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PAKISTAN JOURNAL OF HEALTH SCIENCES

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The Use of Complementary and Alternative Medicine in Health Care

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It's kind of mysterious how complementary and alternative medicine (CAM) is being used more and more in developed, "established" Western countries. There hasn't been much study or good understanding about it. The National Center for Complementary and Alternative Medicine (NCCAM) defines "complementary and alternative medicine" (CAM) as a collection of various medical and health systems, procedures, and objects that are not currently regarded as corresponding to traditional medicine. Over the past 15 years or so, CAM use has grown significantly, and it is without a dispute significant from a medical, economic, and sociological perspective. Even though there are literally hundreds of therapies that fall under the broad definition of CAM, only about 15-20 have definitive proof of their efficacy and safety to be taken seriously (Tiran, 2001). The NCCAM divides complementary and alternative medicine (CAM) into five primary categories: whole medical systems, mind-body healthcare, physiologically based, manipulative and body-based therapies, and energy fields [1]. CAM is frequently used to supplement conventional treatment. Back issues, melancholy, sleeplessness, intense headaches or migraines, stomach or intestinal diseases, and back problems were the most frequent symptoms linked with CAM, according to a review of the worldwide CAM literature by Frass et al. [2]. A few earlier studies looked into the use of CAM for particular diseases or health issues, like cancer and multiple sclerosis. According to Menniti-Ippolito et al., herbal medicine was more frequently used to enhance life expectancy while acupuncture and manipulative treatments were mainly used to treat pain in Italy. Homeopathy, in comparison, was not linked to any particular health issues [3]. Other common reasons people turn to complementary and alternative medicine (CAM) are dissatisfaction with biomedicine, frustration with the doctor-patient relationship, relaxation, enhancements in subjective wellbeing, preventative medicine, a preference for natural care over biomedical medicine, and an eagerness for more individualized and holistic care. People in Pakistan who believe in quacks, pastors, hakeems, homoeopaths, or other psychic healers have used alternative treatments. For issues like infertility, seizures, psychosomatic issues, melancholy, and many other illnesses, these are the first line of defense. The proximity, reasonable cost, accessibility, family obligation, and the positive perception of the community are the primary justifications for visiting a CAM healer. Pakistan has a long history of using medicinal herbs to cure a variety of illnesses. The people's health-seeking behavior, particularly in emerging nations, necessitates integrating all CAM healers into society by giving them access to appropriate training, tools, and referral support.

REFERENCES

[1] Hall HG, Griffiths DL, McKenna LG. The use of complementary and alternative medicine by pregnant women: a literature review. Midwifery. 2011 Dec; 27(6): 817-24. doi: 10.1016/j.midw.2010.08.007.

[2] Frass M, Strassl RP, Friehs H, Müllner M, Kundi M, Kaye AD. Use and acceptance of complementary and alternative medicine among the general population and medical personnel: a systematic review. Ochsner Journal. 2012 Mar; 12(1): 45-56.

[3] Menniti-Ippolito F, Gargiulo L, Bologna E, Forcella E, Raschetti R. Use of unconventional medicine in Italy: a nation-wide survey. European journal of clinical pharmacology. 2002 Apr; 58: 61-4. doi: 10.1007/s00228-002-0435-8.

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Mini Review

Nutritional Potential of Citrus Sinensis and its Pharmacological Action: A Concise Review

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ABSTRACT

Currently, the pharmaceutical industry is becoming increasingly interested in the quest for novel medications derived from natural resources. Since ancient times, new pharmaceuticals have been created using natural ingredients. Secondary metabolites that have been discovered to have advantageous qualities are abundant in plants. This review highlights the medicinal potential of *C. sinensis* as a source of natural chemicals with significant health-promoting properties that could be exploited to create novel medications

INTRODUCTION

The largest fruit tree crop in the world is citrus The Rutaceae family of evergreen shrubs and small trees includes citrus [1]. Citrus is produced in tropical, subtropical, and temperate climates. In the Northern Hemisphere, fruits especially oranges and grapefruit—mature between mid-December and early April. Fruit is generally available all year long. The vitamin C, carotenoids, flavonoids, pectin, calcium, potassium, and other vital nutrients in citrus fruit make it one of the most significant fruits in the world. Citrus fruits are prized as a valuable source of soluble and insoluble fiber with several advantages, including eliminating toxins from the body [2]. Citrus fruit has higher concentrations of phenolic compounds, vitamins C and A, terpenes, phytonutrients, flavonoids, and terpenoids than other fruits [3].

Chemical Composition

The pharmacological effects attributed to *C. sinensis* are a result of the many secondary metabolites found in this

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plant [4]. The fruits, peel, leaves, juice, and roots of *C. sinensis* have been reported to contain the following categories of chemical substances: Flavonoids, Steroids, alkanes, fatty acids, and hydroxyamides, coumarins, peptides, carbohydrates, carbamates and alkylamines, carotenoids, volatile compounds and dietary components [5] as shown in Table 1.

Component	Citrus Sinensis
Moisture (g)	88.4
Protein (g)	0.8
Fat (g)	0.3
Fiber, g	0.5
Carbohydrates (g)	9.3
Minerals (g)	0.7
Calcium (mg)	40
Phosphorous	30
Iron (mg)	0.7
Vitamin C (mg)	50
Energy, Kcal	43

Table 1: Chemical composition of Citrus Fruits (per 100g of edible portion)

Pharmacological Actions

Antibacterial Activity

The antibacterial properties of *C. sinensis* essential oil, raw extracts, and purified components have been demonstrated in several studies [6]. The minimum inhibitory dose (MID) against *Enterococcus faecium* and *E. faecalis* was 50 mg/L, and the MIC range for bergamia essential oils was between 0.25 and 0.5% (v/v). L. monocytogenes, *E. coli*, and other germs were effectively combated by *C. sinensis* oil [7]. C. extracts in hexane and acetone sinensis leaf demonstrated 27 mm inhibitory zones for *Helicobacter pylori*. In this investigation, the examined extracts had less activity than the usual medications. However, it is feasible to obtain molecules with more activity from the extract that is the most active as depicted in Figure 1 [8].

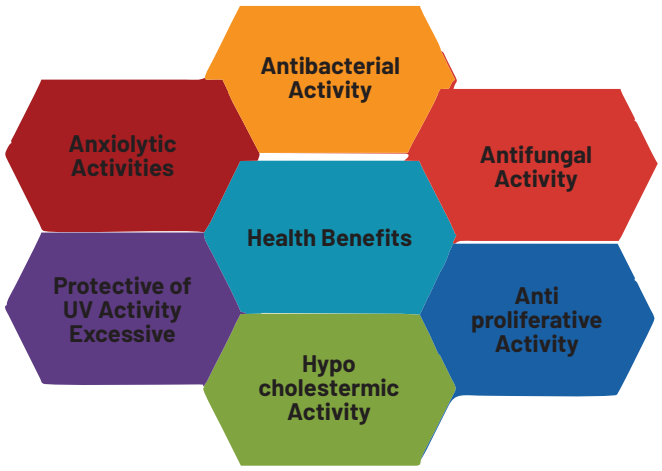

Figure 1: Pharmacological Action of Citrus Sinensis

Antifungal Activity

Finding novel antifungal medicines has become necessary due to the rise in fungal infections, and C. sinensis is a strong contender in this regard [9]. Identified compounds from the damaged peel of *C. paradisa MacFaden* or *C. sinensis L. Osbeck*. *Cladosporium cucumerinum* and *Candida albicans* were both active against by cv. Marsh [10].

Antiproliferative Activity

C. sinensis fruit juice reduced the growth of normal human prostatic epithelial cell line PZ-HPV-7 and Chinese hamster lung fibroblast cell line V79-4 [11]. Polymethoxyflavone-rich C. sinensis peels showed effectiveness against human lung cancer cells [12]. A number of flavones derived from orange peel extract were shown to have inhibitory effects against cell proliferation (IC50) and to induce apoptosis (AC50) when applied to HL-60 cell lines [13]. Flavones and isoflavones have been shown to promote cell death and suppress cell growth in MCF-7 breast cancer cells [14].

Hypocholesterolemic Activity

C. sinensis has advantageous qualities that are related to cholesterol, a severe health issue [15]. Because the fruit's micro sized insoluble fibers increased the excretion of bile acids (129%–133%) and cholesterol (123%–126%) in stool, the levels of blood triglycerides and total cholesterol were reduced [16].

Protective of UV Activity Excessive

C. sinensis red orange extract shown protective properties against ultraviolet B (shortwave) damage that was brought about in human keratinocytes [17]. This function may prevent oxidative stress-related cellular processes like inflammation and apoptosis. Orange is a potential contender for sun care products [18].

Anxiolytic Activities

The use of essential oils and extracts in aromatherapy is a complementary medical procedure [19]. Dental patients experienced a calming and relaxing effect after being exposed to the ambient scent of *C. sinensis* pure essential oil. *C. sinensis* extracts in methanol and dichloromethane exhibited sedative-like effects in Wistar rats [20].

CONCLUSIONS

Natural substances can be used to create new pharmaceutical compounds, and this tendency will persist. Recently, natural product research has drawn increased interest as a result of conventional drug discovery methods' failure to yield a large number of lead molecules in critical therapeutic areas. This review is a great resource for learning more about *C. sinensis* because there is a need to educate the general public on the importance of this plant and the importance of finding new and potent drug compounds.

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Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Hussain SZ, Naseer B, Qadri T, Fatima T, Bhat TA. Citrus fruits—Morphology, taxonomy, composition and health benefits. Fruits Grown in Highland Regions of the Himalayas: Nutritional and Health Benefits. 2021 Jun: 229-44. doi: 10.1007/978-3-030-75502-7_18.

[2] Mahato N, Sharma K, Sinha M, Cho MH. Citrus waste derived nutra-/pharmaceuticals for health benefits: Current trends and future perspectives. Journal of Functional Foods. 2018 Jan; 40: 307-16. doi: 10.1016/j.jff.2017.11.015.

[3] Ahmed W and Azmat R. Citrus: an ancient fruit of promise for health benefits. Citrus-Health Benefits and Production Technology. 2019 Feb: 19-30. doi: 10.5772/intechopen.79686.

[4] Ochekwu EB, Ekeke C, Nwadiaro PO, Christopher S. Phytochemical evaluation of leaves of some medicinal plants from parts of Niger Delta. IOSR Journal of Pharmacy and Biological Sciences. 2015 Mar; 10(2); 26-31. doi: 10.9790/3008-10222631.

[5] Wang L, Kong D, Tian J, Zhao W, Chen Y, An Y, *et al.* Tapinanthus species: A review of botany and biology, secondary metabolites, ethnomedical uses, current pharmacology and toxicology. Journal of Ethnopharmacology. 2022 Oct; 296: 115462. doi: 10.1016/j.jep.2022.115462.

[6] Ngan TT, Nguyen OB, Muoi NV, Truc TT, My VT. Chemical composition and antibacterial activity of orange (Citrus sinensis) essential oils obtained by hydrodistillation and solvent free microwave extraction. Materials Science and Engineering. 2020 Dec; 991(1): 012023. doi: 10.1088/1757-899X/991/1/ 012023.

[7] Nair A, Mallya R, Suvarna V, Khan TA, Momin M, Omri A. Nanoparticles—Attractive carriers of antimicrobial essential oils. Antibiotics. 2022 Jan; 11(1): 108. doi: 10.3390/antibiotics11010108.

[8] Favela-Hernández JM, González-Santiago O, Ramírez-Cabrera MA, Esquivel-Ferriño PC, Camacho-Corona MD. Chemistry and Pharmacology of Citrus sinensis. Molecules. 2016 Feb; 21(2): 247. doi: 10.3390/molecules21020247.

[9] Kandasamy GD, Kathirvel P. Insights into bacterial endophytic diversity and isolation with a focus on their potential applications–A review. Microbiological Research. 2023 Jan; 266: 127256. doi: 10.1016/j.micres.2022.127256.

[10] Adebisi O. Comparative study of essential oil composition of fresh and dry peel and seed of Citrus sinensis (L) Osbeck var shamuti and Citrus Paradise Macfadyen var Marsh. Ife Journal of Science. 2014 Jul; 16(2): 211-7.

[11] Vitali F, Pennisi C, Tomaino A, Bonina F, De Pasquale A, Saija A, *et al.* Effect of a standardized extract of red orange juice on proliferation of human prostate cells in vitro. Fitoterapia. 2006 Apr; 77(3): 151-5. doi: 10.1016/j.fitote.2005.10.001.

[12] Li G, Tan F, Zhang Q, Tan A, Cheng Y, Zhou Q, *et al.* Protective effects of polymethoxyflavone-rich cold-pressed orange peel oil against ultraviolet B-induced photoaging on mouse skin. Journal of Functional Foods. 2020 Apr; 67: 103834. doi: 10.1016/j.jff.2020. 103834.

[13] Ding H, You Q, Li D, Liu Y. 5-Demethylnobiletin: Insights into its pharmacological activity, mechanisms, pharmacokinetics and toxicity. Phytomedicine. 2022 Sep; 104: 154285. doi: 10.1016/j.phymed.2022.154285.

[14] Tedasen A, Sukrong S, Sritularak B, Srisawat T, Graidist P. 5, 7, 4′-Trihydroxy-6, 8-diprenylisoflavone and lupalbigenin, active components of Derris scandens, induce cell death on breast cancer cell lines. Biomedicine & Pharmacotherapy. 2016 Jul; 81: 235-41. doi: 10.1016/j. biopha.2016.03.044.

[15] Reddy BA, Priya VV, Gayathri R. Comparative phytochemical analysis and total phenolic content of citrus seed extract (Citrus sinensis and Citrus limon). Drug Invention Today. 2018 Oct; 10(10): 2038-2040.

[16] Bagetta D, Maruca A, Lupia A, Mesiti F, Catalano R, Romeo I, *et al.* Mediterranean products as promising source of multi-target agents in the treatment of metabolic syndrome. European Journal of Medicinal Chemistry. 2020 Jan; 186: 111903. doi: 10.1016/j.ejmech.2019.111903.

[17] Takshak S and Agrawal SB. Defense potential of secondary metabolites in medicinal plants under UV-B stress. Journal of Photochemistry and Photobiology B: Biology. 2019 Apr; 193: 51-88. doi: 10.1016/j.jphotobiol.2019.02.002.

[18] Hamzah RU, Jigam AA, Makun HA, Egwim EC. Antioxidant properties of selected African vegetables, fruits and mushrooms: A review. Mycotoxin and Food Safety in Developing Countries. 2013 Apr: 203-9. doi: 10.5772/52771.

[19] Stea S, Beraudi A, De Pasquale D. Essential oils for complementary treatment of surgical patients: state of the art. Evidence-Based Complementary and Alternative Medicine. 2014 Jan; 2014: 726341. doi: 10.1155/2014/726341.

[20] Castañeda R, Cáceres A, Velásquez D, Rodríguez C, Morales D, Castillo A. Medicinal plants used in traditional Mayan medicine for the treatment of central nervous system disorders: An overview. Journal of Ethnopharmacology. 2022 Jan; 283: 114746. doi: 10.1016/j.jep.2021.114746.

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Review Article

Use of Ketamine, Propofol and their combination (Ketofol) for Procedural Sedation in Emergency Department: A Review

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ABSTRACT

For Procedural Sedation, sedative and Analgesic agents are frequently used in Emergency Department but titration of anesthetic doses should be performed with care, and patients should be continuously monitored. The use of Ketamine, Propofol and their combination (Ketofol) is in common practice, but there is currently no intravenous anesthetic agent that is ideal. Therefore, this review was conducted to analyze the efficacy as well as the potential side effects of these anesthetic agents during procedural sedation. For this purpose, Medline, EMBASE, CCRCT and CINAHL were searched and systematically analyzed and the meta-analysis included all English-language randomized control trials (RCTs) comparing K-P vs propofol for procedural sedation in ED. The study included the data of ED patients who received procedural sedation for non-elective unpleasant procedures. As a result of the removal of duplicate citations and studies that did not fulfill eligibility requirements, a total of 06 RCTs involving 932 patients (412 in the propofol group and 520 in the K-P group). Very high levels of inter-rater reliability (j = 0.88; 95% CI = 0.68 to 1.0) were found in the final selection of included trials, with 95.2% agreement. Data revealed that the combination of Ketamine with propofol was the most effective anesthetic combination in the larger randomized, prospective studies carried out in the ED that had sufficient power to use the maintenance of vital signs and the success of the procedure as endpoints are still required.

INTRODUCTION

Patients seek medical attention in the emergency room (ER) often because of distress. Ketamine has been used for procedural sedation in the emergency room for decades, and its unique analgesic properties have recently garnered interest as a viable alternative to opioids. Because of its dissociative effects, ketamine is also used to calm down anxious patients. These novel applications of ketamine in the ER are the focus of this narrative review. In case of chest injuries or myocardial infarction, for instance, morphine sulfate, titrated to the clinical response and preceded by an antiemetic, is typically beneficial for uncomplicated analgesia. Ketamine is a safe and effective alternative to opioid analgesics for patients with numerous injuries or those who need to undergo manipulation and splint age of fractures, as well as for entrapments and difficult extractions [1, 2]. Most emergency room procedures that need sedation include alleviating pain. Over-sedation may occur if the pain trigger is removed before the medicine has taken its full effect. With its short on- and off-time, propofol appears like a promising medication for this purpose. However, there is a history of reports of a small therapeutic window, which might increase the possibility of profound sedation. Sedative-hypnotic propofol (2, 6-di-isopropyl phenol) has a relatively

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brief duration of action. It is believed to function by increasing the affinity of C-amino butyric acid for its CNS receptors. It lacks pain-relieving capabilities and hence requires additional medication. When compared to benzodiazepines, studies have shown varying degrees of amnesic effects. However, it has well-known euphoric and antiemetic properties [3]. Physicians who work in emergency rooms need to be at ease and competent in administering Procedures for Sedation and Analgesia (PSA). PSA aims to provide a suitable amount of sedation while decreasing pain and anxiety, increasing forgetfulness, decreasing the risk of adverse drug-related events, regulating behavior, and keeping the patient's heart rate and breathing rate steady. The perfect pharmacologic agent for PSA would have rapid start and offset times, be safe across all age groups, be cost-effective and be equally effective through all routes of administration. There is currently no medication that has all of these desirable characteristics; thus, doctors must use therapeutic combinations at variable doses to get the best potential results. In the most recent literature, a PSA combination of low-dose ketamine and propofol (ketofol) has been reported. In this study, we'll try to outline the purported advantages of combining these two drugs, as well as analyze whether or not these are safe and effective [4]. This study aimed to compare propofol, ketamine, and ketofol for procedural sedation in the emergency department, to provide an overview of the current evidence on the safety and efficacy of these medications for this specific use. The study systematically reviewed and analyzed the literature, including randomized controlled trials, observational studies, and case reports. The key outcomes such as onset and duration of sedation, recovery time, adverse events, and patient satisfaction, were focused on the goal to provide a comprehensive and unbiased evaluation of the available evidence and to make recommendations for best practices based on the findings. Medline, EMBASE, CCRCT, and CINAHL, were searched and the meta-analysis included all English-language randomized control trials, comparing K-P vs propofol alone for PSA in the ED.

Characteristics of Ketamine

Ketamine, a phencyclidine derivative, is widely used for procedural sedation, especially in the emergency room, where painful operations are done. When compared to traditional general anesthetics, ketamine produces a unique state of consciousness known as "dissociative anesthesia" due to a separation of the brain's cortex and limbic regions. Increases in its usage and popularity as a sedative agent, especially among children, may be attributed to the drug's relative cardiovascular stability and preservation of protective airway reflexes [1, 5]. In contrast to its forerunner phencyclidine, the anesthetic ketamine was created in the 1960s to be safer and more predictable. Superior amnesia and analgesia are provided, as well as the maintenance of protective airway reflexes and spontaneous breathing without loss of muscle tone. Some doctors are wary of using ketamine alone despite its clear benefits over other medicines because of the drug's potential to generate vivid and scary emergent responses. When delivered at sedative dosages, other notable side effects include sympathomimetic effects and vomiting [5].

Characteristics of Propofol

It was revealed that procedure sedation in the emergency department for necessary painful disorders, and propofol provided the baseline for anesthesia. But it was accompanied by over-sedation with the removal of painful stimulus from the patient before the medicine has fully taken action. Due to its short on and off times, propofol was a useful medication in this setting. The danger of progressing to severe sedation, however, has been associated with a limited therapeutic index [6]. The studies showed that it is believed to function by increasing the affinity of c-amino butyric acid for its CNS receptors. It lacks pain-relieving capabilities and hence requires additional medication. When compared to benzodiazepines, studies have shown varying degrees of amnesic effects. Nevertheless, it is known to have euphoric and anti-nausea properties. A single arm's circulation to the brain initiates effects within sixty seconds. The quick redistribution from central nervous system tissue to muscle and fat reduces the duration of action to around 10 minutes, despite a half-life of 13-44 hours [7, 8].

Characteristics of Ketofol

Effective procedural sedation and analgesia for unpleasant operations in the ED may be provided by ketofol because it has reduced the side effects of either medicine. It has been shown that combining propofol with ketamine improves hemodynamic stability, eliminates respiratory depression, provides effective postoperative analgesia and speeds up recovery. The contents of both syringes may be combined in a single bolus and given to the patient at once, or the two can be used separately. For lengthier operations, it may be given as a continuous infusion instead of a bolus [9]. In previous studies, various ratios of ketamine to propofol have been examined. It is yet to be determined what the ideal ratio of ketamine to propofol is, or what the best dosage of the two drugs is. In this brief overview, we focused on the emerging evidence that demonstrated the therapeutic value of combining Ketamine with Propofol [10]. The combination of strong hemodynamic stability, no respiratory depression, rapid recovery, and effective post-procedural analgesia were achieved using a combination

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regimen and consequently, the Ketofol revealed that it might be a great option for combined sedation during medical procedures [4, 11]. We manually reviewed the collected papers' reference lists for additional relevant citations. Trials that could have been appropriate were identified by an independent screening of the search results, and their entire texts were then downloaded and evaluated for inclusion (Table 1).

Author	Drug Name	No of patients	Type of Study	Measured Outcomes	Weakness
(Dikti et al., 2022)	Ketamine	243 Patients in emergency and 215 treated individually	Convenience sampling retrospective, descriptive research	Sedation/recovery time, the frequency of undesirable outcomes	Not controlling the small numbers
(Symington and Thakore, 2021)	Propofol	The number of patients in this study was 82	Analytical description of a retrospective sample of patients	The length of time needed to make a full recovery, the frequency of undesirable outcomes.	Cannot measure the depth of sedation
(Andolfatto *et al.*, 2022)	Ketofol	The total number of patients treated with ketofol was 114	In-depth analysis of past case notes	Having better recovery time than ketamine and Propofol.	No measure of the depth of sedation

Table 1: Comparison of Ketamine, Propofol and Ketofol

Two reviewers utilized a standardized form to gather patients' demographics, sample sizes, painful procedures, pharmacologic drugs, and results. Quality evaluation disagreements were settled by consensus. Review Manager 5.2.4 merged the assessments. Risk ratios (RR) and 95% confidence intervals were used to summarize unfavorable respiratory and total events, and random-effects models were adjusted for heterogeneity (CIs). K-P was more effective than propofol alone for procedural sedation if the RR was less than 1. P<0.05 or a non-1 95% CI for the RR showed statistical significance. No meta-analysis was feasible, thus descriptive data were utilized for sedation, procedure, and recovery periods. I2 assesses the percentage of variance in impact estimates that may be attributable to methodological variation versus a random variation. Variation is high when I2 is below 50%. Prior subgroup analyses comparing juvenile vs. adult patients, ASA physical category, 15 procedures, and study drug dosage were aimed to explain observed discrepancies. Rate criteria were used to grade every outcome's evidence and recommendation strength (Figure 1). A total of 1,688 citations were found that could be useful based on the search terms used. As a result of the removal of duplicate citations and studies that did not fulfill eligibility requirements, a total of 21 full-text publications were obtained for further examination. After excluding 15 papers, this evaluation included 6 RCTs that involved 932 patients (412 in the propofol group and 520 in the K-P group). Very high levels of inter-rater reliability (j = 0.88; 95% CI = 0.68 to 1.0) were found in the final selection of included trials, with 95.2% agreement. We summarize key features of the included studies. Solely two of the studies used only adult participants, while the other two included both adults and children (with one study excluding those younger than 14 and the other including those younger than). The patient group in one experiment was not specified, comprised of children and adolescents between the ages of 3 and 18. 22 Orthopedic procedures accounted for more than 65% of all procedures, whereas abscess drainage accounted for more than 20%.

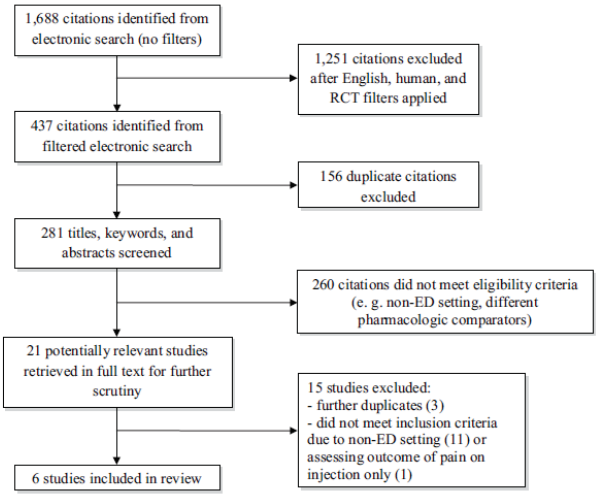

Figure 1: Flow diagram of included studies

Study evidence of Ketamine

A comprehensive six (06) studies were conducted in the literature to analyze the evidence of ketamine. The number of patients who were sedated over the period beginning in September 2020 and ending in March 2021 was 243. And also 215 individuals were treated with ketamine in the emergency department. Both inhalational and intravenous sedative methods (other than ketamine) were disregarded for this investigation. Nitrous oxide, either alone (n=9) or in combination with other methods (n=9), was the second most prevalent procedure, behind ketamine. The age of four years was the most common representation of the patient population (range 14 months to 15 years). One hundred thirty-seven (63.7%) of the patients receiving ketamine sedation were male. Wound care (n=131) and fracture, dislocation, or both care (n=62) were the most prevalent indications for ketamine sedation. The most common starting dosage was 1.25 mg/kg intravenously or 3.94 mg/kg intramuscularly. Seventy individuals needed further doses; 34.8% of those given an intravenous dosage

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and 17.9% of those given an intramuscular dose. Whether it was due to a lengthy operation time (n=32) or insufficient sedation (n=38), additional doses were administered in each case. When comparing the first dosages given intravenously (P=0.07) with intramuscularly (P=0.20), no significant difference was seen between the two groups of individuals needing further sedation.

Study evidence of Propofol

This study evidence analyzed the meaningful use of propofol for the use of procedural sedation in the emergency rooms from an observational, prospective standpoint. Between June 1, 2020, and January 31, 2021, one research investigator enlisted a convenience sample of eligible, consenting patients. The study's investigator was the deciding factor in selecting the convenience sample. The study's investigator was a senior anesthesia resident with emergency medicine residency experience and a board of certification from the American Board of Emergency Medicine. Eighty-two patients were included in the trial during its 6-month duration. They had a mean age of 38 (SD = 14; range = 18-81) and were almost half men. Most of the time incision and drainage (49%) and joint reduction (29%) were the most common indications for EDPS, followed by fracture treatment (11%). Out of the 82 participants, 17 (21%; 95% CI 12%-29%) encountered one of the 28 sedative events; clinical hypoventilation was the most prevalent. Eight respondents had no events, and seven experienced.

Study evidence of Ketofol

This retrospective, observational research examined how often emergency departments utilize propofol for procedural sedation. In the last six months between April 2021 and October 2021 a total of 114 cases, ketofol was used for sedation and pain relief during an emergency, the majority of which were orthopedic, and medication was given at a median dosage of 0.75 mg/kg (range, 0.2 to 2.05 mg/kg for both propofol and ketamine; IQR, 0.6 to 1.0 mg/kg). One hundred and ten patients (96.5%) had their procedures completed without the use of any supplemental sedatives. Doctors, nurses, and patients all gave a median rating of 10 on a scale from 1 to 10 for their overall satisfaction.

Combination of Ketamine and Propofol

The result of Ketamine based on our findings, 76.7% of patients were sent home after recovering under observation in the emergency room, the pediatric assessment unit, or the pediatric ward. The paradoxical agitation of a single patient was the reason for a failed sedative attempt that necessitated a switch to a general anesthetic. Those patients who were first treated for their injuries while sedated afterward required admission for final care. As a result, 165 fewer patients required a general anesthetic, which was a huge relief for the operating room and anesthesia staff. Other benefits include less time spent waiting to be admitted and less interruption to the family's routine. Results of Propofol Based on the data we have at present, it seems that propofol can be administered successfully and safely in the ED. While there is some data available, it seems to be from trials in which participants were under profound sedation or even general anesthesia. Patients may not be fasting or properly prepared for the surgery and even some physicians are not even ready or comfortable to manage the airway instantly, hence it is not advised that non-anesthetists provide these degrees of sedation. Hence, Ketamine combined with Propofol is the most effective anesthetic combination in the available research. Even though all but one of the published studies that were looked at for this article concluded that the combination of Ketamine and Propofol in bolus form provides safer and more effective sedation, larger randomized, prospective studies carried out in the emergency department that had sufficient power to use the maintenance of vital signs and the success of the procedure as endpoints are still required. The reviewed literature suggests that treating PSA with Ketofol in the ER is a safe and effective option. There is some evidence that Ketofol is more effective than either medication alone or as part of combination therapy, however, the evaluated trials are too small, side effects are seldom reported, and the single research performed in the ED is not a randomized controlled trial to make any firm conclusions. Emergency room visits climbed by almost 30% over time. Therefore, it may come as a surprise that the number of pediatric ketamine sedations fell by an average of 10.9% each year. This service may get more difficult to provide when emergency departments face rising demands. Traditional definitions and sedation scales may not apply to ketamine because of the drug's unique mechanism, therapeutic effects and safety profile. Additionally, due to the absence of a well-defined dose-response continuum, dissociative sedation is now defined as the attainment of extreme analgesia and forgetfulness while maintaining protective airway reflexes, spontaneous respirations and cardiac stability. Patients who were apneic after needing just minimal airway manipulation may have been under general anesthesia according to this classification. Propofol has a remarkable safety profile, as shown by the aforementioned observational studies. For instance, Daele *et al.*, followed a large group of people for two years and found no evidence of serious morbidity [12]. Nonetheless, without a comparison group, it cannot be assessed whether the positive results were due to the drug's effects or to better sedation techniques. Minor events, such as temporary hypoxia, occurred at a high incidence, although this may

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reflect the seemingly deep doses of sedation utilized and is comparable to rates previously described with midazolam in a pediatric ED setting. Tolerance of painful stimuli without protest is described as "deep sedation" or "global anesthesia" [10]. For certain procedures, dealing with a pediatric population may need this. There were no cases of aspiration, however, patients were not always instructed to fast before undergoing urgent treatments [13]. For decades, anesthesiologists have benefited from combining ketamine with propofol, but the practice has only just started to expand to other medical specialties. There is a dearth of information in the scientific literature on the bolus administration of ketofol for PSA since its usage is novel to most practitioners [14]. Due to their limited sample size, the existing studies cannot reliably identify differences between groups on any of their predefined outcomes. However, few trials examine the occurrence of other adverse events, such as emerging responses, which may induce practitioners to detour away from Ketofol and adopt another regimen that is determined to be similarly effective if they occur. Furthermore, diverse dosage regimens are utilized in the examined literature, making it challenging to compare and contrast the findings of various research [15-20]. Ketamine is known to retain respiratory function; therefore, it was hypothesized that the combination of ketamine and propofol may counteract the respiratory depression caused by propofol sedation. This possible protective effect is hypothesized to be based on the ability to achieve the desired sedation depth with a lower dose of propofol when using the combination than would otherwise be required if propofol were used alone. Rapid intravenous infusion of ketamine is known to have the potential to cause apnea. In a comparison of ketamine and propofol for mild sedation, a greater proportion of people receiving ketamine alone had symptoms of subclinical respiratory depression. However, this result may have been influenced by the fact that propofol patients utilized supplemental oxygen more frequently than ketamine patients [21-26]. We found that both ketofol and propofol reliably induce profound sedation. Despite the different mechanisms of action of the two medications, the duration and number of doses necessary to induce profound drowsiness were comparable. Deep drowsiness can be produced with 1 to 2 mg/kg of propofol alone, whereas dissociative dissociation with ketamine monotherapy typically needs 1.0 to 1.5 mg/kg. In our investigation, deep sedation with ketofol was reliably accomplished with nearly half of the required dose (0.7 mg/kg; interquartile range [IQR]: 0.55 to 0.90 mg/kg), which is consistent with earlier reports of ketofol use in adults [27-31].

CONCLUSIONS

It was concluded that Ketofol was the preferred agent for numerous procedures. The combination of Propofol and Ketamine is advantageous due to its hemodynamic stability, lack of respiratory depression, rapid recovery, and potent postoperative analgesia. As a sedoanalgesic, the safety and efficacy of Ketofol depend on the dose and ratio of the mixture. Consequently, Ketofol should be an ideal combination medication for procedural sedation. It had fewer adverse respiratory effects than Propofol alone in ED procedural sedation.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Corwell BN, Motov SM, Davis NL, Kim HK. Novel uses of ketamine in the emergency department. Expert Opinion on Drug Safety. 2022 Aug; 21(8): 1009-25. doi: 10.1080/14740338.2022.2100883.

[2] Foo TY, Mohd Noor N, Yazid MB, Fauzi MH, Abdull Wahab SF, Ahmad MZ. Ketamine-propofol (Ketofol) for procedural sedation and analgesia in children: a systematic review and meta-analysis. BMC Emergency Medicine. 2020 Dec; 20(1): 1-4. doi: 10.1186/s12873-020-00373-4.

[3] Symington L and Thakore S. A review of the use of propofol for procedural sedation in the emergency department. Emergency Medicine Journal. 2006 Feb; 23(2): 89-93. doi: 10.1136/emj.2005.023713.

[4] Andolfatto G, Abu-Laban RB, Zed PJ, Staniforth SM, Stackhouse S, Moadebi S, *et al*. Ketamine-propofol combination (ketofol) versus propofol alone for emergency department procedural sedation and analgesia: a randomized double-blind trial. Annals of Emergency Medicine. 2012 Jun; 59(6): 504-12. doi: 10.1016/j.annemergmed.2012.01.017.

[5] Pemayun IG and Sudisma IG. Respons Fisiologis Babi Bali Terhadap Anestetik Ketamin dan Propofol. Jurnal Veteriner. 2022 Jul; 23(1): 70-9. doi: 10.19087/jveteriner.2022.23.1.70.

[6] Akdeniz S, Ulu MB, Bakirtas M, Erdemir F. The renal protective efficacy of ketamine vs. propofol vs. ketofol against renal ischemia/reperfusion injury: An experimental rat study. Medicine. 2022; 11(3): 1317–21. doi: 10.5455/medscience.2022.04.097.

[7] Cosgrove P, Krauss BS, Cravero JP, Fleegler EW. Predictors of laryngospasm during 276,832 episodes of pediatric procedural sedation. Annals of

DOI: https://doi.org/10.54393/pjhs.v4i02.539

Emergency Medicine. 2022 Dec; 80(6): 485-96. doi: 10.1016/j.annemergmed.2022.05.002.

[8] Pusp A, Kumari A, Tiwary R, Kumar R, Ansari MM, Deep A. Clinico-physiological effect of ketamine, propofol and Ketofol as constant rate infusion anaesthesia during elective ovariectomy in dogs. The Pharma Innovation Journal. 2022 Jan; 11(1): 1291–6.

[9] Kayhan GE, Yucel A, Colak YZ, Ozgul U, Yologlu S, Karlidag R, *et al.* Ketofol (mixture of ketamine and propofol) administration in electroconvulsive therapy. Anaesthesia and Intensive Care. 2012 Mar; 40(2): 305-10. doi: 10.1177/0310057X1204000214.

[10] Luna A, Gupta A, Aggarwal S. Comparison of a ketamine-propofol combination and etomidate for anaesthesia induction on haemodynamic parameters in patients undergoing coronary artery bypass grafting. Southern African Journal of Anaesthesia and Analgesia. 2022 Sep; 28(4): 151-5. doi: 10.36303/SAJAA.2022.28.4.2728.

[11] Singh SA, Prakash K, Sharma S, Dhakate G, Bhatia V. Comparison of propofol alone and in combination with ketamine or fentanyl for sedation in endoscopic ultrasonography. Korean Journal of Anesthesiology. 2018 Feb; 71(1): 43-7. doi: 10.4097/kjae.2018.71.1.43.

[12] Daele VA, Zeeuws D, Baeken C. Suicidality during neuromodulation in the elderly depressed: study design. European Psychiatry. 2022 Jun; 65(S1): S736-7. doi: 10.1192/j.eurpsy.2022.1902.

[13] Kurdi MS, Theerth KA, Deva RS. Ketamine: current applications in anesthesia, pain, and critical care. Anesthesia, Essays and Researches. 2014 Sep; 8(3): 283-90. doi: 10.4103/0259-1162.143110.

[14] Marland S, Ellerton J, Andolfatto G, Strapazzon G, Thomassen O, Brandner B, *et al.* Ketamine: use in anesthesia. CNS Neuroscience & Therapeutics. 2013 Jun; 19(6): 381-9. doi: doi.org/10.1111/cns.12072.

[15] Yan JW, McLeod SL, Iansavitchene A. Ketamine-propofol versus propofol alone for procedural sedation in the emergency department: a systematic review and meta-analysis. Academic Emergency Medicine. 2015 Sep; 22(9): 1003-13. doi: 10.1111/acem.12737.

[16] Weisz K, Bajaj L, Deakyne SJ, Brou L, Brent A, Wathen J, *et al.* Adverse events during a randomized trial of ketamine versus co-administration of ketamine and propofol for procedural sedation in a pediatric emergency department. The Journal of Emergency Medicine. 2017 Jul; 53(1): 1-9. doi: 10.1016/j.jemermed.2017.03.024.

[17] Schmitz A, Weiss M, Kellenberger C, OGorman Tuura R, Klaghofer R, Scheer I, *et al.* Sedation for magnetic resonance imaging using propofol with or without ketamine at induction in pediatrics—a prospective randomized double-blinded study. Pediatric Anesthesia. 2018 Mar; 28(3): 264-74. doi: 10.1111/pan.13315.

[18] Tewari K, Tewari VV, Datta SK. Dexmedetomidine–propofol vs ketamine–propofol anaesthesia in paediatric and young adult patients undergoing device closure procedures in cardiac catheterisation laboratory: An open label randomised trial. Indian Journal of Anaesthesia. 2018 Jul; 62(7): 531. doi: 10.4103/ija.IJA_692_17.

[19] Ahmed SS, Hicks SR, Slaven JE, Nitu ME. Deep sedation for pediatric dental procedures: is this a safe and effective option? Journal of Clinical Pediatric Dentistry. 2016 Mar; 40(2): 156-60. doi: 10.17796/1053-4628-40.2.156.

[20] Canpolat DG, Esmaoglu A, Tosun Z, Akın A, Boyaci A, Coruh A. Ketamine-propofol vs ketamine-dexmedetomidine combinations in pediatric patients undergoing burn dressing changes. Journal of Burn Care & Research. 2012 Nov; 33(6): 718-22. doi: 10.1097/BCR.0b013e3182504316.

[21] Willman EV and Andolfatto G. A prospective evaluation of "ketofol" (ketamine/propofol combination) for procedural sedation and analgesia in the emergency department. Annals of Emergency Medicine. 2007 Jan; 49(1): 23-30. doi: 10.1016/j.annemergmed.2006.08.002.

[22] Andolfatto G and Willman E. A Prospective Case Series of Single-syringe Ketamine–Propofol (Ketofol) for Emergency Department Procedural Sedation and Analgesia in Adults. Academic Emergency Medicine. 2011 Mar; 18(3): 237-45. doi: 10.1111/j.1553-2712.2011.01010.x.

[23] Miner JR, Gray RO, Bahr J, Patel R, McGill JW. Randomized clinical trial of propofol versus ketamine for procedural sedation in the emergency department. Academic Emergency Medicine. 2010 Jun; 17(6): 604-11. doi: 10.1111/j.1553-2712.2010.00776.x.

[24] Green SM. Propofol in emergency medicine: further evidence of safety. Emergency Medicine Australasia. 2007 Oct; 19(5): 389-93. doi: 10.1111/j.1742-6723.2007.01016.x.

[25] Akin A, Esmaoglu A, Tosun Z, Gulcu N, Aydogan H, Boyaci A. Comparison of propofol with propofol–ketamine combination in pediatric patients undergoing auditory brainstem response testing. International Journal of Pediatric Otorhinolaryngology. 2005 Nov; 69(11): 1541-5. doi: 10.1016/j.ijporl.2005.04.011.

[26] Mourad M, El-Hamamsy M, Anwar M, Schwartz E. Low

DOI: https://doi.org/10.54393/pjhs.v4i02.539

dose ketamine reduces sedative doses of propofol during ambulatory transoesophageal echocardiography. Egypt Journal of Anaesthology. 2004; 20(1): 41-6.

[27] Aouad MT, Moussa AR, Dagher CM, Muwakkit SA, Jabbour-Khoury SI, Zbeidy RA, *et al.* Addition of ketamine to propofol for initiation of procedural anesthesia in children reduces propofol consumption and preserves hemodynamic stability. Acta Anaesthesiologica Scandinavica. 2008 Apr; 52(4): 561-5. doi: 10.1111/j.1399-6576.2008.01584.x.

[28] Miner JR and Burton JH. Clinical practice advisory: emergency department procedural sedation with propofol. Annals of Emergency Medicine. 2007 Aug; 50(2): 182-7. doi: 10.1016/j.annemergmed. 2006.12. 017.

[29] Miner JR, Biros MH, Seigel T, Ross K. The utility of the bispectral index in procedural sedation with propofol in the emergency department. Academic Emergency Medicine. 2005 Mar; 12(3): 190-6. doi: 10.1197/j.aem. 2004.10.004.

[30] Bell A, Treston G, Cardwell R, Schabort WJ, Chand D. Optimization of propofol dose shortens procedural sedation time, prevents resedation and removes the requirement for post-procedure physiologic monitoring. Emergency Medicine Australasia. 2007 Oct; 19(5): 411-7. doi: 10.1111/j.1742-6723.2007.01009.x.

[31] David H and Shipp J. A randomized controlled trial of ketamine/propofol versus propofol alone for emergency department procedural sedation. Annals of Emergency Medicine. 2011 May; 57(5): 435-41. doi: 10.1016/j.annemergmed.2010.11.025.

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Original Article

Knowledge, Attitude and Practices Regarding Menopause Among Elderly Women Attending Tertiary Health Care Hospital in Lahore, Pakistan

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ABSTRACT

Menopause is a stage in life in which female periods are stopped, as it is a normal part of ending of your fertile, reproductive years. **Objective:** To assess the knowledge, attitude and practices regarding menopause among elderly women of Lahore. **Methods**: A cross sectional study was conducted in the Tertiary Health Care Centers in Lahore, Pakistan. Data were collected by non-probability convenient sampling technique. Inclusion criteria includes all females age between 45 to 60 and above. Whereas the exclusion criteria include non-cooperative individuals, women on any drug therapy. After taking informed written consent, data were collected by using self-structured questionnaire. **Results:** According to the study, 70% women had prior knowledge of menopause. 60% believe menopause is life-altering. Additionally, 67% believe menopause causes weight gain, 67% believe that food changes assist manage menopause. In addition, 65% practice the lifestyle changes help managing menopause. 44% had mild hot flashes and sweating episodes, 23% had severe symptoms, 45% of women had mild sleep issues. 36% were suffering from mild depression, and 30% had no symptoms. In 29% women had osteoporosis, 46% women have joint pain 25% of women made dietary modification for menopause. **Conclusions:** The majority of women were aware of menopause and its symptoms because they were educated, but they did not live a healthy lifestyle that included dietary practices and physical activities such as yoga and exercise. Providing menopause management could be a strategy to encourage successful menopausal transition in middle-aged women.

INTRODUCTION

Menopause is a physiological event, defined as the permanent cessation of menstrual cycles when a woman has had amenorrhea for 12 months without any other obvious physiological or pathological issue. Understanding its nature and associated symptoms can help women experience a good quality of life during this period [1]. The phase of shift in ovarian function from fertile to infertile, known as menopause, is a normal and inevitable phenomenon that affects all women. The phase right before the menopause happens is called perimenopause [2]. During this transitional period preceding menopause, a woman's ovaries produce fewer mature eggs, and ovulation becomes erratic [3]. Simultaneously, estrogen and progesterone production diminish. Although the average age of menopause is 51, it is considered normal between the ages of 40 and 60, whereas premature menopause is the onset of menopause in women younger than 40 [4, 5]. Those who smoke and are underweight are more likely to experience an early menopause, whereas women who are overweight frequently experience a delayed menopause [6]. Menopause is a period of oestrogen depletion characterized by physical and psychological changes such as hot flushes, monthly irregularity, night sweats, dyspareunia, urine incontinence, sleep disruption, weariness, headache, sadness, anxiety, and difficulty concentrating [7, 8]. According to Strategy 2030, life expectancy would rise over 75 years; so, healthcare professionals must prepare to improve their abilities in

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caring for women in the postmenopausal age, as well as to minimize comorbidities and associated expenses [9, 10]. Early detection of symptoms can aid in the decrease of discomfort and concerns among women, improving their quality of life throughout menopause and beyond [11]. The basic purpose of the study is to investigate the knowledge regarding attitude of menopause and menopausal symptoms and to assess the perception of menopause. The research also aimed to analyze prevalent health - related behaviors about menopause and raise knowledge about menopause, its symptoms, and treatment.

METHODS

A cross sectional study was conducted in the Tertiary Health Care Centers in Lahore, Pakistan. The study duration is 4 months and data were collected by non-probability convenient sampling technique. Inclusion criteria includes all females age between 45 to 60 and above. Individuals less than 40 years of age. Individuals not experienced menopause. However, the exclusion criteria include non-cooperative individuals, women on any drug therapy. The Self-Structured Questionnaire was used for data collection after the approval of ethnical committee. After taking informed written consent, data were collected by the help of attached pre-tested data collection tool.

RESULTS

According to Table 1, frequency distribution showed that 39% of women were between ages of 40-50 years, 45% were between 51-60 years, 12% were between 61-70 years and 4% were between 71-80 years. Result showed that 79% women were married, 9% women were unmarried and 12% were widow. The above table showed that 81% women were from urban area and 19% were from rural area. The education status of participants in which only 8% of women were illiterate, 92% were literate, 11% were matric, 25% were inter and 56% were graduate.

No.	Categories	Ranges	Frequency (%)
1.	Age	40-50	39 (39%)
		51-60	45 (45%)
		61-70	12 (12%)
		71-80	4 (4%)
2	Marital Status	Married	79 (79%)
		Un Married	9 (9%)
		Widow	12 (12%)
3.	BMI	Underweight below 18	1 (1%)
		Normal 18.5-24.9	17 (17%)
		Overweight 25-29.9	39 (39%)
		Obese above 30	43 (43%)
4.	Residential Status	Urban	81 (81%)
		Rural	19 (19%)
5.	Education Level	Illiterate	8 (8%)
		Matric	11 (11%)
		Inter	25 (25%)
		Graduation	56 (56%)

Table 1: Frequency distribution of demographics among participants

According to Table 2, 44% women get mild hot flashes and episodes of sweating, 23% get severe symptoms, 5% get extremely severe symptoms, 45% women face mild sleep problems, 26% face severe sleep problems, and 28% didn't face any problem. Out of 100, change in appetite was 39% mild, 18% severe, 5% extremely severe and 38% was none.

Sr.	Symptoms	Mild	Severe	Extremely Severe	None	Total
1.	Feel physical & general exhaustion	32	21	8	39	100
2.	Bladder problems	27	10	4	59	100
3.	Joint & muscular discomfort	33	15	16	36	100

Table 3: Frequency distribution of physical exhaustion, bladder problem and joint pain

According to the Table 4, frequency distribution showed that 46% women have thyroid issue, 54% wasn't have, and in 62% women have symptoms of osteoporosis while 38% of them haven't and 22% women have breast cancer, 78% don't have breast cancer, and 45% women have ovarian issues. The data showed that 43% women were obese, 57% were not obese.

Sr. no	Disease	Yes	No	Total
1.	Thyroid Issue	46	54	100
2.	Osteoporosis	62	38	100
3.	Breast cancer	22	78	100
4.	Ovarian issue	45	55	100
5.	Obesity	43	57	100

Table 4: Frequency distribution of diseases among participants

According to Table 5, 95% of women heard about menopause, while 5% of them don't know about it, and 10% of women think menopause is a disease while 90% knows that menopause is not a disease. Out of 100 women, 60% think that menopause is life-altering while 40% thinks it is not life-altering, 67% of women think that menopause makes one fat, while 33% think that this is not true that menopause makes one fat.

Sr. no	Menopause related knowledge	Yes	No	Total
1.	Heard of the menopause	95	5	100
2.	Menopause is disease	10	90	100
3.	Menopause is life-altering	60	40	100
4.	Menopause make one fat	67	33	100

Table 5: Frequency Distribution of knowledge and awareness among participants

According to Figure 1 frequency distribution showed that 65% of women think that lifestyle changing, and physical activity help manage menopause, while 35% think that lifestyle changing doesn't matter.

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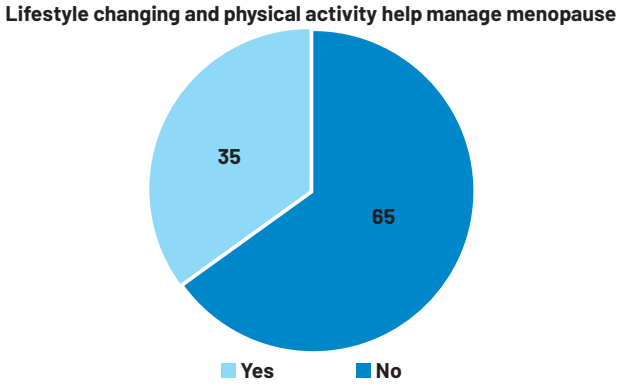

Figure 1: Frequency Distribution about lifestyle changes and physical activity to manage menopause

DISCUSSION

In current study, we find out that almost 70% women had prior knowledge of menopause, whereas 20% of women were not yet menopause, 32% of women undergoing menopause and 48% of them gone through menopause. Similarly, another study investigates the middle-aged women's awareness, knowledge, and perceptions about menopause and hormone treatment. The majority of participating women (82%) had good to poor overall understanding of menopause, did not know who HT is used for (48%), and who it is refuted (77%). Additionally, the higher the understanding of HT, the better the knowledge of menopause (P 0.001)[12]. In the present study data were collected from women attending the Out-Patient Departments of Mayo Hospital and University of Lahore Teaching Hospital, Lahore. In a sampling of 100 women, 95% had heard of menopause, while 5% had not; 10% believed menopause was a sickness, while 90% knew it was not. 60% believe menopause is life-altering, while 40% believe it is not the life altering process rather it's a natural biological phenomenon. In a similar study, attitudes and societal norms around menopause were examined. Sample size include 267 women having menopausal symptoms, according to 48% of respondents, are "not unwell" and "simply experiencing symptoms of a natural physiological process." It is challenging for more than 56% of occupational physicians to identify the association between menopausal symptoms and job performance [13, 14]. Additionally, 67% believe menopause causes weight gain, while 33% believe this is not the case, they don't gain any weight. Similarly, as research investigated those changes in body weight and body composition caused by the menopause. The change in the hormonal level at menopause is associated with an increase in total body fat, abdominal fat and overall weight gain. Excessive weight gain in middle age is not only correlated with an increased risk of cardiovascular and metabolic illness, but it also has a negative influence on health-related quality of life [15, 16].

In this study 86% believe that menopause education and awareness is vital for the general health of women, whereas 14% believe that it is not essential for their wellbeing. Similar to the survey research of 450 females aged 20–40 in two hospitals in Irbid, Jordan, who were aware of menopause and MHT symptoms. More over half of the participants were informed on a variety of menopause-related topics. The results indicated that premenopausal women in Jordan are educated about numerous menopause-related topics. However, educational programmes and counselling are needed to educate young women about menopause, particularly its health effects and treatment alternatives. In current cross-sectional study, 40% said they had sought advice from a healthcare professional on menopause which helps them to cope with the symptoms of menopause, while 60% said it was unnecessary. Similarly, another study conducted to investigate to assess 40–65-year-old women's knowledge of menopause and coping strategies by the healthcare professional. 93% of women preferred visiting a doctor or healthcare center (n=103, 60.9%). Structured menopausal education initiatives are needed to promote awareness [17, 18]. In addition, 65% believe that lifestyle changes and physical activity such as regular exercise, healthy diet, intake of more portions of estrogen rich dried fruits daily help manage menopause, while 35% believe that they can manage symptoms of menopause without any change in their lifestyle. A similar result has been shown by a study in which 1,165 Finnish women aged 45-64 years from population-based study were followed up for 8 years. Women whose physical activity increased or stayed consistent had better QoL than those whose physical activity decreased (eb = 1.49, 95% CI 1.23 $p < 0.001$ to 1.80, eb = 1.46, 95%CI 1.24 to 1.73 $p < 0.001$). Majority of women believe that healthy lifestyle and physical activity will help to support menopause. Women who maintained weight throughout follow-up had better QoL than those who gained weight (eb = 1.26, 95%CI 1.07 to 1.50 $p > 0.01$) [19]. In current study 44% had mild hot flashes and sweating episodes when their menopause begins, 23% have severe symptoms from the onset of menopause, 5% women suffer from severe disabling symptoms, and 28% have no such symptoms in the menopause cycle. 44% have minor cardiovascular problems, 17% have severe cardiovascular problems, 3% have extremely severe heart issues, and 36% have no symptoms. Similarly, a cross-sectional study of 45–70-year-olds analyzed menopausal symptoms. 770 women were enrolled; 98 (12.7%) had moderate to severe depression and 672 (87.3%) did not. Women with moderate to severe depression symptoms were almost twice as likely to have recent symptoms such hot flashes and night sweats than women with minimal to mild depressive

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symptoms (aOR 1.67, 95%CI 1.04–2.68) and to characterize them as severe (aOR 1.63, 95%CI 0.95–2.83). Despite utilizing symptom-improving drugs, 20% of women with moderate/severe depression symptoms (vs. 4.6% no/mild) had a greater symptom burden [20]. Presently, 45% of women have mild sleep issues such as insomnia, REM sleep, narcolepsy etc., 26% have severe sleep problems, few of them have extremely severe sleep problems, and 28% have no problem in their sleep cycles. Similarly, sleep disorders in the menopause are common. Menopause and vasomotor symptoms may cause these illnesses. In menopause, insomnia, nocturnal breathing problems, restless leg syndrome, periodic leg movement syndrome, depression, and anxiety are the most frequent sleep disorders [21]. Many women suffer from menopause-related insomnia. Vasomotor symptoms and hormone changes, circadian rhythm irregularities, worsening of primary insomnia, mental disorders, other medical illnesses, and lifestyle factors may contribute to this issue [22]. One of the core symptoms of the menopausal transition is sleep disturbance and insomnia. Per menopausal women have trouble falling asleep and waking up frequently. Vasomotor symptoms, reproductive hormone changes, circadian rhythm irregularities, mental disorders, coexisting medical problems, and lifestyle may cause this form of insomnia. In menopausal and postmenopausal women, obstructive sleep apnea and restless leg syndrome can also affect sleep quality [23]. In this study changes in appetite were modest in 39% of cases, severe in 18%, extreme in 5%, and non-existent in 38% of cases. Similarly, to study menopausal diet and appetite changes. The baseline research comprised 94 premenopausal women (age: 49.9±1.9 years; BMI: 23.3±2.3 kg/m2). Majority of menopausal women have a frequent change in appetite. By year 5, postmenopausal women had lower food diary energy and carbohydrate intake than women in the menopause transition ($p>0.05$). Fat and protein consumption reduced in postmenopausal women by year 5 ($0.05>P<0.01$). After menopause, fat intake increased ($p<0.05$). Protein and spontaneous EI decreased during time and were greater before menopause ($p<0.05$). Hunger, desire to eat, and projected food consumption rose during menopause and remained high afterward ($0.05>p<0.001$). Menopause lowered fasting fullness ($p<0.05$). Menopausal transition appears to decrease food consumption, enhance hunger and an increase in appetite [24]. Currently, 36% said their depression was mild, 27% said it was moderate, 7% said it was severe, and 30% said they had no symptoms. By year 5, postmenopausal women had lower food diary energy and carbohydrate intake than menopausal women ($p>0.05$). Postmenopausal women consumed less fat and protein by year 5 ($0.05>p<0.01$). Menopause increased fat consumption ($p<0.05$). Protein and spontaneous energy intake declined and were higher before menopause ($p<0.05$). Hunger, desire to eat, and anticipated food consumption increased during menopause and persisted beyond ($0.05>p<0.001$). Menopause reduced fasting fullness ($p<0.05$). Menopause reduces food intake and increases appetite [25]. Currently, 33% women were obese due to decline in the level of estrogen, 25% of women were having type 2 diabetes mellitus, and 27% women diabetes wasn't present. In similar 23% women were obese due to decline in the level of estrogen, 22% of women were having type 2 diabetes mellitus [26]. In the present research 9% women have thyroid issue such as fatigue, forgetfulness, mode swings, cold intolerance etc., 54% weren't have and in 37% no thyroid issue was present. In similar to it a total of 100 patients were included in this study. 17% of hypothyroid female patients. Hypothyroidism is linked to menopausal female age, BMI, TSH, T3&T4, weariness, muscular cramp, depression, weight gain, cold sensitivity, and sleeping issues [27]. Osteoporosis affects 29% of women, weakening bones so much that even modest stress can break them while 71% of them haven't suffer from any bone disorder. About 46% women have joint pain, and 54% women don't have any such symptom. Similarly, another research conducted by Borji and Nasri 2017 in which majority of women have symptoms of osteoporosis which causes bones to become weak and brittle that is responsible for stress fracture moreover 46% women have joint pain and joint stiffness [26]. Presently, 25% of women made dietary modification for menopause, 75% of them don't make any such modification. In similar to this majority of menopausal women have made dietary modification to improve menopausal symptoms and reduce obesity, and body composition [28].

CONCLUSIONS

The majority of women were aware of menopause and its symptoms because they were educated, but they did not live a healthy lifestyle that included dietary habits and physical activities such as yoga and exercise. Understanding the notion of menopause can assist women in understanding that menopause is a natural developmental phase. Women will be better prepared for menopause if they are more aware of hormonal fluctuations and the resulting physical, physiological, psychological, and sexual changes in their bodies. Regardless of the patient's socioeconomic status, health care personnel would be advised to provide more information regarding menopausal symptoms as well as therapy to alleviate these symptoms.

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Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] AlQuaiz AM, Tayel SA, Habiba FA. Assessment of symptoms of menopause and their severity among Saudi women in Riyadh. Annals of Saudi Medicine. 2013 Jan; 33(1): 63-7. doi: 10.5144/0256-4947.2013.63.

[2] Santoro N, Roeca C, Peters BA, Neal-Perry G. The menopause transition: signs, symptoms, and management options. The Journal of Clinical Endocrinology & Metabolism. 2021 Jan; 106(1): 1-5. doi: 10.1210/clinem/dgaa764.

[3] Pajalić Z and Raboteg-Šarić Z. Determinants of menopause-related symptoms in women during the transition to menopause and the postmenopausal period–a systematic literature review. Journal of Health Sciences. 2020 Apr; 10(1): 1-33. doi: 10.17532/jhsci.2020.885.

[4] Jungari SB and Chauhan BG. Prevalence and determinants of premature menopause among indian women: issues and challenges ahead. Health & Social Work. 2017 May; 42(2): 79-86. doi: 10.1093/hsw/hlx010.

[5] Monteleone P, Mascagni G, Giannini A, Genazzani AR, Simoncini T. Symptoms of menopause—global prevalence, physiology and implications. Nature Reviews Endocrinology. 2018 Apr; 14(4): 199-215. doi: 10.1038/nrendo.2017.180.

[6] El Hajj A, Wardy N, Haidar S, Bourgi D, Haddad ME, Chammas DE, *et al*. Menopausal symptoms, physical activity level and quality of life of women living in the Mediterranean region. PloS one. 2020 Mar; 15(3): e0230515. doi: 10.1371/journal.pone.0230515.

[7] Kalhan M, Singhania K, Choudhary P, Verma S, Kaushal P, Singh T. Prevalence of menopausal symptoms and its effect on quality of life among rural middle-aged women (40–60 Years) of Haryana, India. International Journal of Applied and Basic Medical Research. 2020 Jul; 10(3): 183. doi: 10.4103/ijabmr.IJABMR_428_19.

[8] Ilankoon IM, Samarasinghe K, Elgán C. Menopause is a natural stage of aging: a qualitative study. BMC Women's Health. 2021 Dec; 21: 1-9. doi: 10.1186/s12905-020-01164-6.

[9] Yadav V, Jain A, Dabar D, Goel AD, Sood A, Joshi A, *et al*. A meta-analysis on the prevalence of depression in perimenopausal and postmenopausal women in India. Asian Journal of Psychiatry. 2021 Mar; 57: 102581. doi: 10.1016/j.ajp.2021.102581.

[10] Sharma S and Mahajan N. Menopausal symptoms and its effect on quality of life in urban versus rural women: A cross-sectional study. Journal of Mid-Life Health. 2015 Jan; 6(1): 16. doi: 10.4103/0976-7800.153606.

[11] Zhang L, Ruan X, Cui Y, Gu M, Mueck AO. Menopausal symptoms and associated social and environmental factors in midlife Chinese women. Clinical Interventions in Aging. 2020 Nov; 15: 2195-208. doi: 10.2147/CIA.S278976.

[12] Shahzad D, Thakur AA, Kidwai S, Shaikh HO, AlSuwaidi AO, AlOtaibi AF, *et al*. Women's knowledge and awareness on menopause symptoms and its treatment options remains inadequate: a report from the United Arab Emirates. Menopause. 2021 Aug; 28(8): 918-27. doi: 10.1097/GME.0000000000001783.

[13] Geukes M, Oosterhof H, van Aalst MP, Anema JR. Attitude, confidence and social norm of Dutch occupational physicians regarding menopause in a work context. Maturitas. 2020 Sep; 139: 27-32. doi: 10.1016/j.maturitas.2020.05.015.

[14] Simkin-Silverman LR and Wing RR. Weight gain during menopause: is it inevitable or can it be prevented? Postgraduate medicine. 2000 Sep; 108(3): 47-56. doi: 10.3810/pgm.2000.09.1.1204.

[15] Wing RR, Matthews KA, Kuller LH, Meilahn EN, Plantinga PL. Weight gain at the time of menopause. Archives of Internal Medicine. 1991 Jan; 151(1): 97-102. doi: 10.1001/archinte.151.1.97.

[16] Alshogran OY, Mahmoud FM, Alkhatatbeh MJ. Knowledge and awareness toward menopause and hormone therapy among premenopausal women in Jordan. Climacteric. 2021 Mar; 24(2): 171-8. doi: 10.1080/13697137.2020.1813099.

[17] İkiişik H, Turan G, Kutay F, Karamanli DC, Gülen E, Özdemir E, *et al*. Awareness of menopause and strategies to cope with menopausal symptoms of the women aged between 40 and 65 who consulted to a tertiary care hospital. ESTÜDAM Halk Sağlığı Dergisi. 2020 Jan; 5(1): 10-21. doi: 10.35232/estudamhsd.632194.

[18] Moilanen JM, Aalto AM, Raitanen J, Hemminki E, Aro AR, Luoto R. Physical activity and change in quality of life during menopause-an 8-year follow-up study. Health and Quality of Life Outcomes. 2012 Dec; 10: 1-7. doi: 10.1186/1477-7525-10-8.

[19] Reed SD, Ludman EJ, Newton KM, Grothaus LC, LaCroix AZ, Nekhlyudov L, *et al*. Depressive symptoms and menopausal burden in the midlife. Maturitas. 2009 Mar; 62(3): 306-10. doi: 10.1016/j.maturitas.2009.01.002.

DOI: https://doi.org/10.54393/pjhs.v4i02.151

[20] Guidozzi F. Sleep and sleep disorders in menopausal women. Climacteric. 2013 Apr; 16(2): 214-9. doi: 10.3109/13697137.2012.753873.
[21] Ameratunga D, Goldin J, Hickey M. Sleep disturbance in menopause. Internal Medicine Journal. 2012 Jul; 42(7): 742-7. doi: 10.1111/j.1445-5994.2012.02723.x.
[22] Jehan S, Masters-Isarilov A, Salifu I, Zizi F, Jean-Louis G, Pandi-Perumal SR, Gupta R, Brzezinski A, McFarlane SI. Sleep disorders in postmenopausal women. Journal of Sleep Disorders & Therapy. 2015 Aug; 4(5): 212.
[23] Duval K, Prud'Homme D, Rabasa-Lhoret R, Strychar I, Brochu M, Lavoie JM, *et al.* Effects of the menopausal transition on dietary intake and appetite: a MONET Group Study. European Journal of Clinical Nutrition. 2014 Feb; 68(2): 271-6. doi: 10.1038/ejcn.2013.171.
[24] Freeman EW. Associations of depression with the transition to menopause. Menopause. 2010 Jul; 17(4): 823-7. doi: 10.1097/gme.0b013e3181db9f8b.
[25] Shaikh S, Noor FA, Azli S, Sajjad S. Hypothyroidism screening in menopausal women. Pakistan Journal of Medical Health Sciences. 2017 Jan; 11: 14-7.
[26] Borji S and Nasri H. An update on prevention and treatment of osteoporosis. Journal of Parathyroid Disease. 2017 Mar; 5(2): 28-31. doi: 10.15171/jpd.2017.01.
[27] Al-Safi ZA and Polotsky AJ. Obesity and menopause. Best Practice & Research Clinical Obstetrics & Gynaecology. 2015 May; 29(4): 548-53. doi: 10.1016/j.bpobgyn.2014.12.002.
[28] Kozakowski J, Gietka-Czernel M, Leszczyńska D, Majos A. Obesity in menopause–our negligence or an unfortunate inevitability? Menopause Review/Przegląd Menopauzalny. 2017 Jun; 16(2): 61-5. doi: 10.5114/pm.2017.68594.

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Original Article

Frequency of Successful Extubation in Patients with Rapid Shallow Breathing Maximum ($RSBI_{max}$)

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ABSTRACT

Prolonged mechanical ventilation and premature removal from mechanical ventilation (MV) are independent risk factors for morbidity and mortality. Weaning and liberation from MV remain critical stages of a patient's ICU stay. To date, no weaning predictive index has proven to be ideal. **Objectives**: To determine the frequency of successful extubation in patients on mechanical ventilation after 2 hour of spontaneous breathing trial (SBT). **Methods:** A total of 100 consecutive patients admitted in Medical ICU, meeting the inclusion criteria was enrolled. Non probability purposive sampling was employed. Patients of both gender and age ≥18 years, on mechanical ventilator for more than 48hrs were included. Two hours of SBT was performed in a semi seated position. RSBI were measured at 1 min after extubation. Patient who have not developed any feature of SBT intolerance, was continued on SBT up to 120 min. All collected data was entered into Statistical Package for Social Sciences (SPSS) version 24.0 for analysis. **Results:** Successful extubation was found to be (86%). in patients with $RSBI_{max}$ ≤105. Among 43 patients with successful extubation, 60.5% were male and 39.5% were female. The average age was 53± 14.6 yrs and the average days of MV were 7± 2.3 days. Rate of successful extubation was high with the age ≤ 60 yrs, in male gender and with duration of MV ≤7 days. **Conclusion**: It is concluded from the above study that patients with $RSBI_{max}$ ≤105 were found to have successful extubation.

INTRODUCTION

In intensive care units, 40-65% of patients requisite mechanical ventilation (MV).Its eases the breathing labor and provides suitable magnitude of oxygen among these individuals [1]. MV is imperative to sustain life in critically sick patients, though if the MV is used for extended interval it is connected with multiple hitches including lung damage, respiratory muscles weakness and Ventilator associated Pneumonia. To evade these problems, prompt elimination of MV is enforced [2, 3]. Beside that, untimely elimination of MV is associated with elongated hospitalizations, increase stay at intensive care units, augmented medical expenditure, heightened mortality and morbidity [1, 4]. There is also extubation failure in some individuals regardless of planned weaning from MV. This extubation failure blown up the risk of complications which in turn leads to higher mortality. Extubation Failure is defined as requirement of intubation within 72 hours [5]. Weaning is the technique of decreasing ventilator support, it may include either an quick shift from complete ventilatory sustenance to a period of breathing without support from the ventilator (i.e, a spontaneous breathing trial [SBT]) or a steady lessening of ventilator support comprising, Continuous Positive Airway Pressure (CPAP), Pressure Support (PS) with marginal support [6]. Weaning inability is frequently associated with the development of a rapid shallow breathing pattern. The RSBI is a significant predictor of outcome [7]. Yang and Tobin pioneered RSBI, which is now the most widely used predictor of weaning and extubation outcome. Many other studies in both children and adults have supported it. RSBI is defined as

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the ratio of respiratory rate (RR) to tidal volume (VT) measured by spirometer during the first minute after disconnecting from ventilatory support while patients are still intubated and breathing spontaneously on room air. Values of RSBI >105 have been established as being predictor of unsuccessful weaning and extubation failure. RSBI predict success in weaning with a sensitivity of 97%, specificity of 64%, positive predictive value of 78% and negative predictive value of 95% [8, 9]. The present study measures RSBI at 1 minutes of two hours of spontaneous breathing trial which may be an accurate, noninvasive and simple determination that can be used in critical care setting as a predictor of successful extubation. This will result in decreasing the complications of prolonged MV and of premature removal from MV.

METHODS

After the approval from the ethical committee of the Faisal hospital, This Case-series study was conducted at Medical ICU from 1-July- 2021 to 31-December-2021. A total of 100 consecutive patients admitted in Medical ICU, meeting the inclusion criteria was enrolled. A written informed consent was taken from attendant of patients. Non probability purposive sampling was employed. Patients of both gender and age ≥18 years, intubated with tube size ≥7.0mm, on mechanical ventilator for more than 48hrs were included. Patients with known upper airway obstruction, having copious secretions with cough, with status of "Do Not Resuscitate" and having tracheostomy were excluded. The critical care physician with more than five years of expertise decided to conduct a weaning study. A trial of spontaneous breathing was conducted while semi-seated. The assisted-controlled-ventilation was stopped while each patient will breath spontaneously through the ventilator circuit on spontaneous mode of ventilation (pressure support 5 cm H_2O, $FiO_2 \leq 40\%$, PEEP: 0). Patient who have not developed any feature of SBT intolerance, was continued on SBT up to 120 min. Values of respiratory rate RR (breaths/min) and tidal volume VT (Liter) was provided by digital output of the ventilator. RSBI was calculated as the ratio RR/VT at 1 minute. Blood pressure, ECG, and SpO2 were all continuously monitored during SBT. Clinical and demographic data, as well as mechanical ventilation duration and comorbidities, were collected. The critical care team considered extubation if subjects tolerated the SBT. Subjects who will maintain spontaneous breathing >48 hour following extubation was considered as having successful extubation and subjects who were required re-intubation within 48 hours following extubation was considered as having extubation failure. All collected data was entered into Statistical Package for Social Sciences (SPSS) version 24.0. Mean ± SD was calculated for Age of patient, Days on mechanical ventilation, Maximum increase in RSBI ($RSBI_{max}$). Frequency and percentages was calculated for Gender, Successful extubation, Medical comorbid and Indication for mechanical ventilation. Stratification was done with regard to age, gender, duration of mechanical ventilation, comorbid and indication of mechanical ventilation to see the effects of these on outcome.

RESULTS

A total of 100 patients were included in the current study. The patients mean age was 55.1 ± 14.7 yrs. Out of 100 patients 56 (56%) were male and 44 (44%) were female. Among 100 patients who were extubated after 2 hours of SBT, 86 found to have successful extubation.

RSBI	Successful Extubation		Total n = 100
	Yes (n=86)	No (n=14)	
≤ 105	80 (93%)	2 (14.28)	82 (82%)
>105	6 (7%)	12 (85.7)	18 (18%)

Table 1: Successful extubation with RSMI

The average $RSBI_{max}$ in patients with successful extubation was 76.3 ± 22.5 breaths/min/lit. Rate of successful extubation in patients with maximum increase in RSBI ($RSBI_{max}$) ≤ 105 was (93%) while in patients with $RSBI_{max}$ > 105, successful extubation was observed in (7%).

Indication for MV	Successful Extubation		Total n = 100
	Yes (n=86)	No (n=14)	
Pneumonia	30 (34.8)	6 (42.8)	36
Sepsis	25 (29)	4 (28.5)	29
Acute pulmonary edema	20 (23.2)	2 (14.2)	22
Poisoning	11 (12.7)	2 (14.2)	13

Table 2: Successful extubation with respect to comorbids

The average age of patients with successful extubation was 55.1 ± 14.6 yrs. Rate of successful extubation was observed 58/60 (96.7%) in the age 60 yrs or below. While in the age above 60 yrs, rate of successful extubation was 28/40 (70%). Rate of successful extubation was found to be higher in male than in female, 92.8% vs77.3%.

Diagnosis	Successful Extubation		Total n = 100
	Yes (n=86)	No (n=14)	
COPD	7 (8.1)	3 (21.4%)	10
Asthma	6 (6.9)	0	6
Cardiac	13 (15.11)	1 (7.1%)	14
Diabetes mellitus	26 (30.23%)	5 (35.7%)	31
Hypertension	34 (39.5%)	5 (35.7%)	39

Table 3: Successful extubation with respect to diagnosis

The average days of mechanical ventilation in patients with successful extubation were 7 ± 2.3 days. Rate of successful extubation was observed 48/50 (96%) in patients with duration of mechanical ventilation ≤ 7 days while in patients with duration of mechanical ventilation >7 days rate of successful extubation was 38/50 (76%). Successful

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extubation in patients after 2 hours of SBT was correlated with various indications of mechanical ventilation. Rate of successful extubation was 12.7% in patients with poisoning while 34.8% in patients with pneumonia. Successful extubation in patients after 2 hours of SBT was also studied with respect to various co morbid. Rate of successful extubation in patients with hypertension was 34/39 and in patients with diabetes was 26/31.

Age Groups (Years)	Successful Extubation		
	Yes (n=86)	No (n=14)	
≤ 60	58 (96.7%)	2 (3.3%)	
> 60	28 (70%)	12 (30%)	
Male	52 (92.8%)	4(7.1%)	
Female	34 (77.3%)	10 (22.7%)	
≤ 7days	48 (96%)	2 (4%)	
>7 days	38 (76%)	12 (24%)	

Table 4: Successful extubation with respect to age, gender and days on mechanical ventilation

DISCUSSION

Successful weaning and liberation from mechanical ventilation continue to be crucial phases of that patient's ICU stay once they recovered from acute respiratory failure [8]. Weaning decisions based only on expert clinical judgment are not always correct. The rapid shallow breathing index (RSBI) was evaluated by at various studies and can be considered the most used predictor of weaning. In this study, the average age of the patients was 55.1±14.7 yrs. This corresponds to a study done at intensive care unit of Iran by Ghiasi L *et al* which shows mean age 55.1±21.48 years [10]. Another study done at Shifa International Hospital Islamabad by Khan M *et al* shows mean age of patients 55± 16 years [8]. Also close to a study conducted by Tonnelier J *et al* in which the mean age in Protocol-directed weaning group was 57 ± 18 years and in Physician-directed weaning group was 56 ± 18 years [11]. Among 100 patients who were extubated, Gender difference was found out with 56% males and 44% females. This is close to a study conducted by Nuttopol *et al* in which 57% of the participants were female [12]. In the present study, 82 % of patients with $RSBI_{max}$ ≤105 were found to have successful extubation while 18% of patients with $RSBI_{max}$ > 105 have failed extubation. Our this finding of successful extubation was correlated with Khan M *et al*, in this study they concluded that RSBI is better predictor of weaning outcomes than diaphragmatic excursion (DE) but DE can be used along with RSBI in predicting successful outcome [8]. However Kim *et al*. matched the accuracy of DE versus RSBI and found that both were similar in predicting the weaning outcome [13]. Tanaka A *et al* had also concluded that those with lower levels of RSBI had successful extubation. (32 breaths/min/L vs 37 breaths/min/L) [14]. RSBI is consisted of diaphragm and non-diaphragm muscle functions. Non diaphragmatic muscles can compensate when the diaphragm muscles failing to maintain the tidal volume. Though non-diaphragmatic muscles are weaker and get fatigued earlier and cannot sustain to provide sufficient ventilation for long time period [15]. Therefore RSBI can deliver false positive extubation standards and can produced extubation failure despite suitable tidal volume at the beginning [16]. This finding was supported by a systematic review of 20 RSBI studies [17]. Another study conducted by Epstein revealed that 14.6% of 84 patients (16.6%) with RSBI 100 failed extubation, with 13 of these failures attributed to issues with other organ systems, and it was concluded that RSBI was not physiologically suitable to predict extubation success [18]. The failure of RSBI to predict the result of extubation has also been found in other investigations [19, 20]. According to this study, mechanical ventilation is most frequently indicated by pneumonia. This is close to a study that reported 27% patients of pneumonia as an indication of mechanical ventilation [21]. In this study, rate of successful extubation was found to be highest 88.9% in patients with poisoning and this could be due to the fact that the patients with acute poisoning were mostly young and without comorbid.

CONCLUSIONS

It is concluded from the above study that patients with $RSBI_{max}$ ≤105 were found to have successful extubation. It is helpful to predict successful extubation and may be an accurate, noninvasive and simple determination that can be used in the critical care setting to predict successful extubation. However, additional studies are necessary to authenticate the importance of this forecasters for weaning.

