of migraine headaches in individuals seeking medical care at a tertiary hospital in Lahore. The rationale behind this inquiry was rooted in the recognition that if our findings indicated a correlation between increased smartphone use and exacerbated headache severity, behavioural interventions aimed at curbing excessive smartphone usage could be incorporated into migraine patient management strategies. The overarching goal was to enhance patient outcomes by alleviating headache intensity and reducing migraine-related disability. Our demographic analysis unveiled valuable insights into the characteristics of our study participants. The majority of our sample, a substantial 81% (n=81), belonged to the age bracket of 20-30 years, with the remaining 19% (n=19) falling between 31-45 years. The mean age, accompanied by a standard deviation, was computed at 26.6+4.76 years. Gender distribution indicated that 29% (n=29) of the participants were male, while the majority, comprising 71% (n=71), were female. Our investigation delved into the quantification of smartphone usage patterns through the calculation of the mean problematic mobile phone use (PMPU) score, which averaged at 82.49, with a standard deviation of 24.34. This measure offered valuable insights into the extent of smartphone dependence among our participants.

The crux of our study centred on establishing a correlation between smartphone overuse and the severity of migraine headaches. The correlation analysis revealed an R value of 0.2995, technically indicating a positive correlation between these factors. However, it's important to note that the strength of this correlation was relatively weak, as reflected in the R^2 (coefficient of determination) value of 0.0897. This suggests that while a connection exists, it is not particularly robust. In a similar 2019 study by Demir et al., smartphone overuse was observed to increase the frequency, intensity, and duration of headaches. This research also revealed a direct association between smartphone overuse and headache severity, as measured using the visual analogue scale.[11] The release of blue light from smartphones has been shown to disrupt sleep patterns and contribute to sleep problems,[12] a well-known trigger for headaches, including migraines.[13] People have also reported eye strain as a common migraine trigger[14] and smartphone use is a major cause of eye strain.[15] Moreover, a study published in March 2020 by Uttarwar et al. indicated that smartphone usage is linked to an increased need for acute medication and reduced responsiveness to medication in primary headaches, including migraines.[16,17]

A similar result was obtained from the study done by Butt et al[18] recently, these studies were able to establish the worsening of headaches in migraine patients with excessive smartphone use and suggests possible contributory factors towards it. These diverse findings underscore the intricate relationship between smartphone usage patterns and migraine headaches. They also emphasise the potential health effects of smartphone overuse, warranting further research and clinical exploration. On smartphone use and migraine, It has also been shown that excessive use of cell phones can aggravate psychological disorders such as anxiety, stress and depression[19] and these disorders often tend to worsen migraines,[21] so a confounding relation between them needs to be explored further and can add to our knowledge in this regard. These findings are not just limited to adults but similar worsening of migraines with smartphone use is seen in younger adults and adolescents as well.[21]

In light of our study's results and the collective body of evidence, it is evident that excessive smartphone use may have implications for human health and could contribute to headaches, including migraines. However, additional trials and research endeavours are imperative to validate and expand upon our findings, shedding more light on this multifaceted phenomenon.

Conclusion

We concluded that there is a correlation between Smartphone overuse and severity of headache in Migraine patients. However, further local studies are required to validate our results.

Conflict of Interest *None*

Funding source *None*

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Authors Contribution

MAA: Conceptualization of Project
NF: Data Collection
GAA: Literature Search
MAA: Statistical Analysis
AT, MBW: Drafting, Revision
AT: Writing of Manuscript

Spontaneous Bacterial Peritonitis in Cirrhotic Patients: Frequency and Clinical Presentations

Irfan Ahmad,[1] Hajira Irfan[2]

Abstract

Objective: To determine the rate of spontaneous bacterial peritonitis (SBP) in patients of chronic liver disease with ascites and to determine their presenting clinical features.

