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Cook NR, Rosner BA, Hankinson SE, Colditz GA. Mammographic screening and risk factors for breast cancer. American Journal of Epidemiology. 2009 Dec;170(11):1422-32. doi: 10.1093/aje/kwp304.

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ACKNOWLEDGEMENT

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Scenario of HIV infection in Pakistan

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Human immunodeficiency virus (HIV) infection, which was previously lethal, has evolved into a chronic disease that may be treated and well-managed. HIV levels in the bloodstream may become undetectable with antiretroviral therapy (ART). All those providing care for people living with HIV should be aware of the risk factors, transmission, diagnosis, and treatment, acute HIV infection, possible opportunistic infections, and malignancies. Preexposure and postexposure prophylaxis regimens allow for preventive treatment. Home healthcare specialists can help people follow their drug schedules, assess the effectiveness of their treatments, and identify HIV problems and ART side effects. The ability to support, inform, and counsel people living with HIV and their families is most crucial [1].Approximately 38.9 million people worldwide were living with HIV, 25.4 million had access to antiretroviral therapy (ART), 1.7 million had just recently contracted the virus, and 690,000 had passed away from AIDS-related illnesses, according to a Joint United Nations Program on HIV/AIDS 2020 report. Although Pakistan's national HIV/AIDS control program was established in 1987, the number of new HIV/AIDS cases has been rising quickly ever since. In Pakistan, 160,000 people were living with HIV/AIDS as of 2018, yet only 10% of them were receiving ART. 3 Increasing people with HIV/AIDS' access to ART has a number of positive effects, including delaying the advancement of the disease, extending life expectancy, and enhancing people's quality of life and mental health [2]."More than 1,000 new HIV cases are reported each month from all four provinces, including the capitol city Islamabad, Azad Kashmir, and Gilgit Baltistan. This demonstrates unequivocally that homosexuals, persons who inject drugs, male, female, and transgender sex workers, and other critical demographics are now spreading HIV to the broader community. During the final 10 months of 2022, 9,773 people in Pakistan had HIV tests that were positive, casting significant doubt on HIV preventive and control initiatives and amply demonstrating the spread of HIV from important populations to the general public. New HIV infections account for a sizable portion of low-risk males, females, and clients of critical communities, showing an increase in HIV transmission to bridging populations [3].The increased rate of HIV in Pakistan pose a risk to a healthy population, blood recipients etc. Therefore, surrounding communities should also be checked for HIV. The government should direct public education campaigns in coordination with NGOs. To prevent any future epidemics, barbers and unlicensed health professionals in remote regions should receive training.

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Review Article

Relationship Between Obesity, Menopausal Status and Breast Cancer Risks - A Review

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ABSTRACT

"Breast cancer" is of the leading malignant neoplasia responsible for high rate of mortality and morbidity. There are many risk factors of "breast cancer" but "obesity" and increased weight have been recognised as the principal risk as well as the prognostic factors causing "breast cancer" especially in "postmenopausal" female. "obesity" possess the complex association with "breast cancer" which varies in menopause status ("premenopausal" and "postmenopausal"). Various hypotheses have been proposed to demonstrate the interaction among "obesity" and high risks of "breast cancer" in "postmenopausal" females. The specific "obesity"-associated factors", such as leptin, insulin, and inflammatory mediators, are involved in progression of "breast cancer" and its prognosis. The adiposity level before menopause, is inversely interrelated to "breast cancer" risk, exhibiting the protective effect, however in "postmenopausal" females, predominantly in elderly women, the association is positively related to cancer, indicating "obesity" as a risk factor of "breast cancer". Positive association is found for higher levels of estrogen production in adipose tissue, resulting in elevated levels of estradiol in systematic circulation, promoting "obesity" related breast carcinogenesis in in "postmenopausal" women. The expression of tumors also effect both progesterone and estrogen receptors. It can be concluded that relation of adiposity and menopausal status is protective effect in younger females (<35 years), before the menopause and negative effects promoting the cancer in older "postmenopausal" women. Therefore, the body composition and "obesity" are highest risk factors for the prognosis of "postmenopausal" breast carcinoma.

INTRODUCTION

Various research studies have demonstrated that increased concentrations of circulating estrogen levels and higher bioavailability leads to the increased risk of "breast cancer" in "postmenopausal" stages [1, 2]. Additionally, several reports also showed the positive relationship among the menopausal hormones, their changes and the adiposity or "obesity" [3, 4]. Although "obesity" is recognised as the higher risk factor for "breast cancer" especially in "postmenopausal" females, the contrary condition embraces aforementioned to the stage of menopause where the "obesity" is linked with the lower risk in younger women [5]. The consequence of "obesity" on the risks of "breast cancer" and the hypotheses regarding the inconsistent effects which are observed in different circumstances in relation to the different status of menopause ("postmenopausal" and "premenopausal"). Despite the fact there are numerous interconnected cellular pathways and mechanisms in which the "obesity" is directly involved in augmenting the risks of developing "breast cancer", predominantly the mechanisms which are directly involved in controlling the actions of insulin and the function of adipokines [6]. The estrogenic and the steroid hormones also effects the bioactivity of menopausal hormones. The production of extra glandular estradiol

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levels is considered to be one of the basic factor which can be enhance the risks of risk of "breast cancer" after the stages of menopause, but the link among the "obesity" and the reduced risks of "breast cancer" in "premenopausal" females of the younger age, is still not clear.

Obesity and Breast cancer

"Obesity" is generally known as the higher concentration of fats deposits in the body which is associated with several disorders including the type 2 diabetes, and endometrial, metabolic syndrome, and "breast cancer" [6]. There are found various epidemiological evidences supporting the correlation among "breast cancer" and "obesity" in females. The major pathway responsible for regulation of homeostasis as well as "AMP-activated protein kinase (AMPK)" responsible of the actions of phosphorylation and inhibition of the actions of "cAMP-responsive element binding protein (CREB)-regulated transcription coactivator 2 (CRTC2)". In the women after menopause ("postmenopausal" stage), the regulation depending on CREB regarding the aromatase is a critical determining factor for the formation of breast tumor through the production of estrogens. It has been also found that the aromatase expression and its regulation in the breast via pathway of CRTC2and AMPK, as a response to the changed adipokine milieu related to "obesity", demonstrates the substantial connotation among "obesity" and risk of "breast cancer" [7]. Additionally, it is noteworthy that the relationship among "obesity", "breast cancer" and total risk seems to be extremely reliant on the status of menopausal. Thus, it is clear that in "postmenopausal" females, "obesity" is involved in increasing the threat of "breast cancer". Conversely, "obesity" acts as a defensive factor against the risks of "breast cancer" in ""premenopausal"" women involving different clinical factors theoretically involved including "estrogen", "adipokines", "mammogram density", activation of "insulin-signalling pathway" as well as "inflammatory pathways" [8]. So, there exists evidence which supports the strong link among metabolic syndrome, "obesity", insulin resistance involving different factors leading to the increased risk of different types of cancers including the colon as well as the "breast cancer".

Obesity and Postmenopausal Breast cancer

In "postmenopausal" females, "obesity" has been identified as the major risk factor of "breast cancer" [3, 9]. Additionally, there is strong association with the increase in adiposity with the passage of time after menopause, and the effect of "obesity" is consistent with the expression of adipose tissue-derived estrogens to promote the prognosis of cancer. According to the study by Brandt *et al.* (2000) values of BMI greater than 28.4 kg/m^2 showed adequate risks of "breast cancer" in the age group of females among 50 years to 69 years, and this association become even stronger when the age exceeds 70 years [9]. Howell *et al.* (2009) reported after summarizing various research studies, and demonstrated that which the increased weight gains after 18 years of age, particularly after 29 years of age up to the age of menopause, is even the strongest indicator and risk factor of developing "postmenopausal" "breast cancer". It was also indicated that increase in weight usually is more rapid after the menopause [10]. Most of the studies claimed that the relationship of adiposity and "postmenopausal" "breast cancer" applies more specifically to "obesity" of upper parts of body and high waist hip ratio is also one of the risk factor [6, 11]. The study by Huang *et al.*, (1999) also reported a strong and affirmative link of waist circumference and the WHR with "breast cancer" risk, more specifically in those "postmenopausal" women who never get any estrogen replacement therapy [12].

"Obesity" and "postmenopausal" estrogen production

Estrogens is produced by conversion of androgenic steroids due to the action of influence of aromatase enzyme and their complexation. Ovaries are the chief organs responsible for the expression of aromatase in "premenopausal" women, but after the stage of menopause, the adipose tissue is the principal site for the production of estrogen, where androstenedione undergoes aromatization, that is secreted by adrenal glands as well as the ovaries in "postmenopausal" women, resulting in production of estrone. Both the production of androstenedione and the activity of aromatase enzymes are increased in over weight and "obesity", so there exist a positive relation among production of estrogen and the "postmenopausal" adiposity [4, 6]. Various studies reported that the concentration of both estrone and estradiol are increased in obese "postmenopausal" females [3, 13, 14]. Furthermore, the menopausal hormonal changes also contribute towards augmented risk of emergent "breast cancer" in "postmenopausal" obese females especially related to the estrogen levels. A study by Baglietto *et al.* conducted on "postmenopausal" women also showed a positive correlation among free estradiol and the BMI [14]. According to a research the relation among the risks of "breast cancer" and BMI becomes even stronger in elderly "postmenopausal" females with the age of more than 70 years [15]. The research by Kaaks *et al.* also found the positively correlated of BMI with the estradiol and estrone concentrations in the serum, demonstrating that the total estrogen concentration in free form were significantly higher in the patients of "breast cancer" implying that free form of estradiol in serum is the strongest factor of "breast cancer" especially in obese females [2].

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"Obesity", Estrogens and "premenopausal" "breast cancer"

The frequency of "breast cancer" usually began to intensify after the age of 50 years as a reflection of "postmenopausal" as well as "premenopausal" women "breast cancer" [16]. Different biological differences has been observed in patterns of "breast cancer" arising in females of premenopause and postmenopause demonstrating the clinical expression is highly prevalent in tumors which are hormone-independent, and prognosis related to "premenopausal" "breast cancer" [4, 17]. "Postmenopausal" women depict the positive relationship among "obesity" with the risk of "breast cancer" risk, however some studies also reported that "obesity" act as a protective factor in "premenopausal" females after individual case control studies suggesting reduced risks of "breast cancer" in "premenopausal" females [9, 18]. Generally, an inverse association was found in the young females similar findings were reported by EPIC study conducted in "premenopausal" females [4, 19-21]. One of the determining factor for this association is estrogens level which is controlled by homeostatic regulation so in "premenopausal" females estrogen is not influenced by body fat or adipose mass. However, according to previous study the relationship among estradiol levels and adiposity in "premenopausal" female, is inverse demonstrating reduced risk of "breast cancer" but the study by Emaus *et al*. found opposite results representing the positive association among "obesity" and estradiol but these results are not supported by any other study which may be due to cyclic nature and changes of steroid concentrations occurring in "premenopausal" women during various follicular phases [22, 23]. According to another study there exist a positive relationship among concentration of circulating estradiol and risks of "breast cancer" [24]. Eliassen *et al*., found that the levels of estradiol level significantly high in women has greater risks of "breast cancer" in consistent with the findings of Sturgeon *et al*. showing inverse relationship of BMI and serum estradiol [24, 25]. Sturgeon *et al*. demonstrated that the total estradiol concentrations in early phase of follicular phase was higher in the patients of "breast cancer" [24]. It was also found that in obese women the ovulatory menstrual cycles have increased frequency and the mechanism suggested in "premenopausal" women regarding "obesity" supressing carcinogenesis is the loss of normal functioning of ovary along with impaired production of progesterone and estrogen [16, 26-28]. A study by Terry *et al* also found an inverse relationship among infertility occur because of ovulatory irregularities and "premenopausal" "breast cancer" [28]. The study by Michells *et al* also established the opposite relationship among the occurrence of "breast cancer" and adiposity in "premenopausal" females. So it can be summarized as "obesity" is definitely related with reduced risks of "breast cancer" in females before menopause, but the mechanism is still not clear [29].

Reference	Study type	Comparative arms	Measure of association
"Studies supporting a negative correlation between obesity and breast cancer risk in premenopausal women			
van den Brandt 2000 [9]	Pooled analysis [7 cohorts; 337,819 women and 4385 incident cases of invasive BC]	BMI >31 kg/m^2 vs.≤ 21 kg/m^2	RR: 0.54; 95% CI, 0.34 -0.85
Bergstrom 2001 [30]	Meta-analysis [Premenopausal (17 studies); postmenopausal (27 studies)]	Unit increase in BMI	RR: 0.98; 95% CI, 0.97 -0.99
Michels 2010 [29]	Prospective [113,130 premenopausal women]	BMI ≥30 kg/ m^2 vs. 20.0-22.4 kg/m^2	HR: 0.81; 95%CI, 0.68 -0.96
Berstad 2010 [31]	Case-control [2097 premenopausal women, 1900 postmenopausal women, and 4041 case controls]	BMI ≥35 kg/ m^2 vs. <25 kg/ m^2	OR: 0.81; 95%CI, 0.61-1.06
Harris 2011 [32]	Prospective [45,799 premenopausal women]	BMI ≥27.5 vs. <20.5*	HR: 0.74; 95%CI, 0.57-0.96
Renehan 2008 [33]	Meta-analysis [Premenopausal (20 studies); postmenopausal (31 studies)]	5 kg/m^2 increase in BMI	RR: 0.92; 95% CI, 0.88 -0.97
Premeno-pausal breast Cancer Collaborative Group 2018 [34]	Pooled analysis [19 cohorts: 758,592 premenopausal women]	5 kg/m^2 difference in BMI	1.9- to 4.2-fold increased risk for lower BMI, depending on age"
"Studies supporting a positive association between obesity and breast cancer risk in postmenopausal women			
Reference	**Study type**	**Comparative arms**	**Measure of association**
Rosenberg 2006 [35]	Population-based study [3345 postmenopausal women and 3455 matched controls]	≥30 kg vs. <10 kg weight gain	OR: 1.5; 95% CI, 1.2-1.8[a]
Reeves 2007 [36]	Prospective cohort study [1,222,630 women: Premenopausal BC 1179 cases, postmenopausal BC 5629 cases]	Obese women	RR: 1.29; 95% CI, 1.22 -1.36
Renehan 2008 [33]	Meta-analysis [Premenopausal (20 studies); postmenopausal (31 studies)]	5 kg/m^2 increase in BMI	RR: 1.12; 95% CI, 1.08 -1.16
Neuhouser 2015 [37]	Extended follow-up from the WHI Clinical Trial. [67, 142 postmenopausal women]"	BMI >35 kg/m^2	HR, 1.86; 95% CI, 1.60 -2.17[a]"

Table 1: "Summary of analyses investigating correlation of obesity with breast cancer (BC) based on menopausal status"

CONCLUSIONS

After all this discussion it is concluded that adiposity as well as "obesity" has adverse effect on the projection of "breast cancer", with small differences the effects are

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almost comparable in both menopausal conditions ("premenopausal" and "postmenopausal" stages) in women. "obesity" and the etiology of breast cancer as well as the elevated levels of estrogen and its activity are well established in women after menopause, but the resultant relations is still unclear for "premenopausal" types of cancers. It must be noted that before the menopause, the influence of adiposity on the production of estrogen and estradiol is unclear and there is not any acceptable and substantial mechanism proving the defence action of "obesity" in women before the menopause stage relative to "breast cancer". So further investigation is necessary. Moreover, obese patients of "breast cancer" irrespective of the age have high risk for potentially fatal conditions, which must be considered in survivals of "breast cancer"

Conflicts of Interest

The authors declare no conflict of interest.

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Review Article

Roles of Different Radiations in Treatment of Breast Cancer

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ABSTRACT

The review aimed to describe the role of radiations in treatment of breast cancer. The review also describe that which type of radiation is used to treat different stages of breast cancer i.e, metastatic stage, advance stage and early stage of breast cancer. The radiation therapy plays a significant role in the treatment of breast cancer. The treatment delivery methods are considerably changed in the recent decades. The concept of using radiotherapy for the treatment of breast cancer has remained equally important for oncologists throughout the years still research has been going on to make these radiotherapy sessions more and more convenient for the patients. The combination of breast conservation surgery an APBI can result in survival without having any other health related issues for other nearby organs. Recent findings have reported about incorporation of APBI into clinical usage. APBI should be used for patients with low risk of ductal carcinoma or in case of first stage of invasive ductal cancer which has prominent margins for the excision, and where the estrogen receptor positivity is clear. Radiation therapy is effectively used for the treatment and management of loco regionally advanced and distant metastatic disease. There is research going on to find most appropriate technique in which convenient and protected procedure is used for patients to avoid any side effects. New and advanced techniques are used to limit radiation related toxicity.

INTRODUCTION

Breast cancer is the one of the most commonly reported neoplasms. It accounts for almost one-fourth out of all the cancers reported in the female. It has prevalence of 27% in the developed countries. It effect both gender male and female. It is one of the leading cause of mortality among women [1, 2]. But it is most commonly reported in the female. Its incidence is observed 100 times more than the female. The delay diagnosis ultimately leads to the bad prognosis of the cancer. The global burden of this tumor is reported to be rising with the passage of time. It is a major public health concern. The early diagnosis and treatment can prevent the prognosis and further complication. Mammography is usually used for the screening and detection of the breast cancer. The two famous anti-oncogene for breast cancer are BRCA1 and BRCA2. These are located on the chromosome 17 and 13. These encodes for the anti-suppressor proteins. These proteins repair the double stranded break of the DNA [3-5]. The International cancer registry reported the increasing trends in breast cancer incidence. It was predicted that till 2050 there will be 3.2 million women effected from breast cancer. There is need to adopt the preventive measures. For the management of the distant metastatic, advance and early stage breast cancer the radiation therapy is considered as

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well established modality. The novel radiation therapy delivery approaches are considering to reduce the toxicity associated with the radiation therapy. The researchers are also working hard to shorten the duration of the radiation delivery. The patients with distant metastatic disease are usually suggest with the stereotactic radiation delivery. The radiation therapy reduced the need of mastectomy. These also reduced the local recurrence risk. The early prevention can leads to increase the survival rates. In the recent years the survival rate of breast cancer has raised to 80% because of the early diagnosis and prevention [6]. It is difficult to control the breast cancer diagnosed at recurrent locoregional and advanced stage. Approximately the 5% of the breast cancer are associated with the germline mutation. The expression of the BRCA1/2 protein vanish in the breast cancer that effect the DNA repair process. The Double stand breaks are observed in such cases that leads to the genomic instability. These proteins play an essential role in the double-stand break (DSB) and single strand break repair [7-9] The review aimed to describe the role of radiations in treatment of breast cancer. The review also describe that which type of radiation is used to treat different stages of breast cancer i.e, metastatic stage, advance stage and early stage of breast cancer.

The advantage of early breast cancer radiotherapy

The patients suffering from breast cancer are given treatment by either breast conserving surgery or mastectomy, which involves surgery for the removal of breast. Another suggestion given to patients is postoperative radiotherapy. As per previous studies and survey analysis there is increase in survival rate after using these approaches. It is up to patient whether she wants to keep breast or choose mastectomy. Patient can decide whether they want postoperative radiotherapy or not. According to literature most of the time patients prefer to keep breast. Early breast cancer collaborative group have stated that a complete session of radiotherapy after surgery can help decrease the mortality rate up to 5%. In case of breast conservation treatment, the breast cancer tissue is removed along with the lymph node biopsy making axillary clearance leaving the normal breast tissue after brief whole breast radiotherapy [10, 11]. In case of women who are diagnosed with stage 1 breast cancer, the breast conservation approach is effective and curative option. There are few side effects that are reported by patients during radiotherapy that includes erythema and muscle fatigue but the symptoms are gone once radiotherapy sessions are completed. In case of patients that opt for mastectomy had to go for a complicated and laborious breast reconstruction surgery in which breast re-implant is carried out after or during mastectomy. A complete session of radiotherapy after surgery is recommended and according to statistical analysis it was found that there was an increase in survival rate in patients that had radiotherapy performed after surgery as compared to patients that couldn't get radiotherapy after their surgery [12]. As per studies from 15 trials, that included 9422 patients the results showed that risk of cancer reoccurrence was three times more in patients that skip radiotherapy sessions after surgery. The mortality rate for patients not going for radiotherapy is 8.6 more than the mortality rate of patients receiving radiotherapy [13].

Types of radiations used for the loco regional treatment of breast cancer

The concept of using radiotherapy for the treatment of breast cancer has remained equally important for oncologists throughout the years still research has been going on to make these radiotherapy sessions more and more convenient for the patients as it is important to make the radiation exposure duration as short as possible to avoid any side effects.

Accelerated partial breast irradiation (APBI)

In a traditional approach the concept of targeting whole breast tissue was used previously but now with the advances in science APBI offers the targeted therapy where use of radiotherapy to only the tumor bed area is carried out. The chance of reoccurrence is mostly present around the tumor bed so APBI can save the patient from unnecessary exposure to the normal tissue. Especially in case of elderly patients where the surrounding organs like lungs, heart are already weak, much shorter radiation exposure and targeted exposure can help them get better results[14, 15]. APBI is normally given to patients with stage one breast cancer as they opt for breast conservation therapy, after surgery APBI can be used using a interstitial catheter afterloading procedure. In some cases, intracavitary brachytherapy or 3D external beam radiation therapy (EBRT) can also be used. The combination of breast conservation surgery an APBI can result in survival without having any other health related issues for other nearby organs. Recent findings have reported about incorporation of APBI into clinical usage. APBI should be used for patients with low risk of ductal carcinoma or in case of first stage of invasive ductal cancer which has prominent margins for the excision, and where the estrogen receptor positivity is clear [16].

Hypofractionation

Hypofractioned breast cancer radiation treatment is also under study; it consists of a heavy dose of radiation for a shorter period of time. As per study carried out to find that either 5 week or 3-week radiation schedule is more effective. Women undergoing breast conservation surgery and in patients whose resection margins are prominent,

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this type of radiation procedure was used. As per study the risk of reoccurrence was 6.7% as compared to the 6.2% as found in case of hypofractionated regimen. A 10-year study result showed that an original trial consisted of 50.0 Gy of radiation in form of 25 fractions for 5 weeks where a dose of 2.0 Gy was given to patients on daily basis [17]. As per radiology experts a larger dose given to patients on daily basis for a shorter time can prove to be more effective. In this procedure the larger doses of radiations are given to the patients for the very short duration of the time. This procedure can prove to be more effective and convenient for patients and less amount of resources will be used [18].

How to minimize cardiac toxicity after breast cancer radiotherapy?

Radiation therapy is a very popular approach used recently to treat breast cancer. However, the dose of radiations, the type of irradiation is differently used for different physicians. There are novel procedures and techniques used by physicians so that heart and lungs toxicity can be reduced. The key is to adapt the treatment procedure according to the state of the cancer. As per studies techniques like internal mammary chain radiotherapy should be carried out very carefully. The increased risk of heart failure and myocardial infraction are associated with the breast radiotherapy. The irradiation of normal tissue in the breast cancer radiotherapy there are relative residual risk of secondary effects in the patients. These affect the quality of life [19]. The patients can be placed in the prone position to reduce the radiation dose to the heart. Gating and breath hold technique can be used to minimize the cardiac toxicity. Advances in intensity modulated radiotherapies are also significant as these uses the multiple beam angle to ensure that the affected areas get the maximum dose while minimize the dose to the normal structure i.e, heart [20].

IMRT, breathing adapted radiation therapy along with prone-positioning procedure is used to limit toxicity

Techniques like IMRT, breathing adapted radiation therapy are frequently used by physicians to deal with cardiac and skin toxicity after breast cancer radiation treatment. These procedures are effective as heart is close to the breast and in case of pendulous breasts. As the traditional approaches used for radiation therapy had no control over the dose given, intensity modulated radiation therapy (IMRT) proves to be effective technique and it limits the skin related toxicity as well. It uses advanced software programming to change the dose and intensity of the radiation, it leads to a more refined and homogenous distribution of dose. In the prone positioning technique, a customized breast board is made where patient lie prone with the breast in air so that it gets away from the chest wall [21].

Radiation therapy used for treatment of distant metastatic disease

Distant metastatic disease can be defined as breast cancer spread to other parts of the body like lungs, brain and bones. It is highly known as the major cause of cancer-related deaths. The poorest prognosis is observed in case of distant metastatic disease. The mortality rates are reported to be account for the 36%-47% cases out of all tumor specific cases. The metastatic tumor development is highly effected by the distinct tumor features. The most commonly found distant metastatic disease is bone metastasis as 3% cases are reported it is followed by lung and liver cancer [22]. Conditions like spinal cord compression, ocular metastasis and leptomeningeal metastasis are commonly found. As per literature these conditions are effectively treated by radiation therapy. As per studies brain and spine metastasis is effectively treated by SRS (stereotactic radiosurgery) and SBRT (stereotactic body radiation therapy) techniques.

SBRT and SRS for the management of distant metastatic disease

The breast cancer is the genetic disease and it increase with the age. Because of the increase in the elder population it become difficult to treat the patients diagnosed with the cancer. The risk of the breast cancer in the women of age more than 65 years is six times greater than the younger women. The more than the one-third of the cancer are reported in women of age 70 years or more. To treat the older women is even more difficult as they are more vulnerable to the treatment related toxicities. In stereotactic radiation technique the main goal is to maximize the radiation precision by immobilizing the patient, localization of tumor and the targeting of beam to the specific part of the breast. In case of SRS the single heavy dose is given to patient in a single session, however, in SBRT technique low doses are given to the patient. The use of SBRT for oligo metastatic disease is still under debate, however, maximum positive results are obtained in case patients suffering from stage 1 cancer with limited metastasis. The efficacy of the SBRT is dependent on the abscopal effects [23]. The few formal evidences are reported but, still the SBRT is widely using for the treatment. It is majorly use for the oligometastases appear consensual treatment in the elder patients. SBRT is associated with the 13-month improvement. When comparing to the conventional radiotherapies the delayed side effects are associated with the SBRT. No and very few acute complications are associated with the SBRT [24].

Combination of Radiation therapy with neo-adjuvant chemotherapy

For the treatment of the locally advanced breast cancer the neoadjuvant chemotherapy are highly suggested. Triple

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negative breast cancer is treated by neoadjuvant chemotherapy. In this type of cancer maximum receptors i.e Human epidermal growth factor receptor 2 and progesterone receptor are negative.

Poly ADP-ribose polymerase Inhibitor with Chemotherapy

The combination of Poly ADP-ribose polymerase Inhibitor with chemotherapy show the potential synergism. However the reason behind the limited use of this combination is the reported PARPi toxicity. The results and outcomes were analyzed and evaluated. This therapy was observed to improve the response rate and quality of the life. The PARPi can be used as an alternative to the platinum based neoadjuvant regimen.

Immune-check point inhibitor with chemotherapy

The immune-check point inhibitor (ICI) have the evident anticancer activity. The patients diagnosed with the breast cancer can derive benefits from this therapy. The chemotherapy and ICI are proved to effective in the treatment of the metastatic breast cancer. Neoadjuvant ICI are associated with the higher outcomes[25].

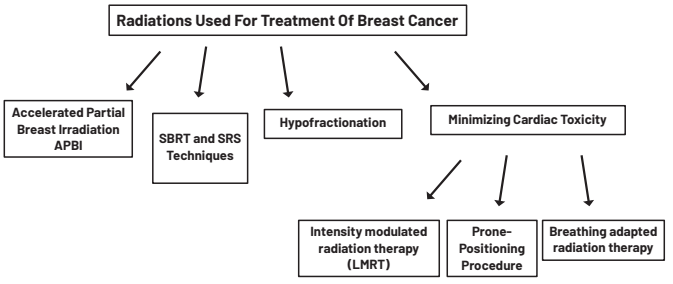

Figure1: Summary

CONCLUSIONS

Breast cancer development is a multi-step process. Multiple cells are involve in the development of breast cancer. Radiation therapy is the mainstay of the breast cancer. Radiation therapy is effectively used for the treatment and management of loco regionally advanced and distant metastatic disease. There is research going on to find most appropriate technique in which convenient and protected procedure is used for patients to avoid any side effects. Neoadjuvant chemotherapies are used to minimize the cytotoxicity. New and advanced techniques are used to limit radiation related toxicity.

Conflicts of Interest

The authors declare no conflict of interest

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Review Article

Autism Spectrum Disorder In Pakistan: A Review

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ABSTRACT

Autism spectrum disorder (ASD) is a neurological condition that affects characterized with limitations the occurrence of specific interests and recurrent behaviors in social interaction. This article explains factors that may influence prevalence rates, such as recent changes to the diagnostic criteria, in light of current concerns about increased prevalence. To observe the development of literature regarding autism spectrum disorder in light of recent researches. The data was collected from data bases such as google scholar, Pubmed, HEC library and Scopus. The researches from only national scholars was considered. The data was vetted by a self appointed committee of expert peer reviewer to ensure maximum quality. Based on our analysis of published works, it can be claimed that there is a lack of academically sound published material from Pakistan, making it challenging to quantify the burden of ASD in this community, identify risk factors, or even create efficient intervention methods.

INTRODUCTION

Autism spectrum disorder (ASD) is a neurological condition that affects characterized with limitations the occurrence of specific interests and recurrent behaviors in social interaction. The DSM-IV classified four distinct pervasive developmental disorders (PDD) as discrete diagnoses: Asperger's disorder, childhood disintegrative disorder, autistic disorder, and PDD-NOS. The notion of a "spectrum" the DSM-5 has a diagnostic for ASD [1]. Standardized ASD screening at ages 18 and 24 months and ongoing developmental monitoring are still advised in primary care because ASD is common, can be detected as early as 18 months of age, and has evidence-based treatments that may improve function [2]. The etiology of ASD is diverse. Risk factors are the importance of parental age, teratogenic substances, prenatal hazards, medications, alcohol and tobacco use, diet, immunization, hazardous exposures, and the effect of severe psychosocial variables are all well mapped out in this study [3]. Deficits in social reciprocity are a fundamental aspect of autism spectrum disorders (ASD) [4]. Early childhood is when typical symptoms first appear [5]. The term "autism spectrum disorder" (ASD) refers to a collection of multifactorial disorders marked by difficulties with social interaction, communication, and repetitive behavior. ASD affects 1 in 59

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kids and is around 4 times more prevalent in boys than in girls [6]. American Psychiatric Association (APA, 2013) describes autism spectrum disorder (ASD) as a complex illness that is defined by enduring challenges with social interaction and communication as well as by the prevalence of stereotypical patterns of interests, behavior, and activities [7]. Six metals (Pb, Hg, As, Cd, Mn, and Al) that are present in the environment are hypothesized to have a direct or indirect effect on autism spectrum disorder (ASD) [8]. In a research including two North African nations found that among African children with developmental problems, the prevalence of ASD was 11.5% and 33 [9]. There is a significant prevalence of ASD in children of African heritage, according to other research [10-12]. Despite the fact that their representativeness is in doubt [13]. As with nonverbal ASD, research on ASD show that African children with ASD have a high co-morbidity of intellectual impairment (over 60%) and nonverbal ASD (50–71%) [14, 15]. These and other distinguishing characteristics of ASD in Africa, including a possible viral origin, delayed diagnosis, and inadequate care [14-16]. After moving passed the discussion that questioned the universality of ASD [17]. ASD is increasingly receiving more attention in Africa, as seen by the continent's growing number of scientific research on the illness. Several reviews have been published that compile data on ASD from Africa [13, 18].

METHODS

Search Methodology. The PRISMA (preferred reporting items for systematic reviews) guidelines were used [19]. The key phrases used in the search were "Autism" or "Autistic" or "Pervasive" AND "Pakistan". In order to find any other possibly pertinent research that the systematic database search could have overlooked, we also examined the reference lists of the retrieved articles and the Google Scholar database. The data on the basic features of the studies and their major conclusions were compiled on one data extraction sheet using a Microsoft Excel spreadsheet (version 2013). The following factors were of particular interest: (i) author; (ii) publication year; (iii) research nation; (iv) sample description; and (v) main findings.

RESULTS

1st Author	Year	Country	Sample	Results
Maria Sohaib Qureshi	2022	Pakistan	Data were gathered through a questionnaire, interviews, and a focus group.	According to the study's findings, parents encountered a number of difficulties when attempting to have their child diagnosed with ASD [20].
Nazish Imran	2011	Pakistan	medical professionals non-medical professionals participated	Total participants=247 Physicians=154 non-physicians=94 respondents' median age was 33 years 53% of them were female [21].
Tania Nadeem	2019	Pakistan	remedial fees, tailored academic programmes, ABA was also used.	Autism sufferers and their families in Pakistan have limited access to pricey services [10].
Shaina Khan Lodhi	2016	Pakistan	233 primary school teachers Karachi self-administered questionnaire.	Ability scores=58.8% Learning difficulties=53.3% [11].
Nazish Imran	2014	Pakistan	All allied health professionals	Age of community over 38% [12].
Dost Muhammad	2014	Pakistan	Individuals age =0-12	Research tells that BDNF plays a critical role in the development of autism, including increased blood levels of BDNF in autistic children [22].
Mohammad H. Rahbar	2021	Pakistan	Total = 30 ASD patients ages of 2 - 12 30 age- and sex-matched Karachi, Pakistan.	Pb concentrations (p = 0.05), Al concentrations, (p = 0.06) [23].

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Usman Hamdani	2016	Pakistan	PASS used in sessions Goa(India) Rawalpindi (Pakistan)	(15 in Goa and 17 in Rawalpindi) (15 in Goa and 18 in Rawalpindi). 26 (81%) of the 32 participants in the intervention completed it [24].
Ansa Rabia	2022	Pakistan	DSM –IV used diagnosis of 147 ASD patients from Children's Hospital and Institute of Child Health	In 131 (89.1%) ASD participants, a total of 381 14 (9.5%) =microcephaly, of which 13= varying number of Dysmorphology. A M:F ratio of 4.7:1 was found among the 131 participants with Dysmorphology, male= 108 female= 23 subjects, whereas a ratio of 6:1 was found male=12 female=2 subjects with microcephaly [25].
Ghazal Nadeem	2018	Pakistan	76 consecutive children with ASD demographic factors cross-sectional research Autism Resource Center Pakistan.	men : women = 4.4:1. 33 (43.4%) children was found to consanguineous. 50 (66%) children had mild to moderate ASD, 13 (17%) had severe ASD, and 13 (17%) had borderline traits [26].
Bushra Akram	2017	Pakistan	83 ASD 5= unique schools ages =8 and 18 Lahore analytical cross-sectional survey practical sample approach. NSSI was evaluated using the Urdu version of a standardized test.	33% overall point prevalence of NSSI. Pounding or self-beating (47%), scratching (38), pinching (35%), picking at sores (33%), self-biting (32%), pulling hair (30%), and rubbing skin (19%) were additional troublesome behaviors [27].
Fatima Sohaib	2017	Pakistan	cross-sectional study of 27 of the siblings of the 58 Pakistani children with ASD	Children with autism =50% greater incidence of tooth decay unaffected siblings, who had a22.2% rate. 24% of children with ASD dental plaque on their front teeth, compared to 14% of the control group [28].
Arwa Quaid	2021	Pakistan	information was gathered using the BREF-COPE standard questionnaire	64.5% =parents recognize the reality of the situation, 51.6% = parents typically focus on their efforts with their kids. 12.9% = people with depression either drink alcohol or use antidepressants, Only 16.1% of people can successfully incorporate coping mechanisms into their daily routines [29].
Ayesha Minhas	2015	Pakistan	interviews with parents (N = 15) Pakistan	The results show that the mother is essentially responsible for everything,

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				which results in high levels of stress [30].
Noreena Kausar	2019	Pakistan	Lazarus and Folk man's (1984) stress model and interviews with parents = 502 children with ASD, a 46-item item tool was created.	The scale is recognized as a viable and reliable tool for measuring the stress that parents of children with ASD believe to be experiencing [31].
Ansa Rabia	2022	Pakistan	115 consanguineous marriages	clinical characteristics of the biallelic pathogenic/ likely pathogenic variation in this research differ from those of heterozygous mutations in the same gene [32].
Farhan sarwar	2022	Pakistan	112 moms who were recruited from autism centers in two cities in Pakistan	The findings revealed a strong direct relationship between social capital and perceived stress, psychological support, and life happiness [33].
Zaib Un Nisa Khan	2022	Pakistan	Midstream urine samples were collected children with ASD who had been identified by a paediatric neurologist	85=total age of 4.5 2.3 years for the ASD group (n=65) 6.4 2.2 years for the TD group (n=20), respectively, there were 72.3% men in each group. In the groups with ASD and TD, parental consanguinity was 47.7 and 30%, (70.8%)= delayed verbal ability (66.2%)= difficulties constructing entire phrases (56.9%) [34].
Anum Farooq	2020	Pakistan	detailed qualitative interviews with eight moms of ASD-diagnosed children who were older than 36 months.	The main themes in the barriers to ASD diagnosis were found to be parental ignorance and misconceptions, as well as issues with the healthcare system, delays brought on by structural and procedural barriers, and family factors like stigma associated with mental illness and disability, family denial, and financial constraints [35].
Shaheen Pasha	2021	Pakistan	100 health professionals public private settings	several institutions offered a range of speech and language therapies to kids with ASD, PECS as speech and language interventions [36].
Shabbih Fatima	2021	Pakistan	4 elementary-aged children with ASD in Pakistan, English was spoken as 2nd language	Despite receiving training in one setting observations revealed that participants enhanced social interaction in a different setting [37].
Adil Ayub	2017	Pakistan	Primary school teachers cross-sectional self-administered questionnaire.	73 educators—with a mean age of 34 and a 66% female representation—replied. Of the 52 instructors who said they knew anything about

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				autism, or 71.2% of them, 23 (44.2%), thought of it as a neurological or mental illness. 73.1 percent of respondents think special education is a good [38]..
Umesh sharma	2019	Pakistan	review process to find peer-reviewed journal publications from South Asian nations, india Pakistan, Sri Lanka.	Three of the nine best teaching methods were most commonly implemented, according to the review's findings [39].
Sumayya Sajjad	2022	Pakistan	Quiet Ego Scale questionnaires Social Support Scale, Life Satisfaction Scale, and Scale of Positive and Negative Experience.	The results showed a significant beneficial relationship between a composed ego and every aspect of social support and subjective wellbeing [40].

Table 1: Cited literature in the study

DISSCUSSION

In this study, we examined the published research on ASD in Pakistan. We study that there is limited literature on sensory issues of autistic child and there is no literature on types of food and medication used for autistic child as compare to other parts of the world. We only found one population-level research that was trying to figure out how common ASD is in Pakistan. In this study we noted that there are limited literature on autism in Pakistan. We need to enhance awareness about autism in all cities of Pakistan at smaller as well as bigger level. Being a part of rehabilitation team as a speech language pathology we should construct a proper formal assessment tool which is use for assessment with the opinion of all expert speech therapist of Pakistan which is based on content of speech and language which is fulfill are requirements which are needed for assessment of level of speech language in autistic child and the level of severity in autistic child. We need much work to be best in the world in our field of rehabilitation sciences and we should also launch awareness campaigns for autism in Pakistan [41]. The neurological underpinnings of autism are further complicated by interactions throughout development between impacted functional networks and abnormal experience consequences (related to atypical behavior) in autistic children, leading to a "exponentially scattered" profile [42].

CONCLUSIONS

Based on our analysis of published works, it can be claimed that there is a lack of academically sound published material from Pakistan, making it challenging to quantify the burden of ASD in this community, identify risk factors, or even create efficient intervention methods.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Outcomes of Laparoscopic Hysterectomies: An Assessment of a Learning Curve Experience of Gynae Laparoscopic Surgeries

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ABSTRACT

Among the most frequent gynecological operations conducted is the hysterectomy. **Objective:** To determine the outcome of TLH in benign uterine pathology of up to 12-week size uterus. **Methods:** It was a prospective case series carried out at Obstetrics and Gynecology department of Memon medical institute hospital, Karachi from January 2019 to January 2021. All patients who underwent laparoscopic hysterectomy secondary to benign utero- ovarian pathology were consecutively enrolled. Demographic characteristics of the patients along with the presence of co-morbidities, hospital admission details, surgical procedure and intra and post-operative complications were noted. The surgery performed with similar technique in all cases. If patients were deemed to be fit for release after 48 hours following surgery, they were discharged. The postoperative follow-ups were performed at 10th, 30th, and 3 months. **Results:** Of 50 patients, the mean age was 50.5 years. The main indication of hysterectomy is adenomyosis diagnosed in 20 patients. There were 4 laparoscopic assisted vaginal hysterectomies and 46 were total laparoscopic hysterectomies. History of previous laparotomies was observed in 12, previous cesarean and bilateral tubal ligation in 6 each, history of mesh repair of umbilical hernia in 4 while history of VP shunt was observed in 2 patients. Eight patients converted into laparotomy due to technical difficulty in controlling hemorrhage of uterine artery. Total rate of intra and post-operative complications was 40%. **Conclusion:** Laparoscopic approach for hysterectomy is a safe alternative to conventional hysterectomy for benign uterine pathology of up to 12 weeks size uterus.

INTRODUCTION

Hysterectomy is one of the most common surgical procedures performed in gynecology worldwide [1]. Over the last two decades, the laparoscopic approach for gynecological purposes has grown in prominence. The use of gynecological endoscopy is no longer limited to diagnostic purposes [2]. Abdominal, vaginal, and laparoscopic hysterectomy are all possible methods. The most common procedure is an abdominal hysterectomy, which is more intrusive and is associated with higher blood loss, a longer recovery time, and a longer hospital stay [3, 4]. First reports on laparoscopy within female pelvis was made by Roul Palmer in Paris 1944. From this it was a small step towards laparoscopic assisted vaginal hysterectomy and finally total laparoscopic hysterectomy was established from 1989 onward [5]. It is reported that the distribution of the surgical approach was abdominal in majority of the cases, followed by vaginal, laparoscopic, while few cases reported robotic and radical hysterectomy [6, 7]. Other cases have reported rate of total laparoscopic hysterectomy increased to approximately 30% while total abdominal hysterectomy rates fell significantly to 7% [8]. Because of the recent improvement of less invasive surgery, the laparoscopic technique to hysterectomy has become more popular. When less invasive treatments are

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available, they are generally chosen over more invasive procedures, and surgeons should choose the strategy that best achieves the surgical goal while also optimizing patient safety [9]. The American College of Obstetricians and Gynecologists (ACOG) recommends that surgeons employ a vaginal approach whenever possible, and that laparoscopic hysterectomy should be preferred over open abdominal hysterectomy in patients for whom vaginal hysterectomy is not possible [9]. Total laparoscopic hysterectomy is equivalent to vaginal hysterectomy in terms of postoperative parameters and patient satisfaction when performed by skilled hands with carefully chosen patients [10]. The rationale of this study was that amongst all gynecological procedures, laparoscopic hysterectomies are common surgeries worldwide including Pakistan. There is a need of continuous thorough investigations regarding indication, treatment outcome, and complications in women who underwent these surgeries. As sufficient literature is not available in Pakistan due to lack of training and availability of resources and supervision related to laparoscopic surgeries, this study was conducted with the aim to generate local data and report laparoscopic hysterectomy surgery related outcome. In this study, intra and post operative complications of laparoscopic hysterectomies during initial phases of laparoscopic surgeries was reported.

METHODS

This prospective study was conducted among patients who underwent Laparoscopic assisted vaginal hysterectomies and Total laparoscopic hysterectomies during 7th January 2019 to 30th January 2021. Informed consent about laparoscopic hysterectomy was taken before admission and all participants informed in detail about potential benefits and risk related to laparoscopic hysterectomies. The study proposal was submitted to hospital ethical review board and was granted exemption as patient's identity was not revealed and surgery performed by the author gynecologist with an additional diploma in Gynae Laparoscopy. This research included all adult women, regardless of parity, who weighed less than 100 kg and were diagnosed with abnormal uterine bleeding, fibroids, or adenomyosis with postmenopausal hemorrhage. Furthermore, participants in this research were chosen based on uterine size, which was limited to no more than 12 weeks of pregnancy. There are no serious cardiac or pulmonary conditions. Whereas patients with malignant diseases, cardiac diseases, high risk for prolong anesthesia, and with fused hip joint were excluded. Before admission, routine examinations such as a comprehensive clinical history, a complete blood profile, liver and renal function tests, and detailed imaging are performed. Biopsy taken in suspected cases to rule out malignant uterine pathology before admission. Pre-operative anesthesia review done as it is a protocol of department before doing major surgery. TEDs stocking placed before procedure. Preoperative antibiotic was given before 15 minute of skin incision. After creating and maintaining pneumoperitoneum of 15mmHg and placement of uterine manipulator, coagulation of round ligament and broad ligament done followed by opening of uterovesical fold and skeletonization of uterine vessels, coagulation of vessels, colpotomy. Coagulation of infundibulopelvic ligament done in last for salpingo oophorectomy followed by specimen retrieval vaginally. Vault closed by V-lock continuous suturing technique by laparoscopy. In cases of Laparoscopic assisted vaginal hysterectomy same steps were followed till coagulation of uterine vessels and colpotomy while vault closed vaginally with vicryl 0, followed by Anterior and posterior colpoperineorrhaphy done if needed. After surgery, patients allowed orally and mobilized within 24 hours of procedure, catheter discharged after 24 hours, Complete blood count recheck after 24 hours of surgery to check HB drop and patients were advised to discharge after 48 hours if they were considered as fit for discharge. The data related to age, Parity, weight, co-morbidities, size of uterus, additional procedure along with laparoscopic hysterectomy, duration of surgery from skin incision to skin closure, hospital stay after surgery, intraoperative blood loss, intra and post operative complications were reviewed and entered on predesigned proforma. The outcome measured were divided into major and minor complications. Major complications were defined as hemorrhage requiring blood transfusion, vascular injury, bowel, bladder, and ureteric injury, re operation and complete vault dehiscence. Minor complications were defined as, port site infection, vault and urine infection or patient had temperature of more than 38 degree C after first 24 hours of surgery. After discharge Patient called for follow up on 10th post operative day, thirtieth day and finally at three months after surgery. SPSS version 21.0 was used for statistical analysis. Frequency and percentages were calculated for qualitative variables whereas mean along with the standard deviation was computed for quantitative variables.

RESULTS

During the study period, 50 patients underwent for laparoscopic hysterectomies, out of which 46 (92%) had total laparoscopic hysterectomy while 4 (8%) had laparoscopic assisted vaginal hysterectomy with perineal repair. The mean age of the patient was 50.5 years and

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majority were multiparous. Hypertension was the most common morbidity presented in 16 (32%) and diabetes presented in 12 (24%). The main indication of total laparoscopic hysterectomy was adenomyosis diagnosed and confirmed by histopathology in 20 (40%) patients followed by fibroid uterus in 18 cases (36%). Regarding previous surgeries, 12 (24%) had laparotomies and 4 (8%) patients had umbilical hernia mesh repair. The majority primary trocar entry was intra umbilical entry 42 (84%) and followed by supraumbilical entry 4 (8%), and 2 (4%) infraumbilical entry (Table 1). Intraoperative complications were observed in 10 (20%) patients (Figure 1).

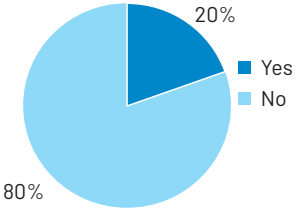

Figure 1: Frequency of intraoperative complications (n=50)

Variables	
Demographics	**Mean ±SD**
Age, years	50.1 ±6.67
Parity	4.45 ±2.6
BMI, kg/m2	32.47 ±5.5
Comorbidities	**n (%)**
Diabetes	12 (24%)
Hypertension	16 (32%)
Hepatitis B	2 (4%)
Hepatitis C	4 (8%)
Indication of surgery	**n (%)**
Fibroid	18 (36%)
Adenomyosis	20 (40%)
Endometrial Hyperplasia	2 (4%)
Endometrial Polyp	4 (8%)
Abnormal Uterine Bleeding	0 (0%)
UV Prolapse	4 (8%)
Ovarian Cyst	2 (4%)
Previous surgery history	**n (%)**
Laparotomy	12 (24%)
Umbilical hernia repair	4 (8%)
Cholecystectomy	2 (4%)
Myomectomy	2 (4%)
Primary Trocar entry	**n (%)**
Intra Umbilical	42 (84%)
Supra Umbilical	4 (8%)
Infra Umbilical	2 (4%)
Lee-Huang Entry	2 (4%)

Table 1: Baseline characteristics of the patients (n=50)

The major intraoperative complications were found to be hemorrhage 8 (16%) and 2 (4%) had thermally induced ischemic ureteric injury presented on 14th day after surgery as uretero vaginal fistula which was repaired with urologist successfully. Conversion of Abdominal hysterectomies were 10 (20%) out of which 8 were due to difficulty in controlling intraoperative hemorrhage and 1 were due to dense adhesions. Port site infection, febrile morbidity, and delayed recovery from anesthesia, and dehiscence were the postoperative complication observed in 2 (4%) patients each (Table 2).

Intra Operative Morbidities	n (%)
Hemorrhage	8 (16%)
Bladder Injury	0 (0%)
Ureteric Injury	2 (4%)
Bowel Injury	0 (0%)
Vascular Injury	0 (0%)
Conversion to Laparotomy	10 (20%)
Post-Operative Morbidities	
Secondary Hemorrhage	0 (0%)
Port Site Infection	2 (4%)
Vault Infection	0 (0%)
Febrile Morbidity	2 (4%)
Deep Venous Thrombosis	0 (0%)
Pulmonary Embolism	1 (2%)
Delayed Recovery from Anesthesia	2 (4%)
Vault Resuturing/Dehiscence	2 (4%)
Vault Hematoma	0 (0%)

Table 2: Distribution of patients according to intra & post-operative complications (n=50)

Average duration of surgery was 164.46 ±30 minutes and average duration of admission was total of 3.3 days (Table 3).

Variables	Mean ±SD
Duration of surgery, minutes	164.6 ±30
Post-Operative Ambulance Time	18 hours
Total days of Hospital admission	3.3 days
Type of surgery	**n (%)**
TLH	10 (20 %)
LAVH+ Perineal Repair	4 (8 %)
TLH + BSO	36 (72 %)

Table 3: Distribution of patients according to duration of surgery, ambulance from surgery, total days of hospital admission

DISCUSSION

The potential benefits and risks of laparoscopic hysterectomy have been widely reported since the first paper on total laparoscopic hysterectomy was published [10]. This study included a series of 50 consecutive laparoscopic hysterectomies. In this study we reported a single surgeon experience of intra operative and post-operative outcomes of Laparoscopic hysterectomies in benign uterine diseases. There is similarity among demographic characters in regards to age and parity in between this and other studies. The mean age of patient in this study was 50 years. Mereu et al., reported a mean age of 49.6 ±6.5 years [11]. Kim et al., reported 46.42 ±5.0 years. BMI in our study was 32.4 ±5.5. Kim et al., also mentioned

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same demographic details [12]. The most common indication of total laparoscopic hysterectomies in the present study is adenomyosis presented in 40% of the cases and followed by fibroids in 36% of the cases. Istre et al., reported fibroid uterus followed by abnormal uterine bleeding as the most common indication of surgery. Dojki et al., reported Heavy menstrual bleeding 31% and fibroid 29.7% as the causes of surgery in their study. According to the current study findings, the mean operative time was 164.46 minutes ±30.23 minutes. Different studies reported differences in mean operative time. Istre et al., reported 124. 26 ±44.74 minutes. Dojki et al., from Patel Hospital Karachi reported median and interquartile value of operative time was 175 (120-225 minutes). In Our study the major intraoperative complication was hemorrhage 16% and there were 10 out of 50 laparoscopic conversions secondary to difficulty in controlling hemorrhage due to technical difficulties. Istre et al., reported 16 TLH converted to laparotomy, 5 patients had dense adhesions, 4 patients had vascular injury and 1 patient had bowel injury [13]. In our study there was one thermal left ureteric injury (2%) which was presented as ureteric vaginal fistula after 14 day of surgery and repaired by urologist successfully. Dojki et al., reported one ureteric injury (0.47%) [14] and another research reported ureteric injury of 2% [15]. The overall major and minor complication rate was 20% in our study and 80% patients had not any complications. A study reported overall complication rate of 10% [16, 17]. There is a case of one pulmonary embolism in our study while other had not mentioned it. Anesthesia related complications also had not mentioned in other studies while there was delayed anesthesia recovery in our study. There were no bladder, bowel, vascular injury and port site infections in our study while other studies mentioned these complications [18]. There was one case of vault dehiscence (2%) reported in 3rd week of post-operative period. Meru et al., reported bladder injury of 0.3%, wound infection of 1.1% and vaginal cuff dehiscence of 0.3% [11]. Dojki et al., reported 1% vault dehiscence and vault infections [14]. In short, various studies have reported that laparoscopic hysterectomies are possible with equivalent advantages. A good laparoscopic experience for surgeons and a careful selection of the cases are the obligatory prerequisites [19-21]. The major limitations of this study are non-randomized nature and small sample size because of low volume of patient flow and affordability of procedure in our hospital. Despite of this limitation, this study is a significant effort in reporting the local estimates.

CONCLUSIONS

This study showed that laparoscopic hysterectomies can be safely performed by the surgeon with an appropriate training in minimal invasive surgery. Total laparoscopic hysterectomies take longer operative time and higher cost. However, it offers several benefits such as earlier ambulation, shorter hospital stays, faster recovery time and minimal incisions. This procedure can be offered in patients as the preferable approach with benign pathology of up to 12-week size uterus by a Gynae surgeons who have laparoscopic surgical skills.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Inadequate Fixed Prosthesis Design Affecting the Periodontal Health

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ABSTRACT

A prerequisite for any type of restoration or replacement prosthesis is to be in harmony with the adjacent periodontal tissue and have no harmful effect on its health. **Objective:** To assess the effect of fixed prosthesis design on health of periodontal tissue. **Methods:** By using a pre-structured proforma for this observational descriptive study, during the period from September to December 2021, data were collected from sample subjects at Peshawar Dental College and Hospital, Peshawar. A total of 175 (93 females, 82 males) subjects of different ages, were selected with a pre-determined inclusion and exclusion criteria. Different variables, such as gingival index, probing pocket depth, margin location of crown / bridge and proximal contact between crown/bridge with adjacent teeth were assessed via William's Probe. The data were analyzed with SPSS version 22. **Results:** All of the 175 subjects had fixed Prosthesis for 10 years or less, among these, 95 received Crown and 80 received Bridge as Fixed Prosthesis. Among these 58 % had Sub-gingivally placed crown margin, 38 % had equi-gingival, while 3 % had Supra-gingival, whereas, 57% of this prosthesis had a tight proximal contact while 42% had an open proximal contact with the adjacent tooth. 55% showed high level of severity for developing Localized periodontal issue at the site of abutment after the insertion of prosthesis, where as 44% developed localized gingivitis at the site of abutment. **Conclusion:** It was concluded that high score of gingival index and probing depth were recorded for subgingival finish line location and discrepancies in proximal contact points.

INTRODUCTION

Replacement and restoration of missing teeth or parts of teeth should be compatible with periodontium and other structures intra-orally. Periodontal tissue is an integral component for the foundation, esthetic requirements, proper function and comfort of all-natural dentition as well as prosthodontics replacement of teeth [1]. Presence of biological width, comprising of gingival tissue and connective tissues, around the teeth serves as protective barrier and assures a long term intact periodontal health against all types of tissue damage caused by restorative procedures [2]. Restoration and replacement of missing tooth structure or teeth has a direct or indirect influence on health of periodontal tissue in the vicinity of these restorations/ replacements. Respecting the periodontal health will ensure successful and long-term outcome of the restorations [3]. A large number of studies have concluded that factors related to prosthesis in terms of design, form and material have an influence on biological width and periodontium, leading to deterioration of surrounding tissue by plaque accumulation [4]. Maintaining a good oral hygiene practice is imperative for the health of periodontal structures. A well-designed prosthesis is doomed to be a failure in presence of weak and diseased health status of the periodontium. Considering the effects of a faulty prosthesis on the periodontium and vice versa, locating the margins of fixed prosthesis in relation to the alveolar bone

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height and maintenance of periodontal health at the margins of crowns are important factors for the success of not only the prosthesis but also the health of gingiva. Despite the advocacy of respecting the perio-restorative interface, many practitioners lack behind during prosthodontics replacement therapies, leading to gingival inflammation and loss of supporting structures [5-7]. Periodontal problems are found in restorative cases where the concerned tooth is damaged by caries or trauma near the alveolar crest, extending the finish line sub gingivally for esthetics demand, enhancing retention, cervical abrasion or root sensitivity. These procedures may affect the health status of the attached soft tissues leading to gingival inflammation, attachment loss and bone loss, clinically manifested by gingival recession and deep periodontal pocketing [8]. A study concluded that success of crown and fixed partial dentures from periodontal health point of view, depends on baseline heath of periodontal tissues, irrespective of placement and location of finish line [9]. They recommended limiting the margin extension sub gingivally up to 0.5-1.0 mm, based on evidence of uncertainty for the clinician to assess and detect the end point of sulcular epithelium and starting point for junctional epithelium [10]. Damage caused by approximation of restorative margins is coupled with formation of bacterial biofilm, which further compromises the host response in dealing with periodontal inflammation process. Several studies indicated that poor marginal adaptation, sub-gingival margin placement, over-contoured crowns and proximal contact relationship contribute to localized periodontal inflammation. These studies have enforced clinicians and researchers to emphasize on the qualities of design of fixed prosthesis in order to preserve good long-term periodontal health. Since most of the relevant studies were carried out in different western countries and because of the lack of such studies from our local set up, it would be interesting to investigate in our populations with different cultural, ethnic and dietary backgrounds. Thus, the aim of the present observational study was to assess the periodontal conditions in relation to inadequate prosthetic designs in general.

METHODS

This cross-sectional study was conducted at the department of Periodontics at Peshawar Dental College and Hospital, Peshawar (September 2021 to December 2021). An ethical approval certificate was obtained from Institutional Review Board before starting the current study. Participants of the study were selected through random convenient sampling method. The target population included patients attending periodontology department for prophylactic periodontal treatment, after receiving fixed prosthodontics treatment. These included crowns and bridges with irrespective of the design of prosthesis, type of material, location of the finish line, and location of the abutment teeth in the arch either maxillary or mandibular. Patients with previous or current, generalized periodontitis, diabetes, hypertension, smoking history and pregnant females were excluded from the study. A total of 175 participants were recruited in the study with 82 males and 93 females, having crowns and bridges with less than ten years of replacement history. The sample size was determined with the help of WHO calculator with a significance level of 95%, power of 80% and margin of error 5%. Prosthesis replacement history was measured from time of first cementation of the prosthesis till the patient was examined for the purpose of this study. An informed verbal consent was obtained from the participants after comprehensively explaining the nature of the study. A thorough clinical examination, performed by a single Author (MI), included assessment of periodontal tissue around the prosthesis, location of the prosthesis margin and proximal contact of the prosthesis with the adjacent tooth. The clinical parameters noted were Gingival Index (Loe and Silness) and Probing Pocket Depth. The probing pocket depth was measured at six sites per abutment tooth (mesio-buccal, buccal, disto-buccal, distolingual, lingual and mesio-lingual) using the William's periodontal probe (Signor), sulcus depth more than 3mm were noted as periodontal pockets.-Location of the Crown margin were assessed visually, the margins were considered sub-gingivally located, if they were 1 mm or more below the gingival margin with William's periodontal probe clinically. Proximal contact relationship with adjacent tooth was also assessed with the help of waxed dental floss. The collected data were statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 22.0.

RESULTS

The study included total 175 subjects. Out of which, 82 (46.8%) were males while 93 (57.3%) were females, with the age ranging between 21-60 years. Participants were categorized as Group-A comprised of age 21-30 years, Group-B from age 31-40 years, Group-C from age 41-50 years and Group-D from age 51-60 years. The number of total participants in Group A, B,C and D was 45 (25.7%), 55 (31.4%), 41 (23.4%), 34 (19.4%) respectively as shown (Table1).

Gender	n (%)	Age Groups (yr)			
Male	Female	Group-A (21-30)	Group-B (31-40)	Group-C (41-50)	Group-D (51-60)
82 (47%)	93 (53%)	45 (26%)	55 (31%)	41 (23%)	34 (20%)

Table 1: Frequency of gender and age groups

All the subjects were checked for the extent of margin placement, 102 (58.2%) had sub-gingival margins i.e.,

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crown margin extending more than 1mm, apical to the free gingival margin, 67 (38.2%) had equi- gingival margins i.e., prosthesis margin at the level of free gingival margin (with a positive / negative ledge) and 6 (3.4%) had supra-gingival i.e., prosthesis margin 1mm or more coronal to the free gingival margin (with a positive / negative ledge). Periodontal status around each prosthesis for all subjects were also assessed, it was found, out of 102 sub-gingival margin prosthesis, 38 (21.7%) had high gingival index score around the margin area, clinically manifested as localized gingivitis and 64 (36.5%) had more than 3mm pocket formation around the prosthesis margin, clinically manifested as localized periodontitis. Similarly, out of 67 (38.2%) equi-gingival margin prosthesis, 36 (20.5%) had localized gingivitis and 31 (17.7%) had localized periodontitis. Out of 6 (3.4%) supra-gingival margin prosthesis, 4 (2.2%) had localized gingivitis and 2 (1.1%) had localized periodontitis (Table 2).

Margin Location	Periodontal Status	
	Localized Gingivitis	Localized Periodontitis
Sub-Gingival margin102 (58.2%)	38 (21.7%)	64 (36.5%)
Equi-Gingival margin 67 (38.2%)	36 (20.5%)	31 (17.7%)
Supra-Gingival margin 6 (3.4%)	4 (2.2%)	2 (1.1%)
Total 175 (100%)	78(44.5%)	97 (55.4%)

Table 2: Frequency of inadequate fixed prosthesis margin and its periodontal status

The fixed prostheses were also examined for the proximal contact points with their adjacent teeth, and the periodontal status around them. A total of 100 (57%) had tight proximal contact point, i.e., it was hard to pass dental floss from between the fixed prosthesis & adjacent tooth, among these 35 (20%) had high gingival index score and clinically manifested as localized gingivitis whereas 65 (37%) had more than 3mm pocket formation around the proximal contact area, clinically manifested as localized periodontitis. While the rest of 75 (42.8 %) had open contact point, out of which, 43 (25%) had localized gingivitis and 32 (18%) had localized periodontitis (Table 3).

Proximal Contacts n (%)	Periodontal Status	
	Localized Gingivitis	Localized Periodontitis
Tight contact 100 (57%)	35 (20%)	65 (37%)
Open contact 75 (43%)	43 (25%)	32 (18%)
Total = 175 (100%)	78 (44.5)	97 (55.4%)

Table 3: Frequency of inadequate proximal contacts and its periodontal status

DISCUSSION

Periodontal diseases are considered one of the most prevalent diseases of the oral cavity, affecting almost 90% of the world population. Plaque accumulation, calculus formation, neglected oral hygiene and systemic diseases are some of the factors responsible for altered periodontal health status. However faulty and inadequate design of the restorations of teeth along with ill-planned treatment planning can play a pivotal role in adversely affecting the periodontal health. The closer is the margin of crown and bridge to the alveolar bone, the more are the chances of violating the integrity of the biological width, for example subgingival margins. The present study focused on understanding the relationship between the two mentioned factors i.e., finish line location and biological width, second proximal contact and periodontal tissue health. Our study observed that all subjects showed high gingival index score and increased pocket depth formation in the area of abutment tooth. No positive relation was found between the developments of gingival or periodontal issue in the area of abutment tooth, with age of the subjects, gender of the subjects and the time duration for which the subject was provided with the prosthesis, Distribution of gingival or periodontal issues showed similar pattern between male and female subjects. This finding was in relation to a descriptive study conducted by Khan *et al.*, at a dental college in Bangladesh that concluded periodontal diseases are primarily correlating with the age but gender may not be associated [11]. Majority of subjects 97(55.4%) showed high gingival index score as well as increased pocket depth and manifested clinically as localized periodontitis at the abutment site and its adjacent tooth after receiving fixed prosthodontics treatment, among these 64 (36.5%) were found with subgingival margin, 31(17.7%) with equi-gingival margin and 2 (1.1%) with supragingival margin. 78 (44.5%) of the 175 (100%) subjects, exhibited high gingival index score only, among these 38 (21.7%) were found with subgingival margin, 36 (20.5%) with equi-gingival margin and 4 (2.2%) with supragingival margin. This outcome indicates a relation that placement of prosthesis margin below the gingival margin, is detrimental to periodontal health. This finding is in agreement with the study done by Gunay *et al.*, where majority of diseased cases were involved with subgingival finish line of the restorations [12]. A minimal width of 2mm, from the deepest point of gingival sulcus and alveolar bone crest is needed for junctional epithelial and connective tissue attachment with the root surface of the tooth. Our study observed this distance to be less in majority of cases which is in agreement to the previous studies [13-15]. Relation between biological with violation and bleeding on probing was justified in one another study that evaluated the histological and clinical response of periodontal tissues to the position of the restoration margins within the biologic width [16]. The gingival recession and inflammation were clinically observed in yet another study by Carvalho *et al.*, in addition to the correlation between the presence of width invasion and the

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decrease in the level of the bone crest observed radiographically [17]. These findings similar to those reported by Douglas *et al.*, second major defect in the prosthetic design that led to formation of localize gingivitis / localize periodontitis among the subjects was the proximal contact discrepancies i.e., either a too tight or open contact was found between prosthetic crown and its adjacent natural tooth [18]. About 57% subjects had tight contact between the prosthesis and adjacent tooth and amongst these 37% had clinical manifestation of localized periodontitis with high gingival index score and deep pockets. Also 20% among tight contact and 24% among open contact, showed high gingival index score only. Our findings are in agreement with a study done earlier which showed attachment loss in many cases and gingival inflammation [19]. Jernberg *et al.*, study regarding the impact of open contacts on periodontium showed greater prevalence of food impaction, in sites with open contacts which presented with deep pockets and clinical attachment loss although there was no significant difference for gingival index, bleeding and calculus index between contact types [20]. Another cross-sectional study reported by Koral *et al.*, that an increase of bone loss (2.4%) in the patients with open contact between prosthesis and adjacent tooth that initiated periodontitis [21]. Regardless of an indirect relationship between open contact and periodontal inflammation, it could be postulated from these studies that food impaction contributes to increase in pocket depth and clinical attachment levels.

CONCLUSIONS

Within the limitation of this study, it can be concluded that a high score of gingival index and probing depth were recorded for subgingival finish line location and discrepancies in proximal contact points.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Comparison of Complications In Patients With Central Venous Catheter Placement Via Internal Jugular, Subclavian And Femoral Route At Intensive Care Unit

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ABSTRACT

Central venous lines are passed in almost all patients admitted in intensive care unit and a need still exist to look for best route for this purpose. **Objective:** To compare the complications in patients with central venous catheter passed via internal jugular, subclavian and femoral route at intensive care unit. **Methods:** A comparative cross-sectional study was conducted on 380 patients admitted in intensive care unit of Bahria International Hospital RWP from January 2022 to June 2022. Central venous catheters were passed by consultant critical care specialist on call at the time of reception of patient in unit. All the patients were observed for one week for presence of any local or systemic complications. **Results:** Out of 380 patients, 240(63.2%)were male while 140(36.8%)were female. Central venous catheter was passed via internal jugular vein in 220 (57.8%) patients, via subclavian route in 60 (15.8%) patients and via femoral route in 100 (26.3%) patients. Failed attempts were seen statistically significantly more in internal jugular route (p-value-0.041) while local cellulitis was seen more in femoral route (p-value-0.012). **Conclusions:** Internal Jugular vein was the route most commonly used for insertion of central venous catheter in patients admitted in our intensive care unit. Complications were seen more not very common in our setting. Failed attempts were more seen in internal jugular route while local cellulitis was seen more in femoral route.

INTRODUCTION

Organ support is a complex and difficult task for which patients with different ailments are referred to medical or surgical intensive care units of the hospital [1]. Primary medical or surgical conditions usually lead to multi-organ failure and if more than organ systems fail to function, intense support is required at critical care setting [2]. Multiple health related conditions which further complicate the clinical picture may arise as a result of ICU admission or different procedures performed to support the organ systems as part of overall management [3]. Different procedures are performed in critical care settings to monitor the patient, administer medications or support different organ systems. Passing central venous catheter is one of the most commonly performed procedures in all types of critical care units [4]. Though a relatively simple procedure but may prone individual to number of local or systemic complications [5]. Different routes can be used to pass the central venous catheter but few common routes include internal jugular, subclavian and femoral route [6]. Insertion of central venous catheter can bring about few adverse events like all other medical procedures. Kornbau *et al.*, published a comprehensive paper in this regard bringing up all the complications which could happen in patients who have been inserted central line and adequate knowledge of them can only enable the treating team to prevent them [7]. Wong *et al.*, tried to look for insertion rate and complication of central lines in UK population. It was revealed that out of 117 catheters inserted only 8% had immediate complications and most of them were mild and self-limiting [8]. Incidence of

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infectious complications of central venous catheters at the subclavian, internal jugular, and femoral sites in patients admitted in intensive care unit was published by Deshpande *et al.* It was concluded that infectious complications occurred in very small number of patients. Route of catheter had no relationship with incidence of infections among their patients [9]. Critical care has been evolving in Pakistan. Still medical doctors or interns pass central venous catheters in most of public sector hospital. Specialized units have critical care experts or anaesthetist performing these procedures and that too sometimes guided by ultrasound. A recent local study revealed that around 10% of patients who had central venous catheter suffered from infection at the site of insertion [10]. It becomes very important in patients admitted at critical care unit to prevent any additional harm by treatment during the admission. Limited local data had compared complications between different routes of central venous catheter. We therefore designed this study with the rationale to compare the complications in patients with central venous catheter passed via internal jugular, subclavian and femoral route at intensive care unit.

METHODS

This comparative ross-sectional study was conducted at the intensive care unit of Bahria International Hospital Rawalpindi from January 2022 to June 2022. Sample size was calculated by WHO Sample Size Calculator by using population prevalence proportion of complications with central venous catheter placement as 1.1% [11]. Study subjects were gathered via non probability consecutive technique for this study. Inclusion criteria: All patients between the age of 18 and 60 years who were admitted in critical care unit either from wards of own hospital or any other hospital and were inserted central venous catheter via either of three routes (internal jugular, subclavian or femoral) were recruited in the study. Exclusion criteria: Patients who came with central venous catheter inserted from ward or other clinical setting were not included. Those who died within 24 hours of CVC insertion or were shifted from the ICU were also not included. Patients with diagnosed bleeding disorders or blood related cancers were excluded. Patients who themselves or whose caregivers refused insertion of central venous catheter were excluded from analysis. Ethical approval from the ethical review board committee (letter no XXX) of Bahria International Hospital was taken prior to commencement of study. Written informed consent was taken from care givers of potential participants. After all these formalities, patients who were admitted in the critical care unit of Bahria International Hospital who required insertion of central venous catheter were recruited for the study. Central venous catheters were passed by consultant critical care specialist on call at the time of reception of patient in unit. Patients were assessed in detail at the time of admission in ICU by a team member and evaluated for requirement of central venous catheter. Route of catheter was decided by the clinician inserting the catheter on the basis of multiple factors including his own expertise [12]. Catheter was passed under aseptic conditions as per set protocols [13]. All the patients were observed for one week for presence of any local or systemic complications related to insertion or presence of central venous catheter [14]. All statistical analysis was performed by using the Statistics Package for Social Sciences version 24.0 (SPSS-24.0). Frequency and percentages for gender, route of central venous catheter insertion and complications were calculated. Mean and standard deviation for age of patients recruited in the study was estimated. Pearson Chi-square test and Fischer exact tests were used to look for statistically significant difference (p-value less than or equal to 0.05) among three groups of study regarding complications.

RESULTS

A total of 380 patients who were admitted in intensive care unit for any reason and had central venous catheter placed were included. Table 1 shows general characteristics of these patients along with primary or comorbid illnesses. Out of all the patients recruited, 240 (63.2%) were male while 140 (36.8%) were female. Central venous catheter was passed via internal jugular vein in 220 (57.8%) patients, via subclavian route in 60 (15.8%) patients and via femoral route in 100 (26.3%) patients.

Study parameters	n (%)
Age (years)	
Mean + SD	41.239 ±7.892 years
Range (min-max)	19 years - 60 years
Gender	
Male	240 (63.2%)
Female	140 (36.8%)
Primary or Comorbid illnesses	
Diabetes Mellitus	145 (38.1%)
Hypertension	75 (19.7%)
Asthma/COPD	64 (16.8%)
End stage renal disease	69 (18.1%)
Stroke	74 (19.4%)
Malignancy	22 (5.7%)
Others	09 (2.3%)
Access route of central venous catheter	
Internal Jugular	220 (57.9%)
Subclavian	60 (15.8%)
Femoral	100 (26.3%)
Complications	
Failed attempt	19 (5%)
Arterial puncture	09 (2.3%)

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Pneumothorax	02 (0.5%)
Hemothorax	01 (0.26%)
Cellulitis at access site	12 (3.1%)
Bleeding at site	03(0.7%)
Others	02 (0.5%)

Table 1: Characteristics of patients with central venous catheter admitted in ICU

Table 2 shows the results of Pearson Chi-square test and Fischer exact tests. Failed attempts to pass the central venous catheter were seen statistically significantly more in internal jugular route (p-value-0.041) while local cellulitis at the central venous catheter access site was seen more in patients in which femoral route (p-value-0.012) was used.

Complications	Internal Jugular	Subclavian	Femoral	p-value
Failed attempt				
No	204 (92.7%)	59 (98.3%)	98 (98%)	0.041
Yes	16 (7.3%)	01 (1.7%)	02 (02%)	
Local cellulites				
No	217 (98.6%)	59 (98.3%)	92 (92%)	0.012
Yes	03 (1.4%)	01 (1.7%)	08 (08%)	
Pneumothorax				
No	219 (99.5%)	59 (98.3%)	100 (100%)	0.364
Yes	01 (0.5%)	01 (1.7 %)	00 (0 %)	
Hemothorax				
No	220 (100%)	59 (98.3%)	100 (100%)	0.157
Yes	00 (0%)	01 (1.7%)	00 (0%)	
Arterial puncture				
No	215 (97.7%)	59 (98.3%)	97 (97%)	0.856
Yes	05 (2.3%)	01 (1.7%)	03 (03%)	
Arterial puncture				
No	219 (99.5%)	60 (100%)	99 (99%)	0.268
Yes	01 (0.5%)	00 (0%)	01 (1%)	

Table 2: Comparison of complications in patients with central venous catheter placed via internal jugular, subclavian and femoral route

DISCUSSION

Multiple procedures are involved in critical care of patients which allow smooth monitoring and management of them. Central venous catheter is passed in majority of patients admitted in ICU. This procedure may be done with or without ultrasound via various routes. Internal Jugular, subclavian and femoral are the most preferred routes. Certain complications may occur while doing this procedure or later on which catheter is in place. Currently no fixed rule exists regarding safest route of central venous catheter insertion. This study was conducted at an intensive care setting of a lower- and middle-income country with an aim to compare the complications in patients with central venous catheter passed via internal jugular, subclavian and femoral route. Marik *et al.*, published a systematic review and meta-analysis regarding difference in catheter related infections with central venous catheter passed via different routes. It was concluded that no difference existed with regard to infection between three routes [15]. It was contrary to previous findings in a lot of studies which found femoral route to be more associated with infections. Our study results were similar to data previously generated and femoral route was more associated with presence of local access site infection as compared to subclavian and internal jugular route. In northern India, all the complications were studied related to central venous catheter and it was found that bleeding complications were found more when catheters were passed via internal jugular route as compared to other routes [16]. In our study failed attempts were seen significantly more in patients in which attempts were made via internal jugular route but bleeding at the access site was not significantly different in all the three routes. Comerlato *et al.*, published a study from teaching hospital of Brazil regarding complications related to central venous catheter insertion. They revealed that arterial perforation and infectious complications were mostly seen in patients in ICU who had insertion of central venous catheter. Route of insertion was not associated with complications in their study sample [17]. Our results showed that Internal Jugular vein was the route most commonly used for insertion of central venous catheter. Complications were seen more not very common in our setting. Failed attempts were more seen in internal jugular route while local cellulitis was seen more in femoral route. A study was published from Bahrain regarding incidence of complications of central venous catheters at an intensive care unit. They came up with the findings that internal jugular vein access for central venous catheter was associated with a lower rate of mechanical and infectious complications as compared to subclavian and femoral access [18]. We found more failure rate was seen in internal jugular vein access while more local infection rate was seen in femoral access. Our findings supported the already existing findings [19, 20] and we suggest special caution regarding infections should be taken into account while choosing femoral route for CVP insertion.