Conflicts of Interest

The authors declare no conflict of interest

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REFERENCES

[1] Jhou HJ, Chen PH, Ou-Yang LJ, Lin C, Tang SE, Lee CH. Methods of Weaning From Mechanical Ventilation in Adult: A Network Meta-Analysis. Frontiers in Medicine. 2021 Oct; 8. doi: 10.3389/fmed.2021.752984

[2] Eggimann P and Pittet D. Infection control in the ICU. Chest. 2001 Dec; 120(6): 2059-93. doi: 10.1378/chest.120.6.2059

[3] Powers SK, Shanely RA, Coombes JS, Koesterer TJ, McKenzie M, Van Gammeren D, *et al*. Mechanical ventilation results in progressive contractile

DOI: https://doi.org/10.54393/pjhs.v4i02.254

dysfunction in the diaphragm. Journal of applied physiology. 2002 May; 92(5): 1851-8. doi: 10.1152/japplphysiol.00881.2001

[4] Duarte H, França DL, Portes MC, Faria AP, Fontes RM, Wittmer VL, *et al*. Comparison of different methods of obtaining the rapid shallow breathing index. Brazilian Journal of Anesthesiology (English Edition). 2021 May. 1-6. doi: 10.1016/j.bjane.2021.05.001

[5] Jaber S, Quintard H, Cinotti R, Asehnoune K, Arnal JM, Guitton C, Paugam-Burtz C, Abback P, Mekontso Dessap A, Lakhal K, Lasocki S. Risk factors and outcomes for airway failure versus non-airway failure in the intensive care unit: a multicenter observational study of 1514 extubation procedures. Critical Care. 2018 Dec; 22(1): 1-2. doi: 10.1186/s13054-018-2150-6

[6] Faruq MO, Ahsan AA, Fatema K, Ahmed F, Sultana A, Mallick UK, *et al*. A Survey of Mechanical Ventilation Weaning Practices in ICUs of Bangladesh. Bangladesh Critical Care Journal. 2021 Apr; 9(1): 4-11. doi: 10.3329/bccj.v9i1.53049

[7] Karthika M, Al Enezi FA, Pillai LV, Arabi YM. Rapid shallow breathing index. Annals of thoracic medicine. 2016 Jul; 11(3): 167-176. doi: 10.4103/1817-1737.176876

[8] Khan MT, Munawar K, Hussain SW, Qadeer A, Saeed ML, Shad ZS, *et al*. Comparing ultrasound-based diaphragmatic excursion with rapid shallow breathing index as a weaning predictor. Cureus. 2018 Dec; 10(12): e3710. doi: 10.7759/cureus.3710

[9] Yang KL and Tobin MJ. A prospective study of indexes predictingthe outcome of trials of weaning from mechanical ventilation. New England Journal of Medicine. 1991; 324: 1445-50. doi: 10.1056/NEJM199105233242101

[10] Ghiasi F, Moghadam KG, Alikiaii B, Sadrzadeh S, Farajzadegan Z. The prognostic value of rapid shallow breathing index and physiologic dead space for weaning success in intensive care unit patients under mechanical ventilation. Journal of Research in Medical Sciences: the Official Journal of Isfahan University of Medical Sciences. 2019; 24: 1-6. doi: 10.4103/jrms.JRMS_349_18

[11] Tonnelier JM, Prat G, Gal GL, Gobert CG, Renault A, Boles JM, *et al*. Impact of a nurses' protocol-directed weaning procedure on outcomes in patients undergoing mechanical ventilation for longer than 48 hours: a prospective cohort study with a matched historical control group. Critical Care. 2005; 9(2): 83–9. doi: 10.1186/cc3030

[12] Rittayamai N, Ratchaneewong N, Tanomsina P, Kongla W. Validation of rapid shallow breathing index displayed by the ventilator compared to the standard technique in patients with readiness for weaning. BMC Pulmonary Medicine. 2021 Dec; 21(1): 1-8. doi: 10.1186/s12890-021-01680-7

[13] Kim WY, Suh HJ, Hong SB, Koh Y, Lim CM. Diaphragm dysfunction assessed by ultrasonography: influence on weaning from mechanical ventilation. Critical care medicine. 2011 Dec; 39(12): 2627-30. doi: 10.1097/CCM.0b013e3182266408

[14] Tanaka A, Yamashita T, Koyama Y, Uchiyama A, Fujino Y. Predictors of successful extubation in reintubated patients: The impact of fluid balance during the 24 hours prior to extubation. Indian Journal of Critical Care Medicine: Peer-reviewed, Official Publication of Indian Society of Critical Care Medicine. 2019 Jul; 23(7): 344-345. doi: 10.5005/jp-journals-10071-23212

[15] Ferrari G, De Filippi G, Elia F, Panero F, Volpicelli G, Aprà F. Diaphragm ultrasound as a new index of discontinuation from mechanical ventilation. Critical ultrasound journal. 2014 Dec; 6(1): 1-6. doi: doi.org/10.1186/2036-7902-6-8

[16] Hershenson MB, Kikuchi YO, Loring SH. Relative strengths of the chest wall muscles. Journal of Applied Physiology. 1988 Aug; 65(2): 852-62. doi: 10.1152/jappl.1988.65.2.852

[17] Meade M, Guyatt G, Cook D, Griffith L, Sinuff T, Kergl C, *et al*. Predicting success in weaning from mechanical ventilation. Chest. 2001 Dec; 120(6): 400S-24S. doi: 10.1378/chest.120.6_suppl.400S

[18] Epstein SK. Etiology of extubation failure and the predictive value of the rapid shallow breathing index. American Journal of Respiratory and Critical Care Medicine. 1995; 152(2): 545-9. doi: 10.1164/ajrccm.152.2.7633705

[19] Martinez A, Seymour C, Nam M. Minute ventilation recovery time: a predictor of extubation outcome. Chest. 2003; 123(4): 1214-21. doi: 10.1378/chest.123.4.1214

[20] Salam A, Tilluckdharry L, Amoateng-Adjepong Y, Manthous CA. Neurologic status, cough, secretions and extubation outcomes. Intensive Care Medicine. 2004; 30(7): 1334-9. doi: 10.1007/s00134-004-2231-7

[21] Boynton JH, Hawkins K, Eastridge BJ, O'Keefe GE. Tracheostomy timing and the duration of weaning in patients with acute respiratory failure. Critical Care. 2004; 8(4): R261-7. doi: 10.1186/cc2885

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Original Article

Frequency of Hyperuricemia in Patients Presenting with Acute Ischaemic Stroke

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ABSTRACT

Hyperuricemia refers to elevated serum uric acid concentration above the upper limit of normal. **Objective:** To determine hyperuricemia in patients presenting with acute ischemic stroke to the Neurology ward of Lady Reading Hospital, Peshawar. **Methods:** A total of 153 patients were observed to the frequency of hyperuricemia in patients presenting with acute ischemic stroke. Study design was cross sectional study which was conducted for the period of 6 months. The total Sample size was calculated by using WHO sample size calculator. It was calculated using the World Health Organization software. **Results:** A total of 153 patients were observed to the frequency of hyperuricemia in patients presenting with acute ischemic stroke. Mean age of study participants was 52.45±1.14 years. Distribution of hyperuricemia was 114(74.5%). Mean serum uric acid level among cases of acute ischemic stroke was 06.15 ± 01.91 mg/dl while the mean serum uric acid level among control group was 05.1 ± 01.4 mg/dl. The results were highly significant p-value < 0.0001. **Conclusions:** Serum uric acid levels can be used to predict stroke risk. Moreover, serum uric acid can be utilized to stratify risk following a stroke. Long-term prospective research is needed to determine the involvement of serum uric acid in ischemic stroke. A trial of serum uric acid reducing medications in stroke patients as well as those at high risk of stroke may also be worthwhile.

INTRODUCTION

Hyperuricemia refers to elevated serum uric acid concentration above the upper limit of normal. It has been recognized as an independent risk factor for stroke since 1950s [1]. It has also been demonstrated by studies to be linked with adverse clinical outcomes among stroke patients e.g., increased stroke severity and early mortality after an acute stroke [2, 3]. This increase in the risk of cerebrovascular disease is because elevated serum uric acid level causes endothelial dysfunction and thus increases oxidative stress. This in turn induces vascular smooth muscle cell proliferation and reduces endothelial nitric oxide bio availability which leads to increased propensity for atherosclerosis [4]. It is also recognized that amyloid angiopathies raise the risk of dementia and stroke. Autosomal dominant inheritance describes the causal nature of mutations in the CST3 gene. Amyloid will be widely deposited in the brains of sufferers. The symptoms usually appear in the third or fourth decade of life, and death usually occurs before the age of 60 [5]. However, this association is currently a matter of debate because there are other studies which have suggested that this correlation of hyperuricemia with cardiovascular disease is merely because of confounding factors such as obesity, dyslipidemia, hypertension, use of diuretics and insulin

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resistance [6]. Border-zone or vascular watershed infarctions happen in the furthest reaches between arterial territories. They are thought to be due to embolic phenomena or severe hypoperfusion, which can happen in conditions like carotid blockage or protracted hypotension, for example [7-10]. Therefore, further studies are needed in order to fully understand the relationship between hyperuricemia and cerebrovascular disease and to resolve this controversy. This study aims to find out the frequency of hyperuricemia in the local population of ischemic stroke patients. This study will therefore form a basis of more advanced comparative studies in the future including case-control studies and prospective cohort study.

METHODS

A Cross-sectional Study was conducted in Neurology ward of Lady Reading Hospital, Peshawar for time period of 6 months after approval of synopsis. Sample size were at least 123 based on formula. It was calculated using the World Health Organization software "Sample Size Determination in Health Studies". The formula for "Estimating a population proportion with specified absolute precision" were used based on the following assumptions: Confidence Interval Strength: 95%. Absolute Precision: 8% and Anticipated proportion of hyperuricemia in patients with acute ischemic stroke: 29% [10]. Non-probability consecutive sampling was done. Sample Selection criteria include 20 to 70 years old patients of either sex with acute ischemic stroke. The Exclusion criteria exclude the patients with ischemic stroke due to a known thrombophilic condition were excluded from the study. Patients with hyperuricemia due to high cell turnover secondary to cancer chemotherapy will also be excluded from the study. The study was conducted after getting approval from hospital ethics and research committee. The patients meeting the inclusion criteria in the neurology ward of Lady Reading Hospital, Peshawar were recruited in the study after taking written informed consent. The purpose of the study and the details of what this study entails were explained to all the recruited patients. The diagnosis of acute ischemic stroke was made by physician on acute ischemic diagnosis criteria. These patients will have their blood drawn to measure serum uric acid levels in the laboratory. They will also be asked about any history of elevated uric acid in the past. An assessment for other risk factors of cerebrovascular disease as confounders/effect modifiers will also be made by asking about known history of hypertension, measuring patient's fasting blood glucose and HbA1c, asking about known history of diabetes, asking about smoking history and measuring fasting lipid profile to look for elevated serum cholesterol. These patients with acute ischemic stroke were managed according to the routine standard of care received by such stroke patients. Hyperuricemia is defined as a high uric acid level in the blood. Anything beyond 7 mg/dL is regarded as saturated, and symptoms may appear. The typical upper limit is 6.8 mg/dL. This elevated level is caused on by either increased uric acid production, decreased uric acid excretion, or a combination of both processes [11]. Normal value of serum uric acid ranging from 03.5 to 7.2 mg/dL. Mean serum uric acid level of patients with ischemic stroke were compared with healthy control who have no ischemic stroke. The data were analyzed using SPSS version 23.0. Descriptive statistics were used to analyze the data. Frequencies and percentages were calculated for categorical variables such as gender, presence/absence of hyperuricemia, hypertension, diabetes, hypercholesterolemia, and smoking. T test was used between hyperuricemia in patients with acute ischemic stroke and control group. Mean and standard deviation were calculated for the numerical variables for example age and serum uric acid level. Post-stratification chi squared test were applied in which a p- value of 0.05 or less were considered significant. All data were presented in the form of graphs and tables.

RESULTS

This study was conducted at Department Neurology ward of Lady Reading Hospital, Peshawar in which a total of 153 patients were observed to the frequency of hyperuricemia in patients presenting with acute ischemic stroke results were analyzed as: Age distribution among 153 patients was analyzed as 20-30 Years 14(9.2), 31-40 Years 17(11.1), 41-50 Years 32(20.9) 51-60 Years 37(24.2), 60-70 Years 53(34.6) and the Mean age was 52.45±1.142 years with standard deviation. Distribution of gender among patients was analyzed as: Male was (49) 31.7% and Female was (104)68.63% as shown in Table 1.

Variables	Frequency (%)
Age	
20-30 Years	14 (9.2%)
31-40 Years	17 (11.1%)
41-50 Years	32 (20.9%)
51-60 Years	37 (24.2%)
60-70 Years	53 (34.6%)
Gender	
Male	49 (31.7%)
Female	104 (68.63%)

Table 1: Age Wise Distribution of Sample Size (N=153)

The diabetes and smoking status of the study participants were shown in Table 2. Among 153 patients 58.8% were diabetes and 96(62.7%) patients were smokers.

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Variables	Frequency (%)
Diabetes	
Yes	90 (58.8%)
No	63 (41.2%)
Smoking Status	
Smoker	96 (62.7%)
Non-Smoker	57 (37.3%)

Table 2: Distribution of Previous History of Known Diabetes and smoking status (N=153)

Distribution of hyperuricemia was 114(74.5%). About 101 (66%) patients show hypertension while 52 patients were no hypertensions history. Most of the patients 70 (45.8%) patients were more than 48 hours of disease duration as shown in Table 3.

Variables	Frequency (%)
Hyperuricemia Status	
Yes	114 (74.5%)
No	39 (25.5%)
Total	153 (100%)
Hypertension	
Yes	101 (66%)
No	52 (34%)
Duration of Disease	
12 - 24 Hours	24 (15.7%)
36-48 Hours	59 (38.6%)
More than 48 Hours	70 (45.8%)

Table 3: Distribution of hyperuricemia, hypertension, and duration of disease

Most of the hyperuricemia were noted in the age group 60 (34 participants) followed by age group 51-60 (31 patients) which was statistically significant as shown in Table 4.

Hyperuricemia	Age wise Distribution					Total
	20-30 Years	31-40 Years	41-50 Years	51-60 Years	60-70 Years	
Yes	14	16	19	31	34	114
No	0	1	13	6	19	39
Total	14	17	32	37	53	153

Table 4: Hyperuricemia * Age Wise Distribution
Chi square test applied p-value was 0<.020

Mean serum uric acid level of patients with ischemic stroke were compared with healthy control who have no ischemic stroke for better presentation of hyperuricemia in ischemic stroke patients. The mean uric acid level was high among acute ischemic patients as compared with health control. Mean serum uric acid level among cases of acute ischemic stroke was 06.15 ± 01.91 mg/dl while the mean serum uric acid level among control group was 05.1 ± 01.4 mg/dl. The results were highly significant p-value < 0.0001 as shown in Figure 1.

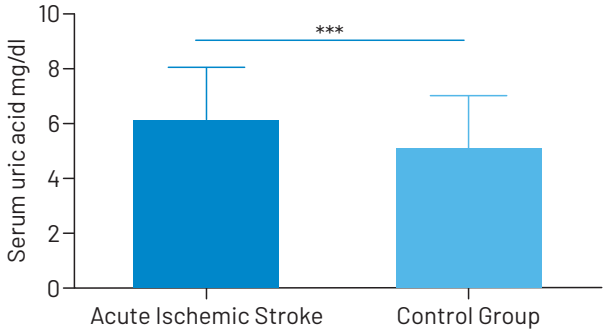

Figure 1: Mean serum uric acid level in acute ischemic stroke and healthy control

DISCUSSION

A stroke or cerebrovascular accident is defined as an abrupt onset of a neurologic deficit that is attributable to a focal vascular cause. Stroke is an important cause of morbidity and long-term disability; up to 40% survivors are not expected to recover their independence with self-care and 25% unable to walk independently [1, 12]. Cerebral ischemia initiates a complex cascade of metabolic events, generating nitric oxide and free oxygen radicals [3]. Serum uric acid being one of the major aqueous antioxidants in human beings should have a protective role in stroke patients [13]. Therefore, the role of uric acid as a risk factor for acute ischemic stroke is controversial. Amidst this controversy and lack of Indian data, it was decided to carry out the present study with the aim of studying uric acid levels in patients of acute ischemic stroke. In our study we determined the role of serum uric acid in acute stroke patients and its prognostic significance on stroke outcome. Both the groups (cases and controls) were comparable for baseline characteristics representing the mean age, sex distribution, kidney function parameters and lipid profile. Amongst cases of acute ischemic stroke mean serum uric acid level was 6.15±1.91 mg/dl and 38% (male 30%, female 50%) of them were hyperuricemia. Amongst control group mean serum uric acid level was 5.1±1.4 mg/dl and 22% (male 14%, female 32%) of them had hyperuricemia. The prevalence of hyperuricemia among the patients, attending medical center in Nepal was 28.33% (male 30.06%, female 26.61%) [14]. Another large study in Bangkok population showed that prevalence of hyperuricemia is 24.4% [15, 16]. Hyperuricemia is common in China's economically developed districts. In 2009-2010, the adjusted prevalence of hyperuricemia among Chinese adults was 8.4% [17]. According to these studies prevalence of hyperuricemia is significantly higher in patients with acute stroke than normal population. Age is the most common non-modifiable risk factor for the development of stroke. In our study, 60% of the patients are between 60 to 79 years with 17 males (56%) and 13

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females (65%). Mullins *et al.*, in their study of 163 patients above 70 years for association of serum uric acid and stroke found that serum uric acid is associated with an increased risk for acute ischemic/nonembolic stroke in elderly patients independently of concurrent metabolic derangements [18]. In the German dataset, a maximum male preponderance was found for patients aged between 55 and 64 years (proportion of male patients 0.67 (95% CI: 0.66-0.67), whereas patients older than 84 years revealed a strong overbalance of females (0.27 (0.26-0.28) [19]. These results are analogous to the findings in this study with majority of patients belonging to age group between 60-79 years with male preponderance. In our study amongst cases the mean serum uric acid levels were higher among males than females, but this difference did not attain statistical significance. Smitha *et al.*, observed higher serum uric acid values in males as compared to females (5.28±0.66 versus 4.47±0.78 mg/dl) [20]. Another study found significantly higher serum uric acid level in males (6.6±7 versus 5.8±6 mg/dl, $p < 0.01$) [21]. In present study the severity of stroke was assessed by Glasgow Coma Scale (GCS). Mean serum uric acid in acute stroke patients who had severe GCS score (6.77±2.43 mg/dl) was higher than that those who had mild/moderate GCS score (5.67±1.21mg/dl) and the difference was statistically significant ($p = 0.0426$). Ahn *et al.*, 2013 found that high uric acid levels cause a modest but statistically significant increase in the risk of both stroke incidence and mortality even after adjusting for known risk factors of stroke like age, hypertension, diabetes mellitus, and cholesterol [22]. A low serum uric acid concentration is marginally associated with an excellent short-term result [23].

CONCLUSIONS

Serum uric acid can be used as a marker for increased risk of stroke. Furthermore, serum uric acid can be utilized to stratify risk following a stroke. Long-term prospective research is needed to determine the involvement of serum uric acid in ischemic stroke. Additionally, it may be worthwhile to test serum uric acid-lowering medications on stroke victims and people who are at higher risk of having a stroke.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Fang J and Alderman MH. Serum uric acid and cardiovascular mortality: the NHANES I epidemiologic follow-up study, 1971-1992. JAMA. 2000 May; 283(18): 2404-10. doi: 10.1001/jama.283.18.2404.

[2] Sarfo FS, Akassi J, Antwi NK, Obese V, Adamu S, Akpalu A, *et al*. Highly prevalent hyperuricaemia is associated with adverse clinical outcomes among Ghanaian stroke patients: An observational prospective study. Ghana Medical Journal. 2015 Sep; 49(3): 165-72. doi: 10.4314/gmj.v49i3.7.

[3] Mapoure YN, Ayeah CM, Ba H, Hentchoya R, Luma HN. The Prognostic Value of Serum Uric Acid in the Acute Phase of Ischemic Stroke in Black Africans. Journal of Stroke and Cerebrovascular Diseases. 2018 Mar; 27(3): 783-92. doi: 10.1016/j.jstrokecerebrovasdis.2017.10.006.

[4] Zhao J, Chen H, Liu N, Chen J, Gu Y, Chen J, *et al*. Role of hyper homocysteinemia and hyperuricemia in pathogenesis of atherosclerosis. Journal of Stroke and Cerebrovascular Diseases. 2017 Dec; 26(12): 2695-9. doi: 10.1016/j.jstrokecerebrovasdis.2016.10.012.

[5] Jensson O, Gudmundsson G, Arnason A, Blöndal H, Petursdottir I, Thorsteinsson L, *et al*. Hereditary cystatin C (γ-trace) amyloid angiopathy of the CNS causing cerebral hemorrhage. Acta Neurologica Scandinavica. 1987 Aug; 76(2): 102-14. doi: 10.1111/j.1600-0404.1987.tb03553.x.

[6] Culleton BF, Larson MG, Kannel WB, Levy D. Serum uric acid and risk for cardiovascular disease and death: the Framingham Heart Study. Annals of Internal Medicine. 1999 Jul; 131(1): 7-13. doi: 10.7326/0003-4819-131-1-199907060-00003.

[7] Derdeyn CP, Khosla A, Videen TO, Fritsch SM, Carpenter DL, Grubb RL Jr. Severe hemodynamic impairment, and border zone—region infarction. Radiology. 2001 Jul; 220(1): 195-201. doi: 10.1148/radiology.220.1.r01jl09195.

[8] Pollanen MS and Deck JH. Directed embolization is an alternate cause of cerebral watershed infarction. Archives of Pathology Laboratory Medicine. 1989 Oct; 113(10): 1139-41.

[9] Waterston JA, Brown MM, Butler P, Swash M. Small deep cerebral infarcts associated with occlusive internal carotid artery disease. A hemodynamic phenomenon? Archives of Neurology. 1990 Sep; 47(9): 953-7. doi: 10.1001/archneur.1990.00530090023007.

[10] Tripathi VD and Hussain Z. A study to find out relationship in between serum uric acid level and stroke. International Journal of Advanced Medicine. 2017 Sep; 4: 1255-9. doi: 10.18203/2349-3933.ijam20173661.

[11] George C and Minter DA. Hyperuricemia. In:

DOI: https://doi.org/10.54393/pjhs.v4i02.457

StatPearls. StatPearls Publishing. 2021 Jul.
[12] Arboix A, García-Eroles L, Massons JB, Oliveres M, Comes E. Predictive factors of early seizures after acute cerebrovascular disease. Stroke. 1997 Aug; 28(8): 1590-4. doi: 10.1161/01.STR.28.8.1590.
[13] Karagiannis A, Mikhailidis DP, Tziomalos K, Sileli M, Savvatianos S, Kakafika A, *et al.* Serum uric acid as an independent predictor of early death after acute stroke. Circulation Journal. 2007 Jul; 71(7): 1120-7. doi: 10.1253/circj.71.1120.
[14] Yadav SK, Nepal N, Niroula D. Prevalence of hyperuricemia among people of Morang district of Nepal. Journal of Nobel Medical College. 2014 Mar; 3(1): 16-21. doi: 10.3126/jonmc.v3i1.10048.
[15] Kasner SE and Grotta JC. Emergency identification and treatment of acute ischemic stroke. Annals of Emergency Medicine. 1997 Nov; 30(5): 642-53. doi: 10.1016/S0196-0644(97)70084-2.
[16] Uaratanawong S, Suraamornkul S, Angkeaw S, Uaratanawong R. Prevalence of hyperuricemia in Bangkok population. Clinical Rheumatology. 2011 Jul; 30(7): 887-93. doi: 10.1007/s10067-011-1699-0.
[17] Liu H, Zhang XM, Wang YL, Liu BC. Prevalence of hyperuricemia among Chinese adults: a national cross-sectional survey using multistage, stratified sampling. Journal of Nephrology. 2014 Dec; 27(6): 653-8. doi: 10.1007/s40620-014-0082-z.
[18] Mullins ME, Lev MH, Schellingerhout D, Gonzalez RG, Schaefer PW. Intracranial hemorrhage complicating acute stroke: how common is hemorrhagic stroke on initial head CT scan and how often is initial clinical diagnosis of acute stroke eventually confirmed? AJNR American Journal of Neuroradiology. 2005 Oct; 26(9): 2207-12.
[19] Foerch C, Ghandehari K, Xu G, Kaul S. Exploring gender distribution in patients with acute stroke: A multi-national approach. Journal of Research in Medical Sciences: The Official Journal of Isfahan University of Medical Sciences. 2013 Jan; 18(1): 10.
[20] Smitha CS and Kumar PK. A Study on Serum Uric Acid Level in Acute Ischemic Stroke. European Journal of Molecular & Clinical Medicine. 2022 Apr; 9(3): 2931-6.
[21] Longo-Mbenza B, Luila EL, Mbete P, Vita EK. Is hyperuricemia a risk factor of stroke and coronary heart disease among Africans? International Journal of Cardiology. 1999 Sep; 71(1): 17-22. doi: 10.1016/S0167-5273(99)00097-2.
[22] Ahn SH, Lee SH, Kim BJ, Lim KH, Bae SJ, Kim EH, *et al.* Higher serum uric acid is associated with higher bone mass, lower bone turnover, and lower prevalence of vertebral fracture in healthy postmenopausal women. Osteoporosis International. 2013 Dec; 24(12): 2961-70. doi: 10.1007/s00198-013-2377-7.
[23] Chiquete E, Ruiz-Sandoval JL, Murillo-Bonilla LM, Arauz A, Orozco-Valera DR, Ochoa-Guzmán A, *et al.* Serum uric acid and outcome after acute ischemic stroke: PREMIER study. Cerebrovascular Diseases. 2013 Mar; 35(2): 168-74. doi: 10.1159/000346603.

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Original Article

Ultrasonographic Findings of Ventriculomegaly in 2nd And 3rd Trimester with Fetal Outcomes

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ABSTRACT

In the second trimester, fetal ventriculomegaly is a typical finding on obstetrical ultrasonography. It is clinically relevant since it can be caused by a variety of disorders that cause brain, motor, and/or cognitive impairment. Many cases are associated with other abnormalities, but in other cases, ventriculomegaly is the only abnormality. **Objective:** To evaluate the incidence of ventriculomegaly in 2nd and 3rd trimester with fetal outcomes. **Methods:** A descriptive study was conducted at of University of Lahore Ultrasound Clinic Greentown for duration of 4 months. Total 774 females were presented at hospital for in 2nd and 3rd trimester. All participants underwent transabdominal ultrasound using 3-5 MHz curvilinear probe. Written informed consent was obtained from all participants. **Results:** Total 774 women in 2nd and 3rd trimester of their pregnancy were included in our study. Out of 774 patients 700 were with cephalic presentation and 74 were with breech presentation. Variables including Spinal defect types, ventriculomegaly and ventricular involvement were noted. Out of 774 patients, 22 patients had fetal ventriculomegaly, 2 patients were with meningocele, 3 were with myelomeningocele and 16 patients were with spina bifida occluta. Ventricular involvement was as follow: In 5 fetuses, fourth ventricle was involved, in 15 fetuses lateral ventricles were involved and in 2 fetuses third ventricle was involved. **Conclusion:** Findings from this study concluded that Severity of ventriculomegaly is highly associated with fetal spinal defects.

INTRODUCTION

Fetal cerebral ventriculomegaly is a common finding on obstetrical ultrasonography in the second trimester. It is clinically significant since it can be caused by a wide range of illnesses that produce neurological, motor, and/or brain damage. Many instances are coupled with additional aberrant features, however ventriculomegaly is the lone abnormality in some pregnancies [1]. Between 15 and 40 weeks of gestation, atrial diameter stays constant [2, 3]. Depending on the research, ventriculomegaly is defined as an atrial diameter of ten millimeters which is 2.5 to four standard deviations above the mean [4]. Ventriculomegaly is termed mild if the atrial diameter is between 10 and 15 mm, and severe if the atrial diameter is greater than 15 mm, while some writers use the subcategories of mild (10 to 12 mm), moderate (13 to 15 mm), and severe (16 mm) 1. Although the incidence of ventriculomegaly is even less than 2%, data vary substantially within that range [5]. In one investigation, among 5400 standard prenatal sonographic tests performed between 16 and 22 weeks of gestation, eight occurrences of mild unexplained lateral ventriculomegaly were discovered (prevalence 1 in 675) [6]. This is an accurate estimate of the frequency in a general obstetric population receiving second trimester prenatal sonography. Males are more likely to develop ventriculomegaly; the male-to-female sex ratio is 1.7 [7]. A thorough assessment necessitates further imaging of the

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CNS beyond what is covered in the baseline obstetrical ultrasonography. A complete examination of the lateral, 3rd, and 4th ventricles; corpus callosum; thalami; germinal matrix area; and cerebellum and cerebellar vermis would be included in such imaging [8]. Compared to the second trimester, ventriculomegaly is not well defined in the first trimester. This might be due to the rare occurrence in early pregnancy. Relation between ventriculomegaly and spinal defects had already been proven. The purpose of this study was to evaluate the overall adverse fetal outcomes caused by ventriculomegaly.

METHODS

A 7-month descriptive research was carried out at the University of Lahore Teaching Hospital's Radiology Department. The research included women in their second and third trimesters of pregnancy who presented for a normal ultrasound check. Women in their first trimester of pregnancy were not allowed to participate. After receiving written informed permission, all females had ultrasonography. Women were lying on their right side. For the exam, the sofa was modified. To apply the gel, the lower abdomen was exposed. Transabdominal probe frequency 3-5 MHz was utilized for the exam, with the preset changed according to the patient's gestation age and BMI. The ISOUG 6 step scan procedure was followed. To observe the head, the probe was put in a transverse position on the lower abdomen. The head circumference, head shape, and ventricle size were all measured. The spine was then traced using a longitudinally rotating probe, and additional biometric measures were taken. Data were evaluated and analyzed with Statistical Software for Social Sciences version 24.0.s

RESULTS

Total 774 women in 2nd and 3rd trimester of their pregnancy were included in our study. Out of 774 patients 700 were with cephalic presentation and 74 were with breech presentation. Variables including Spinal defect types, ventriculomegaly and ventricular involvement were noted. Ventricular involvement was as follow: In 5 fetuses, fourth ventricle was involved, in 15 fetuses lateral ventricles were involved and in 2 fetuses third ventricle was involved. Out of 774(100.0%) patients, 752(97.2%) had no fetal ventriculomegaly while 22(2.8%) had fetal ventriculomegaly. Out of these patients who had no fetal ventriculomegaly, 28 patients had history of diabetes, 57 patients had history of hypertension while 1 patient had history of both diabetes and hypertension and 666 patients had no clinical history of diabetes and hypertension. Out of those 22(2.8%) patients who had fetal ventriculomegaly, 2 patients had history of diabetes while 10 had history of hypertension and 10 patients had no diabetes and hypertension. Table 1 show the Frequency distribution of fetal spinal defect types.

Spinal defect types	N (%)
Meningocele	2(0.3)
Myelomeningocele	3(0.4)
Spina Bifida Occulta	16(2.1)
None	753(97 3)
Total	774(100)

Table 1: Frequency distribution of fetal spinal defect types in included patients

Out of 774 patients, 22 patients had fetal ventriculomegaly (A) and 16 patients were with spina bifida occulta (B) (Figure 1).

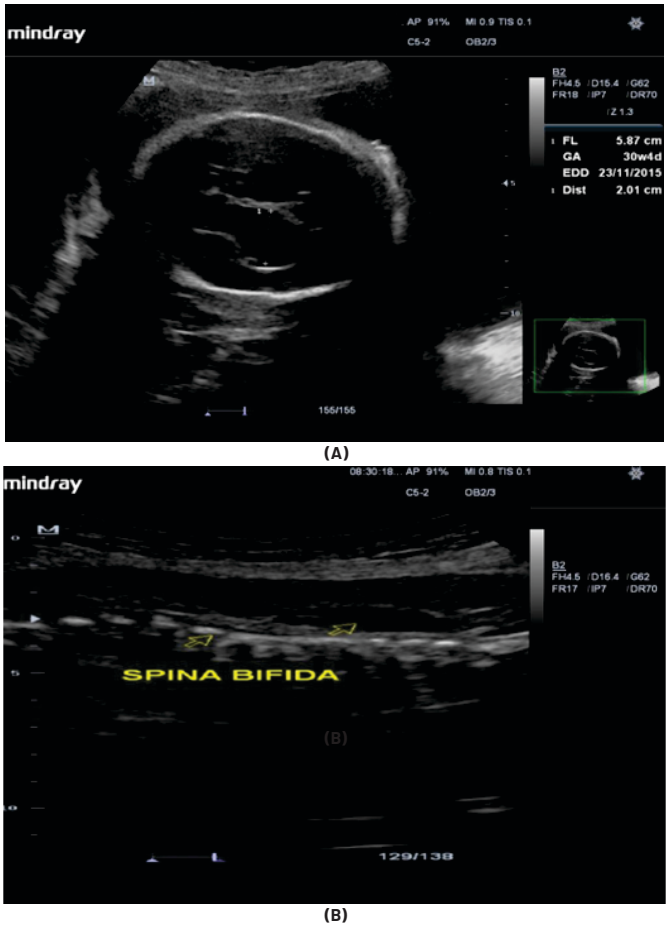

Figure 1: (A) Severe ventriculomegaly at 30 weeks of gestation, (B) Spina Bifida

Figure 2 (C) represent severe ventriculomegaly, and 2 patients were with meningocele (D).

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(C)

(D)

Figure 2: (C) B/L severe ventriculomegaly, (D) Spina Bifida with Meningocele

DISCUSSION

The usual method for assessing foetuses for central nervous system (CNS) abnormalities is ultrasound imaging. While ultrasound is very good for this purpose in experienced hands, it is important to recognise that its diagnostic value can be limited due to the following factors: (1) the non-specific appearance of some anomalies; (2) technical factors that limit visualisation of the sides of the brain close the probe or the posterior fossa, the latter especially in late pregnancy due to cranial ossification; (3) subtle parenchymal abnormalities that cannot be seen by ultrasound; and (4) poor visuospatial contrast. All of these issues may have an impact on the precision with which fetal ventriculomegaly and accompanying malformations can be diagnosed [9]. However, even skilled hands might miss irregularities. Goldstein *et al.*, [10] examined the medical records of babies with an ultrasound diagnosis of moderate ventriculomegaly and discovered 11/30 (37%) undetected abnormalities. They did highlight, however, that the abnormalities missed in the majority of these cases were in babies with other detectable anomalies, therefore only one of the 11 (9%) mistakes led in misclassification in the isolated ventriculomegaly group vs the non-isolated ventriculomegaly group. Other studies find misclassification rates ranging from 0% to 10%. Assessed [11, 12]. Our study was designed to find the ultrasonographic frequency of fetal ventriculomegaly in 2nd and 3rd trimester of pregnancy. In pregnancy, there may be many associated complications in fetus because of ventriculomegaly before and after birth such as central-nervous-system abnormalities, non-central-nervous-system structural abnormality, chromosomal abnormality, fetal infection, traumatic birth, difficult delivery of the baby and hydrocephalus. We reviewed 774 such cases who had 2nd and 3rd trimester of their pregnancy and then we analyzed how many fetuses had ventriculomegaly. Our research reveals that the minimum age of patient was 19 years and the maximum age was 37 years. At the time of the scan, it shows that out of 774 total patients, fetuses of 74(9.6%) patients were with the breech presentation while 700 (90.4%) were with cephalic presentation. Fetal ventriculomegaly is a dilation of the lateral ventricle [13]. In our study we found that a measurement of 10–15 mm was commonly referred to as mild ventriculomegaly, while measurements of 15–20 and >20 mm and above were defined as moderate and severe ventriculomegaly, respectively. Early ventriculomegaly (occurring before 24 weeks) is significantly associated with high risk of spinal defects and severe ventriculomegaly at the end of pregnancy [14]. One of the important strength of our study was that we analyzed the data of patients separately according to the ventricular involvement such as third, fourth and lateral ventricles. By analyzing of data separately, we found that spinal defects were also found in few cases. Studies indicate that prenatal ultrasound (US) can detect spinal abnormalities, linked CNS and non-CNS defects (cardiac, skeletal), and can also gauge fetal growth and well-being [15]. There are over 140000 cases of neural tube defects reported annually worldwide [16]. While spina bifida affects roughly 0.5 out of every 1000 babies born worldwide [17]. Masini *et al.*, examined all cases of spina bifida between February 1980 and December 2015. There were 222 cases of spina bifida with a 94.6 percent prenatal diagnosis rate. The researchers determined and described the prenatal diagnosis, natural history, and long-term outcome of a large contemporary cohort of spina bifida fetuses [18]. Out of 774 patients, spinal defect types were as follow: 2(0.3%) fetuses were with meningocele, 3(0.4%) fetuses were with myelomeningocele, 16(2.1%) fetuses were with spina bifida occluta and 753(97.3%) fetuses had no spinal defects. Yousaf *et al.*, studied 1492 female patients in cross-sectional research. A total of 1492 pregnant women between the ages of 18 and 40 weeks were studied. According to the findings of this study, the

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degree of ventricular dilatation increases the likelihood of abnormalities. A total of seven instances of ventricular dilatation were discovered. Fetus with mild ventricular dilatation 1/7, 4/7 with moderate ventricle dilatation, 2/4 with moderate ventricle dilatation had neural tube abnormalities, and 2/7 with severe ventricle dilatation had neural tube malformations [19]. Out of 774(100.0%) patients, 22(2.8%) patients had fetal ventriculomegaly while 752(97.2%) had no fetal ventriculomegaly. It is shown that out of 774(100%) patients, ventricular involvement in fetuses was as follow: 5(0.6%) fetuses had ventricular involvement of fourth ventricle, 15(1.9%) fetuses had ventricular involvement of lateral ventricles, and 2 (0.3%) fetuses had ventricular involvement of third ventricle while 752 (97.2%) fetuses had no ventricular involvement. Zhao *et al.,* studied the discovery of chromosomal abnormalities during prenatal ultrasonography in fetuses with isolated ventriculomegaly. They concluded that there was a high chance of chromosomal abnormalities in fetuses with solitary ventriculomegaly, particularly if it was severe, bilateral, first present in mid-gestation, and did not go away [20]. Out of 774(100.0%) patients, 21(2.7%) patients had fetal spinal defects. History of diabetes there were 3 patients and with a history of hypertension there were 10 patients.753 (97.3%) patients had no fetal spinal defects rather out of those 753(97.3%) patients, 57 had a history of hypertension, 27 had a history of diabetes and 1 had a history of both diabetes and hypertension. Out of 21 patients who had fetal spinal defects, 10 patients had hypertension and three had diabetes. Patient clinical history and Spinal defect showed a statistically significant association with value of $p < 0.0001$. Out of 774(100.0%) patients, 752(97.2%) had no fetal ventriculomegaly while 22(2.8%) had fetal ventriculomegaly. Out of these patients who had no fetal ventriculomegaly, 28 patients had a history of diabetes, 57 patients had a history of hypertension while one patient had a history of both diabetes and hypertension and 666 patients had no clinical history of diabetes and hypertension. Out of those 22(2.8%) patients who had fetal ventriculomegaly, 2 patients had a history of diabetes while 10 had a history of hypertension and 10 patients had no diabetes and hypertension. Patient clinical history and ventriculomegaly showed a statistically significant association with value of $p < 0.0001$. Out of 774(100.0%) patients, 752(97.2%) patients had no fetal ventriculomegaly while 22(2.8%) patients had fetal ventriculomegaly. Out of those 752(97.2%) patients, 750 Patients had no fetal spinal defects while two patients were with fetal spinal defects. Out of those 22(2.8%) patients who had fetal ventriculomegaly, three patients had no spinal defects while 19 had spinal defects. Therefore, 21 patients had fetal spinal defects out of 774 while 753 had no spinal defects. The frequency of fetal ventriculomegaly in patients of 2nd and 3rd trimester of pregnancy was 2.8%.

CONCLUSIONS

Findings from this study concluded that Severity of ventriculomegaly is highly associated with fetal spinal defects.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCE

[1] Griffiths PD, Reeves MJ, Morris JE, Mason G, Russell SA, Paley MN, *et al*. A prospective study of fetuses with isolated ventriculomegaly investigated by antenatal sonography and in utero MR imaging. American Journal of Neuroradiology. 2010 Jan; 31(1): 106-11. doi: 10.3174/ajnr.A1767

[2] Cardoza JD, Goldstein RB, Filly RA. Exclusion of fetal ventriculomegaly with a single measurement: the width of the lateral ventricular atrium. Radiology. 1988 Dec; 169(3): 711-4. doi: 10.1148/radiology.169.3.3055034

[3] Goldstein I, Reece E, Pilu G-L, Hobbins J. Sonographic Evaluation of the Normal Developmental Anatomy of Fetal Cerebral Ventricles. IV.: The Posterior Horn. American Journal of Perinatology. 1990 Jan; 7(01): 79–83. doi: 10.1055/s-2007-999452

[4] Farrell TA, Hertzberg BS, Kliewer MA, Harris L, Paine SS. Fetal lateral ventricles: reassessment of normal values for atrial diameter at US. Radiology. 1994 Nov; 193(2): 409-11. doi: 10.1148/radiology.193.2.7972754

[5] Alagappan R, Browning PD, Laorr A, McGahan JP. Distal lateral ventricular atrium: reevaluation of normal range. Radiology. 1994 Nov; 193(2): 405-8. doi: 10.1148/radiology.193.2.7972753

[6] Achiron R, Schimmel M, Achiron A, Mashiach S. Fetal mild idiopathic lateral ventriculomegaly: is there a correlation with fetal trisomy?. Ultrasound in Obstetrics and Gynecology: The Official Journal of the International Society of Ultrasound in Obstetrics and Gynecology. 1993 Mar; 3(2): 89-92. doi: 10.1046/j.1469-0705.1993.03020089.x

[7] Melchiorre K, Bhide A, Gika AD, Pilu G, Papageorghiou AT. Counseling in isolated mild fetal ventriculomegaly. Ultrasound in Obstetrics and Gynecology: The Official Journal of the International Society of Ultrasound in Obstetrics and Gynecology. 2009 Aug; 34(2): 212-24. doi: 10.1002/uog.7307

DOI: https://doi.org/10.54393/pjhs.v4i02.465

[8] Malinger G, Paladini D, Haratz KK, Monteagudo A, Pilu GL, Timor-Tritsch IE. Practice Guidelines (updated): sonographic examination of the fetal central nervous system. Part 1: performance of screening examination and indications for targeted neurosonography. Ultrasound Obstetric & Gynecology. 2020 Sep; 56(3): 476-84. doi: 10.1002/uog.22145

[9] Filly RA, Goldstein RB, Callen PW. Fetal ventricle: importance in routine obstetric sonography. Radiology. 1991 Oct; 181(1): 1-7. doi: 10.1148/radiology.181.1.1887016

[10] Goldstein RB, La Pidus AS, Filly RA, Cardoza J. Mild lateral cerebral ventricular dilatation in utero: clinical significance and prognosis. Radiology. 1990 Jul; 176(1): 237-42. doi: 10.1148/radiology.176.1.2191365

[11] Bromley B, Frigoletto FD, Benacerraf BR. Mild fetal lateral cerebral ventriculomegaly: clinical course and outcome. American Journal of Obstetric Gynecology. 1991 Mar; 164(3): 863e7. doi: 10.1016/0002-9378(91)90530-5

[12] Patel MD, Filly AL, Hersch DR, Goldstein RB. Isolated mild fetal cerebral ventriculomegaly: clinical course and outcome. Radiology. 1994 Sep; 192(3): 759e64. doi: 10.1148/radiology.192.3.7520183

[13] Almog B, Gamzu R, Achiron R, Fainaru O, Zalel Y. Fetal lateral ventricular width: what should be its upper limit? A prospective cohort study and reanalysis of the current and previous data. Journal of Ultrasound in Medicine. 2003 Jan; 22(1): 39-43. doi: 10.7863/jum.2003.22.1.39

[14] Giardini V, Verderio M, Cozzolino S, Vergani P. Isolated spina bifida aperta: prenatal ventriculomegaly as an ultrasound prognostic marker. Prenatal Diagnosis. 2019 Oct; 39(11): 1035-7. doi:10.1002/pd.5509

[15] Morris JE, Rickard S, Paley MN, Griffiths PD, Rigby A, Whitby EH. The value of in-utero magnetic resonance imaging in ultrasound diagnosed foetal isolated cerebral ventriculomegaly. Clinical Radiology. 2007 Feb; 62(2): 140-4. doi: 10.1016/j.crad.2006.06.016

[16] Copp AJ, Adzick NS, Chitty LS, Fletcher JM, Holmbeck GN, Shaw GM. Spina bifida. Nature Reviews Disease Primers. 2015 Apr; 1(1) :15007. doi: 10.1038/nrdp.2015.7

[17] Mohd-Zin SW, Marwan AI, Abou Chaar MK, Ahmad-Annuar A, Abdul-Aziz NM. Spina bifida: pathogenesis, mechanisms, and genes in mice and humans. Scientifica. 2017 Feb; 2017: 1-30. doi: 10.1155/2017/5364827

[18] Masini L, De Luca C, Noia G, Caruso A, Lanzone A, Rendeli C, *et al*. Prenatal diagnosis, natural history, postnatal treatment and outcome of 222 cases of spina bifida: experience of a tertiary center. Ultrasound in Obstetrics & Gynecology. 2019 Mar; 53(3): 302-8. doi: 10.1002/uog.20136

[19] Yousaf S, Khadija S, Asad N, Fatima M, GILANI SA, Laique T. Sonographic Association of Ventriculomegaly and Neural Tube Anomalies. Pakistan Journal of Medical and Health Sciences. 2021 May; 15(5): 1021-3. doi: 10.53350/pjmhs211551021

[20] Zhao D, Cai A, Wang B, Lu X, Meng L. Presence of chromosomal abnormalities in fetuses with isolated ventriculomegaly on prenatal ultrasound in China. Molecular Genetics & Genomic Medicine. 2018 Nov; 6(6): 1015-20. doi: 10.1002/mgg3.477

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Original Article

Prevalence of Sleep Disturbance Among DPT Students

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ABSTRACT

Sleeping is essential for student physical as well as mental health. Sleep disturbance is distressing state that affect quality of work. **Objective:** To determine the sleep disturbance in DPT students. **Methods:** This observational study recruited 884 participants out of which 800 filled the questionnaire with mean age 21.54 ±1.76 from different medical universities and medical colleges of Punjab. Non probability convenient sampling technique was used. Both male and female students of all the years of DPT were included. Students with psychiatric illness, chronic medical illness, smoking and taking drugs excluded from the study. The effects of insomnia were checked by Athens Insomnia Scale (AIS) questionnaire. For data analysis SPSS version 26 was used. **Results:** Mean age of the physical therapy students was 21.54 ±1.76. Out of 800, 61.75% students were insomniac. Most of the students had unsatisfactory sleep quality (55.87%), awakening at the night time (62%), and day time sleepiness (76.25%). **Conclusion:** According to present study prevalence of sleep disturbance was very high among physical therapy students.

INTRODUCTION

Sleep is a dynamic, recurring and reversible behavior that serves a no. of functions through brain and body. Learning abilities of students and their academic rewards are strongly associated with sleep timing, sleep quality and quantity. An individual sleep habits are measured by using quality and duration of sleep, regular sleep wake cycle and daytime napping [1, 2]. Adolescent sleep is defined as large difference between weekend and week days sleep patterns, including 1 and 2 hours longer sleep at weekend [3, 4]. While sleeping, nervous system is sluggish/inactive, eyes closed, postural muscles are relaxed and consciousness is delayed [5]. Alteration in sleep pattern is highly associated with adolescence duration. These changes ultimately will results in sleep deprivation in many adolescent students [3, 6]. Both, the environmental and biological factors causing delay in bed time [3]. The most common medical conditions of sleep problems are insufficient sleep and excessive sleep that causes abnormal function and quality of life [7]. Insomnia, the most frequent sleeping problem, is the perception of poor-quality sleep because of certain conditions: awkwardness in falling asleep, awakening during the night, getting up too early in the morning [8]. Insomnia may be an existing problem in initiating sleep three nights in a week with a problem of poor sleep within a life span [9]. The sleep cycle of medical student is characterized by inadequate sleep duration, fluster sleep and the frequent episodes of daytime napping [10]. Many factors can change the sleep habits including use of coffee and tea, excessive internet use, and sleep medications. Furthermore, more than a few

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medical issues disrupt sleep, consisting of obstructive sleep apnea, depression, continual sleep deprivation, narcolepsy [11]. Due to poor sleep, Human cognitive functions such as "learning and information processing are highly affected. Poor sleep quality decreases learning capabilities as well as academic performance. Napping help to improve academic performance as compared to short sleepers [8]. Sleep deprivation is the condition of no longer having enough sleep; can be both acute and chronic. Sleep deprivation is frequent among university students in both East and the West [12]. Females and higher-grade students are most commonly affected by sleep disorder [13]. Medical students are susceptible to poor sleep due to high workload of studies, duties in clinical areas, emotionally difficult work and lifestyle choices [5]. To find out the causes and ways for improving quality of life, there should be strong correlation between life style factors and sleep disturbances [14]. The mental health, physical health and working ability of a medical student is affected by sleep quality [15], these changes lead to medical errors and accidents [11]. The major concept of sleep assessment is also extremely sensitive to recognize the effects of sleep deficiency by MSLT (The Multiple Sleep Latency Test). Sleep latency value is typically declined by 60% or more after one night of total sleep deficiency [16, 17]. College students are at high risk of developing sleep disorders and their academic performance may be adversely affected [18]. Taking into consideration, their academic requirements, medical students may not find sleep as a top priority because they minimize their sleep time to have extra hours to study and work. They become apparent to poor sleep habits particularly during examination [19]. Sleeping hours before exam time has close association with exam scoring in medical students. Similarly, sleep disturbance before exams has been correlate with poorer academic grades [20].

METHODS

This cross-sectional observational study recruited 884 participants out of which 800 filled the questionnaire. Sample size was calculated through open Epi-tool. Students were recruited through non-probability convenient sampling method. Data were collected from different cities of Punjab. The inclusion criteria included both male and female students of physical therapy of all years. Students with psychiatric illness, chronic medical illness, smoking and taking drugs cause sleepiness were screened during interview and excluded from the study. Athens Insomnia Scale (AIS) questionnaire was used to assess insomnia, which contains 8 questions. The total score of these questions ranges from 0 to 24, higher the score the worse the sleep quality. According to scale students with score of 6 or greater than 6 were considered insomniac, <5 no insomnia, 6-9 mild, 10-15 moderate, 16-24 severe insomnia. SPSS version 26.0 was used to analyze the data.

RESULTS

Out of 800 respondents who filled the questionnaire 85.5% were females and 14.5% were males. The mean age of the students was 21.54 ±1.76. According to scoring of Athens insomnia scale 61.75% were insomniac and 38.25% were non-insomniac (Figure 1).

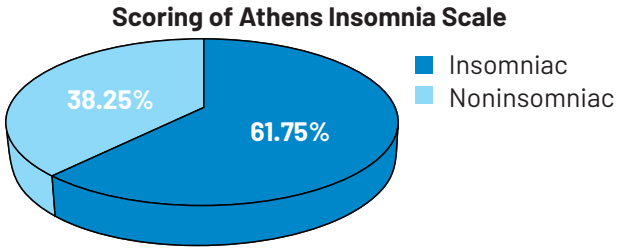

Figure 1: Total distribution of insomnia among students

Majority of the students had sleepiness during the day (76.11%) while 23.75% had no problem at all (Figure 2).

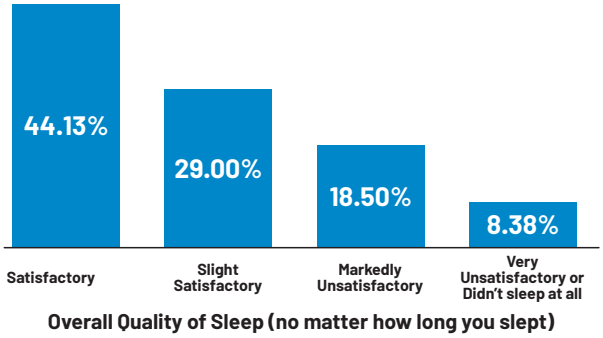

Figure 2: Quality of sleep in DPT students

Results showed majority of the students had unsatisfactory sleep (55.86%) that categorized slightly, markedly and very unsatisfactory sleep 29%, 18.50%, 8.36% respectively (Figure 3) and awakening during the night 61.89% (Table 1).

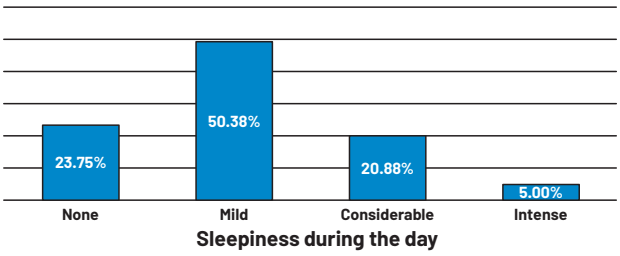

Figure 3: Sleepiness during the day

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Awakening during night	Frequency (%)
No problem	304 (38%)
Minor problem	289 (36.1%)
Considerable problem	164 (20.5%)
Serious problem / did not sleep at all	43 (5.4%)
Total	800 (100%)

Table 1: Awakening during the night

DISCUSSION

For learning and memory, adequate and efficient sleep play important role. In this study our main focus is to find out the prevalence of insomnia in physical therapy students. In current study, 61.75% students were insomniac, A cross-sectional study was conducted at Debre Berhan University that showed similar results, prevalence of insomnia was high among students 61.6% [10]. In Brazil, a study reported that the prevalence of insomnia was 28% among medical students [21]. Likewise, another research was conducted in Iran on same topic revealed 42% students suffering from insomnia [19]. In all over the world this difference of insomnia prevalence among medical students may be due to different lifestyle, mode of study and working hours [22]. Current study determined sleep disturbance and reported 61.89% students had problems in awakening during the night that fall in various categories like serious, considerable and minor problem. Previous study conducted in 2011 among Palestinian students showed similar results on sleep problems, 64.8% students had at least one nocturnal awakening per night. In that study nightmares were the most common cause of nocturnal awakening reported by students [23]. Another study on disturb sleep that was held in 2018 in Tripura showed 57% students were complaining of sleep disturbance and 73.4% being wakeful whole night [5]. Above studies showed a large percentage of students had disturbed sleep and night awakening. Furthermore, Present study reported high prevalence of poor sleep quality and sleepiness during the day. According to research conducted on medical students in king Abdul Aziz University, Saudi Arabia revealed similar results [24]. Day time sleepiness may be due to less sleep duration during the night. By our research, we concluded that physical therapy students have high prevalence of sleep disturbance and poor sleep quality Majority of the students are insomniac, therefore students should be educated about the significance of adequate sleep and its beneficial effects on mental and physical health and on academic performance as well.

CONCLUSIONS

The conclusion of the present study suggests that the prevalence of sleep disturbance is alarmingly high among physical therapy students. This means that a significant number of students pursuing physical therapy are experiencing difficulties with sleep, which can negatively impact their academic performance, mental health, and overall well-being. It is important for educational institutions to acknowledge and address this issue, and to provide resources and support to help students manage their sleep-related difficulties. Furthermore, the findings of this study may have implications for other health professions students as well, as the demands of these programs can be similarly intense.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Curcio G, Ferrara M, De Gennaro L. Sleep loss, learning capacity and academic performance. Sleep Medicine Reviews. 2006 Oct; 10(5): 323-37. doi: 10.1016/j.smrv.2005.11.001.

[2] Rodrigues RN, Viegas CA, Abreu e Silva AA, Tavares P. Daytime sleepiness and academic performance in medical students. Arquivos de Neuro-Psiquiatria. 2002 Mar; 60(1): 6-11. doi: 10.1590/S0004-282X 2002000100002.

[3] Crowley SJ, Acebo C, Carskadon MA. Sleep, circadian rhythms, and delayed phase in adolescence. Sleep Medicine. 2007 Sep; 8(6): 602-12. doi: 10.1016/j.sleep.2006.12.002.

[4] Gradisar M, Dohnt H, Gardner G, Paine S, Starkey K, Menne A, *et al*. A randomized controlled trial of cognitive-behavior therapy plus bright light therapy for adolescent delayed sleep phase disorder. Sleep. 2011 Dec; 34(12): 1671-80. doi: 10.5665/sleep.1432.

[5] Datta A, Nag K, Karmakar N, Chakrabarty T. Sleep disturbance and its effect on academic performance among students of a medical college of Tripura. International Journal of Community Medical Public Health. 2019 Jan; 6(1): 293-8. doi: 10.18203/2394-6040.ijcmph20185261.

[6] Perkinson-Gloor N, Lemola S, Grob A. Sleep duration, positive attitude toward life, and academic achievement: the role of daytime tiredness, behavioral persistence, and school start times. Journal of Adolescence. 2013 Apr; 36(2): 311-8. doi: 10.1016/j.adolescence.2012.11.008.

[7] Nojoomi M, Ghalebandi MF, Akhbari R, Gorji R. Sleep pattern and prevalence of sleep disturbances in medical students and specialist residents. Medical Sciences Journal of Islamic Azad University. 2009 Jan; 19(1): 55-9.

DOI: https://doi.org/10.54393/pjhs.v4i02.499

[8] Haile YG, Alemu SM, Habtewold TD. Insomnia and its temporal association with academic performance among university students: a cross-sectional study. BioMed Research International. 2017 Jun; 2017: 2542367. doi: 10.1155/2017/2542367.

[9] Taylor DJ, Lichstein KL, Durrence HH. Insomnia as a health risk factor. Behavioral Sleep Medicine. 2003 Nov; 1(4): 227-47. doi: 10.1207/S15402010BSM0104_5.

[10] Hamed H, Miskey A, Alkurd R, Ghazal Z, Sami R, Abduljaleel N, *et al*. The effect of sleeping pattern on the academic performance of undergraduate medical students at Ajman University of Science and Technology. Journal of Pharmacy and Pharmaceutical Sciences. 2015 Jun; 4(4): 18-21.

[11] Mirghani HO, Mohammed OS, Almurtadha YM, Ahmed MS. Good sleep quality is associated with better academic performance among Sudanese medical students. BMC Research Notes. 2015 Dec; 8(1) :1-5. doi: 10.1186/s13104-015-1712-9.

[12] Huen LL, Chan TW, Yu WM, Wing YK. Do medical students in Hong Kong have enough sleep?. Sleep and Biological Rhythms. 2007 Jul; 5(3): 226-30. doi: 10.1111/j.1479-8425.2007.00278.x.

[13] Tsai LL and Li SP. Sleep patterns in college students: Gender and grade differences. Journal of Psychosomatic Research. 2004 Feb; 56(2): 231-7. doi: 10.1016/S0022-3999(03)00507-5.

[14] Preišegolavičiūtė E, Leskauskas D, Adomaitienė V. Associations of quality of sleep with lifestyle factors and profile of studies among Lithuanian students. Medicina. 2010 Jul; 46(7): 482. doi: 10.3390/medicina 46070070.

[15] Mume CO, Olawale KO, Osundina AF. Excessive daytime sleepiness, nocturnal sleep duration and psychopathology among Nigerian university students. South African Journal of Psychiatry. 2011 Dec; 17(4): 108-11. doi: 10.4102/sajpsychiatry.v17i4.311.

[16] Parker DC, Rossman LG, Kripke DF, Hershman JM, Gibson W, Davis C, *et al*. Endocrine rhythms across sleep-wake cycles in normal young men under basal state conditions. Physiology in Sleep: Elsevier. 1980: 145-79. doi: 10.1016/b978-0-12-527650-4.50010-4.

[17] Bonnet MH. Performance and sleepiness as a function of frequency and placement of sleep disruption. Psychophysiology. 1986 May; 23(3): 263-71. doi: 10.1111/j.1469-8986.1986.tb00630.x.

[18] Kazim M, Abrar A. Sleep Patterns and Academic Performance in Students of a Medical College in Pakistan. KUST Medical Journal. 2011 Jul; 3(2): 57-60.

[19] Almojali AI, Almalki SA, Alothman AS, Masuadi EM, Alaqeel MK. The prevalence and association of stress with sleep quality among medical students. Journal of Epidemiology and Global Health. 2017 Sep; 7(3): 169-74. doi: 10.1016/j.jegh.2017.04.005.

[20] Sitticharoon C, Srisuma S, Kanavitoon S, Summachiwakij S. Exploratory study of factors related to educational scores of first preclinical year medical students. Advances in Physiology Education. 2014 Mar; 38(1): 25-33. doi: 10.1152/advan.00162.2012.

[21] Atkinson G and Davenne D. Relationships between sleep, physical activity and human health. Physiology & Behavior. 2007 Feb; 90(2-3): 229-35. doi: 10.1016/j.physbeh.2006.09.015.

[22] Lund HG, Reider BD, Whiting AB, Prichard JR. Sleep patterns and predictors of disturbed sleep in a large population of college students. Journal of Adolescent Health. 2010 Feb; 46(2): 124-32. doi: 10.1016/j.jadohealth.2009.06.016.

[23] Hysing M, Haugland S, Stormark KM, Bøe T, Sivertsen B. Sleep and school attendance in adolescence: results from a large population-based study. Scandinavian Journal of Public Health. 2015 Feb; 43(1): 2-9. doi: 10.1177/1403494814556647.

[24] Ibrahim NK, Badawi F, Mansouri Y, Ainousa A, Jambi S, Fatani AN. Sleep quality among medical students at King Abdulaziz University: a cross-sectional study. Journal of Community Medicine and Health Education. 2017 Oct; 7(561): 2161-711. doi: 10.4172/ 2161-0711.1000561.

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Original Article

Multi-Slice Computed Angiography for the Evaluation of Stent Patency after Left Main Coronary Artery Stenting

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ABSTRACT

Due to the high frequency of in-stent restenosis, repeat coronary angiography and left main percutaneous coronary intervention is recommended. But Computed Tomography Angiography is a noninvasive procedure for evaluating coronary arteries. **Objectives:** To assess the proportion of InStent restenosis in left main per-Cutaneous coronary intervention and to evaluate diagnostic efficacy of Computed Tomography Angiography in detecting In stent Restenosis. **Methods:** We assessed 263 consecutive LM PCI patients; 130 patients were chosen for this study procedure as they meet our criteria. CTA was conducted three months following the LM PCI. **Results:** The vast majority of patients (73.8 %) had PCI from LM to LAD and 16.2 % from LM to LCX. Only 10% of patients had bifurcation PCI, and all patients had DES (100%). The average period for ISR development was 125 months, with ISR rates of 32.2 % in the LM to LAD cohort and 38 % in the LM to LCX cohort. The median time between PCI and CTA was 194 days, with a mean basal heart rate of 69 ± 12 beats per minute. CTA exhibited a positive predictive value of 84.7%. **Conclusion:** CTA enables an accurate noninvasive assessment of selected patients following LM PCI. And CTA can be used as a first-line treatment instead of coronary angiography.

INTRODUCTION

It is a dictum that is well accepted in the field of clinical cardiology that substantial left main stenosis (LMS) that is medically controlled is related with an elevated risk of cardiac death that approaches 50 % [1]. There is involvement of atheroma from the distal left main (LM) into the proximal left anterior descending (LAD) artery in the majority of instances of distal left main stenosis (distal LMS). This is most likely the result of accelerated atherosclerosis occurring in a region of the distal wall of the proximal LAD those experiences minimal shear stress. Significant left main stem (LMS) is seen in between 5 and 7 % of individuals who have coronary angiograms done. In right dominant type coronary circulation, LM feeds 75%, whereas in left dominant type coronary circulation, LM supplies 100% of the myocardium. The LM may be broken down into three distinct anatomical regions: the ostium, the mid-part, and the distal section [2]. CTA, or computed tomography angiography, is a well-established noninvasive imaging method for the coronary arteries. Although a number of experiments have shown that it may be used to evaluate the patency of stents, a precise evaluation inside the lumen of the stent is made more difficult because of the blooming artefact, which is created when the metallic struts of the stent are artificially enlarged [3]. The effect of the blooming artefact on the assessment of the structures contained within the stent has a negative correlation with the diameter of the vessel. Neointimal hyperplasia can be identified on CTA in bigger-vessel coronary stents,

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including those implanted in the LM coronary artery. This demonstrates CTA's potential for identifying in-stent restenosis (ISR) in particular lesion subgroups [4]. Although coronary artery bypass graft (CABG) surgery is still recommended in patients of LM disease, the new-generation drug-eluting stents (DES) has led to an increased use of left main (PCI) in contemporary interventional cardiology [5, 6]. However, the mortality rate of LM ISR is greater; hence, thorough supervision in the form of routine angiography is required every three to six months [7]. Therefore, a noninvasive approach to identify ISR and its clinical relevance is of clinical importance in this patient subsets. This patient subset includes patients who have had a previous diagnosis of ISR. In this study, our objective was to evaluate the percentage of LM PCI patients who had ISR as well as the diagnostic performance of CTA in identifying ISR.

METHODS

Between October 2021 and January 2022, we assessed 263 consecutive patients who had LM PCI for inclusion in a protocol to do CTA to search for ISR. All patients in sinus rhythm who could hold their breath for 20 seconds were eligible. Patients with contrast allergy, renal dysfunction (creatinine > 1.8 mg/dL), poor rate control or contraindication to beta-blockers, obesity (body mass index > 30 kg/m2), and acute coronary syndrome (ACS) at the time of selection were excluded from the trial. The Armed Forces Institute of Cardiology's institutional review board authorized the study (ID# 31/1/R&D/2022/146), and all participants provided written informed permission in accordance with the Helsinki Declaration. After three months of LM PCI, CTA was done, and patients with a heartbeat of more than 70 times per minute were given 50 mg of metoprolol in tablet 30 minutes before the scan. All scans were conducted on a 64-slice multi slice CT scanner. After administering a bolus of 100 mL of contrast at 5 mL/s, CTA data were collected during a single breath hold once the contrast reached the ascending aorta at a predetermined 100 HU. The 64-slice CT was calibrated with detector. All data were rebuilt with a 630*512-pixel field of view image matrix and a crisp heart view. Motor artefacts were reduced using cardiac cycle optimization and ECG gated image reconstruction. Two expert scientists examined CTA data sets for the presence of ISR. In the case of LM bifurcation stenting, all three segments (LM, LAD, and LCX) were seen independently. The stent lumen was classified as (i) patent with no apparent ISR, (ii) patent with non-obstructive ISR (<50 % stenosis), (iii) patent with obstructive ISR (≥50 % stenosis), or (iv) fully blocked. Consensus was used to diagnose ISR. Consensus was defined as both the CT experts agreeing to the same classification of in-stent restenosis. Subjects were considered to be positive for ISR with either patent with obstructive ISR (≥50 % stenosis), or fully blocked vessel. Angiography was taken as gold standard. Continuous variables were displayed as mean and standard deviation (SD), whereas categorical data were displayed as frequency and percentages. Kappa statistics was used to determine interobserver variability. The accuracy of CTA was assessed by positive predictive value (PPV), negative predictive value (NPV), sensitivity, and specificity by forming 2x2 table. All the data were analyzed using SPSS version 25.0.

RESULTS

According to the exclusion criteria, 133 of the 263 eligible patients were excluded from this research. On traditional angiography, 74 patients had ISR, 24 had an insufficient scan, and 35 experienced tachycardia that did not respond to rate-limiting medications. The remaining 130 people were chosen as the research population. Table 1 summarizes the baseline and procedure characteristics. The median time between PCI and CTA was 194 days, with a mean basal heart rate of 69 ± 12 beats per minute. Seventy patients were given extra beta blockers, resulting in a pre-scan heart rate of 57 ± 12 bpm on average. The vast majority of patients (73.8 %) had PCI from LM to LAD and 16.2 % from LM to LCX. Only 10% of patients had bifurcation PCI, and all patients had DES (100 %). The average period for ISR development was 125 months, with ISR rates of 32.2 % in the LM to LAD cohort and 38 % in the LM to LCX cohort, separately from the total population size (Table 1).

Variable	Patients (n = 130)
Age (years)	61 ± 12
Males	74 (56.9%)
BMI	27 ± 5
Comorbidities	
DM	47 (36.2%)
HTN	27 (20.8%)
CKD	1 (0.8%)
Dyslipidemia	30 (23.1%)
Smoking	17 (13.1%)
Prior MI	22 (16.9%)
Prior CABG	6 (4.6%)
Prior PCI	20 (15.4%)
Heart rate	69 ± 12
Stent location	
LM to LAD	96 (73.8%)
LM to LCX	21 (16.2%)
Bifurcation dual stent	13 (10%)
ISR time (months)	12 ± 5
ISR rate for vessel (angiography findings)	
LM to LAD	31 (23.8%)
LM to LXC	8 (6.2%)

Table 1: Baseline and procedural characteristics

Table 2 summarizes the diagnostic accuracy of CTA. Seven individuals tested false positive for neointimal hyperplasia. CTA had 100 % sensitivity and negative predictive value for

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detecting ISR, while specificity was 92.3 % and positive predictive value was 84.7 %. Kappa statistics were used to determine interobserver variability, which revealed Substantial interobserver agreement for detecting ISR (k-value 0.79).

Variable	All patients
True negative	84 (64.6 %)
True positive	39(30 %)
False negative	0 (0 %)
False positive	7(5.3 %)
Sensitivity (%)	100 %
Specificity (%)	92.3 %
Positive predictive value (%)	84.7 %
Negative predictive value (%)	100 %

Table 2: Diagnostic accuracy of CTA to detect ISR

DISCUSSION

The use of CTA in repeat follow-up and identification of ISR is the best-case scenario for LM PCI for a variety of reasons. First, stent implantation is greater in the LM and proximal LAD/LCX due to their larger diameters; second, the proximal LAD generally runs in a scan direction in the axial plane; and third, this region of the coronary tree is reasonably shielded from motion artefact. Modern technology and technological breakthroughs in z-resolution, quick tube rotations, and stent-specific filters have considerably enhanced CTA's ability to measure coronary stent patency [8]. The current study indicated that CTA may be used to quantify ISR in LM PCI. The approach is completely reliable for identifying the presence or absence of ISR. However, a few false negative findings (n=7) were recorded. The most apparent reason is the huge amount of metal at and around the ostium of major arteries, involving up to three layers of struts crushed in bifurcation PCIs [9]. This is a source of big artefact on CTA. To the best of our knowledge, this is Pakistan's first research demonstrating the importance of CTA in identifying ISR in LM PCI. A few studies like Papadopoulou *et al.*, and Poon *et al.*, have shown that CTA has a good accuracy in quantifying the degree of coronary artery stenosis in untreated coronary arteries [10-12]. Similarly, this Mauri *et al.*, described the measurement of ISR using LM stents. However, metal-related blooming abnormalities were found, which can compromise stent lumen vision. LM PCI has fewer patients because a significant degree of ISR had limited its growth as a main revascularization technique until recently. However, the use of DES has lowered ISR rates and improved long-term clinical outcomes [13]. However, ISR continues to occur in the LM and can result in a potentially fatal myocardial infarction [14]. The high radiation dose is a general limitation of the CTA technique; however, new developments such as dual source CT scans allow for significantly lower patient radiation via ECG-gated pulsing [15]. Another application of CTA in LM disease is the use of FFR-CT, for which the evidence has gone beyond validation, by allowing for fewer referrals to ICA. Furthermore, individuals with moderate stenosis and FFR-CT > 0.80 had positive clinical results [16]. In our study, there was no difference between males and females when LM illness was assessed by CTA. Although more research is needed to elucidate possible mechanisms for the link between nonobstructive LM plaque and adverse outcomes in women. Women have highly smaller coronary arterial diameter than men, which has been linked to worst results in women after coronary revascularization and may also increase thrombotic occlusion [17].The ISCHEMIA (International Study of Comparative Health Effectiveness with Medical and Invasive Approaches) study overcame concerns that randomization during ICA would discourage health persons from randomizing patients in the catheterization laboratory who knew they had a high anatomic burden of disease. The use of CTA to address these problems was based on the close relationship between CTA and ICA, and role of CCTA as a tool for improving angiography suite utilization [18-21]. According to the findings of Kumar *et al.*, study, the presence of left main, proximal left anterior descending artery stenosis, was related with an increased risk of cardiovascular events as compared to fever widespread coronary artery disease (CAD). However, this finding barely approached the borderline of being significant. Coronary CTA analyze many patients with negative outcomes with CAD than ICA, which is similar with our result that coronary CTA had a worse specificity when ICA was the reference technique [22]. When compared to ICA, coronary CTA has the potential to identify a greater atherosclerotic load. It may be suggested that this change in procedure would have altered the evaluation of CAD expansion, therefore it would result in conflicting results. Data from the Israeli Survey indicated substantial increase CAD in [23].

CONCLUSIONS

With adequate heart rate management, CTA provides for an accurate noninvasive examination of selected patients following LM stenting. The existence of LM ISR may be practically ruled out by a negative CTA, and as a result, coronary computed tomography angiography (CTA) may be a preffered imaging modality alternative to coronary angiogram.

Conflicts of Interest

The author declares no conflict of interest.

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REFERENCES

[1] Sareen N and Ananthasubramaniam K. Left main coronary artery disease: A review of the spectrum of noninvasive diagnostic modalities. Journal of Nuclear Cardiology. 2016 Dec; 23: 1411-29. doi: 10.1007/s12350-015-0152-1.

[2] Neglia D, Rovai D, Caselli C, Pietila M, Teresinska A, Aguadé-Bruix S, *et al*. Detection of significant coronary artery disease by noninvasive anatomical and functional imaging. Circulation: Cardiovascular Imaging. 2015 Mar; 8(3): e002179. doi: 10.1161/CIRCIMAGING.114.002179.

[3] Beohar N, Robbins JD, Cavanaugh BJ, Ansari AH, Yaghmai V, Carr J, *et al*. Quantitative assessment of in-stent dimensions: A comparison of 64 and 16 detector multislice computed tomography to intravascular ultrasound. Catheterization and Cardiovascular Interventions. 2006 Jul; 68(1): 8-10. doi: 10.1002/ccd.20786.

[4] Van Mieghem CA, Cademartiri F, Mollet NR, Malagutti P, Valgimigli M, Meijboom WB, *et al*. Multislice spiral computed tomography for the evaluation of stent patency after left main coronary artery stenting: a comparison with conventional coronary angiography and intravascular ultrasound. Circulation. 2006 Aug; 114(7): 645-53. doi: 10.1161/CIRCULATIONAHA.105.608950.

[5] Mäkikallio T, Holm NR, Lindsay M, Spence MS, Erglis A, Menown IB, *et al*. Percutaneous coronary angioplasty versus coronary artery bypass grafting in treatment of unprotected left main stenosis (NOBLE): a prospective, randomised, open-label, non-inferiority trial. The Lancet. 2016 Dec; 388(10061): 2743-52. doi: 10.1016/S0140-6736(16)32052-9.

[6] Stone GW, Sabik JF, Serruys PW, Simonton CA, Généreux P, Puskas J, *et al*. Everolimus-eluting stents or bypass surgery for left main coronary artery disease. New England Journal of Medicine. 2016 Dec; 375(23): 2223-35. doi: 10.1056/NEJMoa1610227.

[7] Zalewska-Adamiec M, Bachórzewska-Gajewska H, Kralisz P, Nowak K, Hirnle T, Dobrzycki S. Prognosis in patients with left main coronary artery disease managed surgically, percutaneously or medically: a long-term follow-up. Kardiologia Polska (Polish Heart Journal). 2013 Aug; 71(8): 787-95. doi: 10.5603/KP.2013.0189.

[8] Collet C, Onuma Y, Andreini D, Sonck J, Pompilio G, Mushtaq S, *et al*. Coronary computed tomography angiography for heart team decision-making in multivessel coronary artery disease. European Heart Journal. 2018 Nov; 39(41): 3689-98. doi: 10.1093/eurheartj/ehy581.

[9] Li P, Xu L, Yang L, Wang R, Hsieh J, Sun Z, *et al*. Blooming artifact reduction in coronary artery calcification by a new de-blooming algorithm: initial study. Scientific reports. 2018 May; 8(1): 1-8. doi: 10.1038/s41598-018-25352-5.

[10] Papadopoulou SL, Girasis C, Gijsen FJ, Rossi A, Ottema J, van der Giessen AG, *et al*. A CT-based medina classification in coronary bifurcations: Does the lumen assessment provide sufficient information?. Catheterization and Cardiovascular Interventions. 2014 Sep; 84(3): 445-52. doi: 10.1002/ccd.25496.

[11] Grodecki K, Opolski MP, Staruch AD, Michalowska AM, Kepka C, Wolny R, *et al*. Comparison of computed tomography angiography versus invasive angiography to assess medina classification in coronary bifurcations. The American Journal of Cardiology. 2020 May; 125(10): 1479-85. doi: 10.1016/j.amjcard.2020.02.026.

[12] Poon M, Lesser JR, Biga C, Blankstein R, Kramer CM, Min JK, *et al*. Current evidence and recommendations for coronary CTA first in evaluation of stable coronary artery disease. Journal of the American College of Cardiology. 2020 Sep; 76(11): 1358-62. doi: 10.1016/j.jacc.2020.06.078.

[13] Mauri L and Normand SL. Studies of drug-eluting stents: to each his own?. Circulation. 2008 Apr; 117(16): 2047-50. doi: 10.1161/CIRCULATIONAHA.108.770164.

[14] Takagi K, Ielasi A, Shannon J, Latib A, Godino C, Davidavicius G, *et al*. Clinical and procedural predictors of suboptimal outcome after the treatment of drug-eluting stent restenosis in the unprotected distal left main stem: the Milan and New-Tokyo (MITO) registry. Circulation: Cardiovascular Interventions. 2012 Aug; 5(4): 491-8. doi: 10.1161/CIRCINTERVENTIONS.111.964874.

[15] Kosmala A, Petritsch B, Weng AM, Bley TA, Gassenmaier T. Radiation dose of coronary CT angiography with a third-generation dual-source CT in a "real-world" patient population. European Radiology. 2019 Aug; 29: 4341-8. doi: 10.1007/s00330-018-5856-6.

[16] Riedl KA, Jensen JM, Ko BS, Leipsic J, Grove EL, Mathiassen ON, *et al*. Coronary CT angiography derived FFR in patients with left main disease. The International Journal of Cardiovascular Imaging. 2021 Nov; 37(11): 3299-308. doi: 10.1007/s10554-021-02371-4.

[17] Xie JX, Eshtehardi P, Varghese T, Goyal A, Mehta PK, Kang W, *et al*. Prognostic significance of nonobstructive left main coronary artery disease in

DOI: https://doi.org/10.54393/pjhs.v4i02.513

women versus men: long-term outcomes from the CONFIRM (coronary CT angiography evaluation for clinical outcomes: an international multicenter) registry. Circulation: Cardiovascular Imaging. 2017 Aug; 10(8): e006246. doi: 10.1161/CIRCIMAGING.117.006246.

[18] Mancini GJ, Leipsic J, Budoff MJ, Hague CJ, Min JK, Stevens SR, *et al*. CT angiography followed by invasive angiography in patients with moderate or severe ischemia-insights from the ISCHEMIA trial. Cardiovascular Imaging. 2021 Jul; 14(7): 1384-93. doi: 10.1016/j.jcmg.2020.11.012.

[19] Budoff MJ, Li D, Kazerooni EA, Thomas GS, Mieres JH, Shaw LJ. Diagnostic accuracy of noninvasive 64-row computed tomographic coronary angiography (CCTA) compared with myocardial perfusion imaging (MPI): the PICTURE study, a prospective multicenter trial. Academic Radiology. 2017 Jan; 24(1): 22-9. doi: 10.1016/j.acra.2016.09.008.

[20] Hoffmann U, Ferencik M, Cury RC, Pena AJ. Coronary CT angiography. Journal of Nuclear Medicine. 2006 May; 47(5): 797-806.

[21] National Research Council. Tracking Radiation Exposure from Medical Diagnostic Procedures: workshop reports. National Academies Press; 2012 Jun. doi: 10.17226/13416.

[22] Kumar V, Weerakoon S, Dey AK, Earls JP, Katz RJ, Reiner JS, *et al*. The evolving role of coronary CT angiography in Acute Coronary Syndromes. Journal of Cardiovascular Computed Tomography. 2021 Sep; 15(5): 384-93. doi: 10.1016/j.jcct.2021.02.002.

[23] Beigel R, Matetzky S, Gavrielov-Yusim N, Fefer P, Gottlieb S, Zahger D, *et al*. Predictors of high-risk angiographic findings in patients with non-ST-segment elevation acute coronary syndrome. Catheterization and Cardiovascular Interventions. 2014 Apr; 83(5): 677-83. doi: 10.1002/ccd.25081.