Material and Methods: One hundred and three cirrhotic patients with ascites admitted in Medical Unit 3 of Sheikh Zayed Medical College/Hospital, Rahim Yar Khan from August 2020 to June, 2021 were included. Patients with non-cirrhotic ascites, recent antibiotic use or paracentesis and secondary bacterial peritonitis were excluded. Ascitic fluid sent for total and differential cell count, albumin and culture. SBP was diagnosed if neutrophil count was more than 250/cmm and/or there was positive ascitic fluid culture.

Results: Mean age of the patients was 51.55±12.64 years with range of 19 to 85 years. Fifty eight were male and 45 female. Fifty one (49.5 %) patients were found to have SBP. Among these, 33 (64.71 %) had culture negative neutrocytic ascites, 13 (25.49 %) had culture positive neutrocytic ascites and 5 (9.8 %) had culture positive non-neutrocytic ascites. Leukocyte count was significantly high in patients with SBP than those without SBP. Hepatic encephalopathy was presenting diagnosis in 31 patients of SBP, increasing abdominal distension in 8 patients, abdominal pain and fever in 7 and upper gastrointestinal bleeding in 5 patients. Twenty four of 31 hepatic encephalopathy patients also had history of abdominal pain and fever.

Conclusion: Spontaneous bacterial peritonitis was common in admitted cirrhotic patients, and hepatic encephalopathy, abdominal pain and fever were the commonest presenting features in these patients.

Key words: Spontaneous bacterial peritonitis, cirrhosis, ascites

How to cite: *Ahmad I, Irfan H. Spontaneous Bacterial Peritonitis in Cirrhotic Patients: Frequency and Clinical Presentations. Esculapio - JSIMS 2023;19(04):500-503.*

DOI: https://doi.org/10.51273/esc23.251319424

Introduction

Spontaneous bacterial peritonitis (SBP) is infection of ascitic fluid without any surgically treatable cause.[1] It usually occurs in patients with advanced cirrhosis[2] but can occur in other diseases like malignant ascites, nephrotic syndrome and congestive cardiac failure.[3] Bacteria that cause SBP mostly originate from small intestine.[4] Other sources may be urinary tract, skin or oropharynx. Risk factors for SBP include ascitic fluid protein less than 1 g/dL,[5] variceal bleeding and use of proton pump inhibitors.[6] It is associated with high mortality if treatment is delayed,[2] due to sepsis, hepatorenal syndrome and liver failure.[7]

SBP occurs in 20 – 30 % of cirrhotic patients with ascites[8] and 70 % patients who develops it, has recurrence within one year. Patients of SBP present with abdominal pain, tenderness and fever. Abdominal rigidity is typically absent as compared to secondary peritonitis. Abdominal features are absent in one third of cases. Other presentations include diarrhea, hepatic encephalopathy, dizziness, hypotension and renal failure.[9] About 29 % of patients with SBP have no signs or symptoms of infection at the time of diagnosis.[10]

Cirrhosis is common in our area and many of admitted cirrhotic patients have ascites. As mentioned above, patients with SBP may be asymptomatic and admitted in hospital for other reasons, and also, they may have

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Submission Date: 21-09-2023
1st Revision Date: 09-10-2023
Acceptance Date: 01-12-2023

no localizing symptoms and fever. We performed this study to see percentage of our admitted cirrhotic patients who had been suffering from SBP and to note their presenting clinical features, so that this illness could be detected earlier and treatment be started to avoid high mortality in these patients.

The objective of this study was to determine the frequency of SBP in cirrhotic patients with ascites admitted in our hospital and to find out the modes of presentation in symptomatic patients.