CONCLUSIONS

Internal Jugular vein was the route most commonly used for insertion of central venous catheter in patients admitted in our intensive care unit. Complications were seen more not very common in our setting. Failed attempts were more seen in internal jugular route while local cellulitis was seen more in femoral route.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Knowledge and Awareness Regarding Defining Components of Research Process Among Dental Graduates

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ABSTRACT

Modern breakthroughs significantly improve life span and quality. Conducting research should be viewed as crucial to medical education. Critical thinking and reasoning abilities must be developed if dental practitioners are to embrace a positive viewpoint of scientific study. Therefore, efforts are being made for graduate dentists to bridge gap between understanding research process and its components. **Objectives:** To determine how well dental graduates understood key elements of research process. Decisions and curriculum changes for bettering knowledge and conducting research could be made using study's findings. **Methods:** A cross-sectional descriptive study was designed and conducted among house officers of University Dental Hospital, University of Lahore. Self-administered questionnaire was designed and circulated among various dental schools in area. For data analysis, SPSS Version 25.0 was used. **Results:** Total of 161 participants took part in current study out of which majority (n=107, 66.4%) were females and minority (n=54, 44.6%) were males with the age group lying between 23-25 years. Bulk of study participants (n= 53, 32.9%) rarely had any experience in research. Participants indicated that they were knowledgeable about research and its components, scoring 48% fair, 16% good, and 6% excellent, although 30% of them showed inadequate understanding. **Conclusions:** The majority of dental graduates believed they had poor to fair knowledge of how to plan, carry out, and write a research project.

INTRODUCTION

Research is a movement from unknown to known and the evolution of the world from ancient to modern is a result of this movement. J. H. Shera defined research as "an intellectual process whereby a problem is perceived, divided into its constituent elements and analyzed in the light of certain basic assumptions" [1]. In simple words, research starts with a question in one's mind and ends with an answer to that question, which further helps other to solve problems or to identify other questions, that's how we are all evolving in a better place daily [2]. The word "research" is derived from French "recherché" meaning "to go about seeking" [3]. With the advent of internet over the turn of the millennium, an immense amount of information has become available for everyone across the globe leading to a "paradigm shift" toward research-oriented and self-directed learning [4]. According to Hudson Maxim, "All progress is born of inquiry. Doubt is often better than overconfidence, for it leads to inquiry and inquiry leads to investigation" [5]. Quality of life and duration is highly increased by present day advances. Scientific research should be considered as an integral part in medical education. It is important to inculcate aptitude of critical thinking and reasoning in order to develop a positive attitude among undergraduate student towards scientific research [6]. There has been much discussion over the past 25 years regarding the serious decline in medical graduates choosing clinician scientist careers [7]. Other problems identified included lack of time, lack of statistical

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support and lack of interest in research. Apart from the student projects, since most of the faculty in the medical schools are not actively involved in conducting research that led to the failure of medical graduates to imbibe and understand the importance of research in medical science. Moreover, inadequate training, lack of funding, lack of motivation and no mentorship program are also major obstacles to carry out research [8, 9]. The worldwide alleluia of a 7-star doctor is comprised of attributes of 5-star doctor as determined by World Health Organization (WHO) i.e., care provider, decision maker, communicator, community leader, manager; plus, two other competencies deemed necessary in medical graduates are researcher and faith and piety [10]. At international level efforts are being made to encourage and incentivize students to get involved in research activities. To come in line with international standards Pakistan Medical and Dental Council (PMDC) has drafted the competences for fresh graduates which also included area of researcher and lifelong learner [11]. Unfortunately, till date this initiative could not bridge the gap between understanding the need of good research and knowledge of defining components of research process among medical and dental graduates. Therefore, current study was conducted to assess the knowledge and awareness of dental graduates in the area that was led to propose a possible solution to the problem.

METHODS

A cross-sectional descriptive study was conducted from March 2022 till September 2022, with probability purposive sampling technique. The study was conducted among house officers of four private and public dental colleges: University College of Dentistry (UOL), de' Montmorency College of Dentistry Lahore, Akhtar Saeed Medical and Dental College Lahore, CMH medical and dental college Lahore. A self-administered questionnaire was designed. Sample size of 161 was calculated with 90% confidence level, 6.5% margin of error and by taking percentage of awareness about research components as 48% {$X = Z^2 \times p(1-p)/ d^2$}. From a sample size of 161 the initial 70 responses were used to check the validity and reliability of the questionnaire which showed Cronbach's alpha value of 0.923. The questionnaire was holding a cover letter which explained the procedure and purpose of the study, informed the participants about the confidentiality and withdrawal options. Inclusion criteria was fresh dental graduates doing house-job. Consultants, Demonstrators and students were excluded from the study. Consent was obtained and confidentiality of the participants was ensured. The questionnaire was circulated among various dental schools in the area via Google forms as well as in the form of hard copies to be filled by house officers. It consisted of 3 sections with section 1 being related to demographics, section 2 about the basic defining components of research assessed on a 5-point Likert scale and the 3rd section consisted of 4 scenario-based questions each having 5 options with 1 correct answer. A score of 1 for correct answer and 0 for wrong was marked. The latter were included in order to asses a holistic knowledgeable approach of study participants towards various research manoeuvers. Data were analyzed using SPSS Version 25.0 for Windows. Descriptive statistical analysis was performed on the results of all questions whereas Chi-Square test was applied for gender association pertinent to study items.

RESULTS

Total of 161 participants took part in our study out of which majority (n=107, 66.4%) were females and minority (n=54, 44.6%) were males with the age group lying between 23 to 25 years. This gender distribution coincides well with the actual representation of female to male ratio present in the medical and dental colleges of Pakistan. A large proportion of the participants (n=60, 37.2%) were aware of the concept of plagiarism. Knowledge of the participants about journal categorization by Higher Education Commission (HEC) revealed alarming results with only 10% (n=18) being aware. Participants' knowledge of sampling methods and research design was adequate in 21.1% (n=34) and 6.2% (n=10) of responses, respectively. Maximum respondents (n= 77, 48%) were of the opinion that they have fair level of self-perceived competence in research skills while 31% (n= 50) marked poor level followed by only 5% (n=8) who indicated excellent response for aforementioned. Only 5% (n=8) of the participants perceived their research skills as of very poor level (Table 1).

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No.	Questions	Responses n (%)				
		Not aware at all	Slightly aware	Moderately aware	Very aware	Extremely aware
1	How much aware are you of the terms used in research writing?	32 (19.9%)	57 (35.4%)	44 (27.3%)	26 (16.1%)	2 (1.2%)
2	To what extent you know about the implication of "Conflict of Interest" in a research project?	35 (21.7%)	31 (19.3%)	49 (30.4%)	26 (16.1%)	20 (12.4%)
3	Do you know about the appropriate use of graphs and tables in a research paper?	19 (11.8%)	41 (25.4%)	43 (26.7%)	34 (21.2%)	24 (14.9%)
4	Are you aware about scope of journals?	23 (20.4%)	48 (29.8%)	46 (28.5%)	30 (18.6%)	14 (8.6%)
5	Do you know how to cite an article?	32 (19.8%)	53 (32.9%)	34 (21.1%)	18 (11.1%)	24 (14.9%)
6	Do you have any knowledge about funding resources for research?	56 (34.8%)	42 (26.1%)	45 (27.9%)	10 (6.2%)	8 (4.9%)
7	Do you have any knowledge about plagiarism and its implications?	21 (13.4%)	39 (24.2%)	41 (25.5%)	30 (18.6%)	30 (18.6%)
8	Do you have any knowledge about journals recognized by Higher Education commission (HEC)?	44 (27.3%)	57 (35.4%)	42 (26.1%)	6 (3.7%)	12 (7.4%)
9	Do you have any knowledge about various data analyzing tools available for research?	27 (16.8%)	62 (38.5%)	34 (21.2%)	0 (0%)	38 (23.6%)
		Not at all familiar	Slightly unfamiliar	Moderately familiar	Very familiar	Extremely familiar
10		44 (27.3%)	40 (24.8%)	67 (41.6%)	8 (4.9%)	2 (1.2%)
11	Do you think you have enough knowledge about various sampling techniques in a study?	33 (20.5%)	49 (30.4%)	45 (27.9%)	32 (19.8%)	2 (1.2%)
		Very poor	Poor	Fair	Good	Excellent
12	Can you perceive your level of competence in research skills?	8 (5%)	50 (31%)	77 (48%)	26 (16%)	8 (5%)

Table 1: Frequency & percentage distribution of study items assessing awareness regarding basic defining component of research

Regarding previous experience of research, most participants (n=53, 32.9%) had rarely participated in any research followed by those (n=40, 24.8%) who clicked sometimes while some (n=30, 18.6%) never had any experience. Only few (n=28, 17%) of participants had often participated in research activities (Figure 1).

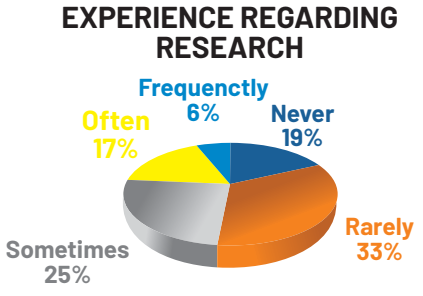

Figure 1: Responses regarding research experience

Many participants had a moderate comprehension of the words used in research, according to their answers to the questions designed to gauge their understanding of the various research components and their knowledge of research terminologies are shown in Figure 2.

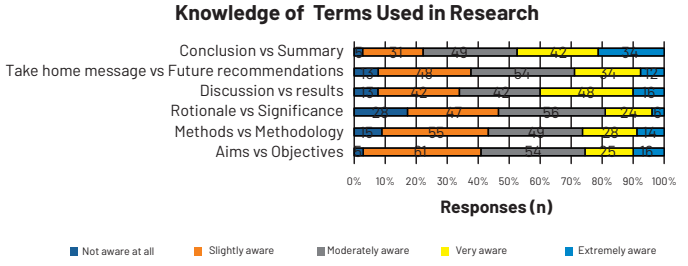

Figure 2: Responses regarding knowledge of terms used in research

The majority of research participants made wrong choices in the scenario-based questions that made up the third section of the survey (Table 2). Association between gender and questionnaire items using Chi-Square test revealed statistically significant results for the questions pertaining to difference between methods and methodology (p=0.000) with female preponderance while difference between aims and objectives (p=0.005) with male predominance. Furthermore, the association of gender with knowledge regarding study designs turned out as statistically significant (p=0.021) with female distinction. Likewise, male dominance was also reflected in response to self-perceived level of their research with p-value of 0.010.

Questions with Options	Correct Option n (%)	Incorrect Option n (%)
To assess the effect of consumption of sugar and development of carious lesions, which of the following study designs do you think would be appropriate? (a) Descriptive (b) Correlational* (c) Casual comparative (d) Experimental (e) Cohort/ follow up	36 (22.4%).	125 (77.6%)
If you want to collect data and you are supposed to ask your initial subjects to assist in identifying other potential subjects, which sampling technique do you think is this? (a) Snowball sampling* (b) Quota sampling (c) Exponential sampling (d) Bias sampling (e) Random sampling	47 (29.2%).	114 (70.8%)
If you want to publish your research in a peer review impact factor journal, which category of HEC recognized journal falls into this group? (a) W* (b) X (c) Y (d) Z (e) None	19 (11.8%)	142 (88.2%)
A person was supposed to get and write a text from an article to include it in his own, he didn't mention that text within quotation marks. Which of the following terms do you think is appropriate? (a) Copied text (b) Plain text (c) Plagiarized text*(d) Forged text (e) None	98 (60.9%)	63 (39.1%)

Table 2: Distribution of responses for individual Scenario-based Question among 161 Participants
* Correct option

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DISCUSSION

It is no longer unusual for undergraduate medical students to carry out research, present it at a conference and publish the results as an abstract or a full paper. The proponents of undergraduate research hold that knowing about research leads to better doctors who study literature and clinical research findings more critically. Exposure to research improves one's understanding of clinical medicine, fosters critical thinking and appraisal, increases one's chances of being accepted for postgraduate study, grants, and high-impact publications, nurtures the development of teamwork, and exposes one to more of the brightest clinical minds [12, 13]. Although there is debate about whether or not early exposure to research is important, the advantages are clear. The Bachelor of Dental Surgery (BDS) programme core curriculum in dental institutions must include research as a requirement [14]. However, lack of mentorship, facilities and infrastructure, lack of time and drive as well as lack of training in certain abilities can all prove to be significant obstacles [15]. In Germany, medical school graduates practice medicine but cannot assume the title 'Doctor' until they have submitted a thesis. As a result, around 90% of practicing German physicians have undertaken a period of research [16]. In relation to the aforementioned, the results of present study revealed that around half of the participants (n=83, 51.6%) did not have any experience in research, be a participant in a research related activity or conducting a research by themselves (Figure 1). Similar results were revealed by the study conducted in Malaysia by Ismail et al., that demonstrated only 50% students were involved in research activities while rest of the participants were not involved in any kind of research work [17]. About knowledge of terms used in research, majority (n=57, 35.4%) of the participating population were slightly aware of the components, which was followed by moderate level (n=44, 27.3%) of awareness. Most of the participants (n=49, 30.4%) marked the option of very aware concerning their understanding about conclusion vs summary and take home message vs future recommendations (n=54, 33.5%) while moderately aware for discussion vs results (n=48, 29.8%). A study conducted in Pakistan by Khan et al., revealed results similar to this study where 63% (n=138) of the participants were either slightly or moderately knowledgeable about the terms used in research (Table 1) [9]. In regards to question on the subject of knowledge about data processing and data analysis revealed awful outcome where majority opted a poor response (n=62, 38.5%). Likewise, results were shown by Murdoch-Eaton et al., where only a few (n= 279, 31%) were knowledgeable about data analyzing process (Table 1) [7]. A study conducted by Burgoyne et al., showed that their study participants had higher level of competence (98.1%) in research skills [10]. Similar findings were obtained from a Saudi Arabian study where individuals believed they had fair (n=108, 40.5%) to good (n=162, 60.4%) levels of competence as research has become a compulsory subject where students are obligated to complete a substantive research during final year at University College Cork [18]. Results of aforementioned studies coincides with the results of present research where majority of the respondents (n=77, 48%) were having fair level of perceived competence followed by those (n=50, 32%) who were falling in the poor level category. It was quite surprising that only 5% (n=8) were of the opinion that their perceived level of competence is excellent while 16% (n=26) ranked it as good (Table 1). About 60% (n=96) of the participants in current study had knowledge about plagiarism and its implications. Alzahrani et al., demonstrated in their study that majority (n=165, 82.6%) of the respondents were aware about plagiarism which is analogous to present study as every student was aware of plagiarism, since it is a common topic of discussion in the research field (Table 1) [19]. Despite the fact that a good majority of participants (n=111, 68.9%) said they were knowledgeable about the research components and skills, a significant portion of participants chose erroneous answers to scenario-based questions that demonstrated real lack of understanding of various research layouts (Table 2). A study conducted in Saudi-Arabia by Habib et al., revealed similar results (mean= 3.36±1.76) about the scenario based research items in which majority of the participants chose incorrect answers to the questions which coincided well with this study [20].

CONCLUSIONS

A greater proportion of dental graduates perceived that they have poor to fair knowledge regarding planning, conducting and writing a research project. This is contradictory to the facts that they might have heard of the terms but they do not have enough knowledge to practically implement them which calls for the need of fresh graduates to be trained properly for the research driven clinical skills. We recommend that research training should be an integral part of undergraduate curriculum in Pakistan so that we can have professionals who are also good researchers.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Mortality Analysis during July & September 2022 at Benazir Bhutto Hospital Rawalpindi

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ABSTRACT

Hospital mortality reflects the quality of healthcare and is a tool to perceive department-wise variations in health care services. **Objectives:** To determine age, gender and department-wise mortality reported during July and September 2022 at Benazir Bhutto Hospital Rawalpindi. **Methods:** A cross-sectional descriptive study was done to analyse the variations in age, sex and department-wise in-hospital mortality among reported deaths at Benazir Bhutto Hospital (BBH) Rawalpindi during July and September 2022. The data were gathered from Hospital administration through informed consent. The demographics and primary cause of mortality were scrutinized. Data were analysed by using SPSS version 25.0 and Microsoft Excel 2010. Hospital death rate during July and September 2022 were computed. Difference in mean age of the expired cases other than those of infant and neonates was statistically determined by independent sample t-test. $P < 0.05$ was considered significant. **Results:** Of the total 5338 and 4514 patients admitted at BBH during July and September 2022, about 8.2% and 7.1% deaths were reported respectively. On an average 53.2% males and 46.8% females succumbed to various diseases. About 58.5% and 64.2% deaths were reported from Paediatrics department during July and September 2022 respectively. Around 45.6% neonatal deaths were reported during two months period. Difference in mean age of expired cases excluding infants and neonates was statistically insignificant (P=0.09). Infants and neonates frequently succumbed to sepsis, low birth weight, birth asphyxia and pneumonia. **Conclusion:** Infants and neonates are more susceptible to in-hospital mortality predominantly due to sepsis and low birth weight.

INTRODUCTION

Mortality indicators of a region are of paramount significance in identifying the age and sex-related fatalities apart from scrutinizing the cause of death. Statistics pertinent to mortality of a nation enable our policy makers to deliberate on this issue for its mitigation [1]. The role of effectively implemented Hospital Management Information System (HMIS) in provision of updated healthcare related data can never be overlooked [2]. Mortality data of a country reflects the quality of its healthcare services. Composite mortality data of any hospital illustrates the operationality of health system in addition to depicting the accountability of healthcare workforce [3]. Sustainable Development Goal (SDG) No. 3 is intended to ensure health and well-being among people of all age groups and one of its 9 targets to be achieved by 2030 is to reduce neonatal and under 5 mortalities to as low as 12 and 25 per 1000 live births respectively [4]. Current neonatal and child death rate of Pakistan is illustrative of almost failure of our healthcare system towards achievement of SDG 3 within specified timeline [5]. Mortality is perceived as an essential tool in assessing the quality of healthcare system [6]. The validity of statistics related to deaths and associated causes cannot be neglected [7]. As deaths during infancy and neonatal

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period are attributed to pregnancy related disorders or genetic diseases, so such deaths are considered inescapable [8]. Although mortality review at departmental level in healthcare facilities provide useful information pertinent to a specific speciality; however, institutional mortality analysis provides a holistic picture of the scenario that can best be brought to the attention of strategic planners for curtailment [9]. The present study was therefore intended to determine the mortality reported during 2 months period i.e; July and September 2022 from all departments of Benazir Bhutto Hospital Rawalpindi. This would enable the stakeholders to pinpoint the commonest causes of deaths among our population in order to chalk out suitable measures for their reduction.

METHODS

A cross-sectional descriptive study was carried out to review the mortality of the patients admitted in Benazir Bhutto Hospital Rawalpindi during July 2022 and September 2022. The data were gathered from the Hospital administration after getting informed consent. The data were collected pertinent to age, gender and primary cause of mortality. Hospital death rate was calculated by putting value in the following formula [10]:

$$\text{Hospital death rate} = \frac{\text{No. of deaths of in patients in a period}}{\text{No. of discharges (including deaths)}} \times 100$$

The data were entered and analysed by using SPSS version 25.0 and Microsoft Excel 2010. Difference in mean age of the expired cases excluding infant and neonates was statistically determined by independent sample t-test. P-value < 0.05 was considered significant.

RESULTS

Of the total 5338 patients admitted at Benazir Bhutto Hospital Rawalpindi during September 2022, about 377 expired while 369 patients died out of 4514 admitted patients during July 2022. Around 58.5% and 64.2% deaths were reported among the patients admitted in Paediatrics department of BBH during July and September 2022 respectively. Trend of mortality during 2 months is depicted below in Figure 1.

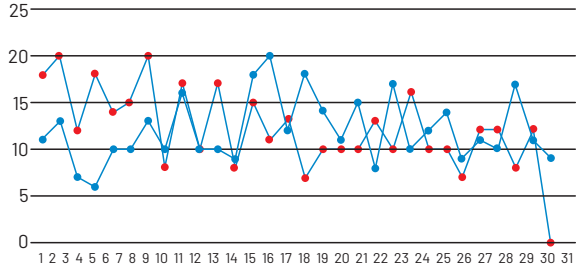

Figure 1: Mortality Trend during July & September 2022 at BBH

Of the 369 expiring patients during July, about 198 (53.6%) and 171 (46.4%) were males and females respectively. Approximately 199 (52.8%) males and 178 (47.2%) females succumbed to various diseases during September 2022. Hospital mortality rate during July and September 2022 were 8.2% and 7.1% respectively. the greatest number of deaths were reported from paediatrics department of BBH as reflected below in Figure 2.

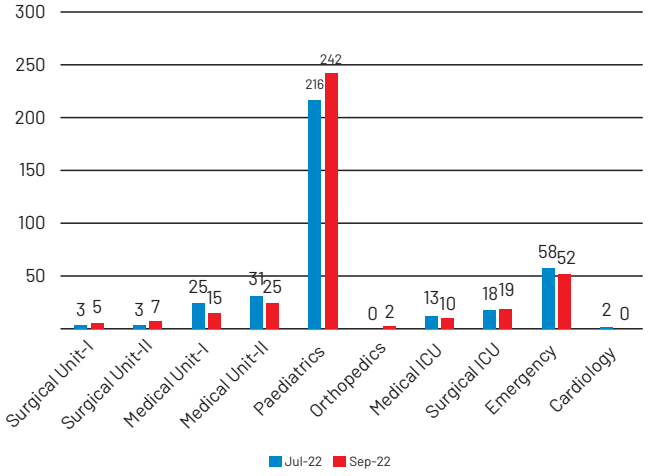

Figure 2: Department-wise mortality at BBH during July & September 2022

Neonatal deaths constituted about 45.6% of the total mortalities registered at BBH during two months period as shown below in Figure 3.

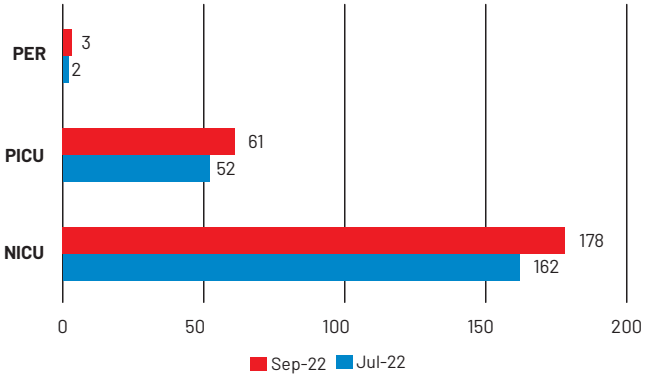

Figure 3: Frequency of deaths from different sections of Paediatric department at BBH

Difference in mean age of the dying people other than those of neonatal and infant deaths had statistically insignificant difference (p= 0.09) as revealed below in Table 1.

Mean age of the expired patients		p-value
July 2022	September 2022	0.09
48.02 ± 23.20	45.31 ± 20.17	

Table 1: Statistical difference in mean age of expired cases at BBH

Infants and neonates constituted about 46.4% of all reported mortalities at BBH as illustrated below in Table 2.

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Age groups	No. of expired patients	
	July 2022	September 2022
Infants & Neonates	169	178
1-10 years	49	49
11-20 years	11	11
21-30 years	17	15
31-40 years	20	20
41-50 years	22	26
51-60 years	33	26
61-70 years	21	24
71-80 years	17	22
81-90 years	08	04
> 90 years	02	02
Total	369	377

Table 2: Frequency of expired patients in different age groups

Primary causes of mortality among reported deaths in our study are illustrated below in Table 3.

Sr. No.	Primary cause of mortality	Frequency	
		July 2022	September 2022
1.	Sepsis / septicemia	116	135
2.	Low Birth Weight (LBW)	35	48
3.	Birth asphyxia	18	13
4.	Pneumonia	18	25
5.	Prematurity	15	13
6.	Hypoxic Ischemia Encephalopathy (HIE-III)	12	07
7.	IUGR	0	02
8.	Carcinoma (Thyroid, pancreas, stomach, rectum)	05	09
9.	Breast carcinoma	0	02
10.	Chronic Kidney Disease (CKD)	12	07
11.	Coronary Heart Disease (CHD)	05	09
12.	CLD / DCLD	13	11
13.	COPD	09	04
14.	DIC	11	15
15.	Nephropathy / uropathy	10	07
16.	Diabetes Mellitus /Diabetic Ketoacidosis	04	07
17.	Respiratory Distress Syndrome (RDS)	12	05
18.	Stroke /cerebral palsy	09	06
19.	Alcoholism	01	02
20.	Road Traffic Accident (RTA) / Trauma	07	06
21.	Upper Gastrointestinal Bleed	14	9
22.	Snake bite	02	0
23.	Leiomyosarcoma	01	0
24.	Anaemia (aplastic / microcytic)	07	04
25.	Rheumatic Heart Disease (RHD)	01	02
26.	Down syndrome	01	0
27.	End Stage Renal Disease (ESRD)	06	0
28.	Acute pulmonary edema / embolism	06	02
29.	Eclampsia / Epileptic fits	04	03
30.	Gangrene (foot / gut)	02	01
31.	Viral Hepatitis (A / C)	01	01
32.	Hypertension	06	10
33.	Pulmonary tuberculosis	03	05
34.	Intracranial bleed	02	04
35.	Tetanus	0	03
36.	Erb's paralysis	01	0

Table 3: Primary causes of Mortality

DISCUSSION

Performance of any healthcare facility is markedly linked to its mortality rate. Competent authorities across the globe use this rate substantially to measure the hospital's performance [11]. Age and gender are substantially important while reviewing in-hospital mortality [12]. Neonatal and infant deaths constituted about 46.4% of in-hospital mortality that has consistently been reported from a public sector tertiary healthcare facility of Rawalpindi. Similarly, a mortality review carried out at BBH during March-April 2022 revealed about 50% of the fatalities among up to 5 years old population [13]. According to UNICEF, approximately 2.4 million neonates died in 2020 with reporting of about one third of such mortalities on first day of their lives and around three fourth of such expiries during first week of life [14]. The incongruity in neonatal deaths have also been determined between developing and developed regions of the globe that needs attention of the policy makers for apt and robust interventions for attainment of Universal Health Coverage (UHC) till 2030 [15, 16]. There has also been a prediction about confrontation with rising neonatal morality in coming days while infant mortality was perceived to have decline due to implementation of adequate relevant measures [17]. A similar study by Dawood Z et al in Pakistani scenario divulged somewhat indifference in trend of interprovincial neonatal mortality that necessitates further studies to dig out the underlying reasons [18]. As children expiring in 1st 28 days of life succumb to various diseases or infections acquired either during intra-natal or postnatal period; this attributes to poor healthcare quality [19]. In short neonatal care should be given due consideration by MNCH care providers for its betterment in our set up. The leading causes of neonatal and infant mortality in our study are sepsis, low birth weight, birth asphyxia, pneumonia and prematurity. Likewise, the key reason for neonatal admission to hospital was sepsis (35.5%) and their expiry was significantly ascribed to respiratory distress syndrome and low birth weight [20]. Likewise, World Health Organization highlighted preterm birth, neonatal infections and birth asphyxia as the prime reasons for neonatal death. In the context of birth defects, that have also been mentioned by WHO as the prime cause for neonatal expiry, it is notable to mention that Hypoxic Ischemic Encephalopathy (HIE) and Intra Uterine Growth

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Restriction (IUGR) have also been detected among our expiring infants and neonates [19]. These details should also be deliberated for lessening the mortality rate. A similar study by Chowdhury et al to determine the causes of neonatal mortality among population of rural Bangladesh disclosed birth asphyxia, prematurity, sepsis, respiratory distress and pneumonia as the frequently reported causes of death. As those deaths were identified among those delivering babies at home, this reflected the dire need of skilled birth attendants in rural areas for maternal and neonatal health and well-being [21]. About 44 deaths in our study have been reported among under 5 years old children primarily due to sepsis and pneumonia. A similar study done by Perin et al on broad based data (2000-2019) revealed approximately 5.3 million deaths among under 5 years old children that were predominantly attributed to prematurity and infections. However, under-5 deaths predominantly due to lower respiratory infections, diarrhea, malaria and measles across the globe have declining trend since 2000 due to vaccination against these ailments [22]. Around 5 million under 5 mortalities have been determined worldwide that reveals the death among about 13,800 less than 5 years old children daily [23]. Likewise, a study based on 9 years data by Gutema et al revealed high under -5 mortality of 85 deaths / 1000 live despite the gradual decline of mortality trend during study [24]. This study also necessitates the implementation of appropriate measures for mitigating this age-specific fatality. Males in current study succumbed to various diseases comparatively more than those of females. About 53.6% and 52.8% of the male patients in present study expired during July and September 2022 respectively. Although unadjusted in-hospital deaths in a study by Fabijanic et al were greater among female patients, the relative risk among women in consideration with different diseases was determined to be relatively less [25]. Contrary to our results, a cohort study revealed statistically insignificant difference in gender-based hospital mortality [26]. In-hospital mortality can sufficiently be lessened by good leadership, operative Health Management Information System (HMIS), community participation and quality assurance [27]. Apart from cultural and ethnic variants of the patients, care provided in hospitals might be associated with mortality that should methodically be studied for identification of the accompanying aspects for their rectification by the concerned authorities.

CONCLUSIONS

Although mortality during September were somewhat less than those reported during July 2022, mounting neonatal and infant mortality is an enigma that seems to be foremost obstacle in attainment of health-related sustainable development goals by 2030. Healthcare indicators of Pakistan can substantially be improved by enhancing the health of under-5 population. However, this alone cannot be achieved without giving due consideration to maternal health. In short, there is dire need to emphasize Maternal & Neonatal Child Health (MNCH) primarily in public sector healthcare facilities for their augmented survival and refraining from their grave health consequences.

Conflicts of Interest

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Original Article

Identification of Nontuberculous *Mycobacterium* Isolates in Suspected Pulmonary Tuberculosis Patients

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ABSTRACT

According to World Health Organization, in the global tuberculosis ranking Pakistan is in 5th position. Mycobacterium tuberculosis bacterium is responsible for this dreadful disease, but there are other nontuberculous mycobacteria species that could also be the possible cause of this disease. Scanty data is available on the incidence and distribution of species responsible for this infection. Local studies on non-tuberculous mycobacterium species would be of great support in targeted therapy. **Methods:** This study was designed to investigate the incidence and distribution of non-tuberculous mycobacteria-associated infection in pulmonary suspected tuberculosis patients. Sputum samples were processed for microscopy and culturing on Lowenstein–Jensen regardless of age and gender suspected TB patients. Positive cultures were then processed for detection of non tuberculous mycobacteria species using commercially available Geno Type *Mycobacterium* CM hybridization strips. **Results:** A total of 1560 sputum samples were tested for *Mycobacteria* by culturing, 215 were positive, 71 contaminated and 1274 were negative. All 215 culture positive isolates were exposed to Geno Type Mycobacterium CM kit revealed, 55 cultures as Non-tuberculous mycobacteria and 160 as *Mycobacterium* complex. Adults between aged 40 to 60 years and male were predominantly (61.81%) infected than females (38.18%). **Conclusions:** Scanty data is available about the contributions of non tuberculous mycobacteria to tuberculosis-like disease, and noteworthy geographical distribution, clinical and molecular epidemiology-related knowledge gaps exist in the areas with a high burden of disease caused by *mycobacterium tuberculosis* complex. Isolation of nontuberculous mycobacteria from clinical specimens should promptly be evaluated for their clinical significance.

INTRODUCTION

Mycobacteria are tremendously diverse with many new discovered and again classified with the advent of new molecular techniques for identification. Besides *Mycobacterium leprae* distinct heritably and phenotypically from other known mycobacterial species due to evolutionary changes and is frequently characterized in a discrete genetic clade [1]. On the basis of microbiological, inheritance, clinical and epidemiological features four major groups of human pathogens in mycobacterial genus can be described. First one is *M. tuberculosis* complex which comprises *M. tuberculosis, M. microti, M. bovis, M. canetti, M. pinnipedii, M. bovis* BCG, and *M. africanum*. Second one is *M. leprae*. Next are slowly growing Non Tuberculous Mycobacteria (NTM) (non-chromogenic, photochromogenic and scotochrmogenic respectively). Last are rapidly growing mycobacteria [2]. Convergence of

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mycobacterial species are centered on results of different biochemical tests, growth features demanding 4-6 weeks for the entire identification procedure. Later another technique was introduced in the 1990s which was more effective because it consumes less time and is more robust known as 16s DNA sequencing [3]. NTM term used to designate species of mycobacteria other than the following basic representatives of *Mycobacterium tuberculosis* such as M. *tuberculosis, M. caprae, M. africanum, M. microti, M. pinnipedii, M. bovis, M. canetti* and *M. leprae*. According to a study, more than 200 species have been documented and up to 95% contain environmental bacteria but only 25 species are highly concerned with diseases and mostly are non-infectious for animals and humans. NTM has multiple species due to evolutionary discrepancy, clinical presentation, mutable biochemical features, clinical applicability, and vulnerability to anti-mycobacterial mediators [4, 5]. Initially these microorganisms were known as Battery bacillus (*M. avium* complex) and Yellow bacillus (*M. Kansasii*) [6]. The recent observed rise in NTM cases is worrisome because of the disease's difficulty in diagnosis and treatment. Nonetheless, there is a lack of data on the geographic ranges of these species inside Pakistan. There are several potential treatments, but which one would work best will depend on a number of circumstances, such as how secluded the species is and how vulnerable it is. In-depth research requires familiarity with the similarities and differences among native species. The purpose of this research is to quantify the incidence of NTM species in patient-submitted clinical laboratory specimens at an academic medical centre in Abbottabad. The findings of this research may inform the development of new preventative measures, diagnostic tests, and therapeutic approaches for the treatment of certain species in the future.

METHODS

A cross-sectional study was designed at BSL II LAB District head quarter Hospital (DHQ), Abbottabad (KPK). Samples were collected at the drug-resistant TB center Ayub teaching hospital and district Headquarters (DHQ) hospital, Abbottabad of Hazara division from September 2019 to April 2020. Pulmonary tuberculosis suspects enrolled in this study visited MDR center ATH and BSL II Lab district headquarter (DHQ) hospital Abbottabad. Patients who tested positive for Mycobacterium tuberculosis and subsequently started treatment were disqualified because of the absence of extrapulmonary TB. Decontaminant and digestant (NALC-NaOH) solutions were mixed in equal volume and then added to each sputum sample in the falcon tubes. Then phosphate buffer was added to falcon tube to make total volume of sample 50 mL and pH was maintained at 6.8. The tubes were recapped and inverted 2-3 times. After that, the samples were centrifuged in a refrigerated centrifuge for about 15 minutes at 3500 Relative Centrifugal Force (RCF). Supernatant was transferred carefully into the splash-proof container, containing the mycobactericidal disinfectant (1 % bleach). A total of 215 culture positive samples were processed for non-tuberculous mycobacteria species detection and rest 71 contaminated and 1274 negative samples were rejected. For the molecular identification, speciation and differentiation of NTM, we had used Geno Type *Mycobacterium* CM and Geno Type *Mycobacterium* CM kit (Hain Life science GmbH, Nehren, Germany). Mycobacteria were grown on Lowenstein-Jensen medium and were used for DNA extraction. We had clean the working bench to avoid any contamination. Geno Lyse® kit for extraction of DNA was used and followed the protocol provided. After the DNA extraction, samples process for amplification. Each of the two Amplification Mixes, A and B, had all of the components needed for amplification (AM-A and AM-B). The defrosted AM-A and AM-B solutions were spun separately before being carefully pipetted together. About 10 µL AM-A, 35 µL AM-B, 5 µL DNA solution with final volume of 50 µL was used. We had determined the number of samples (number of samples to be tested in addition to control samples) and prepared the tubes required. We prepared a master mix that contains AM-A and AM-B and mixed it carefully and thoroughly. All the data collected from the above mentioned assays was calculated by percentage and ratio of variables. SPSS and Endnote were also used for data analysis and references.

RESULTS

The current research was conducted in BSL II LAB District Head quarter (DHQ) hospital, Abbottabad from September 2019 to April 2020. A total of 1560 cultures were run out of which 1274 were negative, 71 contamination and 215 were positive. Out of 215 positive cases, 160 were *Mycobacterium tuberculosis complex*, 55 were NTM species as shown in figure1.

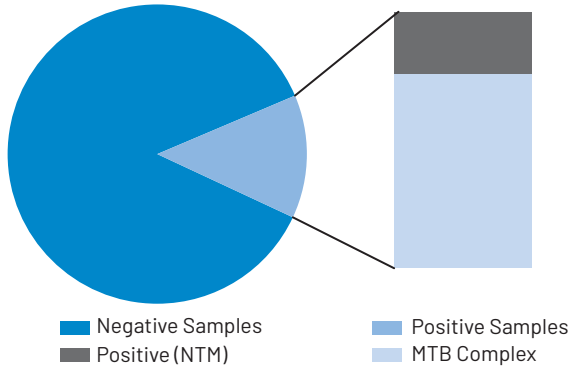

Figure 1: Epidemiology of overall samples in Hazara Division.

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Among the 55 NTM positive species the prevalent specie found were *Mycobacterium avium* 27(49 %), *Mycobacterium abscessus* 13 (23.6%), *Mycobacterium Kansasii* 9 (16.3%), *Mycobacterium intracellulare*6 (10.9%) respectively. Twenty-seven out of the seventeen people tested had good potential for therapy. Table 1 displays the outcomes of cases in which data on NTM isolates was collected from clinical specimens. This was feasible in certain cases when access to patient data was accessible due to the very small number of patients involved.

Species Name	Isolates n (%)
Mycobacterium avium	27(49 %)
Mycobacterium abscessus	13(23.6%)
Mycobacterium kansasii	9(16.3%)
Mycobacterium intracellulare	6(10.9%)
Mycobacterium fortuitum	0(0%)
Mycobacterium marinum	0(0%)

Table 1: Distribution of NTM species differentiated by GenoType Mycobacteria CM/AS assay in pulmonary tuberculosis suspects (55)

The ratio between male to female according to specie were 20 (74.0%) of males and 7 (26.0%) of females diagnosed with *Mycobacterium* avium. While 7 (53.8%) male and 6 (46.2%) of female patients were diagnosed with *Mycobacterium abscessus*. Furthermore 4 (44.5%) male and 5 (55.5%) females were detected for *Mycobacterium Kansasii* along with 3(50%) male and 3(50%) females were positive for *Mycobacterium intracellulare* (Figure 2, 3, and 4).

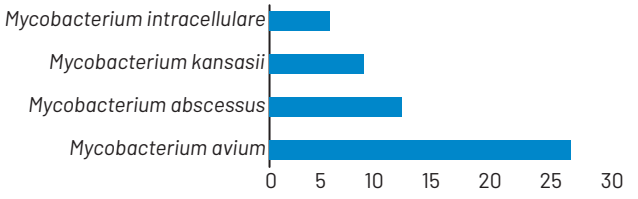

Figure 2: Distribution of NTM species differentiated by GenoType Mycobacteria CM/AS assay in pulmonary tuberculosis suspects (55)

Overall male to female ratio of NTM specie was 34 (61.8%) males while 21 (38.2%) females were diagnosed with NTM out of 55 patients as shown in figure 3. It was also noted that NTM lung disease affects mostly old agers.

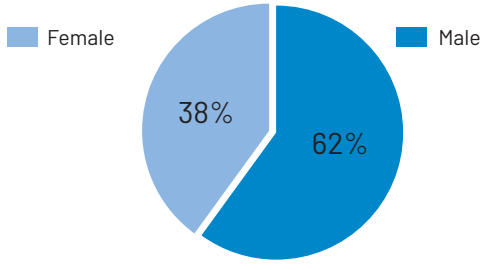

Figure 3: Prevalence of Non-tuberculosis mycobacteria among male and female suspects of pulmonary tuberculosi

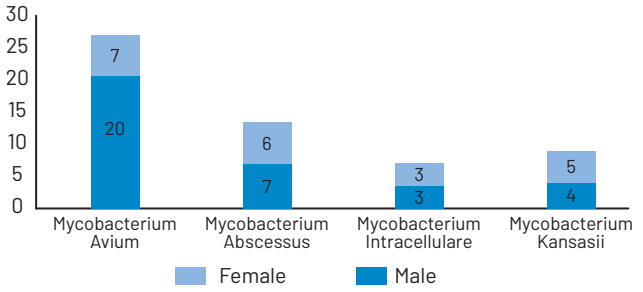

Figure 4: Distribution of different Non-tuberculosis mycobacteria species across gender

DISCUSSION

The predisposing risk factors for NTM infection are advanced age, immuno-suppression (including HIV infection), and pulmonary disease (Chronic obstructive pulmonary disease, bronchiectasis, sequelae of previous TB, cystic fibrosis [7]. The current study also showed the same data that the infected patients were lying between ages 40 to 60 years mostly because they were immuno-compromised and easily got infected by NTM infection so we agree with the previous study conducted by [8]. NTM infections related to healthcare are well described in the published literature [9-11]. We were capable of evaluating three extra-pulmonary NTM infections associated to healthcare. Washing with tap water carrying NTM can easily contaminate the clinical instruments and/or without use of mycobactericidal disinfectants. Similarly, if proper sterile fluids are not used in the irrigation of surgical wounds or during surgical practices, wounds can be contaminated with NTM, as a result wounds does not heal properly. NTM has been linked not only to the spread of infections in healthcare settings but also to the contamination of samples at the time of collection (such as the introduction of NTM into sputum during washing with tape water)[12]. In laboratories reporting a high incidence of NTM, reagent contamination may have occurred during specimen processing [13]. Identification of NTM is global challenge which required rapid and sensitive testing protocol.. The diagnosis and treatment of disorders caused by MTB and NTM are significantly hindered by the fact that the clinical signs of the two infections are frequently quite similar [14]. About 40% of NTM isolates were linked to the Effective therapy requires knowledge of the kind of NTM, the location of infection, and the medications' efficacy Mycobacterium avium complex, as reported in the aforementioned Taiwanese investigation [15, 16]. According to the survey, males made up more than half of India's NTM. chelonae, with the M subtype accounting for 41% of all NTM isolates. Comparison to other animals, we're really lucky, M. was fortunate, according to researchers from 14 different nations [17]. MAC was the most abundant

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species in Brazil and Europe, whereas fortuitum was the most common in Iran and Turkey. In Belgium, xenopi virus isolations were highest, followed by *M. gordonae*. Following M. The writing is on the wall, literally. M. are C. are *C. gordonae* and C. m. When investigating rates of isolation, researchers from the Czech Republic found that the kansasii species was the most often seen. These findings imply shifts in the global distribution of NTM species. The ratio between male to female according to specie were 20 (74.0%) of males and 7 (26.0%) of females diagnosed with *Mycobacterium* avium. While 7(53.8%) male and 6(46.2%) of female patients were diagnosed with *Mycobacterium abscessus*. Furthermore 4 (44.5%) male and 5 (55.5%) females were detected for *Mycobacterium kansasii* along with 3 (50%) male and 3 (50%) females were positive for *Mycobacterium intracellulare*. We compared our findings across sex, age, and species with data from other places and found that 34 men and 21 females were NTM-positive overall. Infections with NTM have been demonstrated to vary in prevalence from species to species. Additionally, *M. kansasii* is frequently isolated in a number of nations or areas. Surprisingly, compared to the reported rates in Japan (3.9%) [17]. and the USA (7.7%), the isolation rate of this pathogen from NTM pulmonary illnesses in Norther Tunisia was very high, reaching 23.3% of all NTM isolations [18]. With Central Europe being one of the hotspots, *M. kansasii* related pulmonary illness tends to concentrate in particular geographic areas [19, 20]. Nevertheless, because *M. kansasii* was specifically extracted from municipal tap water.

CONCLUSIONS

Currently available information suggests that once novel molecular diagnostic procedures are developed, widespread access to diverse NTM species will be possible. Four NTM species, which we will refer to collectively as "M," were detected as a consequence of our research. The letter "M" is the appropriate symbol for species kansasii and intracellulare. Due to the broad range of ages and sexes across which clinical disease symptoms were recorded, it is possible that many pathogenic and potentially pathogenic NTM species can be found in the isolated species.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Relationship of Oral Health Literacy with Decision-making in Dental Treatment Planning among Urban Population of Lahore

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ABSTRACT

In clinical settings, dentists frequently come across patients with variable oral health literacy, and they are not always able to tell which patients might comprehend with health-related explanations and instructions. **Objective:** To calculate oral health literacy level of patients reporting for dental treatment and correlation of the aforementioned with patients' decision-making capacity regarding dental treatment. **Methods**: A quantitative cross-sectional study was conducted with a pilot study on 60 patients in University Dental Hospital, University of Lahore through non-probability purposive sampling technique. Sample of 200 patients was collected over a period of five months (June 2022-October 2022). Data were analyzed using SPSS version 25. Study was divided into two phases; in Phase I, REALD-30 scale was used. Phase-II involved individuals scoring 11-30 points on REALD-30 scale and who had to complete a self-administered 5-point Likert scale questionnaire with eleven closed-ended items in order to determine their level of decision-making. **Results**: Study revealed that there was significant association between Oral Health Literacy Level with getting prior information concerning dental issue (p=0.032), ability to appraise the decided treatment plan (p=0.033) and opinion regarding follow up visits (p=0.026). **Conclusions**: The results of the current study revealed a tenuous link between education, employment position, oral health literacy, and decision-making regarding dental treatment strategy. Effective patient-dentist communication generates strong link between the two leading to compliance of patients with treatment plan suggested by experts.

INTRODUCTION

Health literacy is a common function of social and individual factor that is associated with an individual's potential to gain, learn and follow the medical instructions and decide treatment plan appropriately to manage their disease or maintain their health [1]. Health Literacy is a health promotion strategy that is one of the five key tracks identified at the 7th Global Conference on Health Promotion of the World Health Organization [2]. The American Dental Association (ADA) describes oral health literacy as the extent to which the individuals have the capability to obtain, process and cognize basic health information and services needed to make suitable oral health choices [3]. Theoretically, three categories of literacy are present: 1) Functional literacy, which reflects the reading and writing talents of the patients, such as understanding a prescription or having control over the information on health risks services; 2) Communicative/ interactive literacy that values the most innovative cognitive skills along with social skills and addresses the aptitude to excerpt the information from media and apply new information to personal conditions, thus promoting change in specific circumstances; 3) Critical literacy, which is the capacity to critically analyze info and use it to workout greater control over life events [1, 4]. Individuals with low health literacy level are less likely to comprehend and follow treatment recommendations and lack the expertise

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needed to make knowledgeable decisions about their personal health care [5, 6]. Other researchers propose that those with low literacy levels are incompetent to communicate well with health care providers and this gap in communication may be reason for worse oral health status [7, 8]. A society's oral health literacy level affects the general load of oral health ailments and adds to the existence of oral health disparities [9]. Dentists often come across the patients with limited oral health literacy skills in clinical setup and they are not always able to recognize those that may readily understand health related explanations and guidelines resulting in deprived oral health outcomes [10]. Thus, the aim of this study is to calculate oral health literacy level of patients reporting for dental treatment in private dental setup and to correlate the level of oral health literacy with patients' decision-making capacity regarding dental treatment.

METHODS

A quantitative cross-sectional study was conducted over a period of 5 months (June 2022- October 2022) in University Dental Hospital, University of Lahore through non-probability purposive sampling technique. Following approval of institutional Ethical Review Board, a pilot study on 60 patients fulfilling the inclusion criteria was conducted. After determining the reliability of research questionnaire, a further sample of 140 patients was collected. Data were analyzed using SPSS version 25. The subjects needed to fit the following requirements in order to be qualified for this study: a) Indoor patients of age above 20 years; b) receptive to participation; c) without any clear evidence of cognitive impairment; d) without any issues with vision or hearing; e) and scoring 11-30 points on Rapid Estimate of Adult Literacy in Dentistry (REALD-30) scale. Exclusion criteria was outdoor patients below 20 years of age and those scoring 0-10 points on the scale of REALD-30. The study was divided into following two phases: Phase I: This phase involved evaluation of ability of study subjects to recognize and pronounce words contained within REALD-30 scale. Rapid Estimate of Adult Literacy in Dentistry (REALD-30) scale was used as a tool to assess the health literacy of dental patients, consisting of 30 items. It was established by Lee et al., with a Cronbach's alpha reliability of 0.87. This word recognition test consists of 30 dental-related words that are ordered in ascending order of difficulty based on average word length, number of syllables, and challenging sound combinations. It does not measure conception and comprehension of the items used. Each word must be read out by the study participant, and one point is awarded for each word that is pronounced properly. The cumulative score ranges from 0 (lowest literacy) to 30 (highest literacy) (Table 1) [11]. A trained interviewer distributed laminated copies of REALD-30 to each participant and instructed them to read each word out loud. Participants were told to state "Blank" and go on to the next word if they were unable to read any word.

1. Sugar	11. Abscess	21. Periodontal
2. Smoking	12. Extraction	22. Sealant
3. Floss	13. Denture	23. Hypoplasia
4. Brush	14. Enamel	24. Halitosis
5. Pulp	15. Dentition	25. Analgesia
6. Fluoride	16. Plaque	26. Cellulitis
7. Braces	17. Gingiva	27. Fistula
8. Genetics	18. Malocclusion	28. Temporomandibular
9. Restoration	19. Incipient	29. Hyperemia
10. Bruxism	20. Caries	30. Apicoectomy

Table 1: Rapid Estimation of Adult Literacy in Dentistry (REALD) 30-word items

Phase II: Phase-II included study participants scoring 11-30 points on REALD-30 scale. A self-administered questionnaire was distributed among those who qualified on REALD-30 evaluation. Questionnaire consisted of two parts; first part included socio-demographic information of the participants; second part contained eleven closed ended items designed to estimate level of decision-making capacity of respondents. The study items were scored using 5-point Likert scale ranging from 0-5 in ascending order of options. Reliability parameters were set as needed value for Cronbach's alpha =0.70 while the expected value for Cronbach alpha =0.80. Reliability analysis of study questionnaire revealed Cronbach's alpha value of 0.7 which fulfilled the aforementioned parameter (Table 2).

RESULTS

Over the period of 5 months (June 2022 to October 2022), data were collected for 2 months (July 2022 to August 2022) with an OPD of 5420 patients, out of which 2180 participants were carefully chosen for data collection. N=200(9.17%) study entrants fall under the inclusion criteria of the study with ages ranged between 20 and 79 years. With n=111(55.5%) female participants, bulk of the participants were college or university students who were unemployed (Figure 1).

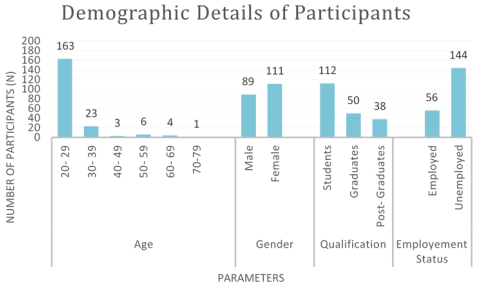

Figure 1: Demographic details of respondents (n=200)

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All of the study subjects (n=200) were eligible enough to recognize and read the REALD-30 words. According to dental treatment seekers, it was concluded that most of the participants (n=84,42%) strongly agreed that dental health information must be provided in their native language. Majority of the respondents (n=94,47%) admitted on the usage of information given by the dentist somewhat better pertaining to their dental problems. Respondents opted almost always in response to questions regarding instructions after dental management (n=86,43%), following advices regarding oral hygiene (n=77,38.5%) and the significance of prior information concerning dental issues (n=69,34.5%). Half of the entrants (n=100,50%) approved on their participation in decision making process that is crucial for their dental treatment outcome. Few study participants (n=58,29%) had an understanding to a greater extent of the significance of investigations advised by the dentist. Exceeding number of respondents (n=103,51.5%) were likely in a favor of preferring their prioritized dental treatment plan. More than half of the study entrants agreed that they will opt second expert opinion to help in their decision making regarding the dental treatment. Few of the respondents approved that they sometimes (n=69,34.5%) are able to appraise the decided treatment plan while several (n=63,31.5%) lean towards often doing that. A greater number of participants (n=93,46.5%) considered follow up visits with the dentist to be very important (Table 2).

Questions	Responses n (%)				
Do you agree that dental health information must be given in a language you understand?	Strongly Disagree 30(15%)	Disagree 1(0.5%)	Undecided 2(1%)	Agree 83 (41.5 %)	Strongly Agree 84 (42%)
How much do you agree that your participation in decision making process is crucial for your dental treatment outcome?	11(5.5%)	5(2.5%)	33(16.5%)	100 (50%)	51 (25.5%)
Do you agree that second expert opinion about your dental health will help you in decision making regarding your treatment?	5(2.5%)	18(9%)	13(6.5%)	111 (55.5 %)	53 (26.5%)
Are you able to use information given by the dentist pertaining to your dental problem?	Much worse 3(1.5%)	Somewhat worse 7(3.5%)	About the same 19(9.5%)	Some what better 94 (47%)	Much Better 77(38.5%)
Are you able to follow instructions following dental treatment?	Never 5(2.5%)	Seldom 5(2.5%)	Sometimes 46(23%)	Often 58 (29%)	Almost Always 86(43%)
Are you able to follow advice regarding dental health given by the dentist to maintain dental condition?	7(3.5%)	8(4%)	61(30.5%)	47 (23.5%)	77 (38.5%)
Do you think that getting prior information regarding your dental issue will exert any significant impact on your treatment?	8(4%)	18(9%)	44(22%)	61 (30.5%)	69 (34.5%)
Are you able to appraise the decided treatment plan?	0(0%)	16(8%)	69(34.5%)	63 (31.5%)	52(26%)
Are you able to understand the significance of investigations advised by the dentist according to your dental plan?	Not at all 5(2.5%)	Very little 33(16.5%)	Somewhat 47(23.5%)	Often 57 (28.5%)	To a greater extent 58(29%)
Do you think that your treatment preferences must be prioritized in your dental treatment plan?	Extremely Unlikely 0(0%)	Unlikely 7(3.5%)	Neutral 49(24.5%)	Likely 103 (51.5%)	Extremely Likely 41(20.5%)
How important do you consider follow up visits with your dentists?	Not Important 1(0.5%)	Slightly Important 12(6%)	Moderately important 23(11.5%)	Important 71 (35.5 %)	Very important 93(46.5 %)

Table 2: Frequency & Percentage distribution of participant's responses for study items

Table 3 shows discriminant validity and association of study items with REALD-30 in regards to decision making capacity of the individuals. Remarkable statistical association (p=0.032), (p=0.033) and (p=0.026) was seen between REALD-30 score with items number 5, 10 and 11 respectively. It was observed that majority of the participants (n=25,39.06%) with low literacy level (REALD-30 score 11-20) almost always believe that getting prior information exerts significant impact on their treatment, contrary to most participants (n=51,37.50%) with high literacy level (REALD-30 score 21-30) often believing in this concept. In regards to appraisal concerning decided treatment plan, most study entrants (n=29,45.31%) scoring 11-20 on REALD-30 sometimes consider this concept while those (n=50,36.76%) scoring 21-30 often regards the decided treatment plan. Concerning the follow up visits to their dentists, most participants (n=33,51.56% and n=60,44.12%) of both categories (REALD-30 score 11-20 and 21-30) consider it very important.

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Research items	Options	REALD-30 score		p-value
		11-20	21-30	
		n (%) (Total =64)	n (%) (Total= 136)	
Dental health information in understandable language	Strongly disagree	4(6.25%)	26(19.12%)	0.109
	Disagree	0(0.00%)	1(0.74%)	
	Undecided	0(0.00%)	2(1.47%)	
	Agree	31(48.44%)	52(38.24%)	
	Strongly agree	29(45.31%)	55(40.44%)	
Ability to use information given by dentist pertaining to dental problem	Much worse	2(3.13%)	1(0.74%)	0.649
	Somewhat worse	2(3.13%)	5(3.68%)	
	About the same	7(10.94%)	12(8.82%)	
	Somewhat better	27(42.19%)	67(49.26%)	
	Much better	26(40.63%)	51(37.50%)	
Ability to follow instructions following dental treatment	Never	2(3.13%)	3(2.21%)	0.856
	Seldom	1(1.56%)	4(2.94%)	
	Sometimes	15(23.44%)	31(22.79%)	
	Often	16(25.00%)	42(30.88%)	
	Almost always	30(46.88%)	56(41.18%)	
Ability to follow advice regarding dental health given by dentist to maintain dental condition	Never	3(4.69%)	4(2.94%)	0.970
	Seldom	3(4.69%)	5(3.68%)	
	Sometimes	19(29.69%)	42(30.88%)	
	Often	15(23.44%)	32(23.53%)	
	Almost always	24(37.50%)	53(38.97%)	
Impact of prior information regarding dental issue on treatment	Never	4(6.25%)	4(2.94%)	0.032*
	Seldom	7(10.94%)	11(8.09%)	
	Sometimes	18(28.13%)	26(19.12%)	
	Often	10(15.63%)	51(37.50%)	
	Almost always	25(39.06%)	44(32.35%)	
Agreement on participation in decision making process considering it crucial for dental treatment outcome	Strongly disagree	3(4.69%)	8(5.88%)	0.489
	Disagree	1(1.56%)	4(2.94%)	
	Undecided	9(14.06%)	24(17.65%)	
	Agree	38(59.38%)	62(45.59%)	
	Strongly agree	13(20.31%)	38(27.94%)	
Understanding significance of investigations advised by dentist according to treatment plan	Not at all	1(1.56%)	4(2.94%)	0.343
	Very little	15(23.44%)	18(13.24%)	
	Somewhat	13(20.31%)	34(25.00%)	
	Often	15(23.44%)	42(30.88%)	
	To a greater extent	20(31.25%)	38(27.94%)	
Opinion regarding prioritization of patient's treatment preferences in dental treatment plan	Extremely unlikely	0(0.00%)	0(0.00%)	0.406
	Unlikely	2(3.13%)	5(3.68%)	
	Neutral	11(17.19%)	38(27.94%)	
	Likely	37(57.81%)	66(48.53%)	
	Extremely likely	14(21.88%)	27(19.85%)	
Agreement about impact of second expert opinion about dental health on decision making regarding treatment	Strongly agree	2(3.13%)	3(2.21%)	0.117
	Disagree	3(4.69%)	15(11.03%)	
	Undecided	3(4.69%)	10(7.35%)	
	Agree	32(50.00%)	79(58.09%)	
	Strongly agree	24(37.50%)	29(21.32%)	
Ability to appraise the decided treatment plan	Never	0(0.00%)	0(0.00%)	0.033*
	Seldom	3(4.69%)	13(9.56%)	
	Sometimes	29(45.31%)	40(29.41%)	
	Often	13(20.31%)	50(36.76%)	
	Almost always	19(29.69%)	33(24.26%)	
Opinion regarding importance of follow up visits with dentist	Slightly important	4(6.25%)	8(5.88%)	0.026*
	Moderately important	1(1.56%)	22(16.18%)	
	Important	25(39.06%)	46(33.82%)	
	Very important	33(51.56%)	60(44.12%)	

*Significance at P≤0.05 level.

Table 3: Statistical association of research items with REALD-30

DISCUSSION

Oral health education is introduced as the process of providing oral health information to the extent that this doctrine can be applied regularly. The importance of health literacy in conveying health imbalance has been achieving increased recognition and refining dental health. There are some studies which have inspected the role of literacy on dental treatment outcomes but only a few have discussed about the treatment planning procedure [12]. This research involves the projection of oral health literacy and the part it plays in deciding treatment plans for dental treatment. The first step of strategizing calculation of Oral Health Literacy involved the recognition and pronunciation of words included in REALD-30 [11]. Despite of different variables, all of the study respondents were literate enough to deliver the words correctly. The following phase was based on determination of how various factors relate to the participants' capacity to make decisions about their dental care. Most of the study entrants (n=84,42%) strongly agreed that their dental health information must be provided in their own language or in a language that they might understand as they will be able to comprehend the given information somewhat better (n=94,47%) to make appropriate decision regarding treatment plan. Similar findings were observed in a study conducted by Levin in 2006 showing 69%(n=36) of the patients were disgruntled with communication between themselves and their doctors due to language barrier [13]. Few numbers of participants almost always follow instructions regarding dental treatment (n=86,43%) and advices to maintain dental health (n=77,38.5%). On contrary, 56.8%(n=154) patients agreed on following home care instructions by dentist in a study conducted by Lahti *et al.*, as they had a good communication with their dental practitioner [14]. Participants almost always (n=69,34.5%) prioritize getting information before initiating treatment and mostly (n=100,50%) agreed that their participation in decision making process is crucially important. This coincides with a study conducted by Reissmann *et. al.*, where patients rated their preferred role in decision making more active and involved that turned out to be statistically significant (P<0.05) for 11 out of 14 treatment decisions [15]. In a study led by Bin Mubayrik *et al.*, revealed that most of the participants showed willingness towards chair side dental screening (p=0.005) and agreed on investigations should

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be executed in the dental setup (p=0.011)[16]. The results of aforementioned are similar to this study where a considerable number of study entrants (n=58,29%) understood that the investigations advised by the dentist are significant to a greater extent as these strategies can assist in early diagnosis and prevention of diseases. The majority of participants (n=103,51%) agreed that patients' preferred treatment modalities should be given top priority in their dental treatment plan because this will promote effective patient-clinician communication and enable patients to comprehend the medical information and treatment recommendations that are given to them by their dentist [17]. Second expert opinion is important for accurate determination of the problem and for planning the right concept of treatment. More than half of the partakers (n=111,55.5%) agreed that second expert opinion is helpful for planning of the best treatment options. This is parallel to a study conducted by Lehnhardt *et al.*, where second opinion led to correct primary diagnosis in most patients (n=440,73.1%) [18]. Majority of the study entrants (n=69,34.5%) agreed that they sometimes critically appraise the decided treatment plan which is similar to study led by Tabassum *et al.*, where 45% of patients were strongly skeptical about their proposed dental treatment plan showing that complete knowledge, good communication and understanding can lead to enhanced patients trust for their clinician [19]. Mainstream of participants (n=93,46.5%) considered the follow up visits very important as a part of their treatment. This was parallel to a study by Brody *et al.*, where active patients (n=55,47%) reported less discomfort, greater improvement of symptoms and more improvement in their general medical condition [20].

CONCLUSIONS

The present study concluded that there is no significant association of age and gender with oral health literacy and decision making for dental treatment plans with a slight impact of education and employment status. Patient-dentist communication improves the rate of success in devised treatments. Communication is very important in health care, as a strong link has been observed between good communication and adherence to the treatments and suggestions recommended by the expert. Oral Health Literacy is an important aspect of community Oral Health Practices. Discernment of exclusive dental terminologies must be made through community based dental programs. Conducive patient-dentist will aid in good collaboration between the two and improved compliance to dental treatment plans and their outcome. Furthermore, inclusion of more dental psychometric tools is required to observe Oral-health behavior of patients and their appropriate modification.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Nurses' Performance Regarding Care of Patients Undergone Liver Transplantation: A Comparative Cross-Sectional Study

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ABSTRACT

Viral hepatitis is the seventh largest cause of mortality, with the hepatitis C virus accounting for over half of all viral hepatitis deaths. The nurse plays a vital role in any team of health care professionals concerned within the care of patients. To determine the nurses' performance regarding care of patients undergone liver transplant. **Methods:** A comparative cross-sectional study was conducted at Liver transplant surgery unit, Pakistan Kidney and Liver institute and research center and Bahria International hospital Lahore. Total 86 nurses were enrolled. Data were collected on a predesigned nurse's performance questionnaire regarding post liver transplant care and socio demographic characteristics for nurses including age, gender, qualification, duty shift and work experience were noted. Statistical analysis was performed by using the Statistical Package for Social Sciences (SPSS) version 24.0. The frequencies, percentages were calculated for qualitative variables and Mean ± SD were calculated for quantitative variables. **Results:** The mean age of nurses in group A as 29.32±5.62 and in group B as 29.35±5.45. Out of 43 participants 9(20.9%) were males whereas 34(79.1%) were females in group A and in group B there were 14(32.6%) were males and 29(67.4%) were females. The mean ranks in group A was 22.66 and in group B it was observed as 21.31. Insignificant difference has been observed in both groups (p-value 0.720). **Conclusion:** In this study, it was concluded that the performance of nurses in terms of patient care is insufficient after liver transplantation.

INTRODUCTION

End-stage liver disease (ESLD) is a serious health condition, and the number of people who have it keeps growing all the time [1]. Viral hepatitis is the seventh largest cause of mortality globally, with the hepatitis C virus accounting for over half of all viral hepatitis deaths [2]. Hepatitis C specifically affects the liver causing chronic hepatitis and hepatocellular carcinoma (HCC), resulting in high morbidity and mortality globally. According to an estimation, almost 200 million people are thought to be infected with HCV around the globe [3]. Patients who have acute or chronic end-stage liver impairment can benefit from liver transplantation. Although it is not seen as a permanent solution, it can offer relief from a liver malfunction concern that is now present [4]. However, it results in a chronic condition and need for ongoing, specialized treatment to protect the transplanted organ [5]. Human liver transplantation is a curative treatment for end-stage liver disease. The enormous advancements in the field of liver transplantation have brought hope to many who are in desperate need of help. The ability to predict the survival is a crucial aspect in determining whether or not a liver transplant will be successful [6]. The surgical outcomes in LT are influenced by a number of factors, including the severity of the disease, the availability of donor organs, the use of immunosuppressive drugs, and the capacity to predict survival. In LT, the postoperative

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surgical outcomes are influenced by a variety of factors such as the severity of the disease, the availability of donor organs, the use of immunosuppressive drugs, and the prediction of survival. Early postoperative monitoring and maintenance of cardiorespiratory function, frequent assessment of allograft performance, rapid diagnosis of unanticipated problems, and prompt treatment of extrahepatic organ system dysfunction are all required for patients with LT [7]. The nurse plays a vital role in any team of health care professionals concerned within the care of patients [8]. The main role of professional nurse is the assessment, implementation, continuous monitoring and evaluation of postoperative progress patients after liver transplantation [9, 10]. Nurse education comprises of both practical and theoretical training delivered to nurses in order to prepare them for their roles as medical care providers [11]. Nursing employees should participate in a lot of training because the needs of patients change and there are new improvements in process [12]. Nurses' education never ends because they are needed to consistently learn new skills and concepts throughout their careers [13]. After the surgery, the patient will stay in the ICU for a few days before being transferred to the transplantation ward, where they will stay for approximately two weeks. Up to their hospital discharge, specialized nurses give patients and their loved ones the proper care and instruction. Direct patient education and the dissemination of knowledge on medications, food, exercise programme preventions, self-assessment, family planning, and medical follow-up are also considered forms of education. So the basic purpose of this study is to determine the nurses' performance regarding care of patients undergone liver transplant.

METHODS

After taking informed consent from the nurses, a comparative cross-sectional study was conducted at Liver transplant surgery unit, Pakistan Kidney and Liver institute and research center and Bahria International hospital Lahore. Total 86 nurses were enrolled. All diploma general and BSN nurses (both gender) aged 20 to 50 years, who were working in the liver transplant surgery department, having at least 1 year experience were enrolled in current study. Data was collected on a predesigned nurses performance questionnaire regarding post liver transplant care and socio demographic characteristics for nurses including age, gender, qualification, duty shift and work experience were noted. Performance questionnaire was a concern to assess nurses' practices regarding the post liver transplant care. The questionnaire has 20 questions. The statements are provided with yes (performed) and no (not performed) options. Each yes answer got a score one, while each no answer got score zero. The nurses who achieved score > 60% on nurses' performance questionnaire was considered as satisfactory whereas score <60% was considered as unsatisfactory nurses' performance. Statistical analysis was performed by using the Statistical Package for Social Sciences (SPSS) version 24.0. The frequencies, percentages were calculated for qualitative variables and Mean + SD were calculated for quantitative variables. Normality was assessed through Kolmogrov-Smirnov test. Comparison regarding performance of nurses was made through Mann Whitney U test. p-value < 0.05 considered statistically significant.

RESULTS

Table 1 depicts the mean age of nurses in group A as 29.32+5.62 and in group B as 29.35+5.45. Out of 43 participants 9(20.9%) were males whereas 34(79.1%) were females in group A and in group B there were 14(32.6%) were males and 29(67.4%) were females. In group A, there were 21(48.8%) participants were diploma holder, 5(11.6%) had diploma plus specialization and 17(39.5%) were BSN and above whereas in group B; 28(65.1%) participants were diploma holder, 6(14.0%) had diploma plus specialization and 9(20.9%) were BSN and above. Majority of the participants were working in morning shifts 27(62.8%) and remaining 16(37.2%) were working in evening shifts, and, in group B 27(62.8%) had morning shift and remaining 16(37.2%) were working in evening shifts. With regard to work experience, 28(65.1%) had experience of upto 5 years, 13(30.2%) had work experience of 6 to 10 years and remaining 2(4.7%) had experience of more than 10 years while in group B, 35(81.4%) had experience of upto 5 years, 7(16.3%) had work experience of 6 to 10 years and remaining 1(2.3%) had experience of more than 10 years

Variables	PKLI n (%) or mean + sd	Bahria Hospital n (%) or mean + sd
Age	29.32+5.62	29.35+5.45
Variables		
Male	9 (20.9%)	14 (32.6%)
Female	34 (79.1%)	29 (67.4%)
Education		
Diploma Holder	21 (48.8%)	28 (65.1%)
Diploma plus Specialization	5 (11.6%)	6 (14.0%)
BSN and above	17 (39.5%)	9 (20.9%)
Duty Shift		
Morning	27 (62.8%)	27 (62.8%)
Evening	16 (37.2%)	16 (37.2%)
Experience		
1 to 5 years	28 (65.1%)	35 (81.4%)
6 to 10 years	13 (30.2%)	7 (16.3%)
more than 10 years	2 (4.7%)	1 (2.3%)

Table 1: Demographic characteristics of nurses

Table 2 illustrates the performance scores in both groups. The mean ranks in group A was 22.66 and in group B it was

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observed as 21.31. Insignificant difference has been observed in both groups(p-value 0.720).

Performance Scores	PKLI (mean ranks)	Bahria Hospital (mean ranks)	U	p-value
	22.66	21.31	216.50	29.35+5.45

Table 2: Comparison of performance scores between PKLI and Bahria hospital

DISCUSSION

According to the results mean age was 29.00±5.34 years in group A and 29.67±5.70 years in group B. In group A, there were 16 (37.2%) males and 27 (62.8%) were females, whereas in group B there were 7 (16.3%) nurses who were male and 36 (83.7%) were females. Most nurses were diploma holders [A=(67.4%) Vs. B=(46.5%)] and have up to 5 years of experience [A= (72.1%) Vs. B= (74.4)]. These findings were compared with a cross sectional study conducting on intensive care unit nurses reported that The average age of the nurses was 45 years old, and 59.1% of them received further training in critical care nursing. The majority of the nurses (51.3%) obtained a diploma and had a mean of 12.56 years of work experience [14]. However, it has been considered that nursing is a feminine profession. The current study also reported that the female's nurses were majority in number among both groups. These findings were in consistent with the study which reported that the majority of nurses were females who work in ICUs [15]. It was also reported in another study that about 90% of nurses around the world were female [16]. In context to this the current study showed that the regarding performance of patient care after liver transplantation nurses have unsatisfactory practices. These findings can relate to a study conducted on nurses to find out the effect of educational program to improve knowledge after renal transplantation. However, this showed that the before the training session nurses have poor practices but after teaching session it has satisfactory positive effect on their prior knowledge of post-operative care. This finding is quite comparable to the London study's findings, which were intended to improve understanding and knowledge of the long-term care of patients receiving kidney transplantation [17]. Moreover, a qusai experimental investigation using an observational study and a nurse knowledge questionnaire was used. The results of this study showed a statistically significant association between total nurses' knowledge and abilities about the evaluation of liver graft function and post-transplant intensive care which demonstrated a positive relationship among knowledge and skills. Additionally, it was demonstrated that after intervention the nurses' understanding and the assessment of liver transplant function in the ICU reaches a satisfactory level [18]. The findings also support the findings that standards and objectives must be established by each medical organization and profession in order to direct teams and practitioners in providing safe and effective care. Not only must there be standards, but leaders and supervisors must also ensure that their staff members are aware of them and understand them. Employees must also be aware that their performance will be evaluated based on their ability to achieve the established criteria for providing high-quality care [19]. At the pre-educational guideline implementation phase, more than half of the investigated nurses had an unacceptable score for their practise regarding total infection control precautions. This may be because there were issues with work overload and a lack of training opportunities for nursing staff during the postoperative period, despite the satisfactory score improved after the implementation and follow-up phases of educational guidelines. This outcome is consistent with De Oliveira Serra's (2015) findings that nursing care is not adequately provided, there are insufficient resources, and nurses find it challenging to use nursing care systematization postoperatively [20].

CONCLUSIONS

In this study, it was concluded that the performance of nurses in terms of patient care is insufficient after liver transplantation. Therefore, educational programme focusing on the importance of patient care should be provided so that the aspect of treatments and social life of patients get improved.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

The Frequency of Carotid Artery Stenosis in Patients with Ischemic Stroke by Using Color Doppler Ultrasound of Carotid Arteries

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ABSTRACT

Stroke is among leading life threatening neurological emergency and single most important reason for disability. **Objective:** To determine the frequency of carotid artery stenosis in patients with ischemic stroke by using color Doppler ultrasound of carotid arteries. **Method:** This Cross sectional study was carried out at Medical Unit-III, Abbasi Shaheed Hospital, and Karachi for Six months from 1st December 2017 to 31st May 2018. 170 diagnosed patients of ischemic stroke fulfilling the inclusion criteria were enrolled. Brief history and bio data were entered in the Pro forma. Ultrasound carotid Doppler was done for all the patients included in the study. Effect modifiers were controlled through stratification of age, gender, hypertension, diabetes mellitus, dyslipidemia, obesity, smoking status and history of CVA to see their effect on the outcome variable. Post stratification chi square test/fisher exact test was applied while odds were computed by binary logistic regression taking p-value of ≤0.05 as significant. **Results:** Among 170 patients with ischemic stroke visiting Medical Unit-III, Abbasi Shaheed Hospital, Karachi who were included in this study, the mean age of patients was 53.14 ±7.49 years and duration of disease was 2.72±0.89 years. 84 (49.4%) were male and 86 (50.6%) were female. Amongst patients with ischemic stroke, 90 (52.9%) had carotid artery stenosis and 80 (47.1%) did not have carotid artery stenosis. **Conclusion:** Our study showed that notable number of patients with ischemic stroke had carotid artery stenosis; furthermore risk factors like hypertension, dyslipidemia and smoking were firmly associated with carotid artery stenosis.