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Original Article

Comparison of Outcome of Traditional Radial Artery versus Distal Artery Approach in Patients undergoing Coronary Intervention

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ABSTRACT

Although most interventional cardiologists favor radial artery (RA) access because to its ergonomic practicality, data on distal artery (DRA) access with relation to RA patency has not been compared in major trials. **Objective:** To compare the access feasibility of distal radial artery vs Forearm radial artery for cardiac catheterization operations. **Methods:** A cross sectional study of total of 198 patients undergoing radial coronary operations were monitored for radial artery occlusion (RAO) and other local problems with DRA and FRA access. Purposive sampling was performed. The inclusion criteria include all participants who had a palpable distal or proximal radial pulse. The patient was free to choose between the two approaches. Patients having an inappropriate radial pulse were eliminated. **Results:** The main objective was fulfilled by 11.7% in the FRA and 10.4% in the DRA group (p-value=0.24). Cannulation time was greater in the DRA group compared to the FRA group; however, this had no effect on hemostasis time (254 20 vs. 254 17; p-value=0.72). Hematoma (26.4% vs. 12.5%; OR (95% CI): 3.18 (1.09–5.63); p-value 0.001) was more prevalent with FRA, while radial artery spasm (18.6 % vs. 22.9 %; OR (95 % CI): 0.53 (0.03 – 0.95); p-value=0.01). **Conclusions:** When compared to Forearm Radial Artery access, Distal Radial Artery access is linked with poorer cannulation success rates and greater RAO rates. It is, however, linked to the production of lower hematomas.

INTRODUCTION

Despite the fact that coronary artery disease (CAD), often known as heart disease, is one of the major causes of mortality throughout the world, recent advances in coronary intervention procedures have helped lower the mortality and morbidity rates associated with CAD. In the past ten years, there has been a notable rise in the percentage of coronary angiograms and percutaneous coronary interventions (PCI) procedures that utilize the radial first method as the standard. At the moment, more than seventy % of arterial accesses during cardiac operations are performed using it [1-3]. Before cardiac catheterization became commonplace, the transfemoral technique was the most common way to get access to the coronary arteries [4]. The femoral route was the initial entry point for the interventional cardiology procedures that were performed. Campeau first shown that the radial artery might be utilized for cardiovascular (CV) therapies in the year 1989 [5]. Following that, a number of studies indicated a high success rate and a low risk of problems associated with accessing the radial artery in the forearm (FRA) [6]. Patients undergoing PCI who have access to the radial artery have a lower risk of bleeding issues and a lower

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risk of passing away as a result. It is now suggested as the method of choice for percutaneous coronary intervention (PCI) in cases with acute coronary syndrome (ACS) [7]. In the past, CV treatments were solely performed through the use of FRA access. On the other hand, access through the distal radial artery (DRA) was just made available in Japan in 2017 [8]. Since then, a great number of studies have demonstrated that DRA access is a secure and convenient alternative to the traditional routes of RA access. Although most interventional cardiologists favor right FRA access owing to its ergonomic practicality, data on DRA access with reference to RA patency has not been compared in major studies. As a result, one of our primary objectives was to perform a comparative analysis of the results obtained from the two methodologies with regard to RAO for coronary diagnostic and interventional operations.

METHODS

This was an observational research at the Armed Forces Institute of Cardiology, comparing DRA and FRA access in catheterization patients from January to December 2019. Sample size was calculated by WHO calculator and came 198. All participants were provided with written informed consent. The authors used no strategy to eliminate selection bias. Three skilled operators with extensive expertise in conventional and DRA access took both radial accesses. Purposive sampling was performed. Before the trial, everyone had completed more than 100 DRA operations. The research included all participants who had a palpable distal or proximal radial pulse. The patient was free to choose between the two approaches. Exclusion criteria Patients having an inappropriate radial pulse and who had a coronary artery bypass graft (CABG) and a history of radial access failure were also excluded. The CV risk factors were determined in accordance with industry standards. No ultrasound-guided punctures or Allen's tests were conducted because they are not routine at our institute. Before the artery puncture, a local anesthetic (lidocaine) was applied. FRA puncture was carried out using the usual procedure and DRA access was obtained using the method published by Malik *et al.* [9]. To avoid vasospasm and thrombosis, the sheath was subsequently given a combination of heparin (5000 units) and isosorbide dinitrate (1 mg). Hemostasis was obtained using a radial band, which was then removed after hemostasis was achieved. At discharge, a color Doppler ultrasonography was performed to search for stenosed arteries. The prevalence of RAO following DRA and FRA access was the main outcome. The time to cannulate the intended place of radial access and acute local problems were the secondary goals (radial artery spasm, hematoma, paresthesia, local edema, ecchymosis). The (SPSS) version 26 was used for the analysis. Continuous variables were given as mean and standard deviation, and categorical data as frequency (n) and percentages. For categorical data, Chi square was employed, and for continuous data, Student's t-test (normal distribution) or Mann-Whitney test (abnormal distribution). The Kolmogorov-Smirnov test was used to determine if the data were normally distributed. A statistically significant p-value of less than 0.05 was evaluated.

RESULTS

This observational study included 198 patients (102 in category 1 and 96 in category 2). Table 1 shows the baseline and procedural characteristics. There were 23.5% females in group 1 and 22.9% females in group 2 with mean age of 54 ± 10 vs. 54 ± 6 (p-value 0.95). All baseline characteristics were statistically matched.

Variable		FRA (n=102)	DRA (n=96)	p-value
Age		54 ± 10	54 ± 6	0.95
Females		23.5%	22.9%	0.82
BMI		25 ± 9	25 ± 5	0.91
DM		25.4%	26.3%	0.70
HTN		17.6%	18.7%	0.68
Dyslipidemia		29.4%	32.2%	0.24
CKD		2.9%	3.1%	0.98
Smoking		16.6%	17.5%	0.54
Antiplatelet therapy	Aspirin	89.2%	92.7%	0.12
	Clopidogrel	69.5%	70.8%	0.72
	Dual antiplatelet	43.4%	42.8%	0.85
Sheath size	5F	26.4%	27%	0.76
	6F	73.6%	73%	0.94
ACT		134 ± 13	132 ± 14	0.21
Hemostasis time		254 ± 20	254 ± 17	0.72
Time to cannulation		4.7 ± 2.5	6.8 ± 3.1	0.004
Cannulation failure		9.7%	15.4%	<0.001

Table1: Baseline and procedural characteristics

Table 2 compares the complication rate between groups 1 and 2. The rate of primary end point (RAO) was 11.7 % in group 1 and 10.4 % in group 2 (OR (95 % CI): 3.24(1.15 – 8.42); p-value=0.24), respectively. Similarly, the differences in paresthesia (p-value=0.37) and ecchymosis (p-value=0.57) between the two techniques were statistically insignificant. FRA was associated with hematoma (26.4 % vs. 12.5 %; OR (95 % CI): 3.18 (1.09 – 5.63); p-value 0.001). whereas radial artery spasm (18.6 % vs. 22.9 %; OR(95 % CI): 0.53 (0.03 – 0.95); p-value=0.01) and local edoema (1.3 % vs. 2.6 %; OR(95 % CI): 0.86 (0.21 – 3.98; p-value=0.02) were higher with DRA. The difference in hemostasis time was statistically negligible (254 20 vs. 254 17; p-value=0.72), while the time to cannulation was shorter with FRA (4.7 2.5

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vs. 6.8 3.1; p-value=0.004). RAO was substantially related to time to cannulation (p=0.007), 6F sheath (p=0.04), smoking (p=0.001), and female gender (p=0.001). Diabetes (p-value=0.005) and delay to cannulation (p-value=0.02) were linked with paresthesia. The failure to cannulate FRA and DRA was statistically significant (9.7% vs. 15.4%; p-value 0.001).

Variable	FRA (n=102)	DRA (n=96)	OR (95%CI)	p-value
Radial artery occlusion	11.7%	10.4%	3.24 (1.15 – 8.42)	0.24
Hematoma	26.4%	12.5%	3.18 (1.09 – 5.63)	<0.001
Spasm	18.6%	22.9%	0.53 (0.03 – 0.95)	0.01
Paresthesia	2.9%	3.1%	2.76 (1.12 – 4.65)	0.37
Local edema	1.3%	2.6%	0.86 (0.21 – 3.98)	0.02
Ecchymosis	9.5%	8.9%	1.54 (0.57 – 2.65)	0.57

Table 2: Complications with FRA and DRA

DISCUSSION

This is Pakistan's first research to examine DRA and FRA access in patients having cardiac catheterization operations. In terms of problems following cannulation, this study found mixed advantages for each radial access location. The major end goal (RAO), ecchymosis, and paresthesias were non-significantly different between the two groups, however additional local sequelae such as radial artery spasm and local edoema were substantially linked with DRA and hematoma with FRA. Furthermore, there appears to be no benefit to DRA access in terms of hemostasis time, and DRA access increased the time to cannulation. DRA access takes longer to cannulate and has a higher failure rate due to greater tortuosity and angulation at the point of puncture, whereas FRA cannulation is conducted in a reasonably straight arterial section. Even though the cannulation indicated satisfactory flow from the artery, we were unable to implant the wire. This discovery should be examined further using various types of sheaths and cannulation procedures. The fact that the primary end aim was not fulfilled with DRA access should not prevent interventional cardiologists from becoming acquainted with this approach, as it can be employed as an alternate route in problematic FRA cannulations. As a result, DRA access is an advantageous adjunct to other traditional arm access sites, potentially reducing the necessity for femoral punctures. Unlike earlier studies that excluded patients with weak, weakly perceptible DRA, we included all patients, even those with weak arterial pulse [9,10]. When compared to FRA access, this might explain the high cannulation failure rate (15.4 %) and lengthy cannulation time. While some studies had lower success rates even after eliminating weakly perceptible pulses, our cannulation success rate was comparable to these strong exclusion criterion studies. The failure rate has been linked to angulation and tortuosity in the DRA and its path over the anatomical snuff box, as well as the presence of small branches under the deep palmar arch in various studies. Another reason for greater puncture failure in DRA is the artery's diameter, which is thought to be lower than in FRA. A research found that DRA had a lower success rate than FRA because to a smaller mean DRA diameter [11]. However, because we did not employ ultrasound guidance to locate the artery before cannulation in our investigation, the puncture rate might have been lower; however, there is no data to corroborate this, and data on ultrasound-guided DRA puncture has limitations. When compared to the Western population, South Asians have smaller body habitus and hence a predisposition for tiny radial arteries, increasing their risk of procedural difficulties and puncture failure [12-14]. Although several researches have indicated a favorable positive rate of distal radial artery cannulation, the only randomized research to date comparing this strategy to the classic radial route revealed a substantial increase in DRA cannulation failure rate [15]. Furthermore, Kiemeneij, the first to evaluate this puncture location, experienced 11% technique failure, essential a return to the standard radial method [16]. There are several explanations for DRA's reduced success rates in cannulation: a) Small size of the radial artery in the area of snuffbox, which often increases the chance of contraction; b) the high asymmetry of the artery, which causes challenging to advance the wire; and c) the unstable angle of the hand. The DRA is practically more difficult, which necessitates a longer learning curve than adjacent radial artery cannulation 0 [17]. No randomized trial has been conducted on the use of the distal radial approach, despite the fact that previous studies exploring the viability of DRA included percentages of ACS ranging from 25 to 45 % [18-20]. Kim *et al.*, recently used the left snuffbox technique, with a high success rate (97.6%) [21]. A research have reported similar positive outcomes with effective PCI utilizing DRA in instances of ACS. Koutouzis *et al.*, favors, that DRA in cases of primary PCIs [22]. Another research proved, that DRA can be utilized in difficult revascularization patients. Gasparini *et al.*, proved the usefulness of PCI through left DRA patients using a 7-Fr Glide sheath Slender [23]. Before attempting cannulation, Doppler ultrasonography was employed in situations where the distal radial artery pulse was missing or faint. Our research has significant limitations. For starters, this was an observational research, and no measure of effect can be drawn from it. Second, the investigation was not sufficiently powered to detect a slight variation in DRA patency using ultrasonography settings between the two groups. Third, no specific hemostasis devices were employed for patent

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hemostasis of both access sites, which might have resulted in a larger RAO in our study. The results cannot be generalized to other ethnic groups with higher artery diameters. Finally, ultrasound guided punctures were not employed, which may have resulted in higher DRA cannulation rates.

CONCLUSIONS

Although DRA access is a safe and effective location for coronary operations, RAO and cannulation failure rates are significant with this technically hard technique. The incidence of vascular problems, such as paresthesia and ecchymosis, were comparable in both the DRA and FRA groups. Large randomized controlled studies are required to assess the benefits of DRA over FRA.

Conflicts of Interest

The author declare no conflict of interest.

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REFERENCES

[1] Liontou C, Kontopodis E, Oikonomidis N, Maniotis C, Tassopoulos A, Tsiafoutis I, *et al*. Distal radial access: a review article. Cardiovascular Revascularization Medicine. 2020 Mar; 21(3): 412-6. doi: 10.1016/j.carrev.2019.06.003.

[2] Aoi S, Htun WW, Freeo S, Lee S, Kyaw H, Alfaro V, *et al*. Distal transradial artery access in the anatomical snuffbox for coronary angiography as an alternative access site for faster hemostasis. Catheterization and Cardiovascular Interventions. 2019 Nov; 94(5): 651-7. doi: 10.1002/ccd.28155.

[3] Vefalı V and Sarıçam E. The comparison of traditional radial access and novel distal radial access for cardiac catheterization. Cardiovascular Revascularization Medicine. 2020 Apr; 21(4): 496-500. doi: 10.1016/j.carrev.2019.07.001.

[4] Bangalore S and Bhatt DL. Femoral arterial access and closure. Circulation. 2011 Aug; 124(5): e147-56. doi: 10.1161/CIRCULATIONAHA.111.032235.

[5] Campeau L. Percutaneous radial artery approach for coronary angiography. Catheterization and Cardiovascular Diagnosis. 1989 Jan; 16(1): 3-7. doi: 10.1002/ccd.1810160103.

[6] Tangwiwat S, Pankla W, Rushatamukayanunt P, Waitayawinyu P, Soontrakom T, Jirakulsawat A. Comparing the success rate of radial artery cannulation under ultrasound guidance and palpation technique in adults. Journal of Medical Association Thailand. 2016 May; 99(5): 505-10.

[7] Neumann FJ, Sousa-Uva M, Ahlsson A, Alfonso F, Banning AP, Benedetto U, *et al*. 2018 ESC/EACTS Guidelines on myocardial revascularization. European Heart Journal. 2019 Jan; 40(2): 87-165. doi: 10.1093/eurheartj/ehy394.

[8] Nairoukh Z, Jahangir S, Adjepong D, Malik BH. Distal radial artery access: the future of cardiovascular intervention. Cureus. 2020 Mar; 12(3): e7201. doi: 10.7759/cureus.7201.

[9] Malik J, Javed N, Naeem H. A comparative study of Terumo radial Band® and Prelude SYNC hemostasis compression device after transradial coronary catheterization. Anatolian Journal of Cardiology. 2021 Mar; 25(6): 402. doi: 10.14744/AnatolJCardiol.2020.34694.

[10] Byrne RA, Cassese S, Linhardt M, Kastrati A. Vascular access and closure in coronary angiography and percutaneous intervention. Nature Reviews Cardiology. 2013 Jan; 10(1): 27-40. doi: 10.1038/nrcardio.2012.160.

[11] Xie L, Wei X, Xie Z, Jia S, Xu S, Wang K. Feasibility of distal radial access for coronary angiography and percutaneous coronary intervention: a single center experience. Cardiology. 2021 Aug; 146(5): 531-7. doi: 10.1159/000517076.

[12] McCarthy DJ, Chen SH, Brunet MC, Shah S, Peterson E, Starke RM. Distal radial artery access in the anatomical snuffbox for neurointerventions: case report. World Neurosurgery. 2019 Feb; 122: 355-9. doi: 10.1016/j.wneu.2018.11.030.

[13] Chugh Y, Kanaparthy NS, Piplani S, Chugh S, Shroff A, Vidovich M, *et al*. Comparison of distal radial access versus standard transradial access in patients with smaller diameter radial Arteries (The distal radial versus transradial access in small transradial ArteriesStudy: DATA-STAR study). Indian Heart Journal. 2021 Jan; 73(1): 26-34. doi: 10.1016/j.ihj.2020.11.002.

[14] Wu CJ, Lo PH, Chang KC, Fu M, Lau KW, Hung JS. Transradial coronary angiography and angioplasty in Chinese patients. Catheterization and Cardiovascular Diagnosis. 1997 Feb; 40(2): 159-63. doi: 10.1002/(SICI)1097-0304(199702)40:2<159::AID-CCD8>3.0.CO;2-A.

[15] Al-Azizi KM and Lotfi AS. The distal left radial artery access for coronary angiography and intervention: a new era. Cardiovascular Revascularization Medicine. 2018 Dec; 19(8): 35-40. doi: 10.1016/j.carrev.2018.03.020.

[16] Kiemeneij F. Left distal transradial access in the anatomical snuffbox for coronary angiography (IdTRA) and interventions (IdTRI). EuroIntervention:

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journal of EuroPCR in collaboration with the Working Group on Interventional Cardiology of the European Society of Cardiology. 2017 Sep; 13(7): 851-7. doi: 10.4244/EIJ-D-17-00079.

[17] Shah RM, Patel D, Abbate A, Cowley MJ, Jovin IS. Comparison of transradial coronary procedures via right radial versus left radial artery approach: a meta-analysis. Catheterization and Cardiovascular Interventions. 2016 Dec; 88(7): 1027-33. doi: 10.1002/ccd.26519.

[18] Alkhawam H, Windish S, Abo-Salem E. Distal radial artery access among cases with radial artery occlusion for primary percutaneous intervention. Future Cardiology. 2019 May; 15(3): 169-73. doi: 10.2217/fca-2018-0057.

[19] Erdem K, Kurtoğlu E, Küçük MA, İlgenli TF, Kızmaz M. Distal transradial versus conventional transradial access in acute coronary syndrome. Turk Kardiyoloji Dernegi Arsivi. 2021 Jun; 49(4): 257-65. doi: 10.5543/tkda.2021.64000.

[20] Kovach C, Banerjee S, Waldo S. Radial artery access for acute coronary syndromes: a review of current evidence. Current Cardiology Reports. 2022 Apr; 24(4): 383-92. doi: 10.1007/s11886-022-01656-x.

[21] Kim Y, Ahn Y, Kim I, Lee DH, Kim MC, Sim DS, *et al.* Feasibility of coronary angiography and percutaneous coronary intervention via left snuffbox approach. Korean Circulation Journal. 2018 Dec; 48(12): 1120-30. doi: 10.4070/kcj.2018.0181.

[22] Koutouzis M, Kontopodis E, Tassopoulos A, Tsiafoutis I, Katsanou K, Rigatou A, *et al*. Distal versus traditional radial approach for coronary angiography. Cardiovascular Revascularization Medicine. 2019 Aug; 20(8): 678-80. doi: 10.1016/j.carrev.2018.09.018.

[23] Gasparini GL, Garbo R, Gagnor A, Oreglia J, Mazzarotto P. First prospective multicentre experience with left distal transradial approach for coronary chronic total occlusion interventions using a 7 Fr Glidesheath Slender. EuroIntervention: Journal of EuroPCR in Collaboration with the Working Group on Interventional Cardiology of the European Society of Cardiology. 2019 May; 15(1): 126-8. doi: 10.4244/EIJ-D-18-00648.

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Original Article

Experiences of Post Esophagectomy Patients Admitted in Lady Reading Hospital Peshawar Pakistan

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ABSTRACT

Patients having esophageal cancer can experience psychological, emotional, physical, social, financial and spiritual changes following surgery. Exploration of such challenges, particularly from the Patient's perspective has been limited in Pakistan. **Objective:** To explore the experiences of post-esophagectomy patients admitted in Lady Reading Hospital Peshawar Pakistan. **Methods:** A qualitative phenomenological study was conducted on ten patients having esophagectomy admitted at Lady Reading Hospital Peshawar. Participants were selected through None Probability purposive sampling technique. Permission was taken from concerned departments as well as from participants before data collection. An interview topic guide was used for Face-to-face individual, in-depth interviews. Audio recorded, transcribed, and analyzed through thematic analysis. **Results:** Five major themes were constructed i.e., Physical changes, psychological effects, social issues and support, financial issues, acceptance, and adjustment to a new changed way of life. **Conclusions:** Post-esophagectomy patients need full support in adjustment to their physical, psychological, emotional, social, financial, and spiritual aspects of life. Family, friends, and society could be an effective channel in this regard. Government should provide medical and financial support to such patients for their treatment as well as for their rehabilitation.

INTRODUCTION

Esophagectomy is a complicated procedure with a high mortality rate ranging from 1-5% [1, 2]. Esophageal cancer is the sixth leading cause of death worldwide [3-5]. It is the reason of about more than 400,000 deaths yearly [2, 3]. In the United States of America every year more than 12000 new cases of esophageal cancer are diagnosed [4]. Whereas it is the fifth most common cause of death in the United Kingdom [6]. It is more common in men than women [7]. The largest numbers of esophageal cancer patients are found in China, Northeastern Iran, the Southeast United States, and South Africa. The rate of cancer in these areas is more than 100 out of 100,000 populations [8]. Whereas in Pakistan it is marked as the seventh most common cancer in males and sixth in females [9]. In Peshawar, about 100 cases of esophagectomy were reported in just one year [10, 11]. Tobacco smoking, snuff, low intake of vegetables and fruits, and high alcohol intake are the most common causes of esophageal cancer [12, 13]. Patients generally suffer from symptoms such as pain, fatigue, dysphagia, and weight loss. Although, early diagnosed esophageal cancer can be treated with esophagectomy [14, 15] the rate of success of esophagectomy is as low as 5-35%, and the survival rate of such patients is only five years [4]. Despite the advancement in science the results of treatment for esophageal cancer are not yet successful [16]. In addition, patients face multiple challenges in living a normal life.

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They need physical, psychological, and emotional support to increase their quality of life (QOL) [1, 14, 17]. Standard nursing care has a relation to better treatment outcomes [18]. Before the advancement in medicine and the nursing field, the focus was on the external causes of disease. But now it has been shifted from external factors to internal factors with a focus on the patient's perceptions of illness [19].

METHODS

The current study was conducted at Lady Reading Hospital Peshawar. Permission was taken from concerned departments and participants before data collection. Participants who had undergone esophagectomy at least two months ago were recruited for the study. The non-probability purposive sampling technique was used for participant selection. Initially, the sample size was not fixed; at last, the sample size was limited to 10 participants after data saturation. An interview topic guide was used as a data collection tool for in-depth interviews. Interviews were audio recorded and handwritten notes were made to capture the impressions of the participants. Data were then translated and transcribed anonymously and further analyzed thematically.

RESULTS

Up to 600 open codes emerged which were then grouped under relevant categories and finally 9 major themes had been constructed i.e., recognizing the difficulty in swallowing, fatigue, hoarseness of voice, feelings of helplessness, and hopelessness, difficulty in falling asleep, impaired social relationship, trusting and caring behavior of the family members, financial issues, recognizing and accepting a changed self. The first and the most highlighted issue was difficulty in swallowing.

Theme 1. Recognizing the difficulty in swallowing

"My diet is soft and light like custard, soup, juices, etc but I am unable to swallow the food and unable to digest it". (Participant 4)

"I cannot take my meals and drinks. Eating and drinking cause stomach discomfort". (Participant 8)

"Whenever I eat something in food, I do vomiting.... I don't feel the need for a meal...when I take food I cannot recognize the taste". (Participant 10)

Theme 2. Fatigue

"When I talk too much I get tired, my heart gets tired and my throat gets dry". (Participant 1)

"I can't walk enough distance....I easily get exhausted and feel numbness in hands and feet after operation". (Participant 3)

Theme 3. Hoarseness of voice

"I am feeling roughness in my voice for the last two weeks". (Participant 1)

"When I start calling for prayers (Azan) I feel pain in the chest.... I cough too much and start vomiting...I am disappointed that my voice is no more supporting me to perform my duty". (Participant 2)

Theme 4. Feelings of helplessness and hopelessness

"I feel deprived and lonely...Alas! Alive but not worthy...I am worried about my family and children's lives...we live in a very miserable condition...this world is merciless no one cares about another". (Participant 1)

"I am so depressed that I am unable to support even myself how I will support my family...Oh! Whatever I would have before is not with me.... everything has been lost.... I am nothing but a dead body". (Participant 2)

"The situation is very pathetic with me ...I am getting mentally ill....most of the time I remain depressed because I am dependent on others...I request others for my domestic problems". (Participant 5)

Theme 5. Difficulty in falling asleep

"I cannot go to sleep because I stay tense... I miss those happy moments when I was healthy and spending time with my children but now the situation becomes different". (Participant-4)

"I don't feel good in noises...when I talk a little I feel frustrated...when I have tried to sleep I can't because of tension and depression". (Participant 10)

Theme 6. Impaired social relationship

"I was attached to my relatives and friends but unfortunately they became disconnected due to my illness which is really a matter of sorrow for me...they are not supporting me financially even though they have stopped visiting me". (Participant 4)

"After I got ill my relatives' behavior got changed...when I stopped contacting them due to my illness, they didn't bother to visit me to give me some relief". (Participant 6)

"I wish I had a son... Sometimes I cry like a child when I need someone to do something for me". (Participant 8)

Theme 7. Trusting and caring behavior of the family members

"She cares for me all the time....I think, without her, I might be the meal of stray dogs (victims of society)....I think, If I am alive it is just because of Allah and because of her love and care". (Participant 1)

"I became intolerant and frustrated due to my illness but my husband treats me like a child....he is caring and loving...he is very kind to me". (Participant 10)

"My children love me a lot and always pray for my health.... They show their concern for my health". (Participant 4)

Theme 8. Financial issues

"Everything got vanished due to my illness...I have no money...I had saved some money but now I have nothing... doctor advised me nutritional supplements and medicine but I have no money, so I have left my treatment incomplete".

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(Participant 1)

"My son borrowed money for me because a lot of money has been spent on my treatment....no one from relatives is supposed to help me financially". (Participant2)

"I have sold my lands and have spent all my money but cancer treatment is very expensive.... I pray before Almighty Allah to help me because no one helps except Him". (Participant 8)

"Treatment is expensive and I cannot afford it.... nowadays my husband does not do any work because he stays here in the hospital with me....so he is compelled to sell everything for my treatment". (Participant 4)

"Due to poverty, my funeral expenses will be impossible for my family". (Participant 6)

Theme 9. Recognizing and accepting a changed self

"I spend all the night in sitting, weeping and praying before Allah...Allah has given me this disease and Allah will give me health also... InshaAllah (if Allah wants)". (Participant 1)

"My problems will be solved if Allah wants..... I have strong faith in Allah, He is the Creator, and He knows better why He put me in this condition I know there would be some reason behind my sufferings and I am sure He will bless me with healthy life". (Participant 6)

"I hope Allah will bless me with health again and I will get a normal life.... we cannot avoid illness because health and illness are the part of life...and grief is attached with the joy same as life is attached with death". (Participant 5)

DISCUSSION

The only treatment for esophageal cancer left for the patients was esophagectomy. As the procedure is very exhaustive and painful that's why caused many complications after surgery [20]. The patients initially felt physical changes after esophagectomy i.e. tiredness and strengthlessness. According to previous study by Tatematsu *et al.*, esophagectomy is a major surgery and the most traumatic surgical procedure as its complications can lead to patient discomfort [21]. Participants described the experiences of ongoing difficulties i.e., weight loss, reduced capacity to eat, nausea, vomiting, and bloating. Similarly, previous studies also stated the same results [22]. In the current study, participants reported many side effects of cancer surgery and cancer treatment i.e. difficulty in swallowing dietary alterations, eating restrictions, reflux, dry mouth, loss of taste, coughing, and loss of appetite are the most common. Previous studies by Jaromahum *et al.*, and also reported the same findings by stating that most of the patients might not be able to eat and feel the taste exactly as they could before their operation even if they become hungry [20, 23]. Participants also stated their experiences of stress, depression, and impaired quality of life. As indicated by previous studies many patients faced psychological problems following esophageal cancer surgery [24, 25] and the prevalence was ranging from 10% to 38% [26]. Some patients reported that due to anxiety, they got angry, worthless, and felt lonely. Studies showed that among survivors of cancers psychological impairment exist such as a disability in occupational performance, anxiety, depression, and disrupted conjugal relations are more common [27]. Esophageal cancer can affect the entire social life of the cancer survivors such as family relationships, financial, and work life. Participants reported that illness affected their social relationships. One of the reasons for this may be the loss of empowerment of the patients. So it would have been assumed that social support is an essential element to fight with the post-surgical challenges. These findings were similar to a previous study that reported that social support is very important for cancer survivors. Pakistan is a developing country where all the patients are supposed to pay for their health. The study participants also faced financial problems which seriously disrupted their treatment process. They were unable to work and their families could not tolerate such expensive treatment. They struggle to run the house through loans or by selling their properties. Many participants adopted more than one way to overcome financial distress; the most common among them was a loan. A previous study by Malmström *et al.*, also indicated that cancer treatment is very expensive those survivors who have low socioeconomic status faced more financial problems with cancer treatment [28]. After esophagectomy, it becomes very difficult for the patients to adjust to their new life. To survive positively they need spiritual and religious therapy. The study participants did the same when got to know about their cancer they tried to cope with the situation and started prayers for themselves. Previous study by Ahmad *et al.*, showed that the patients believed that all good and evil come from God. That's how spirituality became a source of coping with the newly changed way of life [29]. According to another study by Allmon, Individuals seek spiritual support and religious ways to manage traumatic and challenging life events [27]. The majority of participants reported that spirituality is an important source of support during their sickness. They believe that Allah is the Almighty. He is the one Who did it to them and He is the one Who will settle it [30].

CONCLUSIONS

Esophagectomy is a complex surgery and brings many changes to patients' lives due to which their life adjustment becomes very difficult. Better management of such patients requires an understanding of the patient's problems. The current study highlighted the experiences of patients following esophagectomy the study findings

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further suggested the areas for improvement of life of patients suffering from esophageal cancers.

Conflicts of Interest

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REFERENCES

[1] Malmström M, Klefsgard R, Ivarsson B, Roman M, Johansson J. Quality of life measurements as an indicator for timing of support after oesophagectomy for cancer: a prospective study. BMC Health Services Research. 2015 Dec; 15(1): 1-7. doi: 10.1186/s12913-015-0747-x

[2] Casson AG and van Lanschot JJ. Improving outcomes after esophagectomy: the impact of operative volume. Journal of Surgical Oncology. 2005 Dec; 92(3): 262-6. doi: 10.1002/jso.20368

[3] Zeb A, Rasool A, Nasreen S. Cancer incidence in the districts of Dir (North West Frontier Province), Pakistan: a preliminary study. Journal of the Chinese Medical Association. 2008 Feb; 71(2): 62-5. doi: 10.1016/S1726-4901(08)70076-5

[4] Booka E, Takeuchi H, Nishi T, Matsuda S, Kaburagi T, Fukuda K, *et al*. The impact of postoperative complications on survivals after esophagectomy for esophageal cancer. Medicine. 2015 Aug; 94(33): e1369. doi: https://doi.org/10.1097/ MD.000 000000 0001369

[5] Scarpa M, Valente S, Alfieri R, Cagol M, Diamantis G, Ancona E, *et al*. Systematic review of health-related quality of life after esophagectomy for esophageal cancer. World Journal of Gastroenterology: WJG. 2011 Nov; 17(42): 4660. doi: 10.3748/wjg.v17.i42.4660

[6] McCorry NK, Dempster M, Clarke C, Doyle R. Adjusting to life after esophagectomy: the experience of survivors and carers. Qualitative Health Research. 2009 Oct; 19(10): 1485-94. doi: 10.1177/10497323 09348366

[7] Mackenzie DJ, Popplewell PK, Billingsley KG. Care of patients after esophagectomy. Critical Care Nurse. 2004 Feb; 24(1): 16-31. doi: 10.4037/ccn2004.24.1.16

[8] Pakzad R, Mohammadian-Hafshejani A, Khosravi B, Soltani S, Pakzad I, Mohammadian M, *et al*. The incidence and mortality of esophageal cancer and their relationship to development in Asia. Annals of Translational Medicine. 2016 Jan; 4(2): 29. doi: 10.1016/j.prnil.2015.09.001

[9] Bukhari U, Siyal R, Memon FA, Memon JH. Oesophageal carcinoma: a review of endoscopic biopsies. Pakistan Journal of Medical Sciences. 2009 Oct; 25(5): 845-8.

[10] Muslim M, Khan MA, Ahmad N, Zarin M, Ahmad M, Aurangzeb M, *et al*. Perioperative morbidity and mortality in 100 cases of transhiatal esophagectomy-a single surgical unit experience of Khyber teaching hospital, Peshawar. Journal of Postgraduate Medical Institute. 2015 May; 29(2): 97-100.

[11] Ahmed WU, Qureshi H, Alam E, Zuberi SJ, Jamal Q, Alam SM. Oesophageal carcinoma in Karachi. Journal of Pakistan Medical Association. 1992 Jun; 42(6): 133-5.

[12] Logue B and Griffin S. Road Map to esophagectomy for nurses. Critical Care Nurse. 2011 Aug; 31(4): 69-86. doi: 10.4037/ccn2011426

[13] Sadat Yousefi M, Sharifi-Esfahani M, Pourgholam-Amiji N, Afshar M, Sadeghi-Gandomani H, Otroshi O, *et al*. Esophageal cancer in the world: incidence, mortality and risk factors. Biomedical Research and Therapy. 2018 Jul; 5(7) :2504-17. doi: 10.15419/bmrat.v5i7.460

[14] Malmström M. Quality of life and supportive care after oesophageal cancer surgery. Long-term experiences and evaluation of a telephone based nurse-led supportive care programme (Doctoral thesis). Sweden: Media-Tryck, Lund University. 2013. Available at: https://lucris.lub.lu.se/ws/portalfiles/portal/3994318/4015992.pdf

[15] Verschuur EM, Steyerberg EW, Kuipers EJ, Essink-bot ML, Tran KT, van der Gaast A, *et al*. Experiences and expectations of patients after oesophageal cancer surgery: an explorative study. European Journal of Cancer Care. 2006 Sep; 15(4): 324-32. doi: 10.1111/j.1365-2354.2006.00659.x

[16] Cha E, Burgoyne GB, Heitmiller RF. Patient Age Significantly Influences Post-Esophagectomy Inpatient Mortality, Length of Stay, Hospital Charges, and Discharge Disposition. Journal of the American College of Surgeons. 2016 Oct; 223(4): S24-5. doi: 10.1016/j.jamcollsurg.2016.06.063

[17] Lagergren P, Avery KN, Hughes R, Barham CP, Alderson D, Falk SJ, *et al*. Health-related quality of life among patients cured by surgery for esophageal cancer. Cancer: Interdisciplinary International Journal of the American Cancer Society. 2007 Aug; 110(3): 686-93. doi: 10.1002/cncr.22833

[18] Adam C, Patiraki E, Lemonidou C, Radwin L, Charalambous A, Charalambous M, *et al.* Quality of nursing care as perceived by cancer patients : A cross-sectional survey in doi: four European countries. Journal of Balkan Union of Oncology. 2017 May; 22(3): 777-82.

DOI: https://doi.org/10.54393/pjhs.v4i02.515

[19] Andreassen S, Randers I, Ternulf Nyhlin K, Mattiasson AC. A meta-analysis of qualitative studies on living with oesophageal and clinically similar forms of cancer, seen from the perspective of patients and family members. International Journal of Qualitative Studies on Health and Well-being. 2007 Jan; 2(2): 114-27. doi: 10.1080/17482620701305589

[20] Jaromahum J and Fowler S. Lived experiences of eating after esophagectomy: a phenomenological study. Medsurg Nursing. 2010 Mar; 19(2): 96-100.

[21] Tatematsu N, Park M, Tanaka E, Sakai Y, Tsuboyama T. Association between physical activity and postoperative complications after esophagectomy for cancer: a prospective observational study. Asian Pacific Journal of Cancer Prevention. 2013; 14(1): 47-51. doi: 10.7314/APJCP.2013.14.1.47

[22] Shomura M, Okabe H, Iwamoto S, Nakagawa E, Nakamura K. A prospective observational study on changes in physical activity, quality of life, and self-efficacy in perioperative patients with gastric cancer. International Journal of Nursing & Clinical Practices. 2017 Jan; 4(219): 1-6. doi: 10.15344/2394-4978/2017/219

[23] Sun V, Kim J, Kim JY, Raz DJ, Merchant S, Chao J, *et al*. Dietary alterations and restrictions following surgery for upper gastrointestinal cancers: key components of a health-related quality of life intervention. European Journal of Oncology Nursing. 2015 Aug; 19(4): 343-8. doi: 10.1016/j.ejon.2015.01.008

[24] Rouvelas I, Zeng W, Lindblad M, Viklund P, Ye W, Lagergren J. Survival after surgery for oesophageal cancer: a population-based study. The Lancet Oncology. 2005 Nov; 6(11): 864-70. doi: 10.1016/S1470-2045(05)70347-8

[25] Hellstadius Y. Psychological Distress Following Oesophageal Cancer Treatment: Is There a Need for Psychological Support? (Doctoral dissertation, Karolinska Institute (Sweden)). 2017. Available at: https://www.proquest.com/docview/2570011647?pq-origsite=gscholar&fromopenview=true

[26] Hellstadius Y, Lagergren J, Zylstra J, Gossage J, Davies A, Hultman CM, *et al*. A longitudinal assessment of psychological distress after oesophageal cancer surgery. Acta Oncologia. 2017 May; 56(5): 746-52. doi: 10.1080/0284186X.2017.1287945.

[27] Allmon AL. Spiritual growth and decline among patients with cancer. Number 6/November 2013. 1969 Dec; 40(6): 559-65. doi: 10.1188/13.ONF.559-565

[28] Malmström M, Klefsgård R, Johansson J, Ivarsson B. Patients' experiences of supportive care from a long-term perspective after oesophageal cancer surgery–A focus group study. European Journal of Oncology Nursing. 2013 Dec; 17(6): 856-62. doi: 10.1016/j.ejon.2013.05.003

[29] Ahmad F, binti Muhammad M, Abdullah AA. Religion and spirituality in coping with advanced breast cancer: perspectives from Malaysian Muslim women. Journal of Religion and Health. 2011 Mar; 50: 36-45. doi: 10.1007/s10943-010-9401-4

[30] Peteet JR and Balboni MJ. Spirituality and religion in oncology. CA: A Cancer Journal for Clinicians. 2013 Jul; 63(4): 280-9. doi: 10.3322/caac.21187

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Original Article

Frequency of Benign Lesions in Radiologically Presumed Renal Cell Carcinoma Taking Histopathology as Gold Standard

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ABSTRACT

Renal cell carcinoma (RCC) comprises for between 90-95% of renal neoplasms in adults and about 3% of all malignancies overall. **Objective:** To ascertain the prevalence of benign lesions in radiologically presumed renal cell carcinoma ≤ 7 cm, using histology as the gold standard **Methods:** A prospective cross-sectional study was undertaken at the department of urology. A total number of 131 patients who were diagnosed possibly as RCC on CT scan. Demographic characteristics (age and gender), size of renal mass both pre-operatively and per-operatively were noted. After nephrectomy, the specimen was sent to histopathology laboratory for confirmation of diagnosis. Histopathology reports were analyzed post operatively and frequency of benign lesions in radiologically presumed RCC was determined. **Results:** Mean age of patients included in this study was 52.02±13.18 years. Mean size of mass pre-operatively was 4.89±1.47 cm. Mean size of mass per-operatively was 5.07±1.44 cm. There were 87(66.41%) male and 44 (33.59%) female patients. Incidental diagnosis was made in 25 (19.08%) patients. Symptomatic predisposition was found in 107 (81.68%) patients. Partial nephrectomy was performed in 59 (45.04%) and radical nephrectomy was performed in 72 (54.96%) patients. Malignancy was diagnosed in 109 (83.21%) patients and benign lesions were diagnosed in 22 (16.79%) patients on histopathology reporting. **Conclusion:** The frequency of benign lesions in radiologically presumed renal cell masses in our study is 16.8%. The findings of this study may assist urologist in advising patients who have small renal masses and choosing the best course of action.

INTRODUCTION

Renal cell carcinoma (RCC) comprises for between 90-95% of renal malignancies, is the sixth most common cancer in men and tenth in women [1]. In developed nations, where incidence rates are higher and up to half of cases discovered incidentally [2]. Due to the widespread use of abdominal imaging for a variety of renal specific and non-specific complaints, the incidental identification of renal masses has significantly increased over time [3]. According to current estimates, accidental detection accounts for more than half of all kidney masses [4, 5]. The majority of renal mass lesions were once considered to be cancerous, while benign lesions like oncocytoma(3-5%), angiomyolipoma(0.7-2%), and metanephric adenoma(0.1%) were believed to occur just as commonly in incidental tumours as in larger and more prevalent symptomatic lesions [6]. Recent research questioned this paradigm by showing that 20% of small kidney tumours had pathologically benign characteristics [7]. One of the few tumours that has historically only been treated based on the radiological presumption of malignancy is kidney neoplasms. For decades, urologists have held that surgical removal of malignant renal masses was always necessary, hence knowing the histology of the tumour before removal did not affect the decision on therapy. [8]. In contrast, we now know that incidentally discovered kidney masses are frequently benign or malignant tumours with somewhat indolent behaviour [9]. According to numerous research, men are less likely than women to experience benign

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histology findings after undergoing kidney surgery [10, 11]. Historically, the standard therapy for renal cell carcinoma has been radical nephrectomy (RN) [12]. Nephron-sparing surgeries (NSS) has revolutionized kidney cancer care [13]. Suang Hwan lee et al concluded that rate of extirpative surgery for tumor up to 7 cm have increased from 5% before 1998 to 21.2% after 2003. Among 290 cases which undergo partial nephrectomy, 52 (17.9%) reveal benign histology [14]. In a research by Lane BR, which contained data on 862 individuals with small renal masses, 20% of the tumours were benign and 80% were malignant, although only 30% of the tumours were potentially aggressive cancers (24% of the small renal masses) [15]. Another study that investigated the prevalence and risk factors for benign renal mass in 450 individuals who had small renal masses underwent surgical excision, found that 88(19.9%) of the renal masses were benign [16]. Unfortunately, it is still difficult to predict the biological potential of renal mass, and patient decision-making and counselling are suboptimal. Given that majority of small renal mass are benign hence aim of our study is to quantify frequency of benign lesions in radiologically proven RCC. This will help urologist to incorporate biopsy as a routine investigation for lesion up to 7 cm to help them make a definite diagnosis and decide management accordingly thus reducing incidence of unnecessary surgeries, decreasing overall financial burden as well as morbidity of patient.

METHODS

A prospective cross-sectional study was undertaken at the department of Urology in Sindh Institute of urology and transplantation, Karachi from 16th November 2019 to 15th May 2022. Based on the proportion 21.2 % of extirpative surgery for benign lesions <7 cm in patients with 95% confidence level and margin of error 7%, a total of 131 patients were included [14]. Data was collected on the structured proforma after obtaining approval from Institute of ethical committee and after obtaining informed written consent from study subjects. All the patients age between 20-70 years who had been diagnosed possibly as RCC (size ≤ 7cm) on CT scan due to either solid masses or enhanced cystic lesions were included in this study. This research excluded patients who were unable to undergo general anesthesia, had metastatic RCC, were known to have non-RCC diagnoses, a benign non-functioning kidney, had known genetic susceptibility to RCC (such as VHL or Birt-Hogg Dube Syndrome), or had preoperatively biopsy proven RCC. Demographics characteristics (age and gender), size of renal mass both pre-operatively and per-operatively were noted. We also observed, whether the mass is diagnosed incidentally or symptomatically and if any genetic predisposition of the disease. After nephrectomy, either performed open, laparoscopic or robotic, the specimen was sent to histopathology laboratory for confirmation of diagnosis. Histopathology reports were analyzed post operatively and frequency of benign lesions in radiologically presumed RCC was determined. All the data was entered and analyzed using SPSS version 23.0. Descriptive statistics were used to summarize the continuous and categorical variables. Continuous variables such as age, size of mass pre-operative and per operative were presented as mean and standard deviation. Categorical variables like gender, incidentally diagnosed, symptomatic predisposition, and procedure performed were presented as frequencies and percentages. Effect modifiers age, size of mass pre and per-operative were controlled by stratification by outcome variable, histopathology findings benign and malignant as gold standard. After stratification, non-parametric sign test was used and P-value less than 0.05 were considered as significant.

RESULTS

Of the 131 patients there were 87 (66.41%) male and 44 (33.59%) female patients. Incidental diagnosis was made in 25 (19.08%) patients. Symptomatic predisposition was found in 107 (81.68%) patients and it was not found in 24 (18.32%) patients. On frequency of procedure performed, partial nephrectomy was performed in 59 (45.04%) patients and radical nephrectomy was performed in 72 (54.96%) patients. On histopathology, malignancy was diagnosed in 109 (83.21%) patients and benign lesions were diagnosed in 22 (16.79%) patients (Figure 1).

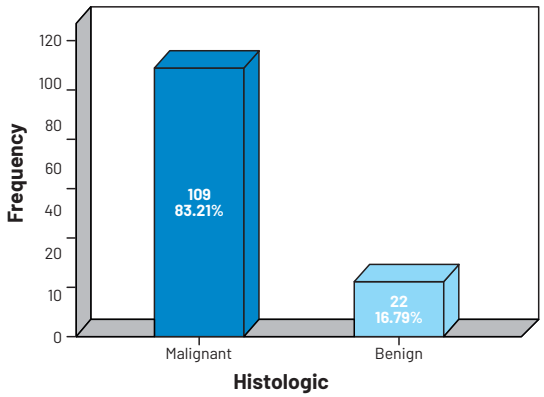

Figure 1: Frequency of histologic diagnosis
*P value < 0.01 was considered statistically significant using Sign Test

Descriptive variables of age and renal mass are given in table 1.

Descriptive statistics	Mean ± S.D	Minimum	Maximum
Age	52.02±13.18	20	70
Size Of Mass Pre-Operatively	4.89±1.47	02	07
Size Of Mass Per-Operatively	5.07±1.44	02	09

Table 1: Descriptive variables of age and renal mass

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There was no association of age with histologic diagnosis, in age group 20-50 years; malignancy was diagnosed in 49 patients and benign lesions in 13 patients. In patients having age 51-70 years, malignancy was diagnosed in 60 patients and benign lesions in 09 patients. This difference was statistically insignificant with p-value of 0.226. There was no association of gender with histologic diagnosis. In male patients, malignancy was diagnosed in 74 patients and benign lesions in 13 patients. In female patients, malignant was diagnosed in 35 patients and benign lesions in 09 patients. This difference was also statistically insignificant with p-value of 0.425. Stratification was also performed on the basis of size of mass pre-operatively and size of mass per-operatively Table 2.

Descriptive statistics of renal mass	Histological diagnosis		p-Value*
	Malignant	Benign	
Size Of Mass Pre-Operatively			
2.0 – 4.90 cm	46 (78%)	13(22%)	<0.01
5.0 – 7.0 cm	63(87.5%)	09(12.5%)	<0.01
Size Of Mass Per-Operatively			
2.0 – 4.90 cm	39(81.3%)	09(18.8%)	<0.01
5.0 – 9.0 cm	70(84.3%)	13(15.3%)	<0.01

Table 2: Descriptive statistics of renal mass pre and per operatively

*P<0.01 was considered statistically significant using Sign test

DISCUSSION

In 2018, more than 400,000 new cases of kidney cancer were identified [17]. Nearly half of all new occurrences of renal cell carcinoma (RCC) are localized tumors, and small, localized lesions are the ones that have increased the highest in incidence rate. The increased inadvertent discovery of small renal masses is assumed to be related to greater use of imaging technologies [18]. Advances in preoperative imaging techniques have made it possible to identify smaller lesions, but they are typically unable to distinguish RCC from benign lesions such oncocytoma or lipid-poor angiomyolipoma (AML) [19, 20]. According to existing literature benign lesions are diagnosed in up-to 20% of the cases after nephrectomy on histopathological reporting among patients who were presumed to have malignant lesions on radiological diagnosis. In present study, benign lesions were diagnosed in 16.8% patients of radiologically presumed malignant lesions. According to a study by the Memorial Sloan-Kettering Cancer Center, non-RCC mass incidence increased from 1996 to 2002 from 16.9% to 23% [21, 22]. According to Alana et al., benign tumours have become more common during renal surgery during the previous two decades. Extirpative surgery for benign lesions less than 7 cm increased significantly during the research period, rising from 5.0% before 1998 to 21.2% after 2003, when stratified by the year of surgery [23]. Although the proportion of benign tumours did not significantly raise when the incidence of benign pathology was stratified by year of surgery, the incidence of partial nephrectomy did increase. This result shows that, despite the current era's growth and advancement in CT imaging the likelihood of benign histology following surgery being mistakenly identified on CT imaging as a cancer had not diminished [24]. A 2004 research by Marszalek et al. on 129 people showed a benign rate of 32.6%. In a study done in 2006, it was shown that 16.1% of 143 people with renal tumours assumed to be malignant based on preoperative imaging actually had benign histology [25]. Lesions ≤ 4 cm were shown to have benign rates of 20–22% in two recent investigations [26, 27]. Similar outcomes are shown by Mullins et al. multicenter data of 873 patients, with a benign incidence of 23.1% for all patients receiving a robotic assisted partial nephrectomy [28]. For benign histology, the use of clinically based predictive models and imaging may be able to prevent some patients from superfluous procedures and their associated problems. Provocative data further support routine biopsy of renal masses in patients with suspected masses [29]. In individuals with equivocal clinical and radiographic symptoms, renal biopsy may be utilized to distinguish between benign and malignant histology. Earlier authors have highlighted the importance of biopsy in aiding risk categorization and management decisions, usually resulting in the avoidance of potentially avoidable surgery (for benign tumours or indolent cancers) [30]. Although 9/53(17%) were found to have been incorrectly assigned due to less favorable final pathology, the authors documented the reassignment of 53(26%) of those tumours to active monitoring as opposed to surgery [31]. In a series of 151 tumours, Halverson et al. discovered a 92% concordance rate between the final pathology and the biopsy [29]. Several indicators have been shown to accurately differentiate between benign lesions and RCC, such as the urine biomarkers aquaporin 1 and perilipin (clear and papillary subtypes) [32]. These models might lessen the amount of people who have benign lesions removed from their kidneys.

CONCLUSIONS

The frequency of benign lesions in radiologically presumed renal cell masses in our study is 16.8%. The findings of this study may assist urologist in advising patients who have small renal masses and choosing the best course of action, which may include renal biopsies and active monitoring, thereby lowering the frequency of unneeded procedures and the patient's related morbidity.

Conflicts of Interest

The authors declare no conflict of interest

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REFERENCES

[1] Siegel RL, Miller KD, Jemal A. Cancer statistics, 2018. CA: a cancer journal for clinicians. 2018 Jan; 68(1): 7-30. doi: 10.3322/caac.21442

[2] Znaor A, Lortet-Tieulent J, Laversanne M, Jemal A, Bray F. International variations and trends in renal cell carcinoma incidence and mortality. European urology. 2015 Mar; 67(3): 519-30. doi: 10.1016/j.eururo.2014.10.002

[3] Capitanio U and Montorsi F. Renal cancer. The Lancet. 2016 Feb; 387(10021): 894-906. doi: 10.1016/S0140-6736(15)00046-X

[4] Novick A, Campbell S. Renal tumors. Walsh Campbell's Urology. 2003; 8(4): 2695-6

[5] Li G, Cuilleron M, Gentil-Perret AN, Tostain J. Characteristics of image-detected solid renal masses: implication for optimal treatment. International journal of urology. 2004 Feb; 11(2): 63-7. doi: 10.1111/j.1442-2042.2004.00750.x

[6] Murphy WM. Tumors of the kidney, bladder, and related urinary structures. AFIP atlas of tumor pathology series 4. 2004: 328-30. doi: 10.55418/1881041883

[7] Remzi M, Özsoy M, Klingler HC, Susani M, Waldert M, Seitz C, *et al*. Are small renal tumors harmless? Analysis of histopathological features according to tumors 4 cm or less in diameter. The Journal of urology. 2006 Sep; 176(3): 896-9. doi: 10.1016/j.juro.2006.04.047

[8] Capitanio U and Volpe A. Renal tumor biopsy: more dogma belied. European urology. 2015 Dec; 68(6): 1014-5. doi: 10.1016/j.eururo.2015.05.007

[9] Kaushik D, Kim SP, Childs MA, Lohse CM, Costello BA, Cheville JC, *et al*. Overall survival and development of stage IV chronic kidney disease in patients undergoing partial and radical nephrectomy for benign renal tumors. European urology. 2013 Oct; 64(4): 600-6. doi: 10.1016/j.eururo.2012.12.023

[10] Murphy AM, Buck AM, Benson MC, McKiernan JM. Increasing detection rate of benign renal tumors: evaluation of factors predicting for benign tumor histologic features during past two decades. Urology. 2009 Jun; 73(6): 1293-7. doi: 10.1016/j.urology.2008.12.072

[11] Snyder ME, Bach A, Kattan MW, Raj GV, Reuter VE, Russo P. Incidence of benign lesions for clinically localized renal masses smaller than 7 cm in radiological diameter: influence of sex. The Journal of urology. 2006 Dec; 176(6): 2391-6. doi: 10.1016/j.juro.2006.08.013

[12] Jang HA, Kim JW, Byun SS, Hong SH, Kim YJ, Park YH, *et al*. Oncologic and functional outcomes after partial nephrectomy versus radical nephrectomy in T1b renal cell carcinoma: a multicenter, matched case-control study in Korean patients. Cancer Research and Treatment: Official Journal of Korean Cancer Association. 2016 Apr; 48(2): 612-20. doi: 10.4143/crt.2014.122

[13] Kutikov A, Smaldone MC, Uzzo RG. Partial versus radical nephrectomy: balancing nephrons and perioperative risk. European urology. 2013 Jan; 64(4): 607-9. doi: 10.1016/j.eururo.2013.01.020

[14] Lee SH, Park SU, Rha KH, Choi YD, Hong SJ, Yang SC, *et al*. Trends in the incidence of benign pathological lesions at partial nephrectomy for presumed renal cell carcinoma in renal masses on preoperative computed tomography imaging: a single institute experience with 290 consecutive patients. International journal of urology. 2010 Jun; 17(6): 512-6. doi: 10.1111/j.1442-2042.2010.02514.x

[15] Lane BR, Babineau D, Kattan MW, Novick AC, Gill IS, Zhou M, *et al*. A preoperative prognostic nomogram for solid enhancing renal tumors 7 cm or less amenable to partial nephrectomy. The Journal of urology. 2007 Aug; 178(2): 429-34. doi: 10.1016/j.juro.2007.03.106\

[16] Akdogan B, Gudeloglu A, Inci K, Gunay LM, Koni A, Ozen H. Prevalence and predictors of benign lesions in renal masses smaller than 7 cm presumed to be renal cell carcinoma. Clinical genitourinary cancer. 2012 Jun; 10(2): 121-5. doi: 10.1016/j.clgc.2012.01.005

[17] Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: a cancer journal for clinicians. 2018 Nov; 68(6): 394-424. doi: 10.3322/caac.21492

[18] Chow WH, Devesa SS, Warren JL, Fraumeni Jr JF. Rising incidence of renal cell cancer in the United States. Jama. 1999 May; 281(17): 1628-31. doi: 10.1001/jama.281.17.1628

[19] Hafron J, Fogarty JD, Hoenig DM, Li M, Berkenblit R, Ghavamian R. Imaging characteristics of minimal fat renal angiomyolipoma with histologic correlations. Urology. 2005 Dec; 66(6): 1155-9. doi: 10.1016/j.urology.2005.06.119

[20] Fujii Y, Komai Y, Saito K, Iimura Y, Yonese J, Kawakami S, *et al*. Incidence of benign pathologic lesions at partial nephrectomy for presumed RCC renal masses: Japanese dual-center experience with 176 consecutive patients. Urology. 2008 Sep; 72(3): 598-602. doi: 10.1016/j.urology.2008.04.054

[21] McKiernan J, Yossepowitch O, Kattan MW, Simmons

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R, Motzer RJ, Reuter VE, *et al*. Partial nephrectomy for renal cortical tumors: pathologic findings and impact on outcome. Urology. 2002 Dec; 60(6): 1003-9. doi: 10.1016/S0090-4295(02)01967-2

[22] Silver DA, Morash C, Brenner P, Campbell S, Russo P. Pathologic findings at the time of nephrectomy for renal mass. Annals of Surgical Oncology. 1997 Oct; 4: 570-4. doi: 10.1007/BF02305538

[23] Murphy AM, Buck AM, Benson MC, McKiernan JM. Increasing detection rate of benign renal tumors: evaluation of factors predicting for benign tumor histologic features during past two decades. Urology. 2009 Jun; 73(6): 1293-7. doi: 10.1016/j.urology.2008.12.072

[24] Heidenreich A and Ravery V. Preoperative imaging in renal cell cancer. World journal of urology. 2004 Oct; 22: 307-15. doi: 10.1007/s00345-004-0411-2

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Original Article

Medical and Dental Faculty's Attitude towards E-Learning as the Mode of Teaching during Covid-19 Pandemic

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ABSTRACT

The use of modern technology infrastructure is regarded as critical for the successful adoption of innovative teaching approaches. **Objective:** To determine the attitudes and concerns of medical and dental faculty about the use of E-learning as a medium of instruction during the Covid-19 outbreak. **Methods:** This cross-sectional study included 368 faculty members from Medical and Dental Colleges of Punjab province and was conducted utilizing a questionnaire developed following a thorough literature review and analysis of questionnaires from previous studies. A 5-point Likert scale was used to record knowledge, attitude, and practice, and the questionnaires were graded. SPSS version 22 was used to enter the data. The mean and SD of quantitative variables such as age and total score for knowledge, attitude, and practice score was calculated. Gender, education level, knowledge, attitude, and practice were all represented as frequency (%). **Results:** Zoom was shown to be the most commonly utilized software (69.0%). E-learning was deemed a beneficial tool in medical education by 56% of the respondents. An equal percentage of individuals (35%) agreed and disapproved the use of E-learning approaches over traditional ones. Only 30% participants resisted the change from traditional educational methods. Technological infrastructure was considered crucial for successful implementation of E-learning by 46% of the participants. **Conclusion:** Faculty members are using the available infrastructure to implement E-learning teaching modalities to the best of their knowledge and abilities.

INTRODUCTION

The bulk of the world's industries have been affected by COVID-19. The education sector has mostly shifted online. The shutdown accelerated the growth of online educational activities, assuring that education would not be hindered, particularly tertiary care medical education [1]. Many faculty members have been involved in establishing the best way to distribute online course material, engage students, and conduct evaluations [2]. The various challenges faced by the educational industry during the pandemic have increased the importance of E-learning, as it provides us with a method of ease to practice educational activities and it works remotely while maintaining the quality of the output [3]. To continue educational activities under unforeseen circumstances adoption of E-learning and shifting to E-mode of teaching is inevitable [4]. Coronavirus SARS-Cov-2 pandemic led to a major public health crisis worldwide [5]. This global outbreak not only changed day-to-day behavior but also adversely affected the education system and has compelled educationists to combine traditional learning

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with E-learning [6-8]. Clinical rotations for medical students have been halted to minimize the transmission of disease, despite the fact that passing on clinical skills to students is mandatory [9]. E-learning is acquisition and application of knowledge by electronic means, which connects teachers and students from a distance [10]. It is easy and fast transfer of knowledge through audio and video resources that reduces use of paper, travel time and cost and has proved to be a safer method during the need to quarantine at home owing to pandemic scenario [9]. Lack of human interaction to transfer clinical skills, unavailability of reliable internet source and lack of technologically proficient academic staff are the upcoming challenges, which need to be addressed [7]. Today's students are always connected to the internet, unlike prior generations, the transition to E-learning is putting additional demand on already overworked faculty [11]. Educators on the other hand are relatively not well aware of full use of digital technologies [12]. It is the need of the hour for the educators to have sound knowledge, acquire digital skills and develop acceptance to the use of digital resources [13]. Traditional teaching methods need to be replaced with more innovative and attractive methods to address the changing nature of learners, and this can only be achieved by employing suitable strategies to engage and keep students more attentive during lectures. A disparity exists between medical faculty's perceptions and the actual use of E-learning materials. This disparity was linked to a lack of required specialized content, awareness of resources, and competence to integrate the available resources [14]. Since integration of E-learning in medical education has become imperative, formal training and workshops for teachers are mandatory for transition from traditional to E-learning [15]. This study looked at faculty attitudes and concerns about using E-learning as a method of instruction during the Covid-19 pandemic.

METHODS

This cross-sectional survey was carried out in the medical and dental colleges recognized by Pakistan Medical Commission (PMC) using a questionnaire constructed after comprehensive literature review and assessing questionnaires of different studies [4, 6]. The institution's ethical review board approved the study (Case #. 580/ERC/CMH/LMC). After conducting a pilot study, the reliability of the questionnaire was assessed using Cronbach's alpha, which yielded a result of 0.818. The survey questions were in English language, and it was kept completely confidential. It was divided into two parts. The first part (Section I) collected data on demographics, while the second part (Section II) collected data on knowledge, attitude, and practices towards e-learning. All questions were closed ended. Section two responses were recorded on a Likert scale ranging from 1 to 5, or from strongly disagree to strongly agree. The questionnaire was uploaded at www.surveys.google.com and was circulated through e-mail, WhatsApp and shared on social media platforms with teaching faculty fulfilling the inclusion criteria. All faculty members, demonstrators and above of PMC recognized medical and dental colleges who were 25 years old and above and were using E-learning teaching methods were included in the study. However, those faculty members not using E-learning teaching methods were excluded from the study. Convenient sampling technique was used, The WHO sample size calculator was used for calculating sample size keeping 95% confidence level, 0.05 as absolute precision and 0.65 as anticipated proportion (proportion of the faculty with positive opinion towards e-learning). Electronic consent was taken from the participants and the responses received were 368. The data was entered using SPSS version 22.0. Each participant received a score ranging from 1 to 5 for each question because the responses were on a 5-point Likert scale. The points from each section were added together to produce a total score. The total scores were categorized into poor (score 5-10), fair (score 11-17) and good (score 18-25). Quantitative variables like age, and total score for knowledge, attitude and practice were calculated as mean ± SD. Qualitative variables like gender, education level, knowledge, attitude, and practice were presented as frequency (%). Cronbach's alpha was recalculated to assess the questionnaire's reliability.

RESULTS

Among the 368 participants, aged between 26->55 years, 192 were males and 176 were females, having a ratio of 1:1.1. Zoom was reported (69.0%) as the most used software, while Google meet (7.1%) was reported as the least preferred one (Table 1).

Variables	N=368	F (%)
Age (years)	26-35	142 (38.6%)
	36-45	106 (28.8%)
	46-55	82 (22.3%)
	>55	38 (10.3%)
Gender	Male	192 (52.2%)
	Female	176 (47.8%)
Education level	Graduation	84 (22.8%)
	Post-Graduation	216 (58.7%)
	PhD	68 (18.5%)
Experience in teaching (years)	<5	118 (32.1%)
	6-10	106 (28.8%)
	11-15	98 (26.6%)
	>15	46 (12.5%)

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Academic designation	Demonstrator	90 (24.5%)
	Senior Registrar / Lecturer	62 (16.8%)
	Assistant Professor	100 (27.2%)
	Associate Professor	66 (17.9%)
	Professor	50 (13.6%)
Type of digital software in use	Google Classroom	62 (16.8%)
	Google Meet	26 (7.1%)
	Learning Management System & Zoom	26 (7.1%)
	Zoom	254 (69.0%)

Table 1: Participants' basic characteristics

Current study reported 56% participants considered E-learning teaching modalities beneficial, 43% of the participants didn't feel any anxiousness while delivering lectures online (Table 2).

Knowledge	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
I have attended workshops/lectures on e-learning methods	9.2%	39.1%	10.9%	36.4%	4.3%
I have sound knowledge to utilize available infrastructure for teaching purpose	4,3%	29.9%	23.9%	36.4%	5.4%
I have good command over synchronous/asynchronous methods of E-learning	4.3%	39.1%	23.4%	28.8%	4.3%
I have adequate knowledge/skills on how to engage participant during online lectures/discussions	2.7%	32.1%	26.6%	34.8%	3.8%
I am familiar with student performance evaluation methods based on E-learning	3.8%	37%	22.3%	32.1%	4.9%
Attitude					
E learning modalities are useful tools in medical education	1.6%	5.4%	12%	56%	25%
I prefer using e-learning techniques over conventional method for teaching	4.3%	35.3%	18.5%	35.3%	6.5%
I do not resist to change from traditional educational method to more technology based	2.7%	29.9%	17.9%	40.2%	9.2%
E learning is less time demanding than traditional education process	16.8%	30.4%	14.1%	29.9%	8.7%
Technological infrastructure is crucial for successful implementation	0.5%	2.7%	8.7%	46.2%	41.8%
Practice					
I have access to sufficient infrastructure to adopt e-learning	3.3%	16.3%	19%	56%	5.4%
I can easily prepare and deliver the online lecture in given	0.5%	12%	27.7%	51.1%	8.7%
I always make my lecture content concise and easy to grasp	0.5%	10.3%	25%	54.3%	9.8%
I frequently use images and videos to grab the attention of students	0	4.9%	11.4%	62.5%	21.2%
I don't feel computer anxiety while delivering online lectures	3.8%	20.7%	17.4%	43.5%	14.7%
E learning results makes students evaluation easier	3.8%	32.6%	21.2%	36.4%	6%
In your opinion does E-learning results in improvement in study	9.8%	27.7%	22.8%	32.6%	7.1%

Table 2: Response from participants

The mean knowledge, attitude and practice scores were observed as 14.88 ± 4.41, 17.34 ± 3.28 and 24.14 ± 3.51 respectively (Table 3).

Parameter	Knowledge	Attitude	Practice
Mean score	14.88 ± 4.41	17.34 ± 3.28	24.14 ± 3.51
Good	128 (34.8%)	176 (47.8%)	356 (96.7%)
Fair	160 (43.5%)	188 (51.1%)	12 (3.3%)
Poor	80 (21.7%)	4 (1.1%)	0 (0.0%)

Table 3: Knowledge, attitude and practice score of participants

As the Cronbach's alpha is >0.70, therefore the questionnaire was acceptable and reliable to collect required information (Table 4).

Characteristic	Value
N of items	17
Cronbach's Alpha	0.774
Cronbach's Alpha if item deleted (1) E learning is less time demanding than traditional education and (2) In your opinion does E-learning results in improvement in study	0.785

Table 4: Reliability of questionnaire

DISCUSSION

The COVID crisis has made new technologies acceptable even to previously resistant institutions. The medical education sector has had a difficult time dealing with the current scenario [16]. E-learning increases the possibility of student-teacher involvement and has the ability to maximize resource utilization with few faculty members [17]. Visiting faculty members who are stuck in far off areas can even continue to impart valuable knowledge through online classes and demonstrations. E-learning programs can meet the complex demands of the modern world [18]. The current study found that the average knowledge score attained by faculty was 14.88 4.41, thus out of all participants, good knowledge was observed in 128 (34.8%) participants, while 80 (21.7%) participants had poor knowledge about E-learning. Similarly, the mean attitude

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score was 17.34 ± 3.28, good attitude was observed in 176 (47.8%) participants while 4 (1.1%) participants had poor attitude towards E-learning. In our investigation, the average practice score was found to be 24.14 ± 3.51, and 356 (96.7%) participants started using E-earning methods and continue to use. The overall reliability of the questionnaire used in our research was re-calculated and was 0.774. This showed that as the Cronbach's alpha is >0.70, therefore the questionnaire was acceptable and reliable to collect required information [19]. However, it is recommended that more such studies should be conducted for comparison and further evaluation of questionnaire reliability. A Korean study by Kim *et al.*, discovered a difference between medical faculty's perception and the actual use of online learning materials in teaching. This gap was attributed to lack of required specific content, lack of awareness of about resources and the lack of ability to utilize the available resources. These findings are more or less consistent with the findings of current study as we can observe that knowledge of faculty needs to improve regarding synchronous and asynchronous methods of E-learning and methods of evaluation and performance assessment. The need for institutional support and faculty awareness strategies were recommended to bridge the gap [15]. The resources are there but the need is to create awareness and help the faculty to gain good command over utilizing those resources. In another study, the need for formal training and arranging workshops for faculty was highlighted to make the transition from traditional learning to blended approach and E-learning smooth, since integration of E-learning in medical education has become imperative. It has been shown that the majority of participants (56.1%) strongly agreed that the technical abilities required to conduct online courses boost the educational value of faculty and staff members' experience [20]. Our study results also back up the findings of prior studies by Bhardwaj and Jamlan [9, 21]. Most of the current study respondents (30.4%) disagreed that E-learning is less demanding than traditional education methods, which is consistent with previous research findings that faculty members believed E-learning can take time, lead to student monitoring difficulties, and reduce interest in direct traditional teaching [9]. In the current study 43.5% participants reported that they didn't feel any anxiousness while delivering online lectures, similar results were reported in another study [18]. However, a prior study discovered that teachers felt nervous when using online methods to take lessons [22]. According to Frehywot *et al.*, and Dhawan research, the use of E-learning can reduce education costs while increasing learning possibilities for students in low and middle-income nations [23, 24]. The World Health Organization actually exhorts poor and medium-income nations to use E-learning as a method for closing knowledge and capacity gaps among health workers [25]. Co et al. reported that distance learning pedagogy has the potential to enhance learner motivation and performance in a comprehensive review. Simple E-learning tools can be used to teach medical students difficult skills like surgery [26]. In light of this, E-learning has the potential to enhance student learning outcomes and experiences, particularly in low-and-middle income countries [27].

CONCLUSIONS

This study found that the participants used E-learning teaching modalities to the best of their abilities within the provided infrastructure. They are comfortable with the current mode of teaching and do not resist the change from traditional educational methods. However, they do consider it demanding as technically sound infrastructure is necessary for its uninterrupted use.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Mukhtar K, Javed K, Arooj M, Sethi A. Advantages, Limitations and Recommendations for online learning during COVID-19 pandemic era. Pakistan Journal of Medical Sciences. 2020 May; 36(COVID19-S4): S27-31. doi: 10.12669/pjms.36.COVID19-S4.2785

[2] Radha R, Mahalakshmi K, Kumar VS, Saravanakumar A. E-Learning during lockdown of Covid-19 pandemic: A global perspective. International Journal of Control and Automation. 2020 Jun; 13(4): 1088-99.

[3] Kaur N, Dwivedi D, Arora J, Gandhi A. Study of the effectiveness of e-learning to conventional teaching in medical undergraduates amid COVID-19 pandemic. National Journal of Physiology, Pharmacy and Pharmacology. 2020 Jun; 10(7): 563-7. doi: 10.5455/njppp.2020.10.04096202028042020

[4] Paules CI, Marston HD, Fauci AS. Coronavirus infections—more than just the common cold. Jama. 2020 Feb; 323(8):707-8. doi: 10.1001/jama.2020.0757

[5] Sohrabi C, Alsafi Z, O'neill N, Khan M, Kerwan A, Al-Jabir A, *et al.* World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). International Journal of Surgery. 2020 Apr; 76: 71-6. doi: 10.1016/j.ijsu.2020.02.034

DOI: https://doi.org/10.54393/pjhs.v4i02.533

[6] Haleem A, Javaid M, Vaishya R. Effects of COVID-19 pandemic in daily life. Current Medicine Research and Practice. 2020 Mar; 10(2): 78–9. doi: 10.1016/j.cmrp.2020.03.011

[7] Abuhashesh M. E-Learning Adoption among Academic Staff during COVID-19 Pandemic Outbreak: The KAP Model. E-Learning. 2020 Jul; 29(03): 12260-72.

[8] O'Doherty D, Dromey M, Lougheed J, Hannigan A, Last J, McGrath D. Barriers and solutions to online learning in medical education–an integrative review. BMC Medical Education. 2018 Dec; 18(1): 1. doi: 10.1186/s12909-018-1240-0

[9] Bhardwaj A, Nagandla K, Swe KM, Abas AB. Academic Staff Perspectives Towards Adoption of E-learning at Melaka Manipal Medical College: Has E-learning Redefined our Teaching Model. Kathmandu University Medical Journal. 2015 Oct; 13(1): 12-8. doi: 10.3126/kumj.v13i1.13746

[10] Akers A, Blough C, Iyer MS. COVID-19 Implications on Clinical Clerkships and the Residency Application Process for Medical Students. Cureus. 2020 Apr; 12(4): e7800–e. doi: 10.7759/cureus.7800

[11] Kalolo JF. Digital revolution and its impact on education systems in developing countries. Education and Information Technologies. 2019 Jan; 24(1): 345-58. doi: 10.1007/s10639-018-9778-3

[12] Olofsson AD, Fransson G, Lindberg JO. A study of the use of digital technology and its conditions with a view to understanding what 'adequate digital competence'may mean in a national policy initiative. Educational Studies. 2020 Nov; 46(6): 727-43. doi: 10.1080/03055698.2019.1651694

[13] Han ER, Yeo S, Kim MJ, Lee YH, Park KH, Roh H. Medical education trends for future physicians in the era of advanced technology and artificial intelligence: an integrative review. BMC Medical Education. 2019 Dec; 19(1): 460. doi: 10.1186/s12909-019-1891-5

[14] Al-alak BA and Alnawas IA. Measuring the acceptance and adoption of e-learning by academic staff. Knowledge Management & E-Learning: An International Journal. 2011; 3(2): 201-21. doi: 10.34105/j.kmel.2011.03.016

[15] Kim KJ, Kang Y, Kim G. The gap between medical faculty's perceptions and use of e-learning resources. Medical Education Online. 2017 Jan; 22(1): 1338504. doi: 10.1080/10872981.2017.1338504

[16] Alodan H. E-Learning transformation during the covid-19 pandemic among faculty members at princess nourah bint abdul rahman university. Utopía y Praxis Latinoamericana. 2021 Feb; 26(2): 286-304.

[17] Zehry K, Halder N, Theodosiou L. E-Learning in medical education in the United Kingdom. Procedia-Social and Behavioral Sciences. 2011; 15: 3163-7. doi: 10.1016/j.sbspro.2011.04.265

[18] Kamal Z, Jamil AZ, Waseem M, Iqbal MJ, Aziz N, Afzal HS. Advances in medical education; perceptions of faculty and students towards e-learning vs. traditional learning in a public sector medical college in Pakistan. Professional Medical Journal. 2021 May;28(5): 619-24. doi: 10.29309/TPMJ/2021.28.05.5396

[19] Barbera J, Naibert N, Komperda R, Pentecost TC. Clarity on Cronbach's alpha use. Journal of Chemical Education. 2020 Dec; 98(2): 257-8. doi: 10.1021/acs.jchemed.0c00183

[20] Zalat MM, Hamed MS, Bolbol SA. The experiences, challenges, and acceptance of e-learning as a tool for teaching during the COVID-19 pandemic among university medical staff. PLoS One. 2021 Mar; 16(3): e0248758. doi: 10.1371/journal.pone.0248758

[21] Jamlan M. Faculty opinions towards introducing e-learning at the University of Bahrain.International Review of Research in Open and Distributed Learning. 2004;5(2):1-14. doi: 10.19173/irrodl.v5i2.185

[22] Salari M, Yaghmayee F, Mehdizade S, Vafadar ZO, Afzali M. Factors related to accept of" e-learning" in nursing students. Education Strategies in Medical Sciences. 2009 Oct; 2(3): 103-8.

[23] Frehywot S, Vovides Y, Talib Z, Mikhail N, Ross H, Wohltjen H, *et al.* E-learning in medical education in resource constrained low-and middle-income countries. Human resources for health. 2013 Dec; 11(1): 1-15. doi: 10.1186/1478-4491-11-4

[24] Dhawan S. Online learning: A panacea in the time of COVID-19 crisis. Journal of Educational Technology Systems. 2020 Sep; 49(1): 5-22. doi: 10.1177/0047239520934018

[25] Al Shorbaji N, Atun R, Car J, Majeed A, Wheeler EL, Beck D, *et al.* eLearning for undergraduate health professional education: a systematic review informing a radical transformation of health workforce development Geneva: World Health Organization.2015Jan.Availableat:http://www.who.int/entity/hrh/documents/14126-eLearning Report.pdf?ua=1

[26] Co M, Cheung KY, Cheung WS, Fok HM, Fong KH, Kwok OY, *et al.* Distance education for anatomy and surgical training–A systematic review. The Surgeon. 2022 Oct; 20(5): e195-205. doi: 10.1016/j.surge.2021.08.001

[27] Co M, Chung PH, Chu KM. Online teaching of basic surgical skills to medical students during the COVID-19 pandemic: a case–control study. Surgery Today. 2021 Aug; 51: 1404-9. doi: 10.1007/s00595-021-02229-1

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Original Article

Effectiveness of Intravenous Magnesium Sulfate in Children Presenting to the Emergency Department with Acute Exacerbation of Asthma

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ABSTRACT

Asthma is a serious medical condition in the pediatric age group and can have a high mortality, therefore it should be managed effectively. Patients not responding adequately to first line therapy need additional treatment. A few research studies have evaluated the use of intravenous magnesium sulfate in improving respiratory scores in severe acute pediatric asthma but the results have been conflicting. **Objectives**: To determine the benefit of intravenous magnesium sulfate in treating children presenting with worsening of asthma symptoms. **Methods:** A cross-sectional prospective study carried out at the Pediatrics Unit of Zia Uddin University Hospital, Karachi from 1st March 2021 to 1st March 2022. On the whole, 280 children in the age group 2-12 years with acute worsening of asthma of were selected by non-probability purposive sampling technique, however, children in need of invasive ventilation and those having asthma related complications on radiological investigations were omitted. Chi-square was applied for categorical variables and a p-value <0.05 was considered statistically significant. **Results:** Out of 280 patients who came to the Pediatric Emergency Department with acute severe asthma, 236 (84.3%) patients responded to a single dose of intravenous magnesium sulfate manifested by an improvement in clinical asthma score, while 44 patients (15.7%) did not show improvement. The admission rate to the pediatric intensive care unit was only 12.8%. **Conclusion:** Magnesium sulfate infusion helps improve respiratory symptoms in acute worsening of pediatric asthma.

INTRODUCTION

Asthma is a common pediatric illness but if not treated effectively, it can have serious consequences requiring urgent treatment in the emergency setting. In the past two decades, the prevalence of pediatric asthma escalated from 5% to about 20% in Pakistani population [1]. Systemic administration of magnesium sulfate has been advocated by many clinical protocols for treatment of severe asthma not showing improvement to standard therapy. Magnesium sulfate possesses bronchodilator and anti-inflammatory characteristics, and is a beneficial adjunct therapy in children unresponsive to usual medication in acute asthma exacerbation [2]. However, its role in children in acute exacerbation of asthma is yet to be clearly established [3].