The Study design was Descriptive, and the study site was Medical Unit 3, Sheikh Zayed Medical College/ Hospital, Rahim Yar Khan and duration was from August 18, 2020 to June 26, 2021. 103 consecutive patients**.** One hundred and three consecutive cirrhotic patients with ascites of any age or gender admitted in Medical Unit 3 were included in the study. Cirrhosis was diagnosed on the basis of clinical, laboratory (prolonged prothrombin time, hypoalbuminemia) and ultrasound (shrunken liver, splenomegaly and ascites) features. Inclusion was regardless of reason for their admission. Following patients were excluded:

1. Those having non-cirrhotic ascites.
2. Those already taking antibiotic or have taken it during last two weeks.
3. Those who underwent peritoneal paracentesis during last three months.
4. Those having intra-abdominal surgically treatable disease.
5. If ascitic fluid leucocyte count was > 10,000/cmm or growth was polymicrobial, both of which point to secondary peritonitis.

Materials and Methods

Included patients were asked about symptoms and comorbid conditions like diabetes mellitus, hypertension, renal failure and cardiopulmonary diseases. Patients' blood was sent for complete blood count (CBC), prothrombin time (PT), liver function tests, albumin and creatinine. Ascitic tap was done using aseptic technique. Ascitic fluid was sent for total leucocyte count and differential count (2 ml in bottle containing anticoagulant), and albumin (3 ml). Ten ml fluid was inoculated in blood culture bottle at bedside and sent to our hospital laboratory for culture. Spontaneous bacterial peritonitis was diagnosed on the basis of ascitic fluid neutrophil count > 250 cells/cmm and/or positive fluid culture.[1] The data was entered and analyzed using SPSS version 25. The qualitative data was expressed as frequency and percentage, and analyzed by Chi-square test. The quantitative data was expressed as mean ± SD and range, and analyzed by Student's t-test. A p value of < 0.05 was considered significant. Study protocol was approved from Institutional Review Board and Ethical Committee.

Results

Mean age of our patients was 51.55±12.64 years. Youngest patient was 19 years old and oldest was 85 years old. Fifty eight patients (56.3 %) were male and 45 (43.7 %) were female. Ninety five patients (92.2 %) were known to have cirrhosis while remaining were diagnosed as cirrhotic during this admission. Cause of cirrhosis was hepatitis C in 96 patients (93.2 %), hepatitis B in 5 (4.9 %) and alcoholism in 2 (1.9 %).

Out of 103 patients having cirrhosis and ascites admitted for various reasons, 51 (49.5 %) were proved to have SBP. There was no significant difference between SBP and non-SBP groups regarding age (51.78 vs 51.33 years, p = 0.855) and gender (p = 0.495). Similarly, number of patients in both groups while considering cause of cirrhosis, presence of various comorbidities and use of drugs were not statistically different (Table 1). Apart from total leucocyte count (TLC) which was significantly different between SBP and non-SBP groups (p = 0.001), other laboratory tests did not show any statistical difference (Table 2). Among 51 patients having SBP, 5 (9.8 %) had culture positive non-neutrocytic ascites, 13 (25.5 %) had culture positive neutrocytic

Table 1: *Past and treatment histories of 103 patients*

Variables	Total patients	SBP present	SBP absent	p value
Known cirrhosis				
Yes	95	49	46	0.269
No	8	2	6	
Cause of cirrhosis				
Hepatitis C	96	47	49	0.890
Hepatitis B	5	3	2	
Others	2	1	1	
Comorbidities				
Diabetes mellitus	36	18	18	
Hypertension	18	9	9	0.510
IHD	2	2	0	
COPD	1	1	0	
Treatment history				
PPI	100	51	49	0.627
Beta blockers	98	49	49	
Prokinetics	86	44	42	

ascites and 33 (64.7 %) had culture negative neutrocytic ascites. Included 103 patients admitted in Medical indoor for various reasons; 58 had hepatic encephalopathy, 28 were admitted due to abdominal distension, 9 presented with upper gastrointestinal bleeding and 8 were suffering from abdominal pain and fever (Table 3). Among patients having hepatic encephalopathy, 24 had history of abdominal pain and fever.