INTRODUCTION

Stroke occurs due to interruption of blood supply to brain resulting damage to brain cells, clinically characterized by focal neurological deficit in the form of limb weakness or numbness, facial weakness, speech problems, vision difficulties, severe headache, loss of balance and coordination or impaired consciousness. As per Global Burden of Diseases, stroke being second leading cause of death along with being third leading cause of combined death and disability, affects approximate 10 million people and results 5.5 million deaths annually across the globe [1]. South Asia shares 20% share of all stroke related mortalities [2]. We don't have any large epidemiological data regarding prevalence of stroke in Pakistan [3]. Yearly 250/100,000 new cases are reported that's accounts for yearly 350,000 new patients [4]. It is important to identify high risk population in whom timely intervention may prevent stroke and its related disabilities [5]. Factors predisposing risk towards stroke are categorized into modifiable and non-modifiable, also known as controllable and uncontrollable risk factors respectively. Age, gender, family history, ethnicity, race and previous CVA are labeled as non-modifiable risk factors where as diabetes mellitus, ischemic heart disease, hypertension, dyslipidemia, smoking, excessive alcohol intake, physically inactive, carotid artery stenosis, and transient ischemic attack fall into category of modifiable risk factors [6]. Majority of our population lack awareness towards risk factors promoting, for instance a study conducted at Karachi revealed very

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little knowledge regarding their disease among diabetic patients [7]. Atherosclerosis of Carotid arteries causing stenosis is well recognized risk factor for ischemic stroke. Ischemic strokes contribute approximate 85% of total cases of strokes, principally due to obstruction of cerebral blood flow either thrombotic or embolic. Multicenter studies like North American Symptomatic Carotid Endartectomy Trial (NASCET) and European Symptomatic Trial (EST) have demonstrated the etiological significance of carotid vessels obstruction among patients affected by ischemic stroke [8].Factors contributing towards ischemic stroke have linear relationship with level of carotid blockage. Since individuals with symptomatic occlusion of the carotid artery and impaired cerebral circulation have higher risk for ischemic infarcts that is why timely recognition and estimation of the degree of carotid artery stenosis is extremely important for risk-factor management. Patients with higher degree of stenosis are more prone to develop ischemic stroke. Majority of stroke survivors are left with permanent physical and psychological disabilities. At 3-5 years, about 20-40% of stroke victims become functionally dependent on their caregivers for most of their daily activites. The two year risk for stroke is 37.4% among patients with carotid stenosis of 75% which increases to 96.3% if 95% carotid vessels are blocked. Duplex ultrasound in comparison with arteriography is an inexpensive, non-invasive and readily available test that can provide information about plaque morphology, estimate blood flow and degree of stenosis [9]. Carotid Doppler ultrasonography is most widely available noninvasive method, it can also circumvent the expense and risks associated with computed tomographic angiography, and magnetic resonance angiography [10]. The carotid duplex ultrasonography has sensitivity and specificity up to 90% to 95% [11]. The aim of this study was to determine the frequency of carotid artery stenosis among the patients with ischemic stroke by ultrasound carotid Doppler. Several local studies done in different institute's shows variable frequencies. As the data is variable, this study would help to establish the local perspective and ascertain prevalence. In light of this study affective screening program can be developed to screen patients at initial stages as well as to develop an effective management plan for stoke and prevent its adverse outcome.

METHODS

After taking ethical approval from the medical superintendent of institute (letter no. MS/ASH/PS169/2017), this descriptive, cross sectional study was conducted at the Medical Unit-III, Abbasi Shaheed Hospital, Karachi for the duration of 06 months i.e. 1st December 2017 to 31st May 2018.A total 170 patients with ischemic stroke presenting with 2 or more of the three, i) GCS < 15, ii)Focal neurological deficit(unable to move one or more limbs or slurred speech) iii)a hypo dense area on CT scan, were enrolled. Patients of both gender and age between 30-60 years were included in this study. Previously conducted study determined the prevalence of carotid stenosis was 31% among ischemic stroke patients12.WHO software was used to calculate the sample size with the prevalence of 31%, confidence level 'C.I'=95% and d=0.07. Sample size was calculated to be 170 stroke patients. Patient with secondary stroke, history of head injury, hemorrhagic stroke, taking anticoagulant drugs or corticosteroids before the attack of stroke were excluded. Also patients with systemic disorders like congestive cardiac failure, chronic liver disease chronic kidney disease and chronic obstructive pulmonary disease were excluded. Brief history regarding duration of disease was taken along with physical examination and patients were asked if they are taking medicines for risk factors like hypertension, diabetes mellitus and dyslipidemia. Patients were also asked about number of cigarettes they smoke daily, and any previous cerebrovascular accidents (CVA).BMI was also calculated, those with BMI over 30 were labeled as obese. Ultrasound carotid Doppler was done by the sonologist at the Radiology Department, Abbasi Shaheed Hospital. The above mentioned variables as were entered in a pro forma. Carotid artery stenosis is defined as > 50% reduction in luminal diameter proven by color Doppler ultrasound. Smoker is defined as a person with life time consumption of at least 100 any type of cigarettes and has smoked in last 4 weeks ,on the other hand, Non-smokes is a person with less than 100 lifetime cigarettes and is not smoking at the present or has never smoked. Analysis of data done on SPSS version 21.0. Mean and standard deviation was calculated for age and duration of disease. Calculation of frequency and percentages were done for categorical variable like gender, hypertension, diabetes mellitus, dyslipidemia, smoking status, obesity, previous cerebrovascular accidents (CVA) and carotid artery stenosis(yes/no). Effect modifiers were controlled through stratification of age, gender, hypertension, diabetes mellitus, dyslipidemia, smoking status, obesity, previous cerebrovascular accidents to check their result on the outcome variable. Post stratification chi square/fisher exact test was applied while odds ratios were calculated by binary logistic regression taking p-value of ≤ 0.05 as statistically significant.

RESULT

A total of 170 patients of ischemic stroke meeting our criteria were included in this study. Minimum age of the patient is 38 years while maximum age is 57 years. Mean age

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in study is 53.14 years with the standard deviation of ±7.49 and mean duration of disease in this study is 2.72 years with the standard deviation of ±0.89. Out of 170 ischemic stroke patients, 90 (52.9%) has carotid artery stenosis and 80 (47.1%) did not have carotid artery stenosis. Baseline Characteristics of patients presented in Table I.

Characteristics	Total (n = 170)
Gender	
Female	84 (49.41%)
Male	86 (50.59%)
Hypertension	
Yes	102 (60%)
No	68 (40%)
Dyslipidemia	
Yes	128 (75.2%)
No	42 (24.7%)
Obesity	
Yes	102 (60%)
No	68 (40%)
Smoking	
Yes	70 (41.1%)
No	100 (58.8%)
History of CVA	
Yes	41 (24.1%)
No	129 (75.8%)

Table 1: Characteristics of patients

Stratification for age, gender, DM, Smoking, history of CVA and obesity with respect to carotid artery stenosis is mentioned in Table 2 which shows hypertension, dyslipidemia and smoking as major risk factor for carotid artery stenosis(p-value ≤ 0.05).

Characteristics	CAS		p-value
	Yes	No	
Gender			
Female	40 (44.4%)	44 (55%)	0.11
Male	50 (55.6%)	36 (45%)	
Age			
30-45 years	20 (22.2)	23 (28.8%)	0.21
46-60 years	70 (77.6%)	57 (71.2%)	
Hypertension			
Yes	49 (54.4%)	53 (66.2%)	0.07*
No	41 (45.6%)	27 (33.8%)	
Hypertension			
Yes	49 (54.4%)	53 (66.2%)	0.07*
No	41 (45.6%)	27 (33.8%)	
DM			
Yes	64 (71.1%)	54 (67.5%)	0.36
No	26 (28.9%)	26 (32.5%)	
Dyslipidemia			
Yes	79 (87.8%)	11 (12.2%)	0.00*
No	11 (12.2%)	11 (12.2%)	
Obesity			
Yes	54 (60%)	48 (60%)	0.056
No	36 (40%)	32 (40%)	
Smoking			
Yes	38 (42.2%)	32 (40%)	0.044*
No	52 (57.8%)	48 (60%)	
CVA History.			
Yes	18 (20%)	23 (28.8%)	0.12
No	72 (80%)	57 (71.2%)	

Table 2: Prevalence of CSA by patient's characteristics
*Statistically significant at 5% level of significance
Post stratification chi square test taking p-value of ≤ 0.05 as statistically significant.

By univariate logistic regression we found that female patients are less likely have CSA in comparison of male patient (OR=0.655, p-value=0.170). We found that patients with dyslipidemia are more likely to have CSA in comparison of patients without dyslipidemia. (OR=4.544, p-value = 0.000). Detailed odds ratios are presented in Table-3.

Characteristics	P-Value	Odds Ratio (95% CI)
Gender		
Female	0.170	0.655(0.357-1.199)
Male®		1
Age		
30-45 years	0.329	0.708(0.354-1.417)
46-60 years®		1
Hypertension		
Yes	0.118	0.609(0.327-1.134)
No®		1
Diabetes Mellitus		
Yes	0.610	1.185(0.617-2.278)
No®		1
Dyslipidemia		
Yes	0.000*	4.544(2.094-9.859)
No®		1
Obesity		
Yes	1.000	1.000(0.541-1.849)
No®		1
Smoking		
Yes	0.769	1.096(0.594-2.022)
No®		1
CVA History		
Yes	0.185	0.620(0.305-1.258)
No®		1
®Reference group. *Statistically significant at 5% level of significance		

Table 3: Odds Ratio for CSA patient's

DISCUSSION.

Results from our study correspond to most of studies carried out elsewhere, could be explained by unhealthy feeding habits and lack of physical exercise among population. Similarly study conducted locally found the rate of carotid stenosis was 31% among ischemic stroke

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patients, with prevalence of diabetes and hypertension was 35% and 50% respectively [12]. Atif et al. showed that among 100 patients included in study with mean age 55±8 years, the frequency of significant carotid atherosclerosis was 21%,the Common risk factors were hypertension (72%), diabetes mellitus (35%), smoking (20%) and obesity (20%) [13]. Shaikh et al illustrated that 39% of the lesions were of severe to critical stenosis among patients with ischemic stroke as determined by carotid Doppler ultrasonography, and major risk factors were older age, male gender, raise blood pressure, smoking, coronary artery disease and hyperlipidemia [14]. Another study analyzed that among 100 patients of ischemic infarction 56% observed to have carotid stenosis, hypertension and diabetes mellitus was present in 59% and 44% of patients respectively [15]. Study conducted at Karachi, included 131 patients with mean age 55 ± 1.26, showed presence of carotid artery stenosis 56% with hypertension(55%) and diabetes(44%)as major risk factors [16]. Study at Peshawar showed carotid artery stenosis in 52.3% patients ,the mean age was 64.03±11.71 years, risk factors were hypertensive (75%), diabetes mellitus(43%), tobacco abusers(23%),obesity(13%),ischemic heart disease(40%) and hyperlipidemias(11%) [17]. The results from our study are similar to other studies conducted abroad also. A study at China demonstrated carotid artery stenosis among 59.38% of patients [18]. Similarly an Egyptian study, patient's age ranging between 43 to 87 years with mean age 63.3±9.79 years showed 64.3% patients had carotid vessels stenosis ,diabetes mellitus, , uncontrolled blood pressure, raised lipids, and smoking [19]. A study conducted at India with patients of mean age 38.26 years demonstrated carotid artery stenosis among 30.4% of patients with ischemic stroke [20]. In Our study, 55.6% of patients with carotid artery stenosis were male whereas 44.4 were female; this male predominance correlates with various studies conducted elsewhere. Atif et al. reported male to female ratio 1.6: 1 [13].Similar male gender predominance was concluded from a study at Peshawar [17]. Likewise male to female ratio reported as 1.5: 1 in a study carried out at Lahore [21]. Another similar study conducted as Karachi show this ratio as 1.05: 1.Piravej K et al. demonstrated this male: female ratio of 1.2: 1 in study carried out at Thailand [22, 23]. Result from our study shows radiological significance of ultrasound carotid Doppler in detection of carotid artery stenosis.

CONCLUSIONS

Carotid artery stenosis is a well-recognized predisposing factor for the development of ischemic stroke, and our study confirms stenosis in a considerable number of patients. This study also illustrates that the presence of multiple causative factors such as hypertension, dyslipidemia and smoking status is firmly associated with carotid artery stenosis. Hence screening with carotid artery Doppler should be considered among the patients with these risk factors both for primary and secondary prevention from stroke.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Frequency of Hidden Hepatitis B and C During Screening in Patients' Undergone Surgical Procedures: Single Centered study

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ABSTRACT

Hepatitis is the serious health related concern and spreading rapidly specifically in developing countries, it also led to liver related diseases and hepatocellular carcinoma. While liver disease is an important health problem and having high health cost and leads to poor quality of life and dependency. **Objectives:** To determine the Incidence of hidden Hepatitis B and C during screening in patients' undergone surgical procedures reported in a single center. **Methods:** A cross-sectional study was conducted in Innovative Health Concepts & Research center by using a non-probability convenient sampling technique. The duration of study was 8 months from December 2021 to August 2022 and the study included those subjects who admitted in hospital for some surgical procedure and both genders aged between 25 to 60 years. Those subjects who have multiple neurological or musculoskeletal or endocrinological condition and came for the 2nd procedure were excluded from the study. Ethical permission was sought from Board of Advance Studies and Expert Review Board of Innovative Health Concepts Hospital (ASRRB/IHC&RC/RH/MED/Letter-003). The assessment for hepatitis B, HCV, and HIV was done through blood test. Data was entered and analyzed through SPSS version 26. **Results:** The results of study showed mean age of subjects was 43.47±10.17, mean weight was 71.35±10.78. The result showed 04% prevalence of hepatitis B, 4.9% prevalence of hepatitis C and no case reported of Human Immunodeficiency Virus (HIV). **Conclusion:** The study concluded that there is very low frequency of hepatitis B and C found in subjects undergone surgical procedures.

INTRODUCTION

Hepatitis is the serious health related concern specifically in developing countries like Asia and it led to the liver related disorders and carcinoma (HCC) too [1]. While liver disease is an important health problem and having high health cost and leads to poor quality of life and dependency [2]. In liver diseases, the primary liver cancer is the most important and 6th most common malignant neoplasm worldwide and 2nd most common type of the cancer that causes mortality [3]. The patients who have the liver cancer, among them 70 to 90% patients are diagnosed with (HCC) [4]. Almost every patient of the HCC has liver cirrhosis [5]. In acute stage of the liver cirrhosis it is difficult to diagnose the patients because in early stage the patient is asymptomatic [6]. In a study, it is concluded that 70% of the HCC cases often because of hepatitis B and C virus [7]. In Endemic areas like Asia and Africa the most common cause of the HCC is Hepatitis B virus while in United states and Europe the main cause is Hepatitis C virus [8, 9]. Prevalence of Hepatitis C virus is 7.44% while Hepatitis B virus is 1.98% and Punjab is the most affected area along with interior of Sindh [10]. The most common risk factors of Hepatitis B and C indicates that exposure to hijama therapy, circumcision performed by barbers, barber shaving, recreational drug use, tattooing, beauty parlor visits, IV injections are the risk factors for developing Hepatitis B and C [11]. Health care workers and medical students are at higher risk to develop hepatitis B due to exposure of the blood and body fluids also due to needle

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stick prickling [12, 13]. World Health Organization (WHO) indicated that only 60% of the patients having Hepatitis Virus are diagnosed while others were not aware about their disease. [14]. Similarly, a study showed that 153000 were HIV positive from which 24700 were unaware of their disease [15]. The prevalence of HIV, HBV and HCV found to be five, three and wight individuals that shows low prevalence appear in preliminary screening [16]. To eliminate the occurrence of hepatitis the programs that aimed to screening, vaccination and different care strategies are introduced [17]. Testing prior to surgery is most important strategy to early diagnose and prevent the hepatitis and early diagnosis makes it possible to receive necessary care and treatment, testing also reduces the risk of transmission because of preventive strategies like use of sterilized equipment [18]. As per the literature, Hepatitis B and Hepatitis C are usually undiagnosed because there are no symptoms appear often in early stages of the disease, so the diagnosis is difficult. The study aims to determine incidence of hidden Hepatitis B and C during screening in patients' undergone surgical procedures reported in single center.

METHODS

The cross-sectional study design was used, and subjects were added in the study by using non-Probability convenient sampling technique. The study duration comprised of 8 months from December 2021 to August 2022 in Innovative Health Concepts Hospital and research center, Lahore. The sample size of 224 subjects were inducted in the study that was calculated through formula $n=z^2\frac{p(1-p)}{d^2}$ by using confidence interval of 95% and margin of error 5%. The study included those subjects who admitted in hospital for some surgical procedure and both genders aged between 25 to 60 years. Those subjects who have multiple neurological or musculoskeletal or endocrinological condition and came for the 2nd procedure were excluded from the study. The demographic information was taken by self-structured questionnaire that include age, weight, gender of participants while routine screening before introduction of surgical procedure was done by taking blood sample of subjects for screening antibodies of HBsAG, HCV and HIV. The ethical approval was taken from the Board of Advance Studies and Expert Review Board of Innovative Health Concepts Hospital and Research Center (ASRRB/IHC&RC/RH/MED/Letter-003). The consent was taken from every subject before recruiting into the study. The permission was also carried out by the administration to before collection of data. The data entry and analysis were done through Statistical Package for Social Sciences (SPSS) version 26.0. The descriptive analysis used to determine the information and demographic information is presented in frequency (percentages), mean ±Standard Deviation. The frequency of Hepatitis B and Hepatitis C is presented in Pie chart and bar chart.

RESULTS

The result of study showed that Mean±SD of age is 43.47 ± 10.17 years, weight of participants was 71.35 ± 10.78 kg. The subjects reported with acute stage was 139 (62.1%), sub-acute 14 (6.3%) and chronic was 71 (31.7) according to the severity of the diseases. In involvement of body regions, patients report with the lower extremity involvement 147 (65.6%), upper extremity involvement 62 (27.7%) and spine involvement was 15 (6.7%). The common causes of trauma in the included participants were congenital 34 (15.2%), fracture 154 (68.8%), infection 15 (6.7%), degenerative 14 (6.3%) and tumor 7 (3.1%) as shown in Table 1.

Group		n (%) (n=224)
Age of Participants		43.47 ± 10.17
Gender	Male	169 (75.4%)
	Female	24.6 (24.6%)
Stage of severity	Acute	139 (62.1%)
	Sub-acute	14 (6.3%)
	Chronic	71 (31.7%)
Types of Trauma	Congenital	34 (15.2%)
	Fracture	154 (68.8%)
	Infection	15 (6.7%)
	Degenerative	14 (6.3%)
	Tumor	7 (3.1%)
Body region involvement	Upper extremity	62 (27.7%)
	Lower extremity	147 (65.6%)
	Spine	15 (6.7%)
Weight (Mean±SD)		71.35 ± 10.78

Table 1: Demographic information of subjects (n=224)

The frequency of hepatitis B found in the subject was only 9 (4%) out of 224 patients during their screening while remain subjects 215(96%) were tested negative (figure 1).

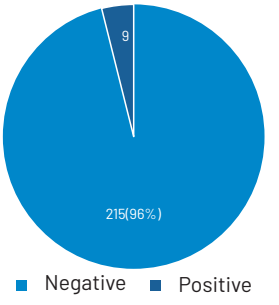

Figure 1: Frequency of hepatitis B in subjects (n=224)

Before their surgical procedures, patients who have positive hepatitis C was 11 (4.9%) and others shows negative in their screening 23(95.1%) as shown in figure 2. During blood screening, no patient report with Human Immunodeficient Virus (HIV).

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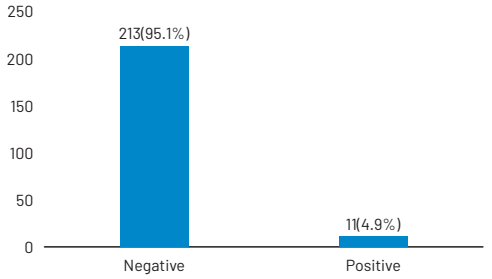

Figure 2: Frequency of hepatitis C in subjects (n=224)

DISCUSSION

The result of this study showed that that frequency of hepatitis B in single centred hospital was only 9(4%) in subjects (n=224) that presented in the hospital for various surgical procedures. The study conducted by Iqbal et al also conducted from October 2017 to July 2019 and concluded that only 7.5% patient have hepatitis B positive in screening [19]. Another cross-sectional study was conducted by Akhtar.et.al at from April 2015 to April 2016 at Fatima Memorial Hospital Lahore and concluded that 366(5.33%) were found positive for anti-HCV antibodies and 117(1.70 %) patients were HBV positive [20]. Naseem et.al., conducted a study showing the estimate screening of HIV, Hep. B , Hep. C in patients residing the zero line of border. He concluded that no patient found positive for HIV while 3% subjects report with HBsAG and 7% subjects have HCV [21]. Mehmood.et.al., conducted a review to identify the percentage of hepatitis virus in Pakistan. There was 1.98% patients have Hepatitis B virus and 7.44% having undiagnosed hepatitis C virus [10]. The result of current study showed that frequency of Hepatitis C was 11(4.9%) who admitted into the hospital for surgical procedures. Khurram et.al., conducted a study which revealed that out of 272 samples of blood taken from a variety of individuals. As compared to HBV, HCV has a higher prevalence, that is, 16.17% (44/271). On the other hand, the prevalence of HBV was only 2.2% (6/271) [22]. In previous literature, Khan et., al conducted study to ascertain the prevalence and potential risk factors associated with HBV and HCV infections in Punjab. This study concluded that the overall prevalence for HBV and HCV was 8.4% and 42.7%, respectively [11]. In current study, out of 224 subjects, no one has Human Immunodeficient Virus (HIV) positive. Ahmad et al in is study concluded that HIV prevalence among the general population is estimated to be less than 0.1%.(23).

CONCLUSIONS

The conclusion of current study is that low prevalence of Hepatitis B and Hepatitis C was found in patients who admitted to the hospital for the surgical intervention while no patient reports with HIV infection.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Comparison Between the Effectiveness of Muscle Energy Technique and Ischemic Compression on Myofascial Trigger Points in Patients with Chronic Shoulder Pain

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ABSTRACT

Patients with chronic shoulder pain often experience myofascial trigger points. An ischemic compression (IC) slows blood flow and relieves tension by applying sustained digital pressure for a specific period of time. MET, which stands for Muscle Energy Technique, is another manual method for releasing muscle tension (inhibition). **Objective:** To compare the effectiveness of muscle energy technique and ischemic compression on myofascial trigger points in patients with chronic shoulder pain. **Methods:** In this quasi-experimental study, 40 patients were enrolled from Physical Therapy Department, DHQ hospital Faisalabad, during September 2018 to March 2019. Patients were allocated into two groups. Muscle energy technique was applied on group A (n=20) and ischemic compression was applied on group B (n=20). Both groups received treatment three days a week for four weeks. Disabilities of Arm, Shoulder and Hand questionnaire, Neck Disability Index, Visual Analogue Scale and Goniometer were used to take measurements at baseline and after four weeks of treatment. SPSS 20.0 was used for data entry and analysis. Difference between two treatments was determined by using independent t-test. **Results:** A statistically significant difference was found between the two groups for all outcome measures ($p < 0.05$) at four weeks follow-up. **Conclusions:** Results suggest that muscle energy technique seems more effective compared to ischemic compression in terms of decreasing pain, upper limb and neck disability and improving shoulder mobility in patients with chronic shoulder pain having myofascial trigger points.

INTRODUCTION

Shoulder pain is prevalent musculoskeletal condition [1]. Multiple physical factors are responsible for causing shoulder pain and disability [2]. Pathophysiological processes for shoulder pain are not clearly understood [3]. Another way to explain pathophysiology underlying shoulder pain is to consider involvement of myofascial trigger points (MTrPs) [4]. MTrPs are prevalent in shoulder muscles and cause discomfort in upper extremity [5]. Treatment methods to inactivate MTrPs in shoulder disorders are not much known [6]. Presence of point tenderness over tight muscle band, local twitch reaction, muscle weakness but no atrophy and referred pain are distinguishing clinical characteristics of MTrPs [7]. Prevalence of trigger points in upper trapezius, supraspinatus and triceps brachii in neck and shoulder disorders is high [8, 9]. Upper trapezius MTrP was quite common in shoulder pain patients, causing pain in temple, rear corner of jaw, down the side of neck behind ear, behind eye [4, 10]. Pain from MTrP in supraspinatus can be felt as a deep ache in outer side of shoulder, as well as upper side of arm and forearm [3, 10, 11]. Although MTrP in latissimus dorsi is frequently neglected as a cause of shoulder pain in

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frontal/lateral regions, it can also produce pain along ulnar nerve distribution and is associated with C3-4-disc lesion [10-13]. Long head of triceps is commonly involved in shoulder dysfunction and refers discomfort to back of shoulder and outer elbow [10, 12]. Treatment of MTrPs in physiotherapy include, Muscle Energy Technique (MET), Ischemic Compression (IC), dry needling, ultrasound therapy and laser therapy [14]. IC as defined by Simons et al., is a type of pressure release therapy that involves gradually increasing painless pressure over a MTrPs until first tissue barrier is reached [10]. This pressure is then maintained for short time to relieve tension in restricted tissues. Before stretching, MET is considered as an effective method to release tension from muscle. This method is based on autogenic inhibition or reciprocal inhibition [15, 16] and evidence supports use of MET in acute and chronic nonspecific neck pain [17]. Previous studies have not compared effectiveness of MET and IC on multiple muscles since these techniques are fast-acting and have a rapid impact on lowering symptoms at MTrPs [18]. Previous studies focused exclusively on upper trapezius MTrPs and was limited to neck pain. Thus, purpose of this study was to compare clinical effects of MET and IC on chronic shoulder pain caused by MTrPs of upper trapezius, supraspinatus, latissimus dorsi, and triceps brachii muscles.

METHODS

This quasi-experimental study was conducted at Physical Therapy Department, DHQ hospital Faisalabad from September 2018 to March 2019. Both male and female patients of age 18-50 years having distinct features of MTrPs were included through convenient sampling. Participants with recent shoulder injury/wound, vascular syndrome, skin disease and those receiving any treatment for myofascial pain were excluded. After taking informed written consent 42 participants were allocated equally into two groups i.e., Group A and Group B. Group A received MET and Group B received IC along with ultrasound as baseline therapy at frequency of 3 MHz, Intensity of 1.4 W/cm2, for 5 minutes at continuous mode. MET was applied by bringing each muscle (supraspinatus, upper trapezius, latissimus dorsi and triceps brachii) to length just short of pain to the stage where resistance was first felt. In IC slowly increasing pressure was applied to all involved muscle and kept for almost 20 seconds to 1 minute with thumb until patient reported decrease in pain. After muscle fibers relaxed under stress, stress was gradually released. Both procedures were repeated 3 to 5 times for 3 sessions per week in four successive weeks. All participants were evaluated by Visual Analogue Scale (VAS), Neck disability Index (NDI), Disabilities of Arm, Shoulder and Hand (DASH) questionnaire and goniometer for measuring pain, disability of neck, shoulder and arm and shoulder range of motion (ROM) respectively at baseline and at 4 weeks follow-up after 12 treatment sessions. Ethical approval was taken from ethical review committee of Riphah College of Rehabilitation & Allied Health Sciences (Ref. No: RCR& AHS/REC/MS-OMPT/004 dated 7th September 2018). A sample size of 19 participants in each group was calculated with power of 80%, 5% margin error, 95% confidence interval and taking mean difference in VAS pain scores between the two groups of 0.7333 [19]. Total 42 participants were recruited in study by assuming 10% attrition rate. Data were analyzed using Windows software SPSS version 20.0. After assessing normality of data by Shapiro-wilk test, independent sample t-test (parametric test) was applied to measure differences between two groups. The significance level α was set to 0.05.

RESULTS

Forty-four participants were assessed for eligibility. Two patients who did not meet inclusion criteria were excluded. One subject was dropped from Group A due to personal problems and one subject from Group B was unable to continue all therapy sessions. Therefore, during final analysis at end of four weeks their information was not included. Age of the participants in MET group was 37.39±10.12 and in IC group was 38.43±10.77. At baseline, Disabilities of arm, shoulder and hand score in MET group was 47.70±9.78 and in IC group was 46.55±12.71. Neck disability index score in MET group was 20.38±8.52 and in IC group was 18.57±10.26 (Table 1).

Variables		Muscle energy technique (n=21) Mean ± SD	Ischemic compression (n=21) Mean ± SD	p-value
Age (year)		37.39±10.12	38.43±10.77	0.748
Height (cm)		163.53 ±7.72	159.17±8.28	0.086
Weight (kg)		65.80±11.02	63.95±10.85	0.585
Body Mass Index		24.54±3.65	25.15±3.76	0.597
Disabilities of arm, shoulder and hand (0-100)		47.70±9.78	46.55±12.71	0.744
Neck disability index (0-50)		20.38±8.52	18.57±10.26	0.538
Visual analogue scale (0-10)		6.76±0.99	6.76±1.17	1.000
Shoulder range of motion (degrees)	Flexion	91.57±8.38	89.86±4.48	0.414
	Extension	39.52±7.05	38.09±6.01	0.484
	Abduction	90.52±7.04	92.04±4.77	0.417
	Internal rotation	46.47±7.68	49.2±7.00	0.223
	External rotation	72.38±11.35	72.38±11.79	1.000

Table 1: Demographic data and baseline characteristics of the participants

Between groups differences at four weeks follow-up reported significant difference in Shoulder range of motion includes flection <0.001, extension<0.001, abduction

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<0.001 adduction <0.001, internal rotation <0.001 and external rotation <0.003, disabilities of arm, shoulder and hand <0.001, and visual analogue scale< 0.004. However no significant difference was found between two groups while comparing Neck disability index with p value < 0.004 (Table 2).

Variables		Muscle energy technique (n=20) Mean±SD	Ischemic compression (n=21) Mean ± SD	Mean difference	p-value
Disabilities of arm, shoulder and hand (0-100)		20.24±5.13	30.51±9.19	10.2	<0.001
Neck disability index (0-50)		8.30±3.8	14.60±9.2	76.30	0.009
Visual analogue scale (0-10)		52.70±0.651	53.50±0.94	0.80	0.004
Shoulder range of motion (degrees)	Flexion	42.75±9.66	107.40±8.14	35.35	<0.001
	Extension	54.65±5.651	43.95±6.12	10.70	<0.001
	Abduction	42.85±9.05	116.25±11.22	26.60	<0.001
	Internal rotation	71.60±8.74	55.20±7.00	16.40	<0.001
	External rotation	83.50±5.87	74.50±10.99	9.00	0.003

Table 2: Between groups differences of DASH, NDI, VAS and Shoulder Movements at 4 weeks follow-up

DISCUSSION

One of the most common causes of neck and shoulder pain is myofascial trigger points (MTrPs) [20]. In patients with chronic shoulder pain who have MTrPs, there has been limited research on manual therapy methods and their effectiveness. Therefore, the current study was designed to determine the effect of MET and IC on MTrPs in chronic shoulder pain patients. In present study, MET increased shoulder ROM in more than IC, these results are in line with the work done previously by Gupta *et al.*, [21]. This is because the phenomenon of viscoelasticity as a consequence of contraction and stretching used in MET leads to a rise in tissue extensibility which reduces rigidity [19, 22]. In this study, MET was more successful in reducing pain than IC, however this is not compatible with the previous study, which concluded that IC was more effective in reducing shoulder pain than MET. This could be because the pain value in the IC group was lower before treatment than in the MET group in the previous study [21]. Pain reduction by MET can be due to inhibitory Golgi tendon reflex, which is stimulated during isometric contraction and leads to reflex muscle relaxation, is responsible for hypoalgesia effects [19]. In current study, there was a significant difference in the post-treatment values of shoulder and arm disability, neck disability, pain, and total shoulder range of motion between the two treatment groups in this study comparing the effectiveness of MET and IC on MTrPs in patients with chronic shoulder pain. Nevertheless, MET showed the greatest improvement in terms of disability, pain, and range of motion. According to the study, pain was reduced, PPT was enhanced, and range of motion was improved in both treatments. Ischemic compression improved PPT more effectively. There was no significant difference in VAS scores between the groups. Ischemic compression technique did not improve CROM as effectively as MET [23]. In current study, MET reduced neck disability more than IC, this is in accordance with studies done previously [19, 24, 25]. A systematic review also agreed upon the beneficial effects of MET on disability reduction [26].

CONCLUSIONS

The current study concluded that clinically MET seems more effective than IC in terms of reducing pain and improving shoulder range of motion and neck and upper limb functions in patients with chronic shoulder pain having MTrPs.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Correlation Between Pre Biopsy Serum Prostate Specific Antigen Level and Gleason Score in Patients Diagnosed with Prostate Adenocarcinoma: A Hospital Based Study

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ABSTRACT

Prostate Specific Antigen (PSA) is a non-invasive biomarker in the management of prostate adenocarcinoma. Due to its low specificity, its diagnostic role is controversial in prostate adenocarcinoma. Gleason score is considered as most powerful predictor of prostate carcinoma. PSA in combination with Gleason grading system improves the detection of pathological stage of prostate adenocarcinoma. **Objective:** To determine the degree of correlation between pre biopsy serum PSA level and Gleason score in patients diagnosed with prostate adenocarcinoma. **Methods:** Retrospective cross sectional study was conducted in Chemical Pathology and Histopathology department, Sheikh Zayed Hospital, Rahim Yar Khan between July 1, 2021 and September 31, 2022. A total of 51 histopathologically confirmed cases of prostate adenocarcinoma with documented Pre biopsy PSA level and Gleason score were included in the study. Serum PSA level correlation is compared with Gleason score, Gleason Pattern and Gleason Grade. p-value ≤0.05 taken as significant. **Results:** Mean age for prostate carcinoma patients was 65.71±10.062 years. Mean pre biopsy serum PSA level in study subjects was 40.31±37.52ng/ml. Of the total 51 study subjects, 27 (52.94%) were having Gleason score 7 suggestive of moderately differentiated tumor. Among these, 15(55.6%) were having serum PSA level between 10.01-50.00ng/ml. Statistically significant good correlation of serum PSA with Gleason score, Gleason pattern and Grade was established with p value <0.05. **Conclusion:** It was concluded that there is good degree of positive correlation between pre biopsy PSA level and Gleason score in patients with Prostate adenocarcinoma.

INTRODUCTION

Adenocarcinoma of prostate is one of the most prevalent carcinoma and is becoming a leading cause of mortality among aging males [1]. Around two-third cases of prostate cancer diagnosed in men over 65 years of age [2]. Prostate specific antigen (PSA) is kallikrein-related serine protease that is released by normal epithelial cells of prostate as well as cancer cells [3]. The use of PSA as a noninvasive screening biomarker can enhance the detection of carcinoma at earlier stage and thus the number of metastatic patients can be reduced [4]. PSA is prostate specific but it is not prostate carcinoma specific thus its use as diagnostic tool for prostate adenocarcinoma is controversial due to its elevation in other lesions and procedures such as benign prostatic hyperplasia, urinary tract infection, acute and chronic prostatitis, digital rectal examination, urethral instrumentation and ejaculation [5]. The levels of PSA are race and age adjusted and elevated levels of PSA in progressive carcinoma can be used as prognostic tool [6]. Prostate biological behavior can be predicted by using Gleason scoring and grading system. According to International Standards of Urological Pathology (ISUP) guidelines, it is recommended that the Gleason scores ≤6, 3 + 4 = 7, 4 + 3 = 7, 8 and 9-10 reported as five ISUP Gleason Grades (1-5) respectively [7]. Gleason scoring system is based on degree of glandular differentiation with five patterns of growth on the basis of

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their increasing aggressiveness. A lower Gleason score is assigned to well differentiated tumor and higher is assigned to poorly differentiated or anaplastic tumor. Clinical staging of the prostate adenocarcinoma is based on DRE (digital rectal examination), PSA testing and Gleason score [8, 9]. The correlation between pre biopsy PSA level and Gleason score is evaluated in this study to see the significance of PSA in advanced cancer detection and tumor pathologic grade by assessing the degree of correlation between serum PSA and Gleason score. Implication will be that higher the level of serum PSA, higher the patients having higher Gleason score and high Gleason score is associated with poor prognosis. PSA in combination with Gleason grade and clinical stage improves the pathological stage prediction in prostate carcinoma

METHODS

Retrospective cross-sectional study conducted in department of chemical pathology and histopathology, Sheikh Zayed Hospital, Rahim Yar Khan from July 1, 2021 to September 30, 2022. Non-probability consecutive sampling technique was used. Male ≥45 years of age, histopathologically confirmed cases of prostate adenocarcinoma with documented Gleason Score, Gleason Pattern, International Standards of Urological Pathology (ISUP) Gleason Grade and pre biopsy PSA level were included in study. The cases with missing data or not documented Gleason score and pre biopsy PSA level were excluded. All data was anaonymized and no additional testing was performed, so there was no requirement of ethical approval. A total of 51 subjects satisfying the inclusion criteria were included in the study. Data were retrieved from laboratory information management system of department of chemical pathology and histopathology, Sheikh Zayed Hospital Rahim Yar Khan. Patient's data such as Age, pre biopsy serum PSA level, Gleason pattern, Gleason score and Gleason Grade were recorded on a predesigned proforma. Data was analyzed using SPSS version 23. Continuous variables such as Age, Gleason pattern, Gleason score, serum PSA level presented in terms of mean and SD. Gleason pattern expressed in terms of frequency and percentage. Cross tabulation also generated. Pearson correlation coefficient was applied to test the correlation between serum PSA and Gleason score, Gleason pattern, Gleason Grade. Chi square test used for analysis of significance. P-value ≤0.05 taken as significant.

RESULTS

Of the total 51 confirmed cases of prostate adenocarcinoma, mean age was 65.71±10.062 years with maximum cases n=21 (41.2%) between 66-75 years age group (Table 1). Mean PSA level was 40.31±37.52ng/ml with maximum cases n=18 (35.3%) having PSA level between 10.01-50.00 ng/ml (Table 1). Distribution of study subjects with respect to Age, PSA level, Gleason score, Gleason Pattern and Gleason Grade is illustrated in table 1.

Variable	Mean±SD	Subgroup	Frequency	Percentage
Age (Years)	65.71±10.062	45-55	10	19.6%
		56-65	14	27.5%
		66-75	21	41.2%
		>75	6	11.8%
Serum PSA level (ng/ml)	40.31±37.52	<10.00	15	29.4%
		10.01-50.00	18	35.3%
		50.01-100	7	13.7%
		>100.00	11	21.6%
Gleason Score	7.35±1.016	6	8	15.7%
		7	27	52.9%
		8	8	15.7%
		9	6	11.8%
		10	2	3.9%
Grade Group	2.90±1.300	1	8	15.7%
		2	13	25.5%
		3	14	27.5%
		4	8	15.7%
		5	8	15.7%

Table 1: Distribution of study subjects with respect to Age, PSA level, Gleason Score, Gleason Grade

Cross tabulation of serum PSA categories with respect to Age, Gleason score, Gleason Pattern and Gleason Grade is illustrated in table 2. There was statistically significant positive correlation of serum PSA with Gleason score (r=0.579, p=0.001), Gleason pattern (r=0.674, p=0.000), Gleason Grade (r=0.680, p=0.000) and there was statistically insignificant negative correlation of serum PSA with age (r=-0.174, p=0.222) as shown in (Table 2).

Variable	Subgroups	PSA level(ng/ml)				Pearson correlation coefficient	p-value
		<10.00	10.01-50.00	50.01-100.00	>100		
Age (years)	45-55	2	3	0	5	-0.174	0.222
	56-65	5	5	1	3		
	66-75	7	6	5	3		
	>75	1	4	1	0		
Gleason score	6	8	0	0	0	0.579	*0.001
	7	7	15	1	4		
	8	0	1	3	4		
	9	0	2	2	2		
	10	0	0	1	1		
Gleason pattern	3+3	8	0	0	0	0.674	*0.000
	3+4	7	7	0	0		
	4+3	0	8	1	4		
	4+4	0	1	3	4		
	4+5	0	2	2	2		
	5+5	0	0	1	1		
	1	8	0	0	0		
	2	7	6	0	0		

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Grade Group	3	0	9	1	4	0.680	*0.000
	4	0	1	3	4		
	5	0	2	3	3		

Table 2: Cross tabulation of serum PSA categories with respect to age, Gleason score, Gleason Pattern and Gleason Grade.
*Correlation is significant at p<0.05(2-tailed)

ISUP Grade Group 1 → Gleason score≤6 Gleason → pattern≤3+3 → discrete well formed glands

. ISUP Grade Group 2 → Gleason score 7→ Gleason pattern 3+4 → discrete well-formed glands with lesser component of poorly formed fused glands

. ISUP Grade Group 3→Gleason score 7→ Gleason pattern4+3 → poorly formed fused glands with lesser component of well-formed glands

. ISUP Grade Group 4 → Gleason score 8→ Gleason pattern 4+4 → only poorly formed fused glands

. ISUP Grade Group 5→Gleason score 9,10 → Gleason pattern 4+5, 5+4, 5+5→lack of gland formation (or with necrosis) with or without poorly formed glands

Frequency of age distribution of study subjects is illustrated in figure 1 showing that minimum number of study subjects (n=6) having >75 years of age and maximum number of study subjects (n=21) were between 66-75 years of age.

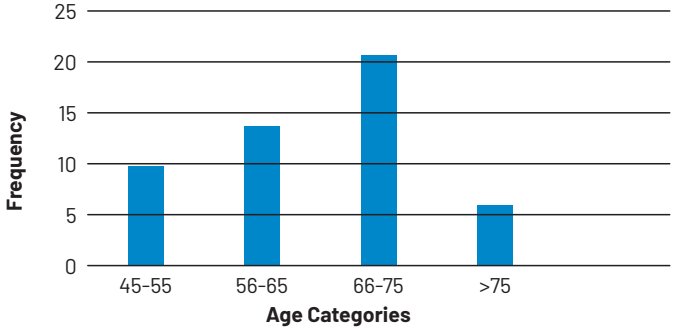

Figure 1: Frequency of Age distribution

Figure 2 illustrate the distribution of study subjects with respect to serum PSA level and it shows that minimum number of study subjects (n=7) were having serum PSA level between 50.01-100.00ng/ml while maximum number of study subjects (n=18) were having PSA level between 10.01-50.00ng/ml.

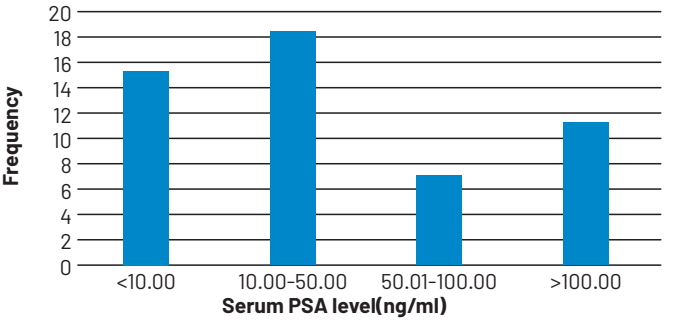

Figure 2: Frequency of Serum PSA level distribution

Figure 3 illustrate the distribution of study subjects with respect to Gleason score and it shows that minimum number of study subjects (n=2) were having Gleason score 10 while maximum number of cases (n=27) were having Gleason score 7.

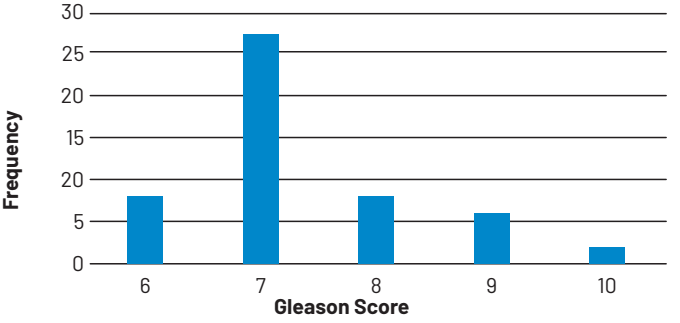

Figure 3: Frequency of Gleason score distribution

DISCUSSION

Of the total of 51 study subjects confirmed cases of prostate adenocarcinoma, age range was 45- 85 years with mean age 65.71±10.062 years. Maximum number of cases n=21(41.2%) were between 66-75 years. Mean PSA level was 40.31±37.52ng/ml with maximum cases n=18 (35.3%)having PSA level between 10.01-50.00ng/ml. Our study revealed no statistically significant correlation between age and serum PSA level in prostate carcinoma with p value (0.222). NgwuPE *et al* demonstrated in their study that the mean age of study subjects diagnosed with prostate adenocarcinoma was 71.3±8.7years and mean PSA level was 52.3±37.5ng/ml with p value <0.001 [10]. According to a study conducted by Okolo C.A. *et al*, mean PSA level was 207.9±221.3ug/l with 55% of patients having PSA values >100ug/l [11]. Temel MC *et al* demonstrated the strong positive correlation of ISUP Gleason grade with age and total PSA level with p value <0.05 [12]. Our study revealed that all study subjects with Gleason score 6 were having serum PSA level <10.00ng/ml. A total of 27 study subjects with Gleason score 7, maximum number of cases n=15(55.6%) were having serum PSA level between 10.00-50.00ng/ml. Of the total 8 subjects having Gleason score 8, maximum number of cases n=4 (50%) were having serum PSA level >100ng/ml. Of the total 6 study subjects with

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Gleason score 9, 2 (33.33%) were having serum PSA level 10.01-50.00ng/ml, 2 (33.33%) were having serum PSA level between 50.01- 100.00ng/ml and 2(33.33%) were having serum PSA level >100.00ng/ml. There was a good degree of correlationbetween serum PSA and Gleason score with r=0.579, p value 0.001. Lojanapiwat B. *et al* demonstrated in their study that there is strong correlation between PSA level and tumor aggressiveness [13]. According to a study conducted by Pinsky P F *et al*, it is concluded that PSA level has association with Gleason score and clinical stage when analysed by univariate analysis but no association established in case of multivariate analysis [14]. Iwamoto H. *et al* demonstrated in their study that PSA is useful predictor of prognosis at level between 20-70ng/ml and prognostic value reaches a plateau at level above 70ng/ml [15]. Goldberg H *et al* have demonstrated in their study that aggressive prostate tumors have Gleasonscore 8-10 with PSA level >20ng/ml requiring different treatment modalities [16]. Izumi K *et al* demonstrated in their study that the patients with serum PSA level <3.5ng/ml were havingadvanced disease than the patients between 3.5-10ng/ml [17]. Masic S *et al* demonstrated in theirstudy that low risk prostate carcinoma is associated with low PSA values and high risk prostate carcinoma is associated with high PSA values with statistically significant difference P <0.05 [18]. Partin AW *et al* demonstrated in their study that PSA level >20ng/ml were having more cases ofmetastatic tumor than the cases with PSA values between 4-10ng/ml [19]. Bantis A *et al* in their study concluded that PSA level in combination with Gleason score enhancesthe prediction of advanced cancer. PSA level more than 20ng/ml and Gleason score 8 or more areassociated with metastatic tumor [20, 21]. Of the total 51 study subjects, 8 were having Gleason pattern 3+3 with serum PSA level <10.00ng/ml in all subjects (100%). Total 14 (27.45%) were having Gleason pattern 3+4 with 7(50%) having PSA level <10.00ng/ml and 7(50%) were having PSA level 10.01- 50.00ng/ml. A total 13(25.49%) were having Gleason pattern 4+3 with 8 having PSA level between 10.01- 50.00ng/ml, 1(7.69%) between 50.00-100.00ng/ml and 4(30.76%) having PSA level >100.00ng/ml. Total 8 (15.68%) study subjects were having Gleason pattern 4+4 with 1(12.5%)having PSA level between 10.01-50.00ng/ml, 3(37.5%) having between 50.01-100.00ng/ml and 4(50%) having >100.00ng/ml. 6(11.76%) were having Gleason pattern 4+5 and 2(3.92%) were having 5+5. 1(50%) subject with Gleason pattern were having PSA level between 50.01-100ng/ml and 1(50%) were having >100.00ng/ml (Table 2). Kamel *et al* demonstrated in their study that patients with Gleason pattern 4+3 have higher level of serum PSA than with 3+4 [22].Of the total 51 study subjects, 8(15.68%) were having grade 1 tumor with all of these having serum PSA level <10ng/ml. 13 (25.49%) were having Grade 2 carcinoma with 7(53.84%) were having PSA level <10.00ng/ml and 6(46.15%) were having PSA level between 10.00- 50.00ng/ml.14(27.45%) were having grade 3 carcinoma with 9(64.2%) having PSA level between 10.00-50.00ng/ml and 4(28.57%) were having PSA more than 100.00ng/ml. 8(15.68%) were having grade 4 tumor with 4(40%) subjects having PSA more than 100.00ng/ml and 8(15.68%) were having grade 5 tumor with 3(37.5%) having serum PSA >100.00ng/ml (Table 2). Aihara M. *et al* illustrated in their study that Gleason Grade 3 is major contributor of serum PSA level than other grades of tumor [23]. Other causes of raised PSA values such as benign prostatic hyperplasia, urinary tract infection, acute and chronic prostatitis, urethral instrumentation, digital rectal examination and ejaculation were not ruled out due to retrospective study. f/ total PSA should have been performed in grey zone patients with serum PSA level between 4.00-10.00ng/ml. Age and race adjusted reference limits should have been used for the interpretation of serum PSA results.

CONCLUSIONS

On the basis of our study, strong positive correlation between pre biopsy serum PSA level and Gleason score was found. Higher level of PSA predicts the aggressive and worst histopathological grading.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Prevalence of Psychological Distress among Mothers of β-Thalassemia Children in a Developing Country

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ABSTRACT

Beta-thalassemia major (BTM) is one of the most common hereditary hemoglobinopathies in Pakistan, with 9.8 million persons in the general population and gene carriers (5-7%). The mothers of these chronically ill patients often endure many challenges associated with caregiving. **Objective:** To determine the prevalence of psychological distress experienced by mothers of children suffering from BTM in a developing country. **Methods:** From March 2022 to August 2022, this descriptive cross-sectional study was done among mothers of thalassemic children who presented to the Outpatient Department of Benazir Bhutto Hospital in Rawalpindi. A self-structured questionnaire consisting of 1) Socio-demographic characteristics and 2) the Kessler-10 (K-10) Distress Measure was used to collect data. To determine the level of psychological distress among mothers of children, a descriptive analysis was done. The Spearman correlation was used to explore the relationship between demographic factors and the level of psychological distress experienced by mothers of children with thalassemia. **Results:** The mean age of mothers being interviewed was 37.65±3.63 years. Out of 83 mothers, 54(65.1%)had psychological distress. The children's age(r=-.275)and any psychological support taken by mother(r=-.253)were correlated(p<.05)negatively with the severity of psychological distress. **Conclusions:** Our study identified that most mothers of children suffering from thalassemia had psychological distress. Thus, these mothers are at risk of poor health outcomes and should be targeted for screening and treatments focused on improving their health and well-being.

INTRODUCTION

In thalassemia, a genetically transmitted disease, the production of hemoglobin (Hb) globin chains is primarily affected. The Southeast Asia, the Mediterranean, the Middle East and the Indian subcontinent, are all notable regions where this illness is a significant public health concern [1]. Beta-thalassemia major (BTM) is one of the most common hereditary hemoglobinopathies in Pakistan, with 9.8 million persons in the general population and gene carriers [2]. In the Pakistani population, the estimated carrier frequency for beta-thalassemia is 6% [3]. There are over 50,000 individuals enrolled at different treatment facilities across the nation. An estimated 100,000 children in Pakistan are transfusion-dependent thalassemia, and children born with the disease continue to increase this number by 7000–9000 each year [4, 5]. The parents of these chronically ill patients often endure many challenges associated with caregiving. The parental responsibilities of caring for a chronically ill child, combined with natural worry and financial woes, may be distressing. for many parents [6]. Generally, it is diagnosed at birth or within the first six to twelve months of life; therefore, mothers are the ones that are specifically involved [7]. These mothers have

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a variety of responsibilities, including looking for the child while receiving blood transfusions and Dysfral, looking after during many hospital stays, meeting the needs of the child with various thalassemia abnormalities, and monitoring various child testing [8]. According to Piran *et al.*, moderate-to-severe levels of care stress was reported by 49% of the mothers of children diagnosed with BTM [9]. Fears and concerns about the disease's progression, and apprehensions over the child's future are the mothers' most pressing psychological problems and conflicts [10]. Saldanha concluded that about 1.5% of the mothers, during the first two-years of child's therapy endure various psychosomatic-illnesses and require the assistance of others to continue treating the child [11]. A child with thalassemia needs special care from their mothers. It is a constant source of distress for the mothers, as their children must undergo the rigorous cycles of recurrent transfusions and iron chelation therapies. Almost 10-years is the average life expectancy among such patients, further adding fuel to the fire for the mothers, who are already concerned about the future of their children [12]. The majority of the literature has focused on the psychological effects of this condition on children's mental health, but there is very little information available that highlights the psychological discomfort experienced by mothers of children with thalassemia. Thus, our study aimed to determine the prevalence of psychological distress experienced by children's mothers in a developing country.

METHODS

From March 2022 to August 2022, this descriptive cross-sectional study was conducted among mothers of thalassemic children presenting in the Outpatient Department of Benazir Bhutto Hospital, Rawalpindi, using a self-structured questionnaire. Mothers of children with diagnosed BTM aged less than 15 years were included in this study. Before starting the interview, a form requesting their informed permission was given to and signed by each participant. The questionnaire had two parts 1) Socio-demographic characteristics and 2) the Kessler-10 (K10). Sample size was calculated using WHO sample size calculator 1.1. The sample size was found to be 61 taking population proportion of beta-thalassemia 6%, absolute precision of 6% and confidence interval 95% [3]. A total of 100 mothers were interviewed, out of which 83 mothers met the criteria and were included in this study. Socio-demographic details included children's age and gender, marital status, any psychological support taken, and the number of children with thalassemia in the family. The Kessler-10 (K10) was used to assess psychological distress. The US National Health Interview Survey designed this 10-item, self-administered questionnaire [13]. Based on questions about anxiety and depressive experiences encountered in the most recent 30-day period, it is intended to provide a global measure of psychological distress. Responses range from "none of the time" to "all of the time" on a 5-point Likert scale for each item. The sum of these 10 questions yields a composite score; higher scores suggest more psychological discomfort. [13]. K-10 scores were further subdivided into comparable levels of psychological distress, with a score under 20, a score 20-24, a score 25-29, and a score 30 or more indicating, respectively, no mental distress, a mild mental distress, a moderate mental illness and a serious level of distress. This questionnaire has Cronbach's alpha value of 0.705, indicating reasonable internal consistency. Frequencies and percentages were used to describe socio-demographic factors. A descriptive analysis was done to determine the levels of psychological discomfort experienced by mothers. To evaluate the relationship between demographic factors and psychological distress experienced by mothers of thalassemia-affected children, Spearman correlation was performed. The IBM Statistical Package for Social Sciences (SPSS) version 23.0 was used to analyze the data. A two-tailed $p < .05$ was defined statistically significant.

RESULTS

A total of 83 mothers were included in this study and the mean age of mothers being interviewed was 37.65±3.63 years. Majority 78.3% of the participants were unemployed. A sum of 24(29%) reported more than one child suffering from BTM. Table 1 shows demographic characteristics of participants.

Characteristics		N (%)
Child's age (mean±SD)	10.92±2.13	
Gender	Male	58 (69.9%)
	Female	25 (30.1%)
Mother's age (mean±SD)	37.65±3.63	
Single parenting	yes	17 (20.5%)
	No	66 (79.5%)
Employed	yes	18 (21.7%)
	No	65 (78.3%)
Any psychological support taken	yes	9 (10.8%)
	No	74 (89.2%)
Number of children with thalassemia in family	One child	59 (71%)
	More than one	24 (29%)

Note. N: Frequency; %: percentages; SD: Standard deviation.

Table 1: Demographic characteristics of participants (n=83)

In this study, 54 (65.1%) mothers had psychological distress. On the other hand, only 29(34.9%) mothers were well according to K10 questionnaire interpretation. Table 2 shows the psychological distress encountered by the mothers of children diagnosed with thalassemia.

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Distress	N (%)
Well	29 (34.9%)
Mildly unwell	22 (26.5%)
Moderately unwell	19 (22.9%)
Severely unwell	13 (15.7%)

Note. N: Frequency; %: percentages

Table 2: Distribution of Psychological Distress among mothers (n=83).

DISCUSSION

Researchers have long been interested in the well-being and quality of life of mothers taking care of their children with chronic illnesses. The mother's anguish and pain are often felt in tandem with the child's suffering. In our study, it was found that 54(65.1%) mothers were suffering from psychological distress. A study by Zolaly *et al*. concluded that stress symptoms were detected in 38.7% of patients [14]. However, in this study, both parents were included, while our study included mothers only. On the other hand, Ali S *et al*. reported psychological stress to be 60% among caregivers [15]. In a study done in Malaysia, psychological distress was present in nearly half of the parents of children with transfusion-dependent thalassemia(42%, n= 68) [16]. In our study, there were 69.9% male and 30.1% female children; Humaira Y. and Shahida H. also reported similar results. In their study, the majority (65.5%) had just one kid with BTM, but in our study, comparable results were obtained 59 (71%) [5]. In our study, the mean child's mean age was 10.92±2.13 years, while a study done in Pakistan documented 10.71±1.99 years [17]. The mean age of our caregivers was 37.65±3.63 years, similar to research conducted in Rawalpindi. According to our study, mild distress affected 26.5%, moderate distress affected 22.9%, and severe distress affected 15.7% of mothers. While a study conducted in Pakistan reported that among the caregivers mild, moderate and severe distress was found in 10 (20.8%), 13 (27.1%) and 25 (52.1%) mothers respectively [18]. Ankush *et al*. found that out of 7 mothers, 4 (57.14%) were psychologically affected by the chronic illness of their thalassemia children [19]. Similar to our findings, research carried out in India and a Greek transfusion center found no significant correlation between stress and the gender of patients and caregivers [1, 20].

CONCLUSIONS

Our study identified that most mothers of children suffering from thalassemia had psychological distress. Thus, these mothers are at risk of poor health outcomes and should be targeted for screening and treatments focused on improving their health and well-being.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Effects of Combined Glucosamine/Chondroitin with Structured Physical Therapy Program on Knee Osteoarthritis: A Randomized Control Trail

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ABSTRACT

Osteoarthritis is the most debilitating condition in general population. The incidence rate of this condition is very high. **Objective:** this study was conducted to observe the effectiveness of glucosamine/chondroitin alone and in combination with physiotherapy on Knee osteoarthritis. **Methods:** A randomized control trail registered at clinicaltrials.gov under the trail no of NCT05321836. Data was collected from the Physiotherapy clinic and Neurocounsel Hospital Islamabad from 26 July 2021 to 25th March 2022. 30 participants met inclusion criteria and were randomly divided into two groups via envelop method. The experimental group was given unlabeled 1500/1200 mg of GH/CS per day for period of 6 months along with physiotherapy treatment for two months (3 sessions per week). The Control group was treated with 1500/1200 mg of unlabeled GH/CS per day for 6 months. Tools used to measure the outcome were WOMAC scale & SF-36. Measure were taken at baseline, 4th week and at 8th week. Repeated Measure ANOVA was used to analyze results at various weeks and Post Hoc analysis was opted for comparison between groups. SPSS version 21.0 was used for data analysis **Results:** Means±S.D of age in experimental & control group was 64.80±9.65, 60.93±7.61respectively. Repeated measure ANOVA within both groups significant difference at various weeks of treatment as $p<0.05$. Between groups, Independent t' test also revealed statistically significant difference as p-value was <0.05. **Conclusion:** GH/CS along with physiotherapy is very effective in reducing patient's pain, improving functions, mobility along with quality of life as compared to GH/CS alone.

INTRODUCTION

Osteoarthritis is the disease of synovial joint which is considered to be the most bothersome arthritic condition among older population. The progressive degeneration of subchondral bone along with synovial membrane starts due to metabolic & structural changes in joints. So, OA is not just the involvement of cartilage but also of synovial membrane and subchondral bone [1]. OA is classified into different phenotypes i.e mechanical induced, OA due to obesity, aging related osteoarthritis etc. stratification of its management related to specific phenotype is thought to be effective in each condition. Identification of specific phenotype is a challenge for clinicians [2]. SYSADOA (symptomatic slow acting drugs for osteoarthritis)includes two natural substances, one is glucosamine and other is chondroitin sulfate. Some of these compounds have also the ability to modify disease progression (DMOAD) on narrowing of joint space when measurement taken on radiographs [3]. OARSI, in year 2008 published guidelines for the management of Hip and Knee OA along with consensus from some experts in the field that glucosamine sulfate and chondroitin sulfate have the disease modifying capabilities with respect to structural cartilage change.

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Treatment should be discontinued if no improvement is observed after 6 months use [4]. Later studies supported these recommendations. In MOVES trail it was observed that 6 months use of fixed dose GS/CS efficacy combination has effects on pain functioning of patients comparable to celecoxib. Both treatments have significant reduction is patient's pain clinically approximately around 50%. Also, neck stiffness (celecoxib 49.2% & 46.9% in GS/CS) and functioning (46.4% & 45.6& respectively) of patient showed comparable outcomes. Euro-5D-5L showed marked improvement in quality of life along with pain reduction on VAS (visual analog scale). OMERACT-QARSI criteria was met by more than eighty percent of patients. Joint effusion and swelling were also improved in both groups [5]. Outcome by the use of glucosamine and Chondroitin sulfate are slow in onset but has long lasting effects on severity of pain reduction and also enhances the patient's quality of life. Patient's physical functional improvement has also been demonstrated. Exercises play a vital role in the management of knee osteoarthritis. Different exercise protocols are done in this regard i.e ROM (range of motion) exercises, strength & endurance training etc. Home plan exercises and education of patient are also crucial. Manual therapists & PT (Physiotherapist) use various exercise programs in combination to improve patient pain and quality of life. Mobilization of joint and soft tissues along with Maitland & Kalternborn joint oscillations traction are first step treatment protocols aim to reduce pain, disability & to improve joint stability along with mobility of OA patients. Knee flexion is the most bothersome mobility disorder of OA sufferer due to joint restricted movement. Many randomized control trails have demonstrated the effectiveness of above-mentioned manual techniques in relieving pain and improving mobility and QoL of osteoarthritis sufferer [6]. There is no consensus in literature on GS/CS along with manual therapy on the management of knee OA. This study will be helpful clinically in the management for OA which will be less expensive and non-invasive as well. The rationale of this study was to compare the effectiveness of glucosamine chondroitin alone & in combination with manual therapy on the management of knee osteoarthritis.

METHODS

A single blind randomized contrail was registered at clinicaltrails.gov under trail registry number NCT05321836, was conducted in 30 patients at the physiotherapy clinic and the Neurocouncil, Islamabad. Patients were divided into two equal groups by non-probability simple convenient sampling technique. WHO calculator was used for sample size calculation & significant level was set 5% and 95% was power of study. Patient who were more than 50 years of age. Kellgren grade I-III (radiological evidence of OA who fall in these grades). All those patients who met ACR criteria. Radiographic confirmation of OA by their primary Physician & those not involved in any other study or taking other drugs were all included. And following patients were excluded, those patients who have dementia and having MMSE (mini mental status examination) score less than 24. Any type of cancer except skin cancer. Anemic patients who have Hb level below 10 or HCT <32 and also hemophilic because such patients cannot do adequate exercise due to their low tolerance and hemophilic has the tendency to bleed in their joints as well. Renal insufficiency. Hepatic disorder as glucosamine is metabolized in liver. Those who are unable to walk for 6 minutes and complete 128 m distance in such time interval. Patients who are involved in ant other study or taking other medications for OA. After taking approval from ethical review committee via reference no ERC75/14 participants were divided to either group A (control group) glucosamine plus CS group & group B (experimental group) glucosamine+chondroitin with physiotherapy group. The group A was treated with unlabeled 1500/1200 mg of GH/CS per day for period of six months. The participants were free to choose either once (OD) or TD (three times per day) regimens. The control group was given unlabeled dose of GH/CS 1500/1200 mg per day for six months along with physiotherapy treatment consisting of manual therapy combined with different exercises for a total of 24 sessions spanning across two months (3 sessions per week). Each participant was evaluated by research interventionist to monitor study drug & rescue medication usage (pill counts). The physiotherapy session instigated and ended with warm-up and cool-down period of 5-min, correspondingly. The exercise stage included manual therapy session (two sets of tibifemoral & patellofemoral oscillations) along with 20 min of strength training. Each strength drill session comprised of 10 to 12 repetitions of the subsequent exercises: (1) leg curl, (2) leg extension with heel raise, and (4) step up. Weight was augmented from 2.5 to 5 lb. increments, depending on the patients, after 12 repetitions of two sets had been performed for consecutive two days. A 1 to 1.5 min rest interval separated each exercise. The assessment was carried out using WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index) for measuring the health status including pain, stiffness, and function. Quality of life was assessed using SF-36 questionnaire.

RESULTS

In experimental group the means+S.D of age was 64.80+9.65 where as in control group it was 60.93+7.61. The frequency of male in experimental group was 4(26.7) and of females was 11(73.3). but in control group n=7 (46.7) were

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males and n=8(53.3) were females. We employed repeated measure ANOVA to analyze the data at 0th, 4th, 8th week intervals. But for quality of life (SF-36) our data was not normally distributed so test of choice was Man Whitney U test. For WOMAC Scale repeated measure ANOVA showed in experimental group mean+SD at baseline was 0.72+0.16 and at 4th & 8th week was 0.60+0.12 & 0.41+0.20 respectively. The p-value was <0.05 which demonstrated that there was a significant difference at various weeks of treatment in experimental group. In control group the mean+SD at baseline, 4th & 8th week were 0.70+0.12, 0.64+0.12 & 0.51+0.20 respectively. P-value was also <0.05 which also showed improvement in control group. For QoL, we used SF-36 questionnaire, median and interquartile of experimental group at baseline was 37.82(1.75) & in control group it was 36.89(21). But after the intervention when we compared the results in both groups at 8th week in control group the median and IQ was 76.62(3) & in experimental group it was 92.56(3.47). p-value was 0.000*** which was <0.05. This implied that with the use of physiotherapy along with glucosamine chondroitin had much improvement as compared to control group intervention (Table 1).

Repeated measure ANOVA				
Variable (WOMAC)	**Baseline value Mean+SD**	**4th week value Mean+SD**	**8th week value Mean+SD**	**p-value**
Experimental group	0.72+0.16	0.60+0.12	0.41+0.20	0.001***
Control group	0.70+0.12	0.64+0.12	0.51+0.20	0.003**
Man-Whitney U test between groups analysis				
	Experimental group Median (IQ)	**Control group Median (IQ)**	**p-value**	
SFQOL (0 week)	37.82(1.75)	36.89(21)	0.04	
SFQOL (8 week)	92.56(3.47)	76.62(3)	0.000*	

Table 1: Between groups Analysis (Statistical Tests)

As our data was normally distributed for WOMAC scale so we used this statistical test. We used Post Hoc analysis for comparison between various week in both groups as mentioned in table 2.

Experimental group	Mean+SD	Mean difference	p-value
0-4	0.60+0.12	0.12	0.004*
4-8	0.41+0.20	0.19	0.001*
0-8	0.41+0.20	0.31	0.000**
Control group			
0-4	0.64+0.12	0.06	0.01*
4-8	0.51+0.20	0.13	0.01*
0-8	0.51+0.20	0.19	0.001**

Table 2: Post Hoc Analysis of Variable in both Groups

To compared the mean of WOMAC scale between groups we used independent t' test. It was obvious from the graph that experimental group participants had much improvement in mean score after 4th and 8th week as compared to control group (Figure 1).

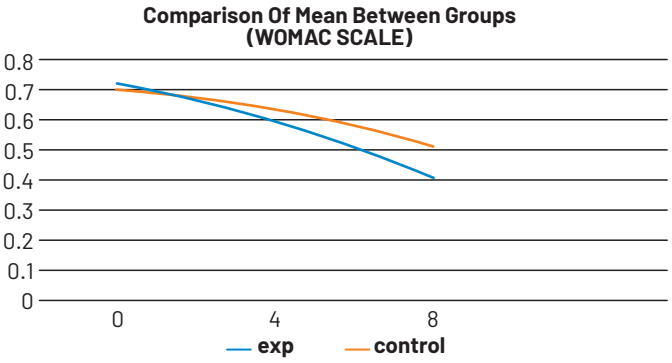

Figure 1: Independent T' Test for between groups Analysis

DISCUSSION

Glucosamine in combination with chondroitin sulfate have widely gained population as an alternative treatment for OA. Two studies of long-term duration have demonstrated that patient self-reported pain and physical function has significantly improved after 3 years of treatment with these compounds [7, 8]. Another study also supported abovementioned results by depicting no reduction in joint space after CS administration for 2 years. But no significant improvement was observed relative to placebo [9]. Various studies have confirmed that combination of GS/CS has beneficial effects on knee OA and can be utilized as alternative treatment option [10]. One research has confirmed that glucosamine plus Chondroitin sulfate have significant role in reduction of participants moderate to severe pain intensity in subset analysis. In patient groups significant reduction in mild to moderated pain intensity was contributed due to no significant group difference. At the conclusion of treatment, both groups had improved function and decreased pain. After 3 months of treatment with GS/CS in combination with manual therapy have demonstrated significant improvement at baseline and at various intervals as compared to placebo [11]. In osteoarthritis management glucosamine and chondroitin sulfate show long lasting effects in pain reduction but they have slower onset of action [12, 13]. In one study it was observed that NSAID (Celecoxib) has superior effects in OA pain reduction as compared to glucosamine when used for 1-4 months but after 6 months results showed that both groups have similar effects (when evaluated on WOMAC scale & VAS of Huskisson) on intensity of pain and functional mobility of patients [14]. Several researched showed that supplements of GS/CS are more beneficial for OA patients. When administered for period of 3 years with dose of 1500mg per day revealed no further reduction in joint space of patient and improvement on WOMAC scale of OA [15]. Another study depicted that 2000mg per day of GS/CS use for 12 weeks has improved patient's quality of life and self-reported reduction in routine pain perception as well [16]. It was reported by some authors that 1500mg/d of

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glucosamine Chondroitin or MSM use for 12-weeks intervals has analgesic and anti-inflammatory effects and showed reduction in patient's pain and enhanced QoL along with functional independence in mild to severe from of OA [17]. The results of our study are supported by above mentioned studies. Therapeutic exercise programs have also aided in symptom management of OA participants. ACSM (American college of sport medicine) has published some guideline for OA management e.g static stretching for enhancing patients muscle flexibility, aerobic exercises (around Vo2 max of 40-60% for half an hour, for 3-5days per week, resistance exercises of low intensity (10-12 reps Or 40-60% or one repetition maximum for 2-3 times/day) involve major muscles [18]. In overweight and obese patient regular exercises have also showed improvement in patient balance, functional mobility & quality of life. Therefore, weight reduction are also thought to be beneficial for symptoms management of OA [19, 20].

CONCLUSION

The GH/CS plus Physical therapy was found to be superior in the management of knee OA than just glucosamine chondroitin in reference to patient's function, pain, or mobility.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Serum IL-1 B Levels in Preeclamptics and Non-Preeclamptics Affected With or Without Periodontitis

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ABSTRACT

Literature supported the association of bio-inflammatory cytokines in multifactorial pathologies such as preeclampsia and periodontitis. **Objectives:** To compare serum IL-1β in non-preeclamptic and preeclamptic pregnancies affected with/without periodontitis. **Methods:** Longitudinal cohort study was conducted on 73 pregnant women of Narowal (Pakistan) aged between 18-34 years, after seeking their consent. Wherein 33 subjects were periodontally healthy (6 preeclamptics, 27 non-preeclamptics) while 40 subjects were with periodontitis (6 preeclamptics, 34 non-preeclamptics). Serum samples were collected in antepartum and postpartum periods of the same subjects. Periodontium was examined by CPITN index, preeclampsia via blood pressure records. IL-1β was estimated through ELISA. **Results:** Raised IL-1β(pg/L) were observed in postpartum than antepartum i.e. 76% in non-preeclamptics with periodontitis(p=0.099), 89% in periodontally healthy non-preeclamptics(p=0.082), 313% in preeclamptics with periodontitis(p=0.242), and 34% in preeclamptics with healthy periodontium(p=0.351). Likewise, elevated IL-1β levels were found in non-preeclamptics than preeclamptics in antepartum and postpartum i.e. 327% in antepartum of periodontitis-affected non-preeclamptics(p=0.251), 0.43% in antepartum of periodontally healthy normotensives(p=0.983), 82% in postpartum of periodontitis affected non-preeclamptics(p=0.382), and 41% in postpartum of periodontally healthy non-preeclamptics(p=0.611). Similarly, high IL-1β levels were estimated in antepartum: 23% in non-preeclamptics with periodontitis than periodontally healthy non-preeclamptics(p=0.553) and 248% in periodontally healthy preeclamptics than periodontitis-affected preeclamptics(p=0.011). Also, increased IL-1β levels were noticed in postpartum: 15% in normotensives with periodontitis than periodontally healthy non-preeclamptics(p=0.694) and 12% in periodontally healthy preeclamptics than periodontitis-affected preeclamptics(p=0.853). **Conclusion:** Pregnancy suppressed IL-1β in preeclamptic and non-preeclamptics, while periodontitis without preeclampsia raised IL-1β in pregnancy and post-pregnancy phases.

INTRODUCTION

Periodontitis and preeclampsia are multifactorial pathologies that are supposed to be linked together through systemic inflammatory mediators or cytokines. Even though researchers are persistently trying to find the nature of the association between periodontitis and preeclampsia, the true association is yet to be ascertained [1]. Periodontal pathologies are bacterial-plaque-induced infectious diseases of the bony and soft tissues supportive structures around the teeth [2]. Those infectious periodontal tissues locally raise the concentration of certain cytokines like interleukin-1 β (IL-1 β), prostaglandin E-2(PGE-2), interleukin-6(IL-6), and tumor necrosis factor-α (TNF-α) [3, 4]. Those cytokines through systemic circulation exacerbate inflammatory reactions [1]. Microbiota involved in periodontitis is linked to the systemic pathologies through the release of direct or indirect immune-mediated destructive mediators [5]. Similarly, periodontitis has also been related to preeclampsia by many researchers [6, 7]. A study in 2017 revealed a high level of IL-8 in the gingival crevicular fluid (GCF) among the

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patients affected with periodontitis while the same type of patients exhibited an increased concentration of IL-6 in another study conducted in 2018 [8, 9]. Preeclampsia as a gestational syndrome is considered an alarming ailment, mainly characterized by the onset of hypertension with proteinuria after the 20th week of pregnancy. According to a study, preeclampsia is responsible for about 6-10% of total neonatal and maternal mortalities in the world [10]. Though many studies could not reveal the exact pathophysiology of preeclampsia [2, 11]. However, a few studies found out the cause of preeclampsia by proposing different pathogenesis like atypical trophoblastic development, placental malfunctioning, and immune-inflammatory pathology [10, 12]. Moreover, other studies also mentioned various genetic, environmental, socioeconomic, ethnic, and immune-inflammatory factors that influence the onset and severity of preeclampsia [2, 13]. A study in the same lines claimed the rise of numerous circulatory cytokines in preeclamptic subjects. IL-1 β, IL-2, IL-6, and INF-γ showed a positive association with preeclampsia. IL-1 β a pro-inflammatory mediator is released by several cellular varieties including monocytes, macrophages, keratinocytes, fibroblasts, synoviocytes, and epithelial cells [14]. Another study from North India supported the argument that IL-1 β stimulates the production of other cytokines like TNF-α, INF-γ, IL-2, and IL-12 [1,15]. In 2014 a group of researchers found the enhanced placental expression of IL-1 β in preeclamptic women [13]. The present study aims to compare serum IL-1 β concentrations in both preeclamptic and non-preeclamptic pregnant women either affected with periodontitis or otherwise.