First-line therapy in acute severe asthma comprises oxygen inhalation, bronchodilator nebulization (β-2 agonists and anticholinergics), and administration of intravenous steroid therapy [4]. Failure to respond to these warrants the use of alternative agents such as magnesium sulfate (I/V MgSO4) infusion [5]. Very recently, an enormous increase in the number of pediatric asthma cases in Pakistan has been reported and the load on the already over -burdened emergency departments (ED) across the country is surging . Therefore, it is important to conduct randomized controlled trials to elucidate the role of magnesium sulfate as a treatment for improving the management of severe asthma and prevent undue hospital

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admissions [6]. A latest report by a Registry involving pediatric emergency highlighted the fact that a mere 10% of severely asthmatic were treated with intravenous magnesium sulfate [7]. Another current research data emphasized that intravenous magnesium was being administered in barely 36% of pediatric asthma admissions [8] and a link between the use of magnesium sulfate infusion in the ED and decreased hospital admission rates was not observed. However, evidence regarding the effectiveness of magnesium sulfate infusion in pediatric severe acute asthma is restricted [7]. Nebulized magnesium sulfate in pediatric asthma with worsening symptoms has not found to be beneficial, however it has been observed that systemic administration lessens the requirement for severe pediatric asthma cases to be admitted .Furthermore, it is inexpensive, has a good safety profile [9] and severe adverse effects such as respiratory failure and decreased blood pressure attributed to its use in children are infrequent [10]. The dearth of pediatric studies on the systemic use of magnesium sulfate in children are attributed to inconvenience of conducting spirometry to assess the working of lungs as well as their hesitancy to be exposed to this procedure. Therefore, research in this age group focusses on the estimation of betterment in clinical scores, employment of assisted ventilation and the duration of hospital visit [11]. However, results of previous published trials indicate conflicting and unequivocal affirmation of advantage .The British Thoracic Society protocols (2014) declare that utilization of magnesium infusion in acute worsening of pediatric asthma cannot be advocated owing to lack of substantial evidence [5]. This study was therefore undertaken, to determine if intravenous magnesium sulfate could improve clinical symptoms in children with acute worsening of asthma as evidenced by improvement in clinical asthma scores (CAS), and thus reduce the need for invasive ventilation by maximizing medical management.

METHODS

A prospective cross-sectional study was done at Ziauddin University hospital Karachi from 1st March 2021 till 1st March 2022 after approval from Ethical Review committee (Reference code: 2901220SHPED). The sample size was calculated using WHO sample size calculator considering the prevalence of children having successful treatment with magnesium sulphate P=97% with confidence level= 95% and margin of error =2%, the total sample size came out to be 280 patients. Patients in the age group 2-12 years visiting the pediatric Emergency Department of Ziauddin Hospital with acute severe asthma and unresponsive to first line therapy as per standard asthma management protocols were included in the study. A non-probability purposive sampling technique was used. Informed consent from parents or guardians was taken after explaining the advantages and disadvantages of the study. Children requiring immediate intubation, those with asthma related complications on chest X-ray and for whom there was a refusal to consent by parents/caregivers were excluded. The severity of asthma was assessed by the Clinical Asthma Score (CAS) wherein the assessment criteria consists of rate of breathing, wheezing, retractions, dyspnea, and inspiration to expiration (I: E) ratio (minimum 0, maximum 10 points) [12]. All subjects received initial treatment in line with the standard treatment protocols Those patients who failed to respond to the initial treatment were thereafter administered intravenous infusion of magnesium sulphate (50% solution of 50 mg/kg in 30 ml 0.18% saline in D5W) over 20 minutes and a change in the CAS score was recorded at the end of 1 hour and then 2 hours after treatment and compared with the initial score. Data was collected on a pre-designed proforma. A good response to magnesium sulphate infusion was considered if there was an improvement in clinical asthma severity score (CAS) of ≥4 points in 1 hour after starting infusion. Poor response to treatment was considered as no improvement in CAS score after the first hour. SPSS version 20.0 was used to carry out statistical analysis and the results were expressed as frequencies and percentages for qualitative data and mean and standard deviation for quantitative analysis. Categorical variables were analyzed by chi-square and p-value was taken as statistically significant if <0.05.

RESULTS

The study population comprised 280 cases ,151 (53.9%) males and 129 (46.1%) females . Frequency distribution according to age revealed 88 patients (31.4%) to be in the age group 1-6 years and 192 patients (68.6%) to be 7-12 years of age respectively . Mean age, respiratory rate, oxygen saturation, Body mass index , height, weight, systolic blood pressure, diastolic blood pressure , Clinical asthma score (CAS) at baseline, 1 hour and 2 hours in our study was 8.79 ± 4.52 years, 34.72±10.19 breath/min, 82.56±10.63%, 15.7±3.1 kg/m2, 116.7±10.5 cm, 21.9±8.6 kg, 100.4±10.4 mmHg, 62.1±8.7 mmHg, 9.5±2.78, 7.4±2.65 and 4.1±1.21 respectively as shown in Table 1.

Variable	Mean ± SD	Min-Max
Age (years)	8.79±4.52	2-12
Respiratory rate (breaths/min)	34.72±10.19	20-38
Oxygen saturation %	82.5±10.63	69-91
BMI (kg/m2)	15.7±3.1	8.8-17.4
Height (cm)	116.7±10.5	90-125
Weight (kg)	21.9±8.6	17-23
SBP (mm/hg)	100.4±10.4	95-105
DBP (mm/hg)	62.1±8.7	55-70

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CAS score at baseline	9.5±2.78	8-10
CAS score After 1 hour of I/V MgSO4	7.4±2.65	4-8
CAS score After 2 hours of I/V MgSO4	4.1±1.21	1-6

Table 1: Clinical characteristics of the study population (n=280)

It was observed that 236 (84.3%) patients in the study population responded to a single dose of intravenous magnesium sulfate, while 44 patients (15.7%) did not show improvement . The response to treatment was reflected in the improvement of their Clinical asthma score (Table1) . Response with respect to age distribution is shown in Table 2. It was observed that a total of 236 patients responded to treatment and out of these 78 (33.1%) were in the age group 1-6 years while 158 (66.9%) patients were between 7-12 years of age .However ,out of the 44 patients who failed to respond to treatment 10 (22.7%) were in age group 1-6 years and 34 (77.3%) patients were 7-12 years old (p-value 0.11).

Age	Response To I/V Magnesium Sulphate		Total
	Yes	No	
1-6 Years	78 (33.1%)	10 (22.7%)	88 (31.4%)
7-12 Years	158 (66.9%)	34 (77.3%)	192 (68.6%)
Total	236 (100%)	44 (100%)	280 (100%)
P-Value	0.11		

Table 2: Response to treatment according to age (n=280)

Gender distribution with respect to response to treatment with intravenous magnesium sulphate showed that out of a total of 151 male patients ,129 (85.4%) responded to treatment while 22 (14.6%) did not .Whereas, out of a total of 129 females , 107 (82.9%) showed improvement while in 22(17.1%) no response to treatment was observed(p-value 0.34) (Table 3).

Gender	Response To I/V Magnesium Sulphate		Total
	Yes	No	
Male	129 (85.4%)	22 (14.6%)	151 (100 %)
Female	107 (82.9%)	22 (17.1%)	129 (100%)
Total	236 (84.3%)	44 (15.7%)	280 (100%)
P-value	0.34		

Table 3: Response to treatment according to gender (n=280)

Stratification for family history of asthma with respect to response to treatment revealed that a total of 124 patients had a positive family history of asthma and out of these 108 (87.1%) patients showed a clinical response while 16 (12.9%) did not respond (p-value was 0.16)(Table 4). Only 36 (12.8%) patients out of a total of 280 patients who presented with acute asthma in the ED needed admission in the pediatric intensive care unit and 4 (11.1%) out of these admitted patients required mechanical ventilation .Side effects of treatment were minor with flushing and drowsiness observed in only 8 children (2.85%).The average duration of hospital stay was 6.5 ± 1.2 days .

Family history of asthma	Response To I/V Magnesium Sulphate		Total
	Yes	No	
Yes	108 (87.1%)	16 (12.9%)	124 (100%)
No	128 (82.1%)	28 (17.9%)	156 (100%)
Total	236 (84.1%)	44 (15.7%)	280 (100%)
P-value	0.16		

Table 4: Distribution according to response to treatment and family history of asthma(n=280)

DISCUSSION

A stepwise approach is recommended for management of acute severe asthma, initially first-line standard therapy is used followed by additional therapeutic options. Review of literature reveals that a number of studies have been conducted in the adult population regarding the efficacy of magnesium sulfate infusion [13, 14]. Although most studies reporting the potential clinical use of MgSO4 treatment in acute pediatric asthma have observed a beneficial effect, its precise role has still not been fully determined [15, 16]. In this regard, effectiveness of magnesium sulfate infusion in children was evaluated by a meta-analysis that analyzed 5 trials and reported favorable effects with its use when added to β2-agonists and systemic steroid therapy. The results revealed magnesium sulfate infusion to be efficacious in reducing hospital admission rates and when used as an add on treatment to conventional therapy it produced 85% reduction in symptoms [17]. These findings are similar to our study wherein we observed that 82% of the children in the age group 2-12 years presenting to the Emergency Department had an improvement is Clinical Asthma Score following the administration of a single dose of intravenous magnesium sulfate .In a similar study by Özdemir *et al* , systemic use of magnesium sulfate was efficacious in improving spirometry values in children aged 6-17 years with acute worsening of asthma symptoms [18]. Furthermore , a systematic review carried out by Mathew *et al* to assess the effectiveness of intravenous and nebulized magnesium sulfate for acute worsening of pediatric asthma, concluded that injectable magnesium sulfate therapy produced considerable improvement in clinical signs and symptoms and led to a twofold decline in admission rate [19]. In our study we noted that after administration of a single dose of intravenous magnesium sulfate only 36(12.8%) patients needed admission while invasive ventilation was needed in a mere 4 patients. Similar observations were reported in a study by Ciarallo *et al*, wherein more pediatric patients with acute exacerbation of asthma who received intravenous magnesium sulfate in ED went home [20]. Griffith *et al* evaluated the effectiveness of intravenous magnesium sulfate in children with acute symptoms of asthma and observed minimal side-effects with a substantial fall in admission rates by 68% [4]. These findings are also

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supported by our study results . Moreover , Singhi *et al*. compared the efficacy of IV MgSO4 with other systemic treatments such as aminophylline and terbutaline for asthma symptoms unresponsive to standard initial treatment [21].They concluded that using IV MgSO4 as an additional therapy to inhaled bronchodilator therapy was extremely useful and safe as compared to other injectable treatments .Our study findings are in concert with these findings and also those of Tassalapa *et al*. wherein in their study they observed that both intravenous as well as nebulized MgSO4 are effective and harmless in severe pediatric asthma [10]. On the other hand, Alansari *et al* evaluated the usefulness of this treatment in bronchiolitis and reported no particular benefit [22]. We however , observed a clear improvement in clinical asthma scores of our study population after one hour and more so after 2 hours of using intravenous magnesium sulfate.

CONCLUSIONS

Based on the study results acute worsening of pediatric asthma can be effectively treated by intravenous magnesium sulfate when combined with conventional treatment.

Conflicts of Interest

The authors declare no conflict of interest

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REFERENCES

[1] Saeed MS, Shahid A, Jawed S, Akram M, Qureshi IH. Intravenous magnesium sulphate: An effective therapy for acute severe attack of bronchial asthma. Annals of King Edward Medical University. 2018 Apr; 24(1): 598-604. doi: 10.21649/akemu.v24i1.2364

[2] Tesse R, Borrelli G, Mongelli G, Mastrorilli V, Cardinale F. Treating pediatric asthma according guidelines. Frontiers in pediatrics. 2018 Aug; 6. doi: 10.3389/fped.2018.00234

[3] Song WJ and Chang YS. Magnesium sulfate for acute asthma in adults: a systematic literature review. Asia Pacific Allergy. 2012 Jan; 2(1): 76-85. doi: 10.5415/apallergy.2012.2.1.76

[4] Griffiths B and Kew KM. Intravenous magnesium sulfate for treating children with acute asthma in the emergency department. Cochrane Database of Systematic Reviews. 2016(4). doi: 10.1002/14651858.CD011050.pub2

[5] British Thoracic Society Scottish Intercollegiate Guidelines Network. British guideline on the management of asthma. Thorax. 2014 Nov; 69(1): 1-92.

[6] Zaheer A, Hayat H, Hussain F, Gohar R, Ali AS. Comparison of the effects of intravenous magnesium sulphate versus intravenous aminophylline in acute attack of asthma in Pediatric Emergency Department, Lahore General Hospital, Lahore. Pakistan Postgraduate Medical Journal. 2019; 30(03): 120-4. doi: 10.51642/ppmj.v30i03.318

[7] Davies SJ, Grundmeier RW, Campos DA, Hayes KL, Bell J, Alessandrini EA, *et al*. The pediatric emergency care applied research network registry: a multicenter electronic health record registry of pediatric emergency care. Applied clinical informatics. 2018 Apr; 9(02): 366-76. doi: 10.1055/s-0038-1651496

[8] Johnson MD, Zorc JJ, Nelson DS, Casper TC, Cook LJ, Finkelstein Y, *et al*. Intravenous magnesium in asthma pharmacotherapy: variability in use in the PECARN registry. The Journal of Pediatrics. 2020 May; 220: 165-74. doi: 10.1016/j.jpeds.2020.01.062

[9] Kelly HW. Magnesium sulfate for severe acute asthma in children. The Journal of Pediatric Pharmacology and Therapeutics. 2003 Jan; 8(1): 40-5. doi: 10.5863/1551-6776-8.1.40

[10] Daengsuwan T and Watanatham S. A comparative pilot study of the efficacy and safety of nebulized magnesium sulfate and intravenous magnesium sulfate in children with severe acute asthma. Asian Pacific Journal of Allergy and Immunology. 2017 Jun; 35(2): 108-12.

[11] 11. Irazuzta JE and Chiriboga N. Magnesium sulfate infusion for acute asthma in the emergency department☆. Jornal de pediatria. 2017; 93: 19-25. doi: 10.1016/j.jped.2017.06.002

[12] Liu LL, Gallaher MM, Davis RL, Rutter CM, Lewis TC, Marcuse EK. Use of a respiratory clinical score among different providers. Pediatric pulmonology. 2004 Mar; 37(3): 243-8. doi: 10.1002/ppul.10425

[13] Rower JE, Liu X, Yu T, Mundorff M, Sherwin CM, Johnson MD. Clinical pharmacokinetics of magnesium sulfate in the treatment of children with severe acute asthma. European journal of clinical pharmacology. 2017 Mar; 73: 325-31. doi: 10.1007/s00228-016-2165-3

[14] Serebrisky D, Wiznia A. Pediatric asthma: a global epidemic. Annals of global Health. 2019; 85(1): 1-6. doi: 10.5334/aogh.2416

[15] Kanchongkittiphon W, Gaffin JM, Kopel L, Petty CR, Bollinger ME, Miller RL, *et al*. Association of FEF25%-75% and bronchodilator reversibility with asthma control and asthma morbidity in inner-city children with asthma. Annals of Allergy, Asthma & Immunology. 2016 Jul 1; 117(1): 97-9. doi:

DOI: https://doi.org/10.54393/pjhs.v4i02.552

10.1016/j.anai.2016.04.029

[16] Hirashima J, Yamana H, Matsui H, Fushimi K, Yasunaga H. Effect of intravenous magnesium sulfate on mortality in patients with severe acute asthma. Respirology. 2016 May; 21(4): 668-73. doi: 10.1111/resp.12733

[17] Shan Z, Rong Y, Yang W, Wang D, Yao P, Xie J, *et al*. Intravenous and nebulized magnesium sulfate for treating acute asthma in adults and children: a systematic review and meta-analysis. Respiratory medicine. 2013 Mar; 107(3): 321-30. doi: 10.1016/j.rmed.2012.12.001

[18] Mathew JL and Walia M. Systematic review on efficacy of magnesium (intravenous or nebulized) for acute asthma episodes in children. Indian pediatrics. 2017 Feb; 54: 133-7. doi: 10.1007/s13312-017-1016-3

[19] Özdemir A and Doğruel D. Efficacy of magnesium sulfate treatment in children with acute asthma. Medical Principles and Practice. 2020; 29(3): 292-8. doi: 10.1159/000506595

[20] Ciarallo L, Brousseau D, Reinert S. Higher-dose intravenous magnesium therapy for children with moderate to severe acute asthma. Archives of pediatrics & adolescent medicine. 2000 Oct; 154(10): 979-83. doi: 10.1001/archpedi.154.10.979

[21] Singhi S, Grover S, Bansal A, Chopra K. Randomised comparison of intravenous magnesium sulphate, terbutaline and aminophylline for children with acute severe asthma. Acta Paediatrica. 2014 Dec; 103(12): 1301-6. doi: 10.1111/apa.12780

[22] Alansari K, Ahmed W, Davidson BL, Alamri M, Zakaria I, Alrifaai M. Nebulized magnesium for moderate and severe pediatric asthma: a randomized trial. Pediatric Pulmonology. 2015 Dec; 50(12): 1191-9. doi: 10.1002/ppul.23158

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Original Article

Frequency of Ventricular Tachycardia in First 48 Hours of ST-Elevation Myocardial Infarction

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ABSTRACT

ST-elevation myocardial infarction (STEMI) has a poor long-term prognosis associated with early ventricular tachycardia (VT). **Objective**: To find out the frequency of ventricular tachycardia in the first 48 hours of ST-elevation myocardial infarction. **Methods:** After approval from the Hospital ethical committee, the study was conducted in the department of cardiology Hayatabad medical complex Peshawar from 1st October 2020 to 31st March 2021. All the patients having new onset ST-elevation Myocardial infarction as per Operational definition, both genders, aged between 40 and 75 years and who have given consent were included in the study. Non-probability consecutive sampling technique is being used for the sampling. **Results:** Standard deviation was ±1.357 years, while the average age was 51.56. Gender-wise distribution among patients male was 89(53.6%) and female was 77(46.4%). Distribution of duration of disease among patients 12-24 hours 80(48.2%) and more than 24 hours 86(51.8%) was 100(52.4%). Family History of coronary artery disease (CAD) 84(50.6%), diabetes mellitus 93(56.0%), hypertension 110(66.3%) and smoking status was 118(71.1%). Distribution of ventricular tachycardia was present among 103(62.0%) patients and was absent in 63(38.0%) patients. **Conclusions:** Ventricular tachycardia is the most common tachycardia occurring in patients in the first 48 hours who sustained myocardial infarction. It was shown that bradyarrhythmia was more common in patients with inferior wall myocardial infarction while ventricular tachycardia was found to be more in patients with anterior wall myocardial infarction.

INTRODUCTION

Necrosis of myocardial tissue owing to severe prolonged ischemia from coronary artery blockage and blood flow compromise defines acute myocardial infarction (AMI) [1, 2]. While mortality from this cause has decreased somewhat in wealthy countries during the last several years [3, 4]. One-third of all fatalities among those aged 35 and above are still attributable to it. The most recent data from the American Heart Association's (AHA) report on heart disease and stroke statistics shows that15.5 percent of all Americans aged 20 years and above have coronary heart disease (CHD) [5, 6]. It has been stated that in 2013 ischemic heart disease was the cause of death for 29.0 percent of people in Russia [7]. Illnesses like these are on the rise in Pakistan, say officials at the country's CDC, ischemic heart disorders account for 8% of all fatalities in the country [8]. Even with optimum medical treatment and widespread use of mechanical reperfusion for AMI, the ratio of in-hospital deaths to long-term fatalities is still as high as 7-13%. When compared to non-STEMI (16.3% of deaths in the registry), ST-elevation myocardial infarction (STEMI) causes more fatalities overall (83.7% of deaths in the registry) [9-12]'. This mortality further increases when a patient has ventricular tachycardia after acute myocardial infarction. The on-table mortality and 30 days

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mortality was higher in the patient who was having early ventricular tachycardia'. Even the 3-year mortality and stent thrombosis are increased in a patient who was having ventricular tachycardia before angioplasty'. Due to major insult to the myocardium, as denoted by ST-segment elevation on ECG, ventricular tachycardia (VT) is common with worse mortality. Its incidence has been presented to be 3.0 to11.6% by different studies". Early VT/VF was detected in 108 (3%) of 3,602 patients with STEMI in the American population ". Patients with STEMI in Denmark had an 11.6% incidence of VF before being transferred to PPCI ". With regard to ST-elevation myocardial infarction, the incidence of VT was 5.7% in the Sweden population [13]. Increased VT incidence is linked to low blood sugar and abnormal serum potassium levels [14]. This study seeks to determine the incidence of ventricular tachycardia (VT) in patients with ST-elevation myocardial infarction (STEMI), since VT is substantially related with higher 3-year rates of mortality. As a result, this would unquestionably help local health experts provide better care for people like these in our community.

METHODS

After approval from the Hospital ethical committee, the study was conducted in the department of Cardiology Hayatabad Medical Complex Peshawar from 1st October 2020 to 31st March 2021. All the patients having new onset ST-elevation Myocardial infarction as per Operational definition., both genders, aged between 40 and 75 years and who have given consent were included in the study. Patients with known cardiac arrhythmias such as chronic atrial fibrillation or Bundle Branch block, as well as those with a history heart failure, congenital heart disease, and ischemic heart disease, or any kind of cardiomyopathies indicated by his/her previous record, were not included in the study. Non-probability consecutive sampling technique was used for sample size calculation. Sample size was calculated using 166 ST-elevation myocardial infarction patients, ventricular tachycardia in ST-elevation myocardial infarction at 5.6%, absolute precision at 3.5%, and a confidence level of 95%. Patients visiting Cardiology OPD or referred through A&E Department to Cardiology Department were enrolled in the study. Written informed consent was also obtained from the patients. Throughout the study, confidentiality was maintained. Demographic data like sex, age, address and contact numbers were taken. The patient was managed as per hospital protocol for his acute myocardial infarction. The modality of treatment like Primary Percutaneous Coronary Intervention, streptokinase injection given or late for kstreptokinase was noted. Patient blood glucose and serum potassium level were also measured in the hospital laboratory at the time of presentation and at the time of ventricular tachycardia if any. Patients were followed up for up to 48 hours of admission. Any ventricular tachycardia observed on ECG as per operational definition was noted in the pro-forma. Any patients lost were excluded from the study. All the information such as age, weight, height, BMI, gender, family history, diabetes mellitus, hypertension, duration of symptoms, smoking status and frequency of VT were noted.

RESULTS

Distribution of ventricular tachycardia was present among 103 (62.0%) patients and was absent among 63 (38.0%) patients. Modality of treatment is shown in Table 1.

Ventricular tachycardias	N (%)
Yes	103 (62%)
No	63 (38%)
modality of treatment	
PCI	57 (34.3%)
Streptokinase	40 (24.1%)
Late for streptokinase	69 (41.6%)
Total	166 (100%)

Table 1: Ventricular tachycardias and modality of treatment (no 166)

Age wise distribution among 166 patients was analyzed as n=40-50 years 26 (15.7%), 51-60 years 37 (22.3%), 61-70 years 39 (23.5%), 70-75 years 64 (38.6%). Table 2 shows the stratification of ventricular tachycardia based on modality of treatment.

Ventricular Tachycardia	Modality of treatment			Total	P-value
	PCI	Streptokinase	Late for streptokinase		
Yes	37(35.9%)	28(27.2%)	38(36.9%)	103	0.259
No	20(31.7%)	12(19.0%)	31(49.2%)	63	
Total	57(34.3%)	40(24.1%)	69(41.6%)	166	

Table 2: Stratification of ventricular tachycardia: * modality of treatment

Mean age was 51.56 years with standard deviation ±1.357. Gender wise distribution among patients male was 89 (53.6%) female was 77 (46.4%). Distribution of BMI classification underweight 66 (34.6%), Normal weight 60 (31.4%), overweight 65 (34.0%). Distribution of duration of disease among patients 12-24 hours 80 (48.2%) and more than 24 hours 86 (51.8%) was 100 (52.4%). Family History of Coronary artery disease (CAD) was 84 (50.6%), diabetes mellitus 93 (56.0%), hypertension 110 (66.3%) and smoking status was 118 (71.1%). Table 4 represents the stratification of ventricular tachycardia based on disease duration.

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Ventricular Tachycardia	Duration of Disaese		Total	P-value
	12-24 hours	More than 24 hours		
Yes	54(52.4%)	49(46.6%)	103	0.201
No	26(41.3%)	37(58.7%)	63	
Total	80(48.3%)	86(51.8%)	166	

Table 3: Stratification of ventricular tachycardia: * duration of disease

DISCUSSION

Participants ranged in the age from 29 to 70, with the largest sample size in the age bracket of 51-60. Beamish *et al.*, [15] reported that the largest population in this age group are corroborated by these findings. Patients' mean ages 53.38± 10.22 years, which is consistent with results from the study by Gooding *et al*. were used in their investigation according to which mean ages was 53 ±10 years [16]. Only 8 of the responses were female, making up only 16% of the total. Arrhythmia after acute myocardial infarction has been studied extensively, and nearly all studies have found a comparable male incidence. Jinnouchi *et al* found a male preponderance of 70 percent to a female preponderance of 30 percent [17]. Since women in low-income nations like ours face more obstacles to education and health care, this tendency may be skewed toward men. A whopping 76% of patients who completed risk factor analysis were found to have a smoking history. Numerous studies observed that 70% of cases involved smokers, which is consistent with our own data. Eighty percent of the risk factors involved smoking, followed by hypertension (64%). Additional risk factors include a family history of coronary artery disease (18%), obesity (34%), dyslipidemia (38%), and diabetic retinopathy (40%) [16-18]. The prevalence rates of diabetes and hypertension in our study (66%) and in (54%) respectively, are quite close to those reported by the Kim found a similar percentage (36% of patients) to be dyslipidaemic. A majority of our study participants (54% overall) had an anterior wall infarction [19]. Consistent with the findings of Weizman et, al., the incidence of the anterior wall was 56% and that of the inferior wall was 44% [20]. Also, Demidova *et al*. showed that the incidence of the anterior wall myocardial infarction was 8 times greater than expected (58%) [21]. Sinus tachycardia accounted for 36.8 percent of all arrhythmias in this study. In the present investigation, sinus tachycardia was likewise shown to be the most frequent arrhythmia. Sinus tachycardia, which affects 30% and 31% of patients, respectively, is the most prevalent arrhythmia. Sinus bradycardia was the second most prevalent arrhythmia in this study, with a prevalence of 22.8 percent. 22 percent and 19 percent, respectively, of prevalence rates are consistent with those reported in past investigations. According to recent study ventricular tachycardia was shown to be prevalent in 19.3 percent of cases. In this study, 12.3 percent of births included an ectopic ventricular septum. Similar results were found by Li at el., who found that 17% of individuals had ventricular ectopic [22]. However, other studies, like the one conducted by Gupta *et al*, have found a much higher AV blockage prevalence, at 15%. Potentially at fault for the disparity is the small sample size of the present investigation [23]. The study found that 5.3% of participants had total AV block. Bhonsale *et al* both identified about the same percentage of patients with first-degree AV block [24]. There was a significant increase in arrhythmias within the first 12 hours of hospitalization (71.9%). The results of Mayosi et. al., who also noted that the majority of arrhythmias occurred within 12 hours after admission, are consistent with this conclusion [25]. In this study, 87.7% of the patients had arrhythmias on the first day of being admitted. In addition, the bulk of arrhythmias (90%) occurred during the first 24 hours of hospitalization, which is consistent with other study results. The findings of almost all the studies on arrhythmia in AMI were the same: 72% of patients had a full recovery. These figures are quite similar to the seventeen percent and eleven percent that Mayosi *et al*. found in their study, respectively [26]. Ten percent of patients in the present study encountered acute left ventricular failure, and eight percent went into cardiogenic shock. This slight variation in incidence may be due to the small size of the sample employed in this study. More patients with CHB and VT experienced shock. One patient with anterior MI and VT died during the first 12 hours of admission (2%). According to a study by Saguner *et al.*, 15% of all hospital deaths occur during the first 24 hours of admission; this is especially true in VT and CHB [27]. The study outcomes may have been positive due to the small sample size and excellent CCU treatment for patients with STEMI at BSMMU's University Cardiac Center. Patients with anterior wall myocardial infarctions had more tachyarrhythmias than those with inferior wall infarctions. It is statistically significant ($p < 0.0001$) that there is an association between the location of a myocardial infarction and several types of cardiac arrhythmia. The researchers Mushtaque *et al*. discovered a connection between the site of the infarction and the subsequent arrhythmias that developed [28]. Results from this study are consistent, with some slight differences, with those from prior studies of arrhythmias in acute STEMI. Potential causes include the following limitations: Single-location studies. The under-sampling of the population might bias the results of the study. The adoption of a purposive sample strategy opened the door to the potential of selection bias.

CONCLUSIONS

Ventricular tachycardia is the most common tachycardia occurring in patients in the first 48 hours who sustained myocardial infarction. It was shown that bradyarrhythmia

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was more common in patients with inferior wall myocardial infarction while ventricular tachycardia was found to be more in patients with anterior wall myocardial infarction.

Conflicts of Interest

The authors declare no conflict of interest

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REFERENCES

[1] Jaffe AS, Lindahl B, Giannitsis E, Mueller C, Cullen L, Hammarsten O, *et al*. ESC Study Group on Cardiac Biomarkers of the Association for Acute CardioVascular Care: A fond farewell at the retirement of CKMB. European heart journal. 2021 Jun; 42(23): 2260-4. doi: 10.1093/eurheartj/ehaa1079

[2] Sandoval Y, Apple FS, Saenger AK, Collinson PO, Wu AH, Jaffe AS. 99th percentile upper-reference limit of cardiac troponin and the diagnosis of acute myocardial infarction. Clinical chemistry. 2020 Sep; 66(9): 1167-80. doi: 10.1093/clinchem/hvaa158

[3] Levi N, Dadon Z, Steinmetz Y, Perel N, Orlev A, Asher E, *et al*. Prevalence, Predictors, and Outcomes of Patients With ST-Elevation Myocardial Infarction and Angiographically Significant Coronary Artery Disease of Non-Infarct-Related Artery. The American Journal of Cardiology. 2022 Jun; 173: 73-9. doi: 10.1016/j.amjcard.2022.03.003

[4] Benjamin EJ, Virani SS, Callaway CW, Chamberlain AM, Chang AR, Cheng S, *et al*. Heart disease and stroke statistics-2018 update: a report from the American Heart Association. Circulation. 2018 Mar; 137(12): e67-492. doi: 10.1161/CIR.0000000000000573

[5] Benjamin EJ, Muntner P, Alonso A, Bittencourt MS, Callaway CW, Carson AP, *et al*. Heart disease and stroke statistics-2019 update: a report from the American Heart Association. Circulation. 2019 Mar; 139(10): e56-28.

[6] Hadi A, Ilyas M, Ali Z, Farooq F. Age and Gender wise Comparison of Risk Factors in Patients with Acute Myocardial Infarction. Journal of Saidu Medical College, Swat. 2019 Jun; 9(1).

[7] Skrypnik D, Vinogradov R, Falco C, Baryshev A, Porhanov V. Early-Term Complications after Carotid Endarterectomy and Their Risk Factors: Eight-Year Employment of Local Treatment Protocol of a Russian High-Volume Center. European Surgical Research. 2020; 61(4): 101-12. doi: 10.1159/000512457

[8] Fazal A, Babar SM, Asad A, Buzdar AW, Shaikh MA, Zaki NA. Frequency of Sustained Ventricular Arrhythmias in Patients with Non-ST Segment Elevation Myocardial Infarction at a Tertiary Care Hospital. Pakistan Heart Journal. 2022 Dec; 55(4): 404-7. doi: 10.47144/phj.v55i4.2329

[9] Wang H, Pang X, Yang J, Shao J, Zhang J, Wang L, *et al*. Effect of Pre-Hospital Ticagrelor in Primary Percutaneous Coronary Intervention on Patients with ST-Segment Elevation Myocardial Infarction: A systematic review and meta-analysis. Journal of Pakistan Medical Association. 2019 Sep.

[10] Soares AA, Tavoni TM, de Faria EC, Remalay AT, Maranhão RC, Sposito AC, *et al*. HDL acceptor capacities for cholesterol efflux from macrophages and lipid transfer are both acutely reduced after myocardial infarction. Clinica Chimica Acta. 2018 Mar; 478: 51-6. doi: 10.1016/j.cca.2017.12.031

[11] Hyun KK. Exploration of inequities in prevention and outcomes of cardiovascular disease in Australia (Doctoral dissertation).2017.

[12] Sandoval Y, Januzzi Jr JL, Jaffe AS. Cardiac troponin for assessment of myocardial injury in COVID-19: JACC review topic of the week. Journal of the American college of cardiology. 2020 Sep; 76(10): 1244-58. doi: 10.1016/j.jacc.2020.06.068

[13] Demidova MM, Carlson J, Erlinge D, Platonov PG. Early repolarization pattern on ECG recorded before the acute coronary event does not predict ventricular fibrillation during ST-elevation myocardial infarction. Heart Rhythm. 2020 Apr; 17(4): 629-36. doi: 10.1016/j.hrthm.2019.11.011

[14] Jinnouchi H, Kolodgie FD, Romero M, Virmani R, Finn AV. Pathophysiology of coronary artery disease. Vessel Based Imaging Techniques: Diagnosis, Treatment, and Prevention. 2020: 211-27. doi: 10.1007/978-3-030-25249-6_11

[15] Beamish AJ, Michalsky MP. Cardiovascular outcomes following adolescent bariatric surgery. InSeminars in Pediatric Surgery 2020 Feb; 29(1). doi: 10.1016/j.sempedsurg.2020.150882

[16] Gooding HC, Gidding SS, Moran AE, Redmond N, Allen NB, Bacha F, *et al*. Challenges and opportunities for the prevention and treatment of cardiovascular disease among young adults: report from a National Heart, Lung, and Blood Institute Working Group. Journal of the American Heart Association. 2020 Oct; 9(19): e016115. doi: 10.1161/JAHA.120.016115

[17] Jinnouchi H, Kolodgie FD, Romero M, Virmani R, Finn AV. Pathophysiology of Coronary Artery. Vessel Based Imaging Techniques: Diagnosis, Treatment, and Prevention. 2019 Oct: 211. doi: 10.1007/978-3-030-25249-6_11

[18] Powell-Wiley TM, Poirier P, Burke LE, Després JP, Gordon-Larsen P, Lavie CJ, Lear SA, *et al*. American

DOI: https://doi.org/10.54393/pjhs.v4i02.551

Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Cardiovascular and Stroke Nursing; Council on Clinical Cardiology; Council on Epidemiology and Prevention; and Stroke Council. Obesity and Cardiovascular Disease: A Scientific Statement From the American Heart Association. Circulation. 2021 May; 143(21): e984-1010. doi: 10.1161/CIR.0000000000000973

[19] Kim SH, Kim DH, Park SD, Baek YS, Woo SI, Shin SH, *et al*. The relationship between J wave on the surface electrocardiography and ventricular fibrillation during acute myocardial infarction. Journal of Korean medical science. 2014 May; 29(5): 685-90. doi: 10.3346/jkms.2014.29.5.685

[20] Weizman O, Marijon E, Narayanan K, Boveda S, Defaye P, Martins R, *et al*. Incidence, characteristics, and outcomes of ventricular fibrillation complicating acute myocardial infarction in women admitted alive in the hospital. Journal of the American Heart Association. 2022 Sep; 11(17): e025959. doi: 10.1161/JAHA.122.025959

[21] Demidova MM, Rylance R, Koul S, Dworeck C, James S, Aasa M, *et al*. Prognostic value of early sustained ventricular arrhythmias in ST-elevation myocardial infarction treated by primary percutaneous coronary intervention: a sub-study of VALIDATE-SWEDEHEART trial. Heart Rhythm. 2022 Dec. doi: 10.1016/j.hroo.2022.12.008

[22] Li G, Fontaine GH, Fan S, Yan Y, Bode PK, Duru F, *et al*. Right atrial pathology in arrhythmogenic right ventricular dysplasia. Cardiology journal. 2019; 26(6): 736-43. doi: 10.5603/CJ.a2018.0123

[23] Gupta R, Tichnell C, Murray B, Rizzo S, Te Riele A, Tandri H, *et al*. Comparison of features of fatal versus nonfatal cardiac arrest in patients with arrhythmogenic right ventricular dysplasia/cardiomyopathy. The American journal of cardiology. 2017 Jul; 120(1): 111-7. doi: 10.1016/j.amjcard.2017.03.251

[24] Bhonsale A, Groeneweg JA, James CA, Dooijes D, Tichnell C, Jongbloed JD, *et al*. Impact of genotype on clinical course in arrhythmogenic right ventricular dysplasia/cardiomyopathy-associated mutation carriers. European heart journal. 2015 Apr; 36(14): 847-55. doi: 10.1093/eurheartj/ehu509

[25] Bhonsale A, Te Riele AS, Sawant AC, Groeneweg JA, James CA, Murray B, *et al*. Cardiac phenotype and long-term prognosis of arrhythmogenic right ventricular cardiomyopathy/dysplasia patients with late presentation. Heart rhythm. 2017 Jun; 14(6): 883-91. doi: 10.1016/j.hrthm.2017.02.013

[26] Mayosi BM, Fish M, Shaboodien G, Mastantuono E, Kraus S, Wieland T, *et al*. Identification of cadherin 2 (CDH2) mutations in arrhythmogenic right ventricular cardiomyopathy. Circulation: Cardiovascular Genetics. 2017 Apr; 10(2): e001605. doi: 10.1161/CIRCGENETICS.116.001605

[27] Saguner AM, Roland F, Li GL, Fontaine GH. 1933Superimposed myocarditis leading to heart transplantation in a young patient with arrhythmogenic right ventricular dysplasia. European Heart Journal. 2017 Aug; 38(1). doi: 10.1093/eurheartj/ehx495.1933

[28] Mushtaq RS, Mushtaque R, Baloch S, Idrees M, Bhatti H. Clinical Manifestations and Diagnostic Approach to Arrhythmogenic Right Ventricular Cardiomyopathy-A Case Report and Literature Review. Cureus. 2020 Nov; 12(11). doi: 10.7759/cureus.11429

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Original Article

Exploring Status of Oral Submucous Fibrosis and its Association with C-Reactive Protein at a Public Sector Medical University

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ABSTRACT

Oral submucous fibrosis (OSMF) is a well-established precancerous condition affecting the oral mucosa. **Objective:** To explore serum C- reactive protein levels in healthy patients and their comparison with diagnosed patients having oral submucous fibrosis. **Methods:** Eighty-two patients of all age groups, irrespective of gender and clinically diagnosed with oral submucous fibrosis, without any other systemic problem were included in the study. Patients were divided into two groups i.e., Group A = normal healthy patients and Group B = clinically diagnosed oral submucous fibrosis patients. After taking detailed history of patients of both groups, blood samples were collected from all patients for C- reactive protein levels. **Results:** Out of 82 patients, male were 30 (73.2%) and 34 (82.9%) and female were 11 (26.8%) and 7 (17.1%) with mean age of 41.0 ± 6.6 years and 42.6 ± 7.4 years in group I (normal healthy patients) and group II (oral submucous fibrosis patients) respectively. All patients were long-term consumers of betel quid with or without tobacco [13 (31.7%) and 28 (68.3%)], whereas no healthy patient was using betel quid. CRP level was significantly high 3.62 ±1.02 mg/dl in OSMF patients as compared to normal healthy patients 0.40 ± 0.21mg/dl. Similarly, CRP level was significantly abnormal (raised) in all OSMF patients as compared to normal healthy patients where only 7 (17.1%) were reported with abnormal (raised) CRP levels. **Conclusions:** Serum C- reactive protein levels in oral submucous fibrosis patients were significantly high as compared to normal healthy patients.

INTRODUCTION

Oral submucous fibrosis (OSMF) is a precancerous condition of the oral cavity characterized by fibrosis of oral mucosa (in the juxta-epithelial layer), which has also been defined by world health organization (WHO) as "Pathological state of Oral Cavity with potential risk of oral cancer" [1]. This condition was first labeled by Schwartz in 1952 and the term-oral submucous fibrosis was first coined by Joshi in 1953 [2]. The literature studies confirms the areca nut as the main etiological factor in causing OSMF [3] and various autoantibodies and antigens such as human leucocyte antigens (HLA) has showed their autoimmune role in some patients as well, with some positive support for a genetic predisposition for occurrence of this potential premalignant oral disease [1]. Other etiological factors may include use of capsaicin in chilies, deficiency of iron, zinc and other vital trace elements and vitamins [4]. Areca nut relation with other disorders have been found like epilepsy, hepatocellular carcinoma, metabolic syndrome, impaired glucose tolerance (IGT), and diabetes [5]. Areca nut is obtained from the seed of the fruit of Areca Catechu (a

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tropical palm tree) and ranks at fourth most widely used substance among tobacco, alcohol and caffeine and has more than 10% usage world widely as psychoactive component [6]. Limited research studies are documented in Pakistan regarding oral submucous fibrosis and its status associated issues in school going children, adults and their relation with periodic usage and rate related with areca nut [7]. Initial clinical features of Oral submucous fibrosis most commonly includes burning sensation in mouth and inability to eat spicy food also there can be inflammation along with hypovascularity, fibrosis, blanching (localized, diffused or reticular), small vesicle (that may rupture) and marble like manifestation of the oral cavity. The later stage of OSF includes presence of clinically palpable fibrous bands causing variable restricted mouth opening (trismus), inability to perform proper oral hygiene inspection, associated with speaking-chewing and difficulty in swallowing issues. Lip fibrosis may also cause its rubbery appearance and elliptical shape, other symptoms like fibrosis of soft palate, uvula and lesser extent fibrosis of gingival tissues, and sometimes blockage of Eustachian tube, labial, faucial and buccal bands may also be present [8, 9]. Many clinical and functional investigations have classified OSMF. In 2012, clinically staged OSF into four groups: S1, S2, S3, and S4 with subtypes S4 (a) and S4 (b). (S1) as stomatitis/blanching of the oral mucosa, (S2) as palpable fibrous bands in buccal mucosa/oro-pharynx with/without stomatitis, (S3) as palpable fibrous bands in buccal mucosa/oro-pharynx or in any part of oral cavity with/without stomatitis, (S4a) as any one of the above stages, along with other potentially malignant disorders, such as oral cancer, leukoplakia, erythroplakia, etc., (S4b) any one of the above stages. His Functional Staging uses inter-incisal measurement mouth opening up to or >35mm as M1, 25–35 mm as M2, 15–25 mm as M3, and <15 mm as M4 [10]. Different treatment modalities have been tried for OSF which includes administration of Steroids, Placental extracts, IFN Gamma, Pentaoxifyline, Lycopene enzymes, Antioxidants and Minerals, Surgical excision, but there is no global uniform treatment accepted [11]. There are approximately 600 million cases of OSMF reported [4]. Asian countries like India, Bangladesh, Sri Lanka, Pakistan, Taiwan and China have the significantly higher ratio of oral submucous fibrosis in comparison to west [12]. There is high risk of potential pre-malignant diseases to be converted in oral malignancy; therefore early assessment of high risk patients is very important [13]. Many researchers are searching for biomarkers that might distinguish healthy people from those at high risk of oral cancer [14]. The C - reactive protein or CRP is a useful and common biomarker. There is proven and well documented work of over 100 years is present that inflammation is related with cancer and that, C-reactive protein escalates in inflammatory conditions where either acute and chronic inflammation and in other conditions like cancer, heart diseases and surgeries [15, 16]. Furthermore, it is also a known absolute independent prognostic and pre-diagnostic factor for malignancies [17]. On the other hand, it is still unclear, and researchers doubt that CRP can be elevated before biological onset of cancer or it can be risk factor for the development of cancer [14]. As the frequency and habit of chewing Areca Nut, Ghutka, and Betel Quid increases, oral epithelium becomes more prone to oral cancer and oral submucous fibrosis increases in young patients. As there are few research on OSMF in Pakistan, we aim to investigate the association between CRP and OSMF instances in our community and its results at LUMHS.

METHODS

This comparative cross-sectional research with non-probability convenience sample was carried out at Liaquat University of Medical and Health Sciences Jamshoro's Oral and Maxillofacial Surgery Department OPD. The 2020 study was carried out between June and July. Rao Soft's sample size calculator was used to determine the sample size. The sample size was divided into two groups (Group I = Normal healthy patients and Group II = Oral Submucous fibrosis patients, 41 patients in each group) by lottery method/random number generator method. Patients with all age groups and either gender and clinically diagnosed with oral submucous fibrosis, without any other systemic problem were included in the study. All oral submucous fibrosis patients having any other systemic disorder or histopathology proven oral cancer, including surgically operated patients with Oral Cancer having associated diagnosed OSMF were exclude from study. Selected Patients were divided into two groups Group A = normal healthy patients and Group B = clinically diagnosed OSMF patients. A written informed consent was taken from adult patients and their parents/ attendants in case of children in both groups by researcher. For both groups, the whole patient history, including name, age, gender, hospital registration number, and any complaints made, was documented. Group B patients were enrolled after diagnosis of OSMF according to clinical and functional classification of OSMF. All the findings were recorded on Proforma (Annexure -1). After synopsis approval from ERC Prior written Permission was taken with a covering letter from Supervisor and reason for this study shared with in charge Pathology Lab, LUM & HS. CRP test was done after collecting blood samples from all study patients by the researcher and stored in test tubes collected if suitable, as per protocol of Pathology Lab, LUM & HS and finally

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submitted for reporting with patients details by the researcher. However, if this is not possible then the study patients were sent with request to collect blood sample and provide its report as per need of this research. CRP results of both groups were compared for respective results. After receiving clearance from the university's Ethical Review Committee, research was carried out. Patients from both groups were requested to undergo blood C-reactive protein testing after thorough clinical exams, and the results were analyzed and documented on Proforma. Data were analyzed by statistical package for social sciences (SPSS) software package version 20.0. Mean and standard deviation was calculated for continuous variables such as age and serum CRP. Frequencies and percentages were calculated for categorical variables such as gender, age in groups, habits, usage of betel nuts, symptoms of OSMF and serum CRP (normal/abnormal). Chi-Square Test and Independent Sample t-test was applied between both groups. Values for $p \leq 0.05$ were considered statistically significant.

RESULTS

In this study 30 (73.2%) and 34 (82.9%) patients were male and 11 (26.8%) and 7 (17.1%) patients were female in group I (Normal Healthy Patients) and group II (Oral Submucous Fibrosis Patients) respectively. Patients were grouped ≤ 40 years in 23 (56.1%) and 16 (39.0%) and > 40years in 18 (43.9%) and 25 (61.0%) patients in group I and group II respectively (Table 1).

Gender	Group I	Group II	p-Value
Male	30 (73.2%)	34 (82.9%)	0.286
Female	11 (26.8%)	7 (17.1%)	
Age Groups	**Group I**	**Group II**	**p-Value**
≤ 40	23 (56.1%)	16 (39.0%)	0.122
> 40	18 (43.9%)	25 (61.0%)	

Table 1: Patients Distribution According to Gender and Age Groups

Patient's distribution in relation to different habits like betel quid, tobacco, chilies, alcohol, and smoking has been documented in table 2.

	Group I	Group II	p-Value
Betel Quid with Tobacco			
Yes	0 (0.0%)	13 (31.7%)	<0.001
No	41 (100.0%)	28 (68.3%)	
Betel Quid Without Tobacco			
Yes	0 (0.0%)	28 (68.3%)	<0.001
No	41 (100.0%)	13 (31.7%)	
Chilies			
Yes	4 (9.8%)	7 (17.1%)	0.331
No	37 (90.2%)	34 (82.9%)	
Smoking			
Yes	10 (24.4%)	35 (85.4%)	<0.001
No	31 (75.6%)	6 (14.6%)	
Alcohol			
Yes	0 (0.0%)	9 (22.0%)	0.002
No	41 (100.0%)	32 (78.0%)	
Usage of Betel Nut (Years)			
< 5 Years	0 (0.0%)	3 (7.3%)	----
> 5 Years	0 (0.0%)	6 (14.6%)	
> 10 Years	0 (0.0%)	20 (48.8%)	
> 15 Years	0 (0.0%)	12 (29.3%)	

Table 2: Patients distribution according to habits

Patients reported various symptoms like burning sensation, difficulty in mouth opening, difficulty in swallowing, taste change, dryness of mouth and appearance of ulcers. Details of these symptoms in both groups have been shown in table 3.

Variables			p-Value
Burning Sensation			
Yes	0 (0.0%)	41 (100.0%)	<0.001
No	41 (100.0%)	0 (0.0%)	
Difficulty In Mouth Opening			
Yes	0 (0.0%)	41 (100.0%)	<0.001
No	41 (100.0%)	0 (0.0%)	
Difficulty In Swallowing			
Yes	0 (0.0%)	6 (14.6%)	0.025
No	41 (100.0%)	35 (85.4%)	
Taste Change			
Yes	2 (4.9%)	6 (14.6%)	0.137
No	39 (95.1%)	35 (85.4%)	
Dryness Of Mouth			
Yes	6 (14.6%)	17 (41.5%)	0.007
No	35 (85.4%)	24 (58.5%)	
Vesicles And Ulcers			
Yes	1 (2.4%)	28 (68.3%)	<0.001
No	40 (97.6%)	13 (31.7%)	

Table 3: Patients distribution according to symptoms

Mean and standard deviation of CRP was 0.40 ± 0.21 (0.03-0.8) mg/dl and3.62 ±1.02 (1.2-5.45) mg/dl in group I and group II respectively (Table 4).

CRP Finding	Group I	Group II	p-Value
	Frequency (%)	Frequency (%)	
Normal	34 (82.9%)	0 (0.0%)	<0.001
Abnormal	7 (17.1%)	41 (100.0%)	
Total	41 (100.0%)	41 (100.0%)	
Descriptive Statistics of CRP			
Minimum	0.03	1.2	<0.001
Maximum	0.8	5.45	
Mean ± SD	0.40 ± 3.62		
	0.21 ± 1.02		

Table 4: Patients distribution according to CRP finding and descriptive statistics

DISCUSSION

Mouth submucous fibrosis is a chronic, slow-moving condition that may affect any portion of the oral cavity and,

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sometimes, the throat. As a result of the subepithelial and submucosal myofibrosis, the oral mucosa and deeper tissues become stiff, and the mouth gradually becomes more tough to open and the tongue protrudes, making it harder to eat, swallow, and speak [18]. A premalignant condition of the oral cavity is oral submucous fibrosis. It is crucial to keep an eye on these patients to spot any early changes into OSMF patients since different studies have indicated that the malignant transformation rate of OSMF ranges from 7 to 13% [19-21]. Relationship between serum CRP and oral submucous fibrosis is very much important and should be studied. In this regard, as very limited studies are documented on OSMF in Pakistan, so we want to explore the relationship of CRP with OSMF cases in our population and explore its associated findings at LUM & HS. OSMF is a significant health concern particularly in men and women belonging to low socio-economic status and should be considered as a major public health issue. In this study 34 (82.9%) patients suffering from OSMF were male and 7 (17.1%) patients were female. Different studies from Pakistan on OSMF patients also reported higher male and lower female prevalence such as Shaikh *et al.*, [22] reported 88.0% male and only 12.0% female patients, and Memon *et al.*, [23]. reported 66.7% male and only 33.3% female patients. A study by Gosavi and Torkadi from India on OSMF patients also reported higher male prevalence 80.0% and lower female prevalence 20.0% [24]. All similar studies on OSMF patients reporting that male patients are mostly suffering from OSMF as compared to female patients. Different studies including current study suggested that betel nut is the main causative factor for OSMF disease. Betel nut is a potent carcinogen next to tobacco in subcontinent. OSMF starts as a simple superficial mucosal lesion to invade wide area of oral cavity and pharyngeal structures causing significant morbidity leading to mortality in the form of squamous cell carcinoma [25]. In this study all of the participants suffering from OSMF were long-term consumers of betel quid with or without tobacco 13 (31.7%) vs 28 (68.3%)]. Other similar studies also reports that all OSMF patients were involved in using betel nuts [23-25]. OSMF shows a complex pattern of inflammation, so it is very interesting and yet challenging to explore relationship of OSMF and to establish a cause–effect relationship. Inflammation reflects its presence in serum in the form of various chemokines and various other molecules including raised CRP. CRP is one such nonspecific inflammatory marker. In humans, the CRP level is low under normal conditions, but increases up to approximately 1000-fold during inflammation, making CRP probably one of the most useful molecules for monitoring inflammation present in many diseases and conditions. Hence, in the present study, serum CRP levels in OSMF were estimated as compared to apparently healthy individuals [25, 26]. In this study CRP level was significantly (p-value=<0.001) high 3.62 ± 1.02 mg/dl in OSMF patients as compared to normal healthy patients0.40 ± 0.21mg/dl. Similarly, CRP level was significantly (p-value=<0.001) abnormal (raised) in all OSMF patients as compared to normal healthy patients where only 7 (17.1%) were reported with abnormal (raised) CRP levels. Different similar studies also reported the higher mean of serum CRP levels in OSMF patients as compared to normal healthy patients such as Kaja *et al.*, reported the CRP mean 0.58 ± 0.83 mg/dlas compared to controls 0.26 ± 0.05 mg/dl and Kohli reported the CRP mean 4.3708 ± 3.9279mg/dlas compared to controls 3.505 ± 1.4449 mg/dl [21, 27]. Similar to this research, Kumar reported significantly high CRP levels in OSMF patients0.68±0.10 mg/dl as compared to controls [14]. All findings help to conclude that mean serum CRP levels can be a useful prognostic marker in early diagnosis of OSMF.

CONCLUSIONS

It was concluded from the study that serum C- reactive protein levels in oral submucous fibrosis patients was significantly high as compared to normal healthy patients. CRP level was also significantly abnormal (raised) in all oral submucous fibrosis patients as compared to normal healthy patients where only few were reported with abnormal (raised) CRP levels.

Conflicts of Interest

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REFERENCES

[1] Arakeri G and Brennan PA. Oral submucous fibrosis: an overview of the aetiology, pathogenesis, classification, and principles of management. British Journal of Oral and Maxillofacial Surgery. 2013 Oct; 51(7): 587-93. doi: 10.1016/j.bjoms.2012.08.014

[2] Patil S and Maheshwari S. Proposed new grading of oral submucous fibrosis based on cheek flexibility. Journal of Clinical and Experimental Dentistry. 2014 Jul; 6(3): e255. doi: 10.4317/jced.51378

[3] Gupta S, Singh R, Gupta OP, Tripathi A. Prevalence of oral cancer and pre-cancerous lesions and the association with numerous risk factors in North India: A hospital based study. National Journal of Maxillofacial Surgery. 2014 Jul; 5(2): 142. doi: 10.4103/ 0975-5950.154816

[4] Hosein M, Mohiuddin S, Fatima N. Association between grading of oral submucous fibrosis with frequency and consumption of areca nut and its derivatives in a wide

DOI: https://doi.org/10.54393/pjhs.v4i02.553

age group: a multi-centric cross sectional study from Karachi, Pakistan. Journal of Cancer Prevention. 2015 Sep; 20(3): 216. doi: 10.15 430/JCP.2015.20.3.216

[5] Javed F, Tenenbaum HC, Nogueira-Filho G, Nooh N, O'Bello Correa F, *et al*. Periodontal inflammatory conditions among gutka chewers and non-chewers with and without prediabetes. Journal of Periodontology. 2013 Aug; 84(8): 1158-64. doi: 10.1902 /jop.2012.120390

[6] Shafique K, Mirza SS, Vart P, Memon AR, Arain MI, Tareen MF, *et al*. Areca nut chewing and systemic inflammation: evidence of a common pathway for systemic diseases. Journal of Inflammation. 2012 Dec; 9(1): 1-8. doi: 10.1186/1476-9255-9-22

[7] Khan MA, Siddqui HK, Hasan T, Bashir S. Prevalence of Areca Nut Eating Habits And Incidence Of Oral Submucosal Fibrosis In School Children—A Prospective Cross-Sectional Survey. Pakistan Oral & Dental Journal. 2014 Sep; 34(3): 462-6.

[8] Yardimci G, Kutlubay Z, Engin B, Tuzun Y. Precancerous lesions of oral mucosa. World Journal of Clinical Cases: WJCC. 2014 Dec; 2(12): 866. doi: 10.12998/wjcc.v2.i12.866

[9] Wollina U, Verma SB, Faridi M, Patil K. Oral submucous fibrosis: an update. Clinical, Cosmetic and Investigational Dermatology. 2015 Apr; 2015: 193. doi: 10.2147/ccid.s80576

[10] Kumar S. Oral submucous fibrosis: A demographic study. Journal of Indian Academy of Oral Medicine and Radiology. 2016; 28(2): 124. doi: 10.4103/0972-1363.195085

[11] Hebbar PB, Sheshaprasad R, Gurudath S, Pai A, Sujatha D. Oral submucous fibrosis in India: Are we progressing??. Indian Journal of Cancer. 2014 Jul; 51(3): 222-6. doi: 10.4103/0019-509X.146724

[12] ul Wahab N, Salima A, Muslim K, Shoaib K, Hassan M, Asifali S. Frequency and clinical presentation of oral submucous fibrosis. Pakistan Journal of Medicine and Dentistry. 2014; 3(04): 48-53.

[13] Vankadara S, Padmaja K, Balmuri PK, Naresh G, Reddy V. Evaluation of serum C-reactive protein levels in oral premalignancies and malignancies: A comparative study. Journal of Dentistry (Tehran, Iran). 2018 Nov; 15(6): 358. doi: 10.18502/jdt.v15i6.329

[14] Kumar CA and Bhateja S. Altered C-reactive protein levels in serum of oral precancer patients in comparison with healthy controls. International Journal of Oral & Maxillofacial Pathology. 2011 Oct; 2(4): 16-20.

[15] Kaja S, Naga SK, Kumar KK, Dasari N, Kantheti LP, Reddy BV. Quantitative analysis of C-reactive protein in potentially malignant disorders: A pilot study. Journal of Orofacial Sciences. 2015 Jan; 7(1): 3-6. doi: 10.4103/0975-8844.157355

[16] Tariq FA, Janjua OS, Khan U. C-Reactive Protein As A Prognostic Indicator Of Oral Squamous Cell Carcinoma-A Retrospective Study. Pakistan Oral & Dental Journal. 2011 Dec 1;31(2): 288-91.

[17] Metgud R and Bajaj S. Altered serum and salivary C-reactive protein levels in patients with oral premalignant lesions and oral squamous cell carcinoma. Biotechnic & Histochemistry. 2016 Feb; 91(2): 96-101. doi: 10.3109/10520295.2015.1077393

[18] Khan S, Sinha A, Kumar S, Iqbal H. Oral submucous fibrosis: Current concepts on aetiology and management–A review. Journal of Indian Academy of Oral Medicine and Radiology. 2018 Oct; 30(4): 407. doi: 10.4103/jiaomr.jiaomr_89_18

[19] Pundir S, Saxena S, Aggarwal P. Oral submucous fibrosis a disease with malignant potential: report of two Cases. Journal of Clinical and Experimental Dentistry. 2010; 2: 215-8. doi: 10.4317/jced.2.e215

[20] Kujan O, Mello FW, Warnakulasuriya S. Malignant transformation of oral submucous fibrosis: A systematic review and meta-analysis. Oral Diseases. 2021 Nov; 27(8): 1936-46. doi: 10.1111/odi.13727

[21] Kaja S, Naga SK, Kumar KK, Dasari N, Kantheti LP, Reddy BV. Quantitative analysis of C-reactive protein in potentially malignant disorders: a pilot study. Journal of Orofacial Sciences. 2015 Jan; 7(1):3-6. doi: 10.4103/0975-8844.157355

[22] Shaikh AH, Ahmed S, Siddique S, Iqbal N, Hasan SM, Zaidi SJ, *et al*. Oral Submucous Fibrosis: Study of Cases Reported At Dow International Medical College Hospital In Karachi, Pakistan. The Professional Medical Journal. 2019 Feb; 26(02): 275-81. doi: 10.29309/TPMJ/2019.26.02.3100

[23] Memon MA, Shaikh MS, Jaffery MH. Oral submucosal fibrosis in Rural Sindh. Journal of Liaqat University of Medical Health Sciences. 2015 Jan; 14(1): 44-7.

[24] Gosavi SR and Torkadi AA. Serum C-reactive protein in oral submucous fibrosis and oral squamous cell carcinoma: A cross-sectional study. Journal of Oral Maxillofacial Pathology. 2020 Jan; 24(1): 46-51. doi: 10.4103/jomfp.JOMFP_317_19

[25] Ray JG, Chatterjee R, Chaudhuri K. Oral submucous fibrosis: A global challenge. Rising incidence, risk factors, management, and research priorities. Periodontology 2000. 2019 Jun; 80(1): 200-12. doi: 10.1111/prd.12277

[26] Bhattacharjee K, Girish HC, Murgod S, Varsha VK, Nishanthi L, Sunder S. Comparison of Serum C-Reactive protein level in Oral potentially Malignant disorders and in healthy individuals. Research Journal of Pharmaceutical Biological And Chemical Sciences. 2016 Mar; 7(2): 1285-90.

[27] Kohli S, Gharote H, Shinde CV. Estimation of serum c reactive protein in oral submucous fibrosis. Journal of Dental & Orofacial Research. 2021 Jan; 17(1): 6-11.

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Original Article

Effects of Parental Oral Health knowledge on Early Childhood Caries and Oral Health Status of Children 3-5 Years of Age in Abbottabad

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ABSTRACT

Dental caries can spread rapidly in children and was given the term "Early Childhood Caries" (ECC) that was coined to describe "one or more carious, non-cavitated or cavitated tooth surfaces that are missing or filled due to caries on a deciduous tooth" in a child of 5 years and 9 months of age or younger. Early childhood caries (ECC) is a "complicated condition affecting the maxillary primary incisors which quickly propagate to other primary teeth about a month of eruption". It is a serious issue of socio-behavior or dental health which strikes pre-schoolers across the globe. **Objective:** To determine effects of parental knowledge on their children's oral health practices and status. **Methods:** A cross-sectional study was carried out, with a total of 384 kids from Government and Private Schools of Abbottabad City. Oral hygiene of the children was assessed through dmft scores upon the request of school administration and parents. Structured oral health questionnaires were distributed by the instructors among the parents during parent-teacher conferences/ meetings that were held after every three months in a fiscal year of the school. **Results:** A total of 372 of the youngsters in the study have all their primary teeth erupted (98.7%). Three-year-olds make up 35.7% of the overall sample, while four-year-olds make up 23%, and five-year-olds make up 0.5% of the sample. One or more of the sample's 245 decaying teeth affects 40.5% of the total. **Conclusions:** Parental knowledge and practise of oral hygiene were found to be linked to their children's oral health in this study.

INTRODUCTION

Dental caries is defined as "a multifactorial microbial infectious disease characterized by demineralization of the inorganic and destruction of the organic substance of the tooth" [1]. Dental caries persists to be the most prevalent childhood disease, five times more common than asthma. Dental caries can spread rapidly in children and was given the term "Early Childhood Caries" (ECC) that was coined to describe "one or more carious, non-cavitated or cavitated tooth surfaces that are missing or filled due to caries on a deciduous tooth" in a child 5 years and 9 months of age or younger [2]. Early childhood caries (ECC) is a "complicated condition affecting the maxillary primary incisors which quickly propagate to other primary teeth about a month of eruption." It is a thoughtful matter of socio-behaviour or dental health which strikes pre-schoolers around the world [3]. ECC is a highly prevalent disease worldwide. The load of ECC's worldwide disease diverges significantly. Conferring to Maharani *et al.*, the disease is not very dominant in Europe, with frequency stretching from 11.4% in Sweden between children aged three to six years to 19.0% in Italy [4]. High frequency is seen in Middle East countries, such as Palestine (76%) and

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the UAE (83%). India registered a prevalence of (51.9%); its frequency amongst Pakistani children is (44.4%) [5-8]. ECC is a disease that can be caused by several reasons. These factors include a fermentable diet with sugars, a susceptible host, the presence of dental plaque, and a large number of pathogenic micro-organisms such as lactobacillus, streptococci mutants, and time [9]. Children from low socioeconomic backgrounds suffer twice as tooth decay as their more affluent peers, mainly because their disease is more likely to go unattended [1]. Pre-schoolers and adults alike suffer greatly if their teeth aren't properly cared for. ECC negatively affects children's lives. Dental decay in children can lead to school absences and financial hardships for parents. Moreover, psychological and social well-being can be adversely affected by dental decay. These include pain when drinking hot and cold beverages, difficulty chewing and biting, decreased appetite, weight loss, sleep disturbances, behavioural changes such as irritability and low self-esteem, and a decrease in school performance.6 Parents are early children's primary providers in every society. They are aware of not just their children's psychology but also their health demands. In order to ensure that their children's teeth remain healthy, parents must be aware of the importance of oral hygiene. As a parent, you can set the stage for a healthy lifestyle, boost your child's confidence, and help them adopt good habits [9]. Additionally, when it comes to their children's oral hygiene habits, parents' skills and attitudes toward oral hygiene can have a significant impact on the prevalence of oral diseases, controlling their children's tooth brushing, and sugar-snacking habits, which is the most significant predictor of children's favorable habits. Research shows that children's dental health is directly linked to their parents' education and income. This study was carried out to emphasis on parental oral health knowledge and also the risk causes responsible for ECC.Furthermore, parental behavior, mother's education level and the willingness of parents to avoid cariogenic snacks are variables related to ECC [10]. The objectives of the study were to assess parents' knowledge related to dental problems among children and to evaluate oral health hygiene of children 3-5 years of age using 'dmft' scoring.

METHODS

A cross-sectional study was conducted in both public and private schools of Abbottabad after approval for the research was given by the Institutional Review Board of Prime Foundation Pakistan. Institutional Review Board (Prime/IRB/2021-355 and formal approval was sought from the Education Department, and the Office of the District Education officer (D.E.O) Abbottabad, as well as the Heads of the selected schools. The parents of all children to be involved in the project were sent introductory letters accompanied by the consent forms through the school principals. All children aged 3-5 years attending the pre-school and their Parents were included in this study while children with any mental medical condition were not included in this study. A stratified random sampling technique was used. In this technique, dmft scores were taken from children aging 3-5 years of age from the schools which were selected by the D.E.O Abbottabad. Children were selected randomly from the pre-nursery and nursery class. As the sample size was 384, we divided the children into three categories on the basis of their ages 3,4 and 5 years. From each class 30 children were selected randomly who took part in this study while children having any mental or psychological disorders were excluded from the study. A total of 384 students by using Open Epi software using the following parameters: Population Size, Frequency of outcome, Population Size, Frequency of outcome, Confidence Level. The data were collected from parents during the parent teacher meeting using a structured questionnaire. A set of 10 questions to assess the knowledge related to the oral health of a child was formulated. The questionnaire was used to collect information about the (e.g., child's age) and dental health practices (e.g., details about tooth-brushing duration, toothpaste amount used). dental visit, current caries. Each question scored 1 was labeled as the correct answer and zero for the incorrect answer. The questionnaire with >8 scoring was considered as having good knowledge about their child's oral health whereas score from 4-7 was considered as having average oral health knowledge and questionnaire scoring < 4 was considered as having little or no knowledge regarding their child's oral health. Oral health status of children participating in this study was assessed using dmft scoring, which was our second questionnaire. dmft is the number of decayed, missing in caries, and filled teeth in deciduous and permanent teeth. This helps in determining the oral health status of the children. The children having Early Childhood Caries was counted according to the AAPD which focuses on the appearance of one or more decayed, missing or filled in any primary tooth in a child up to or below 71 months of age, we had made groups according to the age limits which they have recommended i.e., missing or filled or decayed dmft score of $\geq$4 (age 3), or &$\geq$ 5 (age 4), or $\geq$ 6 (age 5). Children with 3 years of age if their dmft score is>4 than it's considered that they have poor oral hygiene, Children with 4 years age having dmft score >5 and children with age 5 having dmft >6 was considered as compromised oral health status and they were advised to improve their oral health status and visit the dentist. Children with dmft scores of 0 or less than

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4 was considered as having a good oral health status. After successful collection of data, data were entered and analyzed using SPSS software version 20.0. Descriptive statistic like Mean and Standard deviations were calculated for age and dmft scores. The categorical variables like frequencies and percentages were calculated for gender location, age groups and mother's knowledge. T-test was used to compare mean dmft scores between Government and Private school children and between Prenursery and Nursery group. ANOVA was used to compare mean dmft score between three different age groups (3,4 and 5 years). Chi square test was used to compare parental knowledge from private and government schools. Correlation analysis (Pearson's analysis) was used to evaluate the relationship between oral health dmft score of children and parental knowledge score regarding early childhood caries. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Total 384 students were examined of which maximum belonged to 5 years of age 161 (41.81%) followed by 4 years 157(40.77%)(Table1).

Variable	Government schools	Private schools	Total
Age groups	N (%)	N (%)	
3years	28(14.58)	37 (19.27)	65 (16.88%)
4years	79(41.14)	78 (40.62)	157 (40.77%)
5years	85(44.27)	76 (39.58)	161 (41.81%)
Total	192(50)	192 (50)	384 (100%)

Table 1: Children's Mean Age

ANOVA test showed that there is no significant difference among all the age groups (p> 0.05). The highest mean difference (0.0482 ± 0.369) was noted between age group 5 and 4 years followed by (0.0250 ± 0.485) between age group 5 and 3 years (Table 2).

Age Groups	Mean ± SD DMFT	p-value
3 years	3.05 ± 0.48	>0.05
4 Years	3.90 ± 0.36	
5 Years	3.12 ± 0.48	

Table 2: Mean dmft score in different age groups

Table 3 statistics shows that mean value for Questionnaire score for 192 students each in Govt. and primary school having mean values of 6.3438 ± 2.612 and 7.3385 ± 1.959 respectively.

School	Mean ± SD OHK score	p-value
Govt	6.34 ± 2.61	<0.05
Private	7.33 ± 1.95	

Table 3: Mean Parental oral health score

The chi-square test shows a p-value of <0.05. Hence, showing a significant difference between the Parental health knowledge scores between the Private and government schools of Abbottabad (Table 4)

Oral Health Knowledge	Private	Govt.	p-value
Good Oral Health Knowledge	67 (34.89%)	12 (6.25%)	>0.05
Average Oral Health Knowledge	95 (49.47%)	84 (43.75%)	
Poor Oral Health Knowledge	30 (15.62%)	12 (6.25%)	

Table 4: Chi-Square analysis of parental oral health knowledge

This correlation revealed an inverse relationship between dmft and parental knowledge (-0.450) and also a negative covariance (-4.116) indicating that with the increase of parental knowledge the dmft decreases. Pearson's correlation revealed an inverse relationship between dmft and parental knowledge (-0.094) and also a negative covariance (-.555) indicating that with the increase of parental knowledge the dmft decreases (Table 5).

Variable	Mean ± SD	Pearson value	p-value
Correlation b/w dmft scores of govt school children and their parental health knowledge			
Mean dmft	3.92 ± 3.50	-0.45	<0.05
Mean OHS	6.34 ± 2.61		
Correlation b/w dmft scores of private school children and their parental oral health knowledge			
Mean dmft	3.26 ± 3.01	-0.09	<0.05
Mean OHS	7.33 ± 1.95		

Table 5: Correlation b/w dmft scores of private school children and their parental oral health knowledge and Correlation b/w dmft scores of govt. school children and their parental health knowledge

DISCUSSION

According to the findings of this cross-sectional study, parental knowledge of oral health is directly related to their children's dental health. To ensure their child's oral health, parents who teach their children to clean their teeth early and visit the dentist regularly to treat dental disorders have been effective [10]. These findings show a strong link between parents' attitudes, beliefs, and behaviours and their children's. Their children's behaviour reflected their parents' improved knowledge, attitudes, beliefs, and behaviours [11]. Children's oral health-related conduct appears to be correlated with both their parents' and children's understanding of oral health issues. Poor education among parents is a sign of poor child's oral health practices. Children reported oral health behaviour appears to be related to parents' reported actions [10]. According to these findings, a child's behaviour is influenced by the example set by their parents. Like prior surveys, most parents who responded were women (79%), (61%), (69%), (90%), as females spend more time with their children and they know more about their children as compared to the fathers because usually the fathers are busy with their work and it's the mother who looks after a child's needs and wants and the children mostly look up to their mothers when it comes to adapting habits, behaviours and attitude

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[12-15]. We found a substantial correlation between parents' educational attainment and their children's oral health. Caries was a significant predictor of parental education level exclusively amongst mothers. Mothers' enhanced ability to monitor and maintain their children's dental health can explain their increased understanding of good behaviours [16, 17]. A statistically significant difference was found between children whose moms graduated from high school and those whose mothers graduated from college or university. Previous study by Basir *et al.*, have also demonstrated that parents' educational level affects their children's oral health. Due to the role model status of mothers, the high number of moms participating in the study could have influenced the findings. Previous study by Bağ (-0.07), (-0.41) have shown a correlation between mothers' attitudes toward dental health and their young children's exposure to caries [18, 19]. Another study by Kotha found a correlation between mother self-perception of their own oral health and their children's experience of dental caries. As a result, it implies that maternal perception can provide helpful information about a child's oral health state and the need for treatment, as well as regarding the mother's own impression of her own dental health [14]. The dental health status of mothers is a strong predictor of the oral health status of their children. The youngsters whose parents had a higher educational level washed their teeth twice as frequently as those whose parents had a lower educational level every day [8]. Furthermore, a study in Norway by Garrocho-Rangel *et al.*, found that parental education and socioeconomic position affected a child's oral health. Dental caries was more likely to be prevented (71%) by parents with higher education (83%) and wealth than by parents with lower levels of this factors [13]. These parents were also more concerned about their children's dental health. There was a correlation between lower family incomes and less educated parents in families with children who had dental caries. Dental caries can also be caused by a lack of a proper diet, leading to cavities [19]. Children, in particular, enjoy snacking, do not adhere to good eating habits, and choose sugary, sticky foods. Almost everyone agrees that these behaviours harm youngsters' teeth. Poor food habits and an unhealthy lifestyle can be attributed to a lack of parental knowledge and a low socioeconomic standing. Parents' attitudes about oral health are heavily influenced by their educational background [20]. According to systematic research educated parents (79%) are more concerned about the oral health of their children [19]. Furthermore, research Tabakcilar *et al.*, show that parental education and family socioeconomic status directly impact children's oral health. Oral dental caries is more common in low-income and low-educated families because they are less concerned about basic dental care measures and regular preventative dental check-ups with the dentist [21].

CONCLUSIONS

Children's oral health practices are heavily under parental influence especially the mothers, who play a key role in helping them establish healthy habits early on. If parents are properly motivated and informed, oral diseases, especially caries in young children, can be greatly avoided. One of the key elements impacting oral health is dental knowledge. Poor health attitudes are associated to poorer health understanding. The dental health of children is strongly connected with a family's attitude. When compared to parents of children with caries, parents of children without caries showed more optimistic attitudes and beliefs. Therefore, evaluating the knowledge, attitude, and behavior of parents of young children might indicate gaps in the knowledge as well as wrong attitudes and actions. Dentists should educate parents about good dental hygiene habits for their children's overall health. As a result, a more scientifically sound health education programme encompassing the entire family is required to give parents the direction they need to preserve their children's dental health.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Rebelo MA, Rebelo Vieira JM, Pereira JV, Quadros LN, Vettore MV. Does oral health influence school performance and school attendance? A systematic review and meta-analysis. International Journal of Paediatric Dentistry. 2019 Mar; 29(2): 138-48. doi: 10.1111/ipd.12441

[2] Ruff RR, Senthi S, Susser SR, Tsutsui A. Oral health, academic performance, and school absenteeism in children and adolescents: A systematic review and meta-analysis. The Journal of the American Dental Association. 2019 Feb; 150(2): 111-21. doi: 10.1016/j.adaj.2018.09.023

[3] Elkerdany A, Gurenlian J, Freudenthal J. Measuring Oral Health Literacy of Refugees: Associations with Dental Care Utilization and Oral Health Self-Efficacy. Journal of Dental Hygiene. 2020 Apr; 94(2): 9-17.

[4] Maharani DA, Adiatman M, Rahardjo A, Burnside G, Pine C. An assessment of the impacts of child oral health in Indonesia and associations with self-esteem, school performance and perceived

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employability. BMC Oral Health. 2017 Dec; 17(1): 1-0. doi: 10.1186/s12903-017-0358-5

[5] Alanzi A, Muhammad S, Faridoun A, Alterkait A. Pediatricians' Knowledge of Children's Oral Health: A National Survey. International Dental Journal. 2022 Sep: 1-7. doi: 10.1155/2022/2339540

[6] Mahmoud N, Kowash M, Hussein I, Hassan A, Al Halabi M. Oral health knowledge, attitude, and practices of Sharjah mothers of preschool children, United Arab Emirates. Journal of International Society of Preventive & Community Dentistry. 2017 Nov; 7(6): 308. doi: 10.4103/jispcd.JISPCD_310_17

[7] Kumar G, Dhillon JK, Vignesh R, Garg A. Knowledge, attitude, and practical behavior of parents regarding their child's oral health in New Delhi. Journal of Indian Society of Pedodontics and Preventive Dentistry. 2019 Jan; 37(1): 3-7. doi: 10.4103/JISPPD.JISPPD_257_18

[8] Hajiahmadi M, Nilchian F, Tabrizi A, Gosha HM, Ahmadi M. Oral health knowledge, attitude, and performance of the parents of 3–12-year-old autistic children. Dental Research Journal. 2022; 19: 24. doi: 10.4103/1735-3327.340109

[9] Leghari MA. Association Of Dental Caries and Parents Knowledge of Oral Health, A Cross-Sectional Survey Of Schools Of Karachi, Pakistan. JPDA. 2014 Jan; 23(01): 19.

[10] Martínez-Beneyto Y, Navarrete-García C, Serna-Muñoz C, Ausina-Márquez V, Poza-Pascual A, Expósito-Delgado AJ, *et al*. Spanish Paediatricians' Knowledge, Attitudes and Practices Regarding Oral Health of Children under 6 Years of Age: A Cross-Sectional Study. International Journal of Environmental Research and Public Health. 2022 Aug; 19(15): 9550. doi: 10.3390/ijerph19159550

[11] Farid H, Khan FR, Aman N. Knowledge, attitude and practice of mothers regarding their own and children's dental health–a tertiary care hospital based study. Journal of Ayub Medical College Abbottabad. 2013 Jul; 25(3-4): 35-7.

[12] Alkhtib AO and Mohamed HG. Current knowledge about early childhood caries in the gulf cooperation council with worldwide reflection: Scoping review of the scientific literature (2010–2021). PLOS Global Public Health. 2023 Jan; 3(1): e0001228. doi: 10.1371/journal.pgph.0001228

[13] Garrocho-Rangel A, López-Torre ME, Santos-Díaz MÁ, Torre-Delgadillo G, Flores-Arriaga JC, Saadia M, *et al*. Assessment of Pediatricians' Knowledge, Practices, and Attitudes on Oral Health/Care in Children in the Last Decade: A Systematic Scoping Review and Critical Reflection. Journal of Clinical Pediatric Dentistry. 2022; 46(4): 262-72. doi: 10.22514/1053-4625-46.4.2

[14] Kotha SB. Prevalence and risk factors of early childhood caries in the middle east region: A Systematic Review: Prevalence and risk factors of early childhood caries. Journal of Population Therapeutics and Clinical Pharmacology. 2022 Aug; 29(03): e43-57. doi: 10.47750/jptcp.2022.937

[15] Savin C, Balcos C, Zetu I, Dragomir B, Gavrilă L, Mârțu I, *et al*. Mothers level of knowledge and attitudes towards their children oral health. Romanian Journal of Oral Rehabilitation. 2022 Apr; 14(2): 63-72.