Discussion

Patients with cirrhosis have low albumin ascites. This along with low immunity due to advanced disease and other factors like low intestinal motility and increased permeability,[4] and use of proton pump inhibitors[11] leads to the development of infection of ascitic fluid (SBP) which is associated with increased morbidity and mortality.[2]

Table 2: *Lab data of 103 patients according to presence or absence of SBP*

Laboratory tests	SBP present	SBP absent	p value
Hemoglobin (g/dl)	8.53 ± 1.35	8.97 ± 1.37	0.109
TLC (10^9/L)	10.58 ± 5.9	7.43 ± 3.50	0.001
Platelet count (10^9/L)	79.94 ± 24.36	83.77 ± 27.45	0.456
Total bilirubin (mg/dL)	2.50 ± 2.27	2.18 ± 1.65	0.422
Albumin (g/dL)	2.54 ± 0.53	2.41 ± 0.61	0.253
Prothrombin time (seconds)	18.31 ± 3.00	18.33 ± 2.78	0.982
Creatinine (mg/dL)	1.15 ± 0.36	1.12 ± 0.44	0.765
Sodium (mmol/L)	139.45 ± 4.03	138.77 ± 4.47	0.419
Ascitic albumin (g/dL)	1.06 ± 0.49	1.14 ± 0.54	0.458

Table 3: *Clinical presentations of 103 patients*

Presentation	Total patients	SBP patients	Non-SBP patients
Hepatic encephalopathy	58	31	27
Abdominal distension	28	8	20
Hematemesis/melena	9	5	4
Abdominal pain/fever	8	7	1

When tested, 7 to 30 % of cirrhotic patients with ascites found to have SBP.[12] In a teaching hospital in Ghana, 25 % (26/103) cirrhotic patients had SBP.[13] A study conducted in Aswan University Hospital in Egypt showed that 62 % cirrhotic patients had primary ascitic fluid infection.[14] Choubey et al in Central India studied 50 cirrhotic patients with ascites. Twenty-seven (54 %) of their patients had SBP on ascitic fluid analysis.[15] In our study, SBP was detected in 49.5 % of patients. Similar findings were noted in other local studies with rates of SBP of 33 %,[16,17] 36 %,18 40 %,[19] and 56 %.[20] This high rate of SBP in hospitalized cirrhotic patients reflects increased risk of infections in decompensated liver disease.

Regarding types of SBP, most common is culture negative neutrocytic ascites. In our study its frequency is 64.7 % and in others these are 63 %,[15] 60%,[14] 57 %,[20] and 52 %.[21] Classical (culture positive neutrocytic) ascites has frequency of 25.5 % in our study and in others 39%,[20] 30 %,[14,15] and 24%.[21] Least common was bacterascites having rates of 9.8 % (our study), 10%[14] and 3%.[20] Lower frequency of culture positivity reflects lower sensitivity of ascitic fluid culture due to presence of lesser number of organisms. It may be due to prior intake of antibiotics by the patients themselves without prescription as it is a common practice in our setup. Although we excluded such patients but some patients might have concealed this information.

Abdominal pain/tenderness and fever are common presenting complaints of patients with SBP.[21] Abdominal pain was present in 71 to 80 %[15,22] of patients, and fever was seen in 74%[15] and 55%[22] of patients. In our study, hepatic encephalopathy was the most common presenting problem but most of these patients also had history of abdominal pain and fever. Some asymptomatic cirrhotic patients with ascites also had SBP when ascitic fluid analysis was performed in these patients.[23,24]

Conclusion

Spontaneous bacterial peritonitis was present in half of cirrhotic patient with ascites admitted for various reasons. It indicates that every such patient should have ascitic fluid analysis done to detect and treat SBP. Hepatic encephalopathy, abdominal pain and fever are common presenting features in these patients.

Conflict of Interest: *None*

Funding Source: *None*

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Authors Contribution

IA: Conceptualization of Project
HI: Data Collection
IA, HI: Literature Search
IA: Statistical Analysis
IA, HI: Drafting, Revision
IA: Writing of Manuscript

Challenges in Work-Life Balance of Gynecologists Perspectives

Amna Khanum[1], Mehwish Ayyaz[2], Zohra Khanum[3], Mahliqa Maqsood[4], Aymen Javed[5], Zubda Aiman[6]

Abstract

Objective: To explore the challenges gynecologists face in work life issues and their opinion how they cope.