METHODS

A prospective longitudinal cohort study was carried out in rural, under-developed city of Narowal, Pakistan by using convenience sampling approach. The study spanned just over one and half years, from June 2016 to February 2018. Pregnant women aged 18–34 years within 14-24 weeks of pregnancy belonging to rural areas of Narowal District affected with or without periodontitis were included in the study. While pregnant women aged under 18 or above 34 years, with less than 14 or more than 24 weeks of pregnancy, or affected with some other periodontal pathology like gingivitis were excluded from the study. Cochran's Formula was used to calculate the sample size. To get an estimated population portion (p) a thorough survey of the local population was carried out prior to the sampling. According to the best of our knowledge, no previous study was available to readily give an estimation of the prevalence of pregnant women affected with periodontitis in Pakistan. However, the survey conducted on the study population determined a 57% prevalence. There were a total of 73 pregnant women who participated in the study in two consecutive phases (antepartum and postpartum), So serum samples were first taken in their antepartum phase and serum samples were again collected from the same subjects in their postpartum phase. Out of 73 subjects, 40 were with periodontitis (further subdivided as 34-nonpreeclamptics, and 6-preeclamptics) and 33 were with healthy periodontal status (further subdivided as 27-nonpreeclamptics, and 6-preeclamptics). The study was also approved by the Ethical Review Board of the Institute. Written consent was sought from the subjects after duly informing about the study purpose and routine examination procedure. The periodontal status of each participant was thoroughly evaluated by using CPITN (Community Periodontal Index for Treatment Need) index in the presence of an adequate light source. The assessment of clinical attachment loss at gingival sulcus in millimeters was categorized according to the criterion given by 'American Dental Association/American Academy of Periodontology 1999'. Pocket depth of more than 3mm for ten indexed teeth including: 11, 16, 17, 26, 27, 31, 36, 37, 46, and 47 as per 'Federation Dentaire Internationale' (FDI) numbering system, with all four sides of each tooth i.e. mesial, distal, buccal / labial and lingual / palatal, was labelled as periodontitis. Moreover, as an incentive the oro-dental diagnosis of each participant was shared with her and the related treatment options were also recommended subsequently. Participants were professionally advised about the ways to take care of their periodontium on daily basis. Serum samples were collected from the participants in two successive gestational phases. Firstly, in the antepartum phase i.e. between 14-24 week of gestation. Secondly, from the same participants in their postpartum period (within 6 weeks after child birth). To confirm preeclampsia, the blood pressure record of the subjects was acquired from their physician/gynecologist after seeking their permission. Pregnant women having normal blood pressure profile before pregnancy but characterized by high blood pressure and clinical features of edema, severe headache, dizziness, vision changes, nausea, and vomiting during pregnancy were labelled as preeclamptics. Labelled serum samples were kept in Eppendrofs and then refrigerated at -80°C. Ninety six-welled ELISA plates specified for serum IL-1β levels (pg/L) were used separately for the estimation of IL-1 β levels of antepartum and postpartum serum samples and the values were observed through interpolation method. The data was analyzed by using Microsoft Excel and Minitab®18. Student T-Test was employed as a statistical test to determine the significant difference between the two groups. All the statistical tests were performed with 95% confidence interval.

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RESULTS

Non-preeclamptic subjects with healthy periodontium showed 89% increased IL-1 β (pg/L) serum levels in the postpartum period compared to the antepartum period (p=0.082). Whereas, preeclamptic subject with healthy periodontium exhibited 34% high IL-1 β (pg/L) serum levels in the postpartum period than in the antepartum period (p=0.351) (Table 1). Non-preeclamptic subjects with periodontitis displayed 76% increased IL-1 β (pg/L) serum levels in postpartum period compared to the antepartum period, (p=0.099). While preeclamptic subject affected with periodontitis revealed 313% higher IL-1 β (pg/L) serum levels in the postpartum period than in the antepartum period (p=0.242) (Table 1).

Studied Groups		Gestational Phase				p-value
		Antepartum		Postpartum		
Periodontium	Preeclampsia	n	Mean±SEM	n	Mean±SEM	
Healthy i.e. ≤3mm sulcus depth with no gingival inflammation	Without	27	37.41±5.03	24	70.7±19.5	0.082
	With	6	37.57±9.45	6	50.16±8.56	0.351
Periodontitis i.e. >3mm sulcus depth with inflamed gingiva, at least grade I mobility)	Without	34	46.1±12.5	28	81.3±18.4	0.099
	With	6	10.8±0.71	6	44.64±27.67	0.242

Table 1. Gestational Comparison of serum IL-1 β Levels (pg/L) among studied groups

Non-preeclamptic subjects affected with periodontitis in their second trimester presented 327% raised serum IL-1 β levels (pg/L) compared to preeclamptic subjects (p=0.251). On the other hand, Non-preeclamptic subjects with healthy periodontium in their second trimester showed only 0.43% high serum IL-1 β levels (pg/L) than that of preeclamptic subject (p=0.983) (Table 2). In postpartum phase subjects with periodontitis revealed 82% more serum IL-1 β levels (pg/L) in non-preeclamptics than preeclamptics (p=0.382), while in the same phase the subjects with healthy periodontium showed 41% raised serum IL-1 β levels (pg/L) in non-preeclamptics than preeclamptics (p=0.611) (Table 2). In the antepartum period, non-preeclamptics affected with periodontitis exhibited 23% more serum IL-1 β levels (pg/L) compared to non-preeclamptics with healthy periodontium (p=0.553). Whereas, in the same phase, preeclamptics with healthy periodontium revealed 248% increased serum IL-1 β levels (pg/L) than those affected with periodontitis (p=0.011). Besides the difference proved statistically very significant (Table 2). In the postpartum phase, non-preeclamptic subjects having periodontitis showed 15% high serum IL-1 β levels (pg/L) than those without periodontitis (p=0.694) while the preeclamptics in the same phase showed 12% more serum IL-1 β levels (pg/L) in those who possessing healthy periodontal status compared to periodontitis affected patients (p=0.853). Although the differences were proved statistically insignificant (p>0.05) (Table 2).

Comparative Groups		Periodontal Status				p-value
		Healthy Periodontium		Periodontitis		
Periodontium	Preeclampsia	n	Mean±SEM	n	Mean±SEM	
Antepartum	Without	27	37.41±5.03	34	46.1±12.5	0.553
	With	6	37.57±9.45	6	10.8±0.71	0.011*
p-value		0.983		0.251		
Postpartum	Without	24	70.7±19.5	28	81.3±18.4	0.694
	With	6	50.16±8.56	6	44.64±27.67	0.853
p-value		0.611		0.382		
* Statistically significant as p≤0.05.						

Table 2. Serum IL-1 β Levels (pg/L) in comparative groups with respect to periodontitis and preeclampsia

DISCUSSION

In periodontal pathology, there are alternate episodes of periodontal decay and retardation, mainly because of gram-negative bacteria [16, 17]. Periodontitis is an infectious disorder that constantly devastates the periodontium of the tooth, though in a sluggish manner by supra and sub-gingival bacterial pathogens [3]. Periodontitis is a severe periodontal ailment affecting 5-20% of pregnant women across the World [1]. Many studies suggest that pregnant women with periodontitis are more prone to preeclampsia due to the possible translocation of periodontal pathogenic bacteria to the fetoplacental membranes that ultimately lead to immense inflammation and oxidative stress [18, 19]. Intense inflammation stimulated by oral infection may contribute to uteroplacental atherosclerosis, as observed in preeclamptic patients [2]. Other studies conclude that the presence of pathogens at placental cells activates Natural killer cells in the uterus to release pro-inflammatory cytokines such as TNF-α and IL1-β that more deleteriously affect placental membranes [19, 20]. Although the clear etiopathogenesis of preeclampsia is yet to be defined, still there is consensus by many researchers on the role of placental modifications in the ultimate pathology of preeclampsia. Increased serum levels of many cytokines such as TNF-α (Tumor necrosis factor-α), GM-CSF (Granulocyte-macrophage colony-stimulating factor), IL-10, and TGF-β1 (Transforming growth factor-beta 1) are examined in the focal placental tissues in preeclamptics. Similarly, raised serum levels of many angiogenic mediators like PlGF (Placental growth factor), VEGF (Vascular endothelial growth factor), and Flt-1 (Fms Related Tyrosine Kinase 1) are also observed in the focal placental tissues in preeclamptics [18]. Similar to the findings of the current study, another study also revealed that the pregnancy hormones -progesterone and estradiol - promote prostaglandin E-2 levels and reduce the release of cytokine IL-1β [21]. The current study has been conducted with relatively small sample size. Also, the daily nutritional intake of the studied population and their BMIs have not been recorded. In the future, a study with large sample size,

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varied ethnicity, and wide range of age may better explore the relation of periodontitis with adverse gestational consequences.

CONCLUSIONS

Periodontitis in non-preeclamptics increases serum IL-1 β levels in antepartum as well as in the postpartum phases. Likewise, periodontitis in preeclamptics decreases serum IL-1 β levels in both phases. Moreover, periodontitis markedly elevates IL-1 β levels in the postpartum phase, both in preeclamptics and non-preeclamptics. Besides in preeclamptics and non-preeclamptics, pregnancy suppresses IL-1 β levels in subjects with and without periodontitis.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Raised Intraocular Pressure Following Phacoemulsification; A Comparative Study with Two Different Viscoelastic

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ABSTRACT

The new modalities in surgical phacoemulsification techniques are intended to restore the visual acuity and have minimized postoperative astigmatism. **Objective:** To evaluate the difference in the raised intraocular pressure after phacoemulsification and insertion of an intraocular lens using 2% hydroxymethyl cellulose and 1% sodium hyaluronate as viscoelastic. **Methods:** This group comparative study was performed in the Department of Ophthalmology, Khyber Teaching Hospital, Peshawar for six months. A thorough slit lamp examination was executed to confirm intraocular inflammation or proof of prior intraocular surgery. For glaucoma, Gonioscopy was performed along with proper fundus examination. Patients in Group 1 received 2% Hydroxymethyl Cellulose while in Group 2 patients received 1% Sodium Hyaluronate as viscoelastic. No pressure lowering drug was used and mean intraocular pressure was calculated using Goldman Applanation Tonometer. Intraocular pressure was measured preoperatively and then after 6, 12 and 24 hours and then after one week of surgery. **Results:** In Group 1, mean age was 65 ± 8.5 and mean Pre Op IOP was 13.1 ± 2.1. Mean Postop IOPs were 13.8, 14.2, 15.1 and 17.5 at 6, 12, and 24 hours and after 1 week respectively. In Group 2, mean age was 62.7 ± 8.3 and mean Preop IOP was 13.2 ± 2.3. Mean Postop IOPs were 13.5, 13.9, 15.1 and 15.9 at 6, 12, and 24 hours and after 1 week respectively. **Conclusions:** Mean intraocular pressure rise was significantly greater at one week after phacoemulsification and insertion of an intraocular lens using 2% hydroxymethyl cellulose as viscoelastic.

INTRODUCTION

Phacoemulsification is considered to be the most effective procedure for visual rehabilitation and recovery; it usually involves small incisions of 2mm in length, rather than sutures or stitches. It was introduced first by Kelman in 1967 in order to deal with cataract management. Phacoemulsification is the emulsification of the eye's natural lens; it is a very advanced and effective technique for acquiring safety and success during cataract surgery [1-3]. Intraocular Pressure (IOP) is the pressure of the fluid in an eye. The flow of the liquid (aqueous humor) into the anterior and posterior chambers is responsible for the shape of the eye along with other visual properties. Its main tasks are that is transportation of neurotransmitters, provide strength/nutrition to avascular lens and cornea, helps in the maintenance of the ocular structure, etc [4, 5]. Viscoelastic aka Ophthalmic Viscosurgical Devices (OVDs), thick sticky stuff helps during the cataract surgery and makes phacoemulsification safe and achievable, damage to the eye is usually prevented during cataract surgery with the help of Viscoelastic Substances (VES) by replacing aqueous with thick VES. A perfect VES must be free from any kind of microorganisms, hydrophilic, ability to be diluted, well clear, and do not possess any inflammatory properties [6]. More importantly, VES must contain some

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very critical traits like elasticity, viscosity, and pseudo-plasticity for preventing any damage to the anterior chamber. The property of elasticity prevents any damage to the eye as a result of vibration and the shock occurrence by operating the device, viscosity helps in lubrication and safeguarding, and pseudo-plasticity assists in disfiguring of material, which ensures safe control of the tissues [7]. The role of VES in performing phacoemulsification can never be neglected as it prevents corneal endothelial from any damage, keep away broken fragments by causing damage to the posterior capsule, during Continuous Curvilinear Capsulorhexis (CCC) VES plays a vital role in the maintenance of anterior chamber, protecting intraocular tamponade and before Intraocular Lens IOL implant, capsular bag filling. VES is either Cohesive or Dispersive, 1% Sodium Hyaluronate (SH) falls into the category of cohesive VES as its weight of molecules and viscosity is high, which makes it a mass alike giving it the properties regarding tissues stabilizing, displacement, and to sustain the anterior chamber [8, 9]. Dispersive VES includes 2 % Hydroxymethyl Cellulose (HC), which showed promising results in phacoemulsification for endothelium safety against flowing substance, moreover, 2% HC has less viscosity, little ability to intertwine, and its chain of molecules are small in size 8. Elevation in IOP, after the procedure, is noted to be a harmful effect as a result of VES usage in phacoemulsification. The adverse effect of a raise in IOP was commonly observed after few hours of the procedure and comes back to normal after 48 hours maximum [10]. The development of new surgical phacoemulsification techniques is aimed at restoring visual acuity (VA) in order to secure a fast return to normal social life and work. Small incision phacoemulsification procedures have minimized postoperative astigmatism and furthers comparative researches in this part of ophthalmology are highly needed. Therefore, this study was planned with an objective to evaluate the difference in the raised intraocular pressure after phacoemulsification and insertion of an intraocular lens using 2% hydroxymethyl cellulose and 1% sodium hyaluronate as viscoelastic

METHODS

This group comparative study was carried out in Ophthalmology Ward B and the Out Patient Department (OPD) of Khyber Teaching Hospital, Peshawar for six months (November 2020 to May 2021) after taking approval from Hospital's Ethical Committee (IREB No. 002/ADR/KMC). Written consent was taken from the patients participating in the study after informing them about the study. A total of 64 subjects fulfilling the inclusion criteria were selected for the study on the basis of random sampling using simple random number table. The inclusion criteria was defined as patients having age between 45 to 70 years, immature senile cataract having normal IOP of 11mm Hg to 21 mm Hg and gonio scopically open angle (Shaffer's grade III and IV angles). Patients having history of earlier intraocular surgery, diabetes, intraocular inflammation, glaucoma, hypertension and traumatic cataract were disqualified from the study. Through the OPD, patients were analyzed for phacoemulsification and insertion of an IOL as per the sign of a senile small cataract. A structured and validated proforma was employed to record the details of the patients. A thorough slit lamp examination was executed to confirm intraocular inflammation or proof of prior intraocular surgery. For glaucoma, Gonioscopy was performed along with proper fundus examination. Patients were later randomly allocated into 2 groups through lottery method. Group 1 received 1% sodium hyaluronate as viscoelastic. Group 2 received 2% hydroxymethyl cellulose as viscoelastic. All the interventions were performed by the single trained and reliable ophthalmologist. No pressure lowering drug was used pre operatively and mean IOP was calculated using Goldman Applanation Tonometer. IOP was measured preoperatively and then after 6, 12 and 24 hours and then after one week of surgery. Data were analyzed using SPSS version 20.0. For categorical data frequencies and percentages were used. Mean and standard deviation were calculated for continuous data. Student t test was performed for mean IOP comparisons of each group at 1st week. P value >0.05 was considered statistically significant.

RESULTS

The mean age of the patients in Group 1 was 62.5 ± 8.5 and in Group 2 was 62.7 ± 8.3. Group 1 have n=10 (31.25%) of the patients between age 45-60 years while, 22 (68.75%) of the patients in the age group of 61-70 years. In Group 2, n=10 (31.25%) of the patients in 45-60 years of age whereas, 22 (68.75%) of patients were of age between 61-70 years. In Group 1, 20 (62.5%) patients were males and 12 (37.5%) patients were recorded as females whereas, in Group 2, 20 (62.5%) patients were males and 12 (37.5%) patients were females. Significant difference in the rise of IOP has been observed between the two groups. Mean and SD for Pre and Post IOP at different time intervals is demonstrated (Table 1).

Groups	Preop IOP	Postop IOP at 6 Hours	Postop IOP at 12 Hours	Postop IOP at 24 Hours	Postop IOP at one week
Group 1	13.1 ± 2.1	13.8 ± 2.2	14.2 ± 2.3	15.9 ± 2.2	17.5 ± 2.4
Group 2	13.2 ± 2.3	13.5 ± 2.3	13.9 ± 2.4	15.1 ± 2.5	15.9 ± 2.1
Total	13.5 ± 2.2	13.7 ± 2.3	13.9 ± 2.2	15.6 ± 2.5	17.2 ± 2.5

Table 1: Mean and SD for Pre and Post IOP at different time intervals
Group 1= 2% hydroxymethyl cellulose

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Group 2 = 1% sodium hyaluronate
Stratification of Mean IOP at one week with age and gender are illustrated (Table 2 and 3).

Mean IOP	Group 1 (n=32)	Group 2 (n=32)	p-value
45 to 60 yrs	15.6 ± 2.2	17.4 ± 2.1	0.00001
61 to 70 yrs	15.9 ± 2.5	17.2 ± 2.3	0.00001
Total	32 (100%)	32 (100%)	64 (100%)

Table 2: Stratification of Mean IOP with Age
Group 1 = 2% hydroxymethyl cellulose
Group 2 = 1% sodium hyaluronate

Mean IOP	Group A (n=32)	Group B (n=32)	p-value
Male	15.6 ± 2.1	17.4 ± 2.2	0.00001
Female	15.9 ± 2.2	17.2 ± 2.4	0.00001
Total	32 (100%)	32 (100%)	64 (100%)

Table 3: Stratification of Mean IOP with Gender
Group 1 = 2% hydroxymethyl cellulose
Group 2 = 1% sodium hyaluronate

DISCUSSION

This study was aimed to evaluate the difference in the raised intraocular pressure after phacoemulsification and insertion of an intraocular lens using 2% hydroxymethyl cellulose and 1% sodium hyaluronate as viscoelastic and found significantly greater mean intraocular pressure at one week after using 2% HC in comparison to 1% SH as viscoelastic and so the application of such viscoelastic substances like HC may improve the eminence of anterior chamber eye surgery. The use of materials such as viscoelastic in cataract surgery were for the first time described in 1972 [11,12]. Viscoelastics or ophthalmic viscosurgical devices (OVDs), enable the cataract operation by preserving the deepness and the overall anatomy of the anterior chamber of eye. This gives the surgeon enough workspace along with the provision of viscous barrier which shelters the delicate and febrile corneal endothelium. Malvankar-Mehta *et al.*, found that damage to the corneal endothelium was mainly because of the surgical instruments, the cataractous lens debris along with the intraocular lens and injector during the procedure of insertion [13]. Kalode *et al.*, found in his study high IOP was one of the commonest post-operative complications after the procedure of phacoemulsification [14]. The initial post-operative rise in IOP was predominantly associated with the obstruction of trabecular meshwork which is actually because of the remains of OVD in the eye [15]. HPMC are the units of less viscous OVDs which do not stick to each other and therefore are highly dispersive. This dispersive property of low-viscosity OVDs was relatively difficult to eliminate from eye completely [16]. Bardoloi *et al.*, study also reported that retained viscoelastic and susceptibilities like trabecular trauma or unidentified or neglected glaucoma were the foremost reasons behind the IOP increase post-operatively [17, 18]. Furthermore, Payal *et al.*, study related the consequence concerning HC and SH and on IOP and found significant rise in IOP in SH [19]. Another Lin *et al.*, study also described the escalation in IOP from 55 to 60mm of Hg when the anterior chamber was being injected with SH as it obstructs the trabecular meshwork [20]. Numerous surgical procedures were therefore carried out with the aim to completely remove the OVD, predominantly from the backside of the IOL, but unfortunately none of them succeeded in avoiding the development of postoperative IOP rise [21]. In present research, a comparison was been made between the insertion of intraocular lens employing 2% HC and 1% SH as viscoelastic and found significant rise in IOP when 2% HC was used. These results are better in comparison to another similar study related to IOL implantation by means of hydro implantation [22, 23]. One more study has compared the hydroimplantation and viscoimplantation and concluded the same depth of capsular bag and the anterior camera. Watanabe *et al.*, observed no difference in corneal edema one day one post operatively and less time of 40 to 60 seconds was required in lens implantation of hydroimplantation group in contrast to 2.4 to 4 minutes in viscoimplantation group [26]. Moreover, when attempts were made to completely remove the viscoelastic, it was frequently impossible and also increased the duration of operation. The in return rise in postoperative IOP levels may also result in injury to the optic nerve leading to ischemia exclusively in patients with glaucoma [24]. Even though the viscoelastic element present in front of IOL may straightforwardly be aspirated by means of irrigation hand piece, still there was a chance of some left over material in the capsule of the lens mainly at back of the IOL. Well-adjusted salt solution has reported to be effective in decreasing the frequency of endophthalmitis along with toxic anterior segment syndrome. This solution works by washing the capsule of interior lens [25, 26].

CONCLUSIONS

Mean intraocular pressure rise was significantly greater at one week after phacoemulsification with implantation of intraocular lens using 2% Hydroxymethyl cellulose in comparison as viscoelastic.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Efficiency of 5% Sodium Hypochlorite in the Removal of Dental Fluorosis Stains

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ABSTRACT

Dental fluorosis is a specific disturbance in tooth formation, and is defined as a chronic, fluoride-induced condition in which enamel development is disrupted. **Objective:** To test the efficiency of 5% sodium hypochlorite in removing dental fluorosis stains. **Methods:** A 5 percent solution of NaOCl was used in each case. It was administered with a cotton applicator to the whole surface of the teeth, and it was repeated until the NaOCl solution had evaporated. After treatment, a follow-up assessment was conducted by a vita shade guide. **Results:** Patients with dental fluorosis aged 12 to 20 were enrolled in the study. 32 men (59.3%) and 22 women were studied (40.7%). One patient (1.9%) had completed college. There were 23 (42.6%), 23 (42.6%) and 05 (09.3%) cases with inadequate socioeconomic status. One in ten people (or 18.5%) had a family history of fluorosis. 26 (48.1%) brushed once, 23 (42.6%) brushed twice, and just 05 (09.3%) brushed three times. There were 25 mild instances, 15 moderate cases, 10 severe cases, and 4 severe dental cases (DF). 5% sodium hypochlorite was efficacious in 40 (74.1%) and 14 (24.9%) cases of mild to severe dental fluorosis. **Conclusion:** The 5% sodium hypochlorite was found to be an efficient method for eliminating dental fluorosis lesions in this investigation. Non-invasive and safe procedure for these lesions. No additional supplies are needed, and it may be used on children's permanent teeth with ease. To support the efficacy of a bigger sample size, further studies are recommended.

INTRODUCTION

Fluorosis resulting from high groundwater fluoride concentrations is a major public health issue. During the last two decades, tooth decay has decreased in developing countries due to widespread fluoridation. Increased fluorosis rates were found to be linked to a decrease in the incidence of caries [1]. Dental fluorosis is a condition in which the growth of the enamel is slowed down and becomes hypo mineralized because of exposure to fluoride over time. Patients with fluorosis may experience tooth discoloration, which is clinically known as fluorosis. Extrinsic stain absorption, especially from food, is responsible for the dark stains seen in fluorosis of moderate to severe severity. At higher levels of Fluoride, the enamel foundation is pitted, followed by extrinsic stains [2]. Anterior teeth are the most affected and the severity of fluorosis can vary from tooth to tooth.Fluorosis is more common in teeth that begin to develop and mineralize later in life. Fluoride's effect on the growth of men's teeth is cumulative, rather than having a specific threshold dosage. Fluoride intake from a variety of sources has a significant impact on these outcomes [3]. Fluoride is mostly found in drinking water, and some towns' tap water contains high

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levels of naturally occurring fluoride, putting residents at risk of developing fluorosis. In Sindh, Baluchistan, and Punjab, fluorosis is widespread, impacting millions of people, including a high percentage of children. Residents are at risk of developing fluorosis because they live in an area with high levels of naturally occurring fluoride, mostly in the drinking water [4, 5]. Fluorosis, the most prevalent symptom, is characterized by an unappealing yellowing of the teeth. Patients who suffer from tooth discoloration because of fluorosis may benefit from a variety of treatment options including micro abrasion, indirect and direct restorative dentistry techniques such as whitening toothpaste and bleaching with chemicals such as acids and phosphates and sodium hypochlorite [6]. The ability of hypochlorous acid to neutralize amino acids and produce salt and water is what makes it so effective. A decrease in pH results from the removal of hydroxide ions. As a result of the interaction between the amino-protein group and hypochlorite (HOCl), which is found in NaOCl solution, chloramines are formed. Amino acids are oxidized and hydrolyzed by NaOCl and HOCl ions. The chromogenic organic content on enamel surfaces is degraded and destroyed when NaOCl meets hypo-mineralized enamel. Fluorosis patients' stains are caused by an excessive organic part, which is why it's easier to understand how it works [7]. Water irrigation with sodium hypochlorite (NaOCl) has been found to be an effective method for removing dentinal shavings and pulp tissue, as well as antibacterial. The etch/seal/bleach process with NaOCl as a bleaching agent has already been recommended as a careful alternative therapy [8, 9]. To get rid of the fluorotic stains, a solution of 5 percent sodium hypochlorite will do the trick. Fluorosis treatment may be aided if 5 percent sodium hypochlorite is shown to be effective in removing stains caused by dried blood spots. It is a simple, non-invasive, and chair-side treatment option with minimal side effects. We can reduce the financial burden on the community by using this method. The goal of this study was to see if a 5% solution of NaOCl is efficient in removing stains left behind by DF in young patients.

METHODS

The Department of Operative Dentistry at Liaquat University of Medical & Health Sciences, Jamshoro/Hyderabad, Pakistan, after approval fromResearch Ethics Committee, Liaquat University of Medical and Health Sciences, Jamshoro vide letter No. LUMHS/REC/-811, Dated 07 – 10 – 2019 conducted this quasi-experimental study employing non-probability consecutive sampling. The Rao soft software was used to do the sample computation (73 percent were satisfied with their appearance immediately after treatment of 5 percent NaOCl) [10]. Our study used a sample of 54 people, with a 95% confidence level and a 10% margin of error. The study's inclusion criteria were as follows: degrees 1–4 of dental fluorosis (the Dean Criteria), ages 12–20, cases free of caries and restorations, and both sexes as participants. For this study, we did not include patients with any of the following conditions: past bleaching treatment history; sensitivity; periodontal disease; or prior dental trauma. Patients who met the inclusion criteria were included in the trial, which included 54 participants. Informed written consent was obtained after patients or legal guardians were supplied with information on the advantages, hazards, contraindications, and alternatives to bleaching. Brushing procedures, scaling, and polishing were given to all the patients. A 5 percent solution of NaOCl was used in each case. To remove all the plaque, pumice powder was applied to the teeth and water was used to wash them. With a rubber dam in place, a gingival barrier protected each tooth from contact with the bleaching agent. An etching and 15-second soak in 37 percent phosphoric acid were used to penetrate deeper into the enamel surface. It was administered with a cotton applicator to the whole surface of the teeth, and it was repeated until the NaOCl solution had evaporated. At one appointment, the teeth were white within 15 to 20 minutes. After treatment, a follow-up assessment was conducted by a vita shade guide. The proforma had all the necessary information. SPSS 20.0 version was used to enter all data. The quantitative data, such as age, were determined using the mean and standard deviation. Qualitative variables such as gender were estimated using the frequency and percentage method. We performed stratification according to the effect modifiers. The chi-square and t-tests were used, and a p-value of 0.05 was considered significant.

RESULTS

Dental Fluorosis patients ranging in age from as young as 12 years old to as old as 20 years old were studied in total, with a mean age of 15.34 years. Out of a total of 54 patients, 32 (59.3%) were men and 22 (40.7%) were women in this study. In this study, 12 patients (22.2%) were illiterate, 10 patients (22.2 %) had completed elementary school, 25 patients (46.3%) had completed high school, 6 patients (11.1%) had completed secondary school, and only 1 patient (1.9%) had completed college. More than half of the cases had a low socioeconomic status based on their history of socioeconomic level, with 23 (42.6%), 23 (42.6%), and 05 (09.3%) cases having an intermediate socioeconomic position. One in ten patients (or 18.5%) had a family history of fluorosis, as determined by the patient's medical records. Most of the study participants, 26(48.1%), were brushing once, 23(42.6%) were brushing twice, and only 05(09.3%) were brushing trice. There were 25 (46.3%) cases of mild fluorosis; 15 (27.8%) cases had moderate

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fluorosis; 10 (18.5%) had moderately severe fluorosis; and 4 (7.3%) had severe dental fluorosis (DF) (figure 1).

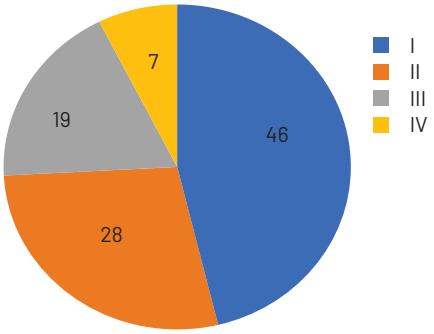

Figure 1: Patients distribution according to degree of Fluorosis

There were 40 (74.1%) and 14 (25.9%) instances in this study in which 5 percent sodium hypochlorite demonstrated good efficacy, and these had moderate and severe dental fluorosis (table 1).

Efficacy	Frequency (%)
Yes	40(74.1%)
No	14(25.9%)
Total	54(100.0%)

Table 1: Efficacy of Sodium Hypochlorite

Male and female participants were found to have similar levels of efficacy in the study (p=0.413). Effectiveness results from this study (p=0.396) were found to be statistically non-significant (table 2 and table 3).

Gender		Efficacy		Total	p-value
		Yes	No		
Males	Frequency	25	7	32	0.413
	Percentage	46.3%	13.0%	59.3%	
Females	Frequency	15	7	22	
	Percentage	27.8%	13.0%	40.7%	
Total	Frequency	40	14	54	
	Percentage	74.1%	25.9%	100.0%	

Table 2: Efficacy of Sodium Hypochlorite according to Gender

Degree of dental fluorosis		Efficacy		Total	p-value
		Yes	No		
I	Frequency	20	5	25	0.396
	Percentage	37.0%	9.3%	46.3%	
II	Frequency	12	3	15	
	Percentage	22.2%	5.6%	27.8%	
III	Frequency	6	4	10	
	Percentage	11.1%	7.4%	18.5%	
IV	Frequency	2	2	4	
	Percentage	3.7%	3.7%	7.4%	
Total	Frequency	40	14	54	
	Percentage	74.1%.	25.9%	100.0%	

Table 3: Efficacy of Sodium Hypochlorite according to Severity of Fluorosis

DISCUSSION

Too much fluoride intake during enamel creation has led to compositional and structural changes in enamel that are referred to as dental fluorosis, even though extensive fluoride treatment has reduced tooth cavities (DF). The average age of participants in this study was 15.34 years old. It was also stated that the mean age was 17.64.0 years by Meireles SS and colleagues. Males accounted for 59% of participants, while females made up the remaining 22%. (40.7 percent)[11]. on the other hand, found that of the total respondents, 48 (68.6%) were women and 22 (31.4%) were men. However, according to Sami E *et al*, 51 percent of 349 children were boys and 49 percent were girls [12]. According to Nevárez-Rascón M *et al*, females and males were both 33 and 34 within a 12- to 16-year age range and an average age of 167 months, respectively [13]. There were 1088 men and 927 females within the Rigo L *et al et al* 2015 study's sample of children (46 percent) [14]. A total of patients, 22.2% were illiterate in this study, 22.2% with primary-level education, 46.3% with matriculation, 11.1% with secondary-level education, and only 1.9% with a university degree. More than half of the cases had a low socioeconomic status based on their history of socioeconomic level. On the other hand, Azevedo MS *et al*. investigated several behavioral, socioeconomic, and demographic characteristics that could be linked to Fluorosis [15]. Writers have suggested that socioeconomic status (SES) and Fluorosis are linked, even though there is no conclusive evidence of this connection in the literature. However, it has been found that children from poorer socioeconomic backgrounds are more likely to be exposed to greater Fluoride levels. Dentifrice may have been given to these children in higher quantities because of their poor socioeconomic level and parental education. As a result of the greater volume of toothpaste used, the risk of fluoride exposure will be greater for all children, not only those from higher socioeconomic backgrounds who prefer to use children's toothpaste over family toothpaste [16]. A higher rate of DF was identified in children who attended private schools, according to Maltz & Silva *et al*. although no link was established between parental education and family income [17]. Similarly, no association between SES and DF was found by other scientists [18]. Dental fluorosis sufferers in the general population have not been studied in terms of their socioeconomic status or educational attainment. In this study, most participants (48.1%) only brush one time, while 42.6% used two time, and just 9.3% brushed thrice. This was supported by Pendrys *et al*. who found that brushing teeth more frequently than once a day using fluoridated toothpaste may eradicate 34% of fluorosis instances [19]. Ozbek CD *et al*. found that 45.2% of youngsters brushed their teeth twice daily, 35.7% brushed their teeth once daily, 8.7% brushed their teeth every day, 8.7% brushed their teeth twice weekly, and 1.6% brushed their teeth more than twice daily [20]. 46.3 percent of

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cases had mild fluorosis, followed by 27.8 percent with moderate fluorosis, 18.5 percent with severe fluorosis, and 7.4 percent with severe fluorosis. Similarly, Ashraf *et al* found that 5.13 percent of patients had DF in mild cases [21]. The next most common condition had an incidence rate of 1.71%. However, research by Rizwan S, *et al*. found that fluorosis was present in 12 percent of the population [22]. Most individuals (58.9%) had fluorosis, with 44.44% having level 2 (very mild) fluorosis, 11.99% had a moderate level of fluorosis, and 0.22% had severe fluorosis, according to Moimaz SA *et al*' findings (level 4) [23]. Studies demonstrate that fluorosis incidence and severity have increased in both areas with fluoridated water sources and those without. Fluoridated toothpaste, fluoridated food, and nutritional supplements all contributed to this increase in Fluoride consumption. During a 2002 study in the same country, 13.8 percent of fluoridated water-source cities were found to have the condition, which was categorized by severity from "very mild" to "moderate" (2.2, 10.9, 0.6, and 0.1 percent respectively). By Rigo L *et al*, 25 percent of the population had fluorosis, with severity levels of 18.3% mild, 5.2% moderate and 1.5% moderate, according to the study results [14]. In this study, 5 percent sodium hypochlorite demonstrated good performance in instances with moderate and severe dental fluorosis, The technique described in this study appears to have advantages over alternative therapies for enhancing fluorotic lesion appearance, according to Flores AC and colleagues [24]. It has been shown previously that the amount of NaOCl needed to dissolve necrotic tissue is directly related to the amount of NaOCl that may be used; a 5.25 percent dilution has been proven to have a significant impact on its capabilities [25]. Gupta A *et al* found that NaOCl was only efficient in removing mild fluorosis stains; moderate to severe stains were lightened to some extent but could not be eliminated [10]. Because of its ability to neutralize amino acids and create salt and water, NaOCl has a high concentration of potency (neutralization reaction). The removal of hydroxyl ions results in a decrease in pH. When hypochlorous acid, a component of NaOCl solution, encounters organic tissue, it releases chlorine as a solvent and forms chloramines when it reacts with the protein amino group (chloramination reaction). After exposure to NaOCl, hypomineralized and discolored enamel lose their chromogenic organic content.

CONCLUSIONS

The 5% sodium hypochlorite was found to be an efficient method for eliminating dental fluorosis lesions in this investigation. Non-invasive and safe procedure for these lesions. No additional supplies are needed, and it may be used on children's permanent teeth with ease. To support the efficacy of a bigger sample size, further studies are recommended.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Effectiveness of Flipped Classroom On 3rd Year Students of Oral Medicine Subject to Achieve the Learning Outcome

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ABSTRACT

In the flipped learning technique, the lesson content is supplied to students prior to the actual class, often in an online form, as background knowledge to prepare for the face-to-face time. In this approach, it puts students in an active learning situation, including them in the learning process prior to class. **Objective:** To determine the efficacy of flipped classroom in achieving learning objectives in third-year BDS students studying Oral Medicine. **Methods:** This study was conducted in Department of Oral Medicine, Institute of Dentistry, LUMHS, Jamshoro. Study was conducted from November 20th 2021 to February 21st 2022. The third-year BDS students of Oral Medicine (100 students) were categorized into two groups (Group-A traditional teaching method n=50 and Group-B flipped classroom teaching method n=50). The pre-test and post-test were conducted. **Results:** Around 60% of the students were satisfied that the instructions for the pre-class preparation were clear but 20% remain neutral. Around 40% agreed that the teaching schedule allow enough time to prepare for the class and 20% were strongly agreed but 40% remained neutral. In terms of post-test scores in both teaching methods, flipped method technique showed a significantly higher 8.45±0.30 versus the traditional method technique of 5.83±0.17 (p-<0.001). **Conclusion:** Third Year BDS students of oral medicine identified flipped learning as a dynamic student-centered technique for teaching

INTRODUCTION

One of the most important concerns for dental educators today is how to enhance the learning environment and raise student satisfaction with the curriculum. Current dentistry students represent a wide variety of cultures, experiences, personalities, and learning preferences and methods [1]. Because of this diversity, it is challenging for dental educators to address the educational requirements of all students [2]. The "traditional lecture," which goes back to the mid-nineteenth century, has been the primary style of instruction since universities were created, and it continues to be the dominating type of teaching in health care professions education [3]. The greatest advantage of lectures is the ability to share information with a large number of students; they are the primary teaching strategy of choice for delivering the curriculum to as many students as can fit in a lecture theatre; and they are cost-effective for institutions, staff, and facilities [4]. The term "flipped classroom" refers to a new educational approach that was created in 2012 and is rapidly gaining popularity throughout the globe [5]. In Flipped learning that was defined by Flipped Learning Network as "an approach in which undeviating instruction is changed from the group learning space to the idiosyncratic learning space, and the resulting group space is transformed into a dynamical, interactive learning situation where the facilitator guides learners as they utilize concepts and engage creatively in the topic

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matter" [6]. In the flipped learning technique, the lesson content is supplied to students prior to the actual class, often in an online form, as background knowledge to prepare for the face-to-face time. In this approach, it puts students in an active learning situation, including them in the learning process prior to class [7]. Furthermore, the classroom atmosphere is utilized to investigate issues and engage in group discussions and problem-based learning [8]. The benefits of a flipped classroom include more one-on-one time between instructor and student, more collaboration time for students, students learning at their own speed, students arriving to class prepared, better engagement with deeper topic mastery, and maybe improved exam performance [9]. Medical education is a lifelong process, and today's students are more involved with new technologies than previous generations. The goal is that with the advancement of technology in medical education, it may be used as a powerful source to aid in the teaching-learning process. One advantage of this technological improvement is the increased simplicity with which pre-reading information may be shared with students by email, WhatsApp, or other means. As a result, the healthcare educator may simply deliver the content ahead of time and conduct a flipped classroom. Now that it is increasingly likely that a flipped classroom will be used, it is important to investigate the usefulness of this learning style. The objective of this research was to determine the efficacy of flipped classroom in achieving learning objectives in third-year BDS students studying Oral Medicine.

METHODS

It was a quasi-experimental (Mixed Method) research that lasted three months from November 20th, 2021 to February 21st, 2022 at the Department of Oral Medicine, Institute of Dentistry, Liaquat University of Medical & Health Sciences, Jamshoro. The study's sample size was 100, and participants were chosen using a non-probability convenience sampling technique. An ethical approval (NO.LUMHS.REC/-209 Dated: 17th November 2021) was obtained from Research Ethics Committee of LUMHS prior conducting the research. The inclusion criteria were all third-year BDS students who were engaged in oral medicine subject and students who were unwilling to participate in the research were excluded. Before enrolling in the research, each subject provided informed written permission. The third-year BDS students of Oral Medicine (about 100 students) were categorized into two groups (Group-A traditional teaching method n=50 and Group-B flipped classroom teaching method n=50). Group-A had a pre-test consisting of 10 Multiple Choice Questions (MCQs) before to the commencement of the lecture and secured their MCQs papers, and then the lecture was presented after the post-test (same) MCQs exam. Group-B received information one week before the subject, and on the day of the lecture, a pre-test consisting of 10 MCQs was administered, followed by a lecture presented after the post-test (same) MCQs. SPSS (SPSS Inc., Chicago, IL) version 22 was used to analyze the data. For quantitative variables, the mean and standard deviation were calculated. For qualitative variables, frequency and percentage were determined (i.e., Likert scale). As needed, pie and bar charts were employed for graphical depiction. Independent T test was applied to compare scores between groups (group A- traditional teaching method 3rd year BDS class) versus group B (flipped classroom teaching method 3rd year BDS class). The paired T test was applied to compare pre and post scores in term of ranks for group A (traditional teaching method 3rd year BDS class) and group B (flipped classroom teaching method 3rd year BDS class) separately. $p \leq 0.05$ was considered as significant.

RESULTS

A total of 100 students from third year BDS engaged in Oral Medicine subjects were included in this study. The population was divided into two groups of flipped teaching method (n=50) and traditional teaching method (n=50). Twelve questions were asked from group of flipped teaching method to analyze the outcome which included response before and after class. Around 60% of the students were satisfied that the instructions for the pre-class preparation were clear but 20% remain neutral. Majority (80%) were agreed that the instructions for the pre-class preparation were provided in good time. However, only 20% completed the pre-class preparation while 60% remained neutral and 20% did not. Around 40% agreed that the teaching schedule allow enough time to prepare for the class and 20% were strongly agreed but 40% remained neutral. The majority of the participants were agreed or strongly agreed when asked about following questions, preparation essential for the class (59% agreed; 41% strongly agreed), the practice was helpful for the course (395 agreed; 41% strongly agreed), You expected to collaborate in the class (79%), the preparation allows you to collaborate effectively in class/session (80%), used social media/ electronic communication (Google, email, WhatsApp or YouTube) to discuss the preparation (80% strongly agreed; 20% agreed), the session itself add to your understanding of the topic (59% strongly agreed; 41% agreed), this method of class teaching effective to understand today's topic/class (80% strongly agreed; 20% agreed) and felt that you achieved the learning outcome of today's topic 61% strongly agreed; 39% agreed) as shown in Table 1.

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Flipped Method Technique Questions	Results % (n=50)				
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The instructions for the pre-class preparation were clear.	0	61	20	19	0
Were the instructions for the pre-class preparation provided in good time?	0	80	20	0	0
Did you complete the pre-class preparation?	0	20	60	20	0
Did your teaching schedule allow enough time to prepare for the class?	20	40	40	0	0
Was the preparation essential for the class?	41	59	0	0	0
Was the preparation useful for the class?	41	39	20	0	0
Were you expected to collaborate in the class?	21	79	0	0	0
If collaboration in the class was expected, did the preparation allow you to collaborate effectively in class/session?	20	80	0	0	0
Did you use social media/ electronic communication (Google, email, WhatsApp or YouTube) to discuss the preparation?	80	20	0	0	0
Did the session itself add to your understanding of the topic?	59	41	0	0	0
Was this method of class teaching effective to understand today's topic/class?	80	20	0	0	0
Did you feel that you achieved the learning outcome of today's topic?	61	39	0	0	0

Table 1: The responses of the participants regarding Flipped Method Technique(n=50)

Paired sample t-test indicated that the post-test scores in both teaching methods showed a significant difference (p-<0.001) flipped method technique 8.45±0.30 versus traditional method technique 5.83±0.17 when compared to the pre-test results as indicated in Table 2 and Table 3.

Activity Name	Flipped Pre-test score Mean ± SD	Post-test score Mean ± SD	p-value
10 Multiple choice questions	5.96 ± 0.45	8.45±0.30	<0.001

Paired sample t- test

Table 2: Pre-test and post-test assessment of the flipped method technique

Activity Name	Flipped Pre-test score Mean ± SD	Post-test score Mean ± SD	p-value
10 Multiple choice questions	2.69 ± 0.28	5.83 ± 0.17	<0.001

Paired sample t- test

Table 3: Pre-test and post-test assessment of the traditional method technique

However, flipped method technique showed a significantly higher 8.45±0.30 versus the traditional method technique of 5.83±0.17(p-<0.001)as given in Table 4.

Activity Name	Group A Flipped method technique Mean ± SD	Group B Traditional method technique Mean ± SD	p-value
10 Multiple choice questions	8.45 ± 0.30	5.83 ± 0.17	<0.001

Independent sampled t-test

Table 4: Flipped method technique versus traditional method technique

DISCUSSION

Despite the fact that the use of flipped-classroom pattern more than around 15 years, it still lacks a coherent theoretical structure or methodology, and it continues to manifest itself as disparate executions across educational contexts and academic fields [10]. However, it is widely acknowledged that the majority of flipped settings include video lectures seen not in the classroom, in-class activities, and little supporting during class time [11]. There have been few studies of the flipped-classroom concept in speedup the courses [12]. Francl detailed the application of the flipped-classroom technique in two master's level accelerated finance/ accounting courses, but did not provide objective evaluations. In a five-week basic spread sheet course, the flipped-classroom technique was proven to be successful and scalable [13]. To our best of knowledge, no flipped-classroom studies for intensify oral medicine courses have been published. Furthermore, we were curious how a primarily non-traditional learner's population would react to the shift in course design. The flipped and control groups had similar mean ages of 21, emphasizing the unconventional character of the student population. Several restrictions should be noted while assessing the findings. It is common activity to administer a pre-test to analyze students' prior cognition in the flipped and traditional groups to ensure comparability [14]. Because of the rapid pace of the subjects, having a pre-test and the first post test(ten multiple choice questions on oral medicine subjects) with only seven days of apart may have influenced learners' answers, so no pre-test was given. While there were momentous differences in student pre-test and post-test levels between the flipped and traditional groups, we cannot rule out the possibility that differences in prior knowledge influenced the results. Another limitation was that the instructors for the flipped and traditional sections were different. Furthermore, the oral medicine course from which the MCQs were drawn was the same across both groups; previous to the assessment, all students had received this oral medicine course, and they all used the same textbook and adhered to the same MCQ format. The question of what factor or factors caused the students' increased performance in the flipped parts remains unanswered since our data did not demonstrate that in-class activities were a significant contributor to it. There have been conflicting results regarding the factors that contribute to improved student performance in the flipped classroom. Some authors have suggested that a more structured curriculum, greater pre-class preparation, active learning, or even a more collaborative classroom environment is to blame. Most students utilized social media to prepare for the flipped instruction style, often more than once, as shown by a variety of indicators,

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including student self-reporting and analytic features of both the media site and the course learning management system. Our pupils did not get points for utilizing social networking sites, in contrast to a previous study. Numerous studies have hypothesized that the various teaching methods used in a blended learning atmosphere may change depending on the study discipline, instructional goals, student characteristics, the types of resources available, and the instructors' backgrounds [15-17]. The FC model appears to have high reaction requirements on the Kirkpatrick's four level model of training assessment criteria, which are often used as particular markers of educational efficacy [15, 16]. According to Kim *et al.*, on student learning styles and personality, homogenous instructions do not promote active learning [17]. Students claim that the availability of online resources is the most significant advantage of the FC model, however there is very little evidence to support the superiority of one resource over another in terms of student preferences or influence on academic achievement[18-20].

CONCLUSIONS

Third-year BDS students who were taught oral medicine identified flipped learning as a dynamic student-centered technique for teaching diverse pupils that may use technology to increase student learning, interaction, and assessment.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Prevalence of Coccydynia Among Postpartum Women

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ABSTRACT

Coccydynia is a painful condition of the coccyx that can have various etiologies. Females are affected five times more than males by this condition. In addition to being chronic and difficult to manage, its symptoms can be detrimental to quality of life. **Objective:** To determine the prevalence of coccydynia among postpartum women. **Methods:** In this study, 881 postpartum women were selected through non probability convenience sampling from obstetrics and gynecology ward of Allied Hospital, Faisalabad. Self-structured questionnaire was used which contains different sections; section 1 contains Demographic information of the participants; section 2 contains subjective and Objective assessment. Two tests straight leg raise and per rectal were performed confirm coccydynia. SPSS version 21.0 were used to enter and analysis the data. **Results:** Test According to SLR test, 396(45%) were positive and 485(55%) were negative in SLR test. According to PR test, 538(61%) were positive and 343(39%) were negative in PR test. The finding of the study shows that 538(61%) postpartum females have coccydynia. A significant relationship was found between Coccydynia and the method of delivery (p<.005), position with less pain (p<.001), and intensity of pain (<p.001). **Conclusions:** Coccydynia is most commonly found in postpartum women based on the results of this study. Coccydynia was also significantly associated with the method of delivery, the position with less pain, and the intensity of the pain during childbirth.

INTRODUCTION

Coccydynia, is also recognized as tailbone pain, is described as: "pain in or around the coccyx" and is evaluate as a symptom not a disease itself [1]. The condition occurs approximately more than five times in women than in men. This condition is considered as a kind of lower back pain but how it influences neuromuscular presentation in the lumbopelvic region is unclear [2]. In 1859 Simpson first give a descriptive name to the coccyx pain which is known as coccydynia, the accounts of coccygeal pain date back to the 16th century. Coccydynia considered as miserable, tortuous and irritating condition. The precise incidence of coccydynia has not been announced and outlined nevertheless circumstances, connected with expanded danger of advancing coccydynia join heftiness and female gender [3]. Youths and grown-ups are more dependable to give coccydynia than offspring's [4, 5]. The clinical presentation of the disease is usually characterized by sharp shooting pains or sometimes aching pain in the lower sacrum or coccyx, especially when sitting on hard surfaces. An individual may suffer from mild to excruciating pain depending on the severity of the pain. The pre-menstrual period is often associated with exaggerated symptoms in women. These patients may also experience exaggerated symptoms due to activities causing increased

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strain on their levator ani muscles, such as defecation and sexual intercourse [2]. Western world has relatively low prevalence of coccydynia and there is little research covers this demographic; consequently, figures for prevalence and incidence are un available. Official reports which are concern with the epidemiological research on coccydynia are lacking. Women health physiotherapy professionals observed that within female community coccydynia was an ordinary, regular and recurrent disorder and this ache could be completely rehabilitated. As noticed, coccydynia customarily accompany with other orthopedic dysfunction in the region of lumbo-pelvic, like low back pain and in some patients' urine incontinence may also include. Coccydynia is also related with obesity and the most usual origin of coccydynia is related with shock reaction of following going on the rumps, repeated minor continues damage or labor [6, 7]. Predominance cases of coccydynia were found to be aggravated by pregnancy and childbirth (postpartum). Coccydynia which is concern with postpartum, no free interval is found in the mid of childbirth and progression of pain. As soon as sitting position is take on coccyx pain appeared. This makes new mother's life tough and limitations occurs in activities such as sitting to feed the baby it may also lead to socially limited activities. According to this study report frequent tail bone pain is observed with sitting, which can provide attention to a dysfunction demanding both quick and follow up awareness [8]. Productive and successful interventions, incorporate conservative treatment or surgery are not evident to date [9]. Finite understanding of coccydynia to physician and allied health professionals restricts the progress of treatment intervention. Thought, manual examination of the coccyx is likewise very significant [10]. This study was conducted to determine prevalence of coccydynia in postpartum females and reported association risk factors with coccydynia pain.

METHODS

We conducted a cross sectional survey involving 880 postpartum women who attended Allied Hospital Faisalabad using probability convenience sampling. Subjects with Pain in the region of coccyx for greater than 2 months Subjects having tenderness over coccyx on palpation and subjects with coccyx pain following childbirth [11]. Subjects under 18 years of age and with partial coccygectomy, radiographic abnormalities of coccyx, with co-existing low back pain and with Subjects with total previous coccyx surgery were excluded [12, 13]. The ethical approval for this study was taken from Riphah International University and consent was taken the included participants from selected Hospital. We used a self-structured questionnaire that contains different sections, the first containing demographic information about participants, and the second contains subjective and objective evaluations. The coccydynia was confirmed by two tests straight leg raise and per rectal measurement. The Straight Leg Raise (SLR) test is commonly used to identify disc pathology or nerve root irritation, as it mechanically stresses the lumbosacral nerve roots. When SLR test performed, increased pain may also be reported [14]. A rectal examination will reveal pain when the coccyx tip is manipulated [15]. Data analysis and entry was done using SPSS version 21.0. Chi square test was used to find out the association of prevalence of coccydynia with is its associated risk factors.

RESULTS

This study includes 483(54.8%) postpartum females from Amna ward and 398(45.2%) from Fatima ward of Allied Hospital. There were 363 postpartum females with 1 to 2 pregnancies, 358 postpartum females with 3-4 pregnancies, and 160 postpartum females with >4 pregnancies(Table 1).

Variables	Frequency (Percentage)
Ward Name	
Amna Ward	483 (54.8%)
Fatima Ward	398 (45.2%)
Language of patient	
Urdu	435 (49%)
Punjabi	446 (51%)
No. of pregnancy	
01-Feb	363 (41%)
03-Apr	358 (41%)
>4	160 (18%)
BMI groups	
Underweight	2 (0.227%)
Normal weight	170 (19.29%)
Overweight	289 (32.8%)
Obesity	420 (47.67%)
Residence of patient	
Rural	485 (55%)
Urban	397 (45%)

Table 1: Demographic information of the participants

There were 484 (54.9%) patients who felt pain in the coccyx region when entering or exiting a seated position whereas there were 397 (45.1%) patients who did not feel pain. Coccyx pain/coccyx injury history was reported by 220 (25%) patients, while 661 (75%%) patients did not have any history of coccyx pain/coccyx injury. There were 471(53.4%) patients with pulling or stabbing sensations in the sacrum, lumbar spine, buttocks, and occasionally into the thighs, compared to 410(46.5%) patients with no pulling or stabbing sensations. A total of 544 patients (61.7%) reported worsening pain after prolonged sitting, while 337 patients (38.3%) did not experience worsening pain. A total

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of 586 patients (66.5%) experienced increased pain when leaning backward in a sitting position, while 295 patients (33.5%) did not. 500 (56.3%) patients experienced the worst pain in the sitting position, while 136 (15.4%) patients experienced the worst pain while standing, while 54 (6.1%) patients experienced the worst pain when lying. There were 191 (19.7%) patients who did not experience any pain in any position. 179 (20.3%) patients' pain got relieved while 702 (79.7%) patients' pain didn't get relieved as a result of sitting on hard surfaces (Table 2).

Questions	Frequency (Percentage)
Pain in the coccyx region, during going into or coming of a seated position	
Yes	484 (54.9%)
No	397 (45.1%)
Previous history of coccyx pain/coccyx injury	
Yes	220 (25%)
No	661 (75%)
Pulling or stabbing sensation that radiate to sacrum, lumbar spine, buttocks, and occasionally into the thighs	
Yes	471 (53.4%)
No	410 (46.5%)
Pain gets worse after prolonged sitting	
Yes	544 (61.7%)
No	337 (38.3%)
Pain increases when you lean backward in sitting position	
Yes	586 (66.5%)
No	295 (33.5%)
Pain increases with bowel movement or sexual intercourse	
Yes	492 (55.8%)
No	389 (44.2%)
Which Position (You Experience Worst Pain)	
Sitting	500 (56.8%)
Standing	136 (15.4%)
Lying	54 (6.1%)
No pain	191 (21.7%)
Relief in pain while sitting on hard surface	
Yes	179 (20.3%)
No	702 (79.7)
Pain during menstruation	
Yes	537 (61%)
No	344 (39%)
Days/weeks of postpartum	
01-02	530 (60.2%)
03-04	259 (29.4%)
>4	92 (10.4%)

Table 2: Pain related factors among Postpartum females

When performing a physical exam, does pain increase during the SLR test, 396 (45%) of the participants were positive, which means they have coccydynia, and 485 (55%), were negative. Similarly, when performing a physical examination, does pain increase during a per rectal (PR) test reported that 538 (61%) were positive, meaning these women suffer from coccydynia, and 343 (39%) remained negative, meaning they do not suffer from coccydynia. (Figure 1).

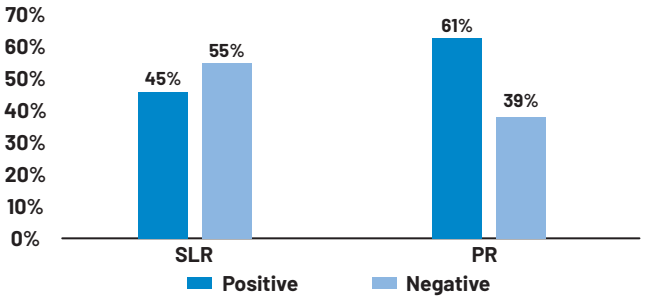

Figure 1: Percentage of Straight Leg Raise (SLR) and a per rectal (PR) Test for Coccydynia

This study reported significant association of coccydynia with method of delivery <.005, position with less pain <.001 and intensity of pain <.00 (Table 3).

Questions	Frequency (Percentage)	p-value
How your delivery occurred?		
Normal	129 (23.9%)	0.005
C-section	240 (44.7%)	
Episiotomy	169 (31.4%)	
In Which Position (You Experience less Pain)?		
Sitting	68 (12.6%)	<.001
Standing	212 (39.4%)	
Lying	258 (48.0%)	
How intense is coccyx pain right now On Visual Analogue Scale?		
No pain	0 (0%)	<.001
1-3 (mild pain)	3 (0.5%)	
4-6 (moderate pain)	147 (27.3%)	
7-9 (severe pain)	259 (48.1%)	
10 (worst pain)	135 (25.1%)	
During palpation was tenderness directly felt over tailbone?		
Yes	402 (74.8%)	<.001
No	136 (25.2%)	

Table 3: Association of coccydynia with method of delivery, tenderness, position and intensity of pain (N: 538)

DISCUSSION

In this study, the primary objective is to determine the occurrence of coccydynia in postpartum females, to discover whether coccydynia is related to the distribution method and any prior history of coccyx, to identify the relationship between coccydynia and number of pregnancies and the relationship between prolonged sitting and coccydynia. Our study reported coccydynia in postpartum women. Lirette *et al.*, claimed in their study that factors associated with increased risk of developing coccydynia include obesity and female gender [16]. In this study 881 subjects were enrolled 56.8% subjects reported sitting posture as worst position with significant p value <.001. The results of the study are supported by Systematic

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literature review study performed by Howard *et al.*, in Thomas Jefferson University, Philadelphia, PA, USA that Sitting is typically the most painful position for patients having coccydynia [17]. Another study showed that Classical, coccyx pain is associated with sitting and is exacerbated when rising from a seated position [18]. Straight leg raise test is positive in 45% subjects and negative in 55 % subjects and per rectal test is positive in 61 % subjects and negative in 39% subjects. SLR test is not permanently helpful with coccydynia for the reason that it may be accompanying with low back pain might be exist as one or the other a pelvic girdle agony flanked by the posterior iliac crest and the gluteal fold as a lumbar pain over and around the lumbar spine. A study about pelvic girdle pain in Netherlands shows that 38% of women still have symptoms at 3 months postpartum and 13.8% at 12 months [19]. In this study 881 subjects were enrolled out of 881 subjects 538 subjects (61%) conformed that pain increase during the per rectal test consequently conformed coccydynia. Study of Lirette *et al.*, claimed that Intrarectal manipulation can pinpoint possibly positive disrupted sacrococcygeal joint [16, 20]. The result of randomized control study of Maigne *et al.*, concluded that success rate of intra rectal manipulation of coccyx was around 25%. In their study patients were divided into two groups of fifty-one patients each [21].

CONCLUSIONS

As a result of this study, it can be concluded that postpartum women are the most likely to suffer from coccydynia. It was also found that coccydynia was correlated significantly with the method of delivery, the position with less pain, and the intensity of the pain during childbirth as well.

CONCLUSION

For the assessment of PAF and the detection of abscesses, MRI is a beneficial and reliable preoperative examination.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Impact of Covid-19 Pandemic on Psychological Behavior of Dental Health Care Workers in Peshawar

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ABSTRACT

During the hard time of Covid, front line health care workers were directly involved in one way or the other to treat the patients or perform duties in Covid-wards. They were at great risk of catching the infection as well as be affected by the psychological disorders. **Objective:** To determine the effects of Covid pandemic on the psychological health of dental health care professionals in Peshawar. **Methods:** A total of 384 participants both Dentists and Dental paramedical staff and technicians were included in the study. The participants were classified as non-infected and Covid recovered participants. Two validated questionnaires (PHQ-9 scale, Scale for COVID-19 related psychological distress in healthy Dental health care workers) were used for these two types of participants respectively to assess the level of mental distress. The distress scores were analyzed and compared among various groups. **Results:** The results showed that non infected DHCWs generally had mild (48.98%) to moderate (31.43%) psychological distress as a result of the Covid situation. While Covid recovered DCHWs had minimal (30.86%) and moderate depression (30.07%) The particularly vulnerable groups showing more psychological distress were non-infected female DHCWs and non-infected DHCWs working at Lady Reading hospital Peshawar. **Conclusion:** The Covid-19 pandemic affected the mental health of DHCWs in a negative way, and most of the DHCWs had mild to moderate severity of distress or depression.

INTRODUCTION

The first coronavirus outbreaks were first revealed in late December 2019 when clusters of pneumonia cases of unknown etiology were found to be associated with exposure epidemiologically linked to a seafood market and untraced exposures in the Wuhan city of Hubei province [1]. However the disease was found to have a high potential for communicability and also had high morbidity and mortality [2]. There were 3 090 445 cases of coronavirus disease 2019 (COVID-19) and 217 769 death reported worldwide as of April 30, 2020. In China alone, there were reports of more than 84,373 COVID-19 cases with 4,643 death after the rapid spread of the outbreak to many countries in the world, the World Health Organization (WHO) declared the COVID-19 outbreak as a pandemic on March 11, 2020 [3]. Despite several preventive measures the pandemic continued to spread rapidly and On January 30, 2020, WHO Emergency Committee classified this outbreak as a global health emergency based on increasing case notification rates in China and other countries. During this hard time, front line health care workers were directly involved in one way or the other to treat the patients or perform duties in Covid-wards. They were at great risk of catching the infection as well as be affected by the psychological disorders [4]. In the city of China, (Zhang *et al*), studied a team responsible for the management of patients with COVID 19. The team was made up of 230 workers (including doctors and nurses) to determine the existence of anxiety and stress disorders, whose incidence it was 23.1% and 27.4%, respectively. In

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the female population, incidence and severity of symptoms are higher [5]. O'Sullivan *et al* investigated psychological distress, depression, anxiety and the stress experienced by medical staff in Australia during the outbreak of COVID 19 and compared the results of medical staff and non-medical staff medical. Among the 500 health workers, 14.5% suffer from anxiety, the 8.9% depression, 6.6% stress and 7.7% post-traumatic stress disorder (PTSD) [6].The prevalence of anxiety disorders among health workers is higher than among non-medical workers [7]. The primary effect of COVID-19 is pneumonia, which indicates that the virus primarily affects the respiratory system. This indicates that within a distance of around 1-1.5 m, saliva, coughing, and sneezing are the main ways in which human coronaviruses are spread from one infected individual to another. With very few treatment options several measures were thus designed to prevent the human transmission [6]. Various guidelines regarding the proper running of health care centers were developed in order to avoid the transmission of infection in the health care centers the main instructions regarding like Mandatory hand washing and disinfection in the workplace; Social distancing; All health use of Personal protection measures, like simple surgical mask or N95 or FFP2 respirator, disposable waterproof apron, protective glasses with suction cup, mask or face shield, disposable latex gloves [7].During the COVID-19 pandemic, self-care and effective prevention of oral problems continue being of great importance. However ironically the DHCWs are particularly vulnerable because of the nature of their jobs which involves the work inside the oral cavity [8]. Although a few studies had previously been carried out in various counties regarding the psychological effects of Covid-19 pandemic on Dentists and other dental workers, but sadly in our community no such study has been performed regarding the psychological response towards covid-19 pandemic among dental professionals, so for that a community based study is needed [6-13]. Current study aims to find the negative mental impact of Covid-19 on DHCWs of both the non-exposed and the Covid-19 recovered workers. The results of the study will help us better understand the effect of Fear of the unknown among the non-exposed and the persistent stress among the Covid-19.

METHODS

This was a cross sectional study conducted at the OPDs of three hospitals of Peshawar,

1. Peshawar Dental Hospital,
2. Lady Reading Hospital MTI and
3. Sardar begum dental hospital Peshawar.

It was carried out within a period of six month from from January, 2022 till June 2022 after approval from Institutional Review Board (IRB) of Peshawar Medical and Dental College vide number 2021-390. Sample size was calculated by using open-epi software, our total calculated sample size was; 384.(212, 132, and 40 participants were included from Peshawar Dental hospital, Sardar Begum Dental Hospital, and Lady Reading hospital, respectively).

Following were included in the study

Dental health care workers of both genders.

Working in Peshawar Dental hospital, lady reading hospital MTI (Dental Block) and Sardar Begum Dental Hospital Peshawar.

DHCWs that are recruited in the hospital before the start of pandemic.

While Dental health care workers who's severely ill or unable to participate were excluded from the current study. After fulfilling the inclusion criteria and willingness for participation, each participant was asked to fill a questionnaire. We used two validated questionnaires, that is one for previously non-infected (healthy) dental health care workers and the other one is for those who had recovered form covid-19 called the PATIENT HEALTH QUESTIONNAIR-9 scale (PHQ-9) [13]. This questionnaire was used by several studies in order to quantify the level of psychological distress in the individuals. The questionnaires for non-infected population was composed of 14 questions, each question was scored from 1 to 5. Fourteen questions were asked from each participant according to their answers scoring was compiled. "Total score is a sum of all 14 items, ranged from 14-70. The final score was further classified as below:

- Score of 14-24 is likely to be well
- Score from 25-34 likely to be neutral
- Score from 35-44 have a mild psychological distress
- Score from 45-54 have a moderate psychological distress
- Score from 55-70 likely to have severe psychological distress

PHQ-9 scale was composed of 9 questions; each question is scored from0 to 3. Nine questions were asked from each participant according to their answers scoring was compiled. Total score was sum of all 9 items, ranged from 0-27. The responders were further classified as shown:

- A score of 0-4 had non-minimal depression
- A score from 5-9 likely to had mild depression
- A score from 10-14 had a moderate depression
- A score from 15-19 had moderate severe depression
- A score from20-27 had severe depression.

After collection of data, data were entered and analyzed by using IBM-SPPS statistic version 23.0. Mean/median and standard deviation were calculated for age. Frequency and percentages was calculated for gender, designation,

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hospitals, infected/non infected health care worker, PHQ-9 classification, Healthy score category. The 5 scoring categories into which the each Covid recovered and non-infected DHCWs groups were divided were displayed as frequencies and percentages. The mean/median scores (calculated using the respective questionnaires) of various groups of participants like gender groups, designations, hospitals were compared using the Mann-Whitney U test. Both the Covid recovered and non-infected DHCWs were compared with their respective group.

RESULTS

A total of 384 Dental Health care workers took part in the study, their demographic data revealed a mean age of 28.35 ±6.29 with a minimum age of 20 years and maximum age of 65 years. When the participants were split based upon age into two categories that is 18-45 years and above 45 years it was seen that, upon comparing no significant difference was found between the two age groups in either Covid recovered or non-infected DHCWs groups (Table 1).

Category		Age Category	N	Mean/ Median score	p-value
Non infected DHCWs	PHQ-9/Healthy score scale	18-45 years	233	120.97	0.973
		> 45 years	8	121.81	
		Total	241		
Covid Recovered DHCWs	PHQ-9/Healthy score scale	18-45 years	141	72.69	0.093
		> 45 years	2	23.25	
		Total	143		

Table 1: Shows a comparison mean scores of the age groups of participants

Male non infected DHCWs were slightly more (58.1%) than non-infected female counterparts. While the Covid recovered participants had a slightly greater number of female participants (56.6%) (Table 2).

Category		Frequency	Percent
Non infected DHCWs	Male	140	58.1
	Female	101	41.9
	Total	241	100.0
Covid Recovered DHCWs	Male	62	43.4
	Female	81	56.6
	Total	143	100.0

Table 2: Shows the gender make up of Covid recovered and non-infected DHCWS

Table 3 shows the designations of different participants in the study, It can be seen that the number of participants from both the non-infected and Covid recovered categories were mostly House officers, training medical officers, followed by dental technicians and dental assistants, while Associate professors and professors were least in number.

Category		Frequency	Percent
Not infected DHCWs	Professor	2	.8
	Associate Professor	10	4.1
	Assistant Professor	7	2.9
	Dental Surgeon	11	4.6
	House Officer	69	28.6
	Training Medical Officer	64	26.6
	Lab Technician	4	1.7
	Dental Technician	33	13.7
	Dental Assistant	22	9.1
	3rd year Medical Student	8	3.3
	Final year Medical student	11	4.6
	Total	241	100.0
Covid Recovered DHCWs	Associate Professor	3	2.1
	Assistant Professor	2	1.4
	Dental Surgeon	6	4.2
	House Officer	49	34.3
	Training Medical Officer	43	30.1
	Lab Technician	3	2.1
	Dental Technician	13	9.1
	Dental Assistant	12	8.4
	3rd year Medical Student	3	2.1
	Final year Medical student	9	6.3
	Total	143	100.0

Table 3: Shows the Designation make up of Covid recovered and non-infected DHCWs.

Table 4 show the comparison of mean scores of male and female Covid recovered and non-infected DHCWs, according to their respective questionnaires and Mann-Whitney U test was applied to compare the male and female participants. It can be seen that P-value for Covid recovered DHCWs was 0.96 and non-infected DHCWs was 0.041.

Category		Gender	N	Mean/ Median score	Mann-Whitney U (p-value)
Non infected DHCWs	PHQ-9/Healthy score scale	Male	140	113.20	
		Female	101	131.81	0.41
		Total	241		
Covid Recovered DHCWs	PHQ-9/Healthy score scale	Male	62	71.88	
		Female	81	72.09	0.976
		Total	143		

Table 4: Shows the comparison mean scores of male and female participants of both non infected and Covid recovered DHCWs

DISCUSSION

Analyzing the demographics of our studies shows that the mean age of the participants was 28.35±6.29. so most of the participants were relatively young being in their 3rd and 4th decade of life, therefore the anxiety and fear of Covid pandemic was generally expected to be lower than based on young age as studies have shown higher anxiety levels among people in older age groups [12]. However when the participants were divided into groups of above 45 years and below 45 years for comparison, and then there was no significant difference(for non-infected DHCWs p=0.97 and for Covid recovered DHCWs p=0.093) observed between the older and younger participants for either Covid recovered or non-infected DHCWs. A study conducted on general population in the province of KPK revealed that fear of Covid was higher among the younger age groups; however the study could not establish a reason for this [14]. Our study further revealed that, 62.76% of the participants were not infected by Covid whereas 37.24% of the DHCWs had recovered from Covid, giving us a good number of individuals in both these categories to be analyzed. Further the results of our study revealed that most of the non-infected DHCWs had mild psychological distress 48.98%

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(120), while 31.43% (77) of them had moderate psychological distress, 7.7% (19) were found to be neutral while only 6.9% (17) had severe psychological distress. When compared with a previous study done in Pakistan, there was some difference in this regard, as that study revealed that a large number of dentists (75%) were afraid of getting infected in the workplace and even a larger number (92%) were afraid to carry the infection back home [15]. Another study from Turkey reported that 90% of the dentists were afraid of getting infected and 95% of them were concerned about carrying the virus to their family [16]. Similar to the non-infected DHCWs the Covid recovered DHCWs mostly had only minimal depression 39.86% (57), Followed by no depression 30.07% (43) and moderate depression 20.28% (29), while only 2%(3) of these participants had severe depression. These participants seemed to have even lesser anxiety and fear as compared to non-infected participants. A study revealed that fear was highly prevalent among the dental professionals of Pakistan [17]. Another study demonstrated that dentists were more afraid of Covid infection as compared to other Doctors and pharmacists [18]. Aerosol generating procedures in confined spaces of the dentist clinics makes them more prone to transference of the disease, This could be a reason for the higher fear and anxiety rates in these studies [19]. The relatively lower rates of fear and anxiety among the participants of our study as compared to other such studies could be explained by the fact that the data collection of our study was done during a time period (04/01/2022 – 28/01/2022) when the pandemic was reported to be declining, with low new positive rates [20]. The decrease in Covid related mental distress among DHCWs could be a result of that demonstrating that health professionals tend to have lesser anxiety as epidemics decline. When the male and female participants were compared it was observed that, there was significant increased mental distress among female DHCWs as compared to male non-infected participants 11 female were found to have severe psychological distress as compared to 6 male DHCWs. When scores of male and female non-infected DHCWs were compared using the Mann-Whitney U test it revealed a significantly higher mean score among the female members (p-value=0.041). Emphasizing the fact, non-infected female DHCWs had significantly higher psychological distress. Another study from Pakistan revealed similar findings that female dentists were more afraid of the Covid situation as compared to males (Mean fear of COVID 19 scale score for, male= 24.54 +- 5.3, female = 27.11+-4.3; p< 0.001) [21]. This can be explained by the factors that females have more work stress than men and as they are also responsible for house chores, and take care of the family members in addition to their careers [22]. The sensitive nature of women could be another contributing factor for this. However our results also showed that there was no significant difference of Covid related depression (p=0.976) among male and female Covid recovered DHCWs. Thus we may be forced to think that this decreased depression levels among female Covid recovered DHCWs, could be from a sense of acquiring immunity following Covid infection [23].It could also be a result of human nature which is more prone of fear of unknown as compared to a fear with known experience and consequences[24].