[16] Berzinski M, Morawska A, Mitchell AE, Baker S. Parenting and child behaviour as predictors of toothbrushing difficulties in young children. International Journal of Paediatric Dentistry. 2020 Jan; 30(1): 75-84. doi: 10.1111/ipd.12570

[17] Fraihat N, Madae'en S, Bencze Z, Herczeg A, Varga O. Clinical effectiveness and cost-effectiveness of oral-health promotion in dental caries prevention among children: systematic review and meta-analysis. International Journal of Environmental Research and Public Health. 2019 Aug; 16(15): 2668. doi: 10.3390/ijerph16152668

[18] Basir L, Khanehmasjedi M, Khanehmasjedi S. Knowledge, attitudes, and practices regarding the oral health of children: a cross-sectional study among iranian parents. Brazilian Journal of Oral Sciences. 2022 Aug; 21: e228274. doi: 10.20396/bjos.v21i00.8668274

[19] Bağ İ. The attitudes of parents toward the oral health of children and their reflection on the non-cavitated caries lesions. Pediatric Dental Journal. 2022 Apr; 32(1): 26-33. doi: 10.1016/j.pdj.2021.12.004

[20] Khan AJ, Sabri BA, Ahmad MS. Factors affecting provision of oral health care for people with special health care needs: A systematic review. The Saudi Dental Journal. 2022 Aug; 34(7): 527-37. doi: 10.1016/j.sdentj.2022.08.008

[21] Tabakcilar D, Peker K, Yilmaz DO, Kasimoglu Y, Tuna-Ince EB, Gencay K, *et al*. Evaluation of the predictors of oral health-related quality of life among 3–5-year-old children with dental trauma. Brazilian Oral Research. 2023 Jan; 36: e140. doi: 10.1590/1807-3107bor-2022.vol36.0140

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Original Article

Association of Musculoskeletal Disorders and Job Satisfaction Among Nurses Working in Hospitals of Lahore

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ABSTRACT

Musculoskeletal disorders are the most common work-related problems reported till today worldwide. This might be because nurses are engaged in activities that require continuous physical efforts and interaction with patients. Job satisfaction can be defined as how the employees feel about job and its attributes. Job satisfaction is one of the most important and common variables in work environment. **Objective:** To evaluate the association between musculoskeletal disorders and job satisfaction among nurses working in the hospitals of Lahore. **Methods:** This analytical cross-sectional study was conducted in Lahore. 194 subjects were enrolled. Nordic Musculoskeletal Questionnaire was used to assess musculoskeletal disorders. The Nursing Workplace Satisfaction Questionnaire was used to assess job satisfaction. The Data were analyzed using SPSS v20. Mean ± SD was calculated for numeric variables while chi square test was used find the association between musculoskeletal disorders and job satisfaction. Cut off value was used to make categories of satisfaction. **Results:** Chi- square test of independence showed no association among neck (0.475), shoulder (0.698), elbow (0.066), wrist/hand (0.857), upper back (0.076) and Low back pain (0.358), Knee pain (0.61), ankle/foot pain (0.329) and job satisfaction as p-value of each was > 0.05 but there was found to be slight positive association among hip/thigh pain and job satisfaction as P-value was 0.43 which is statistically significant. **Conclusions:** There was no association between musculoskeletal disorders and job satisfaction because there were some other factors that determined the job satisfaction. These factors may include low salary, work environment etc.

INTRODUCTION

The disruption in normal function of nerves, muscles, tendons and ligaments are taken under an umbrella term "The Musculoskeletal disorders (MSDs)" [1]. The musculoskeletal disorders that may increase due to prolonged standing at work places and interfere with the worker's capability to do prolonged work are as termed ad work-related musculoskeletal disorder (WMSD) [2]. These disorders are mostly seen common in the hospital staff members like in nurses that comprises about thirty-three percent of total staff. They are at greater risk and constitutes about sixty percent of work-related disorders [3, 4]. Studies showed that 23% of the European workers complain of muscles aches and 25% of back pain. WMSDs are also the main reason of leave absence in western European countries and in USA. Among the hospital nurses the musculoskeletal disorders are also the common cause of leave absence [1]. In many countries, the work-related injuries are commonly caused by musculoskeletal

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disorders. The factors that contribute in musculoskeletal disorders are bad working posture, forceful movements, frequent twisting and lifting heavy weights [5]. Apart from these factors, a number of environmental , physical and psychosocial factors are also one of the major cause of work-related musculoskeletal injuries [6]. According to an Iranian study work-related musculoskeletal disorder is the second most common disease after the cardiovascular diseases. According to the World Health Organization the low back pain is the 2nd leading cause in restraining the people from working in USA. However, in European Countries the main cause of early retirement is also the LBP [7]. Moreover work-related musculoskeletal disorders are subdivided in to different groups, as those of upper extremity which include neck, shoulder, arm wrist and hand. And also, those of trunk and lower extremities. These MSK disorders in the region of head. Neck and low back are common among those healthcare professionals whose work include standing for hours, forward bending, lifting heavy patients, transferring and relocating patients [8, 9]. Job satisfaction can be describing as the way employees feel about the job and the different aspects of their jobs. The one of the most important variables in work is the job satisfaction. Many of the studies have reported that the job satisfaction can be affected by a number of the factors that include enough staff, pleasing working conditions, favorable circumstances for professional development, administration, possible rewards, awareness and relationship with other workers. Many studies have done that showed different ways how the healthcare workers feel about their job [10, 11]. Only a few number of studies have been done on job satisfaction in developing countries in health care professions. Many studies done in Africa have demonstrated that round about a half of the nurses and doctors have satisfaction about their job. In other developing countries such as Malaysia, China and India this job satisfaction proportion little higher. Factors that are involved in high level of job satisfaction include supportive work fellows, supportive work environment and decent rewards [12, 13]. Job satisfaction has been described as an emotional attitude for a job that comes from good and bad job experience. For nurses' job satisfaction is versatile and complicated. Lesser job satisfaction has been associated with high staff turnover, low confidence or self-esteem, less patient outcomes and high financial expenses [14]. Previous researches done on nurses have focused on musculoskeletal disorders and job satisfaction separately. There is no data available on the association of the musculoskeletal disorders and job satisfaction among nurses. The following study will be helpful in distinguishing the musculoskeletal disorders among nurses and will help them to prevent these job related musculoskeletal injuries and provide a better quality of life at workplace.

METHODS

This analytical cross-sectional study was conducted after the approval from the ethical review board. Data were collected through convenient sampling technique from 194 female nurses working in the different hospitals of Lahore namely Government Teaching Hospital Shahdara Lahore, Jinnah Hospital Lahore, Iqra Medical Complex Lahore, Chaudhary Rehmat Ali Memorial Trust Hospital Lahore, Ittefaq Hospital Lahore. The sample size was calculated by using Epitool sample size calculator at 95% confidence interval. Nurses working at least 6 hours a day and having at least 1-year working experience were included in the study while those having musculoskeletal issue secondary to any systemic diseases or any other cause were excluded. All the demographic data and other major details of the nurses was collected. The data from all nurses was collected after taking informed consent. The procedure was explained to the participants. Standardized Nordic Musculoskeletal Questionnaire was used to assess musculoskeletal disorders while Nursing Workplace Satisfaction Questionnaire was used to assess job satisfaction among nurses. The lowest possible score was 17 and 85 was the highest possible score. The lowest the score denotes the highest level of job satisfaction among nurses. The Data were analyzed using SPSS version 20.0. Mean ± SD was calculated for numeric variables while chi square test was used find the association between musculoskeletal disorders and job satisfaction. Cut off value was used to make categories of satisfaction.

RESULTS

The mean age of the nurses was 25.92 with standard deviation of ±5.90. The maximum age of the nurses was up to 56 years while minimum age was found to be 20 years. Out of 194 participants, 137 (70.6%) had experience less than 5 years. Least number of nurses [n=15 (7.7%)] had experience of more than 10 years. About 93 (47.9%) nurses worked for 6-8 hours per day. 56 (28.9%) nurses worked more than 8 hours per day while only 45 (23.3%) of the nurses worked for more than 10 hours per day (Table 1).

Variables		Frequency (%)
Years of experience	1-5	137 (70.6%)
	6-10	42 (21.6%)
	>10	15 (7.7%)
Duty hours per day	6-8	93 (47.9%)
	8-10	56 (28.9%)
	>10	45 (23.2%)

Table 1: Frequency of total years of experience and duty hours per day

The major area of pain as reported by 130 (67%) nurses was low back in the last 1 year as well as in last 7 days the

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frequency of which was 45 (23.3%) which was followed by the shoulder region (40.7% & 21.6%) and neck region (38.1% & 21.1%) for both the time duration i.e., last 12 months and in past 7 days (Table 2).

Region	Frequencies of pain/ trouble in Last 01 year		Frequencies of pain/ trouble in Last 07 Days	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)
Neck	74 (38.1)	120 (61.9)	41 (21.1)	153 (78.9)
Shoulder	79 (40.)	115 (59.3)	42 (21.6)	152 (78.4)
Upper back	73 (37.6)	121 (62.4)	35 (18.0)	159 (82.0)
Elbow	64 (33)	130 (37)	33 (17.0)	161 (83.0)
Wrist/Hand	66 (34)	128 (66)	27 (13.9)	167 (86.1)
Lower back	130 (67.0)	34 (33.0)	45 (23.2)	149 (76.8)
Hip/Thighs	38 (19.6)	156 (80.4)	21 (10.8)	173 (89.2)
Knees	50 (25.8)	144 (74.2)	13 (6.7)	181 (93.3)
Ankle/feet	67 (34.5)	127 (65.5)	25 (12.9)	169 (87.1)

Table 2: Region wise frequencies of pain/trouble/ache in Last 12 Months Versus in last 7days

The means Job satisfaction score on Nursing Workplace Satisfaction Questionnaire was 36.15 (SD=8.25), the minimum score obtained was 17 while maximum score was 57(Table 3).

Job satisfaction score	Mean ± SD	Minimum	Maximum
	36.15±8.25	17.00	57.00

Table 3: Total Mean Score of Job Satisfaction

Chi- square test of independence showed no association among neck (0.475), shoulder (0.698), elbow (0.066), wrist/hand (0.857), upper back (0.076) and Low back pain (0.358), Knee pain (0.61), ankle/foot pain (0.329) and job satisfaction as p-value of each was > 0.05 but there was found to be slight positive association among hip/thigh pain and job satisfaction as p-value was 0.43 which is statistically significant. The following results showed that job satisfaction was majorly related to some factors other than musculoskeletal disorders (Table 4).

Region		Job satisfaction		Total	p-value
		Satisfied	Dissatisfied		
Neck pain	No	93	27	120	.475
	yes	54	20	74	
Shoulder pain	No	86	29	115	.698
	yes	61	18	79	
Elbow pain	No	97	24	121	.066
	yes	50	23	73	
Wrist/hand pain	No	98	32	130	.857
	yes	49	15	64	
Upper back pain	No	102	26	128	.076
	yes	45	21	66	
Lower back pain	No	70	26	96	.358
	yes	77	21	98	
Hip/thigh pain	No	123	33	156	.043
	yes	24	14	38	
Knee pain	No	114	30	144	.061
	yes	33	17	50	
Ankle/foot pain	No	99	28	127	.329
	yes	48	19	67	

Table 4: Association of neck, shoulder, elbow, wrist/hand, upper back, Low back pain hip/thigh, knee and ankle/foot pain and job satisfaction

DISCUSSION

The current study perhaps was the first study conducted in Lahore, Pakistan regarding the association of musculoskeletal association and job satisfaction among nurses working in hospitals of Lahore. This study confirmed that there is slight association of hip/thigh pain and job satisfaction among nurses. So, alternate hypothesis was proved. Punch, in 2020 conducted a study about the prevalence of work-related musculoskeletal disorders among nurses in Guyana. The results of the study showed that the Low back (72%) was most commonly reported region by nurses preceded by neck pain (49.1%) and shoulder pain (37.7%) in both the time duration as last 1 year and 7 days [15]. The results are consistent with the current study where most common region of pain was also low back but the second most common region reported was shoulder pain followed by neck pain. Relationship between work-related musculoskeletal disorder and workload with job satisfaction among nurses working in emergency department was analyzed by Bazazan *et al.*, in 2019. They found a positive association among work load, job satisfaction level and work-related musculoskeletal disorders. As per results of this study 73% of the nurses reported knee pain in last12 months, while 70% nurses reported upper back pain and 66% reported lower back pain. 38.4% nurses had low job satisfaction level while 51.9% showed moderated satisfaction level of job. There was significant association of job satisfaction with pain symptoms of wrists/hands, upper back, hip/thigh, knees and ankle/feet having P-value of 0.001, 0.002, 0.03, 0.001 and 0.004 respectively [16]. In 2019 a cross-sectional stud was conducted by Alnaami *et al.*, on the prevalence of low back pain among health care professionals in Saudi Arabia. In which the highest prevalence was found among dentists (88.9) preceded by paramedics (74.5), physicians (73.2) and nurses (72.9). The major risk factors as reported were belonging to medical health care professional, increased BMI and repetitive bending and twisting movements. Hence the study concluded that low back pain is prevalent in health care professionals including nurses [17]. While the in the current study the most reported region of pain was also Lower back. The evidence of MSD among nurses was supported by another study conducted by Arsalani *et al.*, The participants reported musculoskeletal disorders in different regions of body. This study concluded the high prevalence of musculoskeletal disorders. Neck, shoulder and lower back were the most common regions for

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disorders as reported by this study [18]. Asghar *et al.*, in 2016 carried out a study on musculoskeletal disorders among nurses in Lahore and concluded that nurses had high level of MSD's due to nature of profession. This study found that the most reported region was the low back pain (49.7%) that was due to heavy patient lifting, bending and twisting. Pain in upper back, neck and shoulder region were also frequently reported. This study also concluded significant association with job demands [19]. The results of the current study were in consistent with the study conducted in India in 2013 on the musculoskeletal disorders among nurses the results showed that the major area of reported pain was lower back pain (48.2%) preceded by shoulder (34.6%), neck (33.1%) and knee pain (29%) [3]. while the results of current study also showed that low back pain was most frequent complains of nurses (67%) while the second most common pain region was shoulder (40.7%) followed by pain in neck region (38.1%). Shah *et al.*, in 2018 conducted a study to assess the determinants of job satisfaction among nurses. For this purpose, they collected data from three South Asian countries namely Pakistan, India and Sri Lanka. They concluded that there was a significant association among job satisfaction and employer authorization and the remuneration hey receive for their work [13]. Correlativity between WMSD and working environment, QOL and social support was analyzed by Yan *et al.*, in 2018. The prevalence of WMSD among nurses was 79.52% and the most common reported area of pain was similar to as that of current study i.e. low back (64.83%) followed by region of neck (61.83%) and shoulders (52.36%). As reported by the nurses WMSDs also affected their quality of life, social support and increased absenteeism from work [20]. Nguyen *et al.*, (2016), studied the factors which were associated with the job satisfaction among the health workers in North Vietnam, he concluded that the health care workers were less satisfied with their job. The main causes of their dissatisfaction were low salary, relationship with supervisor and work environment [12]. Curtis and Glacken, conducted a study on job satisfaction among public health care nurses. The result of this study showed the job satisfaction at low levels among nurses. The study also reported that the nurses having low satisfaction level also have low levels of self-esteem and high level of depression and anxiety [21]. Khamlub *et al.*, in 2013, conducted a study on job satisfaction in Vientiane Capital and found that health care workers were satisfied with their job except for salary. The result showed that the job satisfaction was correlate with relations with the staff members and structure of organization [10]. In contrast to the above mentioned studies there are no findings that relate to the present study. Present study is also different from other studies in a way that we determine the association of the musculoskeletal disorders and job satisfaction among nurses and such comparative study is not carried up till now. The slightly existing association is clinically important in a way to reduce the MSDs among nurses and to improve their quality of life.

CONCLUSIONS

There is no significant association between musculoskeletal disorders and job satisfaction among nurses. Only slight positive association was found among hip/thigh pain and Job satisfaction. Job satisfaction level of individual cannot be assessed by musculoskeletal disorders however there are some other factors that affect the job satisfaction level which include low salary, management behavior, work environment and some other factors.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Bernal D, Campos-Serna J, Tobias A, Vargas-Prada S, Benavides FG, Serra C. Work-related psychosocial risk factors and musculoskeletal disorders in hospital nurses and nursing aides: a systematic review and meta-analysis. International Journal of Nursing Studies. 2015 Feb; 52(2): 635-48. doi: 10.1016/j.ijnurstu.2014.11.003.

[2] Punnett L and Wegman DH. Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. Journal of Electromyography and Kinesiology. 2004 Feb; 14(1): 13-23. doi: 10.1016/j.jelekin.2003.09.015.

[3] Anap DB, Iyer C, Rao K. Work related musculoskeletal disorders among hospital nurses in rural Maharashtra, India: a multi centre survey. International Journal of Research in Medical Sciences. 2013 May; 1(2): 101-7. doi: 10.5455/2320-6012.ijrms20130513.

[4] Kakosy T and Németh L. Musculoskeletal disorders caused by hand-arm vibration. Global Occupied Health Network. 2003; 4(winter): 3-6.

[5] Barzideh M, Choobineh AR, Tabatabaee HR. Job stress dimensions and their relationship to musculoskeletal disorders in Iranian nurses. Work. 2014 Jan; 47(4): 423-9. doi: 10.3233/WOR-121585.

[6] Rahman HA, Abdul-Mumin K, Naing L. Psychosocial factors, musculoskeletal disorders and work-related fatigue amongst nurses in Brunei: structural equation model approach. International Emergency

DOI: https://doi.org/10.54393/pjhs.v4i02.557

Nursing. 2017 Sep; 34: 17-22. doi: 10.1016/j.ienj.2017.04.001.

[7] Abdollahi A and Adineh S. Skin and Musculoskeletal Disorders among Nursing Staff of a Referral-Teaching Hospital in Tehran-Iran. International Journal of Occupational Hygiene. 2015 Sep; 7(3): 119-23.

[8] Mirmohammadi S, Yazdani J, Etemadinejad S, Asgarinejad H. A cross-sectional study on work-related musculoskeletal disorders and associated risk factors among hospital health cares. Procedia Manufacturing. 2015 Jan; 3: 4528-34. doi: 10.1016/j.promfg.2015.07.468.

[9] Tinubu BM, Mbada CE, Oyeyemi AL, Fabunmi AA. Work-related musculoskeletal disorders among nurses in Ibadan, South-west Nigeria: a cross-sectional survey. BMC Musculoskeletal disorders. 2010 Dec; 11: 1-8. doi: 10.1186/1471-2474-11-12.

[10] Khamlub S, Harun-Or-Rashid MD, Sarker MA, Hirosawa T, Outavong P, Sakamoto J. Job satisfaction of health-care workers at health centers in Vientiane Capital and Bolikhamsai Province, Lao PDR. Nagoya Journal of Medical Science. 2013 Aug; 75(3-4): 233.

[11] Akinwale OE and George OJ. Work environment and job satisfaction among nurses in government tertiary hospitals in Nigeria. Rajagiri Management Journal. 2020 May; 14(1): 71-92. doi: 10.1108/RAMJ-01-2020-0002.

[12] Nguyen HV, Duong HT, Vu TT. Factors associated with job satisfaction among district hospital health workers in northern Vietnam: a cross-sectional study. The International Journal of Health Planning and Management. 2017 Apr; 32(2): 163-79. doi: 10.1002/hpm.2337.

[13] Shah SM, Ali R, Dahri AS, Brohi NA, Maher ZA, Hameed WU. Determinants of job satisfaction among nurses: Evidence from South Asian perspective. International Journal of Academic Research in Business and Social Sciences. 2018 May; 8(5): 19-26. doi: 10.6007/IJARBSS/v8-i5/4082.

[14] Hayes B, Douglas C, Bonner A. Work environment, job satisfaction, stress and burnout among haemodialysis nurses. Journal of Nursing Management. 2015 Jul; 23(5): 588-98. doi: 10.1111/jonm.12184.

[15] Punch NH. Work-related musculoskeletal disorders among nurses at the Georgetown Public Hospital Corporation in Guyana (Doctoral dissertation, Universidade de São Paulo). 2020. doi: 10.11606/D.22.2021.tde-07052021-151602.

[16] Bazazan A, Dianat I, Bahrampour S, Talebian A, Zandi H, Sharafkhaneh A, *et al*. Association of musculoskeletal disorders and workload with work schedule and job satisfaction among emergency nurses. International Emergency Nursing. 2019 May; 44: 8-13. doi: 10.1016/j.ienj.2019.02.004.

[17] Alnaami I, Awadalla NJ, Alkhairy M, Alburidy S, Alqarni A, Algarni A, *et al*. Prevalence and factors associated with low back pain among health care workers in southwestern Saudi Arabia. BMC Musculoskeletal Disorders. 2019 Dec; 20: 1-7. doi: 10.1186/s12891-019-2431-5.

[18] Arsalani N, Fallahi-Khoshknab M, Josephson M, Lagerström M. Musculoskeletal disorders and working conditions among Iranian nursing personnel. International Journal of Occupational Safety and Ergonomics. 2014 Jan; 20(4): 671-80. doi: 10.1080/10803548.2014.11077073.

[19] Asghar F, Ehsan S, Arshad HS. Frequency of work-related musculoskeletal disorders among nurses working in hospitals of Lahore. International Journal of Science and Research (IJSR). 2016 May; 5(5): 346-9. doi: 10.21275/v5i5.NOV163242.

[20] Yan P, Yang Y, Zhang L, Li F, Huang A, Wang Y, *et al*. Correlation analysis between work-related musculoskeletal disorders and the nursing practice environment, quality of life, and social support in the nursing professionals. Medicine. 2018 Mar; 97(9): e0026. doi: 10.1097/MD.0000000000010026.

[21] Curtis EA and Glacken M. Job satisfaction among public health nurses: a national survey. Journal of Nursing Management. 2014 Jul; 22(5): 653-63. doi: 10.1111/jonm.12026.

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Original Article

Incidence of Hepatitis B due to Multiple Transfusions in Patients of β-Thalassemia Major

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ABSTRACT

β-Thalassemia is one of the most prevalent childhood hemolytic disorders. Multiple blood transfusions of unscreened blood can result in infection transmission. After many transfusions, Hepatitis B infection in thalassemia patients was reported. **Objective:** To determine the incidence of Hepatitis B in β-thalassemia major patients, associated with multiple blood transfusion strategies. **Methods:** This cross-sectional study was executed in Pediatric department of DHQ teaching hospital Dera Ismail khan with the collaboration of the Regional Blood center, and comprised 360 patients, diagnosed with β-Thalassemia Major and maintained on multiple transfusions. **Results:** The average weight of the subjects was 43.50±18.76 Kg and their mean age was 13.10±2.1 years. The significantly high population of the patients ($p<0.05$) was not immunized against Hepatitis B (73.88%), while only 26.66% (94/360) were immunized. The patients having less than 10, 11-20 and more than 20 transfusions per annum comprised 72 (20%), 157 (43.61%) and 131 (36.38%) patients, respectively. The affected patients had significantly altered hematological parameters ($p<0.05$). The highest number of β-Thalassemia Major patients affected with Hepatitis B belonged to the Group having more than 25 transfusions of blood annually, with an incidence rate of 11.53. **Conclusions:** The greatest risk factor for Hepatitis B infection in β-thalassemia major patients is concluded to be multiple blood transfusions. It was also found that a huge population of Thalassemia patients was not immunized against HBV despite the severe risk. Therefore, health education and awareness campaigns are needed for the significance of Hepatitis B immunization and transfusion of screened blood.

INTRODUCTION

The most widespread autosomal recessive genetic disorder, beta thalassemia is caused by an aberrant beta hemoglobin gene, yielding Globin chain and clinically characterized by moderate to stern hemolytic anemia. The wide-reaching carrier frequency of β-thalassemia is approximately 3%, and it is estimated that approximately 600,000 children with thalassemia major are born per annum. There is more than 10 million β-thalassemia trait carrier in Pakistan, where the peculiarity frequency ranges from 5 to 8% and around 5,000 kids are diagnosed with β-thalassemia major per annum. Lack of education, illiteracy and consanguineous marriages (70%) are the crucial causes of Pakistan's high carrier fraction. According to World Health Organization, an effectual screening program should be implemented whenever the birth rate of afflicted newborns surpasses 0.1/1000 for any disease [1]. β-Thalassemia Major patients entail monthly blood transfusions to sustain normal hemoglobin levels. Patients who entail multiple transfusions are always predisposed to contracting transfusion-transmitted maladies [2]. Patients with β-thalassemia major experience numerous difficulties as a result of multiple blood transfusions (MBTs)

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including iron excess and infection transmission of contagious maladies. Inadequate screening procedures upshot in the transmission of infections, among which the most prevalent are Hepatitis B and C infections, rendering increased morbidity and mortality of these patients. According to local and regional studies, the prevalence of HBV and HCV is 5 and 38.7%, respectively [3]. The treatment of patients with β-thalassemia major imposes a significant economic burden. In Punjab (Pakistan), there is a single government-funded project (The Punjab Thalassemia Prevention Program), which provides free beta thalassemia screening and prenatal diagnosis. Complete blood count and hemoglobin electrophoresis remain the initial screening test, although chorionic villi sample and amplification refractory mutation system method is the most common molecular tests for β-thalassemia diagnosis. Modern molecular approaches, and non-invasive prenatal and pre-implantation diagnosis are currently in the testing phase [1]. The current research was conducted to determine the incidence of Hepatitis B in β-thalassemia major patients, associated with multiple blood transfusion strategies and to evaluate the efficacy of blood screening before transfusion.

METHODS

This cross-sectional study was completed in the Pediatrics Department DHQ Teaching hospital, Dera Ismail Khan in the collaboration with the Regional Blood Centre Dera Ismail Khan from February 2022 to December 2022. The study comprised 360 patients of both sexes (259 males; 101 females) aged less than 18 years, diagnosed with β-Thalassemia Major, who were maintained by MBTs. Participants who met the inclusion criteria were enrolled in the study by non-probabilistic convenience sampling. Cases of B-Thalassemia Major with microcytic hypochromic anemia (Hb<10, MCH<25 and MCV<70) and blood transfusions undergoing along with follow-up at tertiary care hospitals in District Dera Ismail Khan, during the study period were enrolled. While the exclusion criteria concluded patients diagnosed previously with hepatitis B or chronic liver disease. The relevant hematological, and demographic parameters of the patients were noted and compiled in the MS Excel sheets (Version 2010), and were compared to the normal hematological values of hemoglobin (12-18g/dl), RBCs count (4.1-6 x 10^{12}/L), PCV (36-51%), MCH (27-33 pg/cell) and MCV (79-96 FL/cell) [4]. Their frequency of blood transfusions per annum was also kept on record and statistically analyzed. Before all transfusions in B-Thalassemia Major patients, complete history along with their vaccination status was recorded on the pre-designed questionnaire and their blood specimens, comprising 3ml each in EDTA (whole blood) and gel tube (for serum extraction) were sent to the laboratory facility of the center for screening of Hepatitis B (3rd generation ELISA and PCR), CBC (Hematology Analyzer) and other maladies. All these medical procedures were executed under the strict compliance of Ethical norms and policies of our institute, and informed consent from the enrolled patients for the subject research was signed by the parents of patients. The gathered data were statistically analyzed using SPSS software (Version 20.0). The continuous variables were expressed in frequency, percentage, means and standard deviations and the treatment groups were instigated through One-Way ANOVA and Chi-square testing, while, a p-value of less than 0.05 was deemed statistically significant.

RESULTS

The blood disorder β-Thalassemia reduced hemoglobin synthesis and is characterized by abnormal erythrocyte production. The affected persons have a deficiency of erythrocytes (anemia), resulting in pale skin, weakness and more severe consequences. Those with beta thalassemia are more likely to have irregular blood profiles. Depending on the severity, it is divided into thalassemia major (transfusion-dependent thalassemia or Cooley's anemia) and thalassemia minor (non-transfusion-dependent). Therefore, this cross-sectional study was conducted to determine the incidence of hepatitis B due to multiple transfusions in patients of β-Thalassemia Major in Dera Ismail Khan from February 2022 to December 2022 and comprised 360 participants including 259 males and 101 females. The average weight of the subjects was 43.50±18.76 Kg and their mean age was 13.10±2.1 years. The significantly high population of the patients ($p<0.05$) was not immunized against Hepatitis B (73.88%), while only 26.66% (94/360) were immunized. The patients having less than 10, 11-20 and more than 20 transfusions per annum comprised 72 (20%), 157 (43.61%) and 131 (36.38%) patients, respectively. The statistically significant difference was found among these three groups and most of the patients ($p<0.05$) were maintained on 11-20 transfusions/annum (Table 1).

S. No	Variable	No. of subjects n (%)	p-value
Age			
1	<7 years	89 (24.72)	0.0004*
	8-14 years	142 (39.44)	
	15-20 years	129 (35.83)	
Weight			
2	>10 Kg	13 (3.55)	0.00001*
	11-20 Kg	47 (13.05)	
	21-30 Kg	83 (23.05)	
	>30 Kg	217 (60.27)	
Gender			
3	Male	259 (71.94)	0.00001*
	Female	101 (28.05)	

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	Female	101 (28.05)	
Vaccination against HBV			
4	Immunized	94 (26.11)	0.00001*
	Not immunized	266 (73.88)	
No. of transfusions			
5	<10	72 (20.0)	0.00001*
	11-20	157 (43.61)	
	>20	131 (36.38)	

Table 1: Demographic characteristics of the patients with β-Thalassemia Major

* Indicated that the value of p is significant at p<0.05

Whole blood was collected from all the participants for the evaluation of their hematological parameters and complete blood count and the values were compared to the normal (Table 2). All the collected values were analyzed and mean and standard deviations were calculated. The hemoglobin (6.89±0.53), erythrocytic counts (7.01±1.10), packed cell volume (39.76±7.68), mean corpuscular hemoglobin (19.19± 4.32) and mean corpuscular volume (55.88±16.73) of the patients affected with β-Thalassemia were compiled (Table 2).

S. No	Hematology parameters	Normal values	Range of subjects	Mean + SD
1	Hemoglobin (g/dL)	12-18	5.2-10.1 4	6.89+0.53
2	RBCs count (x1012/L)	4.1-6.0	4.02-7.87 4	7.01+1.10
3	PCV (%)	36-51	27-44 4	39.76+7.68
4	MCH (pg/cell)	27-33	17-27 4	19.19+ 4.32
5	MCV (FL/cell)	79-96	45-69 4	55.88+16.73

Table 2: Analysis of hematological parameters of β-Thalassemia Major patients

Normal values retrieved from Williams Manual of Hematology, 9th Edition

Based on a number of blood transfusions, the patients were categorized into four groups i.e., Group A (1-7 transfusions/annum), B (8-15 transfusions/annum), C (16-24 transfusions/annum) and D (>25transfusions/annum). It was found that the highest number of β-Thalassemia Major patients affected with Hepatitis B belonged to Group D having more than 25 transfusions of blood annually (Figure 1), followed by Group C, B and A characterized by the incidence rate of 11.53, 5.75, 2.91 and 2.50%, respectively (Table 3).

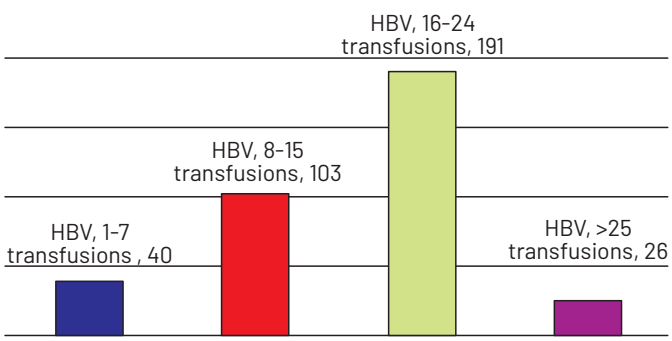

Figure 1: Relationship of HBV with β-Thalassemia

S. No	Groups	No. of transfusions per annum	No. of Subjects (n)	Patients diagnosed with Hepatitis B (n)	Incidence of HBV (%)	p-value
1	A	1-7	40	01	2.50	0.00005*
2	B	8-15	103	03	2.91	
3	C	16-24	191	11	5.75	
4	D	>25	26	03	11.53	

Table 3: Prevalence of Hepatitis B in β-Thalassemia Major patients due to multiple transfusions

* Indicated that the value of p is significant at p<0.05

DISCUSSION

β-Thalassemia is one of the most prevalent childhood hemolytic disorders. Multiple blood transfusions can result in infection transmission. After many transfusions, Hepatitis B infection in thalassemia patients was reported. Our findings revealed that significantly the highest (p<0.05) numbers of β-Thalassemia Major patients (11.53%) were affected with Hepatitis B for having more than 25 transfusions of blood annually. Our results were in accordance with the study conducted at the Department of Pediatric Medicine, Mayo Hospital, Lahore, in which 28 patients (9.3%) tested positive for HBV, with an average age of 9.76±5.26 years [3]. Another descriptive retrospective investigation conducted in Swat in Thalassemia patients undergoing multiple transfusions revealed comparable findings to our study, whereby 10 patients (5.88%) tested positive for hepatitis B surface antigen (HBsAg), through ELISA, in patients who were maintained on MBT strategies. It was also suggested that adequately screened blood must be utilized through a reliable approach to minimize transfusion-transmitted illnesses [5]. A similar nature study was close to our findings in which 250 and 152 multi-transfused thalassemia patients in Cacopardo's and Sicily, had HBV incidences of 8.40 and 8.0%, respectively [6]. Our results were also supported by the research performed in Fauji Foundation Hospital Rawalpindi including 80 Thalassemia patients undergoing MBTs and their results revealed that 5% (4/80) patients were infected with HBV [2]. Another study in East Azerbaijan reported that frequent blood transfusions in people with beta-thalassemia major rendered them to contract blood-borne viral infections among which HBV and HCV were the most significant. 116 beta-thalassemia patients who received blood in Tabriz's Shahid Ghazi hospital were examined by ELISA for the serum markers HCV-Ab, and HBsAg, revealing only four patients (3.4%) positive for HCV-Ab [7]. Our results coincided with the study conducted to assess the prevalence, genotype distribution and risk factors of hepatitis B virus (HBV) infection in individuals with β-thalassemia. Of 126 thalassemia patients, 4 cases (3.17%) were positive for HBsAg, 23 cases (18.25%) were positive for HBcAb, and 6 cases (4.76%) had HBV viremia with

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genotype D [8]. A study reported 3% incidence of β-thalassemia in Bandar-Iran [9], only 1.5% in India in 2020 [10], and incidence of HCV in Pakistan was found to be 36.21% in 2020 [11]. Our findings were corroborated with the study conducted in Bahawalpur and Peshawar to investigate of incidence of Hepatitis B and revealing 9.0 and 7.5%, respectively [12, 13]. Burki *et al.* reported 3.90% incidence of HBsAg in Pakistan in 2009 [14]. Our findings were supported by a study conducted at Quetta, Pakistan and reported 18.3% prevalence of HBsAg in β-thalassemia patients [15], 13.51% in Dhaka, Bangladesh and 10.0% in Palestine through diagnosed through ELISA [16, 17]. Patients with thalassemia who had undergone many blood transfusions were more susceptible to infection as a result of a deterioration in their immunological function [18]. Moreover, in the event of an emergency, it is normal practice in Bangladesh to accept dangerous blood donations from professional donors, the majority of whom are drug abusers [19]. Today, effective and safe blood transfusions have lowered the mortality rate, but complications such as hepatocellular carcinoma are becoming more prevalent in individuals with thalassemia, possibly related to the carcinogenicity of iron overload and chronic infections [20].

CONCLUSIONS

The greatest risk factor for Hepatitis B infection in β-thalassemia major patients is concluded to be multiple blood transfusions. It was also found that a huge population of Thalassemia patients was not immunized against HBV despite the severe risk. Therefore, health education and awareness campaigns are needed for the significance of Hepatitis B immunization and transfusion of screened blood.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Ghafoor M, Sabar MF, Sabir F. Prevention programmes and prenatal diagnosis for beta thalassemia in Pakistan: A narrative review. The Journal of the Pakistan Medical Association. 2021 Jan; 71(1(B)): 326-31. doi: 10.47391/JPMA.665.

[2] Khalil S, Khan HS, Akhtar P. Status of hepatitis B and C in beta thalassemia major patients. Journal of Islamabad Medical & Dental College. 2016 Jun; 5(2): 71-3.

[3] Nadir R, Anjum A, Ijaz SF. Frequency of Hepatitis B and C in Beta Thalassemia Major with Multiple Blood Transfusions. Pakistan Journal of Medical Health Sciences. 2020 Dec; 14(4): 764-5.

[4] Kaushansky K. Williams hematology. McGraw-Hill Education; 2016.

[5] Khattak ID, Shah M, Ahmed I, Rehman A, Sajid M. Frequency of hepatitis B and hepatitis C in multitransfused beta thalassaemia major patients in district Swat. Journal of Saidu Medical College, Swat. 2013 Dec; 3(2): 299-302. doi: 10.52206/jsmc.2013.3.2.299-302.

[6] Mukhtar AS, Muhammad TK, Zahoor U, Yasmeen A. Prevalence of hepatitis B and hepatitis C virus infection in multi-transfused Thalassaemia major patients in North West Frontier Province. Pakistan Journal of Medical Sciences. 2006; 21: 282-3.

[7] Mirzaei G, Shamsasenjan K, Jafari B, Bagherizadeh Y, Sadafzadeh A, Bannazadeh-Baghi H, *et al.* Prevalence of HBV and HCV infection in beta-thalassemia major patients of Tabriz city, Iran. New Microbes and New Infections. 2021 Sep; 43: 100912. doi: 10.1016/j.nmni.2021.100912.

[8] Farshadpour F, Taherkhani R, Farajzadeh H. Hepatitis B infection among β-thalassemia major patients in Bushehr province of southern Iran. Journal of Immunoassay and Immunochemistry. 2022 Dec: 1-5. doi: 10.1080/15321819.2022.2163178.

[9] Allamehzadeh Z, Hamadiyan H, Izadi Raeini M, Shams SA, Koolivand M. Prevalence of hepatitis B and C in thalassemia major patients in south of Iran-Bandar Abbas. Tropical Biomedicine. 2018 Jun; 35(2): 472-7.

[10] Mishra K, Shah A, Patel K, Ghosh K, Bharadva S. Seroprevalence of HBV, HCV and HIV-1 and correlation with molecular markers among multi-transfused thalassemia patients in Western India. Mediterranean Journal of Hematology and Infectious Diseases. 2020; 12(1): e202003. doi: 10.4084/mjhid.2020.038.

[11] Akhtar S, Nasir JA, Hinde A. The prevalence of hepatitis C virus infection in β-thalassemia patients in Pakistan: a systematic review and meta-analysis. BMC Public Health. 2020 Dec; 20(1): 1-9. doi: 10.1186/s12889-020-8414-5.

[12] Mohammad J, Hussain M, Khan MA. Frequency of Hepatitis B & C infection in thalassaemic children. Pakistan Pediatric Journal. 2003; 27(4): 161-4.

[13] Mubarak A, Muhammad S, Atta Ullah M. Hepatitis B and C status of thalassaemia major patients. Medical Channel Journal. 2005; 11: 19-21.

[14] Burki MF, Mumtaz H, Liaqat A, Wadood MZ. Frequency of hepatitis b virus in regularly blood transfused beta thalassemia major patients. Pakistan Paediatric Journal. 2009; 33(3): 153-6.

DOI: https://doi.org/10.54393/pjhs.v4i02.558

[15] Ahmed S, Ayub M, Naeem M, Nazir FH, Hussain A, Ghilzai D, *et al*. Thalassemia patients from baluchistan in Pakistan are infected with multiple hepatitis B or C virus strains. The American Journal of Tropical Medicine and Hygiene. 2021 Apr; 104(4): 1569. doi: 10.4269/ajtmh.20-0740.

[16] Bhuyan GS, Noor AU, Sultana R, Noor FA, Sultana N, Sarker SK, *et al*. Frequency of hepatitis B, C and HIV infections among transfusion-dependent beta thalassemia patients in Dhaka. Infectious Disease Reports. 2021 Jan; 13(1): 89-95. doi: 10.3390/idr 13010011.

[17] Dumaidi K, Al-Jawabreh A, Samarah F, Rabayaa M. Prevalence of sero-molecular markers of hepatitis C and B viruses among patients with β-thalassemia major in Northern West Bank, Palestine. Canadian Journal of Infectious Diseases and Medical Microbiology. 2018 Jan; 2018: 1039423. doi: 10.1155/ 2018/1039423.

[18] Choudhry VP. Hepatitis B and C Infections in Multitransfused Thalassemic Patients. The Indian Journal of Pediatrics. 2015 Mar; 82(3): 212-4. doi: 10.1007/s12098-014-1676-0.

[19] Mollah AH, Nahar N, Siddique MA, Anwar KS, Hassan T, Azam MG. Common transfusion-transmitted infectious agents among thalassaemic children in Bangladesh. Journal of Health, Population and Nutrition. 2003 Mar; 21(1): 67-71.

[20] Moukhadder HM, Halawi R, Cappellini MD, Taher AT. Hepatocellular carcinoma as an emerging morbidity in the thalassemia syndromes: a comprehensive review. Cancer. 2017 Mar; 123(5): 751-8. doi: 10.1002/ cncr.30462.

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Original Article

Causes of Mortality in Hospitalized, PCR Positive Patients of Covid-19 at Tertiary Care Hospital of Sindh Pakistan

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ABSTRACT

In Pakistan, over 10,000 deaths have been reported due to COVID-19 while the exact course of illness and significant causes of mortality has not been found out. **Objective:** To enumerate the causes of death in hospitalized SARS CoV2 PCR positive patients and also to assess the relationship between COVID mortality and comorbidities. **Methods:** The cross-sectional study was conducted at Liaquat University Hospital after taken permission from the ethical review committee. Study included SARS CoV2 PCR positive patients, admitted at Liaquat university hospital and expired during hospitalization, aged greater than 15 year and belonged from either gender. Operated and RTA patients were excluded from study. **Results:** Patient's age ranged from 18 to 90 year. Mean age was 59.6-year, Male were 79% and female were 21%. Triad of fever, cough and SOB present in 48% of patients. Respiratory failure (54%) and respiratory failure with sepsis (38%) were the leading cause of fatality. Anova Test showed statistically significant correlation between causes of death and comorbidities with p-value 0.015. Both Diabetes and Hypertension were present in 25% of patients. **Conclusions:** The study concluded that male gender was the dominant sufferer of COVID-19 and in contrast to normal perception, younger age is not an exception for mortality due to COVID-19. Fever, cough and SOB were the most frequent complain. Respiratory failure alone and with sepsis, was found to be the leading reason for mortality. Causes of death were strongly linked with presence of comorbidities in covid 19 patients.

INTRODUCTION

Corona viruses belong from RNA viruses; have been a threat to mankind since long. These were the culprits behind many epidemics. SARS CoV-2 causing Covid 19 is one of the deadliest infectious disease world has ever encountered [1]. Being one of the highly populated countries Pakistan also shared enormous number of patients of this highly communicable disease. Pakistanis identified their first PCR positive case of COVID-19 on 25 February 2020 [2, 3]. COVID-19 is not only the reason of gigantic morbidities and mortalities of human beings but destroyed world economy as well. It has been observed that consequences of this highly communicable disease varied widely. Different geographical regions of world showed dissimilar end results in terms of mortality [4, 5]. Astonishing fact regarding Covid-19 is that it caused more marked lethality in developed countries in spite of good health facilities, as compare to the third world [4]. Variances also noted in lethality by the disease in low-income countries or through the states of South-East Asia [5]. As the fatality of covid varies with different geographical regions a regional study estimated that death rate diverse from 1–5% to more than 30% [4]. Still many things are unclear about the factors leading to death in covid patients. Considerable debate is there over role of

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metabolic abnormalities in relation to deaths in covid patients that's why we choose to focus on this point also [6]. We conducted this study to see the conditions which contributes in mortality of COVID-19. Whether they are same as of developed world or geographical variance plays its role. This study would help in the assessment whether patients were dying with covid or due to covid and help in understanding the most common complication which turn lethal. This study helped in understanding the most common complication which turned fatal in our patients towards demise so that proper care may be taken while dealing with such patients and prioritizing them.

METHODS

This cross-sectional descriptive study was conducted at Liaquat University Hospital after taking permission from the Ethical Review Committee of Liaquat University of Medical & Health Sciences (Letter No. LUMHS/REC/-57, Dated: 19/03/2021). Study included SARS CoV2 PCR positive hospitalized patients, admitted at Liaquat university hospital, and expired during hospitalization, aged greater than 15 year and belonged from either gender. Operated and RTA patients were excluded from study. Patients were selected through nonprobability convenience sampling, from March 2021 to February 2022. Data were collected on pre designed proforma. Information on clinical condition and comorbidities, lab investigations and medical management was obtained from patient's files and analyzed through SPSS version 23.0. We did not include the files which were not completed.

RESULTS

Our patient's age ranged from 18 to 90 year. Mean age was 59.6 years, maximum no of patients expired at 55 years of age. Male were 79 % and female were 21%. Triad of fever, cough and SOB present in 48% of patients. Figure 1 depicts the causes of death found in Covid-19 patients i.e., Respiratory Failure and Sepsis being the highest in number.

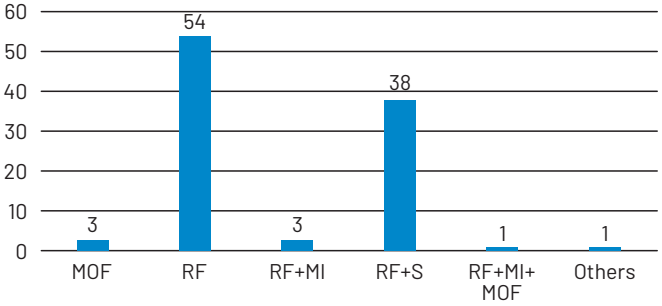

Figure 1: Causes of Mortality among Patients of Covid-19
MOF: Multi-Organ Failure
RF: Respiratory Failure
MI: Myocardial Infraction
S: Sepsis

Figure 2 depicts the status of comorbidities among patients of Covid-19. Most of the patients had dual morbidities that lead to mortality. Anova Test was applied to assess relation between causes of death and comorbidities, it showed statistically signification correlation and p-value was 0.015.

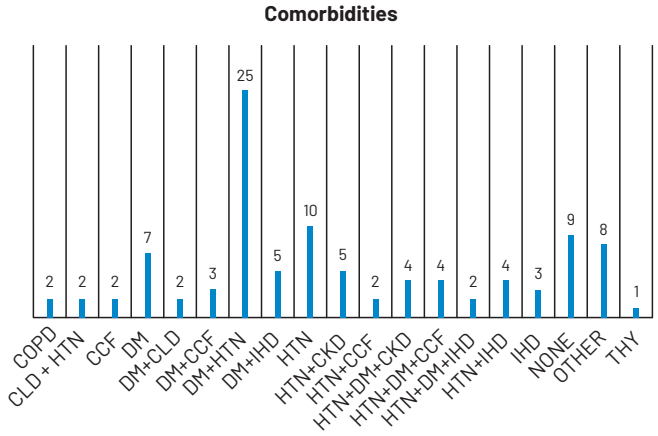

Figure 2: Comorbidities Status among Covid-19 Patients
COPD: Chronic Obstructive Pulmonary Disease
CLD: Chronic Liver Disease
HTN: Hypertension
CCF: Congestive Cardiac Failure
DM: Diabetes Mellitus
IHD: Ischaemic Heart Diseases
CKD: Chronic Kidney Diseases
THY: Thyroid Disorders

As shown in Table 1, Chi square test revealed definite link between patients who perished due to "respiratory failure" and "respiratory failure with sepsis" with the presence of comorbidities and p-value comes 0.000 in both groups respectively. Regarding oxygen consumption 26% patients were on ventilator support 21% and 48% patients were kept on BiPAP and CPAP respectively. The association between Cause and Comorbidity was found to be statistically significant i.e., $p < 0.05$ via chi-square test.

ANOVA[a]					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	57.026	1	57.02	6.188	.015[b]
Residual	903.084	98	69.215		
Total	960.110	99			
a. Dependent Variable: Cause					
b. Predictors: (Constant), Comorbidity					

Table 1: Association between Cause and Morbidity

DISCUSSION

Covid pandemic crushed the health care system and economy of the world. Diverse mortality rates of covid were observed in different countries and regions of the world hence emphasizing the need to assess causes and elements leads to covid related loss of lives. Difference in Covid lethality has been noted not only in various sub

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continents but even vary country to country e.g., India suffered much greater than Bangladesh and Indonesia [6, 7]. Our patient's age ranged from 18 year to 90 year and mean age was 59.6 year. This result showed that our patients expired relatively earlier than Hispanic (63 years) and white people (71 years) [8]. This was a common finding of many studies that aged person became the victim of this disease [9, 10]. Our majority of sufferer were male who were 79% while female was 21 %. Males were the principal victim of this disease, as evident in other studies as well [11, 12]. This phenomenon may be understood by the particulars like expression of more immunity related genes to X chromosome and higher content of ACE2 receptors in males, which are utilized by SARS-CoV-2 virus for producing disease [13]. Mean duration of admission was 12 days while 9th day was crucial for most of the patients. Most common clinical presentation was fever cough and SOB as also noted by other researchers of Pakistan [14, 15]. We found respiratory failure as a cause of death for majority of patients, 54% died due to covid induced respiratory failure further 38 % died due to respiratory failure along with sepsis. MOF alone was responsible for only 3 deaths. An autopsy-based study on causes of death due to COVID-19 by Elezkurtaj *et al.*, revealed that SARS-CoV-2 infection was real cause of death behind fatalities of their studied population, on autopsy it is evidenced that 92.3% of patients deceased due to COVID-19, most of them expired due to virus induced pneumonia (53.8%) [15]. Like our study result they concluded respiratory failure and sepsis along with its complications like septic shock and multi organ failure as principal reason for end of the life of Covid patients [16-18]. In their autopsy-based studies researchers revealed SARS CoV2 induced microvascular thrombosis in pulmonary vasculature and diffuse alveolar damage as major offender in severe hypoxia and respiratory failure resulting in demise of the patients, not only this but Covid pneumonia`s distinctiveness to activates immune system, producing cytokine storm, results in hypercoagulable state and thrombosis which further worsen the outcome [12, 13]. In their study Bryan *et al.*, also noted acute respiratory distress syndrome (ARDS) and septic shock were key contributor to death [9]. In our study we found that covid mortality is directly linked with co-morbidities. Majority of patients had double or triple pathologies, 33 patients had single chronic disease and only 9 patients expired without any other concomitant disease. Most commonly encountered chronic diseases were hypertension and diabetes. Combine hypertension and diabetes were present in 25% of our patients. Both these diseases lead to vascular endothelial abnormalities exhibited by decreased nitric oxide. Damage may be exaggerated by as SARS CoV2 direct toxic effects, hence resulted in poor outcomes [14]. Other researchers also found diabetes and hypertension as high-risk factors for death they also pointed out that in age group 20–39 years old, presence of these risk factors result in high mortality [19]. Another study revealed hypertension, ischemic heart disease, and obesity as significant factors in resultant mortality [20]. Interestingly, we established statistically that respiratory failure and sepsis were significantly related with morbidities.

CONCLUSIONS

The study concluded that male gender was the dominant sufferer of COVID-19 and in contrast to normal perception, younger age is not an exception for mortality due to COVID-19. Fever, cough and SOB were the most frequent complain. Respiratory failure alone as well as with sepsis, was found to be the leading reason for mortality. Causes of death were strongly linked with presence of comorbidities in Covid-19 patients.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Atif M and Malik I. Why is Pakistan vulnerable to COVID-19 associated morbidity and mortality? A scoping review. The International Journal of Health Planning and Management. 2020 Sep; 35(5): 1041-54. doi: 10.1002/hpm.3016.

[2] Abid K, Bari YA, Younas M, Tahir Javaid S, Imran A. Progress of COVID-19 Epidemic in Pakistan. Asia Pacific Journal of Public Health. 2020 May; 32(4): 154-6. doi: 10.1177/1010539520927259.

[3] Noreen N, Dil S, Niazi S, Naveed I, Khan N, Khan F, *et al.* COVID 19 pandemic & Pakistan; limitations and gaps. Global Biosecurity. 2020 May; 2(1): 1-11. doi: 10.31646/gbio.63.

[4] Kung S, Doppen M, Black M, Braithwaite I, Kearns C, Weatherall M, *et al.* Underestimation of COVID-19 mortality during the pandemic. ERJ Open Research. 2021 Jan; 7(1): 1-7. doi: 10.1183/23120541.00766-2020.

[5] Ali I, Sadique S, Ali S. Doctors dealing with COVID-19 in Pakistan: Experiences, perceptions, fear, and responsibility. Frontiers in Public Health. 2021 Dec; 9: 647543. doi: 10.3389/fpubh.2021.647543.

[6] Mulchandani R, Babub GR, Kaur A, Singha R, Lyngdoha T. Factors associated with differential COVID-19 mortality rates in the SEAR nations: a narrative review. IJID Regions. 2022 Feb; 3: 54–67.

DOI: https://doi.org/10.54393/pjhs.v4i02.536

doi: 10.1016/j.ijregi.2022.02.010.

[7] Chakrawarty A, Ranjan P, Thrinath A, Aggarwal E, Isaac JA, Berry P, *et al.* Assessment of preventive practices followed by general public during COVID-19 pandemic-a cross-sectional survey from India. Cureus. 2020 Oct; 12(10): e11274. doi: 10.7759/cureus.11274.

[8] Goodman KE, Magder LS, Baghdadi JD, Pineles L, Levine AR, Perencevich EN, *et al.* Impact of sex and metabolic comorbidities on coronavirus disease 2019 (COVID-19) mortality risk across age groups: 66 646 inpatients across 613 US hospitals. Clinical Infectious Diseases. 2021 Dec; 73(11): e4113-23. doi: 10.1093/cid/ciaa1787.

[9] Bryan MS, Sun J, Jagai J, Horton DE, Montgomery A, Sargis R, *et al.* Coronavirus disease 2019 (COVID-19) mortality and neighborhood characteristics in Chicago. Annals of Epidemiology. 2021 Apr; 56: 47-54. doi: 10.1016/j.annepidem.2020.10.011.

[10] Akhtar H, Khalid S, Rahman FU, Umar M, Ali S, Afridi M, *et al.* Presenting Characteristics, Comorbidities, and Outcomes Among Patients With COVID-19 Hospitalized in Pakistan: Retrospective Observational Study. JMIR Public Health and Surveillance. 2021 Dec; 7(12): e32203. doi: 10.2196/32203.

[11] Baqi S, Naz A, Sayeed MA, Khan S, Ismail H, Kumar V, *et al.* Clinical characteristics and outcome of patients with severe COVID-19 pneumonia at a public sector hospital in Karachi, Pakistan. Cureus. 2021 Feb; 13(2): e13107. doi: 10.7759/cureus.13107.

[12] Sarfaraz S, Shaikh Q, Saleem SG, Rahim A, Herekar FF, Junejo S, *et al.* Determinants of in-hospital mortality in COVID-19; a prospective cohort study from Pakistan. PLoS One. 2021 May; 16(5): e0251754. doi: 10.1371/journal.pone.0251754.

[13] Chaudhry A, Ikram A, Baig MA, Salman M, Ghafoor T, Zakir H, *et al.* Mortality analysis of COVID-19 confirmed cases in Pakistan. medRxiv. 2020 Jun: 2020-06. doi: 10.1101/2020.06.07.20121939.

[14] Olivas-Martínez A, Cárdenas-Fragoso JL, Jiménez JV, Lozano-Cruz OA, Ortiz-Brizuela E, Tovar-Méndez VH, *et al.* In-hospital mortality from severe COVID-19 in a tertiary care center in Mexico City; causes of death, risk factors and the impact of hospital saturation. PLoS One. 2021 Feb; 16(2): e0245772. doi: 10.1371/journal.pone.0245772.

[15] Tazerji SS, Shahabinejad F, Tokasi M, Rad MA, Khan MS, Safdar M, *et al.* Global data analysis and risk factors associated with morbidity and mortality of COVID-19. Gene Reports. 2022 Mar; 26: 101505. doi: 10.1016/j.genrep.2022.101505.

[16] Elezkurtaj S, Greuel S, Ihlow J, Michaelis EG, Bischoff P, Kunze CA, *et al.* Causes of death and comorbidities in hospitalized patients with COVID-19. Scientific Reports. 2021 Feb; 11(1): 1-9. doi: 10.1038/s41598-021-82862-5.

[17] Wu C, Chen X, Cai Y, Zhou X, Xu S, Huang H, *et al.* Risk factors associated with acute respiratory distress syndrome and death in patients with coronavirus disease 2019 pneumonia in Wuhan, China. JAMA Internal Medicine. 2020 Jul; 180(7): 934-43. doi: 10.1001/jamainternmed.2020.0994.

[18] Chen W and Pan JY. Anatomical and pathological observation and analysis of SARS and COVID-19: microthrombosis is the main cause of death. Biological Procedures Online. 2021 Dec; 23(1): 1-2. doi: 10.1186/s12575-021-00142-y.

[19] Beigee FS, Toutkaboni MP, Khalili N, Nadji SA, Dorudinia A, Rezaei M, *et al.* Diffuse alveolar damage and thrombotic microangiopathy are the main histopathological findings in lung tissue biopsy samples of COVID-19 patients. Pathology-Research and Practice. 2020 Oct; 216(10): 153228. doi: 10.1016/j.prp.2020.153228.

[20] Tian W, Jiang W, Yao J, Nicholson CJ, Li RH, Sigurslid HH, *et al.* Predictors of mortality in hospitalized COVID-19 patients: a systematic review and meta-analysis. Journal of Medical Virology. 2020 Oct; 92(10): 1875-83. doi: 10.1002/jmv.26050.

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Volume 4, Issue 2 (February 2023)

Original Article

Prevalence of HCV Infection in End Stage Renal Disease (ESRD) Patients on Maintenance Hemodialysis

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ABSTRACT

Hepatitis C virus (HCV) is a significant cause of morbidity and mortality in haemodialysis patients. Patients on haemodialysis are at high risk for HCV, with frequency of infection several times higher than that in non-hemodialysis patients. **Objective:** To determine the frequency of HCV infection in End Stage Renal Disease (ESRD) patients on maintenance hemodialysis. **Methods:** The Descriptive Cross-sectional study was conducted at Department of Nephrology, Liaquat University of Medical and Health Sciences Jamshoro. All patients above 18 years of age and below 60 years of age of both gender having end stage renal disease on maintenance hemodialysis with 3 months or more of maintenance hemodialysis were consecutively enrolled. Post hemodialysis patient's serum was checked for anti HCV antibody by enzyme linked immune-sorbent assay (ELISA). Presence of anti HCV antibodies in serum detected by ELISA was labeled as HCV positive. **Results:** Of 90 patients, the mean age of the patients was 46.85 ±8.21 years. There were 54 (60%) males and 36 (40%) females. The mean duration of hemodialysis was 10.39 ±3.31 months. The frequency of HCV was found to be 21 (23.3%). A significant association of HCV was found with gender (p-value 0.006) whereas age (p-value 0.597) and duration of hemodialysis (p-value 0.715) was found to be insignificant. **Conclusion:** The frequency of HCV infection was found to be 23% in ESRD patients on maintenance hemodialysis. Early recognition and treatment of which improves the patient outcome.

INTRODUCTION

According to the "National kidney foundation, chronic kidney disease is defined as decrease Glomerular filtration rate (GFR) for ≥3 months duration [1]. In stage 5 CKD also known as end stage renal disease (ESRD) the GFR is < 15 ml /min/ 1.73m^2 [2]. ESRD patients require renal replacement therapy like hemodialysis to sustain life. In the developed country like USA, the number of CKD patient on regular hemodialysis are 468,000 [3-6]. The occurrence of HCV infection in CKD - 5 is increasing as compare to general population as there is strong evidence of HCV transmission in dialysis patient [7]. HCV is transmitted through blood and its load is increasing worldwide [8-11]. Around the globe approximately 130-150 million people are infected with chronic hepatitis C. HCV infection affects liver leading to cirrhosis and hepatocellular carcinoma as well as kidneys causing albuminuria, cryoglobuminemia and membranoproliferative glomerulonephritis [12]. According to center of disease control (CDC%), the prevalence of HCV in ESRD is 8.5% [13]. In middle-east countries the prevalence of HCV in hemodialysis population 25.3% [14]. important viral factors responsible for pathogenesis of chronic hepatitis are viral diversity and replicative activity along with host factors such as immunodeficient states [15]. Increase morbidity in HCV infection in ESRD on

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maintenance hemodialysis patients is due to increase in inflammatory markers and alterations in nutritional status. HCV is also associated with increase cardiovascular mortality [16]. Many risk factors like alcohol abuse, tobacco consumption, older age of HCV acquisition, duration of infection as well as co- infection with Human immunodeficiency virus or other hepatotropic viruses are associated with more rapid progression of liver disease in hemodialysis patients. HCV is a significant cause of morbidity and mortality in haemodialysis patients. Patients on haemodialysis are at high risk for HCV, with frequency of infection several times higher than that in non-hemodialysis patients. Early detection and regression of HCV can cause reduction of mortality in haemodialysis patients. Hence, the study was aimed to determine the frequency of HCV infection in ESRD patients on maintenance hemodialysis. Early recognition and treatment of which improves the patient outcome.

METHODS

The Descriptive Cross-sectional study was conducted up on 90 patients with ESRD (having GFR <15ml/min/1.73m^2) who were on maintenance hemodialysis, at Department of Nephrology, Liaquat University of Medical and Health Sciences Jamshoro. All patients above 18 years of age and below 60 years of age of both gender having end stage renal disease on maintenance hemodialysis with 3 months or more of maintenance hemodialysis were consecutively enrolled. Patients with hepatic dysfunction, alcohol abuse, decompensated liver cirrhosis, multi organ dysfunction specifically AKI and patients with history of blood transfusions, surgery including dental procedures, tattooing, drug abuse, jaundice, hemophilia and thrombocytopenia were excluded from the study. Post hemodialysis patient's serum was checked for anti HCV antibody by enzyme linked immune-sorbent assey (ELISA). Presence of anti HCV antibodies in serum detected by ELISA was labeled as HCV positive. Descriptive statistics was analyzed by SPSS version 21.0. The quantitative variables such age, duration of hemodialysis was recorded as mean ± S.D. and qualitative variables like gender and HCV status of patients. Effect modifiers age, gender and duration of hemodialysis was controlled through stratification, post stratification chi-square test was applied, keeping P-value <0.05 as significant".

RESULTS

The mean age of the patients was found to be 46.85 ±8.21 years, with 54 (60%) males and 36 (40) females (figure 1). There were 30 (33.3% patients with ≤45 years and 60 (66.7%) patients with >45 years of age.

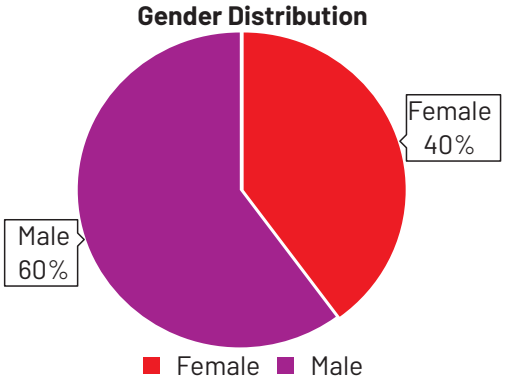

Figure 1: Gender distribution of patients

The mean duration of hemodialysis was 10.39 ±3.31 months. There were 44 (48.9%) patients with ≤10 months of hemodialysis duration whereas 46 (51.1%) patients with >10 months of hemodialysis duration. The frequency of HCV was found to be 21(23.3%). A significant association of HCV was found with gender (p-value 0.006) whereas age (p-value 0.597) and duration of hemodialysis (p- value 0.715) was found to be insignificant (Table 1).

Variable	HCV		Total	P-value
	Yes	No		
Duration of illness				
≤10 years	6 (20%)	24 (80%)	30 (100%)	0.597
>10 years	15 (25%)	45 (75%)	60 (100%)	
Total	21(23.3%)	69 (76.7%)	90 (100%)	
Gender of patients				
Male	18 (33.3%)	36 (66.7%)	54 (100%)	0.006
Female	3 (8.3%)	33 (91.7%)	36 (100%)	
Total	21(23.3%)	69 (76.7%)	90 (100%)	
Duration of hemodialysis				
≤10	11 (25%)	33 (75%)	44 (100%)	0.715
>10	10 (21.7%)	36 (78.3%)	46 (100%)	

Table 1: Comparison of HCV among patients (n=90)

DISCUSSION

This study was conducted in a large public sector hospital to assess the hepatitis C virus infection in patients with ESRD. For this purpose, patients above 18 years of age and below 60 years of age of both gender having end stage renal disease on maintenance hemodialysis with 3 months or more of maintenance hemodialysis were consecutively enrolled. ESRD patients require renal replacement therapy like hemodialysis to sustain life. In the developed country like USA, the number of CKD patient on regular hemodialysis are 468,000 [17]. The occurrence of HCV infection in CKD -5 is increasing as compare to general population as there is strong evidence of HCV transmission in dialysis patient. Around the globe approximately 130-150 million people are infected with chronic hepatitis C. HCV infection affects liver leading to cirrhosis and hepatocellular carcinoma as well as kidneys causing albuminuria, cryoglobuminemia and

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membranoproliferative glomerulonephritis.[17] In the current study, the frequency of HCV was found to be 23.3%. This finding found similar with a study conducted in middle-east countries in which the prevalence of HCV in hemodialysis population was found to be 25.3%.8 However, in a study by centre of diseases control (CDC), the prevalence of HCV in ESRD was reported to be 8.5% [18]. Important viral factors responsible for pathogenesis of chronic hepatitis are viral diversity and replicative activity along with host factors such as immunodeficient states. Increase morbidity in HCV infection in ESRD on maintenance hemodialysis patients is due to increase in inflammatory markers and alterations in nutritional status [19]. HCV is also associated with increase cardiovascular mortality. Many risk factors like alcohol abuse, tobacco consumption, older age of HCV acquisition, duration of infection as well as co- infection with Human immunodeficiency virus or other hepatotropic viruses are associated with more rapid progression of liver disease in hemodialysis patients. In the current study, we failed to collect data on alcohol abuse, tobacco consumption and duration of infection as well as co-infection with Human immunodeficiency virus or other hepatotropic viruses which were accounted by many other researchers [20, 21]. In this study, however, HCV was found significantly associated with gender while age and duration of hemodialysis was found to be insignificant while Ladino M et al, found a significant association between female gender and comorbid infection of HCV [4]. It is reported that HCV is a significant cause of morbidity and mortality in haemodialysis patients. Current study postulates that the patients on haemodialysis are at high risk for HCV, with frequency of infection several times higher than that in non-hemodialysis patients, which is in line with the studies conducted by Pujol H., Crook ED., and Fabrizi F [12, 14, 15].The findings of the study could be highlighted in the light of limitation that this study was a descriptive study. Furthermore, certain important variables were not included. Future multi-centre studies are recommended to preclude the findings of this study.

CONCLUSIONS

The frequency of HCV infection was found to be 23% in ESRD patients on maintenance hemodialysis. Early recognition and treatment of which improves the patient outcome".

Conflicts of Interest

The authors declare no conflict of interest

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REFERENCES

[1] Bahirwani R, Barin B, Olthoff K, Stock P, Murphy B, Rajender Reddy K, *et al*. Chronic kidney disease after liver transplantation in human immunodeficiency virus/hepatitis C virus-coinfected recipients versus human immunodeficiency virus-infected recipients without hepatitis C virus: Results from the national institutes of health multi-site study. Liver Transplantation. 2013 Jun; 19(6): 619-26. doi: 10.1002/lt.23648

[2] Shaikh GM, Khan DA, Khan FA, Ali MK. Validation of modified estimated glomerular filtration rate in chronic kidney disease patients. Journal of the College of Physicians and Surgeons Pakistan. 2013 Nov; 23(10): 793-97.

[3] Zubair UB and Butt B. Assessment of quality of sleep and its relationship with psychiatric morbidity and socio-demographic factors in the patients of chronic renal disease undergoing hemodialysis. Journal of the College of Physicians and Surgeons Pakistan. 2017 Jul; 27(7): 427-31.

[4] Ladino M, Pedraza F, Roth D. Hepatitis C virus infection in chronic kidney disease. Journal of the American Society of Nephrology. 2016 Aug; 27(8): 2238-46. doi: 10.1681/ASN.2016010030

[5] Li M, Wang P, Yang C, Jiang W, Wei X, Mu X, *et al*. A systematic review and meta-analysis: Does hepatitis C virus infection predispose to the development of chronic kidney disease?. Oncotarget. 2017 Feb; 8(6): 10692-702 doi: 10.18632/oncotarget.12896

[6] Molnar MZ, Alhourani HM, Wall BM, Lu JL, Streja E, Kalantar-Zadeh K, *et al*. Association of hepatitis C viral infection with incidence and progression of chronic kidney disease in a large cohort of US veterans. Hepatology. 2015 May; 61(5): 1495-502. doi: 10.1002/hep.27664

[7] Hakim W, Sheikh S, Inayat I, Caldwell C, Smith D, Lorber M, *et al*. HCV response in patients with end stage renal disease treated with combination pegylated interferon α-2a and ribavirin. Journal of clinical gastroenterology. 2009 May; 43(5): 477-81. doi: 10.1097/MCG.0b013e318180803a

[8] Ashkani-Esfahani S, Alavian SM, Salehi-Marzijarani M. Prevalence of hepatitis C virus infection among hemodialysis patients in the Middle-East: A systematic review and meta-analysis. World journal of gastroenterology. 2017 Jan; 23(1): 151. doi: 10.3748/wjg.v23.i1.151

[9] Ocal S, Selcuk H, Korkmaz M, Altun R, Yildirim AE, Akbas E. Effect of HLA on hepatitis C virus clearance and persistence in anti-HCV-positive end-stage renal disease patients. Saudi Journal of Gastroenterology:

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Official Journal of the Saudi Gastroenterology Association. 2014 May; 20(3): 175-81. doi: 10.4103/1319-3767.133007

[10] Fabrizi F, Messa P, Martin P. Recent advances on hepatitis C virus in dialysis population. Kidney and Blood Pressure Research. 2014; 39(4): 260-71. doi: 10.1159/000355803

[11] Poynard T, Yuen MF, Ratzin V, Lai CL. Viral hepatitis C. The Lancet. 2003 Dec; 362(9401): 2095-100. doi: 10.1016/S0140-6736(03)15109-4

[12] Pujol FH, Ponce JG, Lema MG, Capriles F, Devesa M, Sirit F, *et al*. High incidence of hepatitis C virus infection in hemodialysis patients in units with high prevalence. Journal of Clinical Microbiology. 1996 Jul; 34(7): 1633-6. doi: 10.1128/jcm.34.7.1633-1636.1996

[13] Bergman S, Accortt N, Turner A, Glaze J. Hepatitis C infection is acquired pre-ESRD. American journal of kidney diseases. 2005 Apr; 45(4): 684-9. doi: 10.1053/j.ajkd.2004.12.014

[14] Crook ED, Penumalee S, Gavini B, Filippova K. Hepatitis C is a predictor of poorer renal survival in diabetic patients. Diabetes Care. 2005 Sep; 28(9): 2187-91. doi: 10.2337/diacare.28.9.2187

[15] Fabrizi F, Poordad FF, Martin P. Hepatitis C infection and the patient with end-stage renal disease. Hepatology. 2002 Jul; 36(1): 3-10. doi: 10.1053/jhep.2002.34613

[16] Centers for Disease Control and Prevention. Recommendations for preventing transmission of infections among chronic hemodialysis patients. MMWR. 2001; 50(5): 1-43.

[17] Bukh J, Wantzin P, Krogsgaard K, Knudsen F, Purcell RH, Miller RH, *et al*. High prevalence of hepatitis C virus (HCV) RNA in dialysis patients: failure of commercially available antibody tests to identify a significant number of patients with HCV infection. Journal of Infectious Diseases. 1993 Dec; 168(6): 1343-8. doi: 10.1093/infdis/168.6.1343

[18] Nakayama E, Akiba T, Marumo F, Sato C. Prognosis of anti-hepatitis C virus antibody-positive patients on regular hemodialysis therapy. Journal of the American Society of Nephrology. 2000 Oct; 11(10): 1896-902. doi: 10.1681/ASN.V11101896

[19] Sterling RK, Sanyal AJ, Luketic VA, Stravitz RT, King AL, Post AB, *et al*. Chronic hepatitis C infection in patients with end stage renal disease: characterization of liver histology and viral load in patients awaiting renal transplantation. The American journal of gastroenterology. 1999 Dec; 94(12): 3576-82. doi: 10.1111/j.1572-0241.1999.01649.x

[20] Izopet J, Rostaing L, Sandres K, Cisterne JM, Pasquier C, Rumeau JL, *et al*. Longitudinal analysis of hepatitis C virus replication and liver fibrosis progression in renal transplant recipients. The Journal of Infectious Diseases. 2000 Mar; 181(3): 852-8. doi: 10.1086/315355

[21] Mathurin P, Mouquet C, Poynard T, Sylla C, Benalia H, Fretz C, *et al*. Impact of hepatitis B and C virus on kidney transplantation outcome. Hepatology. 1999 Jan; 29(1): 257-63. doi: 10.1002/hep.510290123

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Original Article

Frequency of Liver Fibrosis by Non-Invasive Marker in Patients with Non-Alcohol Fatty Liver Diseases

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ABSTRACT

Nonalcoholic fatty liver disease (NAFLD) is one of the most important causes of liver disease. NAFLD is commonly associated with obesity, insulin resistance and other metabolic abnormalities such as hypertriglyceridemia and hyperuricemia. Patients with NAFLD can be properly rationalized and with early exploration and management of fatty liver the progression and complications of NAFLD in relation to liver fibrosis can be reduced on priority basis because the APRI is noninvasive and a simple calculation of two laboratorial variables. **Objective:** To determine the frequency of liver fibrosis by non-invasive marker in patients with non-alcohol fatty liver disease. **Methods:** This cross-sectional descriptive study was conducted upon 164 patients with NAFLD, presented at Department of Medicine, Liaquat University Hospital, Hyderabad. All the patients with NAFLD were evaluated and explored for liver fibrosis through APRI by taking 2cc venous blood sample in a sterilized syringe by principal investigator and send to laboratory for analysis to get the AST and platelet count. An APRI score greater than 0.7 was set cut off for significant hepatic fibrosis. The data were collected on pre-designed proforma. The study lasted 6 months from 26th February 2020 to 31st August 2020. **Results:** The mean age of the patients was 48.15±11.13 years. Frequency of liver fibrosis by non-invasive marker in patients with non-alcohol fatty liver disease was 10.98% (18/164). The mean APRI score was found to be 1.8±0.6. **Conclusions:** It was concluded that APRI is noninvasive and a simple calculation of two laboratory variables and can easily be used at the bedside or in an outpatient setting to assess the liver fibrosis. In this way, the management of NAFLD can be improved.

INTRODUCTION

Nonalcoholic fatty liver disease (NAFLD) is one of the most important causes of liver disease worldwide and will likely emerge as the leading reason of end stage liver disease in the near future thus placing a growing strain on health-care systems [1, 2]. It has a global prevalence of 24% and involves a high risk of liver-related morbidity and mortality along with metabolic comorbidities and covers a wide spectrum of histologic lesions, ranging from isolated hepatic steatosis (NAFLD) to nonalcoholic steatohepatitis (NASH), the latter characterized by the presence of lobular inflammation and hepatocyte ballooning with or without fibrosis [3-5]. NAFLD is commonly associated with obesity and insulin resistance which per se are closely related to a cluster of other metabolic abnormalities such as hypertriglyceridemia and hyperuricemia [6]. As per World Gastroenterology Organization Global Guidelines the NAFLD prevalence rate in general Pakistani population is 18% [7]. A number of small population-based studies have reported general as well as gender specific NAFLD frequency rates and disease risk factors [8, 9]. As globally declared the alarmingly increasing frequency of NAFLD could be a manifestation of gradual rise in overweight / obesity along with common metabolic health complications [10]. Literature has determined that the

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addition of established simple markers augmented the diagnostic performance and that liver biopsy could be avoided in 88% of cases [11]. The aspartate aminotransferase-to-platelet ratio index (APRI) score has been validated in patients with chronic liver disease [12]. The prevalence for liver fibrosis through APRI in NAFLD is 15% [13]. The major question addressed in present study was to explore the susceptibility of Pakistani population towards existence of liver fibrosis in NAFLD through simple noninvasive markers, to which the study was aimed to determine the accuracy of Non Invasive Marker (APRI) in diagnosis of Liver Fibrosis among NAFLD patients by measuring frequency of liver fibrosis by non-invasive marker in patients with Non-alcohol fatty liver disease.

METHODS

This cross-sectional descriptive study was conducted upon 164 patients with NAFLD, presented at Department of Medicine, Liaquat University Hospital-Hyderabad. All the patients with NAFLD were evaluated and explored for liver fibrosis through APRI by taking 2cc venous blood sample in a sterilized syringe and send to laboratory for analysis to get the AST and platelet count. An APRI score greater than 0.7 was set cut off for significant hepatic fibrosis. The sample size was calculated by WHO open epi calculator via taking prevalence of liver fibrosis by non-invasive marker (APRI > 1.0) in non-alcoholic fatty liver diseases as 4% with margin of error as 3% and confidence interval of 95%. The patients with NAFLD for = 6 weeks duration not taking any treatment, of 20-60 years of age and either gender were included in the study while the patients having history of daily alcohol consumption (evaluate on history), patients taking corticosteroids, immune-suppressive therapy and lipid-lowing agents or patients of known cases of chronic liver diseases as chronic viral hepatitis or autoimmune hepatitis, malabsorption syndrome and chronic renal failure and the pregnant and lactating ladies were excluded from the study The data were collected on pre-designed proforma. The data of all patients were analyzed in SPSS version 20.00. The frequency and percentage were calculated for gender and residence (urban or rural), hypertension, smoking, obesity (BMI), diabetes mellitus, hyperlipidemia, hypomagnesemia, hyperuricemia and diabetes mellitus and liver fibrosis. The study lasted 6 months from 26th February 2020 to 31st August 2020.

RESULTS

There were 164 patients with NAFLD included in this study. The mean age of the patients was 48.15±11.13 years and duration of NAFLD was 10.32±2.93 week and other demographic are also reported in Table 1. The mean APRI score was found to be 1.8±0.6. There were 77 (46.95%) males and 87(53.05%) females (Table 1).

Variables	Mean ± SD / N (%)
Age (Years)	48.15±11.13
Duration Of NAFLD (Weeks)	10.32±2.93
Weight (Kg)	58.84±10.11
Height (Cm)	162.64±7.78
BMI (Kg/M2)	22.20±3.27
Gender	
Male	87 (53.05%)
Female	77 (46.95%)
Residence	
Urban	102 (62.2%)
Rural	62 (37.8%)
APRI Score	1.8 + 0.6.

Table 1: Sample Description

Out of 164 cases, 102(62.2%) were hypertensive, 98(59.8%) diabetic mellitus, 49(29.9%) smoker, Hyperlipidemia 42(25.6%) and Hypomagnesemia 50 (30.5%) as shown in reported in Table 2. Frequency of liver fibrosis by non-invasive marker in patients with non-alcohol fatty liver disease was 10.98% (18/164). Stratification analysis was performed and observed that rate of liver fibrosis by non-invasive marker in patients with non-alcohol fatty liver disease was not statistically significant among different age groups, gender, residential status, obesity and smokers. It was also not statistically significant with hypertension and diabetic mellitus while rate of liver fibrosis by non-invasive marker in patients with non-alcohol fatty liver disease was significantly high in those cases who had hyperlipidemia or hypomagnesemia.