Material and Method: The Study was Qualitative phenomenological type and the study was conducted for 15 days at two places Gynae Unit V, Lady Aitchison Hospital Lahore, King Edward Medical University, Lahore and Obstestric & Gynaecology Unit-2 Services Institute of Medical Sciences, Lahore. The qualitative, phenomenological study was conducted, views of consultants in the field of gynecology were explored and a self-designed Proforma were given to participants to answer open-ended questions. The answers were transcribed manually and codes were formed that led to themes.

Results: Out of 10 subjects included, 1(10%) was department head, 2(20%) were associate professors, 2(20%) were assistant professors, and 5(50%) were senior registrars. Data was segregated into codes of the workplace, home challenges, coping strategies, job satisfaction, and maintaining work-life balance. There are 5-7 themes that fell under each of these seven codes.

Conclusion: Challenges faced by consultants in field of gynecology are explored and we can suggest and recommend policies at work place and how these can help in policy-making rules at local and national levels.

Keywords: Challenges, work-life balance, Gynecologists, perspectives

How to cite: *Khaum A, Ayyaz M, Khanum Z, Maqsood M. Javed A, Aiman Z.Challenges in Work-Life Balance of Gynecologists Perspectives. Esculapio - JSIMS 2023;19(04):504-506.*

DOI:https://doi.org/10.51273/esc23.251319425

Introduction

The term work-life balance describes a state of equilibrium between personal life and professional life. It was first coined in 1986, although work-life programs were in use since 1930s by creating flexible duty hour's inspite of traditional long hours. In the 1980s and 90s work-life programs were offered with special emphasis on supporting women and their children but it must not be gender specific.[1] Work-life balance is beneficial in maintaining good quality of life health, more time to spend with family, do sports and voluntary work. More money can be earned contributing to good child and elder care. Work Life balance in medical professionals is having enough time to be a good doctor and still have enough time to enjoy family life.[2] If we want to achieve perfect blend of happiness, productivity and time management, more realistic goal is to work slightly below 40 hours per week. 55 or more work hours a week is unhealthy for increased risks of strokes and health disease. A good work life is meeting your professional tasks at time and before deadlines and still having time for family and hobbies. Personal consequences of imbalance lead to increased level of stress and its related illness. A 2001 survey concluded that 82% of the men and 85% of women preferred family over work constraints. Support from partner and employer plays a pivotal role in maintaining balance.[3] Challenges specific to this include burnout, stress, marital and financial problems, sick time abuse, distrust, violence, and absenteeism. Common causes of poor work life balance are long working hours, increase responsibilities at work and at home, increased expenses without an increase in salary, having children, expectation of family being

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Submission Date: 26-11-2023
1st Revision Date: 09-12-2023
Acceptance Date: 18-12-2023

Material and Methods

This study was conducted at Obstetrics and Gynaecology Unit-V, King Edward Medical University Lahore and Obs and Gynae Unit-2 Services Institute of Medical Sciences, Lahore. for a period of 15 days (from 01-10-23 to 15-10-23). Ethical permission was taken from ethical review committee. The sample size was up to saturate level and it was 10.

Consultants in the field of Obstetrics and Gynaecology having duty hours more than 40 hours per week were included in the study while those not willing to participate and living in hostel were excluded. Constructive philosophical assumption was applied, according to which various participants take place in study and everyone has her own views and perspectives about the issue and theories are generated on the basis of social and historical factors. All female consultants who are fellows from college of physician and surgeon Pakistan were enrolled.

Non probability convenient sampling technique was applied and qualitative study of phenomenological type conducted. The views of consultants were recorded on a self-designed proforma. Data was collected through open ended questions.