CONCLUSIONS

With a considerable sample size from both Public and private sector hospitals our study can claim to have credible results, which can play an important role for the promotion of psychological well-being among dental professionals. The results showed that DHCWs generally had mild to moderate psychological distress or depression as a result of the Covid situation.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Comparison of Cervical Vertebral Maturation with Fishman's Skeletal Maturity Index Method in Assessment of Growth Status

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ABSTRACT

Assessment of skeletal maturity is paramount for orthodontists since optimal use and effectiveness of orthodontic and orthopedic appliances depends on it. **Objective:** To compare the cervical vertebral maturation (CVM) with Fishman's hand wrist radiograph (HWR) method in assessment of growth status. **Methods:** This comparative cross sectional study was conducted at the Orthodontics department at the Khyber College of dentistry, Peshawar on 100 participants. The patients with 9 to 15 years of age, relatively well aligned arches, both genders, mild to moderate skeletal discrepancy, minimal dental compensations, vertical normal angle, and without temporomandibular joint disorders were included. Along with age and gender, stages of HWR and CVM were recorded. HWRs were acquired by standardized method and lateral cephalograms were taken in natural head position. The staging of HWR was done by using Fishman method while CVM staging. Comparison of CVM stages and Fishmann's HWR stages were done using chi-square test. **Results:** The mean age was 11.79 ± 1.62 years. The females were 53(53%) and males were 47(47%). Most common stage of CVM was III (n=33, 33%) followed by IV (n=27, 27%). Similarly, common stage of hand wrist radiograph was III (n=32, 32%) followed by IV (n=28, 28%).There was no statistically significant different between two methods for assessing skeletal growth status (p=0.697). **Conclusions:** Cervical vertebral maturation can have used as an alternative to hand wrist radiograph for growth assessment without an extra radiation.

INTRODUCTION

The objective of orthodontic treatment is to improve esthetic, phonetic and masticatory function of patients. The main outcome of orthodontic care is achievement of ideal dentofacial appearance.[1] Due to awareness among the people of modern era because of easy access to social and other media there is increased presentation for orthodontic treatment at younger ages [2]. Orthopedic and functional appliances are usually used for correcting skeletal malrelations in growing patients [3]. Skeletal class II malocclusion is more amenable to growth modification therapy than class III. Treatment at growing age is to modify skeletal growth to favorable direction [4]. Growth is

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continuous process spanning over many years [5]. For successful growth modification treatment the short possible time is of utmost importance to improve patients compliance, reduce financial burden, and minimize iatrogenic effect of orthodontic treatment [6]. Growth spurt is the period during maximum growth occurs in individuals. If the functional appliances are given to the patients during growth spurt with skeletal discrepancies optimal corrections can be expected [7]. Many indicators are available for assessing skeletal maturity for growing patients. Some of the biological indicators for growth determination are chronological age, dental age, tooth eruption, cervical vertebral maturation(CVM), hand wrist radiographs and peak height velocity [-8]. The gold standard for recording growth status of an individual is peak height velocity but it involves longitudinal assessment of the subjects which not feasible from clinical stand point of view [9]. The reliability of hand wrist radiograph is next to peak height velocity but it is associated with extra radiation to the patients [10]. The CVM is very commonly used method for growth status assessment but there is a lot of controversies about its efficacy [11, 12]. Some studies showed it is very effective and other show it is least affective [13]. The variation in results can be due to level of experience in assessing CVM staging, ethnic and genetic factors. There is lack of local literature on this topic. This study helped the clinicians in assessing the growth status with reliable method. This study was conducted to compare CVM against Fishman's hand wrist radiographic method in assessing skeletal growth status.

METHOD

This comparative cross sectional study was conducted on 100 cases conducted at the department of Orthodontics at the Khyber College of Dentistry, Peshawar, which is a tertiary care center. A verbal informed consent was obtained from all participants after complete explanation of the study. Hospital ethical approval was obtained. The inclusion criteria were patients 9 to 15 years of age, relatively well aligned arches, both genders, mild to moderate skeletal discrepancy, minimal dental compensations, vertical normal angle, and no temporomandibular joint disorders. The cases with long face syndrome, severe skeletal dysplasia and non-Pakistani nationals were excluded. Along with age and gender, stages of hand wrist radiograph (HWR) and CVM were recorded. HWRs were acquired by standardized method and lateral cephalograms were taken in natural head position. The staging of HWR was done by using Fishman method while CVM staging by Bacetti *et al.*, [14].

The results of hand wrist radiograph evaluation were as follows:

- Growth Stage I = CVM stage I = Fishman's skeletal maturity indicator (SMI) 1 – 3
- Growth Stage II = CVM stage II = Fishman's SMI 4 – 5
- Growth Stage III = CVM stage III = Fishman's SMI 6 – 8
- Growth Stage IV = CVM stage IV = Fishman's SMI 9 – 10
- Growth Stage V = CVM stage V = Fishman's SMI 11

The CVM staging were done from cervical stage 1 (CS1) to CS6 based on presence of concavity on inferior surface of cervical vertebra 2 to 4 and shape of these vertebrae according to Bacetti *et al.*, [14]. Statistical analysis was done in R version 4.1.2. Continuous data like age were computed as mean and SD while qualitative variables like gender, CVM stages and HWR stages as frequencies and percentages. Comparison of CVM stages and HWR stages were done using chi-square test. P ≤0.05 was significant level.

RESULTS

The mean age was 11.79 ± 1.62 years with range from 9 to 15 years. The females were 53(53%) and males were 47(47%). Most common stage of CVM was III (n= 33, 33%) followed by IV (n = 27, 27%). Similarly, common stage of hand wrist radiograph was III (n=32, 32%) followed by IV (n=28, 28%) (Table 1).

Variable	Characteristic	n(%)
Gender	Female	53 (53)
	Male	47 (47)
CVM stage	I	11 (11)
	II	22 (22)
	III	33 (33)
	IV	27 (27)
	V	7 (7.0)
HWR stage	I	11 (11)
	II	22 (22)
	III	32 (32)
	IV	28 (28)
	V	7 (7.0)

Table 1: Frequency of gender, CVM and hand wrist stages

*CVM, cervical vertebral maturation; HWR, Hand wrist radiograph

The relation between age and CVM were similar in both males and females as shown (Table 2).

Gender	CVM	Mean ± SD
Male	I	9.29 ± 0.49
	II	10.7 ± 1.06
	III	12.19 ± 1.11
	IV	13.09 ± 0.83
	V	13.67 ± 1.15
	I	9.5 ± 0.58

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Female	II	10 ± 0.74
	III	12.18 ± 1.19
	IV	12.94 ± 0.85
	V	13.75 ± 0.96

Table 2: Mean age in various stages of CVM in both genders

Similarly, the relation between age and hand wrist radiograph were similar in both males and females (Table 3).

Gender	HWR	Mean ± SD
Male	I	9.29 ± 0.49
	II	10.64 ± 1.03
	III	12.36 ± 1.01
	IV	13 ± 0.85
	V	13.67 ± 1.15
Female	I	9.5 ± 0.58
	II	10 ± 0.77
	III	12.28 ± 1.23
	IV	12.88 ± 1.2
	V	13 ± 0.82

Table 3: Mean age in various stages of HWR in both genders

Comparison of cervical vertebral maturation and hand wrist radiograph show that there was no statistically significant different between two methods for assessing skeletal growth status (p=0.697). All stage 1 of CVM was correlating with stage 1 of HWR. There was 95.45% correlation between stage II of both methods. Rest of results is shown (Table 4).

HWR growth stages	CVM stages n(%)					p-value
	I	II	III	IV	V	
I	11(100.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0.697
II	0(0.00)	21(95.45)	1(3.03)	0(0.00)	0(0.00)	
III	0(0.00)	1(4.55)	30(90.91)	1(3.70)	0(0.00)	
IV	0(0.00)	0(0.00)	2(6.06)	25(92.59)	1(14.29)	
V	0(0.00)	0(0.00)	0(0.00)	1(3.70)	6(85.71)	

Table 4: Comparison of cervical vertebral maturation and hand wrist radiograph
*Fisher exact test

DISCUSSION

This study was conducted to compare two methods for assessing skeletal maturation. Our results showed that there is no significant difference between hand wrist method of Fishman and CVM of Bacetti *et al.*,[14]. Our findings showed that the mean age was 11.79 ± 1.62 years with range from 9 to 15 years. We include only growing participants which commonly belong to this age range. Due to secular trend and modern life style now individuals grow early and achieve maturity a bit earlier than before [15]. Our finding showed that all stage 1 of CVM was correlating with stage 1 of HWR. There was 95.45% correlation between stage II of both methods. Our results revealed that CVM can be used as an alternative to Fishman HWR method. The most common drawback of HWR was extra radiation exposure for the orthodontic cases[16]. Most of the orthodontic cases were in growing age and many factors are associated with this age which predisposes these patients more to the malignant changes than adult population. Some of the factors are: during growth cell multiplication was more so, more chances of malignancy, second these cases have more life expectancy and third their body structure was small as compared adults so more concentration of radiation [17]. We used Chi-square test to see association between the two methods. As both HWR method and CVM method were categorical variables and from statistical standpoint correlation between categorical variable was impossible by Pearson correlation test which is gold stand test for linear relationship. The correlation between such variables was computed Spearman correlation test which assign rank to data and transform the original. Liu *et al.*, study results were just like contingency table of chi-square test [18]. A study was conducted on Chinese population by Alkhal *et al.*, on 400 subjects in which female were in age range of 10-15 years and males were in age range of 12-17 year [19]. All the subjects were in circumpubertal growth spurt (stage 3 and 4 of CVM). Their results showed a very high correlation between CVM and HWR by Fishman method (for males r = 0.93, for female r = 0.94). These results are similar to our study. Gandini *et al.*, study was conducted on comparison of CVM and HWR on 30 cases in age range of 7 to 18 years. They used Cohen Kappa test for relation between CVM and HWR and reported concordance of 83.3% between two methods[20].

CONCLUSIONS

Within limitations of this study it can concluded that cervical vertebral maturation can be reliable alternative to hand wrist radiograph for skeletal maturation assessment.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Evaluation of Buccal Corridors in Patients Seeking Orthodontic Treatment in Different Types of Malocclusion at Tertiary Care Hospital

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ABSTRACT

There are many factors that make an appealing smile, and the buccal corridor is one of the most crucial smiling characteristics. **Objective:** To evaluate the width of buccal corridors in patients with different types of malocclusions seeking orthodontic treatment at tertiary care hospital LUMHS Jamshoro/Hyderabad. **Methods:** 93 subjects were studied. Patients were asked to smile fully to measure buccal corridor width with a vernier caliper. The buccal corridor was estimated by multiplying the maxillary interproximal width by the inner lip corner distance by 100. They were divided into 5 modes by buccal corridor percentage. i-e: Buccal corridor 2% (wide smile), Buccal corridor 10% (nearly a wide smile), Buccal corridor 15% (mediocre smile), Buccal corridor 22% (nearly a narrow smile), Buccal corridor above 22% (narrow smile). Angle's malocclusion classification classified all patients. **Results:** The mean age was 19.18. Males were 34.4% and females were 65.6%. With various types of buccal corridors among them, 37 participants were in a class I malocclusion, 43 were in the class II and 13 were in the class III malocclusion. 14 participants belongs to medium narrow buccal corridors (15.1%), 18 belongs to the medium buccal corridors (19.4%), 47 belongs to the medium broad buccal corridors (50.5%), and 14 belongs to broad buccal corridors (15.1%). The results showed that there was no significant association between these two variables having p-value 0.207. **Conclusion:** Medium broad buccal corridors were seen more frequently in various types of malocclusion.

INTRODUCTION

The most fundamental means of human interaction is the smiling. It enhances face beauty and contributes to the definition of a person's personality's skills and traits. The relevance of the smile on the facial look has been emphasized in contemporary orthodontics. By boosting self-confidence, it influences how socially acceptable we are and leads to more comfortable communication. Children pay greater attention to the anterior teeth's look than to occlusion [1]. The key to starting a successful orthodontic office is to think about your perfect smile and incorporate that information into your practice [2]. A number of elements contribute to an appealing smile, including the phonemic curvature of the upper dental arch with the lower lip, the width of buccal corridors, the portion of dental and gingival display, the colour of the teeth and gingiva, the nonattendance of cant in the occlusal plane, and the number of teeth that are visible when smiling [3]. One of the inescapable elements that has recently attracted clinicians' concern is the buccal corridor [4]. The bright space that appears between the labial surface of the

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maxillary posterior teeth and the inner mucosa of the soft tissues that form the corners of the mouth and the cheeks when someone smiles is produced by this aspect of smile appearance, also known as lateral dark space, lateral negative space, or "shadow tunnel."[5]. The buccal corridor width is the most problematic aspect of smile beauty among the aforementioned elements since there is no disagreement in the studies on the appropriate size. This might be attributed to a variety of etiologic variables that impact the buccal corridor's size, such as a maxillary shortage in either the transverse or sagittal dimensions, and extractions in the upper arch as a consequence of prior tooth loss or the orthodontic treatment strategy [6]. Various malocclusions may have buccal corridor widths that seem to be different sizes. The buccal corridor becomes smaller as the visible maxillary teeth gets wider, creating narrow buccal corridors. The goal of the current research is to evaluate, from a dentist's perspective, the beauty of smiles in relation to various buccal corridor widths in various malocclusions [7]. When there is a significant buccal corridor and transverse maxillary deficit, orthopaedic or surgical maxilla enlargement may be an option. However, in a maxilla that is essentially normal, the diminution of the buccal corridor should not be thought of as the justification for maxillary growth [8]. Buccal pathways reveal both the sagittal and transverse relationships of the maxilla in addition to their transverse relationships. The buccal corridor becomes bigger if the maxilla is positioned posteriorly, and conversely [9]. While there is some knowledge on the appropriate size of buccal corridor in the previous literature, much of it is based on clinical judgments, and the scientific research that have looked into this topic have produced conflicting results [10]. Numerous studies have shown that wider grins and buccal corridors are found as additional appealing. However, some scientists pointed out that buccal corridor width has little impact on how the smile is seen aesthetically. Thus, this study aim to assess the evaluation of buccal corridors width in patients with different malocclusions and their smile esthetics.

METHODS

From September 2020 to April 2021, this comparative cross-sectional research using non-probability consecutive sampling was carried out at the orthodontic department of LUMHS Jamshoro/Hyderabad. Total sample size was 93 (constituted of 3 groups of malocclusion), which was calculated by open Epi calculator. Participants with both genders and having age range of 12 to 30 years were included in the study. While participants with previous history of orthodontic treatment or having any facial deformity such as cleft lip & palate or history of trauma and supernumerary or congenitally missing teeth were excluded from study. All subjects were with normal morphology of dentition with the possible exception of 3rd molars. Those participants who meet the inclusion criteria were asked to sign a written consent and were asked to give a full smile to record the buccal corridor width with the help of vernier caliper. Full face frontal smiling view photographs were taken with Samsung digital camera at standard setting of 10 mega pixels at auto mode, at a distance of 2 feet. The cropping and editing of all the photographs were made by using Adobe Photoshop Version 7.0. The buccal corridor will be determined by multiplying the ratio of the width of the maxillary interproximal to the distance between the inner lip corners by 100. They were divided into five categories based on the amount of buccal corridor, including buccal corridors of 2% (wide smiles), 10% (almost broad smiles), 15% (mediocre smiles), 22% (nearly narrow smiles), and over 22% (modes with more buccal corridor) (narrow smile). According to Angle's classification of malocclusion, all the cases were categorized. Data were transferred to EPI data 3.1, EPI association for analysis after being saved in Microsoft office excel 2007(Microsoft company WA, USA). Frequency and percentage has been completed for qualitative variable like gender, educational status, ethnicity and socioeconomic status. Affect modify like age, gender, educational status, ethnicity and socioeconomic status was controlled through stratification. Post stratification chi-square test, analysis of variants was applied to the data at p-value-0.05.

RESULTS

In this study 93 patients were enrolled. Of 93 patients 32(34.4%) were male and 61(65.6%) were female, as shown in figure 1.

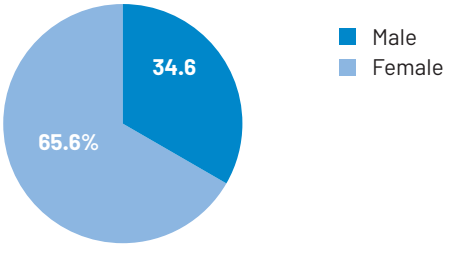

Figure 1: Gender distribution of the participant

Table 1 shows descriptive statistics of age of participants, in which mean age was 19.1828, minimum 14.00, maximum 28.00 and standard deviation was 3.54458.

N (Total No: of Patients)	93
Mean	19.1828
Minimum	14.00
Maximum	28.00
Standard deviation	3.54458

Figure 1: Gender distribution of the participant

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Table 2 shows different types of malocclusions according to angle's classification, 37 participants belongs to class I (39.8%), 43 participants belongs to class II (46.2%), whereas 13 participants belongs to class III(14.0%).

Category	n (%)	Cumulative Percent
Class-I	37 (39.8%)	39.88
Class-II	43 (46.2%)	6.0
Class-III	13 (14%)	100.0
Total	93 (100%)	

Table 2: Different malocclusions according to the angle's classification

Table 3 shows various types of buccal corridors in which narrow buccal corridor was 0%, medium narrow buccal corridor was 15.1%, medium narrow buccal corridor was 19.4%, medium broad buccal corridor was 50.5%, and broad buccal corridor was 15.1%.

Types of buccal corridor	n (%)
Narrow buccal corridor	0 (0%)
Medium narrow buccal corridor	14 (15.1%)
Medium buccal corridor	18 (19.4%)
Medium broad buccal corridor	47 (50.5%)
Broad buccal corridor	14 (15.1%)
Total	93 (100%)

Table 3: Various types of buccal corridors in the participants

According to the distribution of angle's classification with various types of buccal corridors there wasn't any finding of narrow buccal corridor in any class of malocclusion but in medium narrow buccal corridor there were 10 participants of class I, 3 in class II and 1 in class III, in medium buccal corridor there were 6 participants in class I, 9 in class II and 3 in class III, in medium broad buccal corridor there were 18 participants in class I, 23 in class II and 6 in class III, in broad buccal corridor there were 3 participants in class I, 8 in class II and 3 in class III. All these findings are shown in table 4.

Type of buccal corridor	Angle's Classification			Total
	Class-I	Class-II	Class-III	
Narrow buccal corridor	0	0	0	0
Medium narrow buccal Corridor	10	3	1	14
Medium buccal corridor	6	9	3	18
Medium broad buccal corridor	18	23	6	47
Broad buccal corridor	3	8	3	14
Total	37	43	13	93

Table 4: Distribution of malocclusion with different types of buccal corridor

DISCUSSION

As smile aesthetics has grown in popularity in the literature on orthodontics. As more and more adults seek orthodontic treatment, it is crucial for orthodontists to take adult patients' smile aesthetics into account [11]. As people age advances, their perioral soft tissues shift, which has an impact on their smile. In a number of articles, researchers evaluated photographs of smiles with varying buccal corridor widths [12-14]. Researches carried out by Gul e Erum and Ritter DE, altered the same smile by teeth removing or adding, changing the breadth of the teeth beginning with the first maxillary premolars, or altering the quantity and transverse width of the posterior teeth [1, 15, 16]. On the other hand studies performed by Yang IH, Afsari E and Aksu M contrasted the smiles of several people whose lateral dark spaces had nothing in common, either by removing premolars or in another way [17-19]. Jabbar A et al in his study concluded that there is no significant difference when judging the effects of buccal corridors on the smile attractiveness between the male and female raters, for both the consultants and residents [20]. Both preferred narrow buccal corridor to medium and broader buccal corridors. In this study we found that the narrow buccal corridor was 0%, medium narrow buccal corridor were found in 15.1%, medium narrow buccal corridor were found 19.4%, medium broad buccal corridor were found 50.5%, and broad buccal corridor were found15.1%. in contrast to our study, Jabbar A found medium broad buccal corridors as most frequent entity [20]. In this study there were different types of malocclusions according to angle's classification, among them 37 participants belongs to class I (39.8%), 43 participants belongs to class II (46.2%), whereas 13 participants belongs to class III (14.0%). According to the distribution of angle's classification with various types of buccal corridors there wasn't any finding of narrow buccal corridor were present in any class of malocclusion but in medium narrow buccal corridor there were 10 participants of class I, 3 in class II and 1 in class III, in medium buccal corridor there were 6 participants in class I, 9 in class II and 3 in class III, in medium broad buccal corridor there were 18 participants in class I, 23 in class II and 6 in class III, in broad buccal corridor there were 3 participants in class I, 8 in class II and 3 in class III . Similar to our findings, the research done by Bhat R and Ackerman et al, Class II individuals had significantly more buccal corridor space than the Class I group [21, 22]. This might be because Class II Division 1 people have a narrower maxillary arch than Class I subjects. This research used mouth view to assess how buccal corridors affected the aesthetics of smiles. Clinicians should be aware that even a little modification to buccal corridor spaces may have a big impact on how people perceive the aesthetics of a smile.

CONCLUSIONS

The buccal corridor exercised a remarkable influence on smile esthetics, Smile characteristics differ between different types of malocclusion. It was concluded that medium broad buccal corridors were seen more frequently

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in various types of malocclusion. With various types of buccal corridors among them, class II malocclusion was most frequently encountered.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Effect of Growth Hormone Injections in Children with Growth Hormone Deficiency

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ABSTRACT

The most frequent reason of short stature is Idiopathic short stature (ISS). If this condition is left untreated, the person's final height will be below the normal height range. **Objective:** To determine the efficacy of growth hormone treatment in short-stature children with isolated growth hormone deficiency. **Methods:** This was a retrospective cross-sectional study conducted in the department of Pediatric Endocrinology, Children Hospital, PIMS after approval from ethical review board. Epidemiological characteristics and response to therapies were noted and frequencies and Means were calculated. SPSS version 22 was used for statistical analysis. **Results:** Out of 87 study participants, there were 47 males and 40 female patients. The mean age was 10.04 ± 1.89. The mean height and weight of study participants was 105.13 ± 16.98cm and 21.55 ± 7.63kg respectively. The mean isolated growth hormone value was noted as 5.40 ± 1.43. The majority of the study participants were consanguineous i.e., 77%. Almost 48.3% study participants had growth hormone deficiency. The mean growth hormone velocity at 6th and 12th month was 6.52 ± 2.08 and 7.89 ± 2.54 respectively. In the end majority of the participants (82.8%) showed improvement. At 6th and 12th month both time points the results depicts a statistically significant difference among both groups (Improved Vs. Consistent) (p-value < 0.001). **Conclusions:** Recombinant growth hormone (GH) is an effective treatment for patients with GH deficiency to improve their growth. It was concluded that the children with ISS showed improvement after receiving GH therapy.

INTRODUCTION

Growth is a continuous biological process that is influenced by factors such as genetics, environment, diet, and hormones. Any of these components that are disturbed may have altered growth potential. A major issue with children in developing countries is short stature [1]. The most frequent reason of short stature is Idiopathic short stature (ISS). If this condition is left untreated, the person's final height will be below the normal height range. It is described as a type of symmetrical short stature whose etiology has not yet been identified [2]. Since more people have become aware of the potential for curable problems and the provision of diagnostic tools, short stature is now a more commonly studied pediatric endocrine problem. Every child needs to have their height and weight measured annually to determine their growth potential, as healthy growth in children is a key indicator of their overall health [3]. ISS is a type of short stature that affects children who have normal birth weights, normal body compositions, normal GH responses to stimulation tests, height standard deviations (SDs) that is consistent with mean parental SDs, and no known underlying reason. However, ISS children are a diverse group of children with a wide range of non-specific explanations for their small height. The ISS category includes kids who are genetically short-statured and who also have constitutional growth and puberty delays [4]. Decisions about the use of GH have an impact on more than 1 million children in the US who may be candidates for GH therapy [5]. The major and most frequent common cause of short height in developing countries is severe malnutrition. In Pakistan, children under the age of five have severely poor nutritional conditions; over 40% of them are underweight, which

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frequently has lifetime effects on skeletal development [6, 7]. The majority of possible pediatric candidates for GH are children with idiopathic short stature. Idiopathic short stature thus is an important threshold in the extension of the non-traditional use of GH, along with the debate over the boundary between disease and the limits of natural variation. The usefulness of GH in improvement in growth for children with idiopathic short stature is unclear despite multiple research [8-10]. Patients with GH deficiency are individuals whose peak growth hormone concentration, as determined by the growth hormone stimulation test, is less than 10 ng/ml. the GH deficiency patients are treated with recombinant growth hormone to increase their growth and height [11, 12]. According to FDA-approved criteria, children whose height estimates are less than 160 centimeters are candidates for treatment with recombinant growth hormone (rGH) [13]. The etiology of short stature is complicated, and there is variation in the results of ISS according to different regions and ethnicity as well as in the outcomes of growth hormone therapy. However, limited literature is available regarding the effectiveness of growth hormone treatment in Pakistani children or efficacy of growth hormone treatment having growth hormone deficiency. Therefore, the current study aims to determine the efficacy of growth hormone treatment in short stature children with isolated growth hormone deficiency.

METHODS

In the department of Pediatric Endocrinology, Children Hospital, PIMS after the approval from ethical review board a retrospective cross-sectional study was conducted. Total 87 children were enrolled in current study by non-probability consecutive technique. All the children 2-12 years of age diagnosed with isolated growth hormone deficiency by growth hormone provocative test (Levo Dopa & insulin) were enrolled in the study after taking informed consent from the parents. The parents of children not willing to participate in the study, all syndromic patients, chronic idiopathic disease and multiple pituitary hormone deficiency were excluded from current study. Their epidemiological characteristics were noted on a Performa along with height and weight. Response to therapy was noted by seeing the growth velocity at 6 months and 12 months after GH replacement therapy. The frequencies and percentages were used to express all category and qualitative characteristics (such as gender). The mean standard deviation was used to express all continuous/quantitative data such as age, height, weight, SDs, mother and father height, gestational age, and lab results like as growth hormone levels. All p values less than 0.05 were considered significant. Statistical analysis was done utilizing the statistical analysis software SPSS version 22.

RESULTS

Out of 87 study participants, there were 47 males and 40 female patients. The mean age was 10.04 + 1.89. The mean height and weight of study participants was 105.13 + 16.98cm and 21.55 + 7.63kg respectively. Mean gestational age was 36.29 + 1.93 weeks, whereas the birth height and weight were 48.37 + 4.29 and 2.40 + 0.30 respectively. The mean isolated growth hormone value was noted as 5.40 + 1.43 (Table 1).

Variables		Mean + SD Or Frequency (Percentage)
Gender	Male	47 (54.0%)
	Female	40 (46.0%)
Age		10.04 + 1.89
Height (cm)		105.13 + 16.98
Weight (kg)		21.55 + 7.63
Gestational Age (weeks)		36.29 + 1.93
Birth Height (inches)		48.37 + 4.29
Birth Weight (kg)		2.40 + 0.30
Isolated Growth Hormone value		5.40 + 1.43

Table 1: Demographic and Anthropometric measurements of Pediatric Patients

Table 2 depicts the family history and outcome of the study. The majority of the study participants were consanguineous i.e., 77%. Almost 48.3% study participants had growth hormone deficiency in their family members whereas 51.7% participants were not having any family member with growth hormone deficiency. The mean growth hormone velocity at 6th and 12th month was 6.52 + 2.08 and 7.89 + 2.54 respectively. In the end majority of the participants (82.8%) showed improvement.

Variables		Mean + SD Or Frequency (Percentage)
Consanguinity	Yes	67 (77.0%)
	No	20 (23.0%)
GH Deficiency in Family members	Yes	42 (48.3%)
	No	45 (51.7%)
Growth Velocity at 6 months		6.52 + 2.08
Growth Velocity at 12 months		7.89 + 2.54
Outcome	Improved	72 (82.8%)
	Consistency	15 (17.2%)

Table 2: Family History and Outcome of Growth Hormone Therapy

Table 3 compares the mean scores of growth velocity at 6th and 12th month among participants with improvement and consistency. At both time points the results depicts a statistically significant difference among both groups (p-value < 0.001).

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Growth Velocity	Group I Improved Mean+ SD	Group II Consistency Mean+ SD	t-score	p-value
Growth Velocity at 6 months	7.18 + 1.61	3.34 + 0.45	9.108	<0.001
Growth Velocity at 12 months	8.72 + 1.92	3.90 + 0.57	9.608	<0.001

Table 3: Comparison of means scores regarding Growth Velocity among patients

DISCUSSION

Subsequently, recombinant human growth hormone (rhGH) therapy was approved for the treatment of short stature caused by a number of diseases, including Turner syndrome, Noonan syndrome, Prader-Willi syndrome, short stature caused by gene deficiency, chronic renal failure, and idiopathic short stature (ISS), as well as in children who are small for gestational age (SGA). This treatment has been accessible since 1985 [14]. In current study it was reported that out of 87 study participants, there were 47 males and 40 female patients. The mean age was 10.04 ± 1.89. The mean height and weight of study participants was 105.13 ± 16.98cm and 21.55 ± 7.63kg respectively. These findings were comparable in another study, it was reported that total 169 cases were enrolled, and the age group with the highest cases was >5 to 11 years. The ratio of men to women who were present was 1.17:1 [15]. The results of current study it was reported that the mean growth hormone velocity at 6th and 12th month was 6.52 ± 2.08 and 7.89 ± 2.54 respectively. In the end majority of the participants (82.8%) showed improvement. The majority of the study participants were consanguineous i.e., 77%. Almost 48.3% study participants had growth hormone deficiency in their family members whereas 51.7% participants were not having any family member with growth hormone deficiency. These findings were compared with literature. GH deficiency, which was seen in 48 out of 70 (69%) patients, was the most common cause of low stature in the Pakistani population [16]. According to a study conducted in Germany by Knoop *et al.*, familial or CDGP short height accounted for 68% of all cases of short stature [17]. A meta-analysis of data from 21 clinical trials found that children with ISS who received rhGH had significantly greater height gain at the end of the first year than the control group. At the end of the 2nd year. Additionally, this therapy increased eventual adult height. For male patients, the difference between the 2 groups was 5.3 cm, and for female patients, it was 4.7 cm [18]. The Results of another observational research conducted in Korea reported that patients with GHD and ISS had higher height standard deviation scores (SDS) than those without these conditions [19]. Another study was conducted to see how well patients with GHD and ISS grew after receiving GH therapy for two years. The authors also attempted to determine whether the effect of GH therapy varies based on the peak GH on the GH stimulation test. After receiving growth hormone treatment for two years, they reported no differences in height SDS and height velocity between GHD and ISS patients. Additionally, there was no significant different between GHD patients' responses to growth hormone therapy based on peak GH levels [20].

CONCLUSIONS

Recombinant growth hormone is an effective treatment for patients with GH deficiency to improve their growth. It was found that the children with ISS showed improvement after GH therapy. In order to distinguish between special cases of short stature requiring early diagnosis and treatment and normal growth variants, it is essential to accurately understand the prevalence of the multiple causes of short stature in a given population.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Practices On Safe-Handling of Cytotoxic Drugs Among Oncology Nurses in Two Public Sector Hospitals

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ABSTRACT

Administration of cytotoxic medicines (CDs) and occupational exposure to them are global issues. Inappropriate handling can lead to harmful residues getting into patient care areas, hospitals, and even the homes of patients. **Objectives:** To access the practices of nurses regarding safe handling of cytotoxic drugs and to evaluate the association among the level of practices and socio-demographic profile of the participants. **Methods:** Analytical cross-sectional study was carried out among 183 nurses of oncology department of public sector tertiary care hospitals, Lahore, Pakistan. The nurses working in oncology departments of age ranges 20 years to 50 years and having at least six months' experience in oncology units were included in the study. **Results:** The majority (56%) of the nurses reported "Good Practices" regarding safe handling of cytotoxic drugs followed by Fair practices (38%) and poor practices (6%). No significant association was reported among the level of practices and socio-demographic profile of the participants. **Conclusions:** Safe handling of cytotoxic drugs is very important aspect and the nurses can prevent their selves as well as the patients from complications. Overall, good practices were reported by the nurses regarding safe handling of cytotoxic drugs but still a large proportion of the nurses have fair and poor practices. Effective measures are needed to enhance the practices of nurse's working in oncology nurses regarding safe handling of cytotoxic drugs.

INTRODUCTION

Cancer is the most common cause of death in people. It is a debilitating condition that has an extremely high morbidity and fatality rate [1]. Cancer is a disease that does not target a particular age group but rather can strike people at any point in their lives. Cancer is ranked as the second leading cause of mortality worldwide [2]. It is anticipated that there are 443.4 new cases of cancer for every 100,000 men and women. In addition to this, the death rate due to cancer is 158.3 for every 100,000 men and women [3]. Cancer patients' chances of survival are directly influenced by how quickly the disease is diagnosed and by the treatment options that are made available to them [4]. There are only a few alternatives available to treat cancer; chemotherapy and radiation therapy are the two most important and frequently utilized treatments. The most effective form of treatment for people with cancer is chemotherapy [5]. Chemotherapy includes cytotoxic agents, immunotherapies, biologics, hormone therapies, targeted pharmacological therapies, and a few additional drugs. A hematopoietic stem cell transplant is a popular cancer treatment. Typically, chemotherapy is used to treat cancer [6]. In the early part of the 20th century, cytotoxic medications were first used for the treatment of cancer. Since then, these drugs have been successfully used to treat a wide variety of cancers [7]. Cytotoxic drugs (CDs) are one of the important groups of medicines which are used for the treatment of cancer. These drugs are also known as antineoplastic, anticancer or cancer chemotherapy drugs [8]. Because of their high level of toxicity, chemotherapy medicines not only have an effect on patients but also pose

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a threat to the medical professionals who administer them. The administration of chemotherapy is primarily the domain of registered nurses, who serve as the primary caregivers [9]. The safe and correct handling of cytotoxic medications is a topic of concern on a global scale, and more than 5.5 million health care staff were at risk of being exposed to the potentially harmful effects of the cytotoxic agent [10]. Occupational exposure of nurses to the toxic drugs lead to severe problems such as abdominal pain, hair loss, contact dermatitis, allergic reactions, nasal sores, skin injuries and eye injuries. Exposure to these drugs also leads to sever complication in reproductive outcomes including miscarriages, premature births, abortions, fetal loss and disabilities in offspring. As these drugs are cytotoxic, therefore, safe handling of these medications is very important and the basic responsibility of the staff who handle these medicines [11]. Safe handling of the cytotoxic drugs is the main responsibility of the nurses. It not only prevents the patients from harmful effects but also affects the health care professionals. The term "safe handling" refers to the accurate and careful receiving, processing, planning, and administration of cytotoxic medications, as well as their subsequent cleaning and disposal [12]. Therefore, in order for nurses to effectively handle chemotherapy and quality practices, they require certain abilities, knowledge, techniques, and judgments [13]. Since more than 20 years ago, it has been suggested that nurses should follow the standard guidelines of safe handling of cytotoxic drugs to protect not only their selves but the other health care professionals and patients. However, due to unsafe practices of administration of chemotherapy among the nurses, occupational exposure of nurses to cytotoxic medications has persisted for decades [14]. When compared to other types of medical professionals, nurses are the ones that spend the most of their time working directly with patients who are going through the process of getting cancer treatment in the form of cytotoxic medications [15]. Because of this, the primary responsibility of nurses is the management of cytotoxic drugs. This is due to the fact that nurses are regarded as the first line of managers for the management of cytotoxic drugs [16]. Adequate understanding and standard safe handling practices regarding safe handling of cytotoxic drugs is very important for every nurse in any health care facility to protect the patients, care givers and their selves from the adverse effects of chemotherapy [17]. Previous research studies suggested that nurses should have satisfactory and good practices to threaten patient's safety, family and the health care workers safety [18]. In addition, the nurses should be aware regarding the drugs included in cytotoxic drugs, side effects, precautions, personal protective equipment's needed for the nurses while handling the cytotoxic medication, written policies about cytotoxic drugs, preparation of chemotherapy, chemotherapy administration, cytotoxic drugs disposal, handling contaminated excreta and workplace safety [19]. Certain practices are very important to follow by the nurses to reverse these adverse effects. There has been a correlation established between the safe handling practices of cytotoxic medications in a hospital context and increased interaction with potentially hazardous elements. During the manufacture and administration of cytotoxic medications, the utilization of the labeled protective area, use of personal protective equipment's, use of safe needles, protection of light sensitive drugs, preparation of medication in chemotherapy cells and labeling of drugs are important [20, 21]. The current study is therefore designed to access the practices of nurses towards cytotoxic drugs and evaluate the association of practices with different socio-demographic variables.

METHODS

An analytical cross-sectional study was carried out in Public Sector hospitals, Lahore, Pakistan. Overall, 183 participants where cases were calculated in the study using previous proportion 37% [22]. All the nurses working in oncology departments within the age of 20 to 50 years, with at least six months experience and who have not received any training were included in the study. Data were collected using an adopted, reliable (Cronbach's alpha= 0.925) and validated "Cytotoxic drugs Handling Questionnaire . The tool is consisting of two sections. Section "A" is containing of Scio-demographic (age, sex, work experience, educational level and marital status) of the participants. Section "B" is consisting of 20 items Likert scale questions regarding the safe handling of cytotoxic drugs. Each item in section "B" has 3 response options with values of 0 = never, 1 = sometimes, and 2 = always. The practices of the participants were categorized as "Good", "Fair" and "Poor". A score of above 75% was considered as "Good Practices", score between 50% to 75% were considered as "Fair Practices" and below 50% of the score were considered as "Poor Practices". Data were entered and analyzed by using SPSS 25.0. the qualitative variables were presented by frequency and percentages. Chi square test was applied on different demographic variables and practices towards CDs. P-value <0.05 was considered as significant.

RESULTS

In this study the majority (42%) of the participants were from the age group of 36 to 45 years, followed by 25-35 years (36%) and 46-55 years (22%). In addition, the majority (52.2%) of the nurses was holding diploma in nursing and 47.5% of the nurses were educated to BSN level. 82.5% of

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the nurses were married and 62.3% of the nurses were having experience less than five years. Results are given in Table 1.

Variables	Frequency (Percentage)	Valid Percent	Cumulative Percent
25-35 Years	65 (35.5%)	35.5	35.5
36-45 Years	77 (42.1%)	42.1	77.6
46-55 Years	41 (22.4%)	22.4	100.0
Bachelor in Nursing	87 (47.5%)	47.5	47.5
General Nursing	96 (52.5%)	52.5	100.0
Total	183 (100%)	100.0	
Married	32 (17.5%)	17.5	17.5
Unmarried	151 (82.5%)	82.5	100.0
Less than 5 Years	114 (62.3%)	62.3	62.3
5-10 Years	49 (26.8%)	26.8	89.1
More than 10 Years	20 (10.9%)	10.9	100.0
Total	183 (100%)	100.0	

Table 1: Socio-demographic profile of the participants, n=183

The practice of the participants was assessed using questionnaire. The majority (56%) of the nurses reported "Good Practices" regarding safe handling of cytotoxic drugs. 38% of the participants were reported Fair Practices while 6% of the nurses reported poor practices regarding safe handling of cytotoxic drugs (Figure 1).

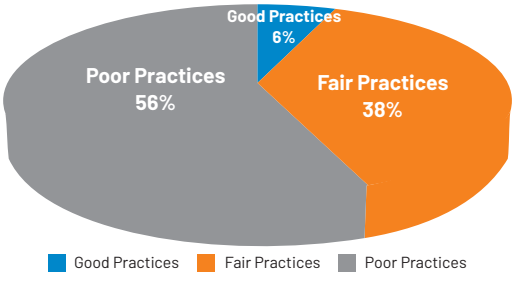

Figure 1: Pie-chart depicting overall practices of nurses regarding CDs

Association among different socio-demographic profile of the nurses and level of practices were accessed. The findings revealed no association among the level of practices towards safe handling of CDs with age, education, marital status and experience of the participants (Table 2).

Variables		Good Practices	Fair Practices	Poor Practices	Total	P-Value
Age		25-35	34	24	7	0.317
		36-45	46	28	3	
		46-55	22	18	1	
Total		102	70	11	183	
Education	Bachelor in Nursing	48	33	6	87	0.891
	General Nursing	54	37	5	96	
Total		102	70	11	183	
Marital	Married	20	8	4	32	
	Unmarried	82	62	7	151	0.91
Total		102	70	11	183	
Experience	Less than 5 Years	71	38	5	114	
	5-10 Years	23	21	5	49	0.143
	More than 10 Years	8	11	1	20	
Total		102	70	11	183	

Table 2: Association among the level of education and practices towards CDs, n=183

DISCUSSION

In this study the majority (42%) of the participants were from the age group of 36 to 45 years, 52.2% of the nurses was holding diploma in nursing and 47.5% of the nurses were educated to BSN level. 82.5% of the nurses were married and 62.3% of the nurses were having experience less than five years. However, it was lover compared to the findings of another study and reported that majority of the nurses were from the age group of 22 to 50 years. 70% of the participants were female, 88.3% of the nurses were holding bachelor's degree in nursing and 65% of the nurse were having more than four years working experience [1]. Supporting the current findings, another study in Pakistan provided relatively similar findings. The findings of the study reported that the majority (57.7%) of the participants were from the age group of 31 to 40 years. 96.2% of the participants were female and 52% of the nurses were diploma holders [23]. In this study the majority (56%) of the nurses reported "Good Practices" regarding safe handling of cytotoxic drugs following by fair practices (38%) and poor practices (6%). Supporting the findings of the current study a study reported partially similar findings and reported that the nursing working oncology departments have satisfactory practices regarding safe handling of cytotoxic drugs [1]. In contrast another study similar study provided totally different findings and the study reported that they nurse working in oncology department had unsatisfactory practices regarding safe handling of cytotoxic drugs [23]. In addition, Hosen *et al.*, inquiry into a separate topic revealed several practices. The survey's findings revealed that 58.3% of nurses lacked knowledge of safe chemotherapy handling techniques, and that only 33.3% of nurses actually adhered to these recommendations when administering chemotherapy [24]. Similar to the above findings, different study reported partially satisfactory practices regarding safe handling of

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cytotoxic drugs [25]. Furthermore, the importance of nurse's education towards the safe handling of cytotoxic drugs and its impact on patients and health care providers should be the part of the interventions [26, 27]. Moreover, 63.6% of the group under study found the nurses' overall KAP scores for the secure management of CDs to be satisfactory. For knowledge, attitudes, and practices, the mean scores were 19.05 4.8 out of 26, 13.09 3.07 out of 16, and 8.87 1.35 out of 12, respectively. More over half of the nurses had prior oncology-related training. During various stages of handling CDs, improper personal protective equipment (PPE) use was noted. It was determined that the examined oncology nurses did not practice safe CD handling and did not apply guidelines in a satisfactory manner, necessitating more frequent in-service training and an audit system to track and assess their performance after training [28]. The majority of studies on nurses' knowledge and behaviors related the safe management of chemotherapy was undertaken in underdeveloped nations. A research study emphasizes the significance of managing chemotherapy safely since it can help healthcare professionals, particularly nurses, avoid complication [29, 30]. The basic reason of the poor or unsatisfactory practices can be the lack of training opportunities for the nurses working in the oncology units. Literature emphasized on the continuous education for the oncology nurses to learn the advance nursing practices of safe handling of cytotoxic drugs [31, 32]. In this study no association was observed among the level of practices and socio-demographic profile of the participants. In the similar context, a study carried out by Simegn *et al.*, provided totally different findings and it was reported that experience and age of the participants were significantly (P=0.001) associated with the level of practices [12]. Similarly, another study carried out by Kumari and Taksande provided totally different findings and the findings of the study reported that age in years, marital status, working experience and professional qualification of nurses, is associated with their practices regarding safe handling of Cytotoxic drugs [33].

CONCLUSION

The safe management of cytotoxic medications by nurses was satisfactory, however many nurses still reported unfair and subpar handling. The handling of chemotherapy was not a topic of training for all the nurses. The nurses' inadequate training was clearly visible. According to the study, nurses handled CDs more frequently while wearing gloves and masks as personal protection. However, no one employed all the protective gear when handling (preparing, administering, and discarding) CDs. The current finding for using gloves while preparing is lower, therefore it is crucial to provide oncology nurses working in oncology facilities with training, safety surveillance systems, personal protective equipment, and standard practice guidelines..

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

A Comparison of Readmission Rates in Heart Failure with Preserved Ejection Fraction (HFpEF) V/S Heart Failure with Reduced Ejection Fraction (HFrEF)

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ABSTRACT

Heart failure (HF) contributes to increased hospital readmissions which results in amplified resource burden and morbidity. The conditions of readmission in HF patients have not been clarified. **Objectives:** To govern the relationship between heart failure with preserved ejection fraction (HFpEF) and heart failure with reduced ejection fraction and correlation with readmissions ratio. **Methods:** This prospective cohort study was held in the Adult Cardiology department of Tabba Heart Institute, Karachi, Pakistan for 6 months from March 10, 2019 to September 9, 2019. After attaining informed consent, an interview and clinical examination were performed and subjects were divided into exposed and unexposed groups (HFpEF and HFrEF). Patients were followed for readmission within one-month of initial hospitalization. **Results:** A total of 162 patients with heart failure (81 patients in each group) were included in the study. The mean total age was 65.4 ± 10.4 years, and 52.5% of the patients were male. Rehospitalization on day 30 was observed in 11 (13.6%) patients from the Group A (HFpEF) and in 10 (12.3%) patients from the Group B(HFrEF). Cardiac readmission was more common in the unexposed group than in the exposed group (80.0% vs. 63.6%). **Conclusions:** After admission due to acute heart failure, patients with HFpEF have a statistically insignificantly higher hospitalization burden compared to patients with HFrEF. In addition, patients with HF with preserved ejection fraction were as likely to be readmitted for cardiovascular reasons as those with HF with reduced ejection fraction.

INTRODUCTION

Heart failure is a well-known clinical condition and the number of hospital admissions with decompensated heart failure is increasing, mainly due to the increasing age of the population [1, 2]. It is estimated to affect 26 million people worldwide, with over one million admissions yearly in both the Europe and United States [3, 4]. In the US, the annual incidence of newly diagnosed heart failure is 670,000 cases per year. It has been reported that between one-third and one-half of HF patients maintain their ejection fraction, and these patients, especially in older age groups, may replace HF patients with reduced ejection fractions [5]. These patients tend to be older and have a different risk factor profile compared to patients with low ejection fraction (HFrEF) and heart failure. The increased incidence and hospitalization rates of subjects with HFpEF also reported higher post-hospital mortality during follow-up compared with HFrEF, but little adjustment was later found for several clinical features [6, 7]. Readmission is a huge financial burden on the health of heart failure patients, especially in a country like ours where the government has no health insurance system [8]. Admission rates also differ in the literature between the two groups; some published studies show similar readmission rates in the short and long term [9]. On the other hand, studies have shown re-hospitalization rates as high as 47% after HF, with or without cardiac causes. A recent follow-up study by

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Caughey *et al*. reports a 42% augmented rehospitalization risk in subjects with HFrEF in comparison with HFpEF after 30 days[5]. Previously, many studies have been conducted in the West to assess the variances in clinical characteristics and patients' outcomes with these two different types of HF, and have shown similar overall mortality and incidence and regional characteristics of HF in Asian countries[10]. However, there have been no local studies evaluating differences in clinical characteristics and treatment outcomes in heart failure patients with preserved and reduced ejection fraction(HFrEF vs HFpEF). Therefore, the goal of this analysis was to assess the differences in clinical features and predictors as well as the rates of rehospitalization in subsequent months among patients presenting with reduced and preserved ejection fraction in Tabba Heart tertiary cardiac care [11, 12]. The adverse clinical consequences of heart failure with preserved and reduced ejection fraction are now well known. Both types of heart failure are equally related to readmission and health economics, but local data are lacking[13, 14]. Our study will explore the relevance of both types of HF by identifying the prevalence and predictors of HFrEF and HFpEF in the local population and differences in readmission rates. Therefore, a better understanding of heart failure and its subtypes of cardiac and non-cardiac failure has the potential to improve survival with heart failure and lead to lower readmission rates.

METHODS

This prospective cohort study was conducted at the Tabba Heart Institute, Department of Adult Cardiology, Karachi, Pakistan, from March 10, 2019 to September 9, 2019. Using the WHO sample size calculator, taking the readmission rate statistics as 23% for heart failure with preserved ejection fraction (HFpEF) and 47% for heart failure with reduced ejection fraction(HFrEF). The confidence interval was 5% and test power as 90%. The calculated sample size turned out to be 81 in each group. The total sample size will be 162. Recruitment and follow-up of all patients, if any, will be conducted throughout the study to compare readmission rates and assess predictors between the two types of heart failure. The admission criteria were,

1. Adult patients of both genders, aged 18 to 80 years, with newly diagnosed heart failure.

Group A: Heart failure with preserved ejection fraction (HFpEF)

Group B: heart failure with reduced ejection fraction (HFrEF)

2. Patients undergoing echocardiography to confirm ejection fraction

Exclusion criteria include, patients with pre-existing heart failure and severe primary valvular disease, and patients who developed heart failure after admission to the hospital (as an in-hospital complication). The study was conducted after obtaining the consent of the CPSP. Tabba Heart Institute ethics committee approval was obtained prior to data collection. The required number of patients who met the inclusion criteria were selected for this study through consecutive sampling from the Department of Adult Cardiology of the Tabba Heart Institute, Karachi, Pakistan. Patient demographic profiles such as age (year), weight (kg), height (cm), gender, hypertension, diabetes, dyslipidemia, family history and smoking history were recorded for all patients. BMI for all enrolled patients was calculated based on weight (kg)/height (m2). Confounding variables and bias were controlled by strict adherence to the inclusion and exclusion criteria during the design and regression phases of the stratification and analysis phases. Patient data is safe and available only to authorized persons. The S.D and mean were calculated for weight, age, BMI and height. Rates and percentages were calculated for gender, diabetes mellitus, dyslipidemia, hypertension, smoking, history of CAD (previous PCI, myocardial infarction, CABG, etc.). Comparison of heart failure with preserved ejection fraction (HFpEF) and rehospitalization was performed using chi -square. A $p \leq 0.05$ will be taken as significant and relative risk will be calculated. Impact modifiers such as age, BMI, dyslipidemia, CAD history(prior MI, PCI, CABG, etc.) were taken into account by stratification. After stratification, the chi-square test will be applied and the relative risk will also be calculated.

RESULT

A total of 162 patients with heart failure were selected for the study and divided into 2 groups as exposed group included patients of Heart failure with preserved ejection fraction and unexposed group include patients with preserved ejection fraction(HFpEF). The overall mean age was 65.4 ± 10.4 years and 52.5% of the patient-years were male and 26.9 ± 5.9 kg/m2 was the mean BMI(Table 1).

	HFpEF (n=81)	HFrEF (n=81)	Total (162)	P-value
Mean Age	68.1 ± 10.5	62.6 ± 9.6	65.4 ± 10.4	0.0006
Mean BMI	28.2 ±6.3	25.6 ±5.4	26.9 ± 5.9	0.004
Gender wise Distribution				
Male	27(33.3)	58(71.6)	85(52.5)	<0.001
Female	54(66.7)	23(28.4)	77(47.5)	
Distribution According to Diabetes Mellitus				
Yes	53(65.4)	44(54.3)	97(59.9)	0.15
No	28(34.6)	37(45.7)	65(40.1)	
Distribution According to Dyslipidemia				
Yes	21(25.9)	20(24.7)	41(25.3)	0.85
No	60(74.1)	61(75.3)	121(74.7)	

Table 1: Mean age, Mean BMI and Distribution of HFpEF and HFrEF according to Gender, Diabetes Mellitus and dyslipidemia.

Of the 81 exposed patients, 27(33.3%) were male with 68.1 ±

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10.5 years of mean age, 58 (71.6%) of the 81 unexposed patients were male with a mean age of 62.6 ± 9. The mean BMI was 28.2 ± 6.3 kg/m2 in the exposed group and 25.6 ± 5.4 kg/m2 in the unexposed group. While 65.4% were diabetic in the exposed group, diabetes was observed in 44 (54.3%) subjects in the unexposed group. While dyslipidemia was observed in 21 (25.9%) patients in the exposed group, dyslipidaemia was observed in 20 (24.7%) patients in the unexposed group. In both exposed and unexposed groups, 88.9% of patients had hypertension. A total of 5 patients had a family history of CAD, 2 (2.5%) cases in the exposed group and 3 (3.7%) cases in the unexposed group (Table 2).

Hypertension	HFpEF (n=81)	HFrEF (n=81)	Total (162)	P-value
Yes	72 (88.9)	72 (88.9)	144 (88.9)	1.00
No	9 (11.1)	9 (11.1)	18 (11.1)	
Distribution according to family history of coronary artery disease (CAD)				
Yes	2 (2.5)	3 (3.7)	5 (3.1)	0.65
No	79 (97.5)	78 (96.3)	157 (96.9)	

Table 2: Distribution of HFpEF and HFrEF according to Hypertension and family history of coronary artery disease (CAD)

Smoking was most frequent in the unexposed group compared to the exposed group (210 vs. 9.9%) (Table 3).

Smoking	HFpEF (n=81)	HFrEF (n=81)	Total (162)	P-value
Yes	8 (9.9)	17 (21.0)	25 (15.4)	0.05
No	73 (90.1)	64 (79.0)	137 (84.6)	
Distribution According to Prior Percutaneous Coronary Intervention (PCI)				
Yes	13 (16.1)	25 (30.9)	38 (23.5)	0.02
No	68 (83.9)	56 (69.1)	124 (76.5)	

Table 3: Distribution of HFpEF and HFrEF according to smoking status and prior percutaneous coronary intervention (PCI)

Prior PCI was higher in the unexposed group in comparison to the exposed group (30.9% vs. 16.1%, respectively). While 20 (24.7%) patients in the exposed group had a history of CABG, 12 (14.8%) patients in the unexposed group had a history of CABG. Rehospitalization was observed after 30 days in 11 (13.6%) patients in the exposed group and in 10 (12.3%) patients in the unexposed group (Table 4).

Prior CABG	HFpEF (n=81)	HFrEF (n=81)	Total (162)	P-value
Yes	20 (24.7)	12 (14.8)	32 (19.7)	0.11
No	61 (75.3)	69 (85.2)	61 (75.3)	
Readmission	**HFpEF (n=81)**	**HFrEF (n=81)**	**P-value**	**R-R**
Yes	11 (13.6)	10 (12.3)	0.81	0.90
No	70 (86.4)	71 (87.7)		

Table 4: Distribution of HFpEF and HFrEF according to coronary artery bypass graft surgery (CABG) and readmission ratio

Cardiac readmission was more common in the HFrEF and HFpEF (80.0% vs. 63.6%) (Figure 1). Age, gender, BMI, smoking status, hemoglobin, prior MI, prior PCI, and atrial fibrillation were significantly associated with HF patients with preserved ejection fraction (p-value ≤0.05). Although no significant association was observed for diabetes, dyslipidemia, hypertension, family history of CAD, prior CABG, CKD, COPD, CVA, asthma, ILD, atrial flutter, in-hospital mortality, and 30-day readmission (p value > 0.05). Age, gender, BMI, smoking status, hemoglobin, prior MI, prior PCI, and atrial fibrillation were significantly associated with HF patients with preserved ejection fraction (p-value ≤0.05). In our study, p < 0.05 was significantly associated with gender, diabetes, dyslipidemia, hypertension, prior MI, prior PCI, prior CABG, and readmission.

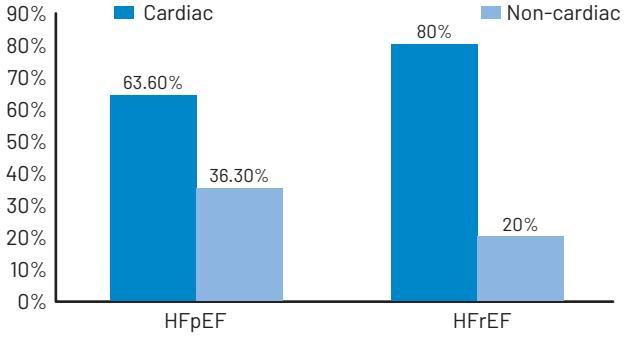

Figure 1: Distribution of HFpEF and HFrEF according to cause of readmission

DISCUSSION

The change of cardiovascular risk factors results in higher incidence of HFPEF in the context of aging and the increasing number of comorbidities [14]. The female gender, increased age, obesity and hypertension are related with HFPEF and these aspects have been shown to have a mechanistic cause [15, 16]. Since we do not understand the relationship between HF type and 30-day readmission rates in the general HF population, we investigated the difference in these outcomes in a prospective study. After adjusting for comorbidity burden, demographics, and BMI, we found that 30-day readmission rates were similar between patients with HFrEF and those with HFpEF [17, 18]. Previous studies of 251 individual populations enrolled in hospitals and regional health organizations had results consistent with our study [19]. Given that HFpEF accounts for approximately half of HF hospitalizations, the results are similar in patients with HFrEF and HFpEF, and there are treatments that improve outcomes for HFpEF but not for HFpEF [20]. In our study, the type of readmission in the exposed group was related to cardiovascular disease in 7 patients (63.6%) and non-cardiovascular in 4 (36.3%) patients, while the type of readmission was related to cardiovascular disease in 8 (72.7%) of patients in the unexposed group. During the 49.5 months of median follow-up, a total of 5,863

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hospitalizations occurred in 2,278 patients [21]. Most hospitalizations for the first time concerned cardiovascular diseases (54%), with the largest percentage being hospitalizations due to heart failure (18%). Worsening HF was the cause of hospitalization with the highest rate (43%) in those with first presentation of HF [22]. The readmitted patients were elder, more often suffered from IHD and most often suffered from diabetes in the study by Goyala *et al*, Loop *et al* [23]. A recent observational study by Caughey *et al*. described a 42% increased risk of readmission in HFrEF patients compared with HFpEF after 30 days [24]. Heart failure with preserved EF is a communal disease, mainly due to hospitalization, has a complex pathophysiology, heterogeneous phenotype, and has a huge impact on mortality and morbidity [5, 25]. Hospitalization is similar to HFREF, accounting for the vast majority of cardiovascular causes [26, 27]. They justify the need to explore new therapeutic strategies to reduce the number of hospitalizations in HFpEF patients [21].

CONCLUSIONS

After admission for acute heart failure, HFpEF patients have a statistically insignificant burden of readmission compared to HFrEF patients. In addition, patients with HF with preserved ejection fraction were as likely to be readmitted for cardiovascular reasons as those with HF with reduced ejection fraction.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Prevalence of Hearing Impairment in Patients with Diabetes Mellitus

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ABSTRACT

Diabetes Mellitus (DM) may be a major health problem in modern society. The disease and its complications can affect most systems of the human body. A possible complication of DM is sensorineural deafness (SNHL). **Objective:** To find out the prevalence of different frequencies of hearing impairment in patients with diabetes mellitus. **Methods:** The study design was analytic cross-sectional. The data was collected from Hameed Latif and the University of Lahore Teaching Hospital. The study took 4 months (February 2022 to July 2022). The sample size was calculated at 325 based on the prevalence (69.73%) of sensorineural hearing loss in diabetic patients through an online sample size calculator (CI: 95% and margin of error=5.00%). The Sampling technique was Non-Probability Purposive Sampling. Data analysis was done by using SPSS Version 21.0 software. The sample-included patient diagnosed with Diabetes Mellitus (DM), of both genders, aged 51-70 years, consented to inclusion in the study. Cases with external or middle ear diseases were excluded from the study. **Results:** The 325 diabetes mellitus patients comprised the study population, in which 36.6 % (n=119) patients had hearing loss on different frequencies, and 30.8% had mild to severe hearing loss on high frequencies. **Conclusions:** This study concludes that the prevalence of hearing impairment is high among patients with diabetes mellitus and has more effect on higher frequencies of hearing rather than mid and low frequencies.

INTRODUCTION

Diabetes Mellitus (DM) is becoming increasingly common worldwide and is more prevalent in Pakistan. 33 million individuals in Pakistan will have diabetes by 2021, a 70 percent rise from 2019 [1].This places Pakistan behind China (141 million) and India in terms of the number of individuals with diabetes worldwide (74 million). Chronic problems are developing in new cases and it adversely affects them [2]. Numerous alterations affecting the vascular system, nerves, skin, and lens over a varied period can be linked to chronic consequences of diabetes mellitus [3]. These complications are the source of severe morbidity and death and negatively influence the quality of life in those with diabetes. With a high-expected prevalence of hearing loss in diabetics and no screening recommendations for hearing loss in DM, this study was carried out to determine the prevalence of SNHL in Diabetes Mellitus in Punjab, Pakistan [4]. This research work provides baseline knowledge hence significant since there is a scarcity of local literature on the prevalence of hearing loss in diabetes in Pakistan and because knowing the prevalence could help plan screening recommendations for preventive and mitigation measures for Diabetes Mellitus (DM) is a metabolic disorder characterized by chronic hyperglycemia, resulting from the impaired secretion of insulin from the pancreas or faulty utilization action, to regulate blood sugar [5]. It is a common problem with a prevalence of as 11.77% and a gender prevalence of 11.20% in males followed by 9.19 % in

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females, in a local study [6]. DM is classified as Type 1 DM predominantly characterized by the destruction of beta cells of the pancreas, Type 2 DM shows resistance to insulin and gestational variety with glucose intolerance [7]. Hyperglycemia may cause microvascular changes resulting in ophthalmic, renal, and neuronal complications consequently [8]. Sensorineural hearing loss (SNHL), is one of the critical complications, and Bainbridge & Hoffman found DM to be an independent risk factor for the development of hearing impairment (HI) with around 35% to 60 % of diabetics facing hearing deficiency, however, this is unrelated to peripheral neuropathy [9]. Although precautionary measures for the prevention of DM-associated HL, have not been fully determined, however, numerous studies have reported that DM can be among others a reason for SNHL [10]. According to Garudasu *et al.*, high blood sugar levels in diabetics can result in damage to the capillaries and nerves in the inner ear resulting in HL concluding that high blood sugar and blood pressure, nephropathy, retinopathy, and neuropathy are the risk factors involved [11]. Meneses-Barriviera *et al* noted the great diversity in prevalence and risk factors of DM in Europe. Al-Rubeaan *et al*. have noted a high prevalence of DM (11.77%) in a local study and a prevalence of HL (43.6%) in diabetics was noted in an Indian study [12, 13]. In different research articles, the association between diabetes mellitus and high-frequency hearing impairment is identified. According to the best of my search, limited articles have been found on the association of diabetes mellitus with different frequencies of hearing impairment internationally and limited articles have been found on a national level [14, 15].

METHODS

The study design was analytic cross-sectional. The data was collected from Hameed Latif and the University of Lahore Teaching Hospital. The study took 4 months (February 2022 to July 2022). The sample size was calculated at 325 based on the prevalence (69.73%) of sensorineural hearing loss in diabetic patients through an online sample size calculator (CI: 95% and margin of error=5.00%) [13]. The Sampling technique was Non-Probability Purposive Sampling. The sample-included patient diagnosed with Diabetes Mellitus (DM), of both genders, aged 51-70 years, consented to inclusion in the study. Cases with external or middle ear diseases, ototoxicity, noise-induced hearing loss, tuberculosis, hypertension, other metabolic disorders, and gestational diabetes were excluded from the study. A detailed history was obtained using a patient history sheet especially related to DM like complications, duration, treatment, family history; history of HL, smoking, use of ototoxic drugs, noise exposure, and other associated diseases. This was followed by Video otoscopy and tympanometry done in all cases, which helped excluded cases with outer and middle ear pathologies. Following this, the recruited cases, which fulfilled the selection criteria were subjected to pure tone audiometry PTA using a pure, tone audiometer (Aurical Plus,). Both ears were tested at 250, 0.5, 1, 2, 4, 6, and 8 kHz frequencies. The hearing measurements were performed in a soundproof room by one audiologist using ascending method followed by descending to 1 and 0.5 kHz, as per the S 3.1-1991 specifications of the American National Standards Institute (ANSI). Cases were classified according to the degree of hearing loss using WHO classification, while cases with FBS above 120 mg% were considered to have uncontrolled DM. Pathologies like neuropathy, nephropathy, retinopathy, and vascular diseases were also noted, and where required other relevant specialties were consulted. Initially, all the observations were recorded in the patient's history sheet, following which data was organized in MS Excel Worksheet, and SPSS 20.0 was used for data analysis and statistical evaluation. For the variables like age and duration, the mean and standard deviation was calculated while the frequency was used for the rest of the variables. The main variable in the study was hearing loss, and the primary exposure variable was DM.

RESULTS

Table 1 shows that 40.6 % (n=132) patients belonged to the age group of Dm patients 51-60 years and 59.4% (n=193) patients belonged to the age group of Dm patients 61-70 years. The above table shows that 60.9% (n=198) are male and 39.1% (127) are female.

Age of Patient's	number(%)
51-60 years	132 (40.6%)
61-70 years	193 (59.4%)
Total	325 (100%)
Gender of Patient's	
Male	198 (60.9%)
Female	127 (39.1%)
Total	325 (100%)

Table 1: Demographics table of population

Table 2 shows that 0.6% (n=2) of the right ear is affected, 0.9% (n=3) left ear is affected, 35.1% (n=114) have both ears affected and 63.4% (n=206) have both normal ears

Effected and Normal Ears	number(%)
Right Ear	2 (0.6%)
Left Ear	3 (0.9%)
Both Ears are Effected	114 (35.1%)
Both Ears are Normal	206 (63.4%)
Total	325 (100.0%)

Table 2: Effected and normal ears

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As table 3 shows the impairment on different frequencies, data shows that out of 119 patients 34.4% (n=41) had mild HL, and 1.6% (n=2) had moderate HL. out of 119 patients, 53.7% (n-64) had mild HL, and 14.2% (n=17) had moderate HL. out of 325 patients, 44.5% (n=53) had mild HL, 35.2% (n=42)had moderate HL, and 4.2%(n=5)had severe HL.

Severity of hearing loss on low frequencies	number(%)
Mild	41(34.4%)
Moderate	2(1.6%)
Severity of hearing loss on mid frequencies	**number(%)**
Mild	64(53.7%)
Moderate	17(14.2%)
Severity of hearing loss on high frequencies	**number(%)**
Mild	53(44.5%)
Moderate	42(35.2%)
Severe	5(4.2%)

Table 3: Severity of hearing loss on different frequencies

DISCUSSION

The current study shows that out of 325 diabetes mellitus patients 119 had hearing loss on different frequencies. Of which 41 patients had mild hearing loss on low frequencies, 2 patients had a moderate hearing loss on low frequencies. 64 patients had a mild hearing loss on mid frequencies, and 17 patients had a moderate hearing loss on mid frequencies. 53 patients had mild hearing loss on high frequencies, 42 patients had moderate hearing loss on high frequencies, and 5 patients had a hearing loss on high frequencies. The study was published in 2022 by Hariprasad Garudasu *et al*. The study shows that out of 60 instances of type 2 diabetes mellitus, 22 (36.67%) cases were determined to be normal, and 38(63.33%) cases were discovered to have sensorineural hearing loss. Out of the 38 cases of sensorineural hearing loss in this study, based on the time since hearing loss first appeared, There were 36 instances (94.73 %) of slow-onset hearing loss and 2 cases (5.26%) of sudden-onset hearing loss. hearing damage. Based on the findings of the pure tone audiometry out of n=38 discovered using bilateral sensorineural hearing loss. 28 (73.68%) of the subjects had mild hearing loss, and 10 instances, or 26.31 %, had moderate hearing loss [16]. Bhat *et al*. another study shows that 519 people of both sexes with a median age of 69 years were examined in total published the study in 2018; those who did not do the audiometric test were disqualified from the research, leaving 498 subjects in the final sample. With the bilateral hearing loss at 91.56 % and low-degree hearing loss at 26.50 %, sensorineural hearing loss was more common (66.26 %) and most often. According to the multiple logistic regression, the risk variables are just age and occupational noise exposure independent of hearing loss. The statistical analysis revealed that the variable DM was related to the high frequency of hearing loss in the elderly [17]. The study was published in 2021 by Khalid Al-Rubeaan *et al*. another study shows that the 157 patients, 77(49.0 %) experienced hearing loss in both ears, 13(8.3 %) in the right ear, and 14 (8.9 %) in the left, while 53(33.8 %) had normal hearing [13]. Ninety had a mild loss (49.7%), 69 had a moderate loss (38.2%), 16 had a severe loss (8.8%), and six had profound loss among the 181 ears with sensorineural hearing loss (3.3%). In 46(29%) individuals, significant hearing loss was noted. Patients with glycated hemoglobin levels under 8% had a greater prevalence of hearing loss. Longer duration of diabetes, poor glycemic management, and the presence of hypertension was shown to be the most significant variables in the multivariate logistic regression analysis related to hearing loss [18-20].

CONCLUSIONS

This study concludes that the prevalence of hearing impairment is high among patients with diabetes mellitus and has more effect on higher frequencies of hearing rather than mid and low frequencies.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Comparison of Cycloplegic Refraction Versus Dynamic Retinoscopy in Children from 5 to 12 Years of Age

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ABSTRACT

Refractive errors are a noteworthy cause of visual disruption worldwide. **Objective:** To compare the results of dynamic and cycloplegic retinoscopy in children. **Methods:** A descriptive-type cross-sectional study was conducted at the university of Lahore teaching hospital on 50 patients from 5 to 12 years of age. Approval was taken from the ethical board of the institution and informed consent from patients parents. Patients who had any other ocular pathology other than refractive errors were excluded. To study the refraction results in children, first in a dark room, retinoscopy without cycloplegic was performed then 1% cyclopentolate eye drops were used. After that retinoscopy was done under cycloplegic effect results were compared after being converted into spherical equivalent. Paired sample t-test was applied to compare means. $P < .05$ was taken as significant. **Results:** There were 25 males and 25 females. The mean age in years was 7.66 ±there were 12 myopic patients, 22 hypermetropic and 16 astigmatic patients. The mean logMar of visual acuity uncorrected was 0.5 ± 0.23 and the best corrected visual acuity was 0.1± 0.01. The mean S.E of right eye dynamic retinoscopy was 1.78±2.60, cycloplegic retinoscopy 1.52± 2.54 and of left eye was 1.72±49 and1.47± 2.34 respectively. It can be deduced that on average 0.26D more by dynamic retinoscopy. A significant correlation with ***r*** 0.96 and ***r*** 0.94 in left eye existed. **Conclusion:** There is a significant difference between cycloplegic retinoscopy and near retinoscopy. It was deduced that near retinoscopy showed more hypermetropic readings than cycloplegic retinoscopy.

INTRODUCTION

Refractive errors are a noteworthy cause of visual disruption throughout the globe. People of every age, ethnicity, and socioeconomic status are affected by refractive errors. World Health Organization (WHO) estimated 285 million people are visually impaired out of which 39 million were blind.80% of visual impairment, including blindness can be cured or prevented. Visually impaired people living in developing countries are about 90% [1, 2]. Foremost causes of visual impairment are 43% uncorrected refractive errors (myopia, hyperopia, astigmatism alone), 33% includes cataract and 2% comprises glaucoma [3]/ When a ray of light fails to focus on the retinal plane, refractive error arises. As a result, the image perceived by the individual is blurred and refractive correction becomes evident. Refractive errors can be classified as Myopia(near-sightedness), which is a disorder in which a patient is unable to perceive far objects clearly [4]. Hyperopia (far-sightedness) and astigmatism. Refractive errors can be corrected with aid of glasses, contact lenses, and refractive surgery. Retinoscopy is a dark room procedure in which a patient is asked to look at a distant target to relax accommodation and a beam of light is thrown into the patient's eye and red reflex is noted. Refractive error is determined according to the kind of reflex observed. In contrary to dry retinoscopy patient is asked to look at the beam of the retinoscope in cycloplegic retinoscopy [5]. To determine accurate refractive errors adequate amount of cycloplegia has immense

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significance. For epidemiological studies in children and adolescents, cycloplegic refraction is the gold standard method. Cycloplegic refraction is an efficient technique to control accommodation by using cycloplegic agents [6]. Cycloplegic drugs paralyze the ciliary bodies and induce accommodation relaxation. As the ciliary body relaxes, the anterior zonular fibers stretch, and the posterior zonular fibers lose tension, resulting in a thinning of the vitreous. This allows the eyes to be relaxed and thus helps to focus on the distance. In the eye, the acetylcholine receptors are located in the iris sphincter, and the ciliary activity of these receptors causes the iris and ciliary body to contract. Cycloplegics temporarily inhibit this action, causing ciliary paralysis and pupil dilation [1]**.** There are three most commonly used cycloplegic drugs, namely atropine, cyclopentolate, and tropicamide. The drug that is considered the gold standard for its cycloplegic effects is atropine but has a slow onset and a 15-20 day recovery period. Therefore, in adults, it is not routinely used as a diagnostic agent [7]. Cyclopentolate is a commonly used drug in children. It is a synthetic antimuscarinic paralytic agent. In patients with dark iris, cyclopentolate has a rapid onset of action (30-45 minutes), a relatively short duration of action (24-48 hours), few side effects, and is contraindicated in closed-angle glaucoma [8-10]. Another numbing agent is tropicamide, a synthetic analog of tropic acid. In addition, compared to cyclopentolate, it is known as safe and fast-acting and it is more suitable for patients because of the onset of action (20-30 minutes) and recovery time (6-7 hours). Near Retinoscopy is a technique for determining refractive errors described by Mohindra in 1975. Near retinoscopy is used as a substitute for cycloplegic refraction and this technique was described by Mohindra. This technique is used to measure the accommodative response of the children [11]. One of the studies shows that cycloplegic drugs have some drawbacks; especially in younger patients' discomfort is the most important drawback during the instillation of drops. The child may become upset or uncooperative and some parents do not allow the administration of any kind of drugs so an alternative is needed [12]. This is a monocular technique; one eye will remain un-occluded eye at a distance of 50cm. It is a dark room procedure. It utilizes the patient's accommodative ability. Along the visual axis, the subject will fixate on the light of the retinoscope. From retinoscope light, an adjustment in lens power for both working distance and tonus of accommodation is estimated at 1.25 diopters. The final non-cycloplegic value is obtained by subtracting 1.25 diopters from the gross retinoscopy values. Examiner asses the retinoscopic reflex by asking the patient to read the accommodative target [13]. The purpose of this study is to investigate whether Mohindra's technique is a useful substitute for the near retinoscopic technique. Cycloplegic refraction is not a friendly procedure for children due to the Stinging effect of drugs. It is also more time-consuming for the examiner as well as the patient.

METHODS

A descriptive type crossectional study was conducted at the University of Lahore Teaching hospital. 50 patients(100 eyes) from ages 5 to 12 years were examined. An equal number of patients of both male and female children per examined in this study because there is an equal no of chances of having refractive errors in both male and female children. First, near retinoscopy or Mohindra's technique was used to rule out the refractive errors of kids. The lights of the examination room were switched off to make it a completely dark room. Then retinoscopy was performed in that dark environment at 50cm. After jotting down results on a paper sheet, the cycloplegic drug mostly used to attain the purpose of cycloplegia, namely Cyclopentolate was instilled in both eyes of the child. One drop in each eye was instilled. After waiting 30-45 minutes same procedure of retinoscopy was repeated and the working distance this time was 1 meter or 2/3 of a meter. A working distance of 1.5D according to the working distance of 2/3 of a meter was deducted from the retinoscopic values of the patient's refractive error. In addition, the tonus allowance of cyclopentolate drug which is about 0.5D also deducted. Whereas in Mohindra's technique of retinoscopy, the readings obtained by retinoscopy were formulated without subtracting 1.5D of working distance. Data were analyzed by using SPSS 25.

RESULTS

Table 1 shows the Mean age of the children was 7.66 ± 2.5. There were 12 myopic patients, 22 hypermetropic and 16 astigmatic patients. There were 25 male and 25 female patients. The mean logMar of visual acuity uncorrected was 0.5 ± 0.23and best corrected visual acuity was 0.1± 0.01.