Variables		Liver Fibrosis Yes	Liver Fibrosis No	Total	p-Value
Hypertension	Yes	10 (9.8%)	92 (90.2%)	102	0.538
	No	9 (12.9%)	54 (87.1%)	62	
Diabetic Mellitus	Yes	11 (11.2%)	87 (88.8%)	98	0.901
	No	7 (10.6%)	59 (89.4%)	66	
Hyperlipidemia	Yes	14 (33.3%)	28 (66.7%)	42	0.0005
	No	4 (3.3%)	18 (96.7%)	122	
Hypomagnesemia	Yes	14 (28%)	36 (72%)	50	0.0005
	No	4 (3.5%)	110 (96.5%)	114	

Table 2: Frequency of Liver Fibrosis by Non-Invasive Marker in Patients with Non-Alcohol Fatty Liver Disease

DISCUSSION

Non-alcoholic fatty liver disease (NAFLD) affects up to 30% of the general population and is the hepatic manifestation of the metabolic syndrome [14]. NAFLD is a spectrum of diseases that encompasses simple steatosis, non-alcoholic steatohepatitis (NASH) and fibrosis, which can lead to cirrhosis, liver failure and hepatocellular carcinoma [15]. However, not all patients progress through the full hepatological spectrum of NAFLD [16, 17]. Determinants of progression include diabetes, diet and ethnicity but the most accurate predictor of liver-related mortality is

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presence of liver fibrosis on biopsy [18-20]. It is neither feasible nor desirable to perform a liver biopsy in every patient with suspected NAFLD because the procedure is invasive, associated with potential complications, cost, sampling error and inter-observer variability. Thus, non-invasive liver tests (NILTs) have been developed as an alternative to liver biopsy. These can be biomarker based or based on routinely collected clinical and laboratory data such as NAFLD fibrosis score (NFS), Fib-4, BARD, aspartate transaminase (AST) to platelet ratio index (APRI) and the AST/alanine transaminase (ALT) ratio [21]. Liver stiffness, measured by transient elastography (TE), acoustic radiation force impulse or MRI can be a surrogate marker of fibrosis, but requires specialist equipment and/or skilled personnel to conduct the tests [22]. In this study the mean age of the patients was 48.15±11.13 years and duration of NAFLD was 10.32±2.93 week while in the study by Kim *et al.*, the mean age was reported to be 44±6.7 years. There were 46.95% male and 53.05% female. Out of 164 cases, 62.2% were hypertensive, 59.8% diabetic mellitus, 29.9% smoker, Hyperlipidemia 25.6% and Hypomagnesemia 30.5%. The prevalence of NAFLD has increased rapidly over the past two decades in the Asia-Pacific region. NAFLD is not uncommon in subjects who are considered non-obese. Previous studies have reported a prevalence of NAFLD that ranges from 7.27% to 23.4% in the non-obese population [23]. In this study frequency of liver fibrosis by non-invasive marker in patients with non-alcohol fatty liver disease was 10.98%. Wai *et al.*, validated the aspartate aminotransferase-to-platelet ratio index (APRI) score in patients with chronic liver disease as value more than 0.6, while our study reported an APRI score of 1.8 [12]. Vernon *et al.*, reported the prevalence for liver fibrosis through APRI in NAFLD is 15% [13]. In a prospective study of 400 US military personnel and their families (mean age 55 years), the prevalence of NAFLD by ultrasound was 46% [24]. Factors associated with NAFLD included male sex, increasing age, and the presence of systemic hypertension, obesity, or diabetes which are in line with the results of our study. In a population-based sample that included 2133 subjects from the US who reported moderate or no alcohol intake, hepatic steatosis was present in 30 and 32%, respectively [25]. Estimates of prevalence of NAFLD in Asia-Pacific regions range from 5 to 30%, depending upon the population studied [26]. In the United States, studies report a prevalence of NAFLD of 10 to 46%, with most biopsy-based studies reporting a prevalence of liver fibrosis from 3 to 5 percent while our study reported twice of that prevalence i.e., 10.98% [25]. Worldwide, NAFLD has a reported prevalence of 6 to 35% (median 20%).

CONCLUSIONS

In this study frequency of liver fibrosis by non-invasive marker in patients with non-alcohol fatty liver disease was 10.98%. APRI is noninvasive and a simple calculation of two laboratory variables and can easily be used at the bedside or in an outpatient setting to assess the liver fibrosis. In this way we can improve the management of NAFLD and to prevent its development, clinicians should be particularly aware of the possibility of NAFLD inpatients.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Townsend SA and Newsome PN. Non-alcoholic fatty liver disease in 2016. British Medical Bulletin. 2016 Sep; 119(1): 143. doi: 10.1093/bmb/ldw031.

[2] Yki-Järvinen H. Diagnosis of non-alcoholic fatty liver disease (NAFLD). Diabetologia. 2016 Jun; 59(6): 1104-11. doi: 10.1007/s00125-016-3944-1.

[3] Hardy T, Oakley F, Anstee QM, Day CP. Nonalcoholic fatty liver disease: pathogenesis and disease spectrum. Annual Review of Pathology: Mechanisms of Disease. 2016 May; 11: 451-96. doi: 10.1146/annurev-pathol-012615-044224.

[4] Leoni S, Tovoli F, Napoli L, Serio I, Ferri S, Bolondi L. Current guidelines for the management of non-alcoholic fatty liver disease: A systematic review with comparative analysis. World Journal of Gastroenterology. 2018 Aug; 24(30): 3361. doi: 10.3748/wjg.v24.i30.3361.

[5] Dassanayake AS. Nonalcoholic fatty liver disease: identifying the disease burden in Sri Lanka. Euroasian Journal of Hepato-Gastroenterology. 2018 Jan; 8(1): 69. doi: 10.5005/jp-journals-10018-1263.

[6] Cho HC. Prevalence and factors associated with nonalcoholic fatty liver disease in a nonobese Korean population. Gut and Liver. 2016 Jan; 10(1): 117. doi: 10.5009/gnl14444.

[7] Ghani RA, Saqlain M, Zafar MM, Jabeen S, Naqvi SM, Raja GK. Identification of metabolic risk phenotypes predisposing to non-alcoholic fatty liver disease in a Pakistani Cohort. Pakistan Journal of Medical Sciences. 2017 Jan; 33(1): 121. doi: 10.12669/pjms.331.11445.

[8] Benedict M and Zhang X. Non-alcoholic fatty liver disease: An expanded review. World Journal of Hepatology. 2017 Jun; 9(16): 715. doi: 10.4254/wjh.v9.i16.715.

DOI: https://doi.org/10.54393/pjhs.v4i02.572

[9] Pappachan JM, Babu S, Krishnan B, Ravindran NC. Non-alcoholic fatty liver disease: a clinical update. Journal of Clinical and Translational Hepatology. 2017 Dec; 5(4): 384. doi: 10.14218/JCTH.2017.00013.

[10] Hassan K, Bhalla V, El Regal ME, A-Kader HH. Nonalcoholic fatty liver disease: a comprehensive review of a growing epidemic. World Journal of Gastroenterology: WJG. 2014 Sep; 20(34): 12082. doi: 10.3748/wjg.v20.i34.12082.

[11] Guha IN, Parkes J, Roderick P, Chattopadhyay D, Cross R, Harris S, *et al.* Noninvasive markers of fibrosis in nonalcoholic fatty liver disease: Validating the European Liver Fibrosis Panel and exploring simple markers. Hepatology. 2008 Feb; 47(2): 455-60. doi: 10.1002/hep.21984.

[12] Wai CT, Greenson JK, Fontana RJ, Kalbfleisch JD, Marrero JA, Conjeevaram HS, *et al.* A simple noninvasive index can predict both significant fibrosis and cirrhosis in patients with chronic hepatitis C. Hepatology. 2003 Aug; 38(2): 518-26. doi: 10.1053/jhep.2003.50346.

[13] Vernon G, Baranova A, Younossi ZM. Systematic review: the epidemiology and natural history of non-alcoholic fatty liver disease and non-alcoholic steatohepatitis in adults. Alimentary Pharmacology & Therapeutics. 2011 Aug; 34(3): 274-85. doi: 10.1111/j.1365-2036.2011.04724.x.

[14] Tai FW, Syn WK, Alazawi W. Practical approach to non-alcoholic fatty liver disease in patients with diabetes. Diabetic Medicine. 2015 Sep; 32(9): 1121-33. doi: 10.1111/dme.12725.

[15] Noguchi H, Tazawa Y, Nishinomiya F, Takada G. The relationship between serum transaminase activities and fatty liver in children with simple obesity. Pediatrics International. 1995 Oct; 37(5): 621-5. doi: 10.1111/j.1442-200X.1995.tb03389.x.

[16] Charatcharoenwitthaya P, Lindor KD, Angulo P. The spontaneous course of liver enzymes and its correlation in nonalcoholic fatty liver disease. Digestive Diseases and Sciences. 2012 Jul; 57: 1925-31. doi: 10.1007/s10620-012-2098-3.

[17] Levene AP and Goldin RD. The epidemiology, pathogenesis and histopathology of fatty liver disease. Histopathology. 2012 Aug; 61(2): 141-52. doi: 10.1111/j.1365-2559.2011.04145.x.

[18] McPherson S, Hardy T, Henderson E, Burt AD, Day CP, Anstee QM. Evidence of NAFLD progression from steatosis to fibrosing-steatohepatitis using paired biopsies: implications for prognosis and clinical management. Journal of Hepatology. 2015 May; 62(5): 1148-55. doi: 10.1016/j.jhep.2014.11.034.

[19] Angulo P. Long-Term Mortality in Nafld. is Liver Histology of Any Prognostic Significance? Hepatology (Baltimore, Md.). 2010 Feb; 51(2): 373. doi: 10.1002/hep.23521.

[20] Angulo P, Kleiner DE, Dam-Larsen S, Adams LA, Bjornsson ES, Charatcharoenwitthaya P, *et al.* Liver fibrosis, but no other histologic features, is associated with long-term outcomes of patients with nonalcoholic fatty liver disease. Gastroenterology. 2015 Aug; 149(2): 389-97. doi: 10.1053/j.gastro.2015.04.043.

[21] Chalasani N, Younossi Z, Lavine JE, Diehl AM, Brunt EM, Cusi K, *et al.* The diagnosis and management of non-alcoholic fatty liver disease: practice Guideline by the American Association for the Study of Liver Diseases, American College of Gastroenterology, and the American Gastroenterological Association. Hepatology. 2012 Jun; 55(6): 2005-23. doi: 10.1002/hep.25762.

[22] Parkes J, Roderick P, Harris S, Day C, Mutimer D, Collier J, *et al.* Enhanced liver fibrosis test can predict clinical outcomes in patients with chronic liver disease. Gut. 2010 Sep; 59(9): 1245-51. doi: 10.1136/gut.2009.203166.

[23] Kim NH, Kim JH, Kim YJ, Yoo HJ, Kim HY, Seo JA, *et al.* Clinical and metabolic factors associated with development and regression of nonalcoholic fatty liver disease in nonobese subjects. Liver International. 2014 Apr; 34(4): 604-11. doi: 10.1111/liv.12454.

[24] Williams CD, Stengel J, Asike MI, Torres DM, Shaw J, Contreras M, *et al.* Prevalence of nonalcoholic fatty liver disease and nonalcoholic steatohepatitis among a largely middle-aged population utilizing ultrasound and liver biopsy: a prospective study. Gastroenterology. 2011 Jan; 140(1): 124-31. doi: 10.1053/j.gastro.2010.09.038.

[25] Amarapurkar DN, Hashimoto E, Lesmana LA, Sollano JD, Chen PJ, Goh KL, *et al.* How common is non-alcoholic fatty liver disease in the Asia–Pacific region and are there local differences? Journal of Gastroenterology and Hepatology. 2007 Jun; 22(6): 788-93. doi: 10.1111/j.1440-1746.2007.05042.x.

[26] Younossi ZM, Stepanova M, Afendy M, Fang Y, Younossi Y, Mir H, *et al.* Changes in the prevalence of the most common causes of chronic liver diseases in the United States from 1988 to 2008. Clinical Gastroenterology and Hepatology. 2011 Jun; 9(6): 524-30. doi: 10.1016/j.cgh.2011.03.020.

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Original Article

Knowledge, Attitude, and Practices of Soft Drinks and its Association with Gender among Nursing Students, Karachi, Pakistan

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ABSTRACT

It has been recognized that soft drinks have become the third most consumed beverage worldwide. In contrast, it has a detirmental effect on health. **Objective:** To assess the knowledge, attitude, and practices of soft drink consumption and determine its association with gender among nursing students in Karachi, Pakistan. **Methods**: This cross-sectional study was accomplished at three nursing institutions in Karachi from 1st January 2018 to 30th June 2018. In this study, there was a total of 369 students of male and female gender were enrolled for the study. Subjects were approached by a non-probability convenient sampling method. Self-structured and pretested questionnaire was used for the collection of data. **Results:** Among 369 subjects, the majority of 261 (70.7%) were male, and 315 (85.4%) were single. 310 (84%) participants knew the deleterious effects of soft drinks. More than 85% admitted that soft drinks are bad for health. Two knowledge questions heard about soft drinks and the idea of the bad effects of soft drinks showed statistically significant associations with gender variables (p-values < 0.05). Whereas only attitude questions regarding the amount of drink students prefer and one practice question related to favorite drink were found to be significantly associated with gender variable (p-values < 0.05). **Conclusion:** Most nursing students had a fair knowledge of soft drink and their hazardous effects on their health. Despite knowing the harmful consequences, nursing students consume soft drinks.

INTRODUCTION

In recent years, the consumption of soft drinks has become a trend worldwide [1]. Recent research has established that soft drinks have become the 3rd most consumed beverage across the globe [2]. It has been affirmed by current research that carbonated soft drinks are recognized as an integral part of welcoming guests [3]. Despite knowing its deleterious adverse effects on health, people consume fizzy beverages frequently [4]. Soft drinks are carbonated drinks that contain water, carbon dioxide, color, synthetic flavors, and preservatives [5-6]. It is shown in a current research study that there is nothing healthy about carbonated drinks [7]. It is established by research that a healthy diet could promote optimum health, growth, and mental development [8]. However, soft drinks pose risks to an individual's health, including obesity, tooth decay, kidney diseases, osteoporosis, nutritional deficiencies, heart disease, and neurological disorders [9-11]. Soft drinks contain added sugar which may cause

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overweight, obesity [12], and type-II diabetic mellitus [13]. In addition, consuming soft drinks may increase the risk of insulin resistance and inflammation [14]. Research revealed that the main reasons for consuming carbonated drinks are dieting, good taste, hot weather, more energy, refreshment, and better sports performance [15]. Despite the risk, the consumption of carbonated drinks is highest among young students [16]. Considering that incredible change in dietary habits among youth has been observed in several populations. According to the new pattern, carbonated drinks have replaced the healthy diet including vegetables, fish, and fruits that have been considered good for health [17]. There is a paucity of data related to carbonated drinks among nursing students in the Pakistani context. Hence, the present study has been undertaken to assess the knowledge, attitude, and practices of soft drink consumption and determine its association with gender among nursing students in Karachi, Pakistan.

METHODS

A cross-sectional study was employed at a public-sector organization (Institute of Nursing, Dow University of Health Sciences) and two other private-sector organizations (New Life College of Nursing and Karachi Kings College of Nursing) in Karachi. The study duration was six months, starting from 1st January 2018 to 30th June 2018. For the determination of sample size OpenEpi version 3.0.was used, considering a 95% confidence level, the sample size of 369 was calculated for both genders of subjects. Both genders of nursing students with diplomas and undergraduates from the first year to the final year were included in the study. The subjects who were not willing to participate and enrolled in one-year post-basic specialty programs were excluded from the study. Subjects were approached by the non-probability convenient sampling method. Data were collected by using an adapted and validated questionnaire. The researcher coded all questionnaires to maintain anonymity. After taking written informed consent, nursing students were invited to fill out the questionnaire. The participation of subjects was fully voluntary and guaranteed the confidentiality of participants. Institutional permissions were obtained from the respective organization. Data was entered and analyzed through SPSS version 21.0. Frequency and percentages were calculated for knowledge, attitude, and soft drink consumption practices. The Chi-square test of independence was employed to determine any potential association with the gender of the nursing students with a level of significance set as ≤5%.

RESULTS

Out of 369 study participants, the majority, 261 (70.7%), were male, and 315 (85.4%) were single. Two third of the participants, 245 (66.4%) were 18 to 23 years old. Regarding discipline, 178 (48.2%) were studying for a nursing diploma (Table 1).

Demographic factor	n (%)
Age (Years)	
18-23	245 (66.4%)
29-29	102 (27.6%)
30-35	22 (6%)
Gender	
Male	261 (70.7%)
Female	108 (29.3%)
Marital Status	
Single	315 (85.4%)
Married	54 (14.6%)
Discipline	
Diploma in Nursing	178 (48.2%)
Bachelor in Nursing	191 (51.8%)

Table 1: The Socio-Demographic factors of study participants (N=369)

Table 2 depicts the Level of knowledge, attitude, and practice of soft drinks among nursing students. There were a total of 11 questions: three for knowledge, three for attitude, and five for practice. Most participants, 351(95%), were familiar with soft drinks. 310 (84%) participants knew the deleterious effects of soft drinks. More than 85% admitted that soft drinks are bad for health. Half of the participants chose soft drinks due to taste, and 216 (59%) reported using soft drinks at home with family and friends. Most students, 282 (76%), liked soft drinks. When asked about quitting soft drinks, 243 (66%) agreed to refrain from soft drinks. Furthermore, 187 (51) students loved to use fruit juice, whereas percentages of dew and coca cola were 17% and 16%, respectively, and 136 (37%) stated to consume soft drinks weekly.

Questions	n (%)
Knowledge	
Have you heard about soft drinks?	
Yes	351 (95)
No	18 (5)
Do you have any idea of the bad effects of soft drinks?	
Yes	310 (84)
No	59 (16)
Do you think having these soft drinks is?	
Good for health	19 (5)
Bad for health	318 (86)
Do not Know	32 (9)
Attitude	
How do you choose your soft drinks?	
TV	17 (4)
Easy availability in the market	38 (10)
Family and friends	110 (30)
Taste	183 (50)
Others	21 (6)

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At a time, how much of these drinks do you prefer having?	
A glass 100ml	222 (60)
A glass bottle 500ml	86 (23)
A pet bottle 500ml	42 (11)
More than 500 ml	19 (5)
When do you like having these drinks?	
When at home with family and friends	216 (59)
When at University/College with colleagues	107 (29)
When feel thirsty	46 (12)
Practice	
Do you enjoy having soft drinks?	
Yes	282 (76)
No	87 (24)
If asked to, would you stop drinking soft drinks?	
Yes	243 (66)
No	126 (34)
What would you choose from these drinks?	
Fruit juice	187 (51)
Carbonated drink	57 (15)
Slice	22 (6)
Milk	91(25)
Others	12(3)
How often do you consume soft drinks?	
Daily	50(14)
Every alternate day	49(13)
Weekly	136 (37)
Monthly	112 (30)
Never	22 (6)
What is your favorite drink?	
Pepsi	48 (13)
Coco cola	57 (16)
4up	55 (15)
Dew	62 (17)
Sprite	38 (10)
Others	109 (29)

Table 2: Level of knowledge, attitude, and practice of soft drinks among nursing students (N=369)

Table 3 reveals the association of knowledge, attitude, and practice of soft drinks with the gender of nursing students. Two knowledge questions heard about soft drinks, and the idea of the bad effects of soft drinks showed statistically significant associations with gender variables (p-values < 0.05). Only attitude questions regarding the amount of drink students prefer were significantly associated with gender (p-value=0.004). The type of drink from practice questions was again the only variable that reached the significance level; however, other variables, such as enjoying a soft drink, quitting a soft drink, and choosing a drink, were close to the significance level.

Questions	Gender		p-value
	Male (f) %	Female (f) %	
Knowledge			
Have you heard about soft drinks?			
Yes	255 (69)	96 (26)	<0.001*
No	6 (1.7)	12 (3.3)	
Do you have any idea of the bad effects of soft drinks?			
Yes	209 (57)	101 (27)	<0.001*
No	52 (14)	7 (2)	
Do you think having these soft drinks is?			
Good for health	10 (2.7)	9 (2.4)	0.144
Bad for health	226 (61.2)	92 (25)	
Do not Know	25 (6.8)	7 (1.9)	
Attitude			
How do you choose your soft drinks?			
TV	14 (3.8)	3 (0.8)	0.72
Easy availability in the market	29 (7.9)	9 (2.4)	
Family and friends	75 (20.3)	35 (9.4)	
Taste	128 (34.7)	55 (15)	
Others	15 (4%)	6 (1.7)	
At a time how much of these drinks do you prefer having?			
A glass 100ml	142 (38.5)	80 (21.7)	0.004*
A glass bottle 500ml	67 (18.1)	19 (5.1)	
A pet bottle 500ml	36 (9.8)	6 (1.7)	
More than 500 ml	16 (4.3)	3 (0.8)	
When do you like having these drinks?			
When at home with family and friends	149 (40.37)	67 (18.15)	0.657
When at University/College with colleagues	79 (21.4)	28 (7.58)	
When feel thirsty	33 (9)	13 (3.5)	
Practice			
Do you enjoy having soft drinks?			
Yes	206 (55.82)	76 (20.6)	0.078
No	55 (14.9)	32 (8.68)	
If asked to, would you stop drinking soft drinks?			
Yes	179 (48.5)	64 (17.35)	0.086
No	82 (22.22)	44 (11.93)	
What would you choose from these drinks?			
Fruit juice	125 (33.9)	62 (16.8)	0.077
Carbonated drink	45 (12.2)	12 (3.3)	
Slice	12 (3.3)	10 (2.7)	
Milk	71 (19.24)	20 (5.4)	
Others	8 (2.16)	4 (1)	
How often do you consume soft drinks?			
Daily	39 (10.56)	11 (3)	0.221
Every alternate day	36 (9.75)	13 (3.52)	
Weekly	101 (27.37)	35 (9.5)	
Monthly	71 (19.24)	41 (11.11)	
Never	14 (3.79)	8 (2.16)	
What is your favorite drink?			
Pepsi	65 (17.61)	23 (6.23)	0.013*
Coco cola	42 (11.4)	15 (4)	
7up	36 (9.8)	19 (5.14)	
Dew	48 (13)	14 (3.8)	

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Sprite	27(7.31)	11(3)	
Others	45(12.2)	24(6.5)	

Table 3: Association of knowledge, attitude, and practice of soft drink with the gender of nursing students (N= 369). *p-value ≤ 0.05 was considered significant

DISCUSSION

The consumption of soft drinks is very common in public, whether they belong to any profession, even when they are aware of the health hazards of soft drink consumption. The current study aimed to assess nursing students' knowledge, attitude, and practices of soft drink consumption. Furthermore, we also tried to determine its association with gender among nursing students. In this study, 84% of study participants revealed that they are aware that soft drinks have badly for health because another study conducted in Lahore, Pakistan, reported 98.3% [18]. Even though the present study participants belonged to the medical profession. Still, 50% of them consumed soft drinks because of their taste, and few consumed them because of family and friend choices. However, a study in Saudi Arabia reported that media advertisement was an infusing reason to do so [19]. Around 206(55.8%) male and 55 (14.9%) female students said they enjoy having a soft drink; this exhibited that the feeling of pleasure is a driving force to make students have a soft drink even when they are aware of its adverse effects on health. Around 101(27.3%) male study participants unveiled that they consume soft drinks weekly, whereas 71 (19.2%) female participants consume them monthly. These results show that male students consume more soft drinks than female students. As in Pakistani culture, male students are more outgoing and attend more social gatherings with friends; hence, they are more vulnerable to being affected by carbonated drinks. It is documented by current research that carbonated drinks can cause dental erosion, dental cavity, kidney stones, osteoporosis, and obesity [20]. Around 101 (27.3%) male students consumed soft drinks weekly, and 41 (11.1%) female students consumed them monthly. However, another study reported that 72% of participants consume daily [19]. Hence study reflects that in Pakistan, consumption is still a lot less in comparison. The positive sign was that around 179 (45.7%) male and 82 (22.2%) female study participants were willing to stop consuming drinks. The second preferred choices of drinks are fruit juice and milk; if these drinks are kept available in schools and colleges, then students may stop consuming them. The majority of this study population (66%) consumed 100 ml of the drinks; this observation was consistent with the finding of Rai et al., in New Delhi and Ghaziabad, India, who noted that 63.42% of populations were the same consuming amount of carbonated drinks [3]. The reason for consuming fewer amounts is that one soft drink bottle could be shared amongst friends in their gathering. Now, it is the time to teach students how to say "No" to friends and family members who offer them these sugar-heavy drinks. This way, we can prevent the adverse effects of soft drinks among the population.

CONCLUSIONS

It is concluded that nursing students have adequate knowledge of soft drinks and their harmful effects on their health. Despite knowing the detrimental consequences, nursing students consume soft drinks considerably.

Conflicts of Interest

The authors declare no conflict of interest

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REFERENCES

[1] Patel NM, Joshi KJ, Kumar P PS, Kartha GP. Knowledge, attitude and practice (KAP) regarding carbonated drinks among medical students of CU Shah. Medical college and hospital of Surendranagar district. Internation Journal of Medical Science and Public Health. 2017 Jan; 6: 38-41. doi: 10.5455/ijmsph.2016.12062016544

[2] Gupta R, Solanki A, Sharma S, Gumber P, Sharma A, Upadhyay R. A knowledge, attitude and practices of soft drinks among adolescent students and their dental health: A Questionnaire study. International Journal of Dental Health Concerns. 2015; 1(1): 1-5. doi: 10.15713/ins.ijdhc.3

[3] Metta KK, Afif MA, AlThagfi NM, Ezzaddin RO, Alam BE, Bandela V. Knowledge, Attitude and Practices Regarding Consumption of Carbonated Soft Drinks Among the Dental Students: A Cross-Sectional Study. Pesquisa Brasileira em Odontopediatria e Clínica Integrada. 2022 Dec; 22.

[4] Thamarai R, Sivakumar K, Ponniraivan K. Awareness of Health Consequences of Junk Foods among Medical Students. International Journal of Recent Scientific Research. 2015; 6(3): 3203-7

[5] Gupta R, Solanki A, Sharma S, Gumber P, Sharma A, Upadhyay R. A knowledge, attitude and practices of soft drinks among adolescent students and their dental health: A Questionnaire study. International Journal of Dental Health Concerns. 2015; 1(1): 1-5. doi: 10.15713/ins.ijdhc.3

[6] Basu M, Sarkar K, Shahbabu B, Ray S, Barik G, Chatterjee S, et al. Pattern and determinants of overweight and obesity among medical students of

DOI: https://doi.org/10.54393/pjhs.v4i02.577

Kolkata. International Journal of Pharmaceutical Sciences and Research. 2016 Jan; 7: 377-86.
[7] Abraham ML, Fernandes MP. A Study on Attitude and Practice Regarding the Consumption of Carbonated Drinks among Students in Selected Colleges of Mangalore. International Journal of Health Sciences and Research. 2018; 8(5): 180-5. doi: 10.24321/2454.325X.201816
[8] Frederick V, Obed H. Knowledge, practice and perception of taking soft drinks with food and the metabolic effect on high school students in Ghana. Endocrinol Metabolism. 2017; 1(1): 103-19.
[9] Kharde A, Deshpande J, Phalke D. Knowledge, Attitude and Practices (KAP) regarding carbonated drinks among students of medical college of western Maharashtra.
[10] Tipton JA. Reducing sugar-sweetened beverage intake among students: school-based programs and policies that work. NASN School Nurse. 2016 Mar; 31(2): 102-10. doi: 10.1177/1942602X15578456
[11] Latha A and Monica A. Knowledge of soft drinks among Nursing Student. Journal of advance Nursing. 2015; 1(3): 54-8.
[12] Zhang Y, Li R, Zhao Q, Fan S. The impact of peer effect on students' consumption of sugar-sweetened beverages-instrumental variable evidence from north China. Food Policy. 2023; 115. doi: 10.1016/j.foodpol.2023.102413
[13] Scarborough P, Adhikari V, Harrington RA, Elhussein A, Briggs A, Rayner M, et al. Impact of the announcement and implementation of the UK Soft Drinks Industry Levy on sugar content, price, product size and number of available soft drinks in the UK, 2015-19: A controlled interrupted time series analysis. PLoS medicine. 2020 Feb; 17(2). doi: 10.1371/journal.pmed.1003025
[14] Meng G, Zhang B, Yu F, Li C, Zhang Q, Liu L, et al. Soft drinks consumption is associated with nonalcoholic fatty liver disease independent of metabolic syndrome in Chinese population. European journal of nutrition. 2018 Sep; 57: 2113-21. doi: 10.1007/s00394-017-1485-0
[15] Ezzat S. Factor associated with soft and energy drinks consumption by university students in Alexandria Egypt. International Journal of Food, Nutrition, and Public Health. 2016; 8(2): 75-88. doi: 10.47556/J.IJFNPH.8.2.2016.2
[16] Higgins JP, Yarlagadda S, Yang B. Cardiovascular complications of energy drinks. Journal of Beverages Research. 2015; 1(2): 104-26. doi: 10.3390/beverages1020104
[17] Siqueira JH, Mill JG, Velasquez-Melendez G, Moreira AD, Barreto SM, Benseñor IM, et al. Sugar-sweetened soft drinks and fructose consumption are associated with hyperuricemia: cross-sectional analysis from the Brazilian longitudinal study of adult health (ELSA-Brasil). Nutrients. 2018 Jul; 10(8). doi: 10.3390/nu10080981
[18] Shafi T and Aman Z. Knowledge attitude & practices (kap) regarding carbonated drinks among female medical students of allama iqbal medical college, lahore. Proceedings SZMC. 2017; 31(2): 92-7.
[19] Alnusayri MO, Khattak AU, Gudipaneni RK, Patil SR. Knowledge, attitude and practices regarding carbonated beverages among the population of Aljouf Province. International Journal of Medical Research Professionals. 2017; 3(1): 80-3.
[20] Kregiel D. Health safety of soft drinks: contents, containers, and microorganisms. BioMed research international. 2015 Jan; 2015. doi: 10.1155/2015/128697

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Original Article

Psychological Effects of Covid-19 Care; A Qualitative Study of Health Care Workers in Punjab Pakistan

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ABSTRACT

The pandemic has caused severe psychological distress among Healthcare Workers. They were readily exposed to extreme workloads and physical and emotional turbulence throughout the pandemic which impacted them on both professional and personal fronts. **Objectives:** To explore the adverse impacts of Covid-19 on the mental health of the Healthcare Workers while delving into the relationship between occupational stress, communal norms, and mental health outcomes. **Methods:** It utilizes content gathered through observation and in-depth interviews of the frontline Healthcare Workers (n=32) that included doctors (n=14), nurses (n=12), and domestic staff (n=6) working in three COVID-19 treatment centers made in three major cities of Punjab, Pakistan, (Lahore, Faisalabad, and Sialkot) during Covid-19. **Results:** The results were divided into two themes followed by their sub-themes based on the results gathered through data collection tools. The themes were analyzed using the transactional model of stress and coping. The results reveal that the psychological distress faced by HCWs is directly related to occupational stress such as extreme workload/demand, while other challenges include fighting the community-imposed stigmas against the pandemic and social isolation. **Conclusion:** Psychological distress is a raising concern; current evidence reveals that low- and moderate-income communities, particularly in South Asian nations, have little or no understanding of workplace stress and its repercussions. Therefore, this study investigated Healthcare Workers' perspectives on mental health concerning the pandemic.

INTRODUCTION

The novel coronavirus that emerged as unknown few cases of severe pneumonia in the city of Wuhan, China, soon took the world by storm, disrupting all aspects of life. It was declared a global pandemic on 11th March 2020 by The World Health Organization (WHO), based on its impact, the severity of the influence, and the ferociously increasing number of cases [1]. During a disease outbreak, psychological reactions play a vital role in determining the emotional and social distress which may be caused by the outbreak [2]. Psychological well-being is not kept into account when dealing with the pandemic, the focus is more on the emergency management, critical treatment, rapid testing, and containing the acute transmissions of the disease, due to this the healthcare systems rarely focus on the mental health and social wellbeing of the individuals [3]. Job stress is defined as the state of psychological and physical stress in the workplace which may be caused by increased demand in the workplace as compared to the capabilities of working individuals [4]. Healthcare professionals are at a greater risk of job stress especially during a disease outbreak due to the nature of their job [5]. The current pandemic has caused severe psychological distress among Healthcare Workers; some of the symptoms include anxiety, depression, fear of death, hopelessness, sleep deprivation, stigma impact, isolation from friends and families due to the fear of transmitting the

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virus and Post Traumatic Stress Syndrome (PTSD) [6]. The medical professionals who are working in direct and immediate contact with the infected patients of Covid-19 are called front-line Healthcare Workers (HCWs). They are readily exposed to extreme workloads, and poor working environment leading to occupational stress and other mental health problems [7]. Although psychological problems have been preexisting in the HCWs, they have exasperated further because of the pandemic outbreak. The mental health problems became a hurdle for the HCWs to perform their duties properly, incidences of cognitive dysfunction, and uncertainty over clinical decisions led to an increase in medical errors [8]. A study conducted in Italy and China on the psychological health of the HCWs showed alarming statistics of poor mental health with 21.90% and 71.5% stress, 19.8% and 44.6% anxiety, and 24.73% and 50.4% depression levels respectively. These studies prove that there is a high prevalence of psychological distress among HCWs during the pandemic outbreak [9]. As the Covid-19 pandemic penetrated in Pakistan, its already deficit healthcare system received a severe blow [10]. Unfortunately, the pandemic healthcare framework implemented did not have any policy for mental health well being [11]. As per a study conducted in Pakistan, the HCWs are exposed to the risk of contracting the virus, extreme workload, moral impasses, tiring working conditions on professional grounds, and dealing with societal stigmas, psychosomatic symptoms, emotional and spiritual distress on the personal level. This makes them extremely vulnerable on both professional and personal fronts [12]. The HCWs have suffered greatly from the pandemic in terms of decreased resources, deteriorated psychological health, lack of job security, stigma regarding mental health, and Covid-19 in general. This study explores the effects of Covid-19 on the mental health of healthcare Workers (HCWs) and evaluates through inductive reflexive thematic analysis HCWs' perspective. The current study has utilized content gathered through observation and interviews of the frontline medical HCWs affected by Covid-19.

METHODS

This qualitative study focuses on the psychological distress caused by Covid-19 among HCWs who worked at Covid-19 treatment centers made in the three major cities of Punjab, Pakistan, (Lahore, Faisalabad, and Sialkot). The HCWs included doctors, nurses, and domestic staff. The researchers formed an in-depth analysis of the experiences of the HCWs. Respondents were selected through a purposive sampling method as only those interviewed were directly dealing with patients of Covid-19. Data were collected from 3rd Oct 2021 to 11th Jan 2022. Data saturation marked the endpoint of the data collection. The interviews were audio recorded. Themes and sub-themes were generated followed by transcription and translation of the collected data through inductive reflexive thematic analysis. Informed verbal consent was taken from the participants and confidentiality was kept in strict consideration. The categorization into themes was done using thematic coding method such as word repetition and indigenous categories. The themes and sub-themes were analyzed by the Transactional Model of Stress and Coping which is illustrated in Figure 1.

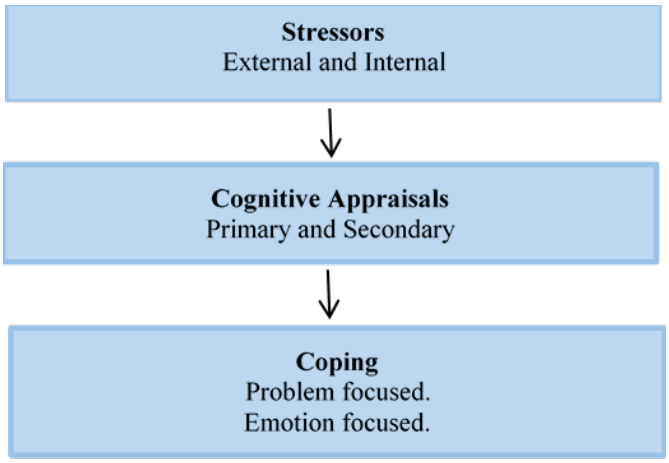

Figure 1: The Transactional Model of Stress and Coping. Source: [13]

Dr. Richard Lazarus anticipated this model in collaboration with Dr. Susan Folkman in 1984. The model assesses how important life events and daily stresses affect emotions, with a focus on cognitive appraisal and stress management. It is comprised of three arenas; the stressors (external and Internal), cognitive appraisal; which includes primary and secondary appraisal, and lastly coping.

RESULTS

The participants of the study were thirty-two in number (n=32), doctors (n=14), nurses (n=12), and domestic staff (n=6). The average age of the participants ranged from 20 to 55 years. Based on the information shared by the respondents and the transactional model of stress and coping, the participants were categorized into three main themes i.e., (1) "the external stressors," which further fall into three sub-themes; "Work demands", and "Following of SOPs" (2) "The internal stressors" which further fall into two sub-themes; "Destructive thoughts", and "social stigma", and (3) "Coping mechanisms" which further fall into two sub-themes; "Personal satisfaction" and "Faith and Spirituality".

External Stressors

Work Demands

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The medical staff working at Covid treatment centers in the current study noted that the nature of their job had become rather more repetitive, with the same medical procedures being performed again and again. *"The daily monotonous tasks have begun to dismantle our mental health, as the brain feels much suffocated repeating a process again and again."* (R2) According to the respondents, the working conditions had become much more stressful after the start of the second wave as the patient burden increased to an alarming level. However, the overburdened wards lacked human resources as well as kits for corona testing. *"People think it's easy as we are safe in those protected shields, but they don't know the extreme amount of stress that we face while attending to a single patient of corona, we have families too and we have to go back to them, thoughts of spreading the virus brings more psychological stress."*(R6)

Following Standard Operating Procedures (SOPs)

To contain the virus SOPs were imposed by governments across the world. However, due to being at greater risk of contracting the virus, HCWs were made to strictly follow the SOPs without any lenience. *"There is so much frustration and rage among the people because of the imposed isolation, staying at home all the time gets into the head and I feel like I am not being productive at all."* (R14) The SOPs became an integral part of the HCWs as they had to be in their Corona kits throughout their duty hours. *"When I wake up, the first thought that crosses my mind is that I have to go back to work and don a complete outfit that will make it impossible for me to breathe during the day. I mentally prepare myself for a full day of attending to patients and breaking bad news to the public. This is incredibly frustrating. I believe I have reached a point in life when I am simply working for the sake of working, with no thought of reward, without even considering my health right now."*(R26)

The Internal stressors

Stigma

The HCWs became subjected to various stigmas that dismantled their strengths and disturbed their mental health. The doctors and other staff were viewed as highly susceptible to Covid-19 and were looked down upon. *"My family has been isolated from the community we live in; the sweeper doesn't come to our house for cleaning, and the mailman doesn't deliver us mail anymore. People have stopped communicating through phones as well. It is like we are doing something bad, or we have become untouchable."* (R30) As per the respondents, the experiences faced by them have changed their perspectives towards their own culture. *"This pandemic has made me question my culture and its toxicity many a time, people have their way of getting into your head, they will challenge you in every possible way, the culture has made us a taboo, and this is so heartbreaking."*(R24) Another stigma that the HCWs faced was that they were the only ones vulnerable to Covid-19 and feared that the ignorance of people might stimulate the virus even more. The people did not follow the SOPs even within the hospital center and felt insulted if pointed out.

Destructive Thoughts

One of the negative impacts of Covid-19 was its triggering of sentiments like personal loss, fear of death, and emotional attachment. People developed a fear of death, and it prevailed to such a threatening degree that they believed if they contracted the virus then they will inevitably die. *"I developed the fear of death and felt very insecure about everywhere I went, I over-sanitized my hands and developed skin allergy as well."* (R8) 19 out of 32 HCWs were on psychotic drugs and taking sessions to keep themselves out of the grey zone. The sense of personal shortcomings convinced the respondents that they were not putting in their best efforts to help the people in need. *"I told the psychiatrist that I fear I might take my own life, he looked at me and calmly said, what you are going through is valid and real and I am glad you came here. I think every colleague I know is on psychotic drugs to keep themselves going and this is weird, but I think we need to stay sane for our patients."*(R18)

Coping Mechanisms

Personal Satisfaction

The HCWs stated that their will to serve humanity in this situation saved them from negative thoughts. They found ways to keep themselves motivated and increase their strength. *"All the stress takes a back seat when we see even one recovered patient going home with a smile on their face."* (R1) As per the respondents, it was difficult for them to be positive, and they too lost hope at times and sought refuge in reminiscing good times. *"We too lose hope but then again if we overthink about the things going around us then we won't be able to treat patients, so I keep on thinking about beautiful moments of my life, when I became a doctor, the first time I performed a surgery, my first pay, all these things make me feel proud to be standing at the frontline."* (R13) Another aspect that kept the staff motivated was the news regarding the successful vaccine drive that instilled hope in HCWs. *"I was over the top, I remember we were all sitting quietly and one of our colleagues was reading the online newspaper, suddenly she shrieked and excitedly shouted that we are going to get rid of this virus! The vaccine is almost ready! I was overjoyed."*(R10)

Faith and Spirituality

As per the respondents, religion is a very important element of the culture that they are part of. It governs most of the other elements of the culture. Covid-19 was seen as God's trial by many and wrath by some. *"These were testing times for Muslims as this virus is a sign that we are very sinful and are straying away from our values and traditions, it is a*

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sign of God's wrath" (R29) The HCWs consider their utmost religious duty to help mankind with the profession they have been chosen for. *"Our religion exhibits the message of helping people in need, especially in despair. I feel obliged to be working in this profession and working in a tribulation period like this will lead me closer to God."* (R6)

DISCUSSION

Based on the findings of the study conducted, three main themes were derived with two sub-themes each respectively. The first theme was "the external stressors" (work demands and following of SOPs). The second theme derived was "the internal stressors" (stigma and destructive thoughts). An amalgamation of the mentioned factors resulted in psychological distress, whereas faith and spirituality, and personal satisfaction were allocated as coping mechanisms amidst the pandemic. The HCWs, who were directly involved in fighting Covid-19 faced extreme circumstances. These factors buffered the relationship between psychological distress and occupational stress involved in the treatment of Covid patients. This study used the inductive approach through qualitative data extracted from interviews and observation. The results were placed in the Transactional Model of Stress and Coping. It encapsulates three arenas, stressors, cognitive appraisal (primary appraisal and secondary appraisal), and coping. Stressors are defined as any scenario or incident that an individual perceives as a threat or challenge [4]. This study showed that HCWs who were exposed to Covid-19 faced a lot of internal as well as external stressors, such as stressful working conditions, monotonous work routines, and fear of illness itself. While they were also prone to internal stressors, HCWs dealt with destructive thoughts such as personal shortcomings, fear of contraction and death, and depression, etc. The abovementioned results are in line with a study conducted in turkey on the prevalence of stress, anxiety, and depression among the HCWs which established that the emotional, cognitive, and clinical decision-making abilities of the HCWs were significantly impacted by their mental health issues, thus increasing the likelihood of medical errors at workplace, and disturbed domestic life [14]. Cognitive appraisal is defined as the process of individuals analyzing a circumstance for relevance to their well-being in a complicated, high-level cognitive process [15]. Although the HCWs were aware of the biomedical conditions of the virus and their possible psychological effects, they still were deeply affected by the rapid spread of the virus. These results are in congruence to a study conducted on the extreme adverse psychological reactions suffered by HCWs during the SARS outbreak in 2003, which validated that similar set of emotions such as the fear of virus transmission to peers and family, stigmatization, reluctance to work and high levels of stress and anxiety were experienced by the HCWs during the outbreak [7]. The categorization of an event as a threat or challenge falls under the primary appraisal, which assesses the relevance of the interaction and determines if it is irrelevant, mild, or unpleasant [16]. The virus posed to be a severe threat to HCW's mental health and lead to extreme stress and burnout at work. They were also deeply impacted by the psycho-cultural and psychosocial factors surrounding them, which impacted their lives. The transactional model contributed to the study by observing and documenting the experiences of HCWs in the identification of the stressors as perceived by them concerning occupational stress. Similar results were found in a study conducted in Karachi, Pakistan, which concluded that frontline HCWs working during Covid-19 were subjected to a great deal of cultural and psychosocial strain, including stigmas, unsupportive family and norms and community isolation [17]. The secondary appraisal determines the degree of emotional stress a person can endure by weighing the stakes involved [15]. HCWs felt inadequate at times in dealing with the virus's predicament, which caused psychological suffering. This is in line with a study conducted on the psychological burdens of the pandemic which validated that HCWs occasionally felt unprepared to deal with the virus's situation, which led to psychological suffering, and exacerbated Post Traumatic Stress Disorder (PTDS), which eventually led to burnout [18]. Coping is characterized by the person's interaction with the environment and is influenced by psychological health, cognitive relationships, and physical health, as well as the importance the individual places on them at any moment [16]. The HCWs countered the stigma element which they were subjected to with personal satisfaction such as helping their community against the virus, reading positive news, and creating a united medical environment. They mentioned the pivotal role of religion in helping them cope with the pandemic. Using the transactional model, we were able to document the factors pertaining to socio-cultural and spiritual nature, which impacted the HCWs in relation to work stress. These results are similar to the results of the study conducted on the role of religious perceptions in coping with Covid-19 which concluded that Healthcare and spirituality had been linked since ancient times but in the wake of the pandemic, spirituality and faith became important areas of study, owing to their ability to induce coping mechanisms in the form of prayers and rituals to instill a hopeful attitude [19]. Moreover, the complete lockdown has had a very profound impact on the HCWs. The closure of outdoor activities restricted them to online services, such as online clinics called teleclinics, social

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media, etc. [20]. The respondents mentioned the professional struggle to get well acquainted with the latest technology aroused feelings of incapability and personal shortcomings among them. A study conducted on the challenges of telemedicine during pandemic states similar results that lack of awareness of online technology usage created barriers among medical professionals, and the shift from interpersonal to online mode of treatment was not widely accepted [21]. The overall results of the study are in line with a similar study conducted in Egypt confirming that the HCWs have been exposed to extreme working conditions amidst the pandemic. The study concludes that the monotonous environment in a healthcare system along with the highly increasing infected patients' ratio and long and hectic duty hours with the stressful working environment were the main reasons causing psychological distress among HCWs [9].

CONCLUSIONS

The study's findings demonstrate that the HCWs in this pandemic experienced certain particularly dangerous obstacles and difficulties, which contributed to their psychological suffering. Most of the problems are directly related to occupational stress such as extreme workload/demand, and hectic working environment, while other challenges include fighting the community-imposed stigmas against the pandemic and social isolation. The above study covers the maximum challenges that could be documented.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] World Health Organization. Situation report - 51. 2020. [Last cited: 13th Feb 2023]. Available from: https://www.who.int/publications/m/item/situation-report—-51.

[2] Pedrosa AL, Bitencourt L, Fróes AC, Cazumbá ML, Campos RG, de Brito SB, *et al*. Emotional, behavioral, and psychological impact of the COVID-19 pandemic. Frontiers in Psychology. 2020 Oct; 11: 566212. doi: 10.3389/fpsyg.2020.566212.

[3] Choi J and Taylor S. The psychology of pandemics: Preparing for the next global outbreak of infectious disease. Newcastle upon Tyne, UK: Cambridge Scholars Publishing. Asian Communication Research. 2020 Sep; 17(2): 98-103. doi: 10.20879/acr.2020.17.2.98.

[4] Fink G. Stress: Definition and history. Stress Science: Neuroendocrinology. 2010 Apr; 3(9): 3-14.

[5] Koinis A, Giannou V, Drantaki V, Angelaina S, Stratou E, Saridi M. The impact of healthcare workers job environment on their mental-emotional health. Coping strategies: the case of a local general hospital. Health Psychology Research. 2015 Apr; 3(1): 1984. doi: 10.4081/hpr.2015.1984.

[6] Zare S, Esmaeili R, Kazemi R, Naseri S, Panahi D. Occupational stress assessment of health care workers (HCWs) facing COVID-19 patients in Kerman province hospitals in Iran. Heliyon. 2021 May; 7(5): e07035. doi: 10.1016/j.heliyon.2021.e07035.

[7] Montemurro N. The emotional impact of COVID-19: From medical staff to common people. 2020 Jul; 87: 23-24. doi: 10.1016/j.bbi.2020.03.032.

[8] Neelam K, Duddu V, Anyim N, Neelam J, Lewis S. Pandemics and pre-existing mental illness: A systematic review and meta-analysis. Brain, Behavior, & Immunity-Health. 2021 Jan; 10: 100177. doi: 10.1016/j.bbih.2020.100177.

[9] Aly HM, Nemr NA, Kishk RM, bakr Elsaid NM. Stress, anxiety and depression among healthcare workers facing COVID-19 pandemic in Egypt: a cross-sectional online-based study. BMJ Open. 2021 Apr; 11(4): e045281. doi: 10.1136/bmjopen-2020-045281.

[10] Malkani S. Lessons for Healthcare. 2020. [Last cited: 13t Feb 2023]. Available from: https://www.dawn.com/news/1544915.

[11] De Kock JH, Latham HA, Leslie SJ, Grindle M, Munoz SA, Ellis L, *et al*. A rapid review of the impact of COVID-19 on the mental health of healthcare workers: implications for supporting psychological well-being. BMC Public Health. 2021 Dec; 21(1): 1-8. doi: 10.1186/s12889-020-10070-3.

[12] Saleem Z, Majeed MM, Rafique S, Siqqiqui Z, Ghandhi D, Tariq H, *et al*. COVID-19 pandemic fear and anxiety among healthcare professionals in Pakistan. Research Square. 2020 Jul: 1-16. doi: 10.21203/rs.3.rs-37608/v2.

[13] Lazarus RS and Folkman S. Stress, appraisal, and coping. Springer Publishing Company; 1984.

[14] Akova İ, Kiliç E, Özdemir ME. Prevalence of burnout, depression, anxiety, stress, and hopelessness among healthcare workers in COVID-19 pandemic in Turkey. INQUIRY: The Journal of Health Care Organization, Provision, and Financing. 2022 Feb; 59: 00469580221079684. doi: 10.1177/00469580221079684.

[15] Litwic-Kaminska K. Types of cognitive appraisal and undertaken coping strategies during sport competitions. International Journal of Environmental Research and Public Health. 2020

DOI: https://doi.org/10.54393/pjhs.v4i02.600

Sep; 17(18): 6522. doi: 10.3390/ijerph17186522.
16.Berjot S and Gillet N. Stress and coping with discrimination and stigmatization. Frontiers in Psychology. 2011 Mar; 2: 33. doi: 10.3389/fpsyg.2011.00033.

[17] Koontalay A, Suksatan W, Prabsangob K, Sadang JM. Healthcare workers' burdens during the COVID-19 pandemic: A qualitative systematic review. Journal of Multidisciplinary Healthcare. 2021 Oct; 14: 3015-25. doi: 10.2147/JMDH.S330041.

[18] Kumar D, Saghir T, Ali G, Yasin U, Furnaz S, Karim M, *et al.* Psychosocial impact of Covid-19 on healthcare workers at a tertiary care cardiac center of Karachi Pakistan. Journal of Occupational and Environmental Medicine. 2021 Feb; 63(2): 59-62. doi: 10.1097/JOM.0000000000002094.

[19] Kowalczyk O, Roszkowski K, Montane X, Pawliszak W, Tylkowski B, Bajek A. Religion and faith perception in a pandemic of COVID-19. Journal of Religion and Health. 2020 Dec; 59: 2671-7. doi: 10.1007/s10943-020-01088-3.

[20] Morse KF, Fine PA, Friedlander KJ. Creativity and leisure during COVID-19: Examining the relationship between leisure activities, motivations, and psychological well-being. Frontiers in Psychology. 2021 Jul; 12: 609967. doi: 10.3389/fpsyg.2021.609967.

[21] Calton B, Abedini N, Fratkin M. Telemedicine in the time of coronavirus. Journal of Pain and Symptom Management. 2020 Jul; 60(1): e12-4. doi: 10.1016/j.jpainsymman.2020.03.019.

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Original Article

Exploring the Experience of Mothers of Premature Babies: A Phenomenological Study

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ABSTRACT

Premature birth of babies is a one of the major public health problems all around the world. **Objective:** To explore the experience of mothers of preterm babies when their baby is admitted in a tertiary care hospital of Lahore. **Methods:** This study was conducted in the Neonatology department of Children's Hospital, Lahore, Tertiary Care Hospital, Pakistan from June 2022 to December 2022. Semi structured face-to-face individual interview was used to obtain data from the 12 participants who were purposively selected for the study. The audio recorded data collected was translated into English and transcribed verbatim. Analysis was done with the help of computer assisted software called NVIVO-12. By using the Coliazzi's method of phenomenological analysis the codes generated from NVIVO-12 were organized into sub-categories, categories, sub-themes and themes. **Results:** Three themes emerged with sixteen subthemes. The themes are: Mixed emotional feelings of the mothers; Mother's satisfaction about care and support from Health Care Professionals; Mother-baby interaction in NICU. Mothers were worried due to unexpected emergency premature delivery and baby's status and had uncertainty related to delivery outcome and the baby's life. Participants have good interaction babies while the Kangaroo Mother Care and Breast Feeding and they applaud HCPs. **Conclusions:** Mothers were concerned about the survival of premature babies admitted to the NICU. They showed different emotions like fear, anger, sadness, worry, tension, lack of confidence, hope, gratefulness, courage and spiritual faith in Allah. They expressed the feelings of satisfaction about care, treatment counseling and teaching by HCPs.

INTRODUCTION

Preterm birth is a major cause of perinatal and neonatal mortality and morbidity worldwide., it contributes to 75% of the neonatal mortality all around the world. Premature baby is defined as the baby who is born before 37 weeks of gestation. It is the single most important cause of poor infant outcomes in relation to survival and good quality of life [1]. Preterm birth is associated with many psychosocial complications and stressful experiences in mothers [2]. Parents of premature babies start their journey of parenthood in a stressful environment of the Neonatal Intensive Care Unit (NICU) [3]. According to the World Health Organization (WHO) report (2020), it is estimated that 15 million preterm babies are born every year and 1 million premature babies die due to the complications of prematurity [4]. Globally the prevalence of preterm birth is estimated at 15 million per year. In Pakistan 900000 premature babies are born each year and the neonatal mortality rate is 42 per thousand live births [5]. Additionally, preterm birth of a baby and admission in NICU is a traumatic experience for parents [6]. Mothers are primary caregivers of their babies and they provide care to their babies in a highly technical, strange and terrifying environment of NICU. It may be resulted as an acute grief and anxiety, depression and posttraumatic stress in mothers [7]. The birth of a premature baby is high among Pakistani Mothers and neonatal mortality rate is also high in Pakistan, still no research conducted in Lahore Pakistan to explore the emotional response of mothers while their

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babies are being admitted in hospital. Birth of a premature baby and admission in NICU tremendously affect the parents, especially mothers. Parents having diverse experiences in NICU. These experiences have long lasting effects on the mental health of mothers, premature babies and eventually the society where they live. Our health care system has more focus on care and treatment of a sick premature baby. There are multiple challenges for preterm baby's mothers which is the subject of the study. What is being faced by mothers of premature babies in NICUs during admission of their baby is still unclear in developing countries which are overburdened and have limited facilities. To fill this gap, this study aimed to explore the experience of mothers with preterm infants admitted to the NICU. This is very important for understanding the challenges faced by mothers and the appropriate strategies for intervening to reduce these challenges. The findings of this research will help to make interventions for caregivers of premature babies especially for mothers and reduce neonatal mortality.

METHODS

A qualitative research was conducted with a descriptive phenomenological approach. Phenomenology can help us learn from experience. It is not just a description of human experience. All participants were fully informed and provided written informed consent. The Institutional Review Board of Lahore University and Allied Health Sciences of Children's Hospital Lahore has granted the approval letter of IRB to conduct this study. Descriptive phenomenological research design was employed in this research. This study was conducted in the Neonatology department of Children's Hospital, Lahore (CHL), Tertiary Care Hospital, Pakistan from June 2022 to December 2022. All mothers of premature babies born before 37 weeks of gestation and in stable condition and mothers who have previous experiences of baby's admission in the neonatology department and were willing to participate in this study were included. Mothers whose preterm babies were critically sick or on ventilators and mothers whose babies had any congenital anomaly due to the peculiar demands of those conditions on them were excluded from this study. Twelve participants were purposively sampled. Eligible participants were selected with the support of specialist nurses in the NICU and invited to participate in the study. Face- to face interviews were conducted from each participant by using a semi structured interview guide. Probing questions were also used to find out more information and in-depth knowledge of the phenomenon. Confidentiality of interviews was assured and recorded interviews of the participants were kept in a safe and secured place. Memo notes were made during and after interviews on the basis of observations made by the researcher on the participants' non-verbal cues. Demographic data were obtained in the first part of the interview. Sample size was determined when data saturation reached. After that the data was transcribed into English Language. Then the transcribed data was converted to text files and imported to NVIVO-12 computer software and cods were generated. Qualitative data set was analyzed by using the Coliazzi's method by following the seven steps read the entire content of the interview extract important statements, formulate the meaning, organize a collection of meanings into a cluster of themes, developing an exhaustive description of cluster of themes, establish the basic structure of the phenomenon identified by a clear statement, go back to the participants for validation and data was organized in sub-categories, categories, sub-themes and themes. Rigor means the reliability and trustworthiness of research studies. It was established by focusing on four criteria, primarily credibility that is the same as internal validity, confirmability dealing with presentations, dependability which related to the reliability, and transferability that can be like external validity. Credibility is defined as the confidence in the truth of the data and its interpretation. In the current study, the researcher made sure the credibility of participants' data by collecting data from those mothers who were still experiencing the phenomenon or those that have previous experience being studied. Participants were selected with different backgrounds to gain multiple perspectives. Data was collected from mothers of premature babies while they were still nurturing preterm infants in the NICU of Children's Hospital Lahore, which helped them to think about it and they explained their experience when they happened as it is. Researcher during data collection process continued to ask detailed questions or probes if needed to gain insights into the participant's experience to increase the reliability of data. Prolong engagement with participants was made to ensure credibility. The researcher increased confidence in the truth of research data by using two methods of data collection that are in-depth interviews based on comprehensive literature review and observations. Member check was also done as research work was evaluated by the supervisor on a regular basis. Member check was also done by contacting three participants of the study. They were invited to review and comment about the findings through a face to face meeting. At the end of data collection, interviews were transcribed and summary was shared with the participants, in this way the facial expressions were observed again to check whether the participants told the true data. Reliability of research work is known as dependability. It is the ability of researchers to maintain it

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and provides reliable data. For achieving dependability, researcher ensured that the research process is logical, easy to understand, and clearly documented. If the reader will examine the research work, they can easily evaluate the dependability or reliability of the research process. Research audit trial is one of the important ways to demonstrate dependability. Reliability is based on dealing with bias, triangulation of data, and reflexivity. Reflexivity is a process of self-diagnosis and an important aspect of dependability during qualitative research and was attained by bracketing as identified by Edmund Husserl to recognize and acknowledge the prejudices, assumptions, or criticisms by discussing with her supervisor. Dependability determines that the findings of the study could be repetitive if the research is replicated with the same participants in the same setting. An audit of research work is required to achieve dependability. The audit of research work was being done by the researcher's supervisor. Confirmability is the proof that a researcher's interpretations and results have been clearly derived from the data, and the researcher needs to demonstrate how the conclusions and interpretations have been reached. Confirmability is achieved when credibility, transferability, and dependability all are established in research work. In this study the researcher included markers such as the rationale for theoretical, methodological, and analytical decisions throughout the study so that others can understand how and why the decision was made. The researcher's supervisor then provided feedback further to enhance or develop stronger, clearer and more dependable results. It significantly showed that the researcher has expressed the real participants' data in the study not any biases or a prejudice of the researcher's imagination or researcher experience in neonatology. Transferability means that the results of qualitative data can be transferred to other settings. The researcher made sure that this criterion of trustworthiness was met by purposive sampling of the participant, which were able to provide sufficient and rich data. Accurate, sufficient and thick description of the mother's living experience related to the care of hospitalized premature babies has been given in data analysis and interpretation. The research report allows other researchers or policy makers to evaluate its applicability to other settings.

RESULTS

Twelve mothers of premature babies have participated in the study. Majority of the participants (80%) were young adults from which job holders were 58.33% and house wives were 41.66%. All the participants were educated and 66.66% have delivered the baby via cesarean section and 33.33% by normal delivery as for the gestational age of babies, most were delivered between 28-32weeks of gestation (66.66%) and 33.33% between 33-37weeks and 16.66% babies has <1.5kg of body weight, 58.33% between 1.5kg-2kg and 25% babies has body weight between 2.1-2.5kg. 41.66% babies admitted in NICU <20days, 41.66% between 21-30days and 16.66% babies admitted for >30days. Three themes emerged with sixteen subthemes. The themes are: Mixed emotional feelings of the mothers; Mother's satisfaction about care and support from Health Care Professionals; Mother-baby interaction in NICU. Birth and admission of a premature baby in the NICU for special care triggered an emotional crisis in the parents, especially mothers. Participants expressed different kinds of emotions depending on the situation they faced. They showed both negative and positive emotions influenced by thoughts which started from the birth of the premature baby to the admission in NICU. Feelings of worry, fear, anger, tension, depression, these are the negative feelings expressed by the participants related to unknown outcome of the delivery and admission of the baby in NICU. Feeling worried or anxious may be due to an actual or potential problem. In the present study participants were worried and afraid for emergency delivery and for their babies' status which is the potential problem for the participants, they communicated about this for instance: "I was worried because labor pains were increasing, not under control and increasing. But I was too worried during all this situation because my days were not completed." (P4), "Mother can cross anything for their babies. Definitely we can scarify everything for our baby" (P6), "I was also very uncertain and scared about the health and life of my little baby" (P8) and "When pain started earlier I was afraid of losing my babies. I said to my husband "I need my 3 living babies. I never want to lose anyone" (P9). Feelings of anger by the participants is a secondary emotion that basically arise from experiences such as loss, disappointment, fear, worry, etc. Feelings of anger was expressed by the participants as "I started weeping bitterly and said to my family members that you people are making me much more. I was angry for myself" (P4). Participants were also angry due to lake of accommodation facilities for them it was reported as: "I felt very angry as already our babies are sick and there is no proper place to stay in NICU with our babies" (P1). Depression is a persistent feeling of sadness and may be caused by a stressful life event like in the present study due to premature delivery and admission of their babies in NICU. Some participants accentuated like this: "My baby born before time I was unable to feed him in NICU I was very depressed" (P8) and "I am very depressed that he born before the time and admitted in CHL, I was very depressed to see my baby in NICU" (P10). Participants were scared to see heavy machinery in NICU attached with their babies.

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They described these feelings like that: "I am afraid while looking on heavy machinery of NICU my baby was also attached with many kinds of machines she also remained on manual ambo bagging. Some other babies are attached with pumps" (P12). Spiritual believe in ALLAH, courage and hope for the recovery of the baby these were the positive feelings which were experienced by the all the participants throughout all the interviews. Participants described it as: "I prefer to recite DAROOD E PAK and pray for my baby" (P11), and "I also got hope that one day my baby will also be healthy and discharged like others IN SHA Allah" (P2). Participants experienced the positive feelings of satisfaction related to the care of their premature babies and support being provided by HCPs in NICU and good facilitated neonatology department. They depicted it as: "I felt very good in government hospital. This is a special hospital for children, it is well facilitated. For the treatment it is the best hospital" (P9) and "They are very nice and loving and taking great care of our baby, if I asked anything from them they replied very nicely they didn't get angry" (P3), "If I told you collectively in short words about my experience that after GOD, they (HCPs) are everything for us. According to me frankly this the definition for them (HCPs) of CHL, NICU. They survive my baby when my baby shifted here on his last breathes, after ALLAH PAK they are everything for my baby. ALHUMDULILLAH, they (HCPs) don't allow us to touch our baby without using hand sanitizer. Everyone attended us very well" (P6). Participants were also encouraging and supporting each other they described about this in the following way: "Mothers take care of each other as we people came from far away for the treatment of our sick babies. We all mothers are here in this hospital due to in dire necessitation. It is a good experience that we are helping each other. We care each other we discuss in this way we encourage each other. If one sees the other person in the same problem, then the other must be encouraged" (P5). Participants also wanted more information and counselling to look after their babies: "There must be a proper schedule for mothers counseling by doctors. But the there is a shortage of doctors also" (P2). Majority of the participants conveyed their positive experience of interaction with their premature babies in NICU in terms of Kangaroo Mother Care (KMC), Breast Feeding and body massage. they reported it as: "KMC is very effective. It is very effective in a sense that baby becomes more active, HCPs in NICU provided me the proper place and privacy for the provision of KMC still I felt shy, When I put him in incubator after the provision of KMC my baby became more active I was very happy, he cried very well. KMC was very good. My breast milk also improved after KMC" (P2), "I felt very happy when I started breast feeding to my admitted baby in NICU. It was a good experience to feed my baby" (P9), and "I notice. MA SHA ALLAH when first day I have given body massage to my baby he didn't respond well. But when second day I have given body massage to my baby, firstly baby's body was not relaxed then he relaxed his body and respond well. At the end of massage my baby put his both hands on my hand" (P6). Participants wanted to stay with their babies and unrestricted visitation in NICU: "I wish to have a healthy full term baby. I again wanted to put him attach with myself my chest. I wanted that mothers never be restricted to see their babies" (P10).

DISCUSSION

The present study was conducted with the aim to explore the experience of mothers of preterm babies when their baby is admitted in a tertiary care hospital of Lahore. The results showed that mothers have encountered several obstacles related to the NICU which provided important and useful information to improve quality of care in NICU, areas that need improvement include emotional aspects of mothers of premature babies and information sharing by the HCPs. Unexpected premature birth is traumatic experience for mothers in this study mothers experienced predominantly negative emotional feelings such as fear, anxiety, and sadness are all consistent with previous qualitative studies [8-11]. Concurring with some other studies participants also explained about the positive feelings of courage, power and hope [11, 12]. Consistent with previously conducted studies the participants of the present study shared that the HCPs of NICU were very competent, good source of knowledge with nice behavior and provide excellent care to the babies instead of their shortage [13-15]. Similarly, like other studies the participants were satisfied and happy to in involve in their baby care by KMC, breasting and body massage. Participants were agreed that involvement in baby care is effective for themselves and their babies [16-18]. Counselling with respect, and clear timely information helpful to maintain a good interpersonal relationship between the mothers of premature baby and health care providers [19, 20]. Adequate accommodation facilities must be provided to post-natal mothers so they can sleep comfortably and give proper care to their babies [21].

CONCLUSIONS

The birth of the premature baby is unexpected and cause different emotional reactions in mothers like worry, fear, anger and depression. Mothers unable to interact with their hospitalized babies as they wish. Mothers were satisfied by the care provided to their babies. Involvement of mothers through information exchange, education, about baby care and proper hospital policies are essential. Cordial interacting with HCPs and mothers and providing support

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in areas such as Breast Feeding and KMC empowers the mothers their physical and mental well-being. A comfortable and spacious place to stay in NICU is important for mothers to ensure adequate rest to cope with unpleasant premature birth and post-natal period.

Conflicts of Interest

The authors declare no conflict of interest

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REFERENCES

[1] Pusdekar YV, Patel AB, Kurhe KG, Bhargav SR, Thorsten V, Garces A, *et al*. Rates and risk factors for preterm birth and low birthweight in the global network sites in six low-and low middle-income countries. Reproductive Health. 2020 Dec; 17(3): 1-16. doi: 10.1186/s12978-020-01029-z

[2] Mousavi SS, Keramat A, Chaman R, Mohagheghi P, Mousavi SA, Khosravi A. Impact of maternity support program on the stress of mothers in the first encounter with the preterm infants. International Journal of Preventive Medicine. 2021; 12. *12*(68), 314-322. doi: 10.4103/ijpvm.IJPVM_314_19.

[3] McCall EM, Alderdice F, Halliday HL, Vohra S, Johnston L. Interventions to prevent hypothermia at birth in preterm and/or low birth weight infants. Cochrane Database of Systematic Reviews. 2018 Feb; (2). doi: 10.1002/14651858.CD004210.pub5.

[4] Requia WJ, Papatheodorou S, Koutrakis P, Mukherjee R, Roig HL. Increased preterm birth following maternal wildfire smoke exposure in Brazil. International Journal of Hygiene and Environmental Health. 2022 Mar; 240. doi: 10.1016/j.ijheh.2021.113901.

[5] Lalani S, Dosani A, Forcheh N, Premji SS, Siddiqui S, Shaikh K, *et al*. Perceived stress may mediate the relationship between antenatal depressive symptoms and preterm birth: A pilot observational cohort study. PloS one. 2021 May; 16(5): e0250982. doi: 10.1371/journal.pone.0250982.

[6] Sabnis A, Fojo S, Nayak SS, Lopez E, Tarn DM, Zeltzer L. Reducing parental trauma and stress in neonatal intensive care: systematic review and meta-analysis of hospital interventions. Journal of Perinatology. 2019 Mar; 39(3): 375-86. doi: 10.1038/s41372-018-0310-9

[7] Geller PA, Bonacquisti A, Patterson CA. Maternal experience of neonatal intensive care unit hospitalization: Trauma exposure and psychosocial responses. Motherhood in the Face of Trauma: Springer. 2018: 227-47. doi: 10.1007/978-3-319-65724-0_15.

[8] Yu X, Zhang J, Yuan L. Chinese parents' lived experiences of having preterm infants in NICU: A qualitative study. Journal of pediatric nursing. 2020 Jan; 50: e48-e54. doi: 10.1016/j.pedn.2019.11.002.

[9] Nazari R, Moradi KF, Rezaie S, Akbari N, Qolizadeh A, Sabzi Z. Experiences of the mothers of infants hospitalized in the neonatal intensive care unit (NICU). Journal of neonatal-perinatal medicine. 2020 Jan; 13(4): 571-9. doi: 10.3233/NPM-190205

[10] Ued FdV, Silva MPC, da Cunha ILR, Ruiz MT, Amaral JBd, Contim D. Perception of mothers when visiting their child in the neonatal unit for the first time. Escola Anna Nery. 2019 Jan; 23. doi: 10.1590/2177-9465-EAN-2018-0249

[11] Hanson VF and Abuijlan MIA. Lived experiences of mothers of with premature babies in a neonatal intensive care unit of a selected hospital, in United Arab Emirates: A qualitative content analysis. Victoria. 2022. 6(1), 47-59.

[12] Amorim M, Alves E, Kelly-Irving M, Silva S. Needs of parents of very preterm infants in Neonatal Intensive Care Units: A mixed methods study. Intensive and Critical Care Nursing. 2019 Oct; 54: 88-95. doi: 10.1016/j.iccn.2019.05.003

[13] Rihan SH, Mohamadeen LM, Zayadneh SA, Hilal FM, Rashid HA, Azzam NM, *et al*. Parents' Experience of Having an Infant in the Neonatal Intensive Care Unit: A Qualitative Study. Cureus. 2021 July; 13(7). doi: 10.7759/cureus.16747

[14] Abuidhail J, Al-Motlaq M, Mrayan L, Salameh T. The lived experience of Jordanian parents in a neonatal intensive care unit: A phenomenological study. Journal of Nursing Research. 2017 Apr; 25(2): 156-62. doi: 10.1097/JNR.0000000000000134.

[15] Jayasinghe C and Abeysena C. Maternal satisfaction on postnatal and neonatal care of babies treated for neonatal sepsis in secondary and tertiary care hospitals of a district in Sri Lanka. 2020.

[16] Shrestha T, Singh A, Bhattarai SKG, Raut KS. Experience of Mothers Having Preterm Newborns in Neonatal Care Units. Journal of Karnali Academy of Health Sciences. 2020 Aug; 3(2): 47-56. doi: 10.3126/jkahs.v3i2.30782

[17] Amadu L, Twumasiwaa BKH, Fuseini A. Experiences of Mothers with hospitalized Preterm Babies in Tamale Central Hospital, Ghana. 2021.

[18] Meyer KE. Parental Experience of Neonatal Intensive Care Unit Support and the Experience of Interventions on Emotional Distress and Infant-Parent Relationships. Alliant International University.

DOI: https://doi.org/10.54393/pjhs.v4i02.518

2021

[19] Alinejad-Naeini M, Peyrovi H, Shoghi M. Emotional disorganization: The prominent experience of Iranian mothers with preterm neonate: A qualitative study. Health Care for Women International. 2021 Jul; 42(4-6): 815-35. doi: 10.1080/07399332.2020.1797040

[20] Gallagher K, Shaw C, Aladangady N, Marlow N. Parental experience of interaction with healthcare professionals during their infant's stay in the neonatal intensive care unit. Archives of Disease in Childhood-Fetal and Neonatal Edition. 2018 July; 103(4): F343-F8. doi: 10.1136/archdischild-2016-312278

[21] Lomotey AY, Bam V, Diji AKA, Asante E, Asante HB, Osei J. Experiences of mothers with preterm babies at a Mother and Baby Unit of a tertiary hospital: A descriptive phenomenological study. Nursing Open. 2020 Jan; 7(1): 150-9. doi: 10.1002/nop2.373

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Original Article

Experiences Of Nurses Attended Covid-19 Pandemic Patients During 2020, In Public Tertiary Care Hospitals

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ABSTRACT

Hospitals are often the epicenter of newly circulating infections, consequently health workers are at high risk to obtain irresistible infections. Nurses are viewed as among the first to contact patients with arising diseases. Nurses with no prior experience with such contagious diseases were recruited who provided care to patients with COVID 19 in this pandemic. **Objective:** To investigate the experiences of nurses who have attended covid 19 pandemic patients during 2020. **Methods:** A qualitative study with thematic analysis was conducted, using a phenomenological approach. A total of 12 nurses have joined in-depth, semi-structured interviews, from three COVID-19-designated hospitals in the capital city of Khyber Pakhtunkhwa province of Pakistan, using purposive sampling technique. Face to face interviews were conducted and their observations were recorded. Interviews were transcribed verbatim and thematically analyzed. **Results:** Five major themes emerged from data analysis that included Nosophobia, Scarcity of Resources, First Line Warriors, Environmental/Physical Problems and Perceived super spreaders. Nurses identified many sources of social support during pandemic situation. Participants expressed and considered high work load, anxiety and fear and concern for patients and family members as negative emotions in early stage of pandemic crises. **Conclusions:** The exhaustive work drained nurses physically and emotionally. Nurses should be given a comprehensive assistance and support in protecting themselves while they have showed their strength and spirit of professional dedication to defeat hurdles and challenges, they have faced. Consistent training for nurses is important to advance preparedness and viability in future crisis management.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) has rapidly spread worldwide. Globally as of August 16, 2020 the outburst of COVID-19 had been confirmed in around 205 countries. the most effected countries with peak prevalent cases were U.S.A, Brazil, India and Russia while United States of America and Brazil were on the top in sense of total mortality [1, 2]. The mortality rate of infections is not well known and tends to be substantially higher than that of other recent pandemics [3]. Compared to SARS and MERS, with mortality rates of 9.5 percent and 35 percent, the mortality rate of COVID-19 is about 3.5 percent, but its ability to spread rapidly is an alarming sign [4, 5]. Health care providers are also at the bleeding edge of any episode reaction and as such are exposed to hazards that put them in danger of contamination with a pathogen, thus many health care workers around the globe have died ~~of~~ from this fatal viral infection due to lack of resources [6, 7]. Health care force has always an important role for each Country. As many medical personnel were infected in Hubei, as initially fear was on its peak among front line nurses due to insufficient understanding of the virus, prevention and control measures [8], thus health care providers feared of infection and worried about their families in the face of this unknown illness and uncertain threats, but they still applied

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to join the war, assumed their roles, focused on their tasks, and displayed a spirit of solidarity and professional commitment [9]. Pakistan was also the part of the world that was affected by this deadly virus during 2020. Though the people who were much prone to this infection were family members of diseased patient and health staff, despite this fact the concerned health-care workers and their professional organizations have constantly used their broad expertise to improve emergency-care systems around the world [10]. Meanwhile, among all health care workers in this pandemic situation nurses as front-line health care force were also facing many challenges regarding patient quality care as well their own health. Therefore, the objective of this study was to investigate the experiences of nurses who have attended covid 19 pandemic patients during 2020.

METHODS

A Qualitative Phenomenology research study design was used to explore the experiences, and involvement of nurses who have attended covid-19 pandemic patients in public tertiary care hospitals of Peshawar. Purposive sampling technique was used meanwhile the sample size was chosen based on data saturation in order to generate enough detailed information to emphasize the blueprints, types, and characteristics of the phenomenon of interest. Permission was taken from the University's ethical review board and concerned hospital before the commencement of data collection. Report was built with the participants and the research purpose. Author's information were fully disclosed to them before agreement was obtained for face-to-face individual in-depth interview as well as audio recording. During the interview, the individuals' preferred language was used and Semi-structured interviews were conducted with each participant. Audio recordings of interviews were made, as well as field notes were documented. Data saturation was found to be reached after 12th interviews. The data were analyzed using a thematic analysis approach, which was preceded by a step-by-step process. After all, using the coded data, themes were discovered. Then codes were sorted according to each subject. Finally, the themes were evaluated, and names for each theme were clearly determined, and all of the themes were documented in detail, providing the readers with a holistic view of the research.

RESULTS

During data analysis, total of 134 open codes were discovered from the information. During the process of axial coding extra and redundant codes were excluded and afterward 20 categories were recognized from open codes. From these categorical data 5 main themes of study were identified as they emerged in data analysis. Five main themes were recognized are as follow: Nosophobia, Scarcity of Resources, First Line Warriors, Environmental/Physical Problems and Perceived super spreaders are debated by participants of study.

1. Nosophobia

Most interviewees showed expression of high level of fear at the beginning of spread of infection and their fear was on peak level after exposure to different patients and environment. It emerged as a result of participant's statement about their experiences with regards to fear of infection.

"I was in much fear on first day because I had got a serious patient who was confirmed positive case. I was using precautionary measure including all PPEs because my fear was on peak level. (Participant 1).

"there was a lot of fear and we were feeling anxious because we were unaware of situation inside of covid ICU. We were in so much pressure from our family. They were asking us to leave the duty and come home due to scary situation" (Participant 5).

Most of the participants have shown their initial fear level at much high peak level while after exposing multiple times their fear level decreased to almost one or zero.

"At the start there was much fear in pandemic situation. I was feeling fear too. But with time period and after attending many patients and became habitual with such patients thus my fear decreased"(Participant 8).

Hostels owners were terrified of situation because there was much restriction from government side for following SOPs in hostel premises.

"All school and universities were closed due to pandemic and we were asking by mates and hostel owners to arrange accommodation for ourselves and there was also issue from neighbors because they had many concerned about our duty in covid units"(Participant 5).

Participants have also shown concern about their family. Nurses were using all PPEs very strictly to ensure their family safety and health.

"We have isolated ourselves in hostel and hadn't gone to home on weekend because we were afraid about our kids and elder, as our elder were not educated medically they were not aware of disease so we tried to protect and restrict our movement there"(Participant 5).

2. Scarcity of Resources

Participants in this study expressed their dissatisfaction with the resources made available for nurses in regard to disinfection protocol**.**

"I am not satisfied of waste management. Patient's rooms are not clean properly after their discharge or patients' death even though no fumigation has done yet. Only bad sheet used to change and nobody is cleaning patients' room properly after each discharge"(Participant 3).

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Heavy workloads on the nurses were also identified with insufficient number of human resources, so they needed more human resources to relieve the actual difficulties and guarantee the standard of care.

"The staff was untrained for covid 19. Staff from cardiac surgeries has deployed on emergency basis and after that all safety kits were provided by management and we have mostly used ICU staff"(Participant 5).

Lack of supplies was considered risk factor of spread of infection among duty staff. Participants preferred to have good stock of resources like availability of all personal protective equipment.

"Most of the staff became infected in other ward as no safety kits were provided there. If they were given proper PPEs in ward the chances of getting infection would be decreased there"(Participants 4).