One hour was spent with each consultant for this purpose. Entry of data in written Performa, name of consultant, interviewer name and open handed questions were mentioned and consultants filled the complete Performa. A standard procedure was followed with each subject. During the process confidentiality was followed to remove bias. The data obtained from direct encounter was the primary material for further work up. There was no bias or fallout. The study was conducted while keeping in mind the role of researchers as defined. The collected data was analyzed in a step wise procedure by making various segments. Data winnow process was used in which some important data is retained while other parts of it are not taken into account. Winnowing means to transform massive data stream into useful information. From the codes and themes, descriptive categories were developed.

Results

The data collected was categorized into seven main codes and themes were formulated corresponding to each code.

Tables 1-7: Challenges in work life balance Gynecologist perspective.

Table 1:

Code	Themes
Work Place Challenges	work load, being perfect, high risk patient management, 24/7 emergency situation, work place conflicts, long duty hours, working environment, time management, trickling down effect.

Table 2:

Code	Themes
Home challenges	house hold help issues, kids time demanding needs, kids upbringing , keeping everything up to mark and being on time .

Table 3:

Code	Themes
Social challenges	Being present in social gatherings, trying to prove ourselves perfect wife and perfect mother.

Table 4:

Code	Themes
Job satisfaction	mental health, increased income, work place satisfaction, timely promotion, motivation, happy and satisfied at work place.

Table 5:

Code	Themes
Mental and physical well being	Hectic routine, little time for self-care , careless attitude regarding mental and physical care , emotional strain.

Table 6:

Code	Themes
coping strategies	Work hard , work smart, time management, daily routine planning, what to do list at start of day, patience, tolerance, empathetic attitude, set priorities, improve portfolio, quality family time.

Table 7:

Code	Themes
Maintaining work life balance	time management, adaptation on performance register, work and home balance, role modelling and mentoring.

Discussion

Effective balance in work and life is crucial in engaging doctors in their profession leading to enhanced patient care.[5] Now more doctors are working for win- win situation, in which both family and professional lives are not compromised. Kids' Education, upbringing and house-

cology, trying to become perfect, high risk patient's management all day and night, 24/ 7 emergency situation, make doctors stressful all time. Stress is encountered Daily and many professionals are trying to achieve work life balance along with work load, long duty hours, long calls[1], roster and trickling down effects. Mild to moderate stress can be productive but increasing levels can be detrimental to performance and morale. Factors affecting performance include absenteeism (habitual absence from work), task avoidance, work place violence, financial problems and career marriage, so, stressful work environment must be addressed.[7]

Home challenges are very important issue for working doctors face daily like household help issue, kids health, education and upbringing, trying to keep everything well on time result in hurry and panic like situation some time. Social challenges like giving time to family and social communication, working hard for timely promotion, dream for good living styles and working day and night for it is important factor in imbalance of work life satisfactory situation.

Proper communication about programs of work- life balance is essential to enhance employee's knowledge and job satisfaction. Monthly prize or initiatives like best worker can solve this problem. Proper attention should be paid to saving time of doctors, retention, productivity and decrease of health care cost.[8] Various strategies and policies can be made to solve this problem like working hard and smart, time management and being patient. Family friendly policies like day care provision leads to enhancing satisfaction and productivity.[9] A study by Joseph Rowntree Foundation at Cambridge University showed positive effects of family friendly policies and 9 out of 10 organizations found them cost-effective and employees are often ignorant of work- life policies. Beauregard, Lesley, 2008, found co-worker support as essential element which affected their rewards and salary packages. Support from head of department and from personals and managerial posts is crucial and negative signals by them can adversely affect performance. In a study of 463 employees in pharmaceutical firms, work life practices improved commitment and negative career consequences should be omitted. In many studies, long duty hours showed commitment and motivation on part of doctors.

Conclusion

Challenges which are faced by consultants and their Coping strategies can help on policy making at local and national level to enhance job satisfaction and productivity.

Conflict of interest: ***None***

Funding source: ***None***

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