	Total	Male	Female
NO.	50	25	25
Mean Age in years	7.66± 2.5	7.64± 2.3	7.4± 2.6
Myopia	12	5	7
Hypermetropia	22	9	13
Astigmatism	16	7	9

Table 1: Descriptive statistics

Table 2 shows the mean S.E of right eye dynamic retinoscopy was 1.78±2.60 compared to 1.52± 2.54. The mean S.E of left eye dynamic retinoscopy was 1.72±49 compared to 1.47± 2.34. It can be deduced that on average 0.26D more by dynamic retinoscopy. A significant correlation with r 0.96 existed and r 0.94 in left eye.

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	Dynamic retinoscopy	Cycloplegic retinoscopy	P value	Co-relation
Right Eye	1.78±2.60	1.52± 2.54	0.03	0.96
Left Eye	1.72±49	1.47± 2.34	0.04	0.94

Table 2: Comparison of near retinoscopy with cycloplegic retinoscopy

Figure 1. shows that there was a difference between spherical equivalents obtained by two techniques in the right eye. 6 patients had a 0.25D difference, and 27 patients had 0.5D. 14 patients showed a 0.75D difference and 2 patients has a 1D difference and 1 patient had no difference.

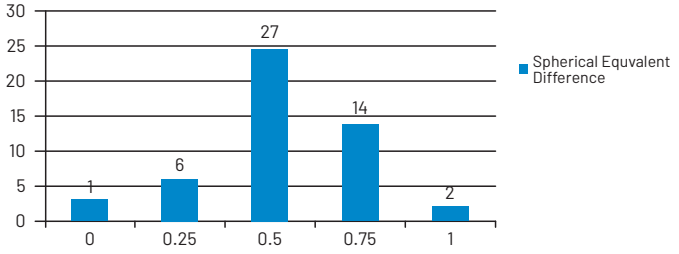

Figure 1: Right eye spherical equivalent difference

Figure 2 showed that there was a difference between spherical equivalents obtained by two techniques in the left eye. 6 patients had a 0.25D difference, and 25 patients had 0.5D. 14 patients showed a 0.75D difference, 2 patients have a 1D difference and 3 patients had no difference.

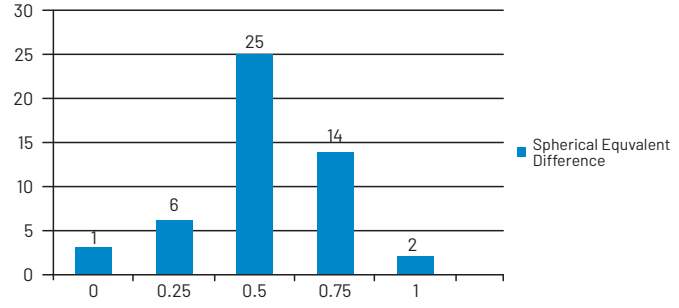

Figure 2: Left eye spherical equivalent difference

DISCUSSION

In this study, near retinoscopy results of refraction were compared with the Cycloplegic Technique of retinoscopy. For this purpose, children between the ages of 5 years to 12 years were examined. Multiple studies showed that non-cycloplegic refraction is not the standard gold method for measuring refractive errors it can lead to the overestimation of myopia [14]. Dynamic or near retinoscopy technique showed less hypermetropic values than the cycloplegic one. Then, differences between the spherical equivalents of the retinoscopic readings obtained from both techniques were analyzed. It was concluded retinoscopy done in a completely dark room is as effective as cycloplegic retinoscopy, if there is an adjustment factor. cycloplegic retinoscopy through an effective method of ruling out refractive errors in children less than 11 years old, also has some drawbacks like drug reaction time, the unfriendly nature of cycloplegics towards children, and most importantly possible side effects of these drugs. Keeping these factors in mind a study was conducted by Ali mirzajani and his colleagues. They introduced a technique known as Mirza tele lens retinoscopy in which they placed a trial lens 22.2 cm far from the spectacle plane and compared its results with cycloplegic retinoscopy they found a significant difference between the two techniques and concluded that mirza tele lens retinoscopy can be performed in uncooperative individuals [15].A comparative study was conducted to evaluate the precision of cycloplegic and non-cycloplegic autorefrectometers and retinoscopy. It was deduced that results obtained by auto refractometer were almost similar to retinoscopy [16]. A study was conducted in which 47 patients were enrolled from 3 to 11 years of age. They were assessed by cycloplegic, dynamic retinoscopy, and auto refractometer and it was concluded that dynamic retinoscopy can be considered as an alternative to cycloplegic retinoscopy [17]. Dynamic retinoscopy is also a suitable technique to measure the amplitude of accommodation [18]. A study on 387 children was conducted in Beijing, the purpose of the study was to determine the difference between cycloplegic and non-cycloplegic autorefrectometers. The difference between non-cycloplegic spherical equivalents was increased in that study with the increase of hyperopic correction [19]. A similar study was carried out by Farnaz Kaousar et all they assesses regression co-relation and agreement between the mohindras retinoscopy technique and results of post-cycloplegic refraction. They included 101 children from 1 to 12 years of age and performed near retinoscopy on them. Afterward instilled cyclopentolate and performed cycloplegic refraction. They again examined patients after 72 hours and deduced the final prescription. They concluded that Mahindra's retinoscopy overestimates hypermetropia and underestimates myopia but there is particular point refraction where alike results by both techniques are deduced.so it can be considered an option [20]. Children which undergo cycloplegic refraction get scared of the examiner and avoid the next possible visit of an optometrist. They also become highly uncooperative and hostile towards the examiner to avoid the instillation of cycloplegic eye drops. So keeping all these facts in view, an optometrist may go for Mohindra's retinoscopy technique in their daily examination practice.

CONCLUSIONS

It was deduced that near retinoscopy showed more hypermetropic readings than cycloplegic retinoscopy. As there is difference of 0.26D that is clinically unimportant so it produces the almost same result as cycloplegic

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retinoscopy. Furthermore, this technique reduces the waste of time considerably by subtracting the wait for the dilation of the pupil and accommodation paralysis. Near retinoscopy is also friendly for children because they do not suffer from any stinging or scorching effect in their eyes. In our study we took spherical equivalents to make the calculations easy. Cylindrical factors should be considered in future. We did not include patients with strabismus ,aphkia anisometropia, and amblyopic children. They should also be considered for further studies.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Evaluation of Focal Hepatic Lesion and Associated changes in Gallbladder and Kidneys using Spiral Computed Tomography

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ABSTRACT

Focal hepatic lesions are the lesions in the liver apart from its usual parenchyma**. Objective:** To check the efficiency of triphasic computed tomography for diagnosing benign and malignant focal liver lesions and to assess frequencies of both types of liver lesions. **Methods**: On 60 patients, triphasic CT scan for the liver was performed in Allied Hospital, Faisalabad. The liver was scanned in the arterial, the portal-venous, and the delayed phases followed by contrast injection. During all of these phases evaluation of lesions was made on enhancement patterns and frequencies of each lesion was checked. **Results**: The results showed that out of 60 patients 26(43.3%) were diagnosed with benign and 34(56.67%) were diagnosed with malignant focal liver lesions. Benign cases had a higher frequency of Haemangioma and malignant cases had a higher frequency of hepatocellular carcinoma. The overall study showed the percentage of incidents in gallbladder and renal system. **Conclusions**: The triphasic CT liver due to its accuracy provides assured diagnosis for liver lesions and thus reduces biopsy procedures.

INTRODUCTION

Focal hepatic lesions are the lesions in the liver apart from its usual parenchyma which are under variable sizes and may or may not affect the normal hepatobiliary system's structure and function [1,2]. Most of the focal liver lesions are solitary and only 20% are multiple lesions. With the advancement in radiography, characterization of the lesion has become easier without having histopathological examinations [3]. Across geographic regions and ethnic groups, the prevalence of lesions category is different. In a wide spectrum of benign focal lesions cysts, hepatocellular adenomas, Haemangioma, and focal nodular hyperplasia are the most prevalent. Through the United States and Europe, focal liver lesions are almost metastatic deposits than primary malignancy. In Pakistan, prevalence of hepatocellular carcinoma is 8–10% and is the fourth most common type of hepatic disorder [4]. Chronic liver disorder (CLD) becomes the cause of primary malignancy like hepatocellular carcinoma [5-8]. Primary and metastatic liver tumors mostly receive blood through the hepatic artery, hence the usual proportion of liver blood supply overturns that is mainly given through the portal vein to the hepatic artery that turns out to be a prime blood supply source [12]. HCC depending upon benign or malignant, if not treated on time can lead to severe damage to related organs i.e., spleen, pancreas, colon, gallbladder or renal system. It can prevalence cancer cells to that organs or

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cause infection due to viruses or bacteria mostly due to HCC pancreas, gallbladder, and kidneys are more affected. In our study, we will discuss the changes that occur in GB and the kidney due to HCC under the CT imaging modality [13,14].

METHODS

This study was carried through the Radiology department of Allied hospital, Faisalabad, Pakistan and included a total of 60 cases. Patients, irrespective of gender and age were considered for this study. Patients with a history of renal failure, pregnancy, and allergic reactions to contrast medium were excluded. On a Performa; gender, age, and lesion characterizations by CT were noted. CT scan was performed to evaluate Hepatocellular Carcinoma and HCC related changes in the gallbladder and renal system and expert opinion was taken in each case about modality. For triphasic CT scanning of liver, GE Scanner machine of 128 slices were used, with 120kVP, 500mAs, and 400 collimations and focal liver lesions were observed. IV Omnipaque / Ultravist contrast dose was given by 1.5ml/kg with 4ml/s speed. After 35-40 seconds, images were taken at the arterial phase. The portal phase was then observed after 65-80 seconds. In the delayed phase, the images were seen after 8-10 min. In each phase, enhancement patterns of each lesion were evaluated and according to enhancement patterns, lesions were recorded as the hypo, hyper, iso, and mixed enhancement. The region of interest was selected at the liver, aorta, as well as at portal vein during the procedure. Images were reconstructed with 5-7 mm thickness. By the triphasic CT scan's findings, benign and malignant lesions were classified. Hepatic cysts, a benign-like lesion, appeared hypodense and the arterial, portal venous, and equilibrium phases had no enhancement. In the case of Haemangioma, enhancement in the peripheral region of the arterial phase and centripetal filling of the contrast in portal-venous and then in equilibrium phase was noted. For the focal nodular hyperplasia and the hepatic adenoma, hyperenhancement on arterial, the mixed and mixed patterns at portal-venous, and equilibrium phases were shown. In the case of hepatomas, hyperenhancement, iso or mixed enhancement, and iso or mixed enhancing patterns in the arterial, portal-venous, and then equilibrium phases respectively, were observed. On the arterial phase, the hyper vascular metastasis seems hyper-enhancing with a mixed pattern on portal-venous and equilibrium phases. Though the hypo-vascular metastatic condition on arterial phase seems hypo enhancing portal-venous phase however showed maximum enhancement. For diagnosis, the history and the clinical presentation were studied by consultant radiologists.

RESULTS

The technique of triple-phase CT is perfect in support of diagnosing benign conditions like hemangioma. With its arterial, late arterial, and portal-venous phases it is a leading procedure for diagnosis as well as for characterization of hepatocellular carcinoma. During a triphasic CT scan of patients, 60 of them were diagnosed with focal liver lesions. The age group was ranged between 45 to 85 years. Maximum patients were between the ages of 52 to 68 years. Out of these 60 patients, 39(65.0%) were males and 21(35.0%) were females (Table 1).

Gender	Number of patients	Percentage (n=100)
Male	39	65
Female	21	35
Total	60	100

Table 1: Gender-wise distribution of patients

Figure 2 shows that 26(43.3.0%) patients had benign focal liver lesions and 24 (56.67.0%) had malignant focal liver lesions.

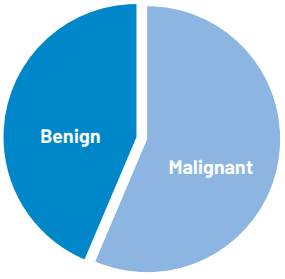

Figure 2: Percentage of benign and malignant liver lesions

Patients had a history of hepatitis in 44 (73.3%), liver cirrhosis in 21(35.0%), and colorectal cancer in 10(16.67%). Some patients were asymptomatic others included symptoms of abdominal pain in 42 (70.0%), fever in 14 (23.3%), nausea and vomiting in 18(30.0%), and weight loss in 12 (20.0%). In our study 26 (43.3%) benign focal liver lesions and 34 (56.67%) malignant focal liver lesions were documented. Of the total, 34 malignant focal lesions, 24 (70.6%) were diagnosed with HCC and 10 (29.4%) with metastasis. The malignant focal lesion HCC is at number five, being major common cancer, and is at number 3 being the major common reason of cancer-associated deaths in the world. Under research, about 80% of HCC cases are because of chronic infection of hepatitis B or C. Out of 24 (70.6%) HCC cases in our study 18 (75%) were males and 6 (25%) cases were among females (Table 2).

Total patients=60	Parameter	Frequency(%)
Sex	Males	39(65.0%)
	Females	21(35.0%)
History	Hepatitis B/C	44(73.3%)
	Liver cirrhosis	21(35.0%)
	Colorectal cancer	10(16.67%)

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Present history	Abdominal pain	42(70.0%)
	Nausea and vomiting	18(30.0%)
	Fever	14(23.3%)
	Weight loss	12(20.0%)
Lesion location	Right lobe	37(61.67%)
	Left lobe	10(16.67%)
	Both lobes	13(21.67%)
Number of lesions	Single	31(51.67%)
	Multiple	29(48.33%)
Type of lesion	Benign	26(43.3%)
	Malignant	34(56.67%)
Characterization	HCC	24(40%)
	Metastasis	10
	Hemangioma	9
	Cyst	6
	Focal fatty infiltration	4
	Abscess	3
	Polycystic liver disease	2
	FNH	2

Table 2: Distribution of gender, history, lesion location, numbers of lesions, and final categorization of the lesion

Figure 3 showed that from a total of 24 HCC patients, 10 (29.4%) were metastasis cases, 5(50%) cases in males, and 5 (50%) cases in females were reported. From total 26 (43.3%) benign focal lesions, 9(34.6%) were Haemangioma, 6(23.1%) were cysts, 4(15.4%) were focal fatty infiltration, 3 (11.5%) were abscess, 2(7.7%) were polycystic lesions and 2 (7.7%) were FNH. Benign focal liver lesions are mostly asymptomatic and diagnosed by chance at the time of other imaging analyses. Beyond the age of 40 simple hepatic cysts are usual findings.

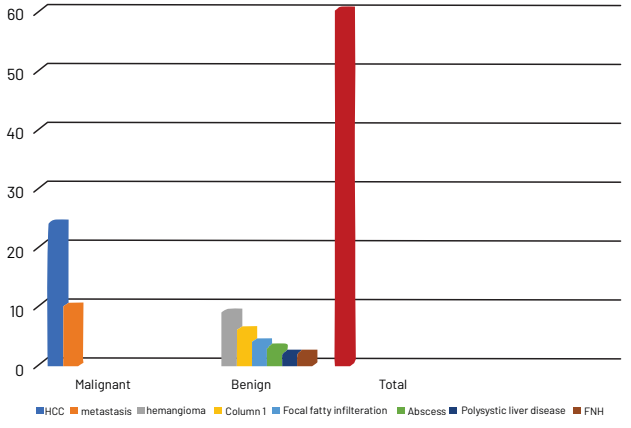

Figure 3: Total number of benign and malignant liver lesions taken from a study population

In HCC patients, gallbladder changes were also seen in CT findings like gallbladder visualization, calculus (35.9%), cyst, Cholecystitis (34.8%), and normal or gallbladder wall thickness(Table 3).

Serial No.	Parameters	Percentage
1.	GBL visualization	94.6%
2.	Calculus	35.9%
3.	Cholelithiasis	34.8%
4.	Normal gallbladder wall thickness	83.7%

Table 3: Gallbladder changes with HCC

Table 4 showed density patches appearance on both kidneys either hyper or hypo dense according to their frequencies, like in 05 patients hypo dense and in 02 patients' hyper dense tissues appear in the right kidney, and in 08 patients hypo dense and in 0 patient's hyper dense tissues appear in left kidney. And 15 patients are which shows the density changes in both kidneys and 30 patients shows no density changes in kidneys with HCC as observed in Table 4.

CT Findings	No. of patients with presence
Right kidney hypo dense	05
Right kidney hyper dense	02
Left kidney hyper dense	08
Left kidney hypo dense	0
Density changes in Both	15
Density changes in None	30

Table 4: Density Appearance in kidneys with HCC

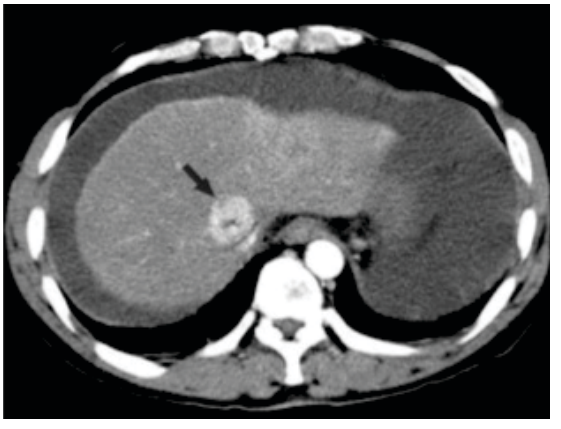

Figure 4: HCC at arterial phase

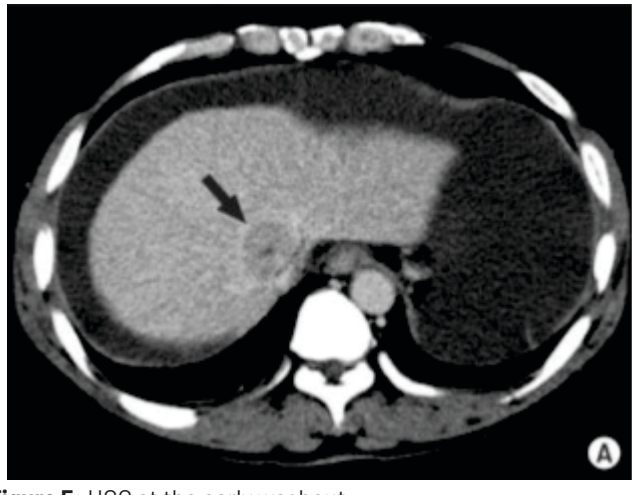

Figure 5: HCC at the early washout

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DISCUSSION

In our study, all of the benign lesions appear homogeneous, whereas each of the 24 hepatocellular carcinomas appears as mixed or hyper-density lesions. Only one lesion was better visualized on portal-venous phase images, but 23 HCC were identified using only arterial phase images. At the arterial phase, all hyper or mixed density liver lesions in patients with underlying chronic liver disease represent hepatocellular carcinomas. Therefore, the lesions visualized at the arterial phase imaging may need a biopsy for further evaluation. Recognition and evaluation for the small lesion of HCC are more significant, as these small liver lesions as compared to large lesions have more chances of removal through surgery. The arterial phase imaging proved useful for the recognition of the hyper vascular lesions and it is crucial in case of characterization of a high proportion of lesions. According to two different studies, hepatocellular carcinoma in comparison to the surrounding liver parenchyma displays characteristic enhancement during the arterial phase imaging, in the portal venous phase imaging shows washout of the contrast material, and in the delayed phase, imaging appears hypodense. With liver cirrhosis, the enhancement pattern is taken as hepatocellular carcinoma. But few HCC lesions do not track this pattern of enhancement as some of HCCs do not show the washout of contrast material on the portal-venous and delayed phase imaging. Although, washout is seen on all other benign and malignant lesions [15,16]. In another study, the simple liver cyst was having a ratio of 4:1 between female and male patients, respectively [17]. In a study conducted in 2011, hepatocellular carcinoma and metastasis being hyper-vascular have a higher arterial blood supply ratio and may be seen merely on hepatic arterial phase imaging. On arterial phase images, metastatic liver lesions with hyper vascularity were seen more accurately than on the portal-venous phase imaging. Hepatocellular carcinoma shows enhancement on the arterial phase images and thus gives the best visualization during the arterial phase imaging [18,19]. For the routine liver assessment and for aiding in the declination in the mortality and the morbidity rates for the patients who have liver diseases, triphasic computed tomography has achieved approval being the ideal CT procedure [20,21]. Through triphasic CT, following injection of contrast media, data acquisition of complete liver at different intervals becomes fast. As a result, triphasic computed tomography of the liver is a standardized technique to detect and characterize enormous types of focal liver lesions including benign and malignant [22,23].

CONCLUSIONS

Through the triphasic CT scan of the liver the frequency and category of benign as well as malignant focal lesion can be evaluated, which lowers the invasive biopsy procedures. Also concluded that the CT abdomen for HCC patients also evaluates the gallbladder and kidney changes which occur secondary due to primary liver cancer, but the occurrence of these changes is rare. HCC commonly affects gallbladder and renal function.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Incidence of Complications of Colostomy in Children with Hirschsprung Disease and Anorectal Malformation

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ABSTRACT

Colostomy formation, A surgery used in the management of Hirschsprung's disease, and anorectal malformations. colostomy complications were represented both in children with Hirschsprung's disease and in those with anorectal malformation **Objective:** To estimate the incidence rate of major complications after colostomy formation surgery. **Methods:** A prospective longitudinal descriptive study was performed to calculate the incidence rates of complications following the surgical intervention of colostomy formation. All 200 cases of consecutive young children (age 2 days to 60 days) who received a colostomy between (date January 2017 to January 2020) were included. The incidence of major colostomy-related complications was calculated. This was analyzed for colostomy formation. Non-colostomy-related complications were not included in study. **Results:** 200 young children were included. And a follow-up of 6 months of this study to review the complications of colostomy formation in infants and children with Hirschsprung's disease or an anorectal malformation. 80% experienced colostomy-related complications, colostomy prolapse (35% in HD more with a transverse colostomy, 20% in Anorectal malformation), colostomy stenosis (15% in HD, 35% in Anorectal malformation), Skin excoriation (40% in HD, 25% in Anorectal malformation), Revision of colostomy (15% in HD, 12% in Anorectal malformation), colostomy bleeding almost same in both conditions 30%, Parastomal herniation, 5% in both conditions, colostomy wound infection were also recorded, Same in both conditions 5%. **Conclusions:** Consider the risks associated with a colostomy formation before undergoing surgery in both Hirschsprung's disease and anorectal malformation. complications can be excluded with careful surgery and proper nursing care.

INTRODUCTION

Two congenital malformations like Hirschsprung's Disease and Anorectal malformations. Both end up in colostomy. There is a wide clinical variety. Mostly colostomy is recommended in the very starting period of life when the reconstructions and sustainability seem to be impossible. The next phase is the closing of colostomy which is done in the later period of life. So colostomy formation and closure are two different surgeries [1]. The study involves colostomy formation. While Hirschsprung's disease. A stoma is formed if the bowel is not decompressed and we see cases of dilated colon. sometimes pull-through surgery is done and in case of stoma is formed. The stoma is closed after the aganglionic part of the colon is resected [2]. The maldeveloped rectum was operated on on the 6th day of birth. Since then the stoma and colostomy formation had been done and preferred in neonatal life. The colostomy is further divided on the bases of location and condition of the severity of the malformation [3]. Many studies had been addressed to differentiate the colostomies on the basis of location transverse and sigmoid colostomy. there is another division of loop and split but the division on the basis of location is more

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deliberately recommended [4]. Likewise in Hirschsprung's disease, the colostomy depends on the part of the a ganglionic colon involved. the location of the transition zone mainly defines the type of colostomy [5]. The literature is available on the basis of loop and split colostomy. The loop colostomy. the bowel is not completely divided and sutured in the abdominal wall. While in split colostomy, there is a differentiated gap between the colostomies and they have such a big gap, without covering the efferent loop the stoma cap is placed on an afferent loop. The stool movement in the mucus fistula is prevented. Which leads to urinary tract infections [6]. Mostly the overflow leads to bacterial growth and contamination. Another procedure named, the Hartman procedure is mostly recommended in the literature for the dilated colon as in Hirshsprungs Disease and in anorectal malformations [7]. When divided on the bases of location the colostomy can be placed anywhere. in the ascending descending and sigmoid colon. The most frequent location for the colostomy is the transverse and sigmoid (descending) colon if we do the efficacy comparison of the transverse and sigmoid colostomy the transverse colon is more mobile and there are more chances of prolapse than in the sigmoid colon [8]. We can also say that there is a greater risk of prolapse in transverse colostomy than in sigmoid. Identifying the exact location of colostomy placement is quite challenging during surgery [9]. Specifically in the case of Hirschsprung's disease. When the bowl is abnormally distended. Mostly the placement of colostomy, in this case, is done far distal point. which lead to the revised surgery also the insufficient length is challenging in reconstruction [10]. However. The colostomy formations involved a variety of cases. On the bases of locations and procedures for Hirschsprung's disease and anorectal malformations both. What to be done is decided during surgery and we can say that everyone has their own pros and cons [11]. Where should a colostomy be placed totally depends on the surgeon's experience and the circumstance during the surgery. So we took cases of 200 children and calculated the complication rates to evaluate the efficiency of the colostomy formation. transverse or sigmoid. The study compared two surgical techniques, transverse and sigmoid (descending) colostomies. Colostomy formation is divided on the bases of cite of colostomy , transverse colon, and descending/sigmoid colon.

METHODS

A prospective longitudinal descriptive study performed to calculate the incidence rates of complications following the surgical intervention of colostomy formation. All 200 cases of consecutive young children (age Age 2 days to 60 days) who received a colostomy between (date Date January 2017 to January 2020) were retrospectively included. The incidence of major colostomy-related complications was calculated. This was analyzed for colostomy formation. Non-colostomy-related complications were not included in the study. The major colostomy related complications including; colostomy prolapse, colostomy stenosis, colostomy skin excoriation, infections, and bleeding. The study highlighted the major complications for which the revision colostomy in done. The mean and SDs are calculated to prove the significance of study and incidence of complications. The study provided a comparison of Hirschsprung's disease and Anorectal malformations. The total number of male patients included in the study with Hirshprung's disease was 108 and the total number of male patients with Anorectal disease was 32. On the other hand number of female patients with Hirshprung's disease was 32 and total number of female patients with Anorectal disease was 22. described in table 1.

Clinical detail	Hirschsprung's disease (n – 140)	Anorectal malformations (n – 60)
Male	108	32
Female	32	22

Table 1: Relative frequency of Hirshsprung's disease and Anorectal malformation in males and females

The total number of patients of Hirshprng's disease and Anorectal disease was 140 and 60 respectively. The complications in the cases were cumulative 80% in 160 patients. And the level of significance was less than 0.05 the other percentages are discussed in table 2.

Disease	N	Total complications in colostomy, n(%)	Colostomy Prolapse, n(%)	Colostomy Infection, n(%)	Colostomy Stenosis, n(%)	Other complications of colostomy, n(%)	Revision surgery, n(%)	Bleeding, n(%)
Hirshsprung's	140	160 (80%)	35%	5%	15%	5%	15%	30%
Anorectal	60		20%	5%	35%	5%	12%	30%
Total	200		P<0.05					

Table 2: Frequencies of complications

In Hirschsprung's disease, the transverse colostomy was done in 8 patients and the sigmoid colostomy was done on 72 patients. The relative frequencies were 10% and 90% respectively. And for anorectal disease, the transverse colostomy was done on 12 patients and the sigmoid colostomy was done on 108 patients. The relative frequency was 10% and 90% respectively for both. discussed in table 3.

Colostomy site	Hirschsprung's disease		Anorectal malformations	
Cite of colostomy	(n = 80)	Relative frequencies	(n = 120)	Relative frequency
Transverse colostomy	87	10%	12	10%
sigmoid	2	90%	108	90%

Table 3: Preferable site of colostomy distribution

In all 200 cases, 80% of cases developed complications and were reported in 6 months of follow-up. Colostomy

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Prolapse, Sometimes after the surgery, the intestines shift towards the site of the surgery also called incision sight. In this study, this complication was more reported in transverse colostomy than in sigmoid or descending colostomy. Occurs in both Hirschsprung's disease and anorectal malformation. prolapse (35% in HD more with a transverse colostomy, 20% in Anorectal malformation) shown in figure 1.

Figure 1: Stoma prolapse in a patient with HD

Another complication is stenosis, which might develop after surgery due to inflammations at the operative site. Occurs in both Hirschsprung's disease and anorectal malformation. colostomy stenosis (15% in HD, 35% in Anorectal malformation). shown in figure 2.

Figure 2: Stoma stenosis of sigmoid loop colostomy in case of anorectal malformation

Sometimes due to incontinence the newly created stoma suffers from skin excoriation that is traumatized part of the operated wound Skin excoriation (40% in HD, 25% in Anorectal malformation), Parastomal herniation, 5% in both (HD and anorectal malformations) conditions. colostomy wound infection was also recorded, the Same in both conditions 5%. (HD and anorectal malformations). shown in figure 3. Revision of colostomy (15% in HD, 12% in Anorectal malformation). colostomy bleeding is almost same in both conditions 30%.

Figure 3: Wound infection and retraction of stoma

DISCUSSION

The children who are born with hirshsprungs disease or anorectal malformations must undergo by the surgery of colostomy formations that might ends in compications depending on the variability of surgical technique or improper nursing care. The morbidities are common but we cant ignore the mortalities that are low in case of both mentioned diseases in the study but we cant ignire the percentages of 3% proven by the literature and demographics. Pena et al, calculated the difference in loop and sigmoid colostomies as 64% and 36%. The study provides support to our investigations as well. Similar findings have been calculated [3]. Our study provided evidences of complications significantly proven to be 80% whereas the literature reports prove the incidence of complications above 91% [5]. Ciğdem et al estimated the complications rates of 47%. With minor complications of skin excoriations. And furthermore the study investigated the hospital admissons of more that 8% in certain cases. Minor infections and bleeding incidences were also reported but the hospital admissions were nor required [6]. Patwardhan et al, estimated the colostomy formation complications in loop and sigmoid colostomy and found no difference in them [10]. The preferable site for the colostomy proven to be sigmoid and descending colon with less chances of prolapse and complications [11]. The systemic reviews compare the effects of colostomy formations and the challenges they might face. The complications rate are more common in underdeveloped countries where proper nursing care is nor available. Sometime morbidities lead towards the reconstructions of colostomy formation. And reconstruction of the stoma site is also performed [12]. A study was conducted in the UK on the incidence rate of colostomy-related complications.

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And they got significant findings for prolapse and stenosis. Which is also confirmed by our study. That retrospective study also included some minor complications. Which include infections, bleeding, and skin excoriation [13]. Colostomy prolapse remained the most prevalent complication. Proven by the literature. And for this, the revision colostomy is the solution [14]. Some studies also support the high incidence of skin excoriation and irritation up to 42%. Skin excoriation leads to minor surgery [15]. And the infections are mostly treated by medications. Colostomy formation must be supervised by strict supervision and proper nursery care. Otherwise, the incidence rate of complications increases [16]. Colostomy dysfunction is a result of inappropriate surgical technique. And due to operative planning and technique [17]. Another complication is small bowel adhesive obstruction these cases are also reported mostly in cases of Hirschsprung's disease who have gone through a laparotomy also. And this complication is significantly less frequent in patients with an anorectal malformation, who have undergone sigmoid colostomy formation [18, 19]. The children who have gone through colostomy formation surgery at an early neonatal reported fewer complications than the children above one year [20]. However, it is concluded that the morbidities associated with colostomy formations are less than 3%. however, the complication rate is quite high up to 97% in the literature [21]. Major complications are associated with morbidities and revision surgery in cases of minor complications like skin excoriations there are fewer hospital admissions reported. The literature for skin excoriation is mostly related to loose stool and location or colostomy at transverse colon than in sigmoid cases. In some cases, gel capsules are given for stool formation. Some complications are more clinically important and treated without surgery redo [22]. Mostly the preferable site of colostomy is transverse and sigmoid. Both complications mentioned in the study and literature mostly follow a sigmoid surgery [9]. The transverse zone colostomy is also performed and it has more incidence of complication. The division of colostomy is mostly studied by loop and split cycle which is not included in this study [23]. During surgery, the decision is made that what will be the best suitable site for the colostomy formation. mostly is Hirschsprung's disease, sometimes the part of the a ganglionic segment is too large that the colon is not sufficiently washed out by the rectum so colostomy formation is a must [24].

CONCLUSIONS

Consider the risks associated with a colostomy formation before undergoing surgery in both Hirschsprung's disease and anorectal malformation. complications can be excluded with careful surgery and proper nursing care.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

The Effect of Yoga on Pain and Quality of Life in Primary Dysmenorrhea: A Cross Sectional Survey

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ABSTRACT

Dysmenorrhea is a painful syndrome that accompanies the menstrual cycles. **Objectives:** The main objective of this research was to determine the effects of yoga exercises on pain and quality of life in female undergraduate students suffering from primary dysmenorrhea. **Methods:** After taking approval from Ethical review committee of Rawal Institute of Health Sciences, an observation type of cross-section survey was conducted in 470 young undergraduate female students of age between 17-26, suffering from primary dysmenorrhea. By non-probability sampling participants were divided into two groups. Group-1 was of those females who had active lifestyle and doing yoga exercises and group-2 were of those who had sedentary lifestyle and didn't do any kind of exercise. To measure the outcome variables, EQ-5D-5L questionnaire was used to measure QoL & NPRS to measure pain. Data were taken at baseline and after 12th week. Wilcoxon rank test was used for within group analysis and Mann Whitney U test was used to compare mean between groups. Data was analyzed in SPSS software version 21 along with Microsoft Excel 2019. **Results:** 21.16±2.66 &22.27±2.53 was the Mean±SD of age of group-1 & group-2 respectively. Between groups analysis revealed that p-value for NPRS was <0.05 but was >0.05 in quality of life. **Conclusion:** Yoga exercises are safer and easiest way to manage pain of primary dysmenorrhea in undergraduate females without any drug use.

INTRODUCTION

Primary dysmenorrhea also abbreviated as PD is a painful condition during menstruation cycle in women without any pathology of Pelvic Floor [1]. Symptoms of PD can be in the form of cramping pain in the region of abdomen which may or may not radiate to the lower lumbar area, which is accompanied by nausea, vomiting, headache, irritability, in short, a general form of not feeling well [2]. On the account of pain experienced by women, dysmenorrhea may be classified as mild, moderate or severe [3]. Apart from general Physical health, primary dysmenorrhea may affect women sleep, social interaction as well as ADLs (activities of daily livings) [4-6]. In young females' primary dysmenorrhea (PD) prevalence is very high [7]. Various authors reported different percentages such as in Italy 84.1% by Grandi *et al* [8], in Egypt 76.1% by Mohamed [9], in Nigeria 78% by Adegbite & his colleagues [1]); by Gulzar *et al* 78% in Pakistan [11]; in Iran 89.1% by Habibi *et al* [12]; in Australia 80% by Hillen [13]; in Japan 72.7% by Kazama & in Malesia 74.5% by Wong [14]. In some study it was reported between 72.7% to 85.75 in Turkey [15]. Numerous researches have reported that being absent of girls from school or college is the major factor due to this condition which in turn affects social as well as economic life of suffers [16] Basic cause of pain is the release of Prostaglandin during onset of menstrual cycle [17]. Traditional management options for primary

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dysmenorrhea include NSAIDs (nonsteroidal anti-inflammatory drugs) and contraceptives [18, 19]. However, there is not sufficient evidence to support the use of different treatment option such as yoga, acupuncture, or massage. Various studies have reported that exercise and lifestyle modifications can reduce these symptoms of primary dysmenorrhea [20]. A research conducted by Mc Govern *et al*, advocate that yoga training is the safest and easiest way to lessen the pain of primary dysmenorrhea [21]. Among the yoga exercises Pilates training is supposed to be more effective. Sharghi and his colleagues proposed that different medicinal plants along with other conservative therapies such as acupuncture, massage & acupressure are also effective ways to lessen PD pain intensity [22]. In song *et al* systemic review, it is proposed that aromatherapy has also prolific effect on dysmenorrhic pain [23]. Nam-Young Yang *et al* demonstrated in single blinded RCT that yoga program is more effective to reduce pain as well as on menstrual cramps in young girls [24]. The purpose of this study was to observe the effects of yoga exercises on pain and quality of life of young medical undergraduates experiencing primary dysmenorrhea.

METHODS

This study was conducted after taking permission from ERC of RIHS (Rawal Institute of Health Sciences), Islamabad. This study was an observational type of cross-sectional survey. Simple convenient sampling technique was employed for data collection. WHO calculator was used for sample size calculation. 470 female medical students between age of 17 to 26 who were suffering from primary dysmenorrhea without any neurological or other comorbidities were included. And those who had any gynecological issue like PCOS (Polycystic ovary syndrome) or secondary dysmenorrhea were excluded in this study. Two groups were made via Chit method. Group-1 was of those who had active lifestyle and doing yoga exercises (cobra, cat, cow and fish poses) & medicine ball exercises while group-2 was of those females who didn't do any kind of exercise. The severity of dysmenorrhea was determined with a 10-point Numeric pain rating scale (NPRS) and the pain duration was calculated in terms of hours. The EQ-5D-5L was used to determine quality of life. Each group was evaluated for three menstrual cycles. At first menstrual cycle the participants only were asked to complete the questionnaire of menstrual characteristics during their menstruation. Then the participants of first group were asked at luteal phase (11-17th day) to complete the EQ-5D-5L and NPRS questionnaire during menstruation. The other group was also asked to complete EQ-5D-5L and NPRS questionnaire during this phase of menstruation. SPSS version 21 software was used to analyze the data of this study, along with Microsoft excel for data entry. Data normality was basically check by Levine test of homogeneity along with skewness & kurtosis and histogram. Data was found to be not normally distributed. A Wilcoxon rank test was employed to check pre-test & post-test variability within group-1 and 2. Then Mann Whitney U test was used to analyze difference between both groups. Mean and Standard deviation was used for descriptive statistics of demographic data. P-value <0.05 was considered significant.

RESULT

Young undergraduate students experiencing primary dysmenorrhea were included in this study. Total number of participants were 470 which were divided into two groups. Descriptive statistics was mentioned as mean±SD. Mean±SD of age of group-1 & group-2 was 21.16±2.66 &22.27±2.53 respectively (Table 1).

Variable	Groups	Mean+SD
Age	Group 1	21.16+2.66
	Group 2	22.27+2.53
Marital status	Group 1	1.20+0.41
	Group 2	1.17+0.37
Frequency of pain	Group 1	2.31+0.83
	Group 2	2.05+0.97
Duration of pain	Group 1	3.13+0.77
	Group 2	3.25+0.59
Nature of Pain	Group 1	1.95+0.21
	Group 2	1.92+0.27

Table 1: Demographic data

Wilcoxon Ran test was used for within group analysis. Pretest & Post-test mean±SD of Numeric pain rating scale (NPRS) of group-1 was 6.53±1.12 & 0.55±0.49 respectively. In group-2 NPRS Pre-test mean±SD was 6.77±0.44 & Post-test mean±SD was 1.10±0.58. P-value was <0.05 in both groups which showed significant difference within groups. In group-1 EQ-5D-5L QoL mean± SD of Pre-test overall Health Score was 22.75±10.32 & Post-test overall health Score was 78.0± 11.94. for grou-2 is mentioned in table no-2. p-value of QoL was also <0.05 in both group which also demonstrated statistically significant difference (Table 2).

Variable	Groups	Pre-Test Mean+ SD	P Mean+ SD ost-test	z-value	p-value
Numeric Pain Scale	Group 1	6.53+ 1.23	0.55+0.49	13.62	<0.000*
	Group 2	6.77+0.44	1.10+0.58	13.39	<0.000*
		EQ-5D-5L (QoL)			
Total Health Score	Group 1	22.75+10.32	78.0+11.94	13.29	<0.000*
	Group 2	21.71+10.41	79.29+12.91	13.30	<0.000*

Table 2: Within group analysis of NPRS & EQ-5D-5L (QoL)

Mann Whitney U test was conducted to analyze the difference between groups at the end of study. Pre-test & Post-test Md (IQR) was 6(2) & 1(1) respectively in NPRS. These results showed that there was significant difference

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between groups from NPRS perspective as p-value <0.05. So, yoga exercises are effective for management of pain in primary dysmenorrhea. In EQ-5D-5L variable Median, interquartile range z-value & "r" (effect size) in pre-test & Post-test was (20(15), 2.82, 0.1 & 77(18),1.337, 0.06 respectively. As p-value of EQ-5D-5L was >0.05 it showed insignificant difference between group quality of life. As value of "r "is less than 0.1 which shows that there is small effect size of analgesics as compared to yoga exercises. Which proved that yoga exercises were more effective as compared to analgesics or home remedies(table 3).

Variable	Pre-Test Md (IQR)	Pre-Test Md (IQR)	z-value	r -value	Man-Whitney U test (p-value)
PNS	6(2)	1(1)	2.82	0.1	0.005
Eq-5D-5L (QoL)					
Over-all Health Today	20(15)	77(18)	1.337	0.06	0.18

Table 3: Between group analysis of NPRS & EQ-5D-5L (QoL)(Menn Whitney U test)

DISCUSSION

Disabling primary dysmenorrhea pain is the main factor that makes women life more stressful. This in turn affects the QoL of many women and makes then irritable in general life. There are some studies which were conducted to reduce the Pain & symptoms of primary dysmenorrhea pain and improve women's QoL by exercises without medicine use. Mc Govern *et al* conducted a systemic review to validate the effect of Yoga training among undergraduate Spanish students. In his study he observed that among yoga exercises Pilates are the safest and easy to perform and had promising results in pain reduction & enhancing QoL [25]. This study supports our results. Many studies had been done to evaluate the effectiveness of Yoga exercises to improve QoL. Nurcan Kirca *et al* conducted a randomized contrail trail to observe the effects of Yoga exercises on dysmenorrhea pain. They gave 12 sessions of Yoga exercises to experimental group females; one session per week for 12 weeks & control group was not given any intervention. They showed that experimental group female's pain was improved significantly as p<0.05 and was no improvement in control group. This study also supports our result that yoga exercises are effective for the management of pain in primary dysmenorrhea (26]. A single blinder study conducted by veena K *et al* demonstrated that effect of yoga exercises and hamstrings curls on Swiss ball or gym training had beneficial effects on the primary dysmenorrhea. In this study they randomized participants into two groups, as this was an RCT, they gave yoga exercise training to group A and gym training along with Swiss ball exercises for hams curls to group B. they observed that both group participants had reduction in pain intensity in PD. But when they compared both groups, they came to know that group B had much better results as compared to group A [27]. So, this study supports our results that yoga exercises are useful and effective in the physical management of pain and improving Quality of life in women suffering from primary dysmenorrhea. Padmanabhan K along with his colleagues conducted a single blind RCT. They divided participants into 2 groups. Group a was experimental and was given yoga exercises for 60 seconds intervals for 12 repetitions for 3 days per week & group B or control group were exercised by medicine ball. They revealed that medicine ball is much effective for the dysmenorrhea pain as compared yoga. This also supports our results of medicine ball exercises are effective for pain of primary dysmenorrhea [27]. A systemic review along with metanalysis was conducted by Ukachukwu Okoroafor Abaraogu to campare the effect of exercise to reduce pain and improve quality of life of patients suffering from primary dysmenorrhea [28]. In his study, he reviewed different RCTs and compare their results. Total number of participants in systemic review were 750. Some of these RCTs were on yoga interventions for PD, which results showed that non-pharmacological especially yoga had better efficacy in reducing Pain symptoms and improving quality of life. Results of this systemic review support our study that yoga is best intervention for improving QoL & diminishing pain. If women are educated about physical training and its impact on primary dysmenorrhea pain, by this way quality of life of many women can be improved. As these analgesics & NSAIDs can cause serious adverse effects such as gastric or duodenal ulcers as well as gastroparesis. By the adoption of yoga exercises many women can enhance their work efficiency and feeling of psychological being well. They can get rid of medicine addiction and of their sedentary lifestyle, which will reduce their level of anxiety, depression, discomfort & usual activities limitations.

CONCLUSIONS

As yoga exercises are found to be very beneficial for management of pain along with improving quality of life of females; such practice should be encouraged. In conclusion, this study was actually an observational type of cross-section study. This type of double blinded randomized control trail should be conducted to see the effectiveness of yoga exercises in comparison with placebo group or sham therapy.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Association Between Nurses' Knowledge and Practice Regarding Chemotherapy Induced Peripheral Neuropathy and its Development in Cancer Patients

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ABSTRACT

The adverse effects of peripheral neuropathy caused by chemotherapy include numbness, tingling, irritation, burning, difficulty keeping balance, and a chilling sensation. CIPN is one of the symptoms that has the potential to negatively impact the patient's quality of life (QoL), the treatment plan, and their overall safety. **Objectives:** To determine oncology nurses' knowledge and practice regarding chemotherapy-induced peripheral neuropathy (CIPN) and its development in cancer patient. **Methods:** In a descriptive cross-sectional study, 172 registered nurses from two public hospitals were chosen with convenient sampling to see if there was an association between their knowledge and practice about chemotherapy-induced peripheral neuropathy in regard with its development in cancer patients. Three revised questioners were used to get information about nurses' knowledge, practice and 1 questioner from patient about neuropathy development. (Knowledge, practice and neuropathy devolvement). **Results**: Knowledge showed that 56.4 % of participants had fair knowledge and Practice showed that 49.4 % of participants had fair practice, while 47.1% of patient had developed mild neuropathy. Chi square test was performed to see the association which showed a significant association between neuropathy development with nurses' knowledge and practice as results were 0.000 (p-value is <0.005 taken as significant). **Conclusions:** There is a critical need to enhance oncology nurses' abilities in neurological assessment, and a reliable method of CIPN evaluation is essential. Guidelines for the treatment and evaluation of CIPN, as well as further studies in different health institutions to generalize the results across Pakistan, are urgently needed.

INTRODUCTION

Cancer is the most common cause of death in people. It is a debilitating condition that has an extremely high morbidity and fatality rate [1]. Cancer is a disease that does not target a particular age group but rather can strike people at any point in their lives. Cancer is ranked as the second leading cause of mortality worldwide [2]. It is anticipated that there are 443.4 new cases of cancer for every 100,000 men and women. In addition to this, the death rate due to cancer is 158.3 for every 100,000 men and women [3]. Cancer patients' chances of survival are directly influenced by how quickly the disease is diagnosed and by the treatment options that are made available to them. Chemotherapy and radiation therapy are the two most significant and widely used treatments for cancer, however there are only a few options available to treat the disease. Chemotherapy is the most successful treatment option for patients diagnosed with cancer [4]. In the early part of the 20th century, cytotoxic medications were first used for the treatment of cancer. Since then, these drugs have been successfully used to treat a wide variety of cancers [5]. Cytotoxic drugs (CDs) are one of the important groups of medicines which are used for the treatment of cancer. These drugs are also known as antineoplastic, anticancer or cancer chemotherapy drugs [6]. The prevalence of cancer patients in Pakistan was projected to be 329,547 according to a survey conducted between the years 2016 and 2020 [7]. And it is reasonable to anticipate that the number of cancer cases will rise by 2.3 million per year. Out of the total number of nurses in the world, there are 28 million, and 5.5 million of them interact with cytotoxic

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medications [8]. Afghani 4.88 %, Balochi 3.89 %, Balti 2.49 %, Gilgit 2.46 %, Hazara 3.48 %, Hindko 3.39 %, Memon 2.26 %, Punjabi 24.47 %, Pushto 16.69 %, Saraiki 9.23 %, Sindhi 11.65 %, and Urban sindhi(Muhajir)15.09 % were observed to have received chemotherapy and other treatments such as radiation and surgery. The demographic or ethnic group with the highest prevalence was Punjabi (24.47 %), while Memons had the lowest prevalence (2.26 %). In Punjab according to cancer registry forum report 2021 most commonly reported cancers across all age groups and both sexes were (N=6,507) [9]. The chemotherapy-induced peripheral neuropathy (CIPN) is one of the most common side effects of antineoplastic drugs, with a prevalence that can range anywhere from 19 % to more than 85 %. CIPN is primarily a sensory neuropathy, but it can also cause varying degrees of motor and autonomic dysfunction for varying amounts of time. Due to the high prevalence of CIPN among cancer patients, it presents a significant challenge not only for cancer patients but also for cancer survivors and the medical professionals who care for them. This is especially true due to the fact that there is no one foolproof way to prevent CIPN, and the treatment options for this syndrome are extremely restricted. To be able to develop effective CIPN prevention and treatment techniques, a deeper understanding of the underlying risk factors and mechanisms that contribute to the condition is required [10]. Oncology nurses play a key role in the diagnosis and treatment of CIPN. Despite broad consensus among nurses regarding the need of CIPN evaluation, research indicates that many practitioners lack confidence in their assessment abilities [11]. Chemotherapy-induced peripheral neuropathy (CIPN) is a typical dose-limiting side effect encountered by cancer patients. Approximately 30-40% of patients treated with neurotoxic chemotherapy may develop CIPN, and the severity varies greatly between people. It is frequently sensory-predominant with discomfort, which can result in long-term morbidity in survivors. As cancer survival rates improve, the prevalence and burden of CIPN late effects are predicted to rise [12]. CIPN occurs in 30 to 90 % of patients receiving neurotoxic chemotherapy, including platinum compounds, taxanes, vinca alkaloids, immunomodulatory drugs, and bortezomib, according to various studies. The incidence and severity of CIPN are known to be affected by the chemotherapeutic agent used, preexisting neuropathy, cumulative dose, dose intensity, and duration of chemotherapeutic drug exposure [13]. The role of nurses in the treatment of CIPN is essential. Assessing CIPN at baseline and before each cycle of chemotherapy is crucial, and nurses have a lot of insight on how to do so. The quality of life of cancer patients can be improved via the education of oncology nurses on the warning signals of chemotherapy and adjuvant medication-induced peripheral neuropathy(CIPN)[14]. As a typical side effect of neurotoxic chemotherapy, treatment-induced peripheral neuropathy is a prevalent problem for cancer patients. Depending on the length of chemotherapy and the usage of platinum-based drugs, plant alkaloids, taxanes, and bortezomib, the incidence of CIPN among cancer patients is estimated to be around 38% [15]. There is a chance that patients will not report experiencing pain from CIPN until they are pushed to do so. Thus, oncologists should often check their patients for neuropathy and neuropathic pain [16]. The contributions of nurses to scientific inquiry and the evaluation of the efficacy of treatments and management improve the QoL of CIPN patients. If oncology nurses had greater knowledge of various pharmacological and non-pharmacological treatments, the effects of CIPN could be prevented and reduced, according to the study [17]. Nurses in many different practice settings carry out the majority of CIPN screening. As a result, nurses are in a prime position to identify the earliest symptoms of peripheral neuropathy while the patient is receiving treatment[11].

METHODS

It was a Descriptive Cross-sectional study conducted in Jinnah Hospital Lahore and services hospital Lahore with sample of n=172 nurses recruited through convenient sampling method. Nurses with the age between 22 years to 50 years, having clinical experience more than 6 months in oncology with qualification of Generic BSN, Post RN, Diploma nursing are included while nurses with experience less than 6 months and doing administrative task were excluded in this study. In this research 3 revised instruments were used (1. knowledge, 2. practice 3. neuropathy development.) knowledge tool consisted of 17 MCQs based questions, which are divided into 3 categorize (0-49% considered as poor, 50-74 considered as fair, 75% or more is considered as good knowledge). Practice tool consisted of 15 observational questions, done and not done, 0 marked as not done while 1 marked as done. Which are divided categorically into 3 categorize (0-50% considered as poor practice, 51-74 considered as fair practice, 75% or more is considered as good practice)[11]. Development Questions are each rated to indicate frequency of practice behaviors on a scale of 0-3(not at all, a little, quite a bit, very much). The neuropathy of the patient is assessed as three categories; mild, moderate and savior. A score of above 75% will considered "saviors", score between 51% to 74% will be considered as "moderate" and below 50% of the score will be considered as "mild"[18]. The quantitative data were measure by SPPS Statistical Package of Social Sciences (SPSS) software version 26. The qualitative data was measure by frequency. Chi-square

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were implemented and p-value less than or equal to 0.05 were taken as significant.

RESULT

Table 1 demonstrate that that172 participants were involved in the study. Age: The majority 37.2% of participants were between the ages of 28-33 years, 27.3% participants were from age group of 34-39, 22.7% participants were from age group of 22-27, 11% participants were from age group of 40-45 while 1.7% participants were from age group of 46-50. Gender: majority of the participants were female with (n=158) 91.9% of the population. Male participants were (n=14) with 8.1% of the population. Total experience: Results revealed that majority of the 56.4% participants had experience of > Then 5 Years. 39% participants had experience of 1-5 years whereas 4.7% participants had experience of < Than 1 year. Oncology experience: majority of the 72.7% participants had 1 to 5 years of experience in recent oncology department, 16.3% had < than 1 year of experience while 11.0% had > than 5 years of experience in oncology department. Qualification: majority 49.4% of participants were diploma holder, 30.8% were Post RN BScN, while 19.8% participants were Generic BSN. Oncology certificate: 89% participants were working in Oncology department has no oncology certificate, whereas 11% participants were working in oncology unit have.

Variables		Frequency (%)
Age	22-27 years	39 (22.7%)
	28-33 years	64 (37.2%)
	34-39 years	47 (27.3%)
	40-45 years	19 (11.0%)
	46-50 years	3 (1.7%)
	Total	172 (100%)
Gender	Male	14 (8.1%)
	Female	158 (91.9%)
	Total	172 (100%)
Job experience	< Than 1 year	8 (4.7%)
	1-5 Years	67 (39.0%)
	> Than 5 Years	97 (56.4%)
	Total	172 (100%)
Oncology experience	< Than 1 year	28 (16.3%)
	1-5 Years	125 (72.7%)
	> Than 5 Years	19 (11.0%)
	Total	172 (100%)
Qualification	Generic BSN	34 (19.8%)
	Post RN BScN	53 (30.8%)
	Diploma in Nursing	85 (49.4%)
	Total	172 (100%)
Oncology certificate	Yes	19 (11.0%)
	No	153 (89.0%)
	Total	172 (100%)

Table 1: Demographic data of the participants

Knowledge: showed that 56.4% of participants have fair knowledge, 29.7% have Poor Knowledge, while only 14% of participants have good knowledge. Practice: showed that 49.4% of participants have fair practice, 45.3% have Poor practice, while only 5.2% of participants have good Practice. Development of neuropathy: showed that 47.1%o f patient has devolved mild neuropathy35.5% have devolved moderate neuropathy, while 17.4% have devolved severe neuropathy (Table 2).

Variables	Frequency (%)
Knowledge	
Poor (0-49%)	51 (29.7%)
Fair (50-74%)	97 (56.4%)
Good (Greater or equal to 75%)	24 (14.0%)
Total	172 (100%)
Practice	
Poor (Less than or equal to 50%)	78 (45.3%)
Fair (51-74%)	85 (49.4%)
Good (Greater or equal to 75%)	9 (5.2%)
Total	172 (100%)
Development of neuropathy in patients	
Mild (Less than or equal to 50%)	81 (47.1%)
Moderate (51-74%)	61 (35.5%)
Severe (Greater or equal to 75%)	30 (17.4%)
Total	172 (100%)

Table 2: Categorical knowledge, practice and neuropathy development scores

Table 3 illustrates the significant association between knowledge with neuropathy development, practice with neuropathy development as the results checked with chi square test, p-value was 0.00 (p-value is <0.05 taken as significant).

Knowledge	Development				
	Mild	Moderate	Severe	Chi-square	p-value
Fair (50-74%)	59	35	3	74.624357	.000
Poor (0-49%)	5	19	27		
Good (Greater or equal to 75%)	17	7	0		
Practice	**Development**				
	Mild	Moderate	Severe	Chi-square	p-value
Poor (Less than or equal to 50%)	8	40	30	89.801	.000
Fair (51-74%)	64	21	0		
Good (greater or equal to 75%)	9	0	0		

Table 3: Association between knowledge with neuropathy development & practice with neuropathy devolvement

DISCUSSION

The current study demographics that were male nurses just 8.1% and age of participants from ages between 22-27 years of were 22.7% that are contrary to the study that revealed that (31.4 %) of the sample was between the ages of (25-29 years) and that (52.1 %) of the sample was male

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[5]. The knowledge of nurses is this study is fair which helped the mild development of CIPN in oncology patient, the present study results conflicting the study of nursing knowledge, practice patterns, and learning preferences regarding chemotherapy-induced peripheral neuropathy and found that nurses in the survey lacked knowledge regarding neurotoxicity of specific agents, evidence-based treatments and assessment of CIPN patients [19]. 50-74 % of nurses have adequate knowledge of CIPN risk factors, indicating a knowledge-practice gap, oncology nurses emphasized the importance of CIPN assessment in their clinical practices; however, 75% believed assessment skills played no significant role. There was a remarkable lack of knowledge among nurses with no prior experience with CIPN assessment instructions. Indicating that the required foundational nursing knowledge for the CIPN assessment was insufficient [20]. Another study showed that more than half of the nurses had 1-5 years oncology experience 72.7%, half of the participants just had diploma degree in nurses 49.4% and most alarming was that two third of the nurses had no oncology certificate 89% which resulted as inadequate practice by half of the nurses. These results of this study were different from another study who found that the oncology nurses had adequate nursing practice regarding chemotherapy induced peripheral neuropathy and assessment practices did not routinely include neurologic physical assessment [11]. In another study conducted in Jordan, on the oncology nurse's knowledge and practices showed the mean CIPN knowledge score of 8.98+1.9 which indicates poor knowledge. Despite the fact that only 58.8% of respondents stated that CIPN assessment is required for their oncology practices, the majority of respondents evaluated their skills as inadequate. The neurologic physical exam is only occasionally included in the practice evaluation. 57.1% of respondents, including patients and their relatives, expressed anxiety about CIPN [20]. Another study reported that the survey's nurses lacked understanding of the neurotoxicity of certain drugs and empirically supported treatments. Rarely were standardized measurement instruments and physical examinations with a CIPN focus employed during assessment [21].

CONCLUSIONS

The nurses with excellent clinical skills had a thorough understanding of how to assess CIPN patients. This study indicated that vast knowledge and best practice benefited the patient, i.e., if these factors are high, there is a lower possibility that patients will acquire CIPN.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Real Time Paper Based Detection of *Streptococcus bovis* using Chromogenic Substrate in Resource Constrained Environments

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ABSTRACT

Healthcare management faces a variety of difficulties in Circumstances with limited resources. Accurate diagnosis is the first step in disease prevention and therapy that works However, the diagnostic tools that are available in the economically advanced world are frequently of little utility in underdeveloped nations including Pakistan. The gram-positive bacterium *Streptococcus bovis* is an opportunistic pathogen that can cause various infections from superficial skin infections to severe and potentially fatal invasive diseases. **Objective:** To design a platform in environments with limited resources for the quick detection of *Streptococcus bovis*. **Methods:** A paper based analytical device (PAD) has been created with enrichment in sterile PYP broth for 1.5 hours and used for the detection of alkaline phosphatase activity using the chromogenic substrate Para-Nitrophenyl Phosphate (PNPP), *the specie* could be found in clinical samples. A coagulase test and sample Gram staining was conducted with the test. Qualitative detection was evaluated by visual detection while quantitative analysis is carried out using Image J software. **Results**: Alkaline Phosphatase (*S. bovis*) reacts with the PNPP substrate (5.7 mM) in the presence of PAD. Concentrations below 4.5x104 cfu mL resulted in the detection of a color change. The micro PADs were incubated at 37 °C for 3-4 hours before reaction. Colored product (yellow) indicated the presence of *S.bovis*. **Conclusion:** Within 2 hours including enrichment time the test may identify *Streptococcus bovis* up to 104 CFUmL-1.

INTRODUCTION

Over the years, the molecular diagnosis of infectious diseases has become the standard of care for the identification and diagnosis of viral, bacterial infections and several bacterial infections. Although molecular testing has a number of benefits for precise diagnosis and the best therapeutic care of patients infected with microorganisms, many test methods are not practical in underdeveloped or resource-constrained environments. From ethical, financial, and scientific aspects, the disparity in testing methodologies is debatable [1]. Because skilled employees are frequently lacking. The World Health Organization states that affordable, sensitive, specific, user-friendly, rapid and robust diagnostic gadgets which is equipment free and deliverable to the required person for poor nations. This will be named as ASSURED. Microfluidic paper-based analytical devices (PADs), a new platform created for ASSURED diagnostic assays which are composed of patterned papers [2]. *S. bovis* is a facultative anaerobe that is non-motile, non-sporulating, and both oxidase and catalase negative [3]. The standard procedure for identifying *Streptococcus bovis* entails direct Gram staining at first, then isolation and biochemical testing. These conventional techniques are time-consuming and laborious. Numerous fast methods for identifying *Streptococcus bovis* directly from cultures have been reported, including nucleic acid-based and immunological methods. However, the majority of these methods can be prohibitively expensive or challenging to use in environments with limited resources [4]. *Staphylococci Micrococci*, *Streptococci*, and *Enterococci* are gram-

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positive cocci that can be discovered in dietary or clinical samples. When cultivated in the presence of 0.3% Pi, *micrococci* do not produce phosphatase, but *enterococci* and *streptococci* may produce phosphatase but do not produce coagulase. By doing a catalase test, S*treptococci* and S*taphylococci* can be distinguished therefore, a probable identification of *Streptococcus bovis* can be made using the current test on paper, Gram staining, and Coagulase test. Only circumstances where *Staphylococcus* or *Streptococcus* is anticipated to be the sample's etiological agent require the use of the catalase test [5]. In all dimensions of human existence, recent advancements in nanoscience and nanotechnology have profoundly changed how we recognize, treat, and prevent a wide range of diseases. Silver nanoparticles (AgNPs) are one of the most significant and intriguing nanomaterials among the various metallic nanoparticles employed in biomedical applications. AgNPs in particular are essential for nanomedicine and other nanoscience and nanotechnology disciplines [6]. Silver nanoparticles (AgNPs) are being used more and more in a range of industries, including medicine, food, health care, consumer goods, and industrial applications, as a result of their unique physical and chemical properties. High electrical conductivity, optical, electrical, thermal, and biological properties are some of these [7]. Precise particle characterization is required following synthesis since a particle's physicochemical characteristics may have a big impact on those particles' biological characteristics [8]. Recent studies have demonstrated that biologically-mediated nanoparticle synthesis is an easy, affordable, dependable, and ecologically friendly method [9]. In several investigations, AgNPs were synthesized without the use of harmful chemicals by biological processes that were both affordable and environmentally friendly [10].

METHODS

A technique created for Laboratory development of paper-based electronics [11] For this, 11 cm 9 cm Whatman filter paper No. 3 (GE Healthcare Life Sciences) was utilized. A simple well-plate design using a 9-mm diameter spot array served as the basis for the PAD's design. *Streptococcus bovis* American type culture collection (ATCC 33317) from a microbial type culture that is known to produce ALP For the creation of the standard graph was utilized. Additionally, hospital isolates of *S. bovis* were used to assess alkaline phosphatase (ALP) activity. ATCC *25922 Escherichia coli*, *Pseudomonas aeruginosa* ATCC 27853 (Laboratory maintained) were used as known negative cultures. The PYP medium, which contained 20 g of peptone, 10 g of yeast extract, 1 g of glucose, and 3.0 g of mixture of mono- and dibasic phosphates,15 g of agar,1 liter of water, and NaH2PO4 to raise the medium's pH to 7. Thermo Fischer GeneJet Genomic DNA purification kit was used to extract the genomic DNA from this culture in accordance with the manufacturer's instructions. At -20 degrees purified DNA was stored. Primers for gene amplification were designed against *streptococcus bovis* Strain sequence mentioned in NCBI databank(table 1).

Name of primers	Sequence of primers
(F-*tuf*)	5-ATGGTCCAATGCCACAAACACGTGAAC-3
(R-*tuf*)	5-CTACAGTACCACGACCAGTGATTG-3

Table 1: Primers sequence

F-*tuf* and R-*tuf* Primers were used for the amplification of the *tuf* gene. Total 25 µl reaction was made.1 min Initial denaturation was done at 94, annealing was done at 63 for 30 seconds, extension at 72 for 90 seconds and final extension was done at 72 for 17 min followed by a hold at 4˚C.After PCR the amplified product was run on 1% agarose gel. Once Electrophoresis was done the amplified product evaluated under UV light for the confirmation of size of the product. Advance Bio-sciences carried out the sequencing. Sanger Dideoxy Chain Termination was used for the ABI-310 sequencer to perform the sequencing. Using BLASTn, the similarity of each gene to known sequences acquired from the gene bank was calculated. Different Bioinformatics tools were used for the current study. The primer binding site on the *tuf* gene was discovered using the bioinformatics tool EMBOSS-needle. The amino acid sequence was converted from the nucleotide sequence using the ExPASy translate programme. The protein 3-D structure of the EF-Tu derived from SWISS-MODEL. To find the site of interaction with the primer, the protein sequence encoded by the targeted *tuf* gene was discovered on the protein 3-D structure. P-Nitrophenylphosphate (PNPP) solution was prepared as per manufacturer's instruction by adding 1 mg/ 1 mL of Glycine Buffer at pH 8.8. Para-Nitophenylphosphate (PNPP) was used as substrate and prepared according to manufactures instruction. the aforementioned paper sheets were used for conducting the test protocol. The paper wells had PNPP poured into them (5 µL). The paper was given 30 minutes to dry. It was followed by the addition of Silver Nanoparticles (5 µL) allowing the paper to dry to proceed next step. Afterwards culture broth or enzymes (5 µL) were added. Devices were kept alive in a foil-covered petri dish at 37 ° C throughout the incubation phase. Alkaline Phosphatase causes the reagent to change color from without color or ranging from extremely light to dark yellow. On a smart phone, a picture of the color development was taken. A qualitative test was conducted to determine the presence *Streptococcus bovis* in samples collected from different Hospitals. Different healthy individuals and clinical samples were also used.

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Streptococcus is routinely detected in clinical samples. Blood, Nasal swabs, Pus, Abscess, oral swabs were among the samples received from a pathology lab with a good reputation and examined. As previously noted, samples were prepared and processed for quantitative analysis. Enriched Medium (broth) was utilized for both the Coagulase test and the paper test. Every sample was simultaneously stained and put on a plate. NaCl broth test was used for *Streptococcus bovis* presence confirmation. Results from clinical samples were compared to the pathological laboratory report. Specificity Test was performed to assess the viability of the paper based sensor designed for *S. bovis.* Known Positive and known Negative controls were used. Positive Control (*S. bovis* ATCC),Test samples *S. bovis* isolated from (Clinical, Dental and Blood) and Negative Controls were (*B. subtilis, E.coli* and *Pseudomonas*) collected from different Hospitals of Lahore. After identification based on Gram staining, Biochemical analysis pure cultures were used for the experiment

RESULTS

Agarose Gel Electrophoresis was applied to samples of DNA that had been extracted and for Gene amplification as well. 1kb ladder was utilized, and 1% Gel was operated at 90 volts. Sequences of S.bovis that were collected from clinical samples were compared to sequences that had already been published in the gene data bank. For a better knowledge of pathogenicity and management of the diseases brought on by the specie, this homology analysis aids in the identification of mutations as well as homologous sequence areas. The comparison revealed sequence similarities between the isolated sequences of the two S.bovis strains. The isolated species identity as S.bovis was established by this comparison. S. bovis clinically isolated strain sequence product was aligned with reported gene sequence of Streptococcus bovis elongation factor Tu (tuf) gene with sequence ID AF276258. Overall similarity was 95%.S. bovis clinically isolated strain sequence product was aligned with reported gene sequence of Streptococcus bovis elongation factor Tu (tuf) gene with sequence CP046919. Overall similarity was 95%.

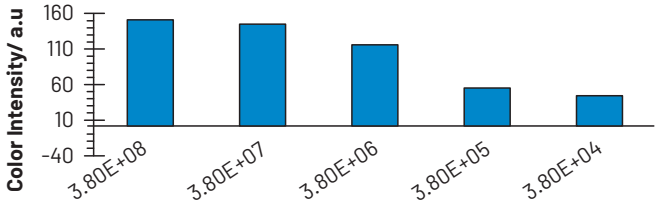

Figure 1: Lowest number of cells exhibiting an observable positive reaction on paper was 3.8×104 CFU mL-1

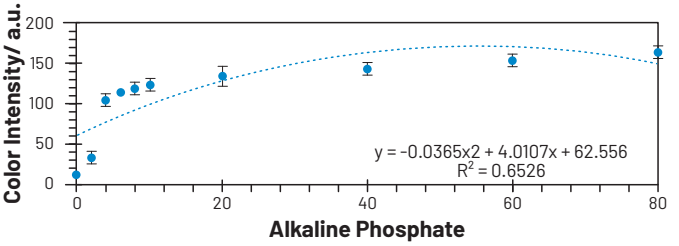

Figure 2: Estimation of cell number in Clinical Samples (Experiments were done in triplicates, (n=3)

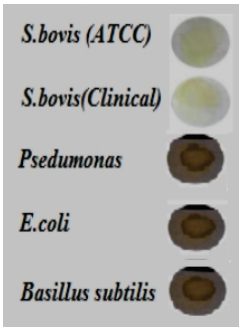

Figure 3: Specificity Test. Positive Control(S.bovis ATCC),Test samples S.bovis isolated from (Clinical) Negative Controls (B.subtilis, E.coli and Pseudomonas)

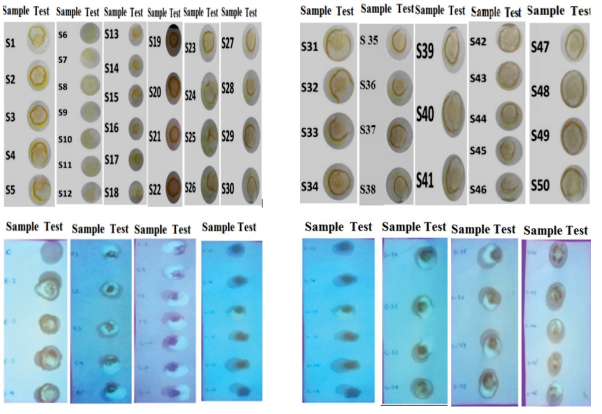

Figure 4: (A) Stripes comprises of filter paper based Enzyme-Substrate interaction in Clinical isolates (S.bovis) form of a color product (yellow) (B) Stripes comprises of filter paper analyzed under UV-Vis Spectrophotometer for the Fluorescence and measurement of the fluorescence intensities evaluated by image J software

DISCUSSION

Facilities in underdeveloped nations generally do not have access to the tools and cutting-edge technologies needed to produce test findings that are quick, accurate, and repeatable. As a result, the kinds of molecular assays that can be used as standards of care for patients in resource-poor nations are constrained. Unfortunately, infectious diseases predominate in these low-resource environments and serve as the foundation for prospective global hazards [12]. These difficulties have pushed lab professionals to develop effective molecular laboratory testing for infectious diseases that satisfies the needs of

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all nations in terms of resources, the environment, and health care [13, 14]. This study addresses the issues encountered by *Streptococcus* species. Samples were Collected from different hospitals of Lahore and characterized by performing different Biochemical Tests and Plate Methods. Because PYP medium have a high salt concentration that encourages the development of gram-positive bacteria, they were specifically utilized for the secondary culture of *S. bovis*. Phosphatase and coagulase tests were used to do qualitative analysis on *S. bovis*. a biofilm-forming organism, has high levels of alkaline phosphatase, which it uses to hydrolyze phosphate from various sources in the media. PNPP was employed in this work as a chromogenic reagent to carry out the test. The enzyme found in the inoculation media hydrolyzed the phosphate group from the reagent, and the phenol group appeared as yellow rings on the filter paper [15]. A typical *Streptococcus bovis* graph preparation demonstrates a linear relationship between the quantity of *Streptococcus bovis* cells and the average values for fluorescence intensity 3.0 × 104 CFU mL-1 was found to be the limit of detection. Out of the five hundred (500) samples analyzed for qualitative tests, twenty clinical samples that produced false positive results may have contained flora other than *Streptococcus bovis* and were capable of producing alkaline phosphatase. Gram staining and coagulase tests was performed for the confirmation of the strains isolated from clinical samples [5, 16]. The designed procedure produces data in 3–4 hours, enrichment time included, and requires no expensive analysis tools. Both qualitative and quantitative testing can be done with the designed platform. Although it offers a very accurate estimate precision of quantitative analysis still needs improvement. This technique can find up to 104. CFU mL-1 and can be used by the food industry, to find out the microbial contaminants in water and in medical field as a screening test. Previously this methodology was used for identification of *Staphylococcus aureus* [17]. They have used BCIP as chromogenic substrate and we have used Paranitrophenylphosphate. We have also implied AgNPs to add up uniqueness of the test. A group of study proposed by Galia and co-workers for the identification of methicillin resistant *Staphylococcus aureus* [18]. Previously another group has proposed a study for the identification of bacteria by using antibody coated microspheres [19]. A Paper based Analytical device was designed and fabricated by a group of researchers for the identification of *E.coli* in real urine samples [20]. Our results were in line with the previous results reported as given above. Given that the Limit of Detection (LOD) of this method is 104 CFU mL-1 and counts above 104 CFU mL-1 yield results in less than 30 minutes, this test could provide speedy results for certain applications. Medical professionals in distant areas can utilize the test to make a preliminary *Streptococcus* species diagnosis in conjunction with Gram staining, coagulase and catalase as well as a clinical picture. In addition to being quick, the test is also reasonably economical. The test does not require any complicated equipment or skilled workers because the number of reagents needed is measured in microliters. Visual color detection is the foundation of the qualitative test. Only a smartphone is needed for quantitative analysis in order to record and process the image. The paper can be incinerated securely for disposal. Thus, a quick test for *Streptococcus bovis* identification that may be utilized in areas with low resources is standardized.

CONCLUSION

The procedure produces result swiftly within 2 hours including enrichment time and the best part it requires no expensive analysis tools. Both qualitative and quantitative testing can be done with the designed assay. Precision of quantitative analysis is excellent, although it offers a very accurate estimate but still needs improvement to switch the whole platform to electrochemical chips. The food industry can utilize this technique as a screening test because it can identify up to 104 CFU mL-1. The limit of detection of this method is 104 CFU mL-1 and counts above 104 CFU mL-1 yield results in less than 30 minutes, this test could provide speedy results for certain applications. Medical professionals in remote areas can utilize the test to make a preliminary Streptococcus diagnosis in continuation with Gram staining, Coagulase and catalase as a clinical picture.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Diagnostic Accuracy of MRI for Detecting the Preoperative Tumor Staging of Colorectal Carcinoma

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ABSTRACT

Colorectal cancer is the third most common carcinoma worldwide and is second leading cause of death in the developed world. Early detection of tumor staging may lead to opting proper management plan and increase chances of survival. **Objective:** To determine diagnostic accuracy of MRI in evaluating preoperative tumor staging of colorectal carcinoma. **Methods:** The cross-sectional study was conducted at, Liaquat University Hospital - Hyderabad/Jamshoro from Jan 2022 to July 2022 on a sample of 204 patients of either gender with aged between 20 to 80 years and presenting with suspected colorectal cancer, diagnosed on the basis of clinical symptoms and physical examination. Patients were enquired about age, gender, duration of symptoms, history of per-rectal bleeding and pain. Preoperative MRI scan along with the Postoperative histopathological assessment of colorectal carcinoma staging of all patients was done. **Results:** Out of 204 patients, 60% of sample i.e. 123 patients were male and 81 (40%) were females with a median age of 68 (29-92) years. Most of the patients had well differentiated colorectal cancers i.e. 175 (85.8%) with 2/3rd sample had more than 5 cm height of primary tumor from the anal verge. T3 tumor stage was found to be highest in number (50.5%), followed by T2 (30.9%) and T4 (11.3%). The diagnostic parameters of preoperative MRI in detecting tumor staging was found to be good when correspondent to postoperative histological findings. **Conclusion:** The study showed that the accuracy of MRI in staging colorectal cancer is significantly high when compared with postoperative histopathological staging.