Most of nurses have also raised concerns about the facilities provided. Few of them have shown their dissatisfaction about accommodation provided to them.

"Hospital managements has provided facilities and gave me option, as accommodation was allotted for quarantine, but I was not satisfied, therefore, I prefer to be quarantined at home in separate room"(Participant 7).

3. First Line Warriors

Nurses from different departments believed that this was the most critical time for them to serve their country and people. They had a responsibility to identify with and collaborate with frontline healthcare practitioners.

"We realized during duty that if the nurses leave the patients so it's mean, as they are neglected. Even the attendants were not coming to give care to the patients. Only nurses were there and remained responsible for all aspect of patients" (Participant 9)

According to the participants they believed in professionalism instead of following false rumors about any new pandemic, as there is always negative pressure for professional from concerned community, family members and colleagues.

"We were in so much pressure from our family. They were asking us to leave the duty and come home due to scary situation. Instead, we believe in professionalism and continue our duty in covid unites"(Participant 5).

"I always tried to find approaches to protect myself and others from getting infection. Meanwhile I have separated myself from other family members by limiting myself to a room which is located on other side of the house" (Participant 7).

More patients' exposure compare to other health professional was another highlighted issue by nurses' participants. They have also expressed their concerned about their exposure and identified that this was the contributing factor in building good relationship with patients.

"I was in favor to perform duty in covid because I have seen most of the patients' were suffering a lot, as we were the only professional who stay for long with patients thus we have built good relationship with patients and their attendance and share their concerned without hesitation"(Participant 6)

4. Environmental/Physical Problems

Environmental and Physical Problems are factors which possibly contribute to health care professional reluctance to perform their duties. Almost all participants shared their experiences with regards to how much lethal their job was during this pandemic.

"Normally we should protect ourselves but most of the senior don't take it seriously but they have their safety kits. This is all their negligence. This may lead to serious consequences for them. Instead, I always force them to be on safe side" (Participant 3).

Participants also shared their perspectives relating to the exceptional task at hand and the pressures of treating COVID-19 patients and adjusting to the current workplace environment. Though nurses continued their responsibilities, they additionally had their own physical and psychological anxieties.

"Situation was too much worsen and there was panic situation at that time and the patients flow was much high in our unit. Initially there was uncertain situation, so we were putting on all safety kits and following hospital protocols very strictly for our own protection"(Participant 4).

"I don't have any fear for myself but I was scare for the sake of my family as my mother has diabetic mellitus. Though they are living in a village but they always ask me to visit them each time"(Participant 8).

Nurses repeatedly stated that the major physical and professional challenge was working with personal protective equipment for long hours. They sweated and their clothes became wet because of the airtight protective equipment.

"I was feeling much suffocation at first time while using safety kit in close room. Whenever i try to touch a mask meanwhile, i reconsider and remembered about corona thus always felt hesitate to touch my mask"(Participant 9).

"Facilities in quarantine were not satisfactory. Food and room facilities were not better. As I was quarantine in separate building so I was feeling type of separation and sense of loneliness there."(Participant 3).

5. Perceived Super Spreaders

Nurses were continually in fear of getting infected with SARS CoV2, because of the infectious nature of the disease. Participants expressed that General ward nurses were infected due to inadequate protection and knowledge of source infection at the beginning of pandemic outbreak.

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"We have only one nursing station. We don't know how many time staff is contacting patient and as well we are sharing everything in same room. There are much chances of cross infection among staff members and patients as well" (Participant 3).

"After expiry of confirmed case we used to put suspected case on same ventilator. Thus, it was the main source of infecting further patients, even some time we didn't receive their test report till putting them on vent" (Participant 9).

Nurses who lived with families additionally had incredible worry about taking infection to their relatives, particularly to their youngsters and guardians.

"I remain in distance with collogue and they ask me to live in separate room. Most of my colleague didn't believe on test quality and were in fear about my presence in hostel" (Participant 9).

Most of the nurses realized social support during whole pandemic to manage uncertain situation. Few were much satisfied from logistic support from their respective hospital managements. Nurses' mind-sets changed with the circumstances. They were relieved and felt great relief when statistic showed good progress of their departments, hence if the circumstances of patients showed little change or regression, they felt depressed and had a profound feeling of powerlessness.

DISCUSSION

During pandemic the point of view toward nursing as a calling is as positive as it has consistently been, whereas same in this pandemic the worth of nurses was as high as usual in crises. In the current study many of the participants have showed fear and claimed to be infected from hospital environment and with same virus they have infected their family members as well, while a study from China presented that in the early stage of the COVID 19 pandemic, more than 3000 medical staff in Hubei were infected, 40% of whom were infected in emergency clinics. Nurses experienced persistent fear of contamination because of the infectious idea of the infection unknown means of transmission [11]. It was concluded by the participants that in emergency unite most of the patients need artificial ventilation and other lifesaving care. a Studies also showed that It is crucial for specialists to emphasize the significance of self-care, set maximum working hours and make sensible steps to shield health workers from exhaustion [12]. It is suggested by participants that lack of resources can lead to further infection. Participants were not satisfied with supplies provided by authority. According to studies, materials supplied by public health officials to combat the outbreak may be ineffective or released too late to effectively address the needs [13]. Another study during the SARS outbreak in Toronto in 2003, The Government has not been able to fulfill the food and other regular routine supply needs [14]. Most of the participants also showed feeling of frustrations due to unequal right for their self, while according to WHO Health care workers can justifiably be prioritized when allocating some resources because of their contribution to the health and well-being of the community [15]. In this pandemic nurses have shown their dedication while they were facing various. The findings were concordant with the study during previous pandemic in which front line nurses were fearful, and disappointed and were at higher danger of emotional well-being [16]. This study revealed that nurses were considered to be more prone in contracting this disease because of their multiple exposures to infected environment. According to another study proximal closeness of patient-nurture communications, nurses were particularly powerless [17]. Nurses have also explained the worse and panic situation and they felt separation and loneliness while they were quarantine. Findings were also consistent with study indicated that workers felt higher levels of stress and fear of others when they were subjected to quarantine themselves, and particularly when given little information support by their respective healthcare institutions [18]. Participant from this study stated that hospital acquired infection remain significant threat to nurses, additionally workload, uncertainty in the work environment due to fears of contamination. The same result was found in a study conducted in China, among healthcare COVID-19 transmission occurred in 3.8% of patients [19]. Study participants stated that most of health care worker infection leaded to trained staff shortage in this pandemic because all the staff that was positive for covid 19 was quarantined. Study in Ontario also stated the shortage of skilled nursing personnel became increasingly apparent. Nurses who might have been exposed to SARS kept working, which put patients further at risk [20]. Nurses were feared of getting infection and considering themselves to be the carrier for their parents, and to their partners[21].

CONCLUSIONS

Study findings showed that the multiple roles and functions played by nurses are considered particularly important during this COVID-19 pandemic and across all hospitals where as the exhaustive work drained nurses physically and emotionally. Nurses should be given a comprehensive assistance and support in protecting themselves while they always have showed their strength and spirit of professional dedication to defeat hurdles and challenges,

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they have faced in many pandemics. Consistent training for nurses and all medical care equipment provisions is for future crisis management.

Conflicts of Interest

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REFERENCES

[1] Young M, Crook H, Scott J, Edison P. Covid-19: virology, variants, and vaccines. BMJ Medicine. 2022 Mar; 1: 1-21. doi: 10.1136/bmjmed-2021-000040.

[2] Wang J, Zhou M, Liu F. Letter to the Editor Reasons for healthcare workers becoming infected with novel coronavirus disease 2019. Journal of Hospital Infection. 2020 May; 105(1): 100-1. doi: 10.1016/j.jhin. 2020.03.002.

[3] World Health Organization. Coronavirus (COVID-19) Events as They Happen. 2020. [Last cited: 22nd Mar 2020]. Available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen.

[4] Ghisolfi S, Almås I, Sandefur JC, von Carnap T, Heitner J, Bold T. Predicted COVID-19 fatality rates based on age, sex, comorbidities and health system capacity. BMJ Global Health. 2020 Sep; 5(9): e003094. doi: 10.1136/bmjgh-2020-003094.

[5] Li L, Xv Q, Yan J. COVID-19: the need for continuous medical education and training. The Lancet Respiratory Medicine. 2020 Apr; 8(4): e23. doi: 10.1016/S2213-2600(20)30125-9.

[6] Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, *et al.* Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. New England Journal of Medicine. 2020 Jan; 382: 1199-207. doi: 10.1056/NEJMoa2001316.

[7] Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G, Wallrauch C, *et al.* Transmission of 2019-nCoV infection from an asymptomatic contact in Germany. New England Journal of Medicine. 2020 Mar; 382(10): 970-1. doi: 10.1056/NEJMc2001468.

[8] Liu Q, Luo D, Haase JE, Guo Q, Wang XQ, Liu S, *et al.* The experiences of health-care providers during the COVID-19 crisis in China: a qualitative study. The Lancet Global Health. 2020 Jun; 8(6): e790-8. doi: 10.1016/S2214-109X(20)30204-7.

[9] Razu SR, Yasmin T, Arif TB, Islam M, Islam SM, Gesesew HA, *et al.* Challenges faced by healthcare professionals during the COVID-19 pandemic: a qualitative inquiry from Bangladesh. Frontiers in Public Health. 2021 Aug; 9: 1024. doi: 10.3389/fpubh. 2021.647315.

[10] Anderson PD, Suter RE, Mulligan T, Bodiwala G, Razzak JA, Mock C, *et al.* World Health Assembly Resolution 60.22 and its importance as a health care policy tool for improving emergency care access and availability globally. Annals of Emergency Medicine. 2012 Jul; 60(1): 35-44. doi: 10.1016/j.annemergmed.2011.10.018.

[11] Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, *et al.* Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. The Lancet. 2020 Feb; 395(10223): 497-506. doi: 10.1016/S0140-6736(20)30183-5.

[12] Adams JG and Walls RM. Supporting the health care workforce during the COVID-19 global epidemic. JAMA. 2020 Apr; 323(15): 1439-40. doi: 10.1001/jama. 2020.3972.

[13] Smith PK, Mahdavi J, Carvalho M, Fisher S, Russell S, Tippett N. Cyberbullying: its nature and impact in secondary school pupils. Journal of Child Psychology and Psychiatry. 2008 Apr; 49(4): 376-85. doi: 10.1111/j.1469-7610.2007.01846.x.

[14] DiGiovanni C, Conley J, Chiu D, Zaborski J. Factors influencing compliance with quarantine in Toronto during the 2003 SARS outbreak. Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science. 2004 Dec; 2(4): 265-72. doi: 10.1089/bsp. 2004.2.265.

[15] World Health Organization. Ethics and COVID-19: resource allocation and priority-setting. 2020; 1-5. [Last cited: 22nd Mar 2020]. Available from: https://www.who.int/ethics/publications/ethics-covid-19-resource-allocation.pdf?ua=1.

[16] Lee SM, Kang WS, Cho AR, Kim T, Park JK. Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. Comprehensive Psychiatry. 2018 Nov; 87: 123-7. doi: 10.1016/j.comppsych.2018.10.003.

[17] Hall LM, Angus J, Peter E, O'Brien-Pallas L, Wynn F, Donner G. Media portrayal of nurses' perspectives and concerns in the SARS crisis in Toronto. Journal of Nursing Scholarship. 2003 Sep; 35(3): 211-6. doi: 10.1111/j.1547-5069.2003.00211.x.

[18] Bai Y, Lin CC, Lin CY, Chen JY, Chue CM, Chou P. Survey of stress reactions among health care workers involved with the SARS outbreak. Psychiatric Services. 2004 Sep; 55(9): 1055-7. doi: 10.1176/appi. ps.55.9.1055.

[19] Chowell G, Abdirizak F, Lee S, Lee J, Jung E, Nishiura H, *et al.* Transmission characteristics of MERS and SARS in the healthcare setting: a comparative study. BMC Medicine. 2015 Dec; 13(1): 1-2. doi: 10.1186/s 12916-015-0450-0.

[20] Picard A. Mommy are you going to die. Globe and Mail. 2003; 5: 2003.

[21] Robertson E, Hershenfield K, Grace SL, Stewart DE. The psychosocial effects of being quarantined following exposure to SARS: a qualitative study of Toronto health care workers. The Canadian Journal of Psychiatry. 2004 Jun; 49(6): 403-7. doi: 10.1177/070674370404900612.

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Original Article

Hypokalemia among Children Having Acute Malnutrition with Diarrhea

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ABSTRACT

Diarrhea is one the most common symptoms encountered in emergency department in children specially and needs prompt management. There are many disastrous complications and hypokalemia is one and most important of them. Hypokalemia warrants urgent diagnosis and expert management. **Objective:** To determine the frequency of hypokalemia among children having acute malnutrition with diarrhea. **Methods:** This cross-sectional study was done in Department of Pediatrics, Khairpur Medical College from 1st November 2021 to 30th April 2022. A total of 134 patients fulfilling the inclusion criteria were included. Informed consent was taken from attendants. The data were collected on prepared proforma. **Results:** There were 134 patients in this study with The mean age of the cases was 2.4 ± 3.13 years. Male children 84 (62.6%) and were in majority while females comprising of 50(37.3%). Frequency of hypokalemia was 57 (42.5%). **Conclusions:** Our results showed that children with acute diarrhea and dehydration have an increased risk of developing hypernatremia and hypokalemia. Significant correlations were found between electrolyte imbalance and mortality.

INTRODUCTION

Diarrhea is one of the leading risk factors that is regarded as major factor for mortality and morbidity of childhood age especially under 5 years. Four million deaths occur each year in under-five children. An average of 3.3 episodes each year per child occur worldwide, but in certain areas this average exceeds nine episodes each year. Acute watery diarrhea is defined as abrupt onset of 3 or more stools per day and last up to 14 days and is due to imbalance of physiology of small intestine and large intestine and process involved in the absorption of ions, organic substrate and water [1]. There are different underlying causes usually in acute and chronic. Diarrhea leads to malabsorption and results into malnutrition if persist for longer time. Dehydration is important cause of mortality, depressed consciousness and depressed sunken fontanel [2, 3]. The clinical presentation of diarrhea depends upon its cause and host response. The common cause is infection mostly because of *salmonella*, *shigella*, *campylobacter* or rotavirus. Chronic diarrhea if not treated may result in severe malnutrition or failure to thrive despite of taking normal diet and has severe implication [4, 5]. Workup usually targets the presentation essentially labs

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that include blood test for leukocytes. Cultures for organisms and immunoassay for viruses. Other labs may include ultrasound abdomen, endoscopy and biopsy if required. In a study in US which enrolled 604 children of age between 3-36 months in community settings before introduction of rotavirus virus vaccine found highest incidence of acute watery diarrhea [6, 7]. One of the important and disastrous impact of diarrhea is electrolyte imbalance among that hypokalemia is the most important is hypokalemia and needs immediate attention for diagnosis and management [8]. Presentation of hypokalemia ranges from weakness and fatigue to muscle cramps and heart block. Psychological manifestation includes psychosis, delirium, hallucination and depression. Muscle weakness from hypokalemia may manifest as dyspnea, abdominal distension and frank paralysis. Replacing electrolytes is early and needs expert attention in emergency department or ICU care. Replacement may be oral or intravenous according to level and severity of patient. Ongoing potassium losses should be taken in consideration while replacing the deficit oral potassium chloride is replenished initially and larger doses can be given safely while intravenous replacement is second step and during that ECG monitoring and close follow up required as there are chances for development of cardiac arrhythmias. Serial monitoring for potassium for every hourly and then three hourly for inpatient is required. Due to paucity of local data that were needed for local guidelines. So, we had designed the study to determine the frequency of hypokalemia among children having acute malnutrition with diarrhea [9].

METHODS

This cross-sectional study was done at Khairpur Medical College, at Khairpur Mir in the duration from 1st November 2021 to 30th April 2022. The sample size was determined using WHO calculator with 7% error margin having 90% confidence interval and the frequency of hypokalemia in acute malnutrition accompanied with diarrhea (40%), calculated as 134. So, we included 138 children aged six months to 59 with malnutrition having acute diarrhea fulfilling the inclusion criteria using Non-Probability, Consecutive Sampling. Malnutrition as defined as edema [bilateral pitting of the foot], a low W/H ratio, and a MUAC are diagnostic markers [mid-upper arm circumference] and acute diarrhea where symptoms lasting less than 15 days. While hypokalemia is defined as potassium level less than 3.5mEq/L. Chronic, bloody diarrhea, necrotizing enterocolitis, congenital illnesses such as Cystic Fibrosis, or acute renal failure or any child who is currently receiving immunosuppressive or steroid medication in children, were not included in this study. After getting permission from ethical committee and informed consent from parents was taken by explaining benefits of the study children's comprehensive demographic information was gathered. By using sterile syringe 5ml of blood is taken and sent for analysis. SPSS version 22 was used for all analyses. The average and standard deviation of the serum K concentration were determined using descriptive statistics. Categorical variables such as gender, age range, and weight and serum potassium concentration were analyzed using frequency and percentage distributions. Statistical significance was assumed when the p-value was less than 0.05.

RESULTS

There were 134 patients enrolled in this study. Majority were males, 84(62.6%) as compare to females, 50(37.3%). The mean age of the cases was 2.4 ± 3.13 years. Mean weight was 5.7 ± 6.4 kg. Majority of children 82(61.1%) belonged to urban areas while 52(38.8%) cases had rural residency as shown in table 1.

Variable	Frequency (%)
Gender	
Male	84(62.6)
Female	50(37.3)
Residence	
Urban	82(61.1)
Rural	52(38.8)
Age Mean (years)	2.4 ± 3.13
Weight Mean (kg)	5.7 ± 6.4

Table 1: Distribution of demographic and clinical characteristics of the study sample

Hypokalemia was observed in 57(42.5%) children as shown in figure 1.

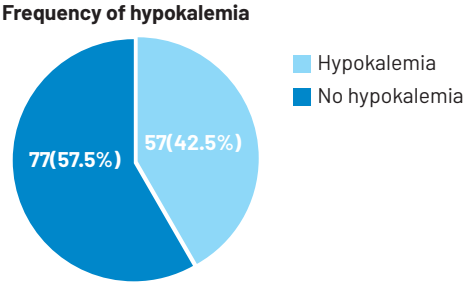

Figure 1: Frequency of hypokalemia

DISCUSSION

Electrolyte imbalance is always devastating especially in children having malnutrition which goes hand by hand with poverty because of poor hygiene and water and sanitary problems. Electrolyte imbalance is almost always lethal presentation during diarrhea. Acute diarrhea is extremely common and usually due to fecal-oral transmission of bacteria, their toxins, viruses or parasites. Infective diarrhea is usually short lived and patients who present

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with a history of diarrhea lasting more than 10 days rarely have an infective cause [10, 11]. A variety of drugs, including antibiotics, cytotoxic drugs, Proton Pump Inhibitors (PPIs) and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), may be responsible for acute diarrhea. The most common chronic diarrhea cause is irritable bowel syndrome which can present with increased frequency of defecation and loose, watery or pellet stools. Other causes may include chronic pancreatitis, cancer of pancreas, cystic fibrosis and coeliac disease [12, 13]. Children underlying malnutrition needs to evaluate children nutritional status and identification of underlying etiology of malnutrition. In mild to moderate cases of malnutrition initial assessment and intervention may be done as outpatient. Micronutrient deficiencies must be corrected for child to attain appropriate growth and development. Children commonly have protein energy malnutrition and present with poor weight gain, slow growth and behavioral changes like irritability, apathy and decrease social responsiveness. Deficiency of different substances like iron that leads anemia, headache and glossitis, while iodine causes goiter and developmental delay. Zinc deficiency may cause decrease immune response, anemia and delayed wound healing [14]. Our study included 134 patients where majority were males 84(62.6%) and female comprising of 50(37.3%). Similarly, male-dominant pattern was observed in several other studies like 57% (57/100) males in a study by Memon *et al.*, [15] and 64.4% (58/90) in a study by Zulqarnain *et al.*, [6], although possible explanation for male predominance is not known. The Mean age of the cases was 2.4 ± 3.13 years. Mean weight was 5.7 ± 6.4 kg. Majority of the children 82(61.1%) belongs to urban areas while 52(38.8%) cases had rural residency. Hypokalemia was observed in 57(42.5%) with insignificant p-value. Out of 57 cases of hypokalemia, majority was observed in male children 38 (66.66%), this may be due to more male children were in study. Whereas hypokalemia was more seen patients from rural areas 36(63.15%), these findings may be because of lower literacy rate in rural areas that possibly result in to unaware of the composition of balance needed for serum electrolyte imbalance. our finding of hypokalemia is little lower than the study by Memon *et al.*, who found hypokalemia 62.5% children with malnutrition with diarrhea and the frequency was lower around 22.2% in group of children who was having diarrhea with no malnutrition [15]. Study by Gangaraj *et al.*, [11] observed hypokalemia in 61.22% (30/49) of malnourished children with diarrhea. In another study they found little lower frequency around 40%, it may be because of lower sample size and lower number of children with rural background. Another study by Ahmed *et al.*, observed the frequency of 25% while in a study hypokalemia reported among 47.5% of children [16]. In a study of extremely malnourished patients, diarrhea was shown to be the most prevalent illness (50.8%), while hypernatremia was found to be the most common electrolyte imbalance [17]. Hypokalemia has very devastating complication as it gets low because it prolongs repolarization phase cells results in delayed or impaired depolarization phase which is responsible for initiating contraction of a muscle that results into various effects like myalgia, fatigability and muscle weakness to paralysis. Study by Andériz *et al.*, has observed paraplegia in children with acute diarrhea because of severe hypokalemia while another study reported paralysis after acute gastroenteritis with low level of serum potassium [18, 19]. In one study comprising of 35 cases quadriparesis was observed in children after diarrhea. Other studies also found hypokalemia as major risk for morbidity and mortality after diarrhea [20].

CONCLUSIONS

Our study suggests that electrolyte imbalance is a common and devastating complication of diarrhea that needs prompt diagnosis and treatment. We suggest that more research with better study designs in terms of the nature of the study, sample size, targeted regions, and varied age groups should be conducted to explore all factors contributing to malnutrition in Pakistan. In the meantime, we recommend adopting national guidelines for the management of acute malnutrition to reduce morbidity and mortality.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Okposio MM, Onyiriuka AN, Abhulimhen-Iyoha BI. Point-of-Admission Serum Electrolyte Profile of Children less than Five Years Old with Dehydration due to Acute Diarrhea. Tropical Medicine and Health. 2015 Dec; 43(4): 247-52. doi: 10.2149/tmh.2015-29

[2] 2. UNICEF. The state of the world's children 2012: Children in an urban world. 2012. [Last Cited: 2nd Sep 2020]Availableat:https://www.unicef.org/media/89226/file/The%20State%20of%20the%20World's%20Children%202012.pdf

[3] Parashar UD, Hummelman EG, Bresee JS, Miller MA, Glass RI. Global illness and deaths caused by rotavirus disease in children. Emerging infectious diseases. 2003 May; 9(5):565-572. doi: 10.3201/eid0905.020562

[4] Tham EB, Nathan R, Davidson GP, Moore DJ. Bowel habits of healthy Australian children aged 0-2 years.

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Journal of Paediatrics and Child Health. 1996 Dec; 32(6): 504-7. doi: 10.1111/j.1440-1754.1996.tb00963.x

[5] World Gastroenterology Organization Global Guidelines. Acute Diarrhea in Adults and Children: A Global Perspective. 2012 Feb. [Last Cited: 21st Jan 2015].Availableat:www.worldgastroenterology.org/assests/export/ userfiles/acute%20diarrhea.

[6] Zulqarnain A, Jaffar Z, Iqbal I. Malnourished Children with Diarrhea: To Assess the Frequency of Serum Electrolytes (NA^+, K^+ & CA^+) Disturbances. The Professional Medical Journal. 2015 May; 22(05): 610-4. doi: 10.29309/TPMJ/2015.22.05.1275

[7] Ashworth A, Ashworth A, Khanum S, Schofield C. Guidelines for the inpatient treatment of severely malnourished children. World Health Organization; 2003.

[8] Chisti MJ, Salam MA, Ashraf H, Faruque AS, Bardhan PK, Shahid AS, Shahunja KM, Ahmed T. Prevalence, clinical predictors, and outcome of hypocalcaemia in severely-malnourished under-five children admitted to an urban hospital in Bangladesh: a case-control study. Journal of Health, Population, and Nutrition. 2014 Jun; 32(2): 270-257.

[9] Javali NS, Shashikala P, Banu N, Ramya R. Hypomagnesaemia in protein energy malnutrition. Journal of Evidence Based Medicine and Healthcare. 2015; 2: 81-88. doi: 10.18410/jebmh/2015/14

[10] Sameen IF and Moorani KN. Morbidity patterns of severely malnourished children at tertiary care hospital. Pakistan Paediatric Journal. 2014; 38(1): 3-8.11.

[11] Gangaraj S, Das G, Madhulata S. Electrolytes and blood sugar changes in severely acute malnourished children and its association with diarrhoea and vomiting. International Journal of Pharmaceutical Science Invention. 2013; 2(5): 33-6.

[12] World Health Organization (WHO) Child growth standards and the identification of severe acute malnutrition in infants and children: joint statement by the World Health Organization and the United Nations Children's Fund. 2009. Available at: https://apps.who.int/iris/bitstream/handle/10665/44129/9789?sequence=1

[13] Fatima BI, Sheikh MA, Naeem MM. The serum sodium, potassium and calcium levels in children 6-59 months of age with severe acute malnutrition. Pakistan Journal of Medical and Health Sciences. 2017 Jan; 11: 292-4.

[14] Boschi-Pinto C, Velebit L, Shibuya K. Estimating child mortality due to diarrhoea in developing countries. Bulletin of the World Health Organization. 2008 Sep; 86(9): 710-7. doi: 10.2471/BLT.07.050054

[15] Memon Y, Majeed R, Ghani MH, Shaikh S. Serum electrolytes changes in malnourished children with diarrhoea. Pakistan Journal of Medical Sciences. 2007 Oct; 23(5): 760-764.

[16] Ahmed T, Begum B, Ali M, Fuchs G. Management of severe malnutrition and diarrhea. The Indian Journal of Pediatrics. 2001 Jan; 68: 45-51. doi: 10.1007/BF02728857

[17] Kinik ST, SeÇMeer G, Kanra G, Ceyhan M, Halit ZE, ÖKsÜZ N. Hypokalemic paralysis in association with acute gastroenteritis: a report of a sporadic case. Pediatrics International. 1998 Apr; 40(2): 143-5. doi: 10.1111/j.1442-200X.1998.tb01899.x

[18] Andériz FO, Clotet NC, de Diego Gamarra R, Garzón IS, Rizaldos SV. Hypokalemia-induced paraplegia secondary to acute diarrhea. InAnales de medicina interna(Madrid, Spain: 1984)2002 Feb; 19(2): 76-78.

[19] Shaheen B, Ismail MH, Parveen D, Sarfaraj S. Serum electrolyte pattern in children with protein energy malnutrition. International Journal of Pharmaceutical Biological and Chemical Sciences. 2013, 2: 10-15.

[20] Chisti MJ, Hossain MI, Malek MA, Faruque AS, Ahmed T, Salam MA. Characteristics of severely malnourished under-five children hospitalized with diarrhoea, and their policy implications. Acta Paediatrica. 2007 May; 96(5): 693-6. doi: https://doi.org/10.1111/j.1651-2227.2007.00192.x

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Original Article

Comparison of Outcome in Immediate Vs Delayed Management in Patients with Gunshot Injuries to Face, A Prospective Study

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ABSTRACT

Facial injuries due to gunshot often comprise on bone and tissue destruction. The destruction or injury to facial muscle and bone depend on the category of weapon used. Surgical intervention must be done, but the timing for the surgical procedure delayed verses immediate closure surgeries are controversial. **Objective:** To compare the outcome of immediate and delayed closure of the facial injuries by a gunshot. **Methods:** A descriptive cross-sectional study consisting of 60 patients getting their treatment in Department of Oral and Maxillofacial Surgery, Mayo hospital, Lahore. Data were analyzed by SPSS version 20.0. Chi-square test was used to compare the results with p-value ≤ 0.05 as significant. **Results:** Age group on average was 21 to 60 years. Out of these 60 gunshot facial injury patients, 52 (86.7%) were males and 8 (13.3%) were females. Among these, patients managed with immediate closure after gunshot injuries were 44 (73.3%) and 16 (26.7%) were managed with delayed closure. Wound infection and wound dehiscence were compared in both groups. The mean wound defect size was found among patients 3.98 ± 1.30cm. Statistically significant difference was observed for wound infection and wound dehiscence among both immediate versus delayed groups (p-value ≤ 0.05). **Conclusions:** In this study, we found that early management is better in terms of lower percentage of wound infection and dehiscence.

INTRODUCTION

Gunshot injuries to face are frequently encountered in hospitals. Both high and low energy injuries are encountered on the face due to firearms [1]. High velocity firearm injuries contribute to morbidity, mortality and social embarrassment due to devastating esthetic and functional consequences if mismanaged [2]. Knowledge of the head and neck anatomy, pathway of bullet and recognition of the type of injury are key factors for the prognosis of patient's health. The wound is not the same from entry and exit, sometimes it is small from the entry but very dangerous from the exit [3]. Facial gunshot injuries mostly present with comminuted fractures, massive soft tissue defects, intraoral communication that later on result in the development of fistulas [4]. Gunshot wounds on the face of injured are mostly polluted and the patient may present at a time when considerable local tissue have

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undergone necrosis to prevent infection and minimization of wound tension. Conflicting opinion was observed among researches as to whether immediate or delayed treatments should be done [5]. In some researches, early management of gunshot wounds results in better psychosocial profile, aesthetics, reduced hospital stay and early return to function. While in others, late repair followed by clean incisions of wounds in the past delayed management was advocated [6]. However, delayed reconstruction may lead towards permanent deformity in facial expressions and delayed wound healing [7]. Similarly, there are challenges while carrying out early intervention such as concomitant injuries to other parts of body, swelling, edema of soft tissues, loosened teeth, mobile bony fragments which may make treatment complex [8]. In high-velocity or blast injuries, primary or single stage surgery is not sufficient to clear the debridements; however, primary management is significant in soft tissue contracture and reassure coverage for osseous reconstruction [9]. There are conflicting data regarding early and late closure of gunshot wounds. In a study conducted by Clark *et al.* shows insignificant difference between two treatment modalities [10]. The data shows 45.8% patients show complication (in terms of wound dehiscence or infection) with early intervention while 50% shows complications with delayed management with p-value > 0.05.[2] However, another study shows that 58.8% patients presenting for immediate closure after gunshot injuries and only 20% of patients with early management came with complications of wound discharge and infection [11].

METHODS

Descriptive Cross-sectional study was carried out in the Department of Oral and Maxillofacial Surgery, Mayo Hospital, allied with King Edward Medical University Lahore, a tertiary care hospital. Sample size of 60 cases was calculated with 95% confidence level after gunshot injury. Non-probability Consecutive sampling technique was used. The diagnosis was on clinical basis selected from Emergency Department of Oral Maxillofacial Surgery, Mayo Hospital. An informed consent was obtained from them or their parents for using their data for research and procedure was explained to them. No ethical issues or risk involved to patient. Computed tomography had performed to assess bony defects and fractures of mid face, defect size or nature of injury was assessed clinically and radio graphically. Correction of fractures had done with proper reduction and fixation. Fixation of the fractured bones had done with miniplates according to the standard guidelines. Patients presenting in hospital emergency were sorted to receive either immediate management for gunshot injuries to face and placed in group A or delayed management were placed in group B. In group A, all patients having gunshot injuries to the face were reconstructed immediately within one week after injury with miniplates and skin grafts to close the facial skin defects if needed as the decision will be totally clinical and taken per operative. In group B, all patients having gunshot injuries to the face were managed after first week of injury. There was delay in management due to unavoidable circumstances such as patients presenting late after sustaining firearm injury, patients with poor general health until improved and those with severe concomitant. Follow up of patients done after two weeks and after one month for the assessment of complications i.e. wound. All this information was recorded on a predesigned proforma attached.

RESULTS

Data were entered and analyzed in SPSS version 20.0. Mean and standard deviation was calculated for quantitative variables like age of patient and defect size of wound and number of infections. There were total 60 patients with gunshot injuries to the face who were enrolled in this study after taking an informed consent. The mean age of the patients was 34.9 ± 11.04 years of which the minimum age was 21 year and maximum of 60 years. Out of these 60 patients 52 (86.7%) were males and 8 (13.3%) were females (Table 1).

Gender	Frequency (%)
Male	52(86.7)
Female	8(13.3)
Total	60(100)

Table 1: Frequency Distribution according to Gender

Patients who were present within first week of their gunshot injuries and managed with immediate closure were 44 (73.3%) and 16 (26.7%) patients were managed with delayed closure (Table 2).

Recovery	Frequency (%)
Immediate	44(73.3)
Delayed	16(26.7)
Total	60(100)

Table 2: Distribution according to no. of patients with Immediate closure

Wound infection was observed in 11 (18.3%) of total patients; among these 5 (11.4%) were examined in immediate closure group and 6 (37.5%) were came acrossed at delayed closure group. It was revealed that highest percentage of wound infection was noticed in delayed group and the difference between both groups was found statistically significant with the p-value = 0.021(Table 3).

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Number of patients with immediate closure		Wound infection		Total
		Yes	No	
Immediate	Count and % within number of patients with immediate closure	5(11.4)	39(88.6)	44(100)
Delayed	Count and % within number of patients with immediate closure	6(37.5)	10(62.5)	16(100)
Total	Count and % within number of patients with immediate closure	11(18.3)	49(81.7)	60(100)

Table 3: Comparison of Wound Infection between Immediate vs Delayed Closure
p-value = 0.021(Statistically Significant)

A total of 4 (6.7%) face gunshot injury patients were observed with wound dehiscence post-operatively at one month follow-up out of which 1 (2.3%) vs 3 (18.8%) were treated for wound dehiscence in immediate versus delayed closure group respectively. It seems that risk is high in the delayed closure group and differ significantly with the immediate group i.e., p-value= 0.024 (Table 4) descriptive analysis was done to quantify the variables.

Number of patients with immediate closure		Wound Dehiscence		Total
		Yes	No	
Immediate	Count and % within number of patients with immediate closure	1(2.3)	43(97.7)	44(100)
Delayed	Count and % within number of patients with immediate closure	3(18.8)	13(81.2)	16(100)
Total	Count and % within number of patients with immediate closure	4(6.7)	56(93.3)	60(100)

Table 4: Comparison of Wound Dehiscence between Immediate vs Delayed Closure
p-value = 0.024(Statistically significant)

DISCUSSION

The goal of this study was to assess the outcome of early surgical intervention versus delayed intervention in patients suffering from facial gunshot injuries in terms of complications associated with either treatment option. No local study has compared both early and delayed intervention. While the international data by Suominen and Tukiainen showed difference in results [12]. In one study there was insignificant difference between outcomes of two types of intervention while other study favors early intervention [13]. These conflicting results provide a rationale for our study so that we can assess which treatment option is better than other [14]. The soft tissue injuries need to be operated on time, Vitkus studied the immediate closure effects. The early repair of soft tissues also had proven significant findings in concomitant injuries. Also, the immediate closure corresponds with aesthetic improved results of surgical interventions. In our study 73% of patients undergone immediate surgeries and wound infections were 18.3% in them. Which is significantly less than delayed closure [15]. With the passage of time wounds of soft tissues get swelling, that make a split wound difficult to operate in primary closure. Also, the delayed wound closure harbors more infections. Also proven by our study 26.7% of patients were managed with delayed closures and wound infections were 37.5% which was significantly high than immediate closure. Ideally, closure should occur within the first 8 hours after injury [16]. A meta-analysis done by Bhattacharya concluded that the management of facial injuries should be followed by immediate closure. The complex injuries can later be managed by secondary closure of complex tissues rearrangement [17]. Sociodemographic, cost effectiveness and cost analysis are important factors that are associated with a surgical intervention. The primary and immediate closure are found to be cost effective that the delayed closures due to cosmetology surgery involvement. Cost analysis was nor a parameter included in our study as the study setting was in government funded tertiary care hospital of Lahore [18]. Mitchener and Canham-Chervak proved definitive repair of bony and soft tissue injuries must be done in single operation. It improves the functional quality and outcomes of the wounds and in high-velocity or blast injuries, primary or single stage surgery is not sufficient to clear the debridement's; however, primary management is significant in soft tissue contracture and reassure coverage for osseous reconstruction [19]. Free flap reconstruction is done in patients who had complex facial injuries. Definitive primary closure must be done. And it decreases the number of multiple stage surgeries and reduce the morbidities and incidence of wound infections. In our study total of 4 (6.7%) face gunshot injury patients were observed with wound dehiscence post-operatively at one month follow-up out of which 1 (2.3%) vs 3 (18.8%) were treated for wound dehiscence in immediate versus delayed closure group respectively. It seems that risk is high in the delayed closure group and differ significantly with the immediate group i.e., p-value= 0.024 [20]. Contaminations and wound infections are not considered among surgical procedure managements, immediate or delayed, by the post-operative care proven to be the leading factors by certain researchers [21]. Tomotography and angiography, the two surgeries that have been found very beneficial for the cranio facial reconstruction of free flap for non-traumatic cases and for traumatic cases that have rather lower-extremity of the injuries, both the surgeries have not been found very beneficial or useful for other traumatic wounds [22] Aveta and Caseati have concluded that the general principles of the surgical procedure are very useful for less complex facial injuries of the soft tissues but for other patients with special cases have to deal with different proximities of the trauma of facial injuries, these special patients were evacuated to a level I trauma center, that enabled the gunshot and battlefield facial wounds to be managed with much discipline and with greater efficiency, just like other types of facial wounds [23]. Choosing

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whether the patient must be treated with aggressive reconstruction of the wound or delayed reconstruction of wound depends on the patient and his condition, the moment when he is presented to the surgeon and last but not the least the surgeon's overall perspective and judgement of the wound. The major objective of the procedure was to restore function of the wounded part and this objective was achievable with careful and immediate planning and sharp and steady surgical moves of the surgeon and his team [24].

CONCLUSIONS

Injuries should be treated early as there is less chance of complications in terms of infection. Primary management of gun-shot wounds ensures undisrupted wound healing and decreases the incidence of morbidities, wound infections and shortens the hospital stay.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Motamedi MH. Management of firearm injuries to the facial skeleton: Outcomes from early primary intervention. Journal of Emergencies, Trauma and Shock. 2011 Apr; 4(2): 212. doi: 10.4103/0974-2700.82208

[2] Vayvada H, Menderes A, Yilmaz M, Mola F, Kzlkaya A, Atabey A. Management of close-range, high-energy shotgun and rifle wounds to the face. Journal of Craniofacial Surgery. 2005 Sep; 16(5): 794-804. doi: 10.1097/01.scs.0000180014.06352.65

[3] Salinas NL and Faulkner JA. Facial trauma in Operation Iraqi Freedom casualties: an outcomes study of patients treated from April 2006 through October 2006. Journal of Craniofacial Surgery. 2010 Jul; 21(4): 967-70. doi: 10.1097/SCS.0b013e3181e17ab5

[4] Peled M, Leiser Y, Emodi O, Krausz A. Treatment protocol for high velocity/high energy gunshot injuries to the face. Craniomaxillofacial trauma & reconstruction. 2012 Mar; 5(1): 31-40. doi: 10.1055/s-0031-1293518

[5] Firat C and Geyik Y. Surgical modalities in gunshot wounds of the face. Journal of Craniofacial Surgery. 2013 Jul; 24(4): 1322-6. doi: 10.1097/SCS.0b013e31829978c3

[6] Kaufman Y, Cole P, Hollier LH. Facial gunshot wounds: trends in management. Craniomaxillofacial Trauma & Reconstruction. 2009 May; 2(2): 85-90. doi: 10.1055/s-0029-1202595

[7] Mannion SJ and Chaloner E. Principles of war surgery. Bmj. 2005 Jun; 330(7506): 1498-500. doi: 10.1136/bmj.330.7506.1498

[8] Vatsyayan A, Adhyapok AK, Debnath SC, Malik K. Reconstruction and rehabilitation of short-range gunshot injury to lower part of face: A systematic approach of three cases. Chinese Journal of Traumatology. 2016 Aug; 19(4): 239-43. doi: 10.1016/j.cjtee.2016.01.016

[9] Thorne CH. Gunshot wounds to the face. Current concepts. Clinic in Plastic Surgery. 1992 Jan; 19(1): 233-44. doi: 10.1016/S0094-1298(20)30906-8

[10] Clark N, Birely B, Manson PN, Slezak S, Vander Kolk C, Robertson B, *et al*. High-energy ballistic and avulsive facial injuries: classification, patterns, and an algorithm for primary reconstruction. Plastic and Reconstructive Surgery. 1996 Sep; 98(4): 583-601. doi: 10.1097/00006534-199609001-00001

[11] Medel NA, Hamao-Sakamoto A, Zuniga J. Comparing early and late reconstruction of gunshot injuries to the upper and lower face. Journal of Oral and Maxillofacial Surgery. 2014 Sep; 72(9): e228-9. doi: 10.1016/j.joms.2014.06.411

[12] Suominen E and Tukiainen E. Close-range shotgun and rifle injuries to the face. Clinics in Plastic Surgery. 2001 Apr; 28(2): 323-37. doi: 10.1016/S0094-1298(20)32368-3

[13] Gruss JS, Antonyshyn O, Phillips JH. Early definitive bone and soft-tissue reconstruction of major gunshot wounds of the face. Plastic and Reconstructive Surgery. 1991 Mar; 87(3): 436-50. doi: 10.1097/00006534-199103000-00008

[14] Olding M, Winski FV, Aulisi E. Emergency free flap reconstruction of a facial gunshot wound. Annals of Plastic Surgery. 1993 Jul; 31(1): 82-6. doi: 10.1097/00000637-199307000-00018

[15] Vitkus K and Vitkus M. Microsurgical reconstruction of shotgun-blast wounds to the face. Journal of Reconstructive Microsurgery. 1990 Jul; 6(03): 279-86. doi: 10.1055/s-2007-1006831

[16] Hollier L, Grantcharova EP, Kattash M. Facial gunshot wounds: a 4-year experience. Journal of Oral and Maxillofacial Surgery. 2001 Mar; 59(3): 277-82. doi: 10.1053/joms.2001.20989

[17] Bhattacharya V. Management of soft tissue wounds of the face. Indian journal of plastic surgery: official publication of the Association of Plastic Surgeons of India. 2012 Sep; 45(3): 436. doi: 10.4103/0970-0358.105936

[18] Kretlow JD, McKnight AJ, Izaddoost SA. Facial soft

DOI: https://doi.org/10.54393/pjhs.v4i02.545

tissue trauma. InSeminars in plastic surgery 2010 Nov; 24(4): 348-356. doi: 10.1055/s-0030-1269764

[19] Mitchener TA and Canham-Chervak M. Oral–maxillofacial injury surveillance in the Department of Defense, 1996–2005. American Journal of Preventive Medicine. 2010 Jan; 38(1): S86-93. doi: 10.1016/j.amepre.2009.10.016

[20] Holmgren EP, Bagheri S, Bell RB, Bobek S, Dierks EJ. Utilization of tracheostomy in craniomaxillofacial trauma at a level-1 trauma center. Journal of Oral and Maxillofacial Surgery. 2007 Oct; 65(10): 2005-10. doi: 10.1016/j.joms.2007.05.019

[21] Ono K, Wada K, Takahara T, Shirotanl T. Indications for Computed Tomography in Patients with Mild Head Injury. Neurologia medico-chirurgica. 2007 Apr; 47(7):291–8. doi: 10.2176/nmc.47.291

[22] Simon B, Letourneau P, Vitorino E, McCall J. Pediatric minor head trauma: indications for computed tomographic scanning revisited. Journal of Trauma and Acute Care Surgery. 2001 Aug; 51(2): 231-8. doi: 10.1097/00005373-200108000-00004

[23] Aveta A and Casati P. Soft tissue injuries of the face: early aesthetic reconstruction in polytrauma patients. Annali Italian Chirurgia. 2008 Nov; 79(6): 415-7.

[24] Karcioglu Ö, Göktas N, Coskun F, Karaduman Sİ, Menderes A. Comparison of tissue adhesive and suturing in the repair of lacerations in the emergency department. European Journal of Emergency Medicine. 2002 Jun; 9(2): 155-8. doi: 10.1097/00063110-200206000-00010

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Original Article

Effect of Age on Survival in Patients with Cervical Cancer

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ABSTRACT

Cervical cancer survival rates depend on several factors, such as the stage of the cancer, age of the patient, and overall health status. However, early detection through regular screening and prompt treatment can significantly increase the chances of survival. **Objectives:** To determine the effects of age and other prognostic factors on survival in patients with cervical cancer. **Methods:** The medical records of 142 patients with cervical cancer were retrospectively reviewed. All patients were diagnosed by biopsy between January 2000 and December 2012 at the Princess Norah Oncology Center of King Abdul Aziz Medical City (Jeddah, Saudi Arabia). Kaplan-Meier survival curves and log-rank tests were used to compare groups. **Results:** The mean age at diagnosis was 51.77 ± 13.36 years (range, 28–96 years). The 1-year survival rates for each age group were as follows: < 30 years, 100%; 30–54 years, 83.9%; 55–65 years, 72.2%; and > 65 years, 73.3%. By contrast, the 5-year survival rates (0%, 38.5%, 30.8%, and 33%, respectively) were much lower. No significant differences in survival outcomes were identified among the age groups. Low mean hemoglobin levels during treatment were associated with poor survival rates. The mean hemoglobin level for all patients was 14.22 ± 16.28 mg/dL. **Conclusions:** Survival outcomes in patients with cervical cancer were not influenced by age at diagnosis. It will be necessary to perform systematic reviews of multiple studies on this topic to come to a more definitive conclusion.

INTRODUCTION

The third most frequent malignancy and the fourth most frequent cause of cancer-related fatalities globally is cervical cancer. In 2008, 275,100 cervical cancer patients passed away and an estimated 529,800 patients received a diagnosis. Importantly, less affluent nations account for more than 85% of cervical cancer instances and fatalities. This can be explained by the poor implementation of effective screening programs to detect precancerous and early malignant lesions [1]. Since the early 1970s, numerous studies have focused on the predictive importance of age in cervical cancer. Age at diagnosis has not always been studied as a prognostic indicator in the same manner. The main topic of discussion was frequently whether youthful patients have worse prognoses than elderly patients [2, 3]. It was assumed that cancer is physically more aggressive in people who are younger. Other studies have associated an older age with a poorer outlook, presuming that elderly patients receive less aggressive, and hence unsuitable, therapy, thereby affecting their longevity [4]. Several other mortality studies on cervical cancer in general or assessment studies on screening programs [5,6] have included age as a prognostic component in the survival analysis. Nevertheless, it is still not obvious whether age is a distinct prognostic factor in cervical cancer. There haven't been many population-based research released up to this point. In fact, the prevalence and mortality of cervical cancer have declined in industrialized nations as a result of the adoption of efficient screening programs [7]. In Saudi Arabia, according to the Saudi Cancer Registry, the number of newly diagnosed patients per year remained

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stable from 1994 to 2009 (97 new cases diagnosed in 1994; 101 new cases diagnosed in 2009)[8] likely due to the lack of effective screening programs for this disease in Saudi Arabia. Various studies have examined the prognostic factors that affect the survival and outcomes of patients with cervical cancer. Advanced stage, Tumor bulk, number of tumors, number of sites of involvement, and incomplete treatment courses are well-known factors associated with poor survival [9]. Other factors such as low hemoglobin level and tumor size usually greater than 4 cm have also been reported to be associated with poor survival and outcomes [10, 11]. Although some studies have examined the effect of age at diagnosis on patient survival, the results have been inconsistent. For example, some studies have shown that patients aged 65 years and older have poorer survival rates than younger patients [12, 13]. Brune *et al.*, demonstrated that women with invasive cervical cancer have increased mortality rates than normal women until the age of 75 after which this factor does not contribute much [14]. By contrast, some studies have shown that younger patients (defined by cut-off ages of 45, 35, or 40 years, respectively) have worse survival outcomes than older patients [14-16]. Other studies have shown that age does not affect the prognosis or final survival outcomes of patients with cervical cancer [17, 18]. Furthermore, no studies on the relationship between age and survival in patients with cervical cancer have been performed in Saudi Arabia. Therefore, in this study, we aimed to determine whether survival rates differed among patients diagnosed with cervical cancer at different ages, based on data collected from "Princess Norah Oncology Center, King Abdul Aziz Medical City-Jeddah in Saudi Arabia". Our study was expected to help national awareness programs for cervical cancer screenings target messages to high-risk patients.

METHODS

This was a retrospective study analyzing the medical records of women with cervical cancer diagnosed by histological biopsy specimens between January 2000 and December 2012 and treated at Princess Norah Oncology Center, King Abdul Aziz Medical City (Jeddah, Saudi Arabia). Using the International Classification of Diseases (ICD) 9 and 10 codes for cervical cancer, the records of 193 patients were retrieved. Of these, 142 patients were considered appropriate for review. Fourteen patients did not fit our inclusion criteria because they were diagnosed with a disease other than cervical cancer, and 37 had records with missing information that would have affected the analysis. We collected information on variables including demographic data, smoking history, Pap smear screening history, FIGO staging, histological type, and grading, tumor size (cm), hemoglobin level (g/dl), lymph node involvement, and treatment modality. We analyzed survival based on 1- and 5-year survival rates, irrespective of disease status. The treatment modalities for patients with cervical cancer included radiotherapy, simple or radical surgical hysterectomy, chemotherapy, or a combination of radiotherapy and surgery or concurrent chemoradiotherapy. The treatment modality was chosen according to the International Federation of Gynecology and Obstetrics (FIGO) staging at diagnosis. All data analyses were conducted using SPSS version 21. The variables were summarized using descriptive statistics. The 1- and 5-year survival rates were estimated using Kaplan-Meier survival curves. Significance was analyzed using log-rank tests, and differences with *p-values* less than 0.05 were considered statistically significant. Different prognostic factors were adjusted according to age groups using multivariate analysis. Ethical approval for our study was obtained from the ethical committee of King Abdul Aziz Medical City-Jeddah.

RESULTS

For the 142 patients reviewed, the mean age (± standard deviation) at diagnosis was 51.77 ± 13.36 years (range, 28–96 years). By age group, 3.5% of patients were younger than 30 years, 59.2% were aged 30–54 years, 17.6% were aged 55–65 years, and 19.7% were older than 65 years. Regarding smoking status, 8.45% of patients were smokers, 38.73% were nonsmokers, and the remaining 52.82% had an unknown smoking status (Table 1). The most common histopathological type was squamous cell carcinoma (78.2%), and high-grade cancers were the most common 62 (43.66%) (Table 1). Concerning lymph node involvement, 35.92% of patients had negative lymph nodes, 2.11% had positive lymph nodes as diagnosed during surgery, 30.99% had positive lymph nodes as diagnosed by imaging (e.g., computed tomography and magnetic resonance imaging), and 30.99% had unknown lymph node status (Table 1). Lymph node involvement was not associated with survival (p = 0.170). However, the size of the primary tumor was significantly associated with survival ($p < 0.001$).

Characteristics	Total (n)	Age groups (years)			
		>65	55–64	30–54	<30
Histopathologic type					
Squamous	111	23	21	63	4
Adenocarcinoma	20	4	2	14	0
Other	11	1	2	7	1
Grade					
Low		2	2	9	1
Moderate		7	8	26	1
High		12	12	35	3
Not reported		7	3	14	0

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History of smoking					
Smoker		3	2	6	1
Nonsmoker		10	11	32	2
Not reported		15	12	46	2
Lymph node involvement					
None		5	8	35	3
Surgical		0	1	2	0
Imaging		11	5	26	2
Not reported		12	11	21	0

Table 1: Patient clinicopathological characteristics by age group.

No significant differences in local recurrence were found among age groups (<30 years, 0%; 30–54 years, 17%; 55–65 years, 3%; and >65 years, 4%). Overall, stage 2B was the most common stage at diagnosis, accounting for 46.48% of all cases (Table 2). A significant association between the advanced stage at diagnosis and poor survival outcome was identified ($p < 0.001$). None of the patients had any record of a Pap smear screening before diagnosis.

Stage	Total (n)	Age groups (years)			
		>65	55–64	30–54	<30
1A	1	0	0	1	0
1B	17	1	1	14	1
1C	1	0	0	1	0
2A	9	3	2	3	1
2B	66	12	11	41	2
3A	5	0	1	4	0
3B	16	3	5	8	0
3C	1	0	0	0	1
4A	10	4	2	4	0
4B	6	2	2	2	0
Not reported	10	3	1	6	0
Total	142	28	25	84	5

Table 2: Analysis of cancer stage in different age groups

The 1-year survival rate for the overall study population was 78%. By age group, the 1-year survival rates were 100% for patients younger than 30 years, 83.9% for those aged 30–54 years, 72.2% for those aged 55–64 years, and 73.3% for those than 65 years (Figure 1). By contrast, only 22% of the study population survived for 5 years or more, with 5-year survival rates of 0%, 38.5%, 30.8%, and 33.3%, respectively, for the four age groups. No significant differences were observed among groups using the log-rank test ($p = 0.934$).

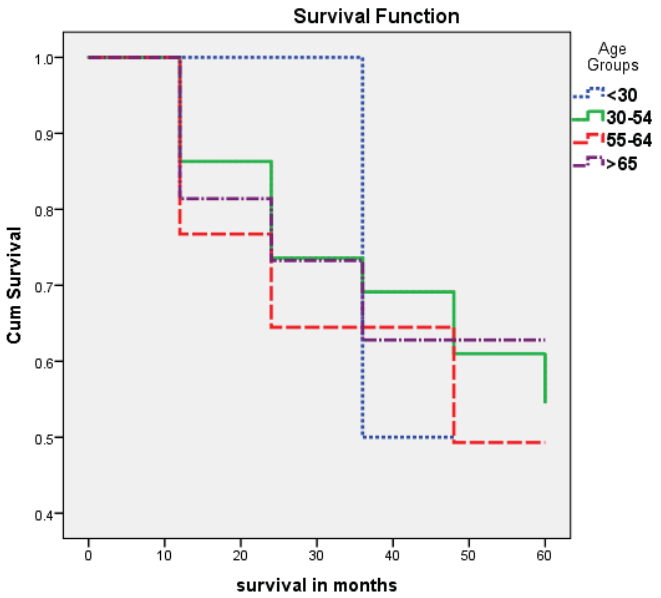

Figure 1: Overall survival according to age groups

Concerning treatment modalities, 76% of patients did not undergo surgical intervention, 9.859% underwent a simple hysterectomy, 8.451% underwent a radical hysterectomy, and 4.22% underwent other surgical treatments. Moreover, 62% received concurrent chemotherapy, and 26.65% received radiotherapy. Of all patients, 80.81% received an entire course of cisplatin therapy, and 88.64% completed radiotherapy. As expected, completion of treatment was positively associated with overall survival (cisplatin chemotherapy, $p = 0.004$; radiotherapy, $p = 0.000$). For patients completing treatment on concurrent chemoradiation, no significant difference was found. Patients who started palliative therapy (11.76%) had poor survival rates ($p = 0.005$) due to the advanced stage of cancer at the time of diagnosis. Only 8% of patients underwent pelvic boost radiotherapy. Interestingly, low mean hemoglobin levels (less than 10 mg/dL) during treatment were negatively associated with survival rates ($p = 0.002$). The mean hemoglobin level for all patients was 14.22 ± 16.28 mg/dL.

DISCUSSION

In this study, we aimed to determine the effect of age at diagnosis on the prognosis of patients with cervical cancer. Our results showed that age at diagnosis is not associated with survival rates and no significant difference in survival rate was found among age groups. Moreover, other well-established prognostic factors for cervical cancer did not differ among age groups. These results are important for the implementation of screening and vaccination programs in less-developed countries, such as Saudi Arabia. Our results showed no significant differences in survival or prognostic factors among age groups. These

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results are consistent with those of other studies that used different age cut-offs, including a population-based study with 2,000 cases of cervical cancer (age groups, <30 years and 40–60 years) [16, 17]. By contrast, in our study, we divided the study population into four groups (<30 years, 30–54 years, 55–64 years, and >65 years) to identify more detailed relationships between 1- and 5-year survival rates and age. We also found that low hemoglobin level (below 10 mg/dL) during treatment is associated with a lower survival rate. This result was consistent with that of other studies investigating the effects of anemia on survival rates [10]. Notably, the mean hemoglobin level in our population was in the normal range. Increased tumor size was negatively associated with survival outcomes, which was consistent with the results of other studies [19]. Moreover, our results confirmed the well-known effects of cervical cancer staging on patient survival: the advanced FIGO stage was significantly associated with low survival rates. Additionally, patients who received palliative therapy had lower survival rates, which could be explained by the advanced stage at diagnosis. Completion of chemotherapy or radiotherapy was significantly associated with higher survival rates. However, in patients receiving chemoradiotherapy, completion of treatment was not associated with better survival, similar to the results of Tharavichitku *et al.*, [20]. Importantly, none of the patients in our study reported to have undergone screening for cervical cancer using Pap smears. Screening for cervical cancer has decreased both the incidence of and mortality from this malignancy worldwide [7]. However, the number of newly diagnosed cases of cervical cancer per year has remained stable in Saudi Arabia, which could be explained by the country's lack of appropriate screening programs [8]. One limitation of this study was that a small number of patients were involved in the different categories. For example, only five patients younger than 30 years of age were included. This resulted in the exaggeration of the 1- and 5-year survival rates (100% and 0%, respectively). Therefore, further studies with a big sample pool and more categorizations of ages are needed to confirm our results.

CONCLUSIONS

In conclusion, in our population, age at diagnosis did not affect the survival outcomes of patients with cervical cancer. However, systematic reviews of multiple studies on this topic should be conducted to obtain a more definitive conclusion. Based on our results, we recommend the establishment of screening and awareness programs to emphasize the importance of cervical cancer screening for all age groups equally rather than targeting a specific age group.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global Cancer Statistics. CA: A Cancer Journal for Clinicians. 2011 Mar; 61(2): 69-90. doi:10.3322/caac.20107.

[2] Anton-Culver H, Bloss JD, Bringman D, Lee-Feldstein A, Disaia P, Manetta A. Comparison of Adenocarcinoma and Squamous Cell Carcinoma of the Uterine Cervix: A Population-Based Epidemiologic Study. American Journal of Obstetrics and Gynecology. 1992 May; 166(5): 1507-14. doi: 10.1016/0002-9378(92)91627-M.

[3] Howell E, Chen YT, Moradi M, Concato J. Cervical Cancer Practice Patterns and Appropriateness of Therapy. American Journal of Obstetrics and Gynecology. 2000 Aug; 183(2): 407-13. doi: 10.1067/mob.2000.105939.

[4] Bjørge T, Thoresen SØ, Skare GB. Incidence, Survival and Mortality in Cervical Cancer in Norway, 1956–1990. European Journal of Cancer. 1993 Jan; 29(16): 2291-7. doi: 10.1016/0959-8049(93)90224-4.

[5] Balducci L. Geriatric Oncology: Challenges for the New Century. European Journal of Cancer. 2000 Sep; 36(14): 1741-54. doi: 10.1016/S0959-8049(00)00169-6.

[6] Free K, Roberts S, Bourne R, Dickie G, Ward B, Wright G, *et al.* Cancer of the Cervix—Old and Young, Now and Then. Gynecologic Oncology. 1991 Nov; 43(2): 129-36. doi: 10.1016/0090-8258(91)90058-D.

[7] Peirson L, Fitzpatrick-Lewis D, Ciliska D, Warren R. Screening for Cervical Cancer: A Systematic Review and Meta-Analysis. Systematic Reviews. 2013 Dec; 2: 1-4. doi: 10.1186/2046-4053-2-35.

[8] Alghamdi MA. Polymorphism of Selected Genes Coding for Xenobiotic-Metabolizing Enzymes and Susceptibility to Colorectal Cancer in a Saudi Population. Journal of King Abdulaziz University. 2015; 26(1): 17-26. doi: 10.4197/Met. 26-1.2.

[9] Gospodarowicz M, Mackillop W, O'sullivan B, Sobin L, Henson D, Hutter RV, *et al.* Prognostic Factors in Clinical Decision Making: the Future. Cancer: Interdisciplinary International Journal of the American Cancer Society. 2001 Apr; 91(S8): 1688-95. doi: 10.1002/10970142(20010415)91:8+%3C1688::AID-CNCR1184%3E3.0.CO;2-7.

[10] Winter WE, Maxwel GL, Tian C, Sobel E, Rose GS, Thomas G, *et al.* Association of Hemoglobin Level with Survival in Cervical Carcinoma Patients Treated with Concurrent Cisplatin and Radiotherapy: a

DOI: https://doi.org/10.54393/pjhs.v4i02.622

Gynecologic Oncology Group Study. Gynecologic Oncology. 2004 Aug; 94(2): 495-501. doi: 10.1016/j.ygyno.2004.04.008.

[11] Wagner AE, Pappas L, Ghia AJ, Gaffney DK. Impact of Tumor Size on Survival in Cancer of the Cervix and Validation of Stage IIA1 and IIA2 Subdivisions. Gynecologic Oncology. 2013 Jun; 129(3): 517-21. doi: 10.1016/j.ygyno.2013.03.008.

[12] Federico C, Alleyn J, Dola C, Tafti S, Galandak J, Jacob C, *et al.* Relationship Among Age, Race, Medical Funding, and Cervical Cancer Survival. Journal of the National Medical Association. 2010 Mar; 102(3): 199-205. doi: 10.1016/S0027-9684(15)30526-5.

[13] Ioka A, Ito Y, Tsukuma H. Factors Relating to Poor Survival Rates of Aged Cervical Cancer Patients: A Population-Based Study with the Relative Survival Model in Osaka, Japan. Asian Pacific Journal of Cancer Prevention. 2009 Jan; 10(3): 457-62.

[14] Brun JL, Stoven-Camou D, Trouette R, Lopez M, Chene G, Hocké C. Survival and Prognosis of Women with Invasive Cervical Cancer According to Age. Gynecologic Oncology. 2003 Nov; 91(2): 395-401. doi: 10.1016/S0090-8258(03)00501-8.

[15] Delaloye JF, Pampallona S, Coucke PA, De Grandi P. Younger Age as a Bad Prognostic Factor in Patients with Carcinoma of the Cervix. European Journal of Obstetrics & Gynecology and Reproductive Biology. 1996 Feb; 64(2): 201-5. doi: 10.1016/0301-2115(95)02290-2.

[16] Robertson D, Fedorkow DM, Stuart GC, McGregor SE, Duggan MA, Nation G. Age is Prognostic Variable in Cervical Squamous Cell Carcinoma. European Journal of Gynaecological Oncology. 1993 Jan; 14(4): 283-91.

[17] Dattoli MJ, Gretz HF, Beller U, Lerch IA, Demopoulos RI, Beckman EM, *et al.* Analysis of Multiple Prognostic Factors in Patients with Stage IB Cervical Cancer: Age as a Major Determinant. International Journal of Radiation Oncology* Biology* Physics. 1989 Jul; 17(1): 41-7. doi: 10.1016/0360-3016(89)90368-4.

[18] Poka R, Juhász B, Lampé L. Cervical Cancer in Young Women: A Poorer Prognosis? International Journal of Gynecology & Obstetrics. 1994 Jul; 46(1): 33-7.

[19] Brewster WR, DiSaia PJ, Monk BJ, Ziogas A, Yamada SD, Anton-Culver H. Young Age as a Prognostic Factor in Cervical Cancer: Results of a Population-Based Study. American Journal of Obstetrics and Gynecology. 1999 Jun; 180(6): 1464-7. doi: 10.1016/S0002-9378(99)70038-4.

[20] Tharavichitkul E, Pinitpatcharalerd A, Lorvidhaya V, Kamnerdsupaphon P, Pukanhaphan N, Sukthomya V, *et al.* Impact of Incomplete Plan to Treatment Results of Concurrent Weekly Cisplatin and Radiotherapy in Locally Advanced Cervical Cancer. Journal of Radiation Research. 2011 Jan; 52(1): 9-14. doi: 10.1269/jrr.10021.

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Original Article

Knowledge, Perceptions and Use of Electronic Cigarettes Among Health Professionals

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ABSTRACT

In the developing era we are facing increasing prevalence of tobacco use and rapid increase of e-cigarette. Health professionals are no longer found to abstain from e-cigarettes. The growing interest of vaping in our society leads to us a debate that e-cigarette are the tools to refrain from smoking or these are provoking people towards more smoking. **Objectives:** To evaluate the knowledge and concepts of e-cigarettes. What are the attitudes of vaping in health care professional? **Methods:** A descriptive cross-sectional study based on questionnaire filling survey, filled by 350 health professionals working in Jinnah hospital Lahore. The questionnaire comprised of four parts: demographic data, knowledge and attitudes toward vaping behavior, interest and trend of e-cigarettes, and perception of harms and health related risks. **Results:** Data were collected from 350 individuals. Average age of health professionals included in study was 30.6±2.60. A large percentage was found for former smokers 22% and current smokers 39%. A cumulative percentage of 42%, electronic cigarettes were supported by the health professionals. Despite of good knowledge most of the professional had opinion in support of e-cigarettes up to 64% and the results were significantly proven by p-value 0.03. E-cigarettes are less harmful than combustible tobacco smoking with and cumulative percent of 76%. **Conclusions:** Health care professionals have favorable attitudes towards vaping or e-cigarettes perceived thought of vaping is less harmful than tobacco smoking is also highlighted. It is important to highlight the health-related problems by e-cigarettes in our society to control the behaviors of population towards e-cigarettes.

INTRODUCTION

A cartridge filled with nicotine (liquid) and other chemicals that produce inhalable smoke is call e-cigarette or vape. A quantity of nicotine varies in different types or e-cigarettes that is also a primary addictive component [1]. There is a debate if the nicotine percentage is fulfilled or increased in smokers who are habitual about combustible cigarettes or e-cigarettes. Also, the inhalable nicotine serves as a source of nicotine to non-smokers community [2]. Varying concentrations of nicotine in electronic devices not only facilitates enhancing the quantity of nicotine intake but also other substances present in e-cigarettes facilitate the absorption of nicotine, or improving to bioavailability of it [3]. It is found an increasing trend of vaping is more among adolescents or youngsters. Also a remarkable use of vaping is highlighted among tobacco smokers who want to quit smoking and use e-cigarettes as an alternate. But instead of decreasing the time of smoking there are found the increase incidence of its usage [4]. The e-cigarettes are not found helpful in stopping person from tobacco smoking according to literature. Although it found as an add on in nicotine intake. In some people vaping is more like a social trend than a need. In some youngsters e-cigarettes is like a life-style or social need [5]. In the developing era the smoking and adolescent are found co-related. A study

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conducted in US has recorded the increasing prevalence of smoking up to 78% in high school students. And up to 48% in middle school children since 2017-2018. The increasing availability of e-cigarettes and tobacco proved to be the major contributor to promote smoking [6]. If we conclude on the surveys held on the prevalence of e-cigarettes, which proved the increased prevalence of e-cigarettes. 0.8% to 4.9% in 10 years 2011 to 2019. The use of vaping created a hype in 2014 and later than most of the smokers preferred e-cigarettes over combustible cigarettes. Same trend of prevalence was found in other developed countries like Canada and USA [7]. Mostly the researchers evaluated that the trend of vaping is more in young population in college students. And if we talk on gender discrimination that vaping trend in 40% more in males than females. Young adults are more prone to e-cigarettes if our society keep on advertising and providing the stock to the population [8]. The regulatory bodies like FDA, since 2016 the e-cigarettes and the use of all tobacco products (cigars, hookah, pipe tobacco) now fall under the authorization of FDA. The FDA controls the deceiving information and quality of tobacco products by all the tobacco manufacturers and retailers. Newly regulated rules must be implemented and follow by all the suppliers [9]. In Malaysia, and Singapore, there are no regulatory bodies that control the products quality and limit of use. There are therefore no specific guidelines for the tobacco uses. Also, there are no guidelines for the quality if liquid in e-cigarettes and that's why there is uncontrolled use of aerosols that is affecting health and environment. No one is unaware of the aerosols and toxins that are produced. There is a misconception that tobacco is different than e-smoking. While nicotine that is an addicting product is available in such a large and purified amount in vape [10]. Health effects that are caused by the vaping and smoking include, the infection of upper respiratory track. Vaping can no longer prevent us from harms of nicotine. The infections of mouth and throat inflammations are less. The propylene glycol present in vape are the risk factors for eye-diseases and damaging spleen [11]. The person who is habitual of vaping also found to have a change in behaviors. Meanwhile e-cigarettes cause less side-effects of nausea and vomiting. The emitted smoke from e-cigarettes, e-juices and smoking-devices found increasing the risk for lungs cancers. [12] The aerosols and harmful chemicals serve as a contributor towards the risk associated. Nicotine effects a person's heart-rate and many users complain the elevated heart rate and blood-pressure. Centre Of Disease Control in USA is a regulatory body that controls the quality and availability of tobacco products. Use of tetrahydrocannabinol (THC) which are proven to cause EVALI product associated lung injuries in the users. While further investigation is continued on the chemicals that make inhalable smoke in vaping [13]. There is also a sociodemographic difference recoded in users. Mostly the young males of wealthy background are found habitual of smoking e-cigarettes. A social influence and media advertisement also promote its use in generation who are un-aware of the harms associated. Objectives of this study were: To assess the knowledge in association of use of e-cigarettes. Which sociodemographic class is more prone towards e-cigarettes? How the mass media contributing the use of vape? And a comparison of perceived and actual harms by e-cigarettes.

METHODS

A specially designed questionnaire tested to calculate the perceived harms and level of knowledge was used. The questionnaire consisted of 4 parts, including sociodemographic, smoking status and knowledge, attitude and perceived thoughts and mass media exposure. The questionnaire consisted of MCQS that classified the variables. A total sample of 350 was included. The sample size of 357 was calculated using the World Health Organization sample size determination in health sciences software version 2.0. Cross-sectional studies parameters for estimating p-value with specific relative precision of 50% (0.50). This was a descriptive cross-sectional study based on questionnaire filling survey, for health professionals working in Jinnah Hospital Lahore. A purposive sampling technique was used to select the samples. Descriptive and inferential statistics were done to calculate the frequencies and percentages and cumulative frequencies. Data were analyzed on IBM SPSS version 23.0; chi square tests were applied to calculate the association of knowledge and perceived harms. Statistically significant results were recorded.

RESULTS

Results were described in terms of binomial theorem. The demographic calculations were recorded for the health professionals. Frequencies for vaping and tobacco smoking were calculated and cumulative percentages were compared (Table 1). Average age of health professionals included in study was 30.6±2.60. a large percentage was found for former smokers 22% and current smokers 39%. Vape users also found in increasing percenntages.so far the mass media roles were evaluated in smoking cessations. The results support that mass media are found promoting vaping via social media influencers while tobacco cessation ads were less.

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Sociodemographic characteristics and behavior	N=350, n (%)
Age (years)	
Mean ± SD = 30.6±2.60	
22	22 (16%)
30	30 (67%)
45	45(24%)
Personal Smoking status	
Former Smoker	22%
Current Smoker	39%
Never Smoked	53%
Personal Vaping Status	
Vape user	14%
Dual user	32%
None	64%
Have you heard any mass media campaign on cessation of smoking	
Yes	26%
No	74%
Do you think you can promote smoking cessation in future	
Yes	82%
No	10%
Maybe	8%
Have you seen any advertisement on vaping	
Yes	62%
No	38%

Table 1: Demographic data of health professionals and response rate of smoking and vaping behavior

A specifically designed scoring table used to check the level of scoring of knowledge and perception, to evaluate the behaviors of house officers of health professional towards e-cigarettes (Table 2). Knowledge about e-cigarettes was measured by a questionnaire that included compositions of the liquids that are used in vapes and health harms associated with all the chemical substances. level of knowledge with the following statements: (1= Strongly disagree, 5= Strongly agree). The hazards of e-cigarettes have been clearly demonstrated. The hazards associated with the chemical substances have been clearly demonstrated. Survey questions from CDC Adult Tobacco Survey (Centers for Disease Control and Prevention) were used to evaluate the knowledge. the questionnaire was assessed by pilot testing and have significant findings. Health professionals were found to have good knowledge about the health harms of cigarettes although the knowledge of harms was not supporting for the smoking abstinence, on average of 42% electronic cigarettes were supported by the health professionals.

Attitudes and perception		Total N= 350 n (%) Cumulative percentages of response rates
Knowledge on electronic cigarettes	**Cutoff values**	
Poor	Less than 3	38%
Good	3 or above	62%
Perception and attitudes towards electronic cigarettes		
Favorable		42%
Less Favorable		58%
Knowledge on health hazards	**Cutoff values**	
Poor	Less than 3	75%
Good	3 or above	25%
Media exposure		
High exposure		11%
Less exposure		89%

Table 2: Attitudes and perception towards E-Cigarettes

The Table 3 corelated the knowledge and behaviors of health professional towards e-cigarettes. Despite of good knowledge most of the professional had opinion in support of e-cigarettes upto 64% and the results were significantly proven by p-value 0.03.

	Supporting behaviors towards e-cigarettes N (%)	Negative response towards e-cigarettes N (%)	p-value
N=350			
Knowledge on health harms			
Poor	34%	18%	0.03
Good	56%	56%	

Table 3: Crosstabulation of positive and negative response rate in association of knowledge

Chi square tests were applied to evaluate the association with cross-tabulation of knowledge of health harms and perceptions for e-cigarettes (Table 4). Another table to compare the knowledge and attitudes that e-cigarettes in more or less harmful than combustible tobacco smoking with and cumulative percent of 76% the perception was clear that the e—cigarette is considered less harmful than tobacco smoking among health professionals.

	E-cigarettes are harmful than smoking tobacco n (%)	E-cigarettes are less harmful than smoking tobacco n (%)	p-value
	N=350		
	Level of knowledge on e-cigarettes		
Poor	24%	34%	0.12
Good	60%	76%	
	Level of knowledge on e-cigarettes		
Favorable /positive	24%	34%	0.12
Less favorable /negative	60%	76%	

Table 4: Association of knowledge of health harms and perceived concept e-cigarettes are harmful than smoking or not

DISCUSSION

E-cigarettes have harmful effects that should not be ignored by the health professionals. Even they are smokers majority of the doctors have a thought to be a part of the cessation campaign of smoking tobacco. Similar studies have been conducted in America which concluded that the young adults who are visiting dental consultants have more knowledge and want to work on cessation of smoking either combustible tobacco smoking and vaping [14]. Oral

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health enlightens or help people to quit smoking. In the young persons even the young doctors perceive smoking e-cigarettes is less harmful than the tobacco smoking. Many local studies enlighten that the e-cigarettes are less harmful and does not affect oral hygiene. Although the amount of nicotine proven a high intake via e-cigarettes. Same results supported by our study that electronic cigarettes are less harmful than combustible tobacco by a cumulative percentage of 76% [15]. Many studies support that the smoking is not a tool for cessation for smoking but in enhances the quantity intake of nicotine per day. Though this is true, that vaping is less harmful than smoking but the risk factors associated with nicotine intake cannot be neglected. In our study the overall scoring in knowledge table was no more than 80% in youngsters. Although this study proven the calculations of nicotine is more in e-cigarettes that is an addictive substance [16]. Although the medical postgraduate trainees and consultants score up-to 100% in knowledge against health harms by e-cigarettes. But the thought of e-cigarettes is not a tool fit smoking cessation got significantly proved a favorable attitude towards E-cigarettes by 42.076%. Some surveys for medical undergraduate students held recorded very less knowledge for health harms in combustible tobacco-smoking and e-cigarettes smoking. [17]. Lewis and Goldstein in 2019 worked on lung injuries, their study highlighted the harms of e-cigarettes smoking in persons who were suffering from lung injuries. The harms of vaping cannot be neglected in persons who have already damaged tracheas. Headache nausea and COPD were reported with significant results [18]. Health professionals are considered to be the royal models and perform the main role in cessation of smoking [19]. Cancer, stroke, lung diseases, heart diseases, diabetes, chronic bronchitis and chronic obstructive pulmonary disease (COPD) are the associated diseases of smoking. Smoking is also proven to be the risk factor for some other diseases like; tuberculosis, certain eye diseases, and rheumatoid arthritis. For the past decades e-cigarettes were used to help chain smokers quit the habit of smoking [20]. Another observational study based on effectiveness and safety which were associated with e-cigarettes in dual users of tobacco smokers and e-cigarettes smokers. The study was conducted in Malaysia to highlight the upcoming trends and associated public health issues in the society [21]. Doctors are the persons who must be included in cessation smoking campaigns, because they are the experts about harms and associated risk factors. Doctors are considered to be best fit to educate people regarding health harms and benefits associated with a subject. In current scenario the vape is in increasing trend in the population. As a part of behavioral support, the e-cigarettes promotes satisfaction in chain smokers for nicotine therapy and cessation of smoking. In our study population the response rate to support smoking cessation by health professional had a positive output of more than 80% [22]. A meta-analysis conducted in Indonesia, Qatar, Greece, and USA, studied the overall tobacco load and associated disease burden in adults. The main aim was to highlight the global health issues and increasing disease burden of COPD by Palipudi *et al.*, in 2016 [23]. There are some studies which conclude that the e-cigarettes are the leading agent towards tobacco smoking in young adults. Collins et al., although there is no evidence that exposure to e-cigarette advertisements affects the pattern use of e-cigarettes among the public. the advertisements effect the perception of people and community. Our study highlighted that more influence is on general public and non-medical people. Vape users also found in increasing percenntages.so far the mass media roles were evaluated in smoking cessations. The results support that mass media are found promoting vaping via social media influencers while tobacco cessation ads were less [24-25].

CONCLUSIONS

Significant results of increased prevalence of smoking were recorded among health professional which is such a dilemma to our society. Having the concept of health harms associated with e-cigarettes, increasing trends were recorded. E-cigarette is not a tool for tobacco replacement was obvious. But it also found associated with promoting smoking habits in youngsters. Clear guidelines must be implemented by the government to control to quality of e-cigarettes.

Conflicts of Interest

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REFERENCES

[1] Abdulrahman SA, Ganasegeran K, Loon CW, Rashid A. An online survey of Malaysian long-term e-cigarette user perceptions. Tobacco Induced Diseases. 2020 Mar; 18: 26. doi: 10.18332/tid/118720.

[2] Ghazali AF, Ismail AF, Faisal GG, Halil MH, Daud A. Oral health of smokers and e-cigarette users: A case-control study. Journal of International Dental and Medical Research. 2018 May; 11(2): 428-32.

[3] Hughes C. Smoking versus vaping: which is worse for your teeth? 2018. Available at: https://dentistry.co.uk/2018/05/14/smoking-versus-vaping-worse-teeth/.

[4] Caraballo RS, Shafer PR, Patel D, Davis KC, McAfee TA.

DOI: https://doi.org/10.54393/pjhs.v4i02.576

Peer reviewed: quit methods used by US adult cigarette smokers, 2014–2016. Preventing Chronic Disease. 2017; 14: E32. doi: 10.5888/pcd14.160600.

[5] Chao D, Hashimoto H, Kondo N. Social influence of e-cigarette smoking prevalence on smoking behaviors among high-school teenagers: Microsimulation experiments. PloS One. 2019 Aug; 14(8): e0221557. doi: 10.1371/journal.pone.0221557.

[6] Copeland AL, Peltier MR, Waldo K. Perceived risk and benefits of e-cigarette use among college students. Addictive Behaviors. 2017 Aug; 71: 31-7. doi: 10.1016/j.addbeh.2017.02.005.