INTRODUCTION

Colorectal cancer is the third most common carcinoma worldwide [1]. It is the second leading cause of death in the developed world [2]. It has a slight male predilection, with slightly increased prevalence after the age of 50 years. Adenocarcinoma accounts for the vast majority (98%) of cases. Other rectal tumors are relatively rare and include carcinoid tumor (0.1%), lymphoma (1.3%), and gastrointestinal stromal tumors (<1%) [3]. Many improvements have been made over the past 20 years in surgical, oncological and radiological treatments of rectal cancer. It is still associated with delayed diagnosis and consequent bad poor prognosis (also the risk of local recurrence and metastasis). A timely diagnosis can hasten treatment and give hopes of a better prognosis. Although rectal tumors can be diagnosed with digital examination, barium enema, and colonoscopy or sigmoidoscopy, these endoluminal techniques do not provide sufficient information about the extraluminal spread of tumor which is necessary for preoperative planning. MRI can be a more promising alternative [4]. The anatomic location of the rectum, its fixation in the pelvic fat, and the lack of peristalsis make the rectum an ideal organ for imaging with MRI. However at present there is no consensus on the role of diagnostic imaging despite the fact that MRI has the potential to diagnose rectal wall laminar structure and show the details of the relationship of the tumor with the meso-rectal fascia and surrounding organs [5, 6]. Al-Sukhni *et al* recently reported a meta-analysis of 21 studies

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where MRI with phased-array coil was found to have 94% specificity (range, 88%–97%) for predicting CRM involvement [7]. A tumor volume reduction of more than 75% was significantly associated with pathologic complete response and higher disease- free survival rate [8]. Currently there is no agreement with regard to the role of gadolinium-enhanced MRI in patients with colorectal cancer [9]. However, it may improve the detection of tumors and malignant lymph nodes increase the accuracy of MRI for diagnosing T3 tumors and loco-regional extensions [10-12]. The basic purpose of our study was to correlate and describe the sensitivity and specificity of MRI findings while taking histopathological findings as gold standard in our own setting. Thin-section MRI with a phased array coil is beginning to be used for T staging of colorectal cancer, and fast assuming the role of an established modality for the preoperative imaging of colorectal cancer in the developed world, but its use in our part of the world is far from optimum. Thus the study was designed to determine diagnostic accuracy of MRI in evaluating mesorectal fascia invasion in pathologically proven cases of colorectal carcinoma.

METHODS

The cross-sectional study was conducted at Department of General Surgery, Liaquat University Hospital - Hyderabad/Jamshoro from Jan 2022 to July 2022 on a sample of 204 patients of either gender with aged between 20 to 80 years and presenting with suspected colorectal cancer, diagnosed on the basis of clinical symptoms and physical examination. Patients were chosen via Non-probability, consecutive sampling. After taking written informed consent, patients were enrolled in the study and were enquired about age, gender, duration of symptoms, history of per-rectal bleeding and pain. Preoperative MRI scan along with the Postoperative histopathological assessment of colorectal carcinoma staging of all patients was done. Non-consenting patients and patients who had taken treatment (medications, radiation or chemotherapy) prior to MRI were excluded from the sample. Patients having extensive metastatic disease on previous imaging (CT scan and MRI), patients having contra-indication for MRI examination (like having prosthesis, cardiac pacemaker etc.) and pre-diagnosed cases (on the basis of biopsy) were also excluded from the sample. Data was analyzed using Microsoft Excel 2016 and SPSS v. 21.0. Qualitative data was expressed as number and percentage (No & %). Quantitative data was expressed as mean & standard deviation (X ± SD). The sensitivity, specificity, positive predictive value, negative predictive value, and accuracy were calculated in the following way: patients were classified as positive if both MRI and histopathology were suggestive of disease (table 1).

Tumor stage	Level of involvement
T1	Limited to mucosa and submucosa
T2	Extension into but not through muscularis propria
T3	Invasion of perirectal fat
T4	Invasion of adjacent structures

Table 1: Colorectal carcinoma t-staging: tumor staging criteria of colorectal carcinoma

RESULTS

Out of 204 patients, 60% of sample i.e. 123 patients were male and 81(40%)were females with a median age of 68(29-92) years. Most of the patients had well differentiated colorectal cancers i.e. 175 (85.8%) with 2/3rd sample had more than 5 cm height of primary tumor from the anal verge (Table 2).

Sample characteristics	
Median Age (Years)	68 (29-92)
Men	123 (60%)
Women	81 (40%)
Median days from MRI to primary surgery	26 (1-119)
Height of primary tumor (from anal verge)	
0-5 cm	69 (34%)
5.1-10 cm	73 (36%)
>10.1 cm	62 (30%)
Tumor differentiation	
Moderately / Well differentiated	175 (85.8%)
Poorly	39 (14.2%)

Table 2: Characteristics of 204 patients undergoing surgery for colorectal cancer. Figures are number (percentage) of patients unless stated otherwise

T3 tumor stage was found to be highest in number (i.e. 50.5%), followed by T2(30.9%)and T4(11.3%)-(Table 3).

Preoperative tumor staging via MRI	
Pt1	17 (8.3%)
Pt2	63 (30.9%)
Pt3	103 (50.5%)
Pt4	23 (11.3%)

Table 3: Preoperative tumor staging via MRI & correspondence with histopathological findings

The diagnostic parameters of preoperative MRI in detecting tumor staging was found to be good when correspondent to postoperative histological findings (Table 4).

Diagnostic Accuracy of Preoperative Tumor Staging via MRI		
Parameters	With corresponding Histological Findings	Without corresponding Histological Findings
Sensitivity	0.91	0.83
Specificity	0.52	0.53
Positive predictive value	0.89	0.91
Negative Predictive Value	0.67	0.39

Table 4: The sensitivity, specificity, positive predictive value and negative predictive value of preoperative MRI

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DISCUSSION

Our study investigated the diagnostic accuracy of MRI in diagnosing preoperative staging of colorectal cancer. The results suggested that the diagnostic accuracy of MRI is very high as evident by similar results obtained on Postoperative histopathology. Colorectal cancer is a common malignant tumor, which often occurs in the elderly. The mortality rate of colorectal cancer is 4-10/10000 per year, which is one of the major causes of cancer-related death [13, 14]. The prognosis of colorectal cancer is related to age, general condition of the patient and depth of tumor invasion, lymph node metastasis, circumferential resection margin and invasion of extravascular vascular [15-17]. The 5-year survival rate of colorectal cancer is 66.6%, and localized cancer 88.2%, regional metastasis 70.0%, distant metastasis 14.0% [18]. The clinical stage of colorectal cancer is one of the factors that determine the patients whether to receive surgery directly, or neoadjuvant therapy followed by radical resection, or palliative chemotherapy, or radiotherapy. And the response evaluation of neoadjuvant therapy may change the following treatment [19]. Therefore, preoperative evaluation of colorectal cancer is important for the choice of treatment and prediction of prognosis. The gold standard for diagnosing colorectal cancer is endoscopy with biopsy for histopathological confirmation. And imaging examinations play an important role in the diagnosis of colorectal cancer. Imaging examinations for colorectal cancer include CT, MRI, endorectal ultrasonography (ERUS), and PET-CT [13, 20]. The strength of MRI is the ability to identify the mesorectal fascia, which makes it possible to preoperatively accurately identify those complete surgical excision are infeasible [21]. MRI can identify mucosa and muscle with different signal characteristics, and assess T stage based on signal intensity in and out the submucosa of the rectal wall. Lymphatic involvement assessment is based on the signal in mixed nodules, boundary irregularity, and nodule size. The effect of neoadjuvant therapy is assessed based on the proportion of residual tumor cells in the fibrotic matrix [18]. A meta-analysis showed that the sensitive of MRI for diagnosing T and N stage of colorectal cancer were 75% and 71% respectively [22]. Brown *et al* revealed that compared with pathological results, the coincidence rate of MRI in diagnosing T stage was 94%, and N stage was 85%. MRI was of poor assessment in lymph nodes relatively [23]. Our study suggested the similar results. In addition, the accuracy of MRI in restaging after neoadjuvant therapy was relatively low. The reason was that the edema, inflammation, necrosis, and fibrosis of tissue made it indistinguishable from tumors after chemo-radiotherapy [20]. Mac Dermid revealed that the proportion of postoperative adjuvant chemotherapy in colorectal cancer patients was increasing significantly after multidisciplinary team with the improved 3-year survival [24]. And for metastatic colorectal cancer, the 3- and 5-year survival improved [25]. Burton *et al* showed the positive rate of circumferential resection margin in colorectal cancer reduced after preoperative diagnosis via MRI. A population-based study suggested colorectal cancer patients received more preoperative MRI examination and the TNM stage was more complete [26].There was a predominance of male patients in the sample (60%), which is indicative of the fact that a higher incidence of colorectal cancer (CRC) is found in males compared to females [27]. The diagnostic parameters of preoperative MRI in detecting tumor staging were found to be good when correspondent to postoperative histological findings. Published evidence reports the sensitivity of MRI to be $\geqslant$93.3%, which is near to our finding (91%) [28]. MRI has been shown to be an effective tool for the accurate staging of colorectal cancer and, the interpretation of MR images in patients with colorectal cancer allows the identification of several prognostic factors [29]. The reports correspond well with current study findings.

CONCLUSIONS

In conclusion, curent study showed that the accuracy of MRI in staging colorectal cancer is significantly high when compared with postoperative histopathological staging. This study has formulated an evidence based account of the accuracy of this diagnostic modality and the significance of preoperative T staging of colorectal carcinoma tested in our part of the world that would encourage healthcare providers towards a greater usage of preoperative MRI for timely diagnosis and thus a consequent better prognosis.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Diagnostic Accuracy of Magnetic Resonance Imaging in Detection of Perianal Fistula keeping Surgical Findings as Gold Standard

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ABSTRACT

An abnormal connection between the rectum or canal and the anal skin is called as a perianal fistula (PAF). MRI is considered as a gold standard for the imaging of PAF because of its operator dependence, non-invasive nature, excellent soft tissue contrast, superior field of view and multiplanar capabilities**. Objective:** To assess the validity of magnetic resonance imaging in detecting perianal fistulas while using surgical findings as the gold standard. **Methods:** From 1 January 2021 to 30 January 2022, a cross-validation research was carried out in the radiology department at Memon Medical Institute Hospital in Karachi, Pakistan. The research comprised 153 individuals with PAF ranging in age from 18 to 70 years and of either gender. A 1.5 T MR scanner was used to obtain the MRI. All techniques used a phased-array coil for image capture in all circumstances. The imaging volume encompassed the distal rectum, anal canal, and subcutaneous tissues. Fat saturation pictures were taken in the oblique, axial, and coronal planes. A radiologist examined images, and pertinent patient data were noted on a pre-drafted proforma. Histopathological and post-surgical results were acquired and documented. **Results:** The validity of MRI for the diagnosis of PAF was 82.4% by taking surgical findings as gold standard. **Conclusion:** For the assessment of PAF and the detection of abscesses, MRI is a beneficial and reliable preoperative examination.

INTRODUCTION

An abnormal link between the rectum or canal and anal skin is known as a perianal fistula (PAF) [1,2]. Anal fissure-related inflammation, chronic cryptoglandular sepsis, radiation damage, inflammatory bowel disease, or conditions including rectal or anal cancer, as well as trauma, are the causes of this condition [3]. PAF has an incidence of 8.6 per 100,000 people and primarily affects men (male to female ratio=2:1) [1]. Males have a PAF incidence of 12.3 per 100,000 people, whereas females have a PAF incidence of 5.6 per 100,000 people [4]. PAF is not only irritating and painful, but it can also serve as a breeding ground for infection. The most frequent complain is discharge accounting for 65% of the cases [2]. PAF leads to acute formation of abscess where prompt surgical decompression is important, thus most uncomplicated fistulae can be managed by fistulotomy [2]. Anal fistula treatment includes the removal of the original opening, any related tracts, and any additional openings without impairing continence. This necessitates precise identification of internal opening of fistula and any secondary abscesses or extensions [5,6]. For surgical planning, it would be advantageous to have a diagnostic technique that can precisely pinpoint the internal entrance of a perianal fistula [5,7]. Traditional fistulography,

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endosonography, computed tomography, 3D ultrasounds, MRI and trans perineal ultrasound, have all been utilized in the past to identify PAF [7]. Cannulating the exterior aperture and injecting a water-soluble contrast into the fistula are both components of traditional fistulograms. The relationship between the tract, the external or internal sphincter, and the levator ani muscle is invisible clear because the major tract and its extensions do not fill with contrast when blocked with debris or pus, and the sphincter muscle feature is not observable [8]. Transrectal ultrasound enhances the ability to see fistulae and the connection they have to the muscles of anal sphincter. However, it has limitations including operator dependence, no imaging coronal plane and a small field of view [9]. CT fistulography is restricted by the fact that the fibrosis areas, fistula tract, and sphincter muscles all have comparable attenuation values. Multidetector row CT fistulography, with its isotropic voxels, is anticipated to enhance the outcomes of modality [9, 10]. However, MRI is considered as a reference standard for the imaging of PAF because of its operator dependence, non-invasive nature, excellent soft tissue contrast, superior field of view and multiplanar capabilities [1, 2]. In addition, MRI can properly diagnose the fistula tract in relation to the sphincter complex and its related problems such as abscesses and secondary tract [3]. A recent study found that MRI is 100% sensitive and 88% specific for the identification of PAF, and concluded that MRI has great sensitivity but low specificity for the diagnosis of PAF [11]. The role of MRI is well established in Western nations, however local data is sparse in this area [5-7,11,12]. Therefore, the goal of current study is to assess the validity of MRI for the detection of PAF by considering surgical findings as gold standard. This investigation would aid in establishing the accuracy of MRI in preoperative evaluation of PAF in ano, allowing needless radiation and diagnostic delay due to incomplete tract healing by granulation tissue to be avoided, as is the case with traditional fistulography. It would also assist to reduce unneeded procedures and complications.

METHODS

It was a cross-validation study conducted at the department of radiology of Memon Medical Institute Hospital (MMIH), Karachi from 1st Jan 2021 to 30th Jan 2022. Sample size of 153 patients was estimated using WHO sample size calculator by taking proportion of fistula in ano as 20% [13], bond on error as 6.4% and 95% confidence level. The research included all probable patients with PAF (had a perianal external skin opening or having watery, blood-tinged, or purulent discharge from the opening) aged 18 to 70 years of either gender. Patients who had surgery for perianal fistula, those with recurrent perianal sinus opening with history of perianal fistulectomy, and patients with cardiac pacemakers indwelling metallic implants were not included in the study. Written informed permission was obtained from patients presenting with discharging perianal sinus on physical examination and referred to the department of radiology for MRI of pelvis for PAF after approval from the institutional review board. A 1.5 T MR scanner was used to obtain the MRI. All techniques used a phased-array coil for image capture in all circumstances. The imaging volume encompassed the distal rectum, anal canal, and subcutaneous tissues. Fat saturation pictures were taken in the axial, oblique, and coronal planes. A radiologist reviewed the images and noted important patient data on the pre-drafted proforma. Histopathological and post-surgical results were acquired and documented. SPSS version 22.0 was used to enter and evaluate the acquired data. For numerical data, mean and standard deviation were presented. For categorical data, frequency and percentage were presented. Using surgical results as the gold standard, the 2 by 2 table was utilized to compute validity of MRI for the detection of PAF.

RESULTS

The overall mean age was 45.11±15.22 years with range 20 to 69 years. There were 69 males (45.1%) and 84 females (54.9%) patients in the study. The overall duration since diagnosis on conventional MRI/ Surgery was 3.46±1.18 weeks ranging from 1 to 5 weeks. MRI findings showed PAF in 107 (68%) patients and no inflammation in 46 patients (32%)(Figure 1).

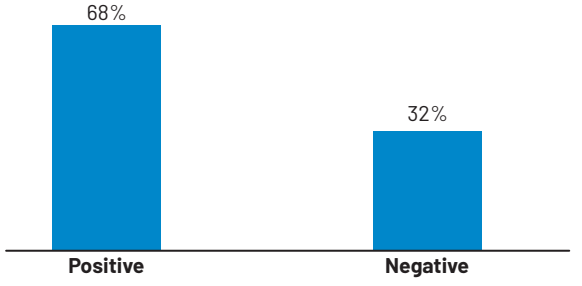

Figure 1: Frequency distribution of MRI findings for perianal fistula (n=153)

Post-surgery histopathology showed positive findings PAF in 106 (69.3%) patients and negative findings in 47 patients (30.7%)(Figure 2).

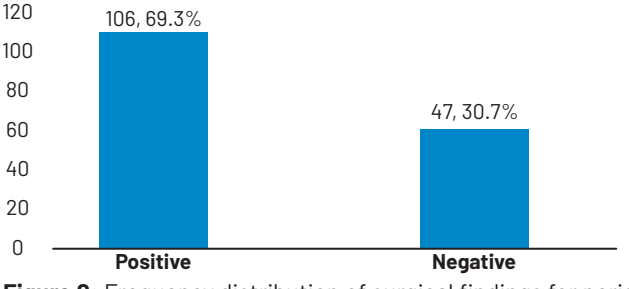

Figure 2: Frequency distribution of surgical findings for perianal

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fistula(n=153)

PAF was identified on MRI and confirmed on surgical findings in 93 cases (true positives) and absence of PAF in 33 patients (true negatives). While, 13 patients shown no PAF on MRI but surgical findings detected it in 13 cases (false negatives). Furthermore, surgical findings denied the presence of PAF in 14 cases which was previously identified by MRI (false positives). Thus, preoperative evaluation of PAF on MRI could detect disease on post-surgery histopathology with Sn, Sp, and accuracy of 87.74% (95% CI=79.9% to 93.3%), 70.2% (95% CI=55.1% to 82.6%) and 82.4% (95% CI=75.4% to 88%), respectively. The PPV and NPV for MRI were estimated as 86.92% (95% CI=80.9% to 91.2%) and 71.4% (95% CI=75.37% to 88%) (Table 1).

	Surgical Findings			Statistic
MRI Findings	Positive (n=106)	Negative (n=47)	Total	Sn=87.7% Sp=70.2% PPV=86.9% NPV=71.7% Accuracy=82.4%
Positive (n=107)	93 (86.9%)	14 (13.1%)	107	
Negative (n=46)	13 (28.3%)	33 (71.7%)	46	
Total	106	47	153	

Table 1: Validity of MRI findings for the identification of PAF by taking surgical findings as gold standard

DISCUSSION

Traditional fistulography, computed tomography, and ultrasound have all failed to diagnose disease accurately [10, 14]. The MRI role in the assessment of fistula-ano was originally established by Koelbel et al., in 1989, and followed by several researchers [2, 15]. We also tested the diagnostic accuracy of MRI for detecting perianal fistulas in the current investigation, considering surgical findings as the gold standard. In our study, the Sn of MRI for PAF diagnosis using surgical findings as gold standard was 87.7%, the Sp was 70.2%, and the diagnostic accuracy was 82.4%. In their study, Singh et al., discovered that MRI has a Sn of 96% and a Sp of 80% in correctly classifying and grading primary tract [2]. Ishfaq et al., found that MRI was 93% sensitive, 92% specific and 92% accurate in detecting PAF by taking surgical findings as gold standard [3]. Tantiphlachiva et al., conducted research on 25 patients which reported that Sn and Sp of MRI for PAF detection were 100% and 88% [9]. Siddiqui et al., concluded that MRI was better than digital rectal exam without or with surgical exploration for detection of fistulas, and that MRI was 97 percent sensitive and 100 percent specific [16]. Garg et al., discovered that MRI had excellent accuracy for detecting fistula-in-ano and provided useful information on previously unknown complicated factors, proving its significance as a critical pre-operative imaging technique for fistula-in-ano [17]. Villa et al., conducted the study to assess validity of MRI in fistula tracts and abscesses. They found MRI was 96% sensitive and 97% specific for the identification of abscesses, while MRI was 100% sensitive and 86% specific for the detection of primary tracts [18]. Similar findings were observed by Rehman et al., and shown that MRI had a specificity of 100% and sensitivity of 90% in identifying type and extent of PAF [19]. MRI accurately detected the opening of an internal fistula and its link to sphincters. The addition of DW-MRI to STIR WI improves sensitivity and specificity for assessing fistula activity and extension, making it a valuable sequence with the greatest diagnostic output. Lee et al., used MRI as a comparative reference standard and reported transperitoneal ultrasound correlated with MRI results with PPV and Sn of 84.2% and 76.3% for detection of fistula and Sn of 56.3% and PPV of 90% for detection of abscess, respectively, whereas colonoscopy correlated with MRI results with Sn and PPV of 68% [20]. In the current investigation, we discovered that the PPV was 87% and the NPV was 72%. In contrast, Singh et al., reported a PPV value of 98% for MRI in their study [2]. Because of the small sample size in this research, more studies with a larger sample size and based in multi-hospitals are needed. In this way, the findings may be generalizable to wider populations.

CONCLUSION

For the assessment of PAF and the detection of abscesses, MRI is a beneficial and reliable preoperative examination.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Comparison of Intracoronary and Intravenous Administration of High Dose Bolus Tirofiban in Patients of St Elevation Myocardial Infarction Undergoing Primary Percutaneous Coronary Intervention

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ABSTRACT

Acute ST-elevation myocardial infarction (STEMI) is a condition in which transmural myocardial ischemia causes myocardial necrosis and is the leading cause of death. **Objectives:** To compare the efficacy of tirofiban bolus administration via percutaneous coronary intervention (PCI) and intravenous route (IV) in STEMI patients for restoration of myocardial perfusion. **Methods:** A retrospective cross-sectional study was conducted at Cardiology Department, Hayatabad Medical Complex, Peshawar, during 2021-22. The study comprised 168 STEMI patients divided into Group A and B (n=84), treated with tirofiban PCI and IV route, respectively. **Results:** Incidence of STEMI was three folds higher in males than females, and the mean age of the patients was 55 years. Smoking and obesity were the potential risk factors. Patients in Group A had a better clinical outcome and prognosis than Group B. In comparison to the IV treatment group (91.66%), the ST-segment resolution time was considerably lower (P<0.05) in the PCI group(48.80%). In both groups, the observational parameters for TIMI flow grade, TIMI major and minor bleeding, MBG, and MACE were not-significantly different (P≥0.05), comprising percentages 94, 3.57, 9.52, 71.42, 5.95%, and 84.52, 2.38, 13.09, 75, 15.47%, respectively. In comparison to IV therapy group, the LVEF percentage in PCI group was statistically significant (P<0.05) after 24 hours and 30 days (57, 63 and 52, 58%, respectively). **Conclusions:** It was concluded that STEMI patients treated with PCI tirofiban bolus had significantly greater(p<0.05) recovery rates, left ventricular ejection fractions and better clinical outcomes than IV-treated group.

INTRODUCTION

Myocardial infarction (MI), sometimes known as a heart attack, occurs when blood flow to the coronary artery of the heart diminishes or stops, resulting in damage to the heart muscle. The most prevalent symptoms are chest pain or discomfort that might radiate to the shoulder, arm, back, neck, or jaw. The most significant of the four primary abnormalities that underlie under the myocardial infarction are acute ST- segment elevation myocardial infarction (STEMI), followed by abnormalities of the QRS complex, early repolarization, and acute pericarditis. Acute STEMI is a condition in which transmural myocardial ischemia causes myocardial necrosis and is the leading cause of death. When patients are admitted to the emergency room with elevated ST-segments, the cardiologist's primary concern is STEMI [1]. The STEMI is leading cause of death in both men and women, accounting for 57 and 43% of acute coronary syndrome patients admitted to hospitals, respectively [2, 3]. The ST- segment elevation is often determined at J-point, where it meets the end of QRS complex, and is compared to TP or PR segment. While,

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some medical professionals prefer to assess the ST elevation when all cardiac fibers are lying in the isoelectric ST- segment, which is when its size ranges from 40 to 80 msec post-J-point [4]. The cutoff values are (a) 1 mm for all leads except V2, V3; (b) 2.5 mm for V2 and V3 (under 40 years old), 2 mm for V2 and V3 (over 40 years old), and 1.5 mm for all other leads (in women), (c) 0.5mm in V7 to V9 (posterior chest leads have minimal cutoff values due to their increased distance from the heart) [1]. The European Society of Cardiology (ESC) advises prompt PCI treatment for STEMI patients to prevent infarction from causing hypoxia and other Major Adverse Cardiac Events (MACE) [5]. The mortality rate, stroke, re-infarction, and intracranial hemorrhages were all reported to be dramatically decreased by 25, 53, 64, and 95%, respectively, following percutaneous coronary intervention (PCI) [6]. With a successful recovery rate and an improved myocardial blush grade, emergency PCI with tirofiban has significantly demonstrated its effectiveness as a therapy for the management of Acute MI and MBG. A novel GP (Glycoprotein) IIb/IIIa receptor antagonist is called tirofiban [7]. It is an antiplatelet medication that relieves myocardial perfusion injuries and MACE by preventing platelet aggregation, activation, and adhesion in coronary vessels [8]. The first therapeutic candidate with origins traceable to a pharmacophore-based virtual screening lead is the small molecule inhibitor of the protein-protein interaction between fibrinogen and the platelet integrin receptor GP- IIb/IIIa [9]. Approval for the use of tirofiban in patients with non-ST-elevation acute coronary syndrome was based on its ability to reduce the rate of thrombotic cardiovascular events, specifically the combined endpoint of mortality and myocardial infarction [10]. Therefore, this study aimed to investigate the efficacy of tirofiban bolus administration via PCI and IV routes in STEMI patients, in terms of patients' safety profile, reduced infarction size, MBG, restoration of myocardial perfusion, and LVEF.

METHODS

The study comprised the metadata of 168 patients presented at the Cardiology Department, Hayatabad Medical Complex (HMC) Teaching Hospital, Peshawar, Khyber Pakhtunkhwa, Pakistan, during the year 2021-22, diagnosed with STEMI**.** The patients were allocated in two groups *viz* Group A and Group B, comprising 84 patients (n=84) in each group. Patients with ST-segment elevation >0.1mV in at-least two leads, clinical evidence of AMI, age>40 years, elevated creatinine-kinase of muscle-brain (CK-MB), and Troponin were included in the study; patients sensitive to tirofiban, persistently hypertensive, at risk for bleeding, hemodynamically unstable, and those requiring emergency coronary artery bypass grafting or rescue PCI were excluded. Prior to intervention, patients in all treatment groups received intravenous doses of clopidogrel (600mg) and acetylsalicylic acid (300mg), and tirofiban was always provided concurrently with an IV bolus of un-fractionated heparin (50-IU/Kg). Patients in Group A were treated with PCI bolus infusion of tirofiban, followed by the administration of intravenous maintenance dosage of tirofiban, while, Group B patients were only treated with a bolus intravenous infusion of tirofiban. Initially, in STEMI cases, tirofiban was infused intravenously at 0.4micrograms/Kg body weight, per minute for 30 minutes, and its infusions were continued at 0.1 micrograms per kilogram per minute. In STEMI the PCI, tirofiban was infused @0.25 micrograms/KG/minute for three minutes, and it was continued at 0.15 micrograms/Kg/per minute for 18 hours [11]. The initial care given to patients in both groups is depicted. Various risk factors including age, gender, genetic predisposition, smoking, diabetes mellitus, obesity, dyslipidemia, angiotensin-converting enzyme-II insertion/ deletion (ACE- I/D+ II), hypertension [12] were also recorded and analyzed. Before and during the coronary intervention, the reduction in the primary endpoint of infarct size, myocardial blush grade (MBG) and TIMI flow grades were evaluated. After the tirofiban PCI, 48 hours later, and then 30 days later, the LVEF was assessed. The TIMI flow grades, high-sensitivity Troponin T (hs-TnT), LVEF, MBG, C-reactive protein (CRP), CK-MB, MACE rates after 30 days, and 50% ST-segment resolution time were all compared between the two therapeutic groups [8]. Ethically the patients' social and moral values were not debilitated during the study's execution, and their authorized family member or the patients themselves provided informed consent in writing. The data was analyzed using Mean±SD, one-way ANOVA followed by the Tukey HSD test, while, between-group statistical analysis was performed using the Chi-Square (x2) test. The statistical analysis was performed in SPSS 20.

RESULTS

There were a total of 168 patients (111 male and 57 females) in the study diagnosed with STEMI (Figure 1).

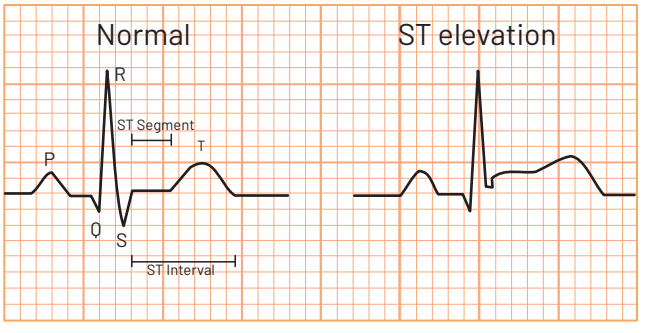

Figure 1: ST-segment elevation recorded in STEMI patients

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Patients in the PCI group and IV group had similar mean ages (54.99 +10.54 and 54.88+8.55 years, respectively). However, statistically significant difference (P<0.05) was found between the genders, with males having twice the susceptibility to STEMI than females (66.07 vs. 33.90%, respectively)(Table 1).

Drugs administration	Group A		Group B	
	Initial Dose	Maintenance Dose	Initial Dose	Maintenance Dose
Tirofiban	0.25µg/ Kg/min	0.15µg/ Kg/min	0.4µg/ Kg/min	0.1µg/ Kg/min
Route	PCI bolus infusion	Intravenous route	Intravenous route	Intravenous route
Treatment Duration	3minutes	18hours	30minutes	12-24hours

Table 1: Drug administration posology of Tirofiban

Clinical outcome is the evaluation of the patients to determine the degree of symptoms alleviation, the return of their health and physiology, and the case's prognosis. In our study, patients treated with tirofiban bolus PCI had significantly better clinical outcomes and prognosis (P<0.05) than those treated with tirofiban bolus intravenously(Figure 2).

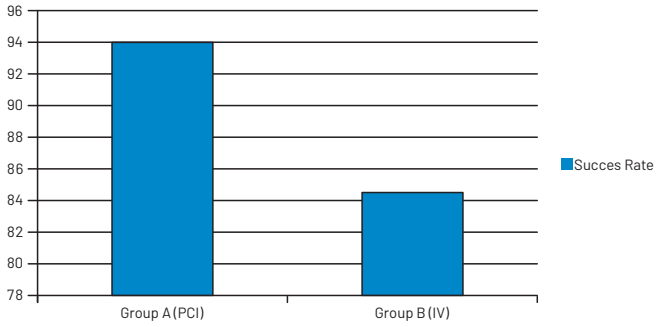

Figure 2: The success rate of the PCI group was higher than IV group

In the PCI group, the primary endpoint of infarction size was 22.61%, which was considerably greater (P<0.05) than the IV treatment group's infarction size of 5.95%. However, compared to the IV-treated group (91.66%), the ST-segment resolution time was substantially lower(P<0.05)in the PCI group(48.80%)(Table 2). .

Risk Factor	No. of Patients	Incidence in Males (n=111)	Incidence in Females (n=57)	Means+ SD	p - value
Age	168	56.49+11.88	53.58+7.21	55.03+9.54	0.9107
Gender	168	111/168 (66.07%)	57/168 (33.90%)	___	0.006349*
Genetic predisposition	168	18(16.21%)	7(12.28%)	14.24+2.21	0.6126
Smoking	168	31(27.92%)	2(3.50%)	15.71+0.21	0.000092*
Diabetes mellitus	168	69(62.62%)	39(68.42%)	65.52+1.21	0.681
Obesity	168	26(15.47%)	19(33.33%)	24.40+1.01	0.0239*
Dyslipidemia	168	76(68.46)	39(68.42%)	68.44+2.65	0.943
ACE-(I/D+II)	168	20(18.01%)	11(19.29%)	37.30+2.30	0.9777
Hypertension	168	81(72.97)	43(75.4%)	74.18+3.10	0.0063

Table 2: Incidence of STEMI associated with the risk factors in genders.

*Indicated the significant difference in the factors at(P<0.05)

In both the treatment groups PCI and IV, the observational parameters for TIMI flow grade, TIMI major bleeding, TIMI minor bleeding, MBG, and MACE did not differ significantly (P≥0.05), with percentages of 94, 3.57, 9.52, 71.42, 5.95%, and 84.52, 2.38, 13.09, 75, 15.47%, respectively(Figure 3).

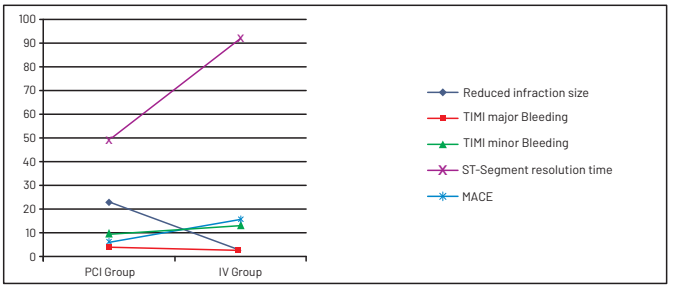

Figure 3: The pictorial of clinical outcome parameters in PCI vs IV treated group

Hence, all the variables and parameters indicated that the PCI group had a better chance of recovering than the IV treated group did(Table 3).

S. No	Variables Observed	Group A (n=84)	Group B (n=84)	Chi-square (χ2)	P-Value
1	Reduced infarction size	19(22.61%)	5(5.95%)	6.059	0.0138*
2	TIMI flow grades post-intervention	79(94%)	71(84.52%)	0.1314	0.7169
3	TIMI major bleeding	3(3.57%)	2(2.38%)	0.0002	0.9895
4	TIMI minor bleeding	8(9.52%)	11(13.09)	0.1684	0.6815
5	MBG after intervention	60(71.42%)	63(75%)	0.0075	0.9370
6	ST-segment resolution	41(48.80%)	77(91.66%)	5.9501	0.0147*
7	MACE	5 (5.95%)	13 (15.47%)	2.3885	0.1222

Table 3: The clinical outcomes of the patients treated with PCIvsIV bolus.

*Indicated the significant difference in the factors at(P<0.05)

Compared to the IV-treated group, LVEF percentage in the PCI group was statistically significant (P<0.05), 24 hours and 30 days post intervention (57, 63 and 52, 58%, respectively). Similarly the Peak CPK-MB value in the PCI group (298+56) was much lower than IV group (543+67), indicating that the patients in the PCI group had a better prognosis. Peak levels of hs-TnT, CK-MB, and CPK were lowest in the PCI group (5111+1011, 7.12+2.12, and 2377+912, respectively), whereas these enzymes were higher in the IV group patients (5587+1298, 9.98+2.33, and 2456+876, respectively). Additionally, these values favored the post-intervention prognosis of the PCI-treated group(Table 4).

S. No	Variables Observed	Group A (n=84)	Group B (n=84)	Chi-square (χ2)	P-Value
1	LVEF at 24 hours (%)	57	52	7.987	0.0479*
2	LVEF at 30 days (%)	63	58	5.994	0.0457*
3	Peak hs-TnT (ng/dl)	5111+1011	5587+1298	0.0376	0.8461
4	Peak CK-MB (U/l)	7.12+2.12	9.98+2.33	0.1989	0.6554
5	Peak CPK, U/L	2377+912	2456+876	0.0010	0.9753
6	Peak CPK-MB, U/L	298+56	543+67	4.7735	0.0289*

Table 4: Determination of the LVEF and cardiac enzymes in patients treated with PCIvsIV bolus

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*Indicated the significant difference in the factors at (P<0.05)

DISCUSSION

It was found that out of 934 STEMI patients 83.6% were males with an average age of 54.09±12.4 [13]. Our findings were also confirmed that men had three-fold greater incidence of STEMI than females and patients with STEMI had mean age of 55years [14]. It was evident that patients with a family history, smoking, diabetes mellitus, obesity, dyslipidemia, and hypertension had a greater risk of STEMI, with mean ratio of 14.24±2.21, 15.71±0.21, 65.52±1.21, 24.40±1.01, 68.44±2.65 and 74.18±3.10, respectively. Similar findings concurred our study, that high frequency of 74.18±3.10; hypertension significantly increased the incidence of STEMI [15-17]. It was noted that the ST-segment elevation in the STEMI population was significantly influenced by hypertension [18]. The patients with STEMI with hypertension had the highest chances of death while hospitalized and suffered from recurrent MI [19]. There was non-significant difference (P ≥ 0.05) in the ACE (I/D+ II) of the STEMI patients, in male and female patients at 34.9 and 29.5%, respectively [13]. The individuals who received PCI had considerably lower ST-segment resolution times than those who did not [11]. The findings of a trial that treated patients with a bolus of tirofiban during PCI greatly enhanced myocardial perfusion and significantly reduced infarction size, providing additional support for our research [20]. It was found that PCI treatment significantly reduced infarction size in STEMI patients compared to IV treatment by 14.46 and 18.06%, respectively [21]. Similar findings reported that clinical outcomes in STEMI patients treated with PCI and IV therapy groups' had non-significant difference in MACE, TIMI major, and minor bleeding rates [11]. Another study reported that MBG and TIMI flow had superior effects in PCI treated group [6]. Pertaining to MACE and TIMI bleeding there was no discernible difference between the PCI and IV treatments [21]. The PCI-treated group's LVEF was much higher than IV-treated group, and MACE was also reduced [8]. The LVEF in the PCI group was considerably enhanced (P<0.05) by the administration of tirofiban bolus in comparison to the STEMI patients who received tirofiban injection intravenously, provided strong support to our study [7]. Another study found that STEMI patients receiving tirofiban PCI had Peak hs-TnT, Peak CK-MB, and Peak CPK levels that were significantly lower (P<0.05) than IV-treated group [11].

CONCLUSIONS

It was concluded that patients who received tirofiban bolus treatment for STEMI showed significantly greater (P<0.05) recovery rates and comparably better left ventricular ejection fraction. Clinically, the PCI group performed better than the IV treated group and the risk of MACE was also lower in them. The post-intervention cardiac perfusion rate was greater in the PCI group. Therefore, according to perspectives of this study, tirofiban should be preferably given to patients with STEMI through PCI.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Physical Activity as an Element of Health Life Style among High School Children's: an Analytical Approach

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ABSTRACT

Physical inactivity is one of the most alarming health indicators in the world. Physical activity and fitness levels decline worldwide among children and adolescents. The use of electronic entertainment in Pakistan affects the activity levels of students. **Objectives:** To compare physical activity levels of urban and rural high school children using analytical study. **Methods:** A cross-section study was conducted on 200 government high school children (ages 12-16 years) in Rawalpindi city, Pakistan. Data on physical fitness were collected through different physical fitness tests and BMI by measuring height and weight. Physical activity was assessed through physical activity questionnaire (PAQ-A) and a youth physical activity questionnaire (Y-PAQ). **Results:** Analysis of study in term of different fitness shows that the mean score of pushups was 14.9050±8.91704, and the mean for standing vertical jump was 28.3700±5.35035. The mean of the 30-meter sprint was 4.3667±.34039, and the mean of sit and reach test was 27.7700±4.09401. The mean of the handstand was 3.8600±9.02038. **Conclusions:** Based on the findings, the researcher concluded that physical activity and physical fitness levels are low in rural and urban high school children. Still, there is no significant difference in physical activity and physical fitness levels between rural and urban high school children. The rural students were better in height and weight, but the BMI rate was higher in urban students.

INTRODUCTION

Physical inactivity is the main reason for obesity, overweight, heart and chronic diseases worldwide. Being overweight and obese starting from children-hood carried health-related problems, mainly non-communicable disorders in adults such as cardiovascular diseases, diabetes, hypertension etc. [1]. World Health Organization (WHO) reported that about 1.5 billion adults are overweighed, and astonishingly above and over 200 million men and 300 million women are obese worldwide. Obesity is higher in the South Asian population [2]. In the United States, it has been found that overweighting between 4-5 years of children groups increased from 5.8% in 1971-1974 to 10% in 1988-1994. Among all preschool-aged children, 10.1% are overweight, and 10.7% are at risk of becoming overweight [3]. The rates of psychological problems have increased in overweight or obese children who also remained obese in adulthood [4]. Data from National Health and Nutrition Examination Survey 2014-2015 and 2016-2017 indicates that significantly urban town children were more obsessed than those in rural and semi-rural areas. In the light of the study, children in rural and semi-rural regions were engaged in more physical activities than urban ones. As the urban towns have more facilities related to technology and have closed relations with up-to-date

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technology, the urban children were used to electronic entertainment rather than physical events. On the other hand, in rural areas, children are deprived of technology and have only one option to engage in some daily physical errands [5-7]. According to a survey conducted in America, about 26% of children watch four or more hours to watch television in a day. Conversely, the study showed that 67% were observed at least 2 hours daily. Further, the study explained that boys and girls who watch television more than four hours a day have more fat in their bodies than those who watch television less than two hours a day [8]. The origin of chronic diseases lies in early childhood, and physical activity levels decline after 12 years. Promoting physical activity in the early years is necessary to reduce the incidence of lifestyle diseases in later life [9]. Pakistani Primary school children's lifestyle showed that they had had less information from their parents about their diet and the positive effects of participating in sports. That caused high Body Mass Index and gaining weight day by day, such independent factors leading our societies right now. A study from Allama Iqbal Medical College Lahore, Pakistan, indicates that 17% of children were overweight and 7.5% were obese among the sample of 1860 primary school children aged 5-12 years [10, 11].

METHODS

The researcher adopted the following procedures for reaching specific findings and conclusions. The population of the study was comprised of government high school children of Rawalpindi city, Pakistan. Multistage sampling techniques were used for selecting a sample for the analysis. At stage 1st, four rural and four urban schools were chosen randomly. In the 2nd stage, 100 students were selected as samples using available sampling techniques. In addition, during the selection process of sampling, age factors, socioeconomic and health factors were considered. Ethical consent was taken from all the participants of the study. For the calculation of body mass index, the researcher measured the height and weight of the students. Children were attired in their usual uniforms and without shoes for this calculation. Body mass index (BMI) was calculated from measured height and weight. Physical activity level was assessed through the physical activity questionnaire for adolescents (PAQ-A) and youth physical activity questionnaire (Y-PAQ). The calculation of physical activity questionnaire (PAQ-A) and and youth physical activity questionnaire (Y-PAQ) was calculated as; to calculate MET minutes a week, multiply the MET value given (remember walking = 3.3, moderate activity = 4, vigorous activity = 8) by the minutes the activity was carried out and again by the number of days that activity was undertaken. Physical fitness standards were accessed through various physical fitness tests (30-meter sprint, standing vertical jump, sit and reach test, handstand, and pushups). The collected data were tabulated and analyzed using a statistical package for social sciences (SPSS, Version-26.0); thus, mean, median, mode and standard deviation were used as a statistical tools.

RESULTS

The table 1 shows the age, height, weight and body mass index (BMI). Result of all the demographic attributes were calculated through means and standard deviation. Therefore mean age of children was 15.27±0.73 from 13 to 16 years, and the mean height was 1.67±.06. The participants' mean weight was 51.20±8.002, and the mean BMI was 18.43±2.114.

Testing Variables	Mean±SD
Age	15.27±0.73
Height	1.67±0.06
Weight	51.20±8.002
BMI	18.43±2.114

Table 1: Demographic detail of the students (number=200)

The table 2 shows the physical fitness level. Physical fitness was measured by push-ups, standing vertical jump, 30 meter sprinit, sit and reach test and hand stand. Result of all the all the physical fitness parameters were calculated through means and standard deviation. Therefore the mean score of Push Ups was 14.91±8.92, and the mean for standing vertical jump was 28.37±5.35. The mean of the 30-meter sprint was 4.37±.34, and the mean of sit and reach test was 27.77±4.09. The mean of the handstand was 3.86±9.02.

Testing Variables	Mean±SD
Push ups	14.91±8.92
Standing Vertical Jump	28.37±5.35
30 Meter Sprint	4.37±.34
Sit and Reach Test	27.77±4.09
Hand Stand	3.86±9.02

Table 2: Physical Fitness Tests detail of Children

Table 3 shows the youth physical activity questionnaire (Y-PAQ. youth physical activity questionnaire (Y-PAQ) was calculated through eight different items i.e Y-PAQ.2, Y-PAQ.2, Y-PAQ.3, Y-PAQ.4, Y-PAQ.4, Y-PAQ.5, Y-PAQ.6 Y-PAQ.7 Result of all the items of Y-PAQ. the physical fitness parameters were calculated through means and standard deviation. Therefore the mean of different activities in the past 7 days, like cricket, football, hockey etc., was 372.55±261.02 and the mean of activities like running, swimming etc., was 92.9750±96.94. The mean of leisure time activities in the past 7 days was 254.12±226.38, and the mean of activities like skipping, walking for exercise etc., was 65.65±114.69. The mean of activities done in school time was 184.30±136.38, and the mean of activities

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done in free time was1383.45±642.204. The mean of any other activities in the past 7 days was 36.97±79.288.

Testing Variables	Mean±SD
Youth Physical Activity Questionnaire (Y-PAQ.1)	372.55±261.02
Youth Physical Activity Questionnaire (Y-PAQ.2)	92.97±96.94
Youth Physical Activity Questionnaire (Y-PAQ.3)	254.12±226.38
Youth Physical Activity Questionnaire (Y-PAQ.4)	65.65±114.69
Youth Physical Activity Questionnaire (Y-PAQ.5)	184.3±136.38
Youth Physical Activity Questionnaire (Y-PAQ.6)	1383.45±642.204
Youth Physical Activity Questionnaire (Y-PAQ.7)	36.97±79.288

Table 3: Item-wise Results of Youth Physical Activity Questionnaire(Y-PAQ)

The mean of physical activities like dance, football, running etc. in the last 7 days was 12.21±.424 and the mean of activity during physical education classes was 1.52±.913. The mean of activity besides eating lunch was 1.72±.88 while the mean of activity right after school during past 7 days was 1.79±2.43. The mean of activity in evening time in the last 7 days was 2.38±1.408 and the mean of physical activity on the weekend was 2.05±1.02. The mean of best activity in the last 7 days was 2.34±1.313 while the mean of physical activity for each day of the last week was 2.52±1.103. The mean of sickness in the last 7days was 1.90±.29(table 4).

Variables	Mean±SD
PAQ-A 1	1.21±0.424
PAQ-A 2	1.52±0.912
PAQ-A 3	1.72±0.88
PAQ-A 4	1.79±2.43
PAQ-A 5	2.38±1.41
PAQ-A 6	2.05±1.021
PAQ-A 7	2.34±1.313
PAQ-A 8	2.51±1.103
PAQ-A 9	1.91±0.29

Table 4: Results of physical activity level through physical activity Questionnaire(PAQ-A)

DISCUSSION

This study's results suggested no significant difference in physical activity levels between rural and urban high school children. However, the rural students were better in height and weight, but the BMI rate was higher in urban students. The urban students are better in strength (handstand), and the rural students are better in upper body strength (pushups), power and athletic ability (standing vertical jump), speed and acceleration (30-meter sprint) and flexibility (sit and reach test). Mean score of Push Ups was 14.9050±8.91704, and the mean for standing vertical jump was 28.3700±5.35035. The mean of the 30-meter sprint was 4.3667±.34039, and the mean of sit and reach test was 27.7700±4.09401. The mean of the handstand was 3.8600±9.02038. Such emerging concept is supported by the study conducted by [12] by showing that In India, children's physical fitness in rural areas is better than in urban residences. The rural children in India were better in speed, endurance and strength than urban children, and there was no difference in performance or flexibility between the rural and urban children. Life in rural areas in India is more complex and active, which benefits physical fitness. On the other hand, in urban areas, different variables may cause lower levels of physical fitness among children. In addition, the acute effect of pre-event lower limb massage and static stretching vertical jump, 30-m sprint and agility in college athletes' students was compared. And thus, it was concluded that both static stretching and Swiss massage methods significantly degrade the performance of the vertical jump, 10, 20 and 30-m sprint and agility T-test. In contrast, static-stretching and massage significantly increased the flexibility of the hip joint (sit & reach test) [13]. Youth physical activity questionnaire (Y-PAQ) was calculated through eight different items i.e Y-PAQ.2, Y-PAQ.2, Y-PAQ.3, Y-PAQ.4, Y-PAQ.4, Y-PAQ.5, Y-PAQ.6 Y-PAQ.7. Result of all the items of Y-PAQ. the physical fitness parameters were calculated through means and standard deviation. Therefore the mean of different activities in the past 7 days, like cricket, football, hockey etc., was 372.5500±261.01801 and the mean of activities like running, swimming etc., was 92.9750±96.94077. The mean of leisure time activities in the past 7 days was 254.1150±226.38299, and the mean of activities like skipping, walking for exercise etc., was 65.6500±114.69460. The mean of activities done in school time was 184.3000±136.38001, and the mean of activities done in free time was1383.4550±642.20374. The mean of any other activities in the past 7 days was 36.9750±79.28845. In line of this study previous studies showing that physical education supplies only 12%, teacher-led conditions 22% and specialist-led states supply 27% of the recommended 150 minutes of physical activity per school week [14-17]. The gap between rural and urban areas has been reduced gradually. This situation has provided a better environment for the growing up and development of children and adolescents [15]. Physical activity also affects lower or higher socioeconomic status. Similarly, to develop physical activity levels, it is essential to understand all features which affect the different populations. Parents, players, physical education teachers and society can play a crucial role in increasing physical activity. They should provide individual sports, playgrounds, sports equipment, healthy diet, facilities, gyms, community health care centers, etc [18]. Inline of this finding, the study conducted by [19] by finding out that the government of Pakistan should consider it and play a vital role in increasing physical activity at all levels. They

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should develop awareness in public through print and electronic media. Furthermore, physical education teachers, athletes, coaches and trainers should motivate societies to be involved in physical activities for better mental and physical health growth. We should create a trend to focus on physical activities so that our children can positively adopt a healthy and physically active lifestyle [20-22]. Similarly study was conducted by [23] and concluded that urban school girls had higher skin folds and girths, indicating high body fat than rural school girls. As a result, urban school girls were lower in fitness capacity than rural because higher body fat reduces fitness performance.

CONCLUSIONS

Based on the findings, the researcher concluded that physical activity and physical fitness levels are low in rural and urban high school children. Still, there is no significant difference in physical activity and physical fitness levels between rural and urban high school children. The rural students were better in height and weight, but the BMI rate was higher in urban students.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Association of Serum Zinc Levels with Acne Vulgaris: A Case-Control Study

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ABSTRACT

Acne is an inflammatory skin disease that affects the hair follicles and sebaceous glands. The disease is multifactorial and the diagnosis is based on laboratory tests. Zinc is an element that is involved in many processes in our bodies. **Objectives:** To identify the relationship between serum zinc levels in both groups and whether zinc levels are associated with the severity of the disease and other related health outcomes in these patients. **Method:** This case-control study was carried out on 100 patients of Acne vulgaris in Dermatology ward 4, Outpatient department, Jinnah Postgraduate Medical Center, Karachi. Patients of age between 11-35 years, with untreated acne vulgaris with mild, moderate, or severe condition. Intravenous blood samples up to 3 mL were taken from both selected cases and controls in yellow top tubes. The collected blood was centrifuged at 3000 rpm for 10 minutes, and the serum was collected and stored at −40°C until further processing. **Results:** A significant correlation was observed between the case and control groups for moderate hair fall (p-value 0.045) and severe hair fall (p-value = 0.013) among participants and serum zinc levels. Whereas no significant difference was observed in the minor and unknown status of hair fall groups (p-value >0.05). **Conclusion:** The findings suggest of this study that zinc has a potent role not only in the management of acne but is also related to other factors such as hair fall, diarrhea, and vision.

INTRODUCTION

Acne is an inflammatory skin disease that affects the hair follicles and sebaceous glands. The clinical manifestations are inflammatory papules, pustules, comedones, and occasionally cystic nodules. The effects of ane are only related to physical appearance but also create trouble socially. The disease is multifactorial and the diagnosis is based on laboratory tests. During puberty, androgens stimulate the sebaceous glands, causing them to swell and secrete natural oils that rise to the top of the hair follicles and flow to the surface of the skin, and the accumulated oil, called sebaceous glands, can block the drains. The accumulation of this substance can lead to acne [1]. Zinc is an element that is involved in many processes in our bodies. It is required in a body for many physiological functions, such as DNA replication, cell division, and immune response. The role of zinc is also established in many allergic reactions and in the structural composition of many hormones. It is known to possess anti-inflammatory properties [2]. There is a well-established role of diet in the development of acne. Some studies showed a positive association while others showed a negative association, which makes it controversial [3–5]. Several studies showed the potent role of dietary intake in acne severity. Alternatively, a study of 47355 women was conducted and

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found a negative association between milk intake and acne. Their study showed that milk intake exacerbated acne [6]. Zinc deficiency is a common problem in Pakistan. It is known that 70-80% of the dietary requirement is obtained from grain, which is known to lack zinc. However, on the other hand, animal-sourced foods are sufficient in zinc and can help to overcome the deficiency of this metal in the body [7]. Acne Vulgaris is also known to be linked with zinc deficiency. It has been seen that people with zinc deficiency develop acne-like papulopustular lesions [8]. We have conducted this study to measure the zinc levels in the serum of acne patients and healthy individuals. The study aimed to identify the relationship between serum zinc levels in both groups and whether zinc levels are associated with the severity of the disease and other related health outcomes in these patients.

METHODS

This case-control study was carried out during the month of November 2022, among patients of Acne vulgaris in Dermatology ward 4, Outpatient department, Jinnah Postgraduate Medical Center, Karachi. The study was approved by the Institutional Review Board (IRB) of the Basic Medical Sciences Institute (BMSI), JPMC, Karachi. The complete research work was carried out following ethical considerations, and prior to the inclusion of any participant, written consent was taken. Prior to the sampling, the sample size was estimated using an online sample size calculator of mean difference, available at www.openepi.com, after inserting the mean and SD of serum Zinc levels of Acne Vulgaris patients, and normal controls. A total of 100 samples were collected, of which 50 were from diagnosed acne patients and 50 from healthy participants without acne. The diagnosis of acne in study participants was carried out by professional dermatologists. The inclusion criteria for acne patients were set as; an age range of 11-35 years, with untreated acne vulgaris with a mild, moderate, or severe condition. The lactating and childbearing women and the patients who were taking systemic drugs, and had a problem with zinc absorption were excluded from this study. Intravenous blood samples up to 3 mL were taken from both selected cases and controls in yellow top tubes. The collected blood was centrifuged at 3000 rpm for 10 minutes, and the serum was collected and stored at –40°C until further processing. For zinc estimation, a commercially available colorimetric kit was utilized for zinc estimation. The normal range of zinc levels in the blood is 70-140 µg/dl. The data were analyzed using IBM-SPSS version 23.0. The descriptive analysis was used to count percentages, the distribution of gender, the mean age with standard deviation, and serum zinc levels in acne and non-acne samples. An independent sample t-test was used to compare the mean serum zinc levels between acne and non-acne samples in total samples, One-way ANOVA was used to check the association of gender with acne and non-acne samples. p-values less than 0.05 were considered statistically significant.

RESULTS

Total 100 samples was collected with no missing data (50 controls and 50 cases), in which 24% were healthy males, and 17% were cases, whereas 26% were healthy females and 33% were cases. The male-to-female ratio was 0.7. The means and standard deviations of the ages of males were 23.9 ± 5.06 and 23.1 ± 5.9 for the healthy and case groups, respectively. The respective means of age with standard deviations for females were 25.1 ± 6.95 and 23.6 ± 5.6. Table 1 shows the zinc levels in the serum of the study participants grouped into cases and controls. A significant difference (p-value 0.01) in the control and case groups was observed in the results.

Groups	N	Mean	Standard Deviation	Standard Error	p-value
Case	50	61.74	26.8	3.8	0.01
Control	50	75.086	23.6	3.3	

Table 1: Zinc levels (µg/dL) in the case and control groups

The mean zinc ion concentrations in the control group's males were 80.5 ± 23.61 (mean and SD), while the males in the case group had 66.44 ± 26.78 (Table 02). The female control group had 70.09 ± 22.82 µg/dL zinc levels in serum. In contrast, the female case group had 59.32 ± 26.96 µg/dL serum zinc levels, which was significantly different (p-value 0.044) combined in males and females of cases vs. males and females of controls.

Gender	Control			Case			p-value
	n (%)	Mean ± S.D	S.E	n (%)	Mean ± S.D	S.E	
Male	24 (58.5%)	80.5 ± 23.6	4.82	17 (41.5%)	66.4 ± 26.7	6.5	0.044
Female	26 (44.1%)	70 ± 22.8	4.48	33 (55.9%)	59.3 ± 26.9	4.69	
Total	50 (50%)	75 ± 23.5	3.33	50 (50%)	61.7 ± 26.8	3.8	

Table 2: Zinc levels (µg/dL) based on gender in the case and control groups

Similarly, the correlation of the serum zinc levels with parameters were analyzed, i.e., vision, diarrhea, fatigue, weak immunity, and ulcer. However, no significant difference (p-value > 0.05) was observed in the serum zinc levels of individuals with unhealthy vision, without diarrhea, without fatigue, without weak immunity, and without ulcers among participants in both the case and control groups. A significant correlation was observed between the case and control groups for moderate hair fall (p-value 0.045) and severe hair fall (p-value = 0.013) among participants and serum zinc levels. Whereas no significant difference was observed in the little and unknown status of hair fall groups (p-value >0.05). The data also revealed higher concentrations of zinc in control people with

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unhealthy vision, diarrheal status, and weak immunity, as shown in Table 3.

Variables		Control	Case	p-value
Hair fall	Little	63.6 ± 12.41	75.13 ± 21.4	0.054
	Moderate	66.17 ± 13.78	54.38 ± 12.1	0.045
	Severe	26.2 ± 0	32.39 ± 9.55	0.013
	Don't Know	92 ± 23.7	113.38 ± 24.33	0.084
Vision	Healthy	73.02 ± 22.44`	61.5 ± 26.42	0.035
	Unhealthy	84.51 ± 27.54	63.23 ± 31.51	0.172
Diarrhea	Present	67.22 ± 19.61	62.16 ± 24.87	0.592
	Absent	77.57 ± 24.37	61.62 ± 27.68	0.009
Fatigue	Present	71.71 ± 24.28	63.61 ± 27.2	0.259
	Absent	79.05 ± 22.56	59.54 ± 26.84	0.011
Weak immunity	Present	82.81 ± 29.94	58.47 ± 35.61	0.19
	Absent	73.61 ± 22.28	62.19 ± 25.92	0.031
Ulcer	Present	77.67 ± 26.42	59.72 ± 39.71	0.351
	Absent	74.73 ± 23.46	62.18 ± 23.79	0.061

Table 3: The correlation of the analyzed parameters with the serum zinc levels (µg/dL)

DISCUSSION

This study was conducted to correlate serum zinc levels with acne vulgaris. It is reported that zinc reduces inflammation in acne pathogenesis by inhibiting chemotaxis, followed by the release of lysosomal enzymes, and transforming lymphocytes [9]. Several variables were analyzed in this study to check the impact of serum zinc levels on vision, diarrhea, fatigue, immunity, and ulcers. In this study, a significant difference was observed between the serum zinc level and acne case samples. The control group had significantly higher serum zinc levels compared to the cases. These results were consistent with a meta-analysis study by Yee et al. [9]. However, the average serum zinc levels in the 12 studies mentioned in this meta-analysis were slightly higher (96.308 ± 4.053 µg/dL in acne and 102.442 ± 3.744 µg/dL in controls) compared to our study, which was 75.1 ± 23.6 µg/dL in healthy subjects and 61.7 ± 26.8 µg/dL (mean ± STD). This difference in both studies can be attributed to the number of subjects, as Yee et al., (2020) did a meta-analysis of the 12 studies. Notably, these 12 studies were from several countries, including Italy, France, Sweden, the United Kingdom, Iran, Iraq, the United States of America, and India were dependent on the zinc supply and assessment of serum zinc levels for a certain duration. Furthermore, no significant difference was observed in the comparative analysis for serum zinc levels between the healthy male vs. case male and healthy female vs. case female groups. However, the levels of zinc in males and females were found to be significant (p-value= 0.044) in our study. These results were consistent with the findings of another study in which they found higher serum zinc levels in males compared to females [10]. It is also worth mentioning that the age of the participants in both studies was not too different, which could have influenced the zinc levels. A possible reason for this contradiction could be the sampling time as the zinc status is subject to change with diurnal variation from morning to evening [11]. Moreover, the correlation between the serum zinc levels and other variables like healthy or unhealthy vision showed a significant difference in the healthy vision of cases and control groups (p-value 0.035), with and/or without diarrhea showed a significant difference in participants without diarrhea of both cases and control groups (p-value 0.009), with or/and without fatigue showed a significant difference in case and control group participants without fatigue (p-value 0.011), with or/and without weak immunity showed a significant difference in the case and control group participants without weak immunity (p-value 0.031), and with or/and without ulcer were also analyzed. No significant differences were observed in the other groups in the ANOVA, i.e., participants with unhealthy vision, participants with diarrhea, participants with fatigue, participants with weak immunity, participants with ulcers, and participants with little or unknown hair fall status in both the case and control groups with serum zinc levels (p-value > 0.05). However, a significant difference was observed between the moderate and severe hair fall groups. These findings are consistent with those of Kil., et al [12]. Overall, these findings suggest that serum zinc levels are inversely correlated with acne vulgaris and with hair fall, as in individuals, the moderate and severe hair fall groups of both healthy and case samples had lower serum zinc levels compared to normal serum zinc levels.

CONCLUSIONS

Our study has revealed lower levels of zinc serum in acne-bearing patients. On the other hand, the data also showed that hair fall is also strongly associated with elevated levels of zinc. These findings suggest that zinc has a potent role not only in the management of acne but is also related to other factors such as hair fall, diarrhea, and vision. The role of zinc needs more insight to better understand the effects of levels of zinc in different aspects of the body. Acne-prone skin can be treated with zinc-containing products to identify the effect of zinc on the skin, while also maintaining the diet under the supervision of a physician.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Diagnostic Accuracy of Visual Inspection of Cervix Using Lugol's Iodine for Detecting Cervical Carcinoma taking Histopathology as a Gold Standard

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ABSTRACT

Cervical cancer arises from the transformation zone of the cervix. Diagnosis is usually made by screening later confirmed by a biopsy. In low resource setups, where modern methods are not suitable, an alternate method is to inspect the cervix with naked eye after applying Lugol's iodine as it highlights the precancerous lesions. **Objective:** To look for the diagnostic accuracy of visual investigation of cervix using lugol's iodine (VILI) for detecting the cervical cancer taking histopathology as a gold standard. **Methods:** Cross sectional study was conducted at Obstetrics and Gynecology department, Services Hospital, Lahore for six months from 1st July 2021 to 31st December 2021. 150 patients were examined using lugol's iodine solution and then underwent colposcopy to determine the diagnostic accuracy of lugol's iodine in cervical carcinoma while setting histopathology as a gold standard. **Results:** The mean age of the patients was 42.11 ± 10.12 years. 8.67% patients were nulliparous, 13.33% registered patients were with parity one, 38.67% patients with parity two, 29.33% patients were with parity three and 10% patients were para four. The sensitivity, specificity, and diagnostic accuracy of VILI was found to be 92.59%, 93.75% and 93.33% respectively, taking histopathology as gold standard. **Conclusions:** According to results of our study we can say that the visualizing the cervix using lugol's iodine (VILI) can be used for detection of cervical cancer.

INTRODUCTION

The rising burden of malignancies in low & medium-income countries is worrisome [1]. Cervical cancer is the third most common cancer across the globe and it poses great risk to population. The disease burden of cervical cancer varies across the globe, but it is more prevalent in developing countries as compared to developed countries. Cervical cancer among the developing countries is second most common, and 9th most common malignancy globally [2]. Cervical carcinoma is 3rdin place in terms of incidence in females of Pakistan making it a burden on healthcare system [3]. Despite the importance of cervical cancer for public health, the risk of the disease and death from it are still largely out of control since most poor nations lack effective preventative programs [4]. Primary prevention and early detection are two methods for preventing cervical cancer. As a result of screening, early identification, and treatment, the incidence of cervical cancer has reduced in developed countries. However, because of their advanced development, 80% of cervical malignancies in developing nations are incurable at the time of discovery [5]. Cervical carcinoma offers us plenty of possibility for early detection and therefore a significantly improved prognosis because of its sluggish evolution from pre-cancerous lesion to malignancy and easy accessibility to inspection. Early detection may be achieved by systematic screening programs or opportunistic assessment of women visiting outpatient clinics [6]. In low resource countries, a good cancer control approach is through screening and early diagnosis of cancer and pre-cancerous lesions. It being 3rd most

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frequent cancer in our country needs urgent intervention [7]. Timely detection through human papillomavirus (HPV) testing and visual inspection of cervix are very effective and reliable approaches [1]. As cytology-based screening is main stay screening protocol in developed countries. In developing countries, visual inspection of cervix can be an alternative for cervical cancer screening and these programs should be incorporated in national screening programs [4]. Eradicating the cervical cancer is practically unrealistic and applying HPV and molecular testing to LMICs is a bad choice given the heavy burden on the economy of these countries. So, an approach suitable to resources should be planned [8]. The annual deaths due to late detection are increasing in Asia pacific region that too due to late detection. We aimed to conduct this study to confirm whether VILI is reliable tool for early assessment of cervical cancer [9]. It was accessible in areas where surgical or biopsy facilities were not available. Moreover, restricted local studies have been done to assess the accuracy of VILI. Through this study we wanted to gain local magnitude also. This study helped us in improving our screening practice and improve local guidelines for detecting the cervical cancer at an early stage.

METHODS

A Cross-sectional study was conducted in department of obstetrics and gynecology of services hospital for 6 months from 1st July 2021 to 31st December 2021. After written consent 150 cases who fulfilled the inclusion criteria were enrolled in this study following non-probability, consecutive sampling. Sample size of 150 cases was calculated with 95% confidence level, 15.5% margin of error and taking expected percentage of cervical cancer i.e., 33.5% and taking sensitivity and specificity of VILI i.e., 72.7% and 89.6% respectively for detection of cervical cancer taking histopathology as gold standard. Ethical approval for this study was taken from IRB of the hospital. Females of age ranging from 25 to 60 years, with suspicion of cervical carcinoma, were enrolled in this study. Cervical carcinoma was suspected due to having repeated vaginal discharge i.e., >2 episodes even after 14 days treatment with metronidazole, intermenstrual, post-coital and post-menopausal bleeding. Women who underwent hysterectomy, pregnant females, diagnosed or treated cases of CIN or Cervical cancer, active bleeding from vagina or cervical growth, females who are not sexually active, women with diabetes and hormone replacement therapy were excluded. Demographic data was collected. Visual examination using Lugol's iodine was done with application of Lugol's iodine (VILI). Patients labeled as positive or negative (as per operational definition). All procedures were done by researcher herself. Then females underwent colposcopy leading to biopsy for histopathology by a single surgical team. Reports of histopathology were assessed and compared with results of Visual examination with Lugol's iodine. All this information was recorded in pre-designed proforma. Data were collected then entered and analyzed by SPSS version 20.0. Age being the quantitative variable was calculated as mean and standard deviation. Qualitative variables like symptoms, parity and cervical cancer on Lugol's iodine and histopathology was calculated as frequency and percentage. A 2x2 table was made to know the sensitivity, specificity, positive predictive value, negative predictive value in order to find out the diagnostic accuracy of Visual examination with Lugol's iodine taking histopathology as gold standard. Data was stratified for parity. Post-stratification, chi-square was applied. p-value ≤ 0.05 as significant.

RESULTS

Cervical malignancy was diagnosed positive by VILI in 56(37.3%) patients, and it was diagnosed negative in 94(62.7%) patients (Table 1).

VILI	Frequency (%)
Positive	56 (37.3)
Negative	94 (62.7)
Total	150 (100)

Table 1: Frequency distribution of VILI

VILI	Histopathology		Total
	Positive	Negative	
Positive	50	6	56
Negative	4	90	94
Total	54	96	150
Sensitivity	92.59%	Specificity	93.75%
PPV	89.29%	NPV	95.74%
Diagnostic accuracy	93.33%		

Table 2: Comparison of VILI with histopathology

The mean age of the patients was 42.11 ± 10.12 years with minimum and maximum ages of 25 and 60 years respectively. Results showed that in patients below 45 years the VILI diagnosed positive cervical malignancy in 32 cases in which histopathology also diagnose positive malignancy in 26 cases. Similarly in above 45 years patients the VILI diagnosed positive cervical malignancy in 24 cases and all the 24 cases were also diagnose positive by histopathology. A highly significant difference, if seen statistically, was noted between the comparison of VILI and histopathology stratified by age. i.e., p-value = 0.000, 0.000 respectively (Table 3).

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Age (years)	VILI	Histopathology		Total	p-value
		Positive	Negative		
< 45	Positive	26	6	32	0.000
	Negative	0	57	57	
≥ 45	Positive	24	0	24	0.000
	Negative	4	33	37	
Age		<45 years		≥45 years	
Sensitivity		100%		85.7%	
Specificity		90.5%		100%	
PPV		81.3%		100%	
NPV		100%		89.2%	
Diagnostic accuracy		93.3%		93.4%	

Table 3: Comparison of VILI with histopathology stratified by age

In this study, cervical malignancy was diagnosed positive by histopathology in 54(36%) patients, and it was diagnosed negative in 96(64%) patients (Figure 1).

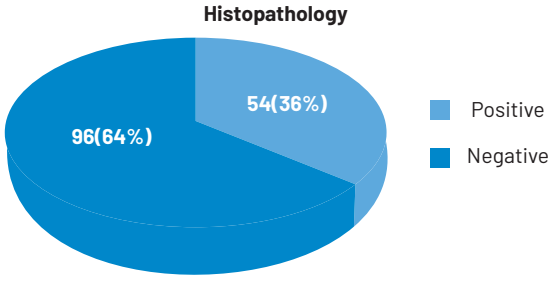

Figure 1: Frequency distribution of histopathology

The study showed that in nil or zero parity patients. The VILI diagnosed positive cervical malignancy in 9 cases in which histopathology also diagnosed, positive malignancy were present in 3 cases. Similarly, in multipara patients the VILI diagnosed positive cervical malignancy in 47 cases and all the 47 cases were also diagnose positive by histopathology. Statistically, significant difference was found between the comparison of VILLI and histopathology stratified by parity i. e p-value = 0.015, 0.000 respectively (Table 4).

Parity	VILI	Histopathology		Total	p-value
		Positive	Negative		
≤1	Positive	3	6	9	0.015
	Negative	0	24	24	
>1	Positive	47	0	47	0.000
	Negative	4	66	70	
Parity		≤1		>1	
Sensitivity		100%		92.2%	
Specificity		80%		100%	
PPV		33.3%		100%	
NPV		100%		94.3%	
Diagnostic accuracy		81.8%		96.6%	

Table 4: Comparison of VILI with histopathology stratified by parity

DISCUSSION

Cervical cancer is a potentially preventable cancer. Global disease burden is enormous costing both money and human resources across the globe with 90% of death due to cervical carcinoma occurring in LMICs [10]. Cervical cancer always develops from a precancerous lesion taking around a decade to convert from premalignant to malignant lesion. The key in improving survival rate is early detection and treatment at pre-malignant stage having almost 100% survival rate as compared to almost one third of that if detected at advanced stage. It was tried to devise a framework for cancer elimination and was concluded that HPV vaccination and screening with VIA or VILI HPV testing and thermocoagulation were effective ways [11]. In China, a meta-analysis consisting of 6 studies was carried out involving 2817 patients. The study concluded that Folate receptor mediated staining solution detection could be used for the screening of cervical cancers in low resource settings [12]. In another study carried out in China, it was found that testing the HPV DNA 3 or 5 yearly or Liquid based cytology 3 yearly and HPV + LBC 5 yearly could be a dominant step, but cost effectiveness can be a big barrier in low resource settings [13]. In Bouvard *et al.*, study found that the pooled sensitivity of VILI was 88% and specificity was 86% VILI appeared to be most useful [6]. Another study carried out on 654 patients who were randomized to undergo VIA or VILI, the positive test rate for VILI was 30.6% and 11.5% were having CIN2+. The sensitivity was 84.2% and specificity was 76.4% with PPV of 31.7% and NPV of 97.4% [14]. Bryan *et al.*, has reported the sensitivity and specificity of VILI ranged from 66.7% - 100% and 71.9% - 91.1% [15]. In Aoki *et al.*, study VILI was found to have a pooled sensitivity of 88% and pooled specificity of 86%. VILI was more sensitive to VIA with equal specificity [16]. 73% sensitivity of VILI and 100% when combined with Pap smear, and specificity of 90.6% of VILI alone and 91.7% when combined with pap smear stated in literature [17]. So, Catarino *et al.*, study has reported that VILI is a good and reliable alternative to interventional investigation methods. Moreover, it was non-invasive and time and cost effective [18]. Pimple *et al.*, found that low cost screening tools are operationally feasible with reduced procurement cost [19]. Total eradication was though financially and practically unrealistic [20].

DISCUSSION

According to results of our study we can say that the visual inspection of cervix with lugol's iodine (VILI) can be used for detection of cervical cancer in place histopathology, because it has the high sensitivity, specificity and diagnostic accuracy.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Relationship of Socioeconomic Status with Special Reference to Leucorrhoea

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ABSTRACT

Leucorrhoea is a common female problem; recurrent especially in women of reproductive age that may or not be associated with vaginal infection or elevated estrogen levels. It may accompany vaginal discharge, vulvae burning and itching, low backache, pains in lower abdomen and legs, general weakness and loss of appetite. This disorder is associated with psychological, physiological and pathological problems. **Objectives:** To investigate nutritional status of girls having leucorrhoea. The aim of this study was nutritional health status assessment of girls of university with special reference to leucorrhoea. **Methods:** The volunteer girls of sample size 150 were interviewed in the study. For this study leucorrhoea is categorized into 3 group's mild moderate and severe. **Results:** The volunteers were from university of Sargodha between the ages of 16-40. In this study it was observed that out of 150 volunteers 82.5% were leucorrheal and 17.33% were none leucorrheal physiological status of girls were mostly influenced by socioeconomic status like 53.33% girls belong to lower middle income group and physical activity was also a major factor for leucorrhoea like most girls with leucorrhoea have sedentary lifestyle (56.66%). Further it was notice that one of the major causes of severe leucorrhoea was constipation which affects 76.47% girls. **Conclusions:** Leucorrhoea can be reduce or by better our socioeconomic status eating well natural food, reduce tension of income and overcome constipation which is bone of contention. If we stay in nature the diseases will avoid us.