[7] Damle SG. Tobacco (Electronic cigarette): An evil in many faces. Contemporary Clinical Dentistry. 2015 Apr; 6(2): 145. doi: 10.4103/0976-237X.156032.

[8] DeVito EE and Krishnan-Sarin S. E-cigarettes: impact of e-liquid components and device characteristics on nicotine exposure. Current Neuropharmacology. 2018 May; 16(4): 438-59. doi: 10.2174/1570159X15666171016164430.

[9] Driezen P, Nordin AS, Hairi FM, Yee A, Tajuddin NA, Hasan SI, *et al.* E-cigarette prevalence among Malaysian adults and types and flavors of e-cigarette products used by cigarette smokers who vape: Findings from the 2020 ITC Malaysia Survey. Tobacco Induced Diseases. 2022 Mar; 20: 32. doi: 10.18332/tid/146363.

[10] Duan Z, Wang Y, Huang J, Redmon PB, Eriksen MP. Reasons why Chinese smokers prefer not to use electronic cigarettes. Tobacco Induced Diseases. 2020 Dec; 18: 104. doi: 10.18332/tid/130477.

[11] Froum S and Neymark A. Vaping and oral health: It's worse than you think. Perio-Implant Advisory. 2019 May. Available at: https://www.perioimplantadvisory.com/clinical-tips/article/16412201/vaping-and-oral-health-its-worse-than-you-think.

[12] Hajek P, Phillips-Waller A, Przulj D, Pesola F, Myers Smith K, Bisal N, *et al.* A randomized trial of e-cigarettes versus nicotine-replacement therapy. New England Journal of Medicine. 2019 Feb; 380(7): 629-37. doi: 10.1056/NEJMoa1808779.

[13] Hammond D, Reid JL, Rynard VL, Fong GT, Cummings KM, McNeill A, *et al.* Prevalence of vaping and smoking among adolescents in Canada, England, and the United States: repeat national cross-sectional surveys. BMJ. 2019 Jun; 20: 365. doi: 10.1136/bmj.l2219.

[14] Minhat HS, Selvanathan S, Wahab A. Perceived health related risks of vaping among undergraduate students in faculty of medicine and health sciences, Universiti Putra Malaysia. International Journal of Public Health and Clinical Sciences. 2017 Jun; 4(3): 89-96.

[15] Ibrahim KS, Katiman D, Lim CW, Ismail JR, Chua NY, Khir RN, *et al.* A Study of Knowledge, Attitude and Practice of Vaping as Smoking Cessation Tool Among General Public in Selangor. International Journal of Cardiology. 2017Dec; 249: S43. doi: 10.1016/j.ijcard.2017.09.150.

[16] Akinkugbe AA. Cigarettes, E-cigarettes, and Adolescents' Oral Health: Findings from the Population Assessment of Tobacco and Health (PATH) Study. JDR Clininical and Translational Research. 2019 Jul; 4(3): 276-83. doi: 10.1177/2380084418806870.

[17] Lazard AJ. Social media message designs to educate adolescents about e-cigarettes. Journal of Adolescent Health. 2021 Jan; 68(1): 130-7. doi: 10.1016/j.jadohealth.2020.05.030.

[18] Lewis N, McCaffrey K, Sage K, Cheng CJ, Green J, Goldstein L, *et al.* E-cigarette use, or vaping, practices and characteristics among persons with associated lung injury—Utah, April–October 2019. Morbidity and Mortality Weekly Report. 2019 Oct; 68(42): 953. doi: 10.15585/mmwr.mm6842e1.

[19] Martell KM, Boyd LD, Giblin-Scanlon LJ, Vineyard J. Knowledge, attitudes, and practices of young adults regarding the impact of electronic cigarette use on oral health. The Journal of the American Dental Association. 2020 Dec; 151(12): 903-11. doi: 10.1016/j.adaj.2020.08.002.

[20] Minhat HS, Selvanathan S, Wahab A. Perceived health related risks of vaping among undergraduate students in faculty of medicine and health sciences, Universiti Putra Malaysia. International Journal of Public Health and Clinical Sciences. 2017 Jun 19; 4(3): 89-96.

[21] Mohamed MH, Rahman A, Jamshed S, Mahmood S. Effectiveness and safety of electronic cigarettes among sole and dual user vapers in Kuantan and Pekan, Malaysia: a six-month observational study. BMC Public Health. 2018 Dec; 18: 1-10. doi: 10.1186/s12889-018-5951-2.

[22] Navon L, Jones CM, Ghinai I, King BA, Briss PA, Hacker KA, *et al.* Risk factors for e-cigarette, or vaping, product use–associated lung injury (EVALI) among adults who use e-cigarette, or vaping, products—Illinois, July–October 2019. Morbidity and Mortality Weekly Report. 2019 Nov; 68(45): 1034. doi: 10.15585/mmwr.mm6845e1.

[23] Palipudi KM, Mbulo L, Morton J, Mbulo L, Bunnell R, Blutcher-Nelson G, *et al.* Awareness and current use of electronic cigarettes in Indonesia, Malaysia, Qatar, and Greece: findings from 2011–2013 global adult

DOI: https://doi.org/10.54393/pjhs.v4i02.576

tobacco surveys. Nicotine & Tobacco Research. 2015 Apr; 18(4): 501-7. doi: 10.1093/ntr/ntv081.

[24] Pepper JK, McRee AL, Gilkey MB. Healthcare providers' beliefs and attitudes about electronic cigarettes and preventive counseling for adolescent patients. Journal of Adolescent Health. 2014 Jun 1;54(6):678-83. doi: 10.1016/j.jadohealth.2013.10.001.

[25] Pokhrel P, Fagan P, Kehl L, Herzog TA. Receptivity to e-cigarette marketing, harm perceptions, and e-cigarette use. American Journal of Health Behavior. 2015 Jan; 39(1): 121-31. doi: 10.5993/AJHB.39.1.13.

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Original Article

Incidence of the Atrial Fibrillation in Patients with Chronic Obstructive Pulmonary Disease (COPD) in Sindh, Pakistan

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ABSTRACT

Chronic obstructive pulmonary disease (COPD) is a major public health problem and leading cause of death globally. COPD fails to receive adequate attention from the health care community and government officials, with these concerns in mind we designed our study. **Objective:** To find out the incidence of atrial fibrillation in patients with COPD. **Methods**: A cross-sectional study was conducted from 12th February 2019 to August, 2020 at the Department of Pulmonology, Ghulam Muhammad Maher Medical College teaching Hospital, Sukkur. N=150 patients with chronic obstructive lung disease were involved in this study. The Criterion for the selection of patients for the study was those patients who was a diagnosed case of COPD. The exclusion criteria were known asthmatic patients and the case of restrictive lung diseases; history of ischemic heart disease, already on cardiac medication, patients with hyperthyroidism whereas the percentages, mean and Standard deviation were computed for study variables. **Results:** During One year and six months phase, patients who had COPD for > 3-Year duration were explored and study. The mean, SD for age (years) of citizens of Sindh Rural and Urban was 59.52 ± 7.81. Regarding gender, male 64 % and female 36 % individuals whereas the Atrial Fibrillation (AF) was identified in 62 % patients of COPD. **Conclusions**: High risk of AF has been identified among the COPD patients in Pakistani Populace. Hypertension and CHF among the COPD patients were notable as self-sufficient hazard features for new beginning of AF.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is the key cause of dying globally. COPD is currently ranked the 4th maximum common exact base of death worldwide and predicated to be the 1/3 through way of 2030 [1, 2]. COPD is characterized by using slowly progressive development of airflow trouble that is poorly reversible, in sharp contrast to asthma in which there's variable airflow obstruction this is normally reversible spontaneously or with remedy [3]. Atrial Fibrillation (AF) is a distinctive arrhythmia seen in clinical practice. AF is additionally a significant vulnerability issue for stroke, and the threat of AF augmentation with grows old, climbing on or after 15% at an age of 50 to 59 years to 23.5% at an age of 80 to 89 years [3]. AF in patients with Chronic Obstructive Pulmonary Disease is a principal origin of morbidity and death globally [3]. The broad incidence in elderly men, 30 years or above is more than 14 % as compared to women, it's far considerably higher [4, 5]. In women the prevalence of Atrial Fibrillation in patients with COPD is estimated from 7 % to 8.2 % in different studies [6]. Chronic Obstructive Pulmonary disease is at current rate the exclusively frequent particular purpose of casualty globally and it's predicated

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that it becomes the third most common cause of death in patients of Atrial fibrillation with chronic obstructive pulmonary disease by the 2030 [7, 8]. In COPD patients the occurrence of AF impairs diagnosis, while presence of COPD in Atrial fibrillation patients additionally seems to have a unique effect on atrial fibrillation progression [9-11]. The Patients with COPD had an advanced risk for developing AF among the Pakistani populace. COPD patients, hypertension and CHF were eminent autonomous risk factor for resurgence AF, and a mount up evidences indicated that COPD is associated with AF [12]. Many studies reported that the abridged enforced expiratory quantity in one 2nd (FEVI) is an impartial predicator for traditional cardiovascular danger elements, height and Threat ratios of AF inspect the lacking with the most quartile of FEV1 [13, 14]. From 1985 to 1999, hospitalizations for Atrial Fibrillation all gone triple, and the high occurrence of Atrial Fibrillation bring about more remarkable curative consumption [15, 16]. A past report practiced stable electrocardiography to display arrhythmias in patients with COPD and established the frequency of Atrial Fibrillation become first and fundamental more prominent in COPD patients [17, 18]. A study demonstrated that during hospitalization for AF, COPD patients have an expended span of emergency clinic remain and expended medical clinic death [19, 20]. COPD has been independently related to AF however the correct pathophysiological mechanisms are complex and yet to be completely understood. There is a scarcity of information on atrial fibrillation incident and exposure elements in sufferers with COPD in most of the research studies, and they require evidences with regard to populace in Pakistan [21-23]. The point of present study was to examine the rate of atrial Fibrillation in Pakistan with COPD and look into the sovereign risk factors for AF in this population. Investigating the effects of hypoxia on atrial electrophysiology of the study acquiesce divergent results. In affected person with COPD who developed AF, management of the basic pulmonary disorder and the corrections in acid-base unevenness and hypoxia are of most important and symbolize first line treatment.

METHODS

This was a cross-sectional study conducted from 12th February, 2019 to August, 2020. A total of one hundred and fifty patients with chronic obstructive lung disease were included in this study. This study was carried out at the Department of Pulmonology, Ghulam Muhammad Mahar Medical College teaching Hospital, Sukkur. The inclusion criterion for the study was those patients who were diagnosed case of COPD. The exclusion criteria were known asthmatic patients and the case of restrictive lung disease; history of ischemic heart disease, already on cardiac medications, patients with hyperthyroidism. After having selected cases for the study, careful history & examination was carried out in each patient in particular relation to respiratory and cardiovascular examination. The demographical and clinical profile of subjects was also noted. The co-morbidities were also explored through clinical history, physical examination and specific investigations (ECG and echocardiography) whereas the data were composed in pre-intended proforma. SPSS 16.0 version had been used to show Statistical analysis. Categorical data were presented as frequencies and percentages and the percentages, mean and Standard deviation were computed for study variables.

RESULTS

Total 150 patients with COPD have been studied during the period of 1.5 years in current study. The baseline characteristic of the all patients in the Figure 1 shows the total percentage of Selective parameters which is also included in Table 1.

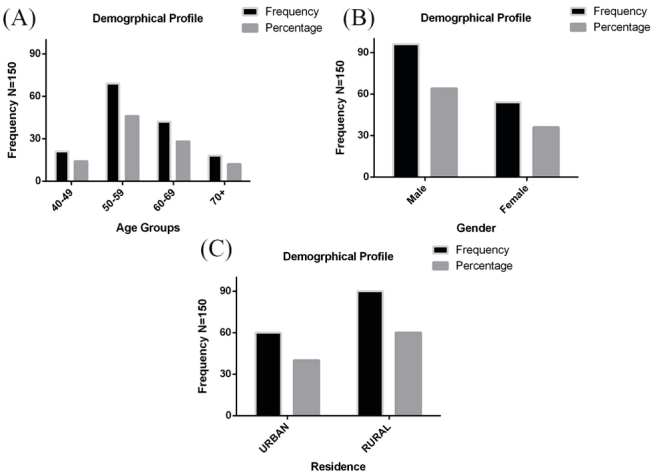

Figure 1: (A) shows the total percentage of each age group from the total frequency of COPD patients, 40-49 shows 14%, 50-59 (46%), 60-69 (28%) and 70+ (12%) correspondingly. (B) Gender group shows total percentage of Male (64%) and Female (36%) from the total COPD patients and (C) Residence group shows 40% for urban and 60% from rural areas from entire frequency of patients respectively Table 1 shows the total percentages vs. all parameters from the total 150 COPD Patients, Body mass index of the patients shows 27.5%, Female Gender shows 36%, Angina Class IV 30.2%, Previous wave myocardial infarction (MI) 21.9%, Q-wave MI within previous 30 days 15.9% and left ventricular ejection fraction <30% shows 17.2% among the total 150 COPD patients.

Parameter	COPD (n=150)
Body Mass index (BMI)	27.5 %*
Female gender	36 %
Angina class IV	30.2 %*
Previous Q-wave myocardial infarction (MI)	21.9 %*

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Q-wave MI within previous 30 days	15.9 %*
Left ventricular ejection fraction <30%	17.2 %*

*p<0.05

Table 1: Patients Characteristics profile of study population

The demographical profile of study population shown in Figure 2. Demographical profile has been categorized in three parts, Age group, Gender and Residence. Furthermore, age groups were further divided into 4 groups, 40-49, 50-59, 60-69 and 70+ respectively. Gender group divided into two groups, Male and Female and Residence group have been divided into two groups, Urban and Rural.

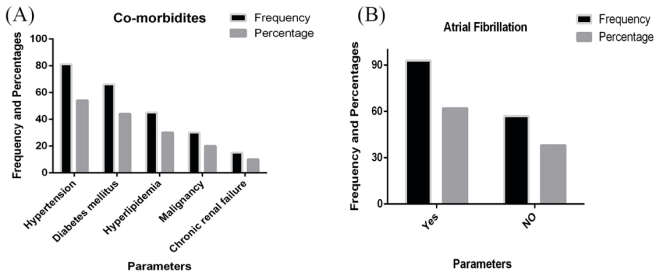

Figure 2: (A) Co-morbidity parameters like Hypertension, Diabetes mellitus, Hyperlipidemia, Malignancy and Chronic renal failure showed 54%, 44%, 30%, 20%, and 10% respectively in overall COPD frequency. (B) Atrial fibrillation diagnosed patients were 62% and un diagnosed 38%.

The demographical profile of study population shown in Table 2; In which mostly patients were male (64%) and female were 36 %. Among 150 patients 60% was belong to the rural area of the Sindh.

Parameter	Frequency (%) (N =150)
Age Groups	
40-49	21 (14%)
50-59	69 (46%)
60-69	42 (28%)
70+	18 (12%)
Gender	
Male	96 (64%)
Female	54 (36%)
Residence	
Urban	60 (40%)
Rural	90 (60%)

Table 2: The demographical profile of study population

The clinical profile of study population shown in Table 3. The mean ± SD for age (years) of population was 59.52 ± 7.81, whereas the atrial Fibrillation was identified in 62 % patients of COPD. Co-morbidities conditions have been found out through using different parameter for instance Hypertension, Diabetes mellitus, Hyperlipidemia, Malignancy and Chronic renal failure. The given parameters showed that highest frequency (81) of patients had hypertension accounts for 54%, second highest frequency (66) of the patients had Diabetes mellitus which accounts for 44%, Hyperlipidemia showed 30% in 45 patients, 30 out of 150 patients had malignancy which accounts for 20% and Chronic renal failure showed only 10% in 15 patients out of 150 COPD frequency. Moreover 93 patients had Atrial fibrillation which accounts for 62% and 57 patients doesn't diagnose with atrial fibrillation which accounts only 38% from total frequency of COPD.

Co-Morbidities	
Parameter	**Frequency (%) (N =150)**
Age Groups	
Hypertension	81 (54%)
Diabetes mellitus	66 (44%)
Hyperlipidemia	45 (30%)
Malignancy	30 (20%)
Chronic renal failure	15 (10%)
Atrial fibrillation	
Yes	93 (62%)
No	57 (38%)

Table 3: The Clinical profile of study population

DISCUSSION

Our Study promised few discoveries during our work on the rate of new-beginning of AF in COPD patients. In the first place, COPD was related to the danger of AF [24]. Chronic patients with COPD with male patients leading. The ARIC study, demonstrated that lower pneumonic capacity was correlated per a higher frequency of AF [14]. Our study indicated that COPD associations with AF which increased the mass of evidences. The incidence of AF in COPD has major influence on mortality, whilst the presence of COPD in AF has a particular effect on AF development. There are numerous studies of AF in COPD were conducted globally, the major constituent includes inflammation, in previous study [15]. CHF, hypertension, chronic kidney infection and inflammation were threat elements for AF in the elderly population [13]. Our present study showed that CHF and hypertension were likewise altogether associated by new-beginning AF in the COPD population. Related discoveries have been reported by who miscarried to uncover and influence of hypoxia on either atrial refractoriness or atrial condition [23]. COPD is an initial inflammable disease; the elevated levels of serum C-responsive protein (CRP) are hard to control in these patients. In addition, CRP is concomitant with lung vocation, age and O_2 immersion [23]. The subsequent component includes medicine [25, 26]. COPD patients are recommended respiratory medications, including β-agonists, anticholinergic medications. Meanwhile the β-receptors and adenylate cyclase is initiated via aminophylline and theophylline and β-agonists that prompting the mechanism of cyclic adenosine monophosphate (cAMP) and protein kinase A, which causes the phosphorylation of target proteins and prompts a compression of myocytes [27-29]. The chronotropic and depolarization impacts lead an

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arrhythmogenicity [30, 31]. Different variables that actuate AF in the COPD populace incorporate more established age, hypoxia, smoking, and cardiovascular parameters [32]. Our Current research showed that CHF and hypertension were similarly altogether concomitant by new-beginning AF in the COPD population but there are some boundaries to the present study.

CONCLUSIONS

The Patients with COPD had an advanced risk for developing AF among the Pakistani populace. Amin COPD patients, hypertension and CHF were eminent autonomous risk factor for resurgence AF. In this approach the outcomes similarly endorse that doctors could do with to expand examination and early mediation for COPD patients during examination.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Rabe KF and Watz H. Chronic obstructive pulmonary disease. Lancet. 2017 May; 389(10082): 1931-40. doi: 10.1016/S0140-6736(17)31222-9.

[2] Pauwels RA, Buist AS, Calverley PM, Jenkins CR, Hurd SS. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: NHLBI/WHO Global Initiative for Chronic Obstructive Lung Disease (GOLD) Workshop summary. American Journal of Respiratory and Critical Care Medicine. 2001 Apr; 163(5): 1256-76. doi: 10.1164/ajrccm.163.5.2101039.

[3] Fabbri LM, Romagnoli M, Corbetta L, Casoni G, Busljetic K, Turato G, *et al.* Differences in airway inflammation in patients with fixed airflow obstruction due to asthma or chronic obstructive pulmonary disease. American Journal of Respiratory and Critical Care Medicine. 2003 Feb; 167(3): 418-24. doi: 10.1164/rccm.200203-1830C.

[4] January CT, Wann LS, Calkins H, Chen LY, Cigarroa JE, Cleveland Jr JC, *et al.* 2019 AHA/ACC/HRS focused update of the 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society in collaboration with the Society of Thoracic Surgeons. Circulation. 2019 Jul; 140(2): e125-51. doi: 10.1161/CIR.0000000000000665.

[5] January CT, Wann LS, Alpert JS, Calkins H, Cigarroa JE, Cleveland JC, *et al.* 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society. Journal of the American College of Cardiology. 2014 Dec; 64(21): e1-76. doi: 10.1016/j.jacc.2014.03.022.

[6] Wolf PA, Abbott RD, Kannel WB. Atrial fibrillation as an independent risk factor for stroke: the Framingham Study. Stroke. 1991 Aug; 22(8): 983-8. doi: 10.1161/01.STR.22.8.983.

[7] Magnani JW, Rienstra M, Lin H, Sinner MF, Lubitz SA, McManus DD, *et al.* Atrial fibrillation: current knowledge and future directions in epidemiology and genomics. Circulation. 2011 Nov; 124(18): 1982-93. doi: 10.1161/CIRCULATIONAHA.111.039677.

[8] Konecny T, Park JY, Somers KR, Konecny D, Orban M, Soucek F, *et al.* Relation of chronic obstructive pulmonary disease to atrial and ventricular arrhythmias. The American Journal of Cardiology. 2014 Jul; 114(2): 272-7. doi: 10.1016/j.amjcard.2014.04.030.

[9] Mendez-Bailon M, Lopez-de-Andres A, de Miguel-Diez J, de Miguel-Yanes JM, Hernández-Barrera V, Munoz-Rivas N, *et al.* Chronic obstructive pulmonary disease predicts higher incidence and in hospital mortality for atrial fibrillation. An observational study using hospital discharge data in Spain (2004–2013). International Journal of Cardiology. 2017 Jun; 236: 209-15. doi: 10.1016/j.ijcard.2017.02.017.

[10] Chahal H, Heckbert SR, Barr RG, Bluemke DA, Jain A, Habibi M, *et al.* Ability of reduced lung function to predict development of atrial fibrillation in persons aged 45 to 84 years (from the Multi-Ethnic Study of Atherosclerosis-Lung Study). The American Journal of Cardiology. 2015 Jun; 115(12): 1700-4. doi: 10.1016/j.amjcard.2015.03.018.

[11] Buch P, Friberg J, Scharling H, Lange P, Prescott E. Reduced lung function and risk of atrial fibrillation in the Copenhagen City Heart Study. European Respiratory Journal. 2003 Jun; 21(6): 1012-6. doi: 10.1183/09031936.03.00051502.

[12] Shibata Y, Watanabe T, Osaka D, Abe S, Inoue S, Tokairin Y, Igarashi A, Yamauchi K, Kimura T, Kishi H, Aida Y. Impairment of pulmonary function is an independent risk factor for atrial fibrillation: the Takahata study. International journal of medical sciences. 2011 Aug; 8(7): 514-22. doi: 10.7150/ijms.8.514.

[13] Terzano C, Romani S, Conti V, Paone G, Oriolo F, Vitarelli A. Atrial fibrillation in the acute, hypercapnic

DOI: https://doi.org/10.54393/pjhs.v4i02.498

exacerbations of COPD. European Review for Medical and Pharmacological Sciences. 2014 Oct; 18(19): 2908-17.

[14] Li J, Agarwal SK, Alonso A, Blecker S, Chamberlain AM, London SJ, *et al.* Airflow obstruction, lung function, and incidence of atrial fibrillation: the Atherosclerosis Risk in Communities (ARIC) study. Circulation. 2014 Mar; 129(9): 971-80. doi: 10.1161/CIRCULATIONAHA.113.004050.

[15] Ganga HV, Nair SU, Puppala VK, Miller WL. Risk of new-onset atrial fibrillation in elderly patients with the overlap syndrome: a retrospective cohort study. Journal of Geriatric Cardiology: JGC. 2013 Jun; 10(2): 129. doi: 10.3969/j.issn.1671-5411.2013.02.001.

[16] Kucher N and Goldhaber SZ. Cardiac biomarkers for risk stratification of patients with acute pulmonary embolism. Circulation. 2003 Nov; 108(18): 2191-4. doi: 10.1161/01.CIR.0000100687.99687.CE.

[17] Söhne M, Ten Wolde M, Büller HR. Biomarkers in pulmonary embolism. Current Opinion in Cardiology. 2004 Nov; 19(6): 558-62. doi: 10.1097/01.hco.0000138991.82347.0e.

[18] Kaczyñska A, Pelsers MM, Bochowicz A, Kostrubiec M, Glatz JF, Pruszczyk P. Plasma heart-type fatty acid binding protein is superior to troponin and myoglobin for rapid risk stratification in acute pulmonary embolism. Clinica Chimica Acta. 2006 Sep; 371(1-2): 117-23. doi: 10.1016/j.cca.2006.02.032.

[19] Binder L, Pieske B, Olschewski M, Geibel A, Klostermann B, Reiner C, *et al.* N-terminal pro–brain natriuretic peptide or troponin testing followed by echocardiography for risk stratification of acute pulmonary embolism. Circulation. 2005 Sep; 112(11): 1573-9. doi: 10.1161/CIRCULATIONAHA.105.552216.

[20] Tulevski II, ten Wolde M, van Veldhuisen DJ, Mulder JW, van der Wall EE, Büller HR, *et al.* Combined utility of brain natriuretic peptide and cardiac troponine T may improve rapid triage and risk stratification in normotensive patients with pulmonary embolism. International Journal of Cardiology. 2007 Mar; 116(2): 161-6. doi: 10.1016/j.ijcard.2006.03.030.

[21] Becattini C, Vedovati MC, Agnelli G. Prognostic value of troponins in acute pulmonary embolism: a meta-analysis. Circulation. 2007 Jul; 116(4): 427-33. doi: 10.1161/CIRCULATIONAHA.106.680421.

[22] Bajaj A, Saleeb M, Rathor P, Sehgal V, Kabak B, Hosur S. Prognostic value of troponins in acute nonmassive pulmonary embolism: a meta-analysis. Heart & Lung. 2015 Jul; 44(4): 327-34. doi: 10.1016/j.hrtlng.2015.03.007.

[23] Stevenson IH, Roberts-Thomson KC, Kistler PM, Edwards GA, Spence S, Sanders P, *et al.* Atrial electrophysiology is altered by acute hypercapnia but not hypoxemia: implications for promotion of atrial fibrillation in pulmonary disease and sleep apnea. Heart rhythm. 2010 Sep; 7(9): 1263-70. doi: 10.1016/j.hrthm.2010.03.020.

[24] Chen CY and Liao KM. The impact of atrial fibrillation in patients with COPD during hospitalization. International Journal of Chronic Obstructive Pulmonary Disease. 2018 Jul; 13: 2105-12. doi: 10.2147/COPD.S166534.

[25] Goldhaber SZ. Assessing the prognosis of acute pulmonary embolism: tricks of the trade. Chest. 2008 Feb; 133(2): 334-6. doi: 10.1378/chest.07-2464.

[26] Puls M, Dellas C, Lankeit M, Olschewski M, Binder L, Geibel A, *et al.* Heart-type fatty acid-binding protein permits early risk stratification of pulmonary embolism. European Heart Journal. 2007 Jan; 28(2): 224-9. doi: 10.1093/eurheartj/ehl405.

[27] Leung AN, Müller NL, Pineda PR, FitzGerald JM. Primary tuberculosis in childhood: radiographic manifestations. Radiology. 1992 Jan; 182(1): 87-91. doi: 10.1148/radiology.182.1.1727316.

[28] Hussey G, Chisholm T, Kibel M. Miliary tuberculosis in children: a review of 94 cases. The Pediatric Infectious Disease Journal. 1991 Nov; 10(11): 832-6. doi: 10.1097/00006454-199111000-00008.

[29] Kabra SK, Lodha R, Seth V. Some current concepts on childhood tuberculosis. Indian Journal of Medical Research. 2004 Oct; 120: 387-97.

[30] Van Dyck P, Vanhoenacker FM, Van den Brande P, De Schepper AM. Imaging of pulmonary tuberculosis. European Radiology. 2003 Aug; 13: 1771-85. doi: 10.1007/s00330-002-1612-y.

[31] Kim WS, Moon WK, Kim IO, Lee HJ, Im JG, Yeon KM, *et al.* Pulmonary tuberculosis in children: evaluation with CT. AJR. American Journal of Roentgenology. 1997 Apr; 168(4): 1005-9. doi: 10.2214/ajr.168.4.9124105.

[32] Koh WJ, Jeong YJ, Kwon OJ, Kim HJ, Cho EH, Lew WJ, *et al.* Chest radiographic findings in primary pulmonary tuberculosis: observations from high school outbreaks. Korean Journal of Radiology. 2010 Dec; 11(6): 612-7. doi: 10.3348/kjr.2010.11.6.612.

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Original Article

Risk Factors of Intestinal Perforation Associated with Peritonitis

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ABSTRACT

Perforation is known as an abnormal opening in an empty organ. It is copied from the Latin word perforatus, meaning "to bore through." In western world the estimated frequency of intestinal perforation ranges from 0.6% to 4.9%. **Objective:** To find out the risk factors of intestinal perforation associated with peritonitis. **Methods:** It was a cross-sectional study and data was collected from February 2022 to July 2022. Data was collected from, DHQ Teaching Hospital Gujranwala and Social Security Hospital Multan chungi Lahore. Calculated sample size was 50 based on prevalence (0.68%) of intestinal perforation through an online sample size calculator (CI 95% and margin of error=0.09%). Patients of both genders with age limit of 10-60 years and patients presenting with perforation peritonitis were included in this study. Patients with Post-operative peritonitis and Immuno-compromised patients were excluded from study. Patient demographic information was collected. For demographic variables and risk factors of intestinal perforation descriptive analysis was used. Ethical approval has been obtained from concerned department and statistical analysis was done using SPSS version 24. **Results:** Out of 50 patients 38% were female and 62% were male. Major risk factors for intestinal perforation were Appendicitis (32%), Trauma (26%), Abdominal distension (24%) and Intestinal obstruction (20%). **Conclusion**: This study concludes that intestinal perforation is commonly seen between the age group of 21-30 years. Common risk factors of intestinal perforation are fever, appendicitis, trauma, abdominal distension, followed by intestinal obstruction, ascites and infection. The most commonly found perforation is duodenal perforation.

INTRODUCTION

Perforation is described as an abnormal opening in an empty organ. It is derived from the Latin word *perforatus*, meaning "to bore through" [1]. Perforation is stated to happen when there is a pathology that affects the entire hollow organ down to the peritoneal blemish with intraluminal packing. The gastrointestinal system can get perforated anywhere, initially from the esophagus to the rectum. Perforation peritonitis can cause bacteremia, generalized sepsis, multiorgan failure and shock if not treated [2]. Typhoid caused by Salmonella Typhi is still a devastating systemic illness in developing nations that also cause intestinal perforation [3]. The presence of various microorganisms in intestinal perforation peritonitis varies with geographic location, patient characteristics and the site of perforation [4]. The condition known as pancreatitis is an inflammatory process brought on by bacterial, fungal, and viral infections as well as various irritants, papilloma and drugs. It results in open colonic or intestinal perforations, which are the most frequent condition leading to a surgical emergency [5]. Lower intestine perforation (LIP) is a rare but serious condition that typically needs emergency surgery due to its high fatality rate. The lower gastrointestinal tract was found to be where gastrointestinal perforations in people with rheumatoid arthritis (RA) most frequently occurred [6]. Colonic perforative peritonitis (CPP) is one of the severe

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and challenging surgical emergencies due to range of clinical manifestations, complicated diagnosis and high lethality. a variety of etiopathogenetic factors can origin of perforation of the colon - inflammatory, oncological, vascular, obstruction, foreign bodies, iatrogenic interventions and others [7-9]. The gallbladder, extrahepatic biliary tree, urinary bladder, stomach, duodenum, jejunum, ileum, appendix, caecum, ascending, transverse and large intestines are some of the organs in the abdomen that can be perforated [10]. Disease with H.pylori, non-steroidal anti-inflammatory drugs (NSAIDs), chronic alcohol use, cigarette smoking, consumption of smoked foods, spicy foods and an imbalanced diet are the main risk factors [11]. Hippocrates first reported the Hippocratic facies, which is still seen as a critical predictive factor today, when first identified the condition of peritonitis [12]. For prevention of morbidity and mortality of peritonitis due to spillage of intestinal contents early identification and correct treatment is necessary. For diagnosis of intestinal perforation, ultrasound is the primary test and secondary testing such as CT, MRI and X-ray are reasonable options if required [13]. One of the common surgical emergencies that bears a greater death rate is secondary bacterial peritonitis caused by empty viscous perforation. In order to predict the outcome of patients with perforation peritonitis, several scoring systems are used. One of many is the Mannheim Peritonitis Index (MPI). MPI is an easy grading system for mortality in patients with peritonitis[14]. Surgery is not required in all cases of intestinal perforation but in both conditions operative and non-operative patient's early treatment includes bowel rest, intravenous fluids, intravenous broad-spectrum antibiotics, and frequent abdominal examination. Surgery is required for patients with perforative peritonitis and for those who have persistent symptoms after conservative treatment. No matter the underlying an etiology, laparotomy has historically been the preferred method of treatment for perforative peritonitis. However, because to several diagnostic and therapeutic benefits, laparoscopy for abdominal emergencies has recently gained widespread recognition. Resection of perforated site is undertaken [15]. We worked our best to find out the risk factors of intestinal perforation with peritonitis, so that we can diagnose it early for administering early treatment. By knowing the risk factors, rate of mortality and morbidity can be reduced. On the best of my knowledge and literature, we have found the international research but less literature was found at National level.

METHODS

This was cross-sectional study and data was collected from February 2022 to July 2022. Data were collected through Questionnaire comprising of questions related to risk factor of intestinal perforation associated with peritonitis. Risk factors for intestinal perforation such as, Intestinal obstruction, Abdominal distention, Gastric ulcer, Duodenal ulcer, Infection, Inflammation, Fever, Trauma, Appendicitis and Perforation were noted. Calculated sample size was 50 based on prevalence (0.68%) of intestinal perforation through an online sample size calculator (CI 95% and margin of error=0.09%). Data was collected from, DHQ Teaching Hospital Gujranwala and Social Security Hospital Multan chungi Lahore. Patients of both genders with age limit of 10-60 years and patients presenting with perforation peritonitis were included in this study. Patients with post-operative peritonitis and Immunocompromised patients were excluded from study. Participant consent was also taken and they were informed by the objective of the study. Patient demographic information was collected. Descriptive analysis was used for demographic variables and risk factors of intestinal perforation. Ethical approval has been obtained from concerned department and patients' statistical analysis was done using SPSS version 24.0. Descriptive analysis was carried out. All the quantitative variables were presented with Mean+SD and qualitative with frequency and percentages.

RESULTS

Table 1 shows that 12 (24%) patients belongs to 10-20 years of age category, 14 (28%) patients belongs to 21-30 of age category, 13 (26%) patients belongs to 31-40 year of age category , 3 (6%) patients belongs to 41-50 years of age category and 8 (16%) patients belongs to 51-60 years of age category in total population.

Age	Frequency (%)
10-20	12 (24.0%)
21-30	14 (28.0%)
31-40	13 (26.0%)
41-50	3 (6.0%)
51-60	8 (16.0%)
Total	50 (100.0%)
Gender of Patient's	
Female	19 (38.0%)
Male	31(62.0%)
Total	50 (100.0%)

Table 1: Demographic Table of Population

In table 2, we found that Out of 50 patients, 10 patients had Intestinal Obstruction,12 patients had Abdominal distention, 4 patients had Gastric Ulcer and 3 patients had Duodenal Ulcer, 9 patients had Ascites, 4 patients had Infection,19 patients had fever,16 patients had Appendicitis,13 patients had Trauma, 11 patients had Inflammation in which 34 patients had Duodenal

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perforation, 11 patients had Colon perforation, 7 patients had Stomach, 7 patients had Jejunum, 7 patients had Ilium and 2 patients had Rectum perforation.

Variables	Sub Variables	Frequency (%)
Intestinal obstruction	Yes	10 (20%)
	No	40 (80%)
Abdominal distension	Yes	12 (24%)
	No	38 (76%)
Gastric Ulcer	Yes	4 (8%)
	No	46 (92%)
Duodenal Ulcer	Yes	3 (6%)
	No	47 (94%)
Ascites	Yes	9 (18%)
	No	41(82%)
Infection	Yes	4 (8%)
	No	46 (92%)
Trauma	Yes	13 (26%)
	No	37 (74%)
Appendicitis	Yes	16 (32%)
	No	34 (68%)
Fever	Yes	19 (38%)
	No	31 (62%)
Inflammation	Yes	11 (22%)
	No	39 (78%)
Stomach Perforation	Yes	7 (14%)
	No	43 (86%)
Duodenal Perforation	Yes	34 (68%)
	No	16 (32%)
Jejunum Perforation	Yes	7 (14%)
	No	43 (86%)
Ileum Perforation	Yes	7 (14%)
	No	43 (86%)
Rectum Perforation	Yes	2 (4%)
	No	48 (96%)
Colon Perforation	Yes	11 (22%)
	No	39 (78%)

Table 2: Descriptive statistics of risk Factors of intestinal perforation

DISCUSSION

In current study we found that out of 50 patients, 38% patients had fever, 32% patients had appendicitis, 26% patients had trauma and Infection in 8% patients. Similar study was conducted by Bali et al in 2014. They showed that appendicitis was 18.5%, infectious 12%, tuberculosis 10%, and trauma 9% [16]. A study was published in 2010 by Gupta et al. They collected data of 400 patients to find the risk factors of perforation peritonitis. The results showed that Duodenal ulcer was in 176(44%), Appendicitis was in 96(24%), Typhoid was in 56(14%,) Trauma was in 28(6%), Gastric ulcer was in 12(3%,) Obstruction in 16 (4%) and 8(2%) had malignancies [17]. According to the current research the results shows that Duodenal ulcer was in 3(6%) patients, Appendicitis in 16(32%) patients and Trauma in 13(26%) patients, infection in 4(8%) patients and gastric ulcer in 4 (8%). Another study conducted by Jhobta RS et al. published in 2014. They found that commonest cause of perforation was duodenal ulcer 289, appendicitis was 59, trauma 45, and 41 had typhoid fever [18]. Current study shows that out of 50 patients, 16 patients had appendicitis, 13 had trauma, 19 patients had fever, 11 had inflammation, 12 had abdominal distension and 4 patients had gastric ulcer, 3 had duodenal ulcer. Gupta and Kaushik conducted a study on peritonitis. They found that duodenal perforation was most commonly seen. Less commonly seen perforations were small bowel and appendicular perforation. Colonic perforation was not common [19-20]. According to the current research the results show that the age of patients in this study ranged from 10 to 60 years. Intestinal Perforation was normally seen among the age group of 21-30 years and most common perforation was duodenal perforation (68.0%). Common risk factor of intestinal perforation was appendicitis and fever followed by trauma, inflammations and abdominal distension.

CONCLUSIONS

This study concludes that intestinal perforation is commonly seen between the age group of 21-30 years. Common risk factors of intestinal perforation are fever, appendicitis, trauma, abdominal distension, followed by intestinal obstruction, ascites and infection. The most commonly found perforation is duodenal perforation.

Conflicts of Interest

The authors declare no conflict of interest

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REFERENCES

[1] Meena LN, Jain S, Bajiya P. Gastrointestinal perforation peritonitis in India: A study of 442 cases. Saudi Surgical Journal. 2017 Sep; 5(3): 116-121. doi: 10.4103/ssj.ssj_33_17

[2] Nadkarni FM, Shetly SD, Kagzi RS. Small-bowel perforation. A study of 32 cases. Archives Surgery 1981; 116: 53-57. doi: 10.1001/archsurg.1981.01380130033008

[3] Gedik E, Girgin S, Taçyıldız IH, Akgün Y. Risk factors affecting morbidity in typhoid enteric perforation. Langenbeck's archives of surgery. 2008 Nov; 393(6): 973-7. doi: 10.1007/s00423-007-0244-8

[4] Jindal N, Arora S, Pathania S. Fungal culture positivity in patients with perforation peritonitis. Journal of Clinical and Diagnostic Research: JCDR. 2015 Jun; 9(6). doi: 10.7860/JCDR/2015/13189.6050

[5] Shahid MH, Khan FI, Askri Z, Asad A, Alam MA, Ali D, et

DOI: https://doi.org/10.54393/pjhs.v4i02.574

al. One Year of Experience Managing Peritonitis Secondary to Gastrointestinal Perforation at a Tertiary Care Hospital: A Retrospective Analysis. Cureus. 2022 Apr; 14(4). doi: 10.7759/cureus.23966

[6] Jacobs B, Jawad A, Fattah Z. Pneumatosis intestinalis and intestinal perforation in a patient receiving tocilizumab. Archives of Rheumatology. 2018 Sep; 33(3): 372. doi: 10.5606/ArchRheumatol.2018.6668

[7] Joshi P, Poudel R, Chandra K. Mannheim Peritonitis Index (MPI) score as a predictor of outcome in patients with secondary peritonitis. Journal of Universal College of Medical Sciences. 2016; 4(2): 6-9. doi: 10.3126/jucms.v4i2.19083

[8] Afridi SP, Malik F, Ur-Rahman S, Shamim S, Samo KA. Spectrum of perforation peritonitis in Pakistan: 300 cases Eastern experience. World Journal of Emergency Surgery. 2008 Dec; 3(1): 1-5. doi: 10.1186/1749-7922-3-31

[9] Chakma SM, Singh RL, Parmekar MV, Singh KG, Kapa B, Sharatchandra KH, et al. Spectrum of perforation peritonitis. Journal of clinical and diagnostic research. 2013 Nov; 7(11): 2518. doi: 10.7860/JCDR/2013/5768.3596

[10] Jain U, Chauhan A, Gupta J, Gupta AK. Evaluation of Boey scoring in predicting morbidity and mortality in peptic ulcer perforation peritonitis. International Journal of Surgery Science. 2021; 5(3): 41-3. doi: 10.33545/surgery.2021.v5.i3a.735

[11] Kallely M, Panchabhai S, Nichkaode P, Rayani H, Teja JR, Patil D. Perforation peritonitis: a clinical profile and management. Sri Lanka Journal of Surgery. 2020 Apr 30; 38(1). doi: 10.4038/sljs.v38i1.8649

[12] Kabongo KM, Erzingatsian K. Early postoperative complications associated with perforation. 2021.

[13] Hafner J, Tuma F, Hoilat GJ, Marar O. Intestinal perforation. InStatPearls. 2021 Nov.

[14] Endo Y, Abe Y, Kawano S, Ando T, Sakamoto K, Tamura N. The association between absence of abdominal pain and mortality in lower intestinal perforation in patients with autoimmune rheumatic diseases. BioMed research international. 2019 Feb; 2019. doi: 10.1155/2019/5381453

[15] Sakaguchi T, Tokuhara K, Nakatani K, Kon M. Laparoscopic management for spontaneous jejunal perforation caused by nonspecific ulcer: A case report. International journal of surgery case reports. 2017 Jan; 39: 309-12. doi: 10.1016/j.ijscr.2017.08.048

[16] Bali RS, Verma S, Agarwal PN, Singh R, Talwar N. Perforation peritonitis and the developing world. International Scholarly Research Notices. 2014 Apr; 2014. doi: 10.1155/2014/105492

[17] Gupta SK, Gupta R, Singh G, Gupta S. Perforation peritonitis: a two-year experience. Jk Science. 2010 Jul; 12(3): 141.

[18] Jhobta RS, Attri AK, Kaushik R, Sharma R, Jhobta A. Spectrum of perforation peritonitis in India-review of 504 consecutive cases. World journal of Emergency surgery. 2006 Dec; 1(1): 1-4. doi: 10.1186/1749-7922-1-26

[19] Gupta S and Kaushik R. Peritonitis-the Eastern experience. World journal of emergency surgery. 2006 Dec; 1(1): 1-6. doi: 10.1186/1749-7922-1-13

[20] Bano F, Malik S, Soomro I. Secondary Bacterial Peritonitis. Journal of Surgery Pakistan. 2017 Oct; 22: 4. doi: 10.21699/jsp.22.4.6

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Original Article

Contributing Factors Towards Low Back Pain Among Front Line Health Care Workers in Lahore, Pakistan

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ABSTRACT

For nurses' low back pain is a serious health issue. **Objective:** To determine the contributing factors towards low back pain among front line health care workers in Lahore, Pakistan. **Method**: The design of this study was cross-sectional, descriptive, and quantitative. 191 nurses were selected for this study through non-probability purposive sampling. Data were collected by adopted Performa by Prof. Cilliers. **Results**: This study encompassed 191 nurses working in the four public hospitals of Lahore. The response rate was 100%. The regular prevalence of low back pain was 41.4%. The highest ratio of contributing factors towards low back pain was physical, (poor posture 36.6%), while in the psychological factors fatigue 52.4%, whereas in the social factors age 35.6%, similarly in patient care Lifting a heavy Patient 23.6%, and work environment workload 36.6%. **Conclusion**: Low back pain was moderately prevalent among front-line health care workers. A physical, psychological, social, patient care, and work environment are all contributing factors towards low back pain.

INTRODUCTION

Low back pain is a serious health issue for front-line health care workers such as nurses due to the nature of their employment [1]. Low back pain influenced all ages of people [2]. The Word Health Organization defined low back pain as" It is a troublesome sensory and emotional practice accompanying with or comparable with, real or probable muscle damage [3]. Pain is due to the defense mechanism of the body to prevent further damage to the body [4]. Moreover, it is an undesirable influence on the body and intellectual health, due to the incidence of disease in the community [5-7]. Several studies revealed the tremendous incidence of lower back pain among front line health care workers [1]. LBP is a dorsal discomfort that occurs above the gluteal curvature and below the costal edge. Low back pain may also be called lumbosacral pain [8]. Deficit knowledge of back care and absence of lifting equipment during patient shifting and lifting of patients in a complex work environment, particularly in developing countries where assistive devices are not existing, are the major causes of low back pain among nurses [9]. Moreover, other contributing factors of low back pain are physical, psychological, social, psychological, patient care, and work environment [4]. Low back discomfort affects people all around the world. The prevalence of lower-back pain in China is 80.1% and in Korea 90.3% [10]. Likewise, in Turki 79%, in Africa 44.1% to 82.7%, and in Ethiopia 45.8% to

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70.9% [10-12]. The incidence of lower- back pain in Nigeria is 73%. Many people worldwide suffer from low back pain, and the disease's impact is rising with the passage of time. For instance, from 1990 to 2017, its prevalence rose from 377.5 to 577 million [13]. According to a 2015 study, 540 million people worldwide experienced activity-limiting low back pain at some point in their lives, with the global point prevalence of this condition being 73% [14]. Similarly, LBP has been moderately to higher prevalence between 45% in Britain and 63% in Australia. According to a study from Hong Kong and China, low back pain among nurses was 40.6% and 56%. individually. According to different Diverse African studies low, back pain had also higher rates at 44.1, 79.4, and 82.7%, respectively [12]. In Tunisia, the prevalence of low back pain was 58.1%. The components which are altogether related to lower lumbar pain were: increased body mass index, multiple pregnancies, arthritis, deprived physical condition, incorrect body posture, and heavy weightlifting in the workplace [15]. Moreover, it has been considered the highest source of incapacity in the world. As compared to developed countries low back pain is more prevalent in developing countries. It is considered the second most common disease in adults under the age of 45 years [14-16]. Low back discomfort was also common among nurses at a typical Nigerian hospital. Four hundred and eight respondents 36.27% males and 63.7% women participated in this research. This study's low back pain predominance of twelve months was about 73.53%. In this study low back pain was 68 % greater predominant among woman nurses as compared to male nurses. Prevalence and chance variables of low back pain were also among nurses in an ordinary Nigerian healing center were also high [17-21]. One study from Hong Kong and China also showed that nurses' involvement in LBP is around 40.6% and 56%. A study was conducted in Pakistan. According to this study, the frequency of low back pain between nurses was 65.1 %. Furthermore, in twelve months the incidence of lower-back pain among nurses was 57.8% [22]. Moreover,7 days' recurrence of lower- back pain was 32.5%. Among them, a large part of nurses depicts the pain of a modest amount. Besides, the ratio of lower- back pain was extraordinary in those nurses who were married, had children, was overweight, fatty, and were more than 30 years of age. Furthermore, they are having 15 years of clinical experience [23]. Low back pain can be contributed to many factors such as physical, psychological, social, psychological, patient care, and work environment [24]. Moreover, being female, overweight, obese, lack of assistive devices, lifting and shifting the patient, lack of regular exercise and job-related stress due to the heavy workload of the patient, lack of staffing, and extensive duty hours are also corelated factors of lower- back pain [25]. Finally, the prevalence of low back pain and the factors that contribute to it among front-line health care workers (nurses) in Lahore, Pakistan, have not been thoroughly determined. This leaves policymakers with a knowledge gap and a lack of a foundation for future study. As a result, the goal of this study is to determine the factors that contribute to lower-back pain among frontline health care workers in Lahore, Pakistan. This study will be helpful to assess the prevalence and connected factors towards lower back pain. Lower-back pain causes nurses to retire prematurely; this might be avoided. After assessing the prevalence and contributing factors of low back pain, the institution can employ friendly approaches to prevent low back pain and reduce its contributing factors [26]. The study's findings will be used as a baseline for future studies, as an input for policymakers to lessen the problem by identifying the causes, and to investigate preventive strategies and treatments among healthcare professionals in the country. It is also crucial for clinicians to identify the factors that contribute to the development of low back pain and to apply preventive interventions as soon as possible. The study's findings will be utilized as a baseline for future studies, as an input for policymakers to reduce the problem by identifying the variables, and to explore preventive measures and treatments among healthcare professionals in the country. It is also critical for clinicians to identify the factors that contribute to the development of low back pain and to implement preventive measures as soon as possible. This study will be supportive in an arrangement-making for chance administration and welfare promotion and anticipation plans to address how to prevent employees from encountering serious and long-term disabilities concerning daily working operations.

METHODS

A descriptive cross-sectional study was conducted. The duration of the study was nine months. The setting of his study was four public hospitals of Lahore Jinnah, General, Services and Mayo Hospitals of Lahore The Sample size of 191 cases was calculated with the following formula.

$N=(Z\_(1-\propto/2)\hat{}2\ \ P(1-P))/d\hat{}2$

The inclusion criteria of this study were female registered nurses; their age was between 23-55 years. Moreover, their job experience was as a registered nurses for one year to 25 years. Furthermore, the participants were mentally active. Nurses were excluded if they exhibited nursing Students, presented with positive neurologic signs and symptoms, history of head injury fits, dementia, etc., and neurological deficit. Moreover, nurses were unable to complete the questionnaire due to a vacation or extended sick leave. Besides, Nurses unwilling to participate in the study were excluded. Sample size was consisted of 191 registered

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female nurses who have one years working experience. The sampling method of this study was purposive sampling. In the current study associated factors toward lower- back ache were measured by one questionnaire established by Professor Liezel Cilliers, Department of information systems, Deputy Dean: Research and Internationalization, Faculty of Management and Commerce, University of the Western Cape, South Africa. The questionnaire of this study was consisting of the prevalence of low back pain, and contributing factors, and comprised of subsequent categories: General information of the contributor, was also addressed by the confounding factors such as gender, age, workplace, type of work, and duration of a career. SPSS version 25.0 was used to enter and evaluate the data. Quantitative variables were described as mean standard deviation and a histogram was created. The qualitative factors were reported as frequency and percentages.

RESULTS

191 respondents overall participated in this study. There were no missing responses. The participants' average age was 33, with a standard deviation of 9. The respondent's age ranged from 23 years old to 55 years old. This table indicated that most of the participants N= 45 (23.6%) were ICU ward and n= 37 (19.4%) respondents were from the surgical ward while minimum contributors, n= 7 (3.7%) were from Orthopedic ward. The marital status of the respondents can be defined as follows: n= 95 (49.7%) respondents were married, 71 (37.2 %) were single, 20 (10.5%) were divorced and 5(2.6%) were windowed. The educational status of the participants indicated that n= 117 (61.3%) respondents were nursing diplomas, 45 (23.6%) were Bachelor of Science in Nursing (Generic), 23 (12%) were Bachelor of Science in Nursing (Post R.N) and only 6 (3.1%) were MSN nursing. The designation of the contributors specified that n= 43 (22.5%) participants were head nurses, 41(21.5%) were senior nurses and 107(56.0%) were charge nurses. The stay in the organization of the participants revealed that 0-5 years of experienced participants were n=79 (41.4%) and 6-10 years of experience contributors were n=46 (24.1%). Similarly, 11-15 years stay in the organization of the participants were n=20 (10.5%), and 16-20 years of experience participants were n =16 (8.4%). Finally, 21 years and above 21 years of experience participants were stay in the organization were n=30 (15.7%)(Table 1).

S.No.	Socio-demographic characteristics	N (%)
Departments		
1.	Medical	31 (16.2%)
	Surgical	37 (19.4%)
	Orthopedic	10 (5.2%)
	Gynecology	22 (11.5%)
	Pediatric	15 (7.9%)
	Emergency	24 (12.6%)
	Urology	7 (3.7%)
	ICU	45 (23.6%)
Marital status		
2.	Married	95 (49.7%)
	Single	71 (37.2%)
	Divorced	20 (10.5%)
	Windowed	5 (2.6%)
Qualification		
3.	Nursing Diploma	117 (61.3%)
	BSN Nursing (Generic)	45 (23.6%)
	BSN Nursing (Post R.N)	23 (12.0%)
	MSN Nursing	6 (3.1%)
Designation		
4.	Head Nurse	43 (22.5%)
	Senior Nurse	41 (21.5%)
	Charge Nurse	107 (56%)
Stay in the organization		
5.	0-5 years	79 (41.4%)
	6-10 years	46 (24.1%)
	11-15 years	20 (10.5%)
	16-20 years	16 (8.4%)
	21& above	30 (15.7%)

Table 1: Participants' socio-demographic characteristics

This table highlighted the frequency of low back pain among nurses. According to this table n=79 (41.4 %), participants experienced low back pain on a regular basis while whereas n=112 (58.6%) nurses were not experienced low back pain on a regular basis. Moreover, this table emphasized the frequency of low back pain occurrences amongst nurses. According to this table n=11 (5.8 %) contributors experienced no low back pain, n=26 (13.6%) experienced low back pain once a year, while, n=18 (9.4%) were experienced low back pain twice a year, n=16 (8.4%) were experienced low back pain once a week, n=41 (21.5%) were experienced low back pain twice a week, whereas n=79 (41.4%) nurses were experienced low back pain on a regular basis (daily). Furthermore, this table underlined the episode of low back pain among nurses. According to this table n=11 (5.8 %) respondents were no low back pain episodes, n=121 (63.4%) experienced low back pain episodes 1-6 weeks, whereas n=32 (16.8%) respondents were low back pain episodes longer than 12 weeks (Table 2).

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Variable	N (%)
1. Low back pain on a regular basis	
Yes	79 (41.4%)
No	112 (58.6%)
2. Duration of low back pain	
No pain	11 (5.8%)
Once a year	26 (13.6%)
Twice a year	18 (9.4%)
Once a week	16 (8.4%)
Twice a week	41 (21.5%)
Daily	79 (41.4%)
3. Episode of low back pain	
No pain	11 (5.8%)
1-6 weeks	121 (63.4%)
6-12 weeks	27 (14.1%)
Longer than 12 weeks.	32 (16.8%)

Table 2: Prevalence of low back pain among nurses

Table 3 shows the contributing factors of the participants toward low back pain. This table indicated that physical aspects could arise to the progress of low back pain comprising poor posture (n= 70; 36.6%), prolonged standing (n= 37; 19.4%), and prolonged walking (n= 11; 5.8%), whereas slumping / half -sitting (n= 16; 8.4%), bending forward (n= 29; 15.2%), and poor physical fitness (n= 28; 14.7%).Similarly in patient care factors towards low back pain involved the positioning of patients in the bed (n= 31; 16.2%), repetitive lifting (n= 19; 9.9 %), and lifting a heavy patient (n= 45; 23.6 %), whereas lifting without a partner (n= 15; 7.9 %), accepting emergency patients (n= 37; 19.4%), moving bed or equipment's, (n= 14; 7.3%), washing patients in the bath (n= 10; 5.2%), and lack of pulleys/ lifts to transfer patients (n= 20; 10.5%). Likewise in social factors, Smoking (n= 10; 5.2%), obesity (n= 61; 31.9%), and age (n= 68; 35.6%) were assumed, while dependency e.g., alcohol, drugs (n= 4; 2.1%), poor social and educational status (n= 21; 11%), and none of the above were assumed (n= 27; 14.1 %). Moreover, psychological factors which can contribute to lower back pain are as follows: fatigue (n =100; 52.4%), emotional distress (n =28;14.7%), and depression (n =29;15.2%), and (n =34;17.8%) contributors were considered that none of the above factors could contribute of lower back pain. Furthermore, this table shows the factors in the workplace that can cause low back pain. These comprised work control (n= 13; 6.8%), workload (n= 70; 36.6%), work pressure (n= 21; 11 %), work status (n= 26;13.6%), while support at work from supervisors (n= 23; 12%), work satisfaction (n= 12; 6.3 %), whereas poor work environment only (n = 2;1%), and Shifts e.g., day/night (n= 24; 12.6 %) (Table 3).

Variable	N (%)
1. Physical factors	
Poor posture	70 (36.6%)
Prolong standing	37 (36.6%)
Prolonged walking	11 (19.4%)
slumping / half sitting	16 (5.8%)
Bending forward	29 (8.4%)
Poor physical fitness	28 (14.7%)
2. Patient care factors	
Positioning of patient in the bed	31 (16.2%)
Repetitive lifting	19 (9.9%)
Lifting a heavy Patient	45 (23.6%)
Lifting without a partner	15 (7.9%)
Accepting emergency patient	37 (19.4%)
Moving beds or equipment's	14 (7.3%)
Washing patient in the bath	10 (5.2%)
Lack of pulleys/ lifts to transfer patients	20 (10.5%)
3. Social factors	
Smoking	10 (5.2%)
Obesity	61 (31.9%)
Age	68 (35.6%)
Dependency e.g., alcohol, drugs	4 (2.1%)
Poor social and educational status	21 (11%)
None of the above	27 (14.1%)
4. Psychological factors	
Fatigue	100 (52.4%)
Emotional distress e.g., anxiety	28 (14.7%)
Depression	29 (15.2%)
None of the above	34 (17.8%)
5. Work environment factors	
Work control	13 (6.8%)
workload	70 (36.6%)
work pressure	41 (21.5%)
work status	30 (15.7%)
Support at work from supervisors	23 (12.0%)
work satisfaction	12 (6.3%)
Poor work environment only	2 (1.0%)
Shifts e.g., day/night	24 (12.6%)

Table 3: Contributing factors towards low back pain

DISCUSSION

This study's sample comprised 191 nurses from public Hospitals of Lahore. The sociodemographic characteristic of the study shows that many of the participants were from the ICU and surgical ward. It was 23% [27]. And this study's results connect with the study findings conducted in the Saudi Arabia King Abdul Aziz University Hospital. In this study, most of the participants of lower-back pain among nurses were from the surgical ward. In this study, 24.7% of the participants were from the surgical ward [27]. The recent study found that 41.4% of nurses had low back problems. This study's findings can be related to the study done on "prevalence and factors associated with low back Pain". The frequency of low back pain among nurses was

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44.2% in this study [28]. This study's prevalence rate can be compared to the previous study [29]. The prevalence of low back pain in this study was 57.46%. This study can be contrasted to another where the prevalence of low back pain was 37.6% after one week [30]. The finding of the study can be compared with the study [31]. In this study the contributing factors towards low back pain were job related stress, lifting of heavy weight and work environment factors. This study can be correlated with the study of Ethiopia. In this study, the contributing factors towards low back pain were long-standing, bending, lifting equipment, moving bed, and poor posture. Moreover, social factors were obesity and age. Similarly, in psychological factors, the associated factors of low back pain were job-related fatigue, depression, and anxiety. Furthermore, environmental factors workload, work pressure, and poor working environment [32, 33]. In the current study associated factors towards low back pain were lifting heavy weights during workplace, day, and night long shifts, Age, poor posture, and fatigue due to heavy work pressure and workload. The finding of this study can also be correlated with the study conducted in Nigeria. In this study, contributing factors towards low back pain were poor posture, long duty hours, long standing, age, lifting and shifting heavy material in workplace, and bending forward during the long period of clinical procedures [34].

CONCLUSIONS

Low back discomfort is a common health issue among nurses. Most nurses experienced low back pain on a regular basis. The factors that contributed toward low back pain were physical, social, psychological, work environmental, and patient care factors.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Al Amer HS. Low back pain prevalence and risk factors among health workers in Saudi Arabia: A systematic review and meta-analysis. Journal of occupational health. 2020; 62(1): e12155. doi: 10.1002/1348-9585.12155

[2] Chiwaridzo M, Chamarime KJ, Dambi JM. The burden of low back pain among undergraduate physiotherapy students at the University of Zimbabwe: a cross-sectional study. BMC Research Notes. 2018 Dec; 11: 1-5. doi: 10.1186/s13104-018-3796-5

[3] Raja SN, Carr DB, Cohen M, Finnerup NB, Flor H, Gibson S, Keefe F, Mogil JS, Ringkamp M, Sluka KA, Song XJ. The revised IASP definition of pain: Concepts, challenges, and compromises. Pain. 2020 Sep; 161(9): 1976-82. doi: 10.1097/j.pain.0000000000001939

[4] Alonso-García M, Sarría-Santamera A. The economic and social burden of low back pain in Spain: a national assessment of the economic and social impact of low back pain in Spain. Spine. 2020 Aug; 45(16): E1026-32. doi: 10.1097/BRS.0000000000003476

[5] Gaowgzeh RA. Low back pain among nursing professionals in Jeddah, Saudi Arabia: prevalence and risk factors. Journal of back and musculoskeletal rehabilitation. 2019 Jan; 32(4): 555-60. doi: 10.3233/BMR-181218

[6] Wu A, March L, Zheng X, Huang J, Wang X, Zhao J, et al. Global low back pain prevalence and years lived with disability from 1990 to 2017: estimates from the Global Burden of Disease Study 2017. Annals of translational medicine. 2020 Mar; 8(6): 1-14. doi: 10.21037/atm.2020.02.175

[7] de David CN, Deligne LD, da Silva RS, Malta DC, Duncan BB, Passos VM, Cousin E. The burden of low back pain in Brazil: estimates from the Global Burden of Disease 2017 Study. Population health metrics. 2020 Sep; 18: 1-0. doi: 10.1186/s12963-020-00205-4

[8] Oude Hengel KM, Visser B, Sluiter JK. The prevalence and incidence of musculoskeletal symptoms among hospital physicians: a systematic review. International archives of occupational and environmental health. 2011 Feb; 84: 115-9. doi: 10.1007/s00420-010-0565-8

[9] Tefera BZ, Zeleke H, Abate A, Abebe H, Mekonnen Z, Sewale Y. Magnitude and associated factors of low back pain among nurses working at intensive care unit of public hospitals in Amhara region, Ethiopia. Plos one. 2021 Dec; 16(12): e0260361 doi: 10.1371/journal.pone.0260361

[10] Mijena GF, Geda B, Dheresa M, Fage SG. Low back pain among nurses working at public hospitals in eastern Ethiopia. Journal of pain research. 2020 Jun: 1349-57. doi: 10.2147/JPR.S255254

[11] Mekonnen TH. Work-related factors associated with low back pain among nurse professionals in east and west Wollega zones, Western Ethiopia, 2017: a cross-sectional study. Pain and therapy. 2019 Dec; 8: 239-47. doi: 10.1007/s40122-019-0129-x

[12] Belay MM, Worku A, Gebrie SA, Wamisho BL. Epidemiology of low back pain among nurses working in public hospitals of Addis Ababa, Ethiopia. East and Central African Journal of Surgery. 2016 Jul; 21(1): 113-31. doi: 10.4314/ecajs.v21i1.139040

[13] Wu XD, Tian M, He Y, Chen Y, Tao YZ, Shao L, et al.

DOI: https://doi.org/10.54393/pjhs.v4i02.629

Efficacy of a three-day prolonged-course of multiple-dose versus a single-dose of tranexamic acid in total hip and knee arthroplasty. Annals of Translational Medicine. 2020 Mar; 8(6): 1-11. doi: 10.21037/atm.2020.02.99

[14] Vos T, Allen C, Arora M, Barber RM, Bhutta ZA, Brown A, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015. The lancet. 2016 Oct; 388(10053): 1545-602.

[15] June KJ and Cho SH. Low back pain and work-related factors among nurses in intensive care units. Journal of clinical nursing. 2011 Feb; 20(3-4): 479-87. doi: 10.1111/j.1365-2702.2010.03210.x

[16] Pinar E, Dilek O, Mujde I, Aynur C, Sukran A. Low back pain and related factors in nurses in a university hospital. Turkish Journal of Public Health. 2010; 8(2): 94-104.

[17] Kasa AS, Workineh Y, Ayalew E, Temesgen WA. Low back pain among nurses working in clinical settings of Africa: systematic review and meta-analysis of 19 years of studies. BMC Musculoskeletal Disorders. 2020 Dec; 21(1): 1-1. doi: 10.1186/s12891-020-03341-y

[18] Azizpour Y, Delpisheh A, Montazeri Z, Sayehmiri K. Prevalence of low back pain in Iranian nurses: a systematic review and meta-analysis. BMC nursing. 2017 Dec; 16(1): 1-0. doi: 10.1186/s12912-017-0243-1

[19] Suliman M. Prevalence of low back pain and associated factors among nurses in Jordan. In Nursing forum 2018 Oct; 53(4): 425-431. doi: 10.1111/nuf.12269

[20] Dlungwane T, Voce A, Knight S. Prevalence and factors associated with low back pain among nurses at a regional hospital in KwaZulu-Natal, South Africa. Health SA Gesondheid. 2018; 23(2018). doi: 10.4102/hsag.v23i0.1082

[21] Mohammadi M, Raiegani AA, Jalali R, Ghobadi A, Salari N. The prevalence of low back pain among Iranian hospital nurses: A systematic review and meta-analysis. Nursing and Midwifery Studies. 2019 Jan; 8(1): 1. doi: 10.4103/nms.nms_46_18

[22] Rasheed H, Rashid J, Javeed RS. Frequency of low back pain among nurses working in Jinnah hospital Lahore. International Journal of Endorsing Health Science Research. 2017 Sep; 5(3): 44-51. doi: 10.29052/IJEHSR.v5.i3.2017.44-51

[23] Boughattas W, El Maalel O, Maoua M, Bougmiza I, Kalboussi H, Brahem A, et al. Low back pain among nurses: prevalence, and occupational risk factors. Occupational Diseases and Environmental Medicine. 2017 Jan; 5(1): 26-37. doi: 10.4236/odem.2017.51003

[24] Maher C, Underwood M, Buchbinder R. Non-specific low back pain. The Lancet. 2017 Feb; 389(10070): 736-47. doi: 10.1016/S0140-6736(16)30970-9

[25] Grabovac I and Dorner TE. Association between low back pain and various everyday performances: Activities of daily living, ability to work and sexual function. Wiener klinische Wochenschrift. 2019 Nov; 131(21-22): 541-9. doi: 10.1007/s00508-019-01542-7

[26] Negash NA, Tadele A, Jember Ferede A. Prevalence and Associated Factors of Low Back Pain Among Healthcare Professionals at University of Gondar Comprehensive and Specialized Hospital, Northwest Ethiopia: Cross-Sectional Study. Journal of Pain Research. 2022 May: 1543-52. doi: 10.2147/JPR.S351987

[27] Kim Y, Yang GY, Kim Y, Yang GY. Complementary and alternative medicine for treating low back pain with teaching exercise: a narrative review. Journal of Korean Medicine. 2020 Dec; 41(4): 78-87. doi: 10.13048/jkm.20046

[28] Gashawbeza B, Ezo E. Prevalence and factors associated with low back pain among health care providers in public hospitals of Gamo zone, Southern Ethiopia. SAGE Open Medicine. 2022 Jul; 10: 1-12. doi: 10:20503121221114311.

[29] Savic G, DeVivo MJ, Frankel HL, Jamous MA, Soni BM, Charlifue S. Long-term survival after traumatic spinal cord injury: a 70-year British study. Spinal cord. 2017 Jul; 55(7): 651-8. doi: 10.1038/sc.2017.23

[30] Almaghrabi A, Alsharif F. Prevalence of low back pain and associated risk factors among nurses at king abdulaziz university hospital. International Journal of Environmental Research and Public Health. 2021 Feb; 18(4): 1567. doi: 10.3390/ijerph18041567

[31] Sikiru L, Hanifa S. Prevalence and risk factors of low back pain among nurses in a typical Nigerian hospital. African health sciences. 2010 Mar; 10(1): 26-30. doi: 10.4314/eajph.v6i1.45737

[32] Ibrahim MI, Zubair IU, Yaacob NM, Ahmad MI, Shafei MN. Low back pain and its associated factors among nurses in public hospitals of Penang, Malaysia. International journal of environmental research and public health. 2019 Nov; 16(21): 4254. doi: 10.3390/ijerph16214254

[33] Cilliers L, Maart S. Attitudes, knowledge and treatment of low back pain amongst nurses in the Eastern Cape, South Africa. African journal of primary health care & family mehdicine. 2013; 5(1). doi: 10.4102/phcfm.v5i1.535

[34] Osunde NR, Nwozichi CU, Olorunfemi O, Sodimu JO, Olorunfemi OM. Low back pain among nurses as related to work environment: A cross-sectional observational study. Current Medical Issues. 2023 Jan; 21(1): 9-13. doi: 10.4103/cmi.cmi_46_22

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Case Report

Desmoid tumor of the Left Abdominal Wall: A Rare Case Report

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ABSTRACT

Desmoid tumors are the type of tumors that are infrequent. However, Desmoid tumors can invade in nearby areas and can re-appear even after excision. They can reach the abdominal areas and can result in pain and swelling. The author presents a case of Desmoid tumors in a 24 years old female involving the rectus sheath. **Case Summary:** We present a case of 24 year old woman initially diagnosed with fibroadenoma of the right breast. After a month of the procedure, the patient complained of nausea, pain and cramping in the left abdominal area. She was referred to us for further evaluation of the growing mass in the left abdominal area. A Trucut Biopsy revealed an abdominal mass in the left upper quadrant about 5x5cm hard in consistency. A desmoid tumor was revealed in the diagnosis. She underwent wide local excision. **Conclusions:** Desmoid tumors are a rare type of tumor. These types of tumors arise most commonly in the upper limb, lower limb and in the popliteal region. Our case presents a representation of the tumor in the abdominal region particularly rectus sheet. MRI and CT scan can be helpful in diagnosis of these tumors but histological findings are necessary. Our case outlines the importance of identification of desmoid tumors in a timely manner and also the symptoms that it presents with. These tumors are to be treated with surgical excision with follow up every two to four weeks.

INTRODUCTION

Desmoid tumors account for the rarest type of benign tumors. these types of tumors can occur sporadically, and it mainly includes the involvement of the shoulder, abdominal cavity and in lower limbs (popliteal fossa). They can invade the nearby tissues and can cause discomfort including swelling and pain in the abdominal area. Rectus sheath can be involved and may require surgical excision. According to Weschenfelder *et al.*, in 2015 it was firstly described by MacFarlane in 1832 and was later named desmoid tumor. The term "desmoid" was attributed to these tumors by Muller in 1838 [1]. The chief complaints of the patients with desmoid tumors includes swelling and pain along with nausea and numbness in the areas effected with these types of tumors. It occurs commonly in females during the reproductive years of their lives. According to Choi *et al.*, the definite etiology of desmoid tumors, whether pregnancy-associated or otherwise, is currently unknown [2]. It has been found that the hormonal and immunological changes occurring during pregnancy and post-partum contribute to the formation of these tumors in females. According to Johner *et al.*, the local effect due to the mechanical stress from a gravid uterus may also contribute to the occurrence of a desmoid tumor [3]. MRI and CT Scan can be helpful in the diagnosis of these tumors but a histological finding can best describe the diagnosis [4]. Reoccurrence rates have been reported locally, and surgically excised cases have been reported to reoccur in over two-thirds of cases [5-7]. MRI and CT Scans can be helpful in the diagnosis of these tumors but a histological finding can best describe the diagnosis [8]. Surgical excision is best recommended as a treatment option for desmoid tumors. However, according to a study by Alman *et*

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al., surgery had a favorable recurrence rate (15%), but some recurrences were associated with a significant treatment burden. A multidisciplinary program can be beneficial for good treatment effects [9]. Cryotherapy and radiotherapy are also considered alternative therapy in treating Desmoid tumors [10-12]. The author presents a case of Desmoid tumors in a 24 years old female involving the rectus sheath in the left upper quadrant.

Case Presentation

A 24-year-old female patient presented with a mass in R) abdomen region on anterior aspect that on examination was firm in consistency was smooth and mobile in nature. The lesion was about 5*5 cm in dimension and the overlying skin was unaffected. Ultrasound was advised and it showed a round well circumscribed, heterogeneous mass was noticed and was queried as being a Desmoid lesion and advised CT scan to know the extent of the lesion on CT scan it was showing a lesion of 8*6 cm and having well defined margins but involving rectus abdominis muscle. Decision was made to excise the lesion and on excision biopsy the lesion was sent for histopathology that turned out to be Desmoid lesion. The patient underwent a complete surgical excision of the tumor. The patient has been discharged from the hospital on the 2nd post-operatory day with an uneventful recovery; she was in good health and two weeks follow up was given to the patient. ON followup patients stitches were removed and patient was completely free of any complaints.

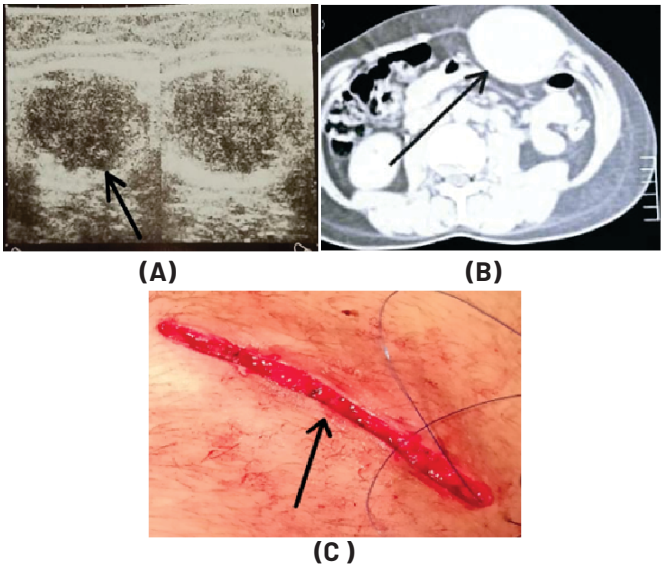

Figure 1: (A) Ultrasound of lesion (B) CT SCAN of Lesion (C) Operative site

DISCUSSION

Desmoid tumor, or aggressive fibromatosis, is a benign mesenchymal monoclonal proliferations arising from the connective tissue of the muscle and overlying the aponeurosis or fascia. In this case it was found in the left upper quadrant of the abdominal cavity in the rectus sheath. The chief complaints of the patients with desmoid tumors includes swelling and pain along with nausea and numbness in the areas effected with these types of tumors. Genetic factors including mutations in the CTNNB1 gene or in the APC gene are largely responsible for desmoid tumors [5]. The development of Desmoid tumors occurs more frequently in women. It commonly occurs during the reproductive years of a women's life, specially during pregnancy and after child birth when the mother is lactating. The gold standard to evaluate the augmentation of Desmoid tumors is an MRI [4]. MRI can be useful in distinguishing desmoid tumor from other malignancies of the breast, as well as revealing the extent of the tumor and relationship to adjacent structures. Desmoid tumors are a rare type of tumor. These types of tumors arise most commonly in the upper limb, lower limb and in the popliteal region. Our case presents a representation of the tumor in the abdominal region particularly rectus sheet. MRI and CT scan can be helpful in diagnosis of these tumors but histological findings are necessary. Our case outlines the importance of identification of desmoid tumors in a timely manner and their presentation in association with fibroadenoma and also the symptoms that it presents with. These tumors are to be treated with surgical excision with follow up every two to four weeks.

CONCLUSIONS

In conclusion, desmoid tumors are a rare and complex type of tumor that can present in various regions of the body, including the limbs and the abdominal area. Early recognition of the symptoms and proper diagnostic techniques, such as MRI and CT scans with histological confirmation, are crucial for effective treatment. Surgical excision is the preferred treatment option for desmoid tumors, and close follow-up and monitoring are essential for successful outcomes.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Weschenfelder W, Lindner R, Spiegel C, Hofmann GO, Vogt M. Desmoid tumor of the popliteal fossa during pregnancy. Case Reports in Surgery. 2015 Feb; 2015: 1-4. doi: 10.1155/2015/262654

[2] Choi SH, Lee JH, Seo BF, Kim SW, Rhie JW, Ahn ST. Desmoid tumor of the rectus abdominis muscle in a postpartum patient. Archives of Plastic Surgery. 2012

DOI: https://doi.org/10.54393/pjhs.v4i02.542

Jul; 39(04): 439-41. doi: 10.5999/aps.2012.39.4.439

[3] Johner A, Tiwari P, Zetler P, Wiseman SM. Abdominal wall desmoid tumors associated with pregnancy: current concepts. Expert Review of Anticancer Therapy. 2009 Nov; 9(11): 1675-82. doi: 10.1586/era.09.98

[4] Mabrouk MY, Bouzayan L, Malki S, Jabi R, Bennani A, Bouziane M. Desmoid tumor of the anterolateral abdominal wall: a rare case report. Annals of Medicine and Surgery. 2021 Oct; 70: 102804. doi: 10.1016/j.amsu.2021.102804

[5] Colangeli S, Parchi P, Andreani L, Beltrami G, Scoccianti G, Sacchetti F, *et al*. Cryotherapy efficacy and safety as local therapy in surgical treatment of musculoskeletal tumours. A retrospective case series of 143 patients. Journal of Biological Regulators and Homeostatic Agents. 2018 Nov; 32(6 Suppl. 1): 65-70.

[6] Goodlad JR, Fletcher CD, Smith MA. Surgical resection of primary soft-tissue sarcoma: incidence of residual tumour in 95 patients needing re-excision after local resection. The Journal of bone and joint surgery. British Volume. 1996 Jul; 78(4): 658-61. doi: 10.1302/0301-620X.78B4.0780658

[7] Phillips SR, A'Hern R, Thomas JM. Aggressive fibromatosis of the abdominal wall, limbs and limb girdles. Journal of British Surgery. 2004 Dec; 91(12): 1624-9. doi: 10.1002/bjs.4792

[8] Turner B, Alghamdi M, Henning JW, Kurien E, Morris D, Bouchard-Fortier A, *et al*. Surgical excision versus observation as initial management of desmoid tumors: A population based study. European Journal of Surgical Oncology. 2019 Apr; 45(4): 699-703. doi: 10.1016/j.ejso.2018.09.015

[9] Alman B, Attia S, Baumgarten C, Benson C, Blay JY, Bonvalot S, *et al*. The management of desmoid tumours: a joint global consensus-based guideline approach for adult and paediatric patients. European Journal of Cancer. 2020 Mar; 127: 96-107. doi: 10.1016/j.ejca.2019.11.013

[10] Lazar AJ, Tuvin D, Hajibashi S, Habeeb S, Bolshakov S, Mayordomo-Aranda E, *et al*. Specific mutations in the β-catenin gene (CTNNB1) correlate with local recurrence in sporadic desmoid tumors. The American Journal of Pathology. 2008 Nov; 173(5): 1518-27. doi: 10.2353/ajpath.2008.080475

[11] Hennuy C, Defrère P, Maweja S, Thiry A, Gennigens C. Bilateral breast desmoid-type fibromatosis, case report and literature review. Gland Surgery. 2022 Nov; 11(11): 1832-41. doi: 10.21037/gs-22-271

[12] Naama H, Ludmila F, Ahuva G, Eran S. DeSMoiD tuMor MASQuerADiNg AS fiBroADeNoMA. CASe rePort AND reView of LiterAture. Medical Connections| Conexiuni Medicale. 2013 Mar; 1(29): 67-70.