INTRODUCTION

Nutritional health status is performed to asses and understand the changes in human physiology during life cycle. The nutritional health assessment is a good practice of clinic to evaluate the different health parameters. It is depend on the excessivenes and deficiency of nutrient in the body [1]. During the reproductive age (13-44) of female face the lot of problems one of them is Lucorrhoea which may be associated with infection of vigina or caused by estrogen levels increased on the ovulation time. The white color discharge from vigina is called leucorrhoea.after the menses cycle (11-14 days) the quantity of discharge increase also may be in the last days for 4-3 days. Due to different reason of leucorrhoea one is high level of estrogen. Poor hygienic condition in adult may be causes of leucorroea [2]. Discharge of leucorrhea is visible from vigina is little bit sticky, transparent, odorless and slimy in nature [3]. The microbial communities that inhabit the vagina of healthy reproductive age women commonly contain high proportions of *lactobacillus spp*. which are dominated by either *Lactobacillus iners*, *Lactobacillus crispatus*, *Lactobacillus gasseri*, or *Lactobacillus jensenii* [4]. *Candida albicans* is a fungus, which is a part of normal

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flora of mouth, gastrointestinal tract and vaginal mucosa [5]. *Candida albicans* become hyperactive to irradiate the toxins which produce in the result of calcium, iron, vitamins A, B and C deficiency, dressing especially tight clothes, using tight belts, chronic obesity, alcoholic addiction, infectious diseases, cancers, diabetes, use of corticosteroids, antibiotics, anticancer and immunosuppressive drugs. Contraceptives may cause candidiasis by prevailing the natural immunity mechanisms and producing toxins, these elements hyperactivate the normal flora which may move to leucorrhoea [6]. Worldwide leading cause of ill health among women is mainly due to reproductive health problems. An initial symptom of all reproductive tract diseases is abnormal vaginal discharge [7]. Most of the women suffer from leucorrhoea and do not present themselves for seeking medical treatment in early stage as the women has poor understanding regarding leucorrhoea [8]. Some problems occure in social active life, physical and mental activity and status of physiology due to leucorrhea. Some factors causes the leucorrhoea secreation like bad eating habbits, bad diet hectic life style,obesty mostly increasing in developed country [9].

METHODS

The volunteers were girls from University of Sargodha, Sargodha. The volunteers were selected through convenience and purposive sampling technique. The research plan was clarified in detail, and the agreed ones were selected as volunteers by getting their consent form was the part of further studies [10]. The cross sectional study design was adopted for research work which is utilized for estimation of the prevalence of a disease and investigation of causes; establishing links between risk factors and health outcomes or exposures to suspected factors over some period [11]. One hundred and fifty (n=150) girls (75 leucorrheal and 75 non-leucorrheal volunteers) were selected from university of Sargodha, Sargodha [12]. Performa and questionnaire was used for collection of data regarding demographics, anthropometrics, clinical signs and symptoms, family history and medical history [2]. Some parameters of demographic, causes, clinical sign and symptoms related to leucorrhea is used to assessed status of health of nominated volunteers [13]. Some factors of demographic parameters i.e., name, age, socioeconomic status, education, physical activity, and ethnicity, income and contact information were recorded. The questionnaire developed by UWHPRC (2006) was used to get the Physical activity of every volunteer. Clinical signs i.e pale complexion, hair fall, tingling, dyspnea, dysmenorrhea, and symptoms including vaginal discharge (white, yellow or greenish in color), low backache, vulvar itching and burning, abdominal pain, pain in legs, constipation, general weakness and anorexia were recorded [9]. Family Medical history of the selected population was explored. Any disease related to leucorrhoea which may present in their family for this determination a questionnaire was developed [13]. The data on various parameters of students were analyzed by using SPSS-20 (software) mean, standard deviation, ranges, correlation and percentages were worked out [14].

RESULTS

To check the nutritional health status of leucorrheal and non-leucorrheal victims and its correlation with demographics in girls of university of Sargodha, Sargodha. The cross sectional study included demographics questionnaire to assess the health status of volunteers. Results of my study are discussed below: Highly significant association was found between marital status and physiological status as given in Table 1 of frequency distribution. Most mildly suffered were unmarried 43.0 % due to slightly hormonal changes before and after periods. Moderately and severely suffered were married 66.67 % and 33.33 % respectively due to sexual activity and more prevalent to sexually transmitted diseases. The highest percentage of mild, moderate and severe leucorrhoea patients 33.94 %, 58.33 % and 41.18 % had graduation, master and postgraduate level of education respectively. This might be due to the young adults that were consuming fiber less food, like fast and junk foods. This might be due to the postgraduates' were having less time to attention her health. The significant relationship between education and physiological status of volunteers as provided (Table 1).

Marital status	Leucorrhoea				
	Mild F(%)	Moderate F(%)	Severe F(%)	No F(%)	Total F(%)
Married	0(0)	4(66.67)	2(33.33)	0(0)	6(4)
Unmarried	29.86(43)	48(33.33)	27(18.75)	26(18.06)	144(96)
X-squared = 5.3548 df = 3 p-value = 0.1476					
Graduation	37(33.94)	33(30.28)	21(19.27)	18(16.51)	109(72.66)
Master	3(17.65)	5(29.41)	7(41.18)	2.00(11.76)	17(11.33)
Post graduates	3(12.5)	14(58.33)	1(4.17)	6(25)	24(16)
X-squared = 16.798 df = 6 p-value = 0.01005					

Table 1: Marital status, education and physiological status of volunteers

The highest percentage of mild, moderate and severe leucorrhoea patients were from peri urban 37.5 %, rural 42.67 %, urban 25.42 % it might be due to unhygienic conditions. It is expected that sanitation facilities at home in rural areas are less prevalent. Urban women have higher leucorrhoea than rural women it might be due to small houses and poor ventilation system. Correlation between residence and physiological status of volunteers was shown (Table 2).

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Residence	Leucorrhoea				
	Mild F(%)	Moderate F(%)	Severe F(%)	No F(%)	Total F(%)
Peri urban	6(37.5)	6(37.5)	3(18.75)	1(6.25)	16(10.66)
Rural	25(33.33)	32(42.67)	11(14.67)	7(9.33)	75(50)
Urban	12(20.34)	14(23.73)	15(25.42)	18(30.51)	59(39.33)

Table 2: Residence and physiological status of volunteers
X-squared = 17.682, df = 6, p-value = 0.007079

The highest percentage of mild leucorrhoea patients were not using social media 57.14 % moderate and severe leucorrhoea patients were using social media 36.36 % and 19.58 %. Prevalence of non leucorrhoeal which were not using social media were high as compared to those which were using social media at some extent social media have more stimulating factors for female discharge. Association between use of social media status and physiological status of volunteers showed non-significant results (Figure 1).

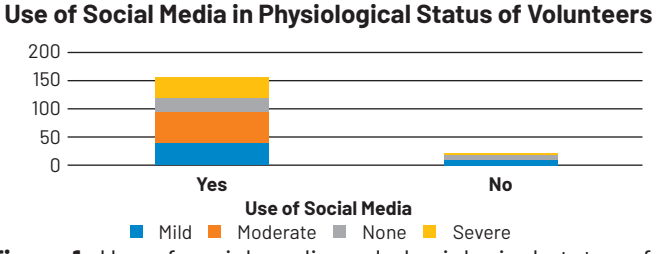

Figure 1: Use of social media and physiological status of volunteers

The relationship between socio economic status and physiological status of volunteers shows nonsignificant results. The above table revealed that almost mild leucorrhoeal patient 37.29% were from middle income while 50% patients suffered from moderate leucorrhoea fall in high income group and 60% severe leucorrhoeal patients were from low income. It might be due to high income class population consume more junks and less physical activity and most of low income class population suffered from lack of adequate diet that's why these two classes of population have more prevalence of leucorrhoea then others. Highly frequent mild leucorrheal were 35.63 % which were happy from her circumstances while highly frequent moderate leucorrheal were 47.83 % which were very happy from her circumstances and highly frequent severe leucorrheal were 33.33 % which were not happy from her circumstances (Table 3).

Socio Economic Status	Leucorrhoea				
	Mild F(%)	Moderate F(%)	Severe F(%)	No F(%)	Total F(%)
High income	1.00(16.67)	3(50)	2.00 (33.33)	0(0)	6(4)
Low income	0(0)	1(20)	3(60)	1(20)	5(3.33)
Lower middle income	20(25)	28(35)	16(20)	16(20)	80(53.33)
Middle income	22(37.29)	20(33.9)	8(13.56)	9(15.25)	59(39.39)
X-squared = 11.826, df = 9, p-value = 0.2233					
Feeling of social circumstances	6(26.09)	11(47.83)	3(13.04)	3(13.04)	23(15.33)
Very happy	31(35.63)	27(31.03)	17(19.54)	12(13.79)	87(58)
Happy	0(0)	0(0)	1(33.33)	2(66.67)	3(2)
Not happy	6(16.22)	14(37.84)	8(21.62)	9(24.32)	37(24.66)
X-squared = 14.02, df = 9, p-value = 0.1216					

Table 3: Socio economic status, feeling of social circumstances and physiological status of volunteers

Time of study effects the health regarding leucorrhoea highly frequent mild leucorrhoea was maximum 33.33 % observed in those students who study at morning time as compared to other timing while moderate leucorrhoea were observed 40.62 % maximum in those who study at night time and severe leucorrhoea were found high frequent 43.75 % who study at mid night. Most highly frequent and severe leucorrhoea were in mid night studying group it might be due to disturbed sleep or less sleeping hours (Figure 2).

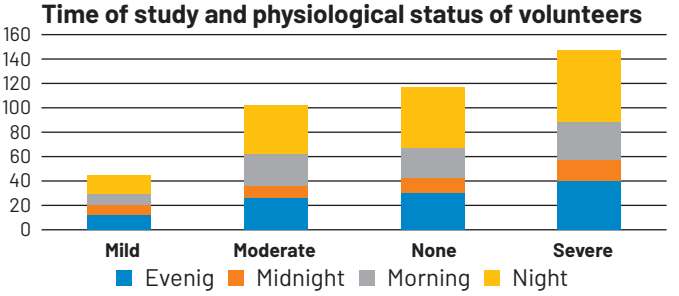

Figure 2: Time of study and physiological status of volunteers

The significant correlation between physical activity and physiological status of volunteers. Most suffered leucorrheal patients were from sedentary 56.66 %, light active were 33.33 %, moderate active 8.66 % and very active 1.33 % were less effective as compared to others. It might be due to less physical activity and more bench work leads to accumulation of toxic substances in body and increasing of adipose tissues (Figure 3).

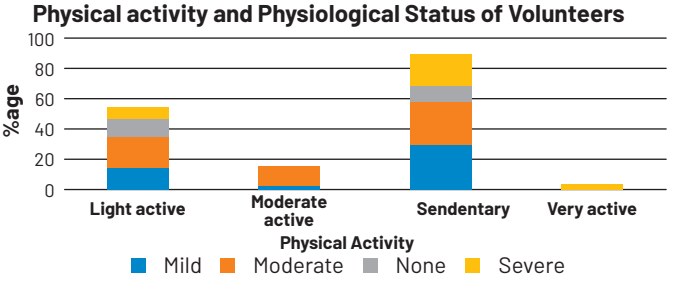

Figure 3: Physical activity and physiological status of volunteers

Mild leucorrhoea 36.67 % were highly prevalent in those girls who had family history of obesity while moderate leucorrhoea were highly prevalent 48 % in stress background girls and severe leucorrhoea 26 % were also

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found in obese family history. My study showed that most of leucorrhoea found in those girls who had history of obesity and had more chances of accumulation of fat or more adipose tissue. While stressed family background also play role in mind and hormonal disturbance which causes severe leucorrhoea. These observations are supported by other researchers. Highly significant correlation between family diseases and leucorrhoea(Figure 4).

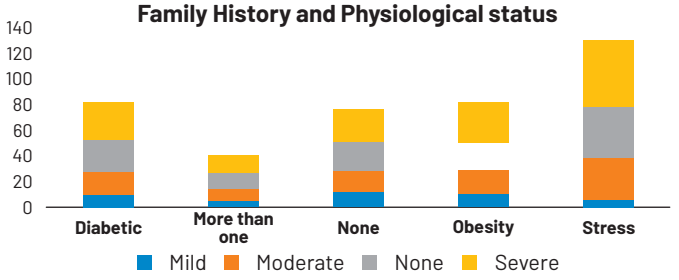

Figure 4: Family history and physiological status of volunteers

Associated symptom of leucorrhoea highly frequent 43.00 % girls were not having anorexia but they had mild leucorrhoea while 40 % were having anorexia with moderate leucorrhoea and 34.48 % were not suffering from anorexia with moderate leucorrhoea in case of severe leucorrhoea 40 % were suffering from anorexia and 18.62 % were not having anorexia but having severe leucorrhoea. In case of moderate and severe leucorrhoea anorexia was highly prevalent it might be due to hormonal disturbance. Affiliation between dysmenorrhea and physiological status was found non-significant. Mild leucorrhoea was highly prevail in 33.33 % who were suffering from dysmenorrhoea while 26.67 % were not suffering from dysmenorrhoea but having mild leucorrhoea. Moderate leucorrhoea was highly prevailing in 37.78 % girls who had leucorrhoea while in severe leucorrhoea 22.22 % girls were suffering from dysmenorrhoea. In case of mild, moderate and severe leucorrhoea highly prevalence was found which relate with dysmenorrhea. It might be due to hormonal disturbance (Table 4).

Anorexia	Leucorrhoea				
	Mild F(%)	Moderate F(%)	Severe F(%)	No F(%)	Total F(%)
No	43(29.66)	50(34.48)	27(18.62)	25(17.24)	145(96.66)
Yes	0(0)	2(40)	2(40)	1(20)	5(3.33)
X-squared = 2.6891df = 3p-value = 0.4421					
Dysmenorrhea					
No	28(26.67)	35(33.33)	19(18.1)	23(21.9)	105(70)
Yes	15(33.33)	17(37.78)	10(22.22)	3(6.67)	45(30)
X-squared = 5.165, df = 3, p-value = 0.1601					

Table 4: Anorexia, dysmenorrhea and physiological status of volunteers

DISCUSSION

According to the table 1 of the frequency of distribution. Most mildly suffered were unmarried 43.0% due to slightly hormonal changes before and after periods. Moderately and severely suffered were married 66.67% and 33.33% respectively due to sexual activity and more prevalent to sexually transmitted diseases. This observation is supported by Kulkarni and Durge the study participants included 506 females, out of which 149 were unmarried and 357 were married [15]. Leucorrhoea was present in 139(27.47%) females. Leucorrhoea was found significantly more in married females as compared to unmarried ($p<0.001$). The highest percentage of mild, moderate and severe leucorrhoea patients 33.94%, 58.33 % and 41.18% had graduation, master and postgraduate level of education respectively and out of total 400 females illiterate were 19.3% primary 41.3% secondary 29.3% higher secondary 5.0 % graduate 5.0 % postgraduate 3% which were facing vaginal discharge problem. The highest percentage of mild, moderate and severe leucorrhoea patients were from peri urban 37.5 %, rural 42.67%, urban 25.42 % it might be due to unhygienic conditions. This observation is supported by Devi in her study out of total 200 patients 60% patients were from rural area while 40% patients were from urban area [16]. Results as given in figure 1. The highest percentage of mild leucorrhoea patients were not using social media 57.14 % moderate and severe leucorrhoea patients were using social media 36.36 % and 19.58 %. Some teenagers accepted the fact that they feel this heavy vaginal discharge when they encounters with erotic feelings and at present age media, magazines, sex videos, TV shows and movies rank as a top source of inducing indecent erotic feelings. Our study indicate highly frequent mild leucorrheal were 35.63% which were happy from her circumstances while highly frequent moderate leucorrheal were 47.83% which were very happy from her circumstances and highly frequent severe leucorrheal were 33.33% which were not happy from her circumstances studies like Gul *et al.*, studied that more than half of the respondents belonged to Upper lower socioeconomic 62.7%. Whereas, 36.8% were from middle class (upper middle: 9.8% and lower middle: 27%) and very few were from upper socioeconomic class. Epidemiological studies among population of Karachi indicate that psychosomatic (women who live under severe stress and worries develop leucorrhoea) were associated with vaginal discharge in the multivariate model. The maximum 33.33 % observed in those students who study at morning time as compared to other timing while moderate leucorrhoea were observed 40.62% maximum in those who study at night time and severe leucorrhoea were found high frequent 43.75% who study at mid night shows in Figure 2. observed that females with sleeplessness were 10% which were having heavy vaginal discharge. Most suffered

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leucorrheal patients were from sedentary 56.66 %, light active were 33.33%, moderate active 8.66% and very active 1.33% were less effective as compared to others. Observed that most common cause of heavy vaginal discharge is unhealthy life style and no regular exercise in age of 31-38 year was 9%. Mild leucorrhoea 36.67% were highly prevalent in girls. These observations are supported by Gul *et al.*, study [17]. Tabassum *et al.*, Studied that common cause of leucorrhoea was unhealthy life style and no regular exercise in age of 31-38 year which contributed 9%. While stressed persons which were suffering from leucorrhoea 19% at the age of 14-40 years and sleeplessness were 10% at the age of 23-40 years. Highly frequent 43.00% girls were not having anorexia but they had mild leucorrhoea while 40% were having anorexia with moderate leucorrhoea and 34.48% were not suffering from anorexia with moderate leucorrhoea in case of severe leucorrhoea 40 % were suffering from anorexia and 18.62% were not having anorexia but having severe leucorrhoea [18]. Observed the symptoms associated with leucorrhoea out of 150 patients 73.33% patients' complaint low backache, 36 % had vulval itching, 12.66% had pain in both legs, 38% had general weakness, 18% had loss of appetite, and 19.33% patients had other symptoms like headache and hair fall. Other studies observed that vaginal discharge with other symptoms were vulval itching 8.8% menstrual problems like dysmenorrhoea, irregularity of menstrual cycle 2.8 %, lower abdominal pain 2.5% [19, 20].

CONCLUSIONS

It was concluded that leucorrhoea can be reduce or by better our socioeconomic status eating well natural food, reduce tension of income and overcome constipation which is bone of contention. If we stay in nature the diseases will avoid us.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Associated Factors of Empathy Level Among Nurses in Tertiary Care Hospital Lahore

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ABSTRACT

It is well acknowledged that a high level of empathy among nurses is critical to their nursing care. For successful and efficient nursing care, empathy is a fundamental component of the nurse-patient relationship. Nurses are responsible to deliver patient-centered, safe, and effective nursing care at all levels of the health-care system. Nurses' sympathetic role in the therapeutic setting begins with a thorough assessment of their patients' bodily, psychological, and spiritual needs. Nurses' capacity to listen empathetically to their patients and deliver empathic nursing care successfully leads to proper patient care, which increases patient satisfaction with nursing care. **Objective:** To determine the association of empathy levels with demographic factors among Nurses working at Public Tertiary care Hospitals Lahore. **Methods:** A cross sectional analytical study design was used to conduct this study. The Sample size of n=180 nurses were recruited through simple random sampling technique. Jefferson Empathy scale was used for data collection from participants to assess the empathy level among nurses. Filled questionnaires were collected and processed for data analysis through SPSS version 21. **Results:** The study findings stated that empathy level among nurses was not found in association with educational institute (p-value=.623), marital status (p-value-.771), education level (p-value=.556) and job experience (p-value=.395). It simply means that the mentioned demographic factors have no influence on nurses' empathy level here in this study. **Conclusion:** It is concluded that the level of empathy among nurses was not found to be associated with the demographic factors of nurses like their age, experience and institute of graduation.

INTRODUCTION

After the 1950s, the nursing literature began to address the subject of empathy. It is possible that Rogers' study on empathic understanding in the therapeutic relationship in psychology served as an inspiration for academics in the discipline to start their own investigations. However, it wasn't until the middle of the 1970s that this idea started to be used in discussions about interactions between nurses and patients as well as in practical nursing practice. The research held that empathy was appropriate, desirable, therapeutic, and a helpful element of nurse-patient interactions up until the 1990s. Empathy subsequently became a crucial tool for raising the standard of nursing care in the 21st century educational tactics and healthcare facility programs[1]. Nursing professionals themselves see empathy as a personal quality that is essential to the effective discharge of their professional duties. Empathy goes beyond merely recognizing another person's emotional condition and entails actually feeling it in both its affective and cognitive dimensions. The emotional aspect of empathy in the context of health and at the factor level refers to the professional's capacity to identify with and share the patient's emotions[2]. Nobody can disagree that empathy is the foundation or core of high-quality nursing care. Empathy has been regarded as the cornerstone of a successful therapeutic nurse-patient interaction for more than a century. Empathy among nurses is a complicated, multifaceted, and dynamic notion that can have a significant impact on patient outcomes. Empathy has been

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defined in several ways as a theoretical discipline, including emotional, moral, cognitive, behavioral, and clinical empathy [3]. Empathy among nurses provides several advantages for patients throughout their hospital stay. Patients are more satisfied with the treatment delivered by nurses when nurses take an empathic approach. Furthermore, nurses with a high level of empathy encourage greater adherence to therapies, aid in more accurate patient diagnosis, and minimize the anguish of seriously ill patients [4]. Contemporary researchers commonly differentiate between two types of empathy, which are affective and cognitive empathy. Affective empathy refers to the sensations and feelings we get in response to other's emotions. Cognitive empathy refers to the ability to identify and understand other people's emotions. Another classification of empathy exists that lends itself as a concept that can be taught as basics and trained. Basic empathy begins developing as a maturing child and continues into adulthood. It can be viewed as an integrated empathetic emotion. Trained empathy is something that can be developed through practice and builds on the skills of empathy formed during the basic empathy timeframe[5]. A number of factors determine the amount of empathy among nurses. True identification with the patient's pain, as well as knowledge of the patient's viewpoints, are two indicators of empathy degree. Furthermore, nurses' personal drive to empathize, as well as their capacity to communicate their comprehension of their patients' feelings and views back to them, may contribute to good nursing care[6]. It has been suggested that high levels of nurses' empathy leads to positive health-care outcomes such as patient satisfaction, therapeutic adherence among patients, and low occurrence of errors and complications [7]. Furthermore, nurses' scope of practice necessitates empathy practice, which is critical for creating therapeutic trust and relationship between competent empathetic nurses and their clients. Nurses' empathy can also be influenced by their personality and the clinical setting. Workplace variables such as a lack of time, a lack of support from coworkers, worry for patients, exposure to unfavorable attitudes among healthcare workers, and a heavy workload can all be barriers to nurses' empathy [8]. Several investigations analyze personal characteristics of nurses such as age, experience, education, gender, and field of experience in connection to empathy levels. Various characteristics among nurses are identified in correlation with empathy among nurses, according to research that looked at all such factors in relation to both trait and state empathy levels[9]. Effective empathetic conduct by nurses has been shown to improve healthcare outcomes and is thus a critical trait. Being able to transmit this knowledge of the patient to the patient is a key part of empathy in healthcare. It's also critical for nurses to have this awareness of the patient/client without being overly emotionally involved, which is known as keeping a professional distance. Empathy is established early in the nurse-patient interaction, which leads to increased rapport, trust, and meaningful information exchange. Empathic activities aid in the development of therapeutic connections and the achievement of favorable health outcomes [10]. Three high-order elements were identified in a literature review: organizational, personal and interpersonal, and demographic characteristics. Burnout, increasing workload, lack of organizational support, training workshops, patient behavior, incorrect role modeling, and informal, experiential learning were among the seven sub variables. Empathy inhibition is highly linked to workplace culture. The empathic responses of healthcare personnel to patients are linked to a well-resourced, collegial, professional organizational environment that fosters empathy for all [11]. Kerr and Tegge conducted a cross-sectional survey at Illinois Wesleyan University in the United States in 2017. The goal of this study was to see if there was a link between empathy levels and a variety of demographic characteristics. Nurses have much greater levels of empathy than those in other occupations. Empathy levels among students of all majors with a predicted specialty were strongly impacted by gender and age [12]. Objective of this study was to determine the association of empathy levels with demographic factors among Nurses working at Public Tertiary care Hospitals Lahore. Literature suggested that if Nurses show empathy and provide empathetic nursing care to patients, there would be great improvement in patients' health outcomes. Therefore, empathy among nurses is considered as a fundamental attribute to have quality nursing care. Studies have suggested that there is strong relationship between nurses' empathy and improvements in patient outcomes. In other countries, studies have been conducted regarding the levels of empathy among nurses, nursing students and other allied health professionals. Some studies are also conducted to assess empathy among psychiatric nurses also. Looking at the prime importance and lack of research regarding nurses' empathy in our country, there is a dire need to conduct such studies which help to determine the empathy levels of nurses. That is why this topic has been selected to find the empathy level among nurses.

METHODS

A cross sectional analytical study was conducted to carry on this study. A sample of n=180 nurses were recruited through simple random sampling technique.This study was conducted at a public tertiary care hospital (Jinnah

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Hospital Lahore). The registered nurses working at the selected clinical areas of the Jinnah hospital Lahore were the population for this study. All the nurses who were having age 20 to 55 years of age with at least one year of experience both male and female were included. Nurses with any specialized course in ethics were excluded. Two parts instruments were used in this study, one for demographic data and other for Nurses' empathy level. Nurses level of empathy modified Jefferson empathy scale was used. It consists of with 25 empathy related statements. A 5-point scale of Strongly Disagree to Strongly Agree is being used. The higher number on the scale indicates higher the empathy level among nurses. Quantitative data were entered and analyzed in SPSS version 21.0. For quantitative variables, mean & standard deviation were computed. Frequencies and percentages were computed. Chi square test was used to see the association of nurses' empathy level with their demographic characteristics. ANOVA test was used to assess the difference of empathy level among nurses at different clinical areas of the hospital. p-value <0.05 was considered as significant.

RESULTS

Table 1 shows the demographic findings of the participants where participants' age related information indicated that 86 (47.8%) of the nurses were in the age group 20 to 30 years, 78 (43.3%) of the nurses' participated in this study were in the age group of 31-40 years, 15 (8.3%) of the participant nurses were aged 41 to 50 years and only 1(0.6%) of the participants were age above 50 years. Looking at the gender distribution of participants in this study it was revealed that all 180 (100%) study participants were female nurses who took part in this study. The findings also revealed that 115 (63.9%) of the study participants were married and remaining 65 (36.1%) were unmarried nurses who participated in this study. It was also found that among the study participants, 48 (26.7%) nurses were having General Nursing Diploma qualification, 78 (43.3%) of the nurses were having Diploma plus post basic specialization and 54 (30.4%) of the nurses had qualification BSN and above in nursing. Furthermore, it is also found in the result that 77 (42.8%) of the study participants were having working experience less than or equal to 5 years, 62 (34.4%) of the nurses had experience of 6 to 10 years of services, 27 (15%) of the nurses participated in this study had experience of 11 to 15 years and remaining 14 (7.8%) nurses had experience more than 15 years. Finding of this study also revealed that of the participants 18 (10%) were from the Chemotherapy department, 44 (24.4%) of the participant nurses were from the Emergency department of the hospital, 30 (16.7%) of the nurses were from the operation theater and rest of the 88 (48.9%) nurse participants were from the inpatient departments of the selected hospital. Finally, the information based on the type of nursing institute from where the participant nurses received their nursing education showed that 164 (91.1%) of the nurses participated in this study stated that they have received their nursing education from public institution while remaining 16 (8.9%) of the nurse participants stated that they have received their nursing education from Private Institution.

Variables	Frequency (%)
Age in (Years)	
20-30 years	86 (47.8%)
31-40 years	78 (43.3%)
41-50 years	15 (8.3%)
>50 years	01 (0.6%)
Gender	
Females	180 (100%)
Male	0 (0.0%)
Marital Status	
Married	115 (63.9%)
Unmarried	65 (36.1%)
Education	
Diploma Nursing	48 (26.7%)
Diploma Plus Specialization	78 (43.3%)
BSN and above	54 (30.4%)
Experience	
<5 years	77 (42.8%)
6-10 years	62 (34.4%)
11-15 years	27 (15%)
>15 years	14 (7.8%)
Clinical Area	
Chemotherapy Department	18 (10%)
Emergency Department	44 (24.4%)
Operation theater	30 (16.7%)
Inpatient Units	88 (48.9%)
Educational Institute	
Public Institute	164 (91.1%)
Private Institute	16 (8.9%)

Table 1: Demographic characteristics of staff nurses (n=180)

Findings presented in Table 2 reveal the association of various demographic variables such as Educational Institute, Marital status, qualification level and experience with nurses' empathy level. Results states that empathy level among nurses was not found in association with educational institute (p-value=.623), marital status (p-value-.771), education level (p-value=.556) and job experience (p-value=.395). it simply means that the mentioned demographic factors have no influence on nurses' empathy level here in this study.

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Variable	Low Empathy	Moderate Empathy	High Empathy	Chi-Square Value	p-Value
Educational Institute					
Public Institute	6	119	39	.947	.623
Private Institute	0	11	5		
Marital status					
Unmarried	3	50	12	.521	.771
Married	3	90	22		
Education					
General Nursing	2	39	71	3.013	.556
Diploma+ Specialization	1	61	6		
BSN and above	3	39	12		
Experience					
< 5 years	4	62	11	4.079	.395
6-10 years	1	45	16		
> 10 years	1	32	8		

Table 2: Association of Empathy Level among Nurses with their Demographics(n=180)

Table 3 represents the comparison of empathy levels among nurses at various clinical areas of the selected hospital. The finding suggested that no significant difference in empathy level among nurses was found at different clinical areas such as chemotherapy, emergency department, operation theater and inpatient departments (p-value=.283).

Variable	Low Empathy	Moderate Empathy	High Empathy	ANOVA Test Value	p-Value
Clinical Area					
Chemotherapy	0	15	3	1.280	.283
Emergency Department	1	38	5		
Operation Theater	0	22	8		
Inpatient Units	4	65	19		

Table 3: Departmental Comparison of Empathy Level Through ANOVA(n=180)

DISUSSION

The findings suggested that in contrast to what most other part and context think, the study's conclusions were unexpected. Positively, there was no discernible difference in empathy between the groups of nurses representing the various aspects as human services. If there are other aspects of empathy that our study may have missed, more investigation will be required. The demographic findings of the participants revealed that looking at the gender distribution of participants in this study it was revealed that all 100% study participants were female nurses. Somewhat similar findings found from a past study where 78% female participated in the study [13]. Another study found somewhat different findings where 64% were female participants. This difference might be because of the variation of male and female nurse statistics in different countries. The findings of this current study also revealed that 64% of the study participants were married. In opposite to to this study, a previous study showed different number of married where majority 75% of participants were unmarried [14]. Findings of this study revealed that empathy level among nurses was not found in association with educational institute (p-value=.623), marital status (p-value-.771), education level (p-value=.556) and job experience (p-value=.395). It simply means that the mentioned demographic factors have no influence on nurses' empathy level here in this study. A similar finding was obtained from a past study where it was claimed that no relationship of nurses' empathy was found with age of the participants, their marital status, total period of employment in nursing and current work unit[13]. In contrary to the current study findings, a previous study found that job experience of nurses was found to be significantly associated with their empathy (= 0.19, p = 0.04) [15]. Findings of a previous study revealed that Female empathy (mean 110.8, SD 11.7) was considerably greater than male empathy (mean 105.3, SD 13.5) (P,0.0001) [14]. But unfortunately, it cannot be compared with current study because all the study participants were females where no comparison is possible. A past study found opposite study to this research where they found that young nurses had a higher mean score of total empathy (p0.05). Furthermore, on the basis of the inpatients ward variable, there were significant variations in mean scores of patients' feedback and patients' expectations dimensions (p<0.05) [15]. Similarly, high-qualified nurses exhibited more empathy than low-qualified nurses [16]. The major findings of another study indicated that the mean (S.D) levels of empathy among graduated nurses from public nursing institutes was 33.47 ±11.654 and private 38.16±10.161, respectively, which suggests that graduates of private nursing institutes have higher empathy levels than those graduated from public nursing colleges [17, 18]. Similarly, another study also revealed that nurses in the public healthcare system were shown to have much less empathy than those in private hospitals when it came to nurse-related issues [19, 20]. There was no as such difference found in our context which might be because of following same educational plans by the public as well as private nursing institutes in training nursing students.

CONCLUSIONS

Findings of this study showed that empathy level among nurses was not found in association with educational institute, marital status, education level and job experience. it simply means that the mentioned demographic factors have no influence on nurses' empathy level here in this study. Moreover, the finding also suggested that no significant difference in empathy level among nurses was found at different clinical areas such as

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chemotherapy, emergency department, operation theater and inpatient departments. Based on the results of this study we recommend that: Relevant university decision makers, as well as nurse educators, should take seriously the current study's finding that nurses are not very high empathetic which implies that they should engage in continuous educational activities as part of their clinical training in order to improve their empathic attitudes. Another recommendation is that in future such studies are needed to be conducted at public versus private hospital nurses to see the real comparison of empathy among them.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Prevalence of Musculoskeletal Pain due to Smart Phone Usage among High School Students: A Cross Sectional Study

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ABSTRACT

In the past decade, mobile phone usage rates have increased and there have been concerns that the overuse of smart phones may contribute to various musculoskeletal (MSK) problems primarily in neck and shoulder region. The most reported complaint is pain that can be seen in many parts of the body, especially in neck. **Objective:** To check the prevalence of cervical pain and its association with smart phone usage among high school students. **Methods:** It was an observational cross-sectional study in which non-probability purposive sampling technique was used to collect data from high schools of Faisalabad. 105 subjects both male and female with musculoskeletal pain were included. The data were analyzed by SPSS version 23. **Results:** Females were found to have more pain (58.1%) compared to (41.9%) the males. 72.4% subjected recorded the moderate to severe pain measured on VAS. No association was found among disability score and gender and age with p-value > 0.005. **Conclusions:** There was no noticeable relationship between gender and age regarding pain intensity. Most variables showed an association with pain intensity indicating that there is a prevalence of cervical pain more than any other musculoskeletal pain in high school students due to smart phone usage.

INTRODUCTION

The previous two decades have seen incredible modifications in portative technologies such as smartphones, and the foreword of tablets, predominantly in the use of touch screen operation preferably than any earlier indirect approach [1]. The combination of repetitious motions, imperfect poses, and the excessive usage of portable phones to send text messages or play games, without taking breaks, can provoke injury, which if bypassed can result in prolonged impairment. This addiction also results changes in cognitive function [2, 3]. Musculoskeletal problems especially in the neck and shoulder area is fairly common [4]. Neck ache is the most expected complaint in hospitals with a plurality varying between 5.9 percent and 38 percent of the inhabitants. There is evidence that the existence of MSK pain including neck and shoulder pain in preadolescence and youth may be a significant element in the outset of pain in adultness [5]. When individuals operate smartphones for a prolonged duration it causes defective posture such as forward neck posture, slouched posture, or rounded shoulder, along with it renders sleep disorders and depression among grown-ups [6]. There is a strong correlation between smartphone and various mental health symptoms like anxiety and depression [7, 8]. In most of the smartphone users, MSK manifestations emerge not only in the neck but also in the additional regions of the body, including shoulders, elbows,

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arms, wrists, and fingers, particularly the thumb. The indications notified are ache, tiredness, immobility, deficiency, and sensorial issues such as numbness and tingling [9]. It is stated that 16 minutes after using a smart phone, the upper neck and back pain signs will initiate, and as the span of use elevates by 10 to 30 minutes, the possibility of the MSK disease predominantly in the shoulder area will rise [10]. It is briefed that strenuous usage of portative phones at late night by adolescents may lead to crankiness, temper swings, personality irritations, and numerous other crises [11]. Comprehensive and periodic use of smart phones, as well as the reprised motion of the upper limbs in a discomfiting posture, have been displayed to be the primary contributing characteristics to the incidence of musculoskeletal symptoms [12]. Even though they are aware of the negative effects, smartphone addicts are unable to control their use [13]. Based on current analyses, it can be acquainted to use the apparatus at eye level with both hands and reverse positions at standard gaps during use [14]. There was relatively little research done on SPA interventions. Six categories of measures for both prevention and treatment were identified: applications restriction, social intervention, psychotherapies, cognitive training, behavioral intervention, and complementary and alternative medicine. Students, parents, or online experts can implement them [15].

METHODS

This study was a Cross-sectional or a survey based study to determine the prevalence of cervical pain due to smart phone usage among high school students. In this study, non-probability purposive sampling technique was used among high school students aged 16-18 years in accordance with their willingness to involve in the study. This study was conducted within private schools and colleges of Faisalabad. The duration of this study was 6 months afterwards approval of research and ethical review committee. Sample size was 105 participants, measured with margin of error 5% and confidence level of 95%. Selection of subjects was based on following criteria. The age range was between 16-18 years, both (male and female) students with their own smart phones. Students who use their phone for 3-6 hours daily. Participants were excluded having subjects with previous history of musculoskeletal diseases, previous head and neck surgeries, previous diagnosis of any cervical disc problems, those with recent head and neck trauma, subjects with cervical and shoulder neurological movement disorders, diagnosed inflammatory joint disease and systemic illnesses, bed ridden subjects, any subjects with psychological issues (depression, anxiety, bipolar disorder etc) and other degenerative changes. Data collection tool used in this study were VAS and Modified neck and shoulder disability index. The questionnaire was used to assess the intensity of pain and its effect on their life. The participants were assured that their information will remain private. Data were analyzed by using SPSS-23. Results were drawn by applying appropriate statistical analysis. Chi-square test was applied, both age and gender wise frequency distribution of physical activity was calculated.

RESULTS

The frequency distribution for age of high school students who participated in the study, majority of the students 74.3% aged between 16-17 years and 25.7% aged 18 years who responded to the NDI questionnaire. Out of 105 students, majority of the student i.e., 61 (58.1%) were females while 44 (41.9%) were the males. The VAS scale shows that the 76(72.4%) have moderate pain and 24(22.9%) have mild pain. However, Modified neck and shoulder disability index shows that 59% students have moderate disability and 28% have mild severity (Table 1).

Variables	Responses	F(%)
Age	16-17 yrs.	78(74.3)
	18yrs	25(25.7)
Gender	Female	61(58.1)
	Male	44(41.9)
VAS Scale	No pain	1(1)
	Mild pain	24(22.9)
	Moderate pain	76(72.4)
	Severe pain	4(3.8)
Modified neck and shoulder disability index	Mild	28(28)
	Moderate	59(59)
	Severe	18(17.1)

Table 1: Showing the frequencies and percentages for respective variables of VAS and Modified neck and shoulder disability index

129 students belong to age group <18 among which 66.1% show moderate disability and in >18 age group 71 students were enrolled among which 33.9% have moderate disability. There was insignificant association between age and Modified neck and shoulder disability index (p-value>0.0)(Table 2).

Age	Modified neck and shoulder disability index			Total	p-value
	Mild Disability	Moderate Disability	Severe Disability		
<18	42(58.3%)	74(66.1%)	13(81.3%)	129(64.5%)	0.194
>18	30(41.7%)	38(33.9%)	3(18.8%)	71(35.5%)	

Table 2: Association of age and Modified neck and shoulder disability index

114 students were female among which 59.8% show moderate disability and in male group 86 students were enrolled among which 59.8% have moderate disability. There was insignificant association between gender and Modified neck and shoulder disability index (p-value>0.0)

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(Table 3).

Gender	Modified neck and shoulder disability index			Total	p-value
	Mild Disability	Moderate Disability	Severe Disability		
Female	42(58.3%)	67(59.8%)	5(31.3%)	114(57.0%)	0.09
Male	30(41.7%)	45(40.2%)	11(68.8%)	86(43.0%)	

Table 3: Association of gender and modified neck and shoulder disability index

DISCUSSION

Our findings demonstrated that cervical pain has dominant prevalence in 74.3% of smart phone users between the age group 16-17 years, which also corresponded to the study conducted in (2002) that explains that More than 30% of people, particularly young adults, reported waking up with neck pain at least once a week. This problem is common. 37.3% of people with neck pain said they had persistent pain that made them disabled, and 9.9% said their neck problems got worse in a follow-up year [16]. Extreme cervical posture and neck pain were not linked in several studies. Additionally, no correlation has been reported between cervical posture and deep cervical flexor endurance. However, when compared to people who never or rarely experience neck pain, those with frequent neck pain had lower levels of neck muscle endurance. Only a few studies examined the relationship between a position and cervical range of motion in relation to neck pain, and the findings of those studies were inconclusive [17]. However, the results of this study was in favor of the current study. most of the people who reported with cervical pain usually ranged between the age group 16-17 years. Males present with more flexible postures than females. The range of bending was linked with the duration of usage of computer and digital devices, even the cause of this relationship were necessary to be determined. This study presents the link between gender importance and daily use of digital devices on health of cervical curve. In this study comparison was determined between the routine of standing and mobile use. Because people looked at their mobile phones the angle of head and neck flex increased to 23.54 degree respectively, this indicates a flexed neck position [18]. Results of the investigation of Madardam *et al.*, suggested that adults have a higher pain threshold than children do. It was discovered that the participants' varying ages and the length of the game may cause minor pain variations. The results of this study was in contrast to the current study where students reported higher level of moderate pain [19]. Additionally, a correlation between smartphone addiction risk and MSD in particular body regions has been demonstrated by a study. The use of smartphones, which required repetitive movements over the thumb and fingers as well as prolonged static neck flexion, is one common body region the researcher focused on when it came to MSD related to problematic smartphone use. Previous studies found that the main pathology of MSD is linked with the presence of physical risk factors like repetitive movements and static posture [20]. The results of this study were consistent to the current research. Kim and Kim conducted a study to determine the musculoskeletal symptoms, hazard ratio, and use of smartphones by university students in specific areas. After using smartphones, the shoulders and neck were found to be the body parts that were the most painful. Back pain was found to be positively correlated with the size of the smartphone's liquid crystal display (LCD) screen in the musculoskeletal system, while pain in the legs and feet was found to be negatively correlated with the amount of time spent using the smartphone. Subsequently, it was uncovered that the utilization of a cell phone corresponded with outer muscle side effects. As a result, in today's environment, where smartphone use is on the rise, it is necessary to improve smartphone usage and create a preventative program to alleviate musculoskeletal damage symptoms [21]. These findings were found to be consistent with the current study.

CONCLUSIONS

There was no noticeable relationship between gender and age. The prevalence of the musculoskeletal pain was found to be 40%. The 0.009% of the targeted population reported no pain, 0.22% showed mild pain, 0.72% reported moderate pain while 0.03% complaint of severe pain. 3.5 % reported no disability, 3.1% complaint moderate disability while 2.5% showed severe disability and 1.1% with worst possible disability. Lifting, Reading, Personal Care, Headache, Driving, Recreation, and Pain Sale showed association with pain intensity. While Concentration, Work, and Sleep didn't show any association with pain intensity.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Frequency of Catheter Infections in Patients of Hemodialysis Despite Using Antibiotic Lock

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ABSTRACT

Non-tunneled catheters are associated with many complications, including infections and thrombosis. **Objective:** To determine the frequency of catheter infections in patients of hemodialysis despite using antibiotic locks, in a Tertiary Care Hospital Karachi. **Methods:** It was a cross-sectional study conducted at the department of nephrology, Liaquat national hospital and medical college, Karachi, Pakistan from 18th October 2020 to 18th April 2021. Patients of age 20 to 70 years of either gender on hemodialysis through double lumen catheter- non-cuffed for ≥ 2 weeks were included in the study. Brief history was taken from all the patients. Gentamicin lock solutions were administered in all patients. Catheter tip was sent to institutional laboratory for culture and sensitivity to reach the outcome i-e catheter related infection. **Results:** The mean age was 58.97 ± 14.82 years. The catheter related blood stream infection was in 21 patients (17.5%). The most common organism was coagulase negative *Staphylococci* (CoNS) (5.9%), followed by Vancomycin-resistant *Enterococcus* (VRE) (4.2%), respectively. There was insignificant association observed between catheter related blood stream infection and age groups, gender, comorbids, duration of catheter insertion and hemodialysis, site of catheter infection and reasons of hemodialysis ($p > 0.05$). **Conclusions:** Catheter-related infections in patients of hemodialysis despite using antibiotic locks is frequent but it has been observed that gram negative infections have responded well to gentamicin lock solution, where as in our study most common organism responsible for infection is coagulase negative *Staph.* followed by VRE.

INTRODUCTION

Chronic kidney disease (CKD) is a major public health concern across the world and the global prevalence of CKD is 9.1% [1]. According to the results of systemic review conducted in 2015, the burden of CKD is higher in developing countries as compared to developed countries (387.5 million cases vs 109.9 million cases)[2]. The reason of high burden of CKD in developing might be the treatment cost, which is very high and unaffordable for majority of the patients [3]. The management of CKD patients who developed end stage renal failure or acute renal failure is renal replacement therapy or dialysis after getting an access placed [4]. Usually for those requiring dialysis for lifetime arteriovenous fistula is the preferred choice and tunneled dialysis catheters, is commonly used for patients who do not have functioning arteriovenous fistulas or grafts. However, access can be a temporary one placed in situations such as for failure of arteriovenous access or for acute renal failure or for bridging the gap to transplantation [5, 6]. In such conditions, when an access is required for a limited time then temporary non-tunneled dialysis catheters/ double lumen catheter are usually placed at bed side [7, 8]. Non-tunneled catheters are associated with many complications, including infections and thrombosis [9]. Hemodialysis patients have compromised immune

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systems as a result of underlying diseases such as diabetes and malnutrition induced by dialysis and uremia therapy, which can lead to catheter-related infection. The reasons and preventive strategies of these infections have been well discussed in literature. Infections are commonly caused by colonization of the catheter tip, the skin around the site of insertion, in the catheter by hematogenous spread from another place, and contamination of the locking solution. Other factors include contamination after catheter placement due to inadequate aseptic procedures and iatrogenic contamination during any subsequent catheter manipulation. There are many types of catheter-related infection including exit site infections, localized infections, tunneled infections, bloodstream infections and pocket infections [10, 11]. In a recent study, the catheter colonization was reported in 4.8% and catheter related bloodstream infection was reported in 4.2% of the hemodialysis patients [12]. In another study, 69% of the hemodialysis patients have experienced bloodstream infections and 31% have experienced localized infections [13]. As we had very few our own local statistics for catheter related bloodstream infections, therefore, the aim of the current study was to determine the frequency of related bloodstream infections and common organism causing catheter related infection in patients of hemodialysis despite using antibiotic locks, in a tertiary care hospital Karachi. This study helped in early suspicion of infection and prevent diagnostic delay in our population.

METHODS

It was a cross-sectional study carried out at the department of nephrology, Liaquat national hospital and medical college, Karachi from Oct 2020 to April 2021. Sample size of 118≈120 patients on hemodialysis, calculated on the basis of frequency of catheter related infection despite using antibiotic lock was 22% [13], confidence level as 95% and bond on error as 7.5%. Patients of age 20 to 80 years of either gender on hemodialysis through double lumen catheter– Non-Cuffed for > 2 weeks were included in the study. Patients with sepsis, malignancy and ESRD patients having AV fistula were excluded from the study. Non-probability consecutive sampling was applied. The approval from the institutional ethical committee was taken prior to commencement of study. Patients meeting the inclusion criteria were enrolled and prior to inclusion written informed consent was taken. Brief history regarding the co-morbid conditions i.e. diabetes mellitus (patients having HbA1C > 6.5 on treatment for > 1 year), hypertension (patients on antihypertensive medications for > 3 months, uncontrolled due to lack of exercise and dietary modifications), duration of hemodialysis, duration sine catheter insertion, site of catheter insertion, reason of hemodialysis and clinical examination was done. Gentamicin locks were administered in all patients. In all patient's catheter tip sent to institutional laboratory for culture, catheter related infection were labeled as positive if culture report showed > 102 cfu bacteria/ml on catheter tip. This information along with demographics were entered in the proforma by researcher herself. Data were entered on SPSS version 22.0. Mean, standard deviation was calculated for age, duration of hemodialyis and duration sine catheter insertion. Frequency and percentages was calculated for gender, co-morbids i.e., diabetes mellitus, hypertension, site of catheter insertion (femoral / transjuglar), reason of hemodialysis, catheter related blood stream infection (yes / no), if yes then organism of catether tip culture. Effect modifiers were controlled through stratification of age, gender, diabetes mellitus, hypertension, duration of hemodialysis, duration since catheter insertion, site of catheter insertion and reason of hemodialysis. Chi square test was applied and $p \leq 0.05$ was taken as significant.

RESULTS

Of 120 patients, the mean age was 58.97+ 14.82 years. The median duration of hemodialysis was 14.5 days ranging from 7 to 425 days. Furthermore, the mean duration since catheter insertion was 8.975 + 2.612 days. Most of the patients were males (56.7%) and 43.3% were females. Out of 119 patients, 65% were diabetic and 70.8% were hypertensive. Common reason of hemodialysis was AKI (75%), followed by ESRD (25%), respectively. In 97 patients site of catheter insertion was femoral and in 22 patients, it was transjuglar (Table 1).

Variables	Statistics
Age (years)	58.97 + 14.82
Duration of hemodialysis (days)	14.5 (7-425)
Duration since catheter insertion (days)	8.98 + 2.62
Gender	
Male	68 (56.7%)
Female	52 (43.3%)
Comorbids	
Hypertension	85 (70.8%)
Diabetes mellitus	78 (65%)
Reasons of hemodialysis	
ESR	30 (25%)
DAKI	90 (75%)
Site of catheter	
Femoral	97 (81.7%)
Transjuglar	22 (18.7%)

Table 1: Baseline characteristics of study variables

The catheter related blood stream infection was present in 21 patients (17.5%). We found no gram-negative bacteria. The most common organism responsible of catheter related infection was coagulase negative *Staph*. (5.9%),

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followed by VRE (4.2%), respectively (Table 2).

Organism of catheter culture	N (%)
Diptheroid species	1 (0.8)
Enterococcus	4 (3.3)
Klebsella MDR	1 (0.8)
Morgenella morganil	1 (0.8)
Ochrobactrum anthropic	1 (0.8)
Coagulase negative Staph.	7 (5.8)
VRE	5 (4.2)
Yeast	1 (0.8)

Table 2: Frequency distribution of organism of catheter culture

We found that catheter related infection was more in higher age (46-80 years) than lower age, but this difference was statistically insignificant. The proportion of infection in males and females were almost similar. In hypertensive individuals, proportion of infection was higher, while in diabetic and non-diabetic individuals proportion of infection was similar. No significant in proportion of comorbid and infection was observed. Furthermore, duration of hemodialysis, duration since catheter insertion, site of catheter infection, and reasons of hemodialysis showed statistically insignificant differences in proportion of catheter related infections (Table 3).

Age groups	Catheter related blood stream infection		p-value
	Yes	No	
	N(%)	N(%)	
20-45 years	3 (14.3)	18 (85.7)	0.457
46-80 years	18 (18.2)	81 (81.8)	
Gender			
Male	11 (16.2)	57 (83.8)	0.421
Female	10 (19.2)	42 (80.8)	
Diabetes mellitus			
Yes	12 (15.4)	66 (84.6)	0.451
No	9 (21.4)	33 (78.6)	
Hypertension			
Yes	16 (18.8)	69 (81.2)	0.379
No	5 (14.3)	30 (85.7)	
Duration of hemodialysis			
<1 month	12 (14.8)	69 (85.2)	0.567
1 to 6 months	7 (23.3)	23 (76.7)	
>6 months	2 (22.2)	7 (77.8)	
Duration since catheter insertion			
6 to 11 days	17 (17)	83 (83)	0.481
12 to 16 days	4 (20)	16 (80)	
Site of catheter infection			
Femoral	18 (18.4)	80 (81.6)	0.431
Transjuglar	3 (13.6)	19 (86.4)	
Reasons of hemodialysis			
ESRD	5 (16.7)	25 (83.3)	0.567
AKI	16 (17.8)	74 (82.2)	

Table 3: Effect modification of catheter related blood stream infection

DISCUSSION

The requirement of high flow intravascular devices to do dialysis in ESRD patients implies an increased risk of developing bloodstream infections, which negatively affects the clinical profile of the patients. Catheter related bloodstream infections in hemodialysis increased the risk of complications like endocarditis, septic thrombosis, and need of ICU admission and mortality. Therefore, its prevention and monitoring is very essential [14, 15]. According to CDC, the rate of catheter related bloodstream infections are steady in chronic hemodialysis patients, accounting for 37 per 1000 cases in 2008. As of 2011, rate of infection stays increased and 300 hospital admission were due to sepsis or bacteremia per 1,000 patient-years [16]. Hence, in the current study, we have assessed the frequency of catheter related bloodstream infections in hemodialysis patients. We found catheter related blood stream infection in 17.5% hemodialysis patients. In a similar study conducted by Menegueti *et al.*, the catheter related bloodstream was reported in 69% of the patients and 31% had localized infections [13]. In another recent study conducted in Malaysia by Shahar *et al.*, observed catheter related blood stream infections in 4.2% of hemodialysis patients and 4.8% of the patients had catheter colonization [12]. Thompson *et al.*, conducted a cohort study in Canada among adult hemodialysis patients and found that the overall incidence rate of catheter related blood stream infections was 0.19/1000 catheter days [17]. In another retrospective cohort study conducted in India, the overall incidence rate of catheter related blood stream infections was 0.36 per 1000 catheter days [18]. Zhang *et al.*, in their retrospective cohort study observed rate of catheter related blood stream infections as 0.84 / 1000 catheter days. They also observed that catheter related blood stream infections were highly associated with complications, prolonged hospital stay, and mortality [19]. In a recent Pakistani study by Shehzadi *et al.*, the frequency of bloodstream infection was 52.9%, exit site infection was 16.3% and tunnel infection was 7.7% among hemodialysis patients [20]. In the present study, we have also assessed the organisms responsible for catheter related bloodstream infections found on tip of catheter. We found most frequent was coagulase negative *Staph.* (5.9%), followed by VRE (4.2%), and *Enterococcus* (3.4%). We found no gram-negative infections; hence, gentamicin locks were effective against it. While, there is difference observed in distribution of pathogens in catheter related infections by different studies [21, 22]. In a recent Pakistani study by Shoaib *et al.*, the catheter contamination was observed in 51% of hemodialysis patients and most of gram-negative rods, among them 14.3% of the bloodstream infection was related to tunneled double lumen catheter. Additionally, they found *Pseudomonas aeruginosa* in 10.4% of the cases [23]. In another Pakistani

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study by Mehmood *et al.*, gram positive organism was present in 69% and gram negative was present in 31% of the cases [24]. Shehzadi *et al.*, reported that *Staphylococcus aureus*, *E. coli* and *Klebsiella pneumoniae* were the frequent pathogens observed in blood culture whereas, *Staphylococcus aureus*, *Pseuodmonas aeuroginosa* and *E. coli* were the common pathogens found in culture of catheter tip [20]. The high proportion of catheter-associated infection in dialysis patients necessarily needs frequent antibiotics administration. Moreover, vancomycin usage is common because of the *Staphylococcus* infections showed resistance to methicillin. Unfortunately, this resulted into the emergence of vancomycin-resistant *S. aureus* in the dialysis patients [25, 26]. There is an urgent need for an efficient non-antibiotic chemoprophylaxis of catheter-related bacteremia given that there will always be a subset of hemodialysis patients with catheters.

CONCLUSIONS

Catheter-related infections in patients of hemodialysis despite using antibiotic locks is frequent but it has been observed that gram negative infections have responded well to gentamicin lock solution, where as in our study most common organism responsible for infection is coagulase negative Staph. followed by VRE.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Perception of Mothers Regarding Malnutrition in Children Under Five Years Old in Muzaffargarh

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ABSTRACT

Malnutrition is still a serious issue that mostly affects children under the age of five worldwide, not just in impoverished nations. Early on in life, ensuring that children get the nutrients they need is critical to their immune system health, as well as their physical and intellectual growth **Objectives:** To explore the perception of mothers regarding malnutrition in children under five years old in Muzaffargarh. **Methods:** This was a descriptive qualitative study carried out in Muzaffargarh, Punjab. Overall, 35 participants were employed in the study from Tehsil headquarters Jatoi, Muzaffargarh. The participants were interviewed and the data was audio recorded and in written notes. Thematic analysis was done once the data was collected. **Results:** The majority (48.6%) of the participants was from the age group of more than 35 years and 71.4% of the participants were living in extended families. More than half (54.3%) of the participants were having 3-4 children and 51.4% of the participants were illiterate. A total of 112 codes were extracted. Overall, five these were extracted from 20 categories which highlighted the perception of mothers regarding malnutrition in children under five years old. These five extracted themes were "Lack of Awareness", "Contributing Factors", "Poor socioeconomic status", "Poor quality of diet" and "Poor child Health". **Conclusions:** Parents perceived that they done have enough understanding regarding malnutrition. Besides, poor hygiene, improper nutrition, lack of balance diet is some of the contributors of malnutrition among children under five years old. In order to improve parents' knowledge of the appropriate feeding methods for infants and children, health promotion activities should be strengthened at child welfare clinics, health facilities, and at the community level.

INTRODUCTION

A condition known as malnutrition is characterized by a lack of calories, carbohydrates, vitamins, proteins, or minerals in the diet, or by an excess of these elements [1, 2]. It is a state of nutrition that can be shown by either a lack of vital nutrients or an excess of those nutrients [3]. Malnutrition has always been a major issue, affecting primarily children under the age of five worldwide and not just in developing nations [4]. There are 663 million individuals in the world that are malnourished. As a result of inadequate nutrition or recurrent infections, 22% of children less than the age of five are considered to be malnourished [5]. According to the statistics, approximately, 170 million children under the age of five around the world are expected to be moderately or severely stunted, while 110 million children under the age of five are moderately or severely underweight [6]. According to UNICEF, South Asia is home to more than half (56%) of the world's total stunted children, which amounts to 87 million individuals [7]. At least half of all childhood deaths that occur anywhere in the world can be attributed to malnutrition [8]. If a child does not receive appropriate nutrition during the first one thousand days of their existence, it can cause stunted growth, which can last a lifetime and result in a diminished capacity for cognitive function [9]. In Pakistan, the proportion of children under the age of five who are stunted is 40 percent, while the proportion who is underweight is 17.7 percent. The double burden of malnutrition is becoming more and more

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obvious, as almost one in three children (28.9%) are underweight [10]. The statistics for breastfeeding mothers in Pakistan are the worst in all of South Asia, while the statistics for the province of Punjab are the worst in Pakistan. Every month, the department receives registrations of more than 4,000 children suffering from severe acute malnutrition in 18 of the province of Punjab's 36 districts [11, 12]. Inadequate nutrition is one of the leading contributors to illness and mortality in children. It's been estimated that malnutrition is responsible for over half of all child deaths that occur around the world [13]. According to the World Health Organization (WHO), child malnutrition is responsible for roughly 35 percent of all fatalities that occur among children younger than 5 years old all over the world [14]. Severely malnourished have an increased chance of death from common childhood illnesses such as pneumonia and diarrhea [15]. A variety factors contributes to malnutrition. Inadequate intake of nutrients, infectious diseases, and improper techniques for breast-feeding, early age pregnancy, inadequate health services, poor sanitary conditions, poverty, illiteracy, and gender inequality are some of the factors that contribute to the high prevalence of malnutrition in children under the age of five [16]. Malnutrition can have a variety of adverse effects, some of which are listed below: an elevated risk of illness, stunted growth in children, and an increased risk of passing away [17]. In addition to this, it poses a threat to the child's physical and mental development, which in turn leads to poor academic performance. Early on in life, ensuring that children get the nutrients they need is critical to their immune system health, as well as their physical and intellectual growth [18]. In the parts of the globe that are still developing, childhood malnutrition is still rather common; nevertheless, the role that mother perception plays in nutritional status and its effect on the outcome of nutritional treatments is not well understood. There are not nearly enough studies that look at how mothers feel about their children being malnourished. Therefore, this study was designed to explore the perception of mothers regarding malnutrition among children under five years old.

METHODS

This was a Qualitative exploratory study to explore the perceptions of mothers regarding malnutrition among the children less than five years old. The study was carried out in Tehsil headquarters (THQ) Jatoi, Muzaffargarh, a district in the south of Punjab, Pakistan. The study was carried out in 2022 (January 2022-september 2022). A total of 35 participants were included in the study. the sample size was based on previous study carried out by Reither et al [17]. All the participants were recruited in the study using Simple random sampling technique. Mothers who were 20 to 40 years of age with a parity status of 1-6 were included in the study. Mothers who are already having treatment for their malnourished children were excluded from the study. The study was approved from ethical review board of university of Lahore. Data collection permission was also granted from the concern hospital. Written permission was granted from all the participants. Data was gathered using interviews. All conversations during the interview were conducted in Saraiki language so that participants were able to talk freely without any restrictions in expressing their opinions. Thematic analysis was used to analyze the data in codes, categories and themes.

RESULTS

The basic purpose of the study was to explore the perception of mothers regarding malnutrition in children under five years old. A total of 35 participants were included in the study. The majority (48.6%) of the participants was from the age group of more than 35 years and 71.4% of the participants were living in extended families. More than half (54.3%) of the participants were having 3-4 children and 51.4% of the participants were illiterate (Table 1).

	n (%)
Age of the Participants	
Less than 25 Years	3 (8.6%)
25 to 35 Years	15 (42.9%)
More than 35 Years	17 (48.6%)
Total	35 (100.0%)
Type of family of the Participants	
Nuclear	10 (40.0%)
Extended	25 (71.4%)
Total	35 (100.0%)
Number of children	
1-2 children	10 (28.6%)
3-4 children	19 (54.3%)
5-6 children	6 (17.1%)
Total	35 (100.0%)
Education status of the participants	
Illiterate	18 (51.4%)
secondary	8 (22.9%)
Secondary	7 (20.0%)
Masters	2 (5.7%)
Total	35 (100.0%)

Table 1: Socio-demographic profile of the participants, n=35

Thematic analysis was done and overall 112 codes were extracted. 20 categories were extracted from these codes. Overall five these were extracted from 20 categories which highlighted the perception of mothers regarding malnutrition in children under five years old. These five extracted themes were "Lack of Awareness", "Contributing Factors", "Poor socioeconomic status", "Poor quality of diet" and "Poor child Health" (Figure 1). Poor child health was

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also reported by the mothers. The mother responded that recurrent illness and diarrheal diseases are most frequent among the children. They also responded that the children are not responding to the treatment and they also experience problems in approaching health care centers. The mothers were reported that their children used to eat junk food like chips, burgers and biscuits etc. the mothers also reported nutrition which is not recommended in children less than 2 years such as cow mild, black and green tea. Similarly, the mothers also reported that they rarely cook meat and provide balanced diet to the children.

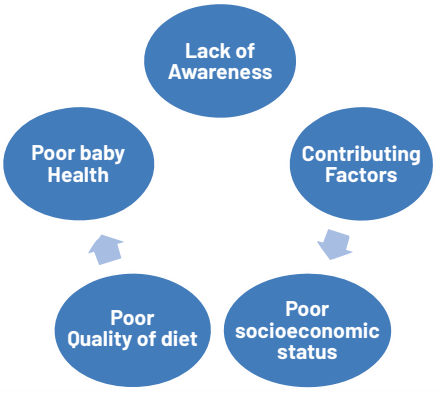

Figure 1: Thematic analysis of the data

The first extracted theme was "Lack of Awareness". The theme was extracted from four categories i.e. "Lack of feeding information", "Poor Assessment", "Poor Literacy", "Lack of proper checkup information" (Figure 2). Lack of awareness among the mothers regarding malnutrition was the main concern. poor assessment of the children about malnutrition was reported by the mothers. poor lateracy was also a concern which affect the awareness among the mothers reharding malnutrition. The mothers were reported that they were not aware about the regalar checkup of their babies for malnurishment. Also, mothers were unaware about feeding of the children.

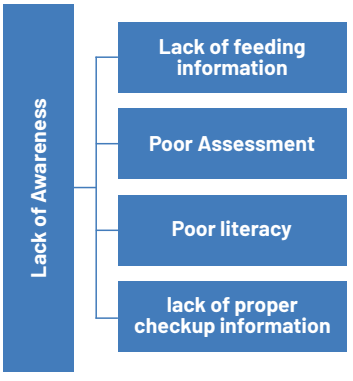

Figure 2: Catagories for the theme Lack of Awareness

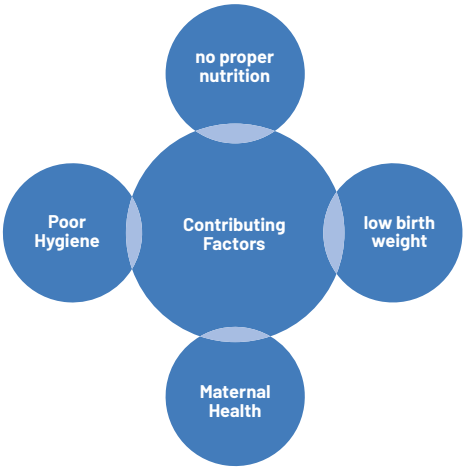

Figure 3: Categories for the theme "contributing factors

Poor socioeconomic status of the family and participants was also a theme extracted from the categories; "No Proper Drainage system" , " Poor Financial status" , " lack of garbage disposal system" and " poor sanitation system" (figure 4). The mothers were reported that they have poor socioeconomic condition. They reported that they have no proper drainage system in their houses, they experience poor financial status. Similarly, some of the mothers reported that they don't have specific garbage disposal system and poor sanitation system.

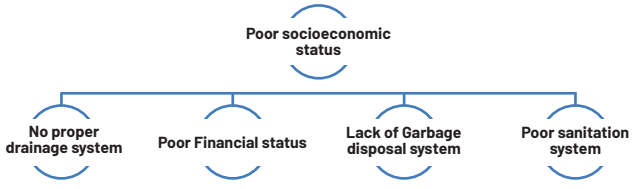

Figure 4: Categories for the theme "Poor Socioeconomic status

DISCUSSION

The basic purpose of the study was to explore the perception of mothers regarding malnutrition in children under five years old. In the current study, five extracted themes were "Lack of Awareness", "Contributing Factors", "Poor socioeconomic status", "Poor quality of diet" and "Poor child Health". These findings were supported by another studies, the findings suggested that mothers have a limited understanding of malnutrition as an illness, as well as its signs and symptoms, causes, and methods for preventing and treating malnutrition in children. As a result of this lack of awareness, mothers had incorrect beliefs regarding the issue of child malnutrition. It was discovered that mothers did not view malnutrition as a significant problem that could necessitate hospitalization for the purpose of receiving treatment; rather, they anticipated receiving a diagnosis of something else. A lack of awareness regarding hunger, incorrect conceptions of malnutrition held by mothers, illiteracy and unemployment, as well as cultural factors such as bringing a kid to a

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traditional healer rather than a medical health institution are all contributing causes [19, 20]. In this study lack of awareness of mothers about malnutrition was a major problem. The mothers were not aware about child health status, follow-ups and the way they improve nutrition status of the children. Similar findings were reported by another similar study and mothers reported low awareness about malnutrition among the children less than five year of age [21]. Similarly, these findings were supported by another study which stated that mothers have poor understanding regarding assessment, prevention and associated factors of malnutrition among the children [22, 23]. The current study, mothers perceived that some factors such as "No proper nutrition", "Poor Hygiene", "low birth weight" and "Maternal Health" contribute to malnutrition in children. Supporting the current findings, malnutrition was significantly higher in children who were born with LBW compared to children who had normal birth weights (stunting prevalence was 51% compared to 39%, wasting prevalence was 25% compared to 14%, and underweight prevalence was 52% compared to 33%). Children who LBW had had a significantly increased risk of becoming malnourished compared to their counterparts who had stunting, wasting, and underweight, respectively. This was the case even after taking into account the known risk factors [24]. In the current study, No Proper Drainage system, Poor Financial status, lack of garbage disposal system and poor sanitation system was perceived by the mothers who have malnourished children. Supporting the current findings, study reported that this index expands the boundaries of poverty beyond the lack of material assets to a concept that encompasses multiple deprivations, including but not limited to: assets, living standards, education, sanitation and hygiene, health and nutrition [25]. Poverty is portrayed through this index as a deprivation of basic amenities that restricts individuals from leading a good and healthy life. It also takes into account the systemic disparities that exist within a country [26]. Similarly, in the current study, Prohibited food, Lack of balance diet, Junk Food, and Improper Nutrition were perceived by the mothers. Literature revealed that balance diet is very necessary for the children to maintain optimum health. How milk contains mycotocins [27]. Numerous health issues, including immune system suppression, organ dysfunction (damage to the kidney and liver), reproductive issues, neurological issues, child stunting, abrupt death in cases of acute exposure, and cancer promotion are all linked to human exposure to various mycotoxins [28]. In this study mother highlighted poor health status of children and furthermore that Recurrent Illness, no response to treatment, Lack of health care facilities and diarrheal disease are commonly prevalent among the children. These findings were supported that by another study and the findings revealed that poor child health is associated with malnutrition [29]. Furthermore, chronic and acute diseases which led the children to admit in the hospital lead to severe malnutrition in children [30]. In the similar context, other studies also provided similar findings and reported that recurrent diarrhea among the children lead to severe loss minerals and electrolytes. This not only affects the children current health status but also lead to severe malnutrition [31, 32].

CONCLUSIONS

One of the main problems affecting children under the age of five is malnutrition. The mother's understanding, health, literacy, family background, and interests are all somehow related to the children's nutrition status, which is entirely dependent on the mother. Overall, there were five themes that captured the mother's perceptions of malnutrition in children under the age of five: "Lack of Awareness," "Contributing Factors,""Poor Socioeconomic Status,""Poor Quality of Diet," and "Poor child Health." Parents said they did not comprehend malnutrition well enough. In addition, inadequate nutrition, poor cleanliness, and an unbalanced diet are some of the factors that contribute to malnutrition in children under the age of five. Health promotion initiatives at child welfare centers, hospitals, and the local level should be reinforced in order to increase parents' knowledge of the best feeding practices for newborns and kids.

Conflicts of Interest

The authors declare no conflict of interest

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Systematic Review

Causes and Consequences of Preterm Birth: A Systematic Review

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ABSTRACT

To systematically review the potential causes and possible effects of preterm birth [<37 weeks gestational duration]. We searched PubMed, google scholar, clinicaltrials.gov and science direct for English language articles published from 2004 to march 2021. All kinds of study schemes were considered acceptable, comprising case –control, cohort studies, experimental and cross- sectional studies. Significant evidences indicate that social stress, elevated cadmium exposure, genomic variations, vitamin D deficiency, pre-conception hepatitis B infection, declined vaginal microbial community, intrauterine infection, reduction in cervical consistency index, strong exposure of creatinine corrected thallium, systemic autoimmune diseases, ozone, primary traffic air pollutants, road traffic noise, potential exposure of arsenic, HIV exposure, maternal thyroid dysfunction, maternal plasma protein level and COVID-19 exposure in pregnant females are the major risk factors for PTBs. Results of earlier investigations indicated prominent risk of insulin resistance, hypertension, neurological defects, heart failure, Chronic kidney disease, Lung function impairment, lower birth weight, thalamocortical system defects, cancer, altered cardiac phenotype and cardio metabolic diseases in survivors of preterm births. This review will help clinicians to isolate the fundamental etiology and to proactively identify, cope and improve outcomes of at-risk pregnancies.

INTRODUCTION

World Health Organization (WHO) suggested that birth before the end of gestational duration or fewer than 259 days since first day of women's last menstrual period (LMP) is preterm birth [1]. It affects approximately 12% of births [2]. Approximately 15 million babies with pre-term births (PTBs) born each year and 28% of child deaths at early age are related to prematurity [3]. At delivery and clinical presentation, PTBs are usually examined on the basis of gestational age [2]. An inverse relationship is found between risk of mortality and morbidity in infants and gestational age at delivery [4]. Various preterm risk factors have been identified by epidemiologic studies, such as smoking, reduced BMI, overweight pre-pregnancy BMI, short stature, physical and psychosocial stress and maternal age (<17 and >35 years) [1]. Results of earlier studies indicate a significant risk of stroke, cardiovascular mortality and hypertension in survivors of PTBs [5]. Moreover, the survivors of PTBs have increased risk of neurologic and developmental disabilities. Significant evidences are associated with intrauterine infection and/or inflammation to PTB [6]. From birth to mid adulthood two to three times risk factor for chronic kidney disease was observed in case of PTBs and extremely PTB (<28 weeks) respectively [7]. Prematurity can damage respiratory passage which ultimately cause obstructive lung diseases [8]. Recent studies described the incidence of germ cell tumor and AML in infancy[9] and cardio metabolic diseases in survivors of PTB [10]. To evaluate the risk of PTB in

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symptomatic females the most commonly used methods are the assessment of reduction in cervical length and fetal fibronectin [11]. Several other factors have also been associated with PTB including uteroplacental ischemia, mechanical over-distension of the uterus, infection chorioamnionitis and hemorrhage [12]. The bacterial community residing in lower genital tract of a female has crucial importance in neonatal and maternal health. Abnormalities of vaginal microbial community are frequently attributed with adverse reproductive health consequences, like PTB. Intrauterine infection is thought to be a prominent risk factor of preterm labor [13]. PTB and gestational age are complicated factors that affect both maternal and fetal genomes [14]. Cadmium, a ubiquitous lethal heavy metal, primarily gains enter into the body through smoking and food ingestion. Pregnant females have been found to accrue more cadmium as compared to non-pregnant women. Cadmium profoundly resides in placenta and adversely affects neonatal health. Several previous investigations have reported considerable associations between increased risk of preterm birth and prenatal cadmium exposure [15]. The high-risk factor for PTB in all autoimmune conditions was observed. Considering the rate of PTB population can achieve medical care and provide mechanistic understanding of obstetric problems [16]. During pregnancy higher levels of traffic noise and primary traffic non exhaust related PM2.5 are significant causes of still birth and PTB [17]. Recently it was described that HIV exposed unaffected infants experience very PTB and low birthweight more than HIV unexposed unaffected infants which ultimately contribute to severe morbidity such as respiratory, gastrointestinal, immune system and metabolic complications. These cases need advanced care and poses increased burden on health care system [18]. Another deadly effect of current pandemic of COVID-19 (SARS-CoV-2) is that it also elevates the risk of cesarean and PTB in pregnant females [19]. It is concluded from latest meta-analysis that to predict PTB no significant soluble biomarker from body fluid has yet been discovered. Moreover, may be possible biomarkers have low concentration or limited stability in blood that leave them unidentified [2]. Therefore, instant preventive measures are required to reduce the rate of PTB [4]. This review summarizes the possible effects caused by PTB and the potential reasons of the induction of PTB (Figure 1).

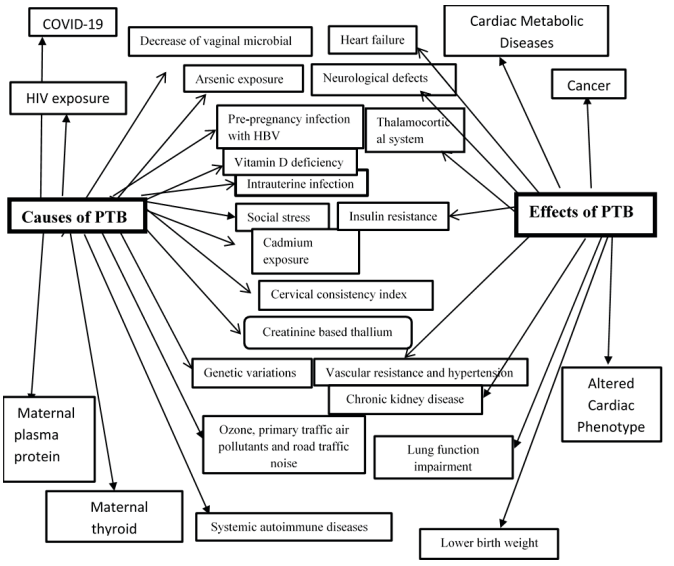

Figure 1: Flow sheet to summarize the effects and causes of PTB

METHODS

We searched PubMed, google scholar, clinicaltrials.gov and science direct for English language articles published from 2004 to March 2021. In all databases search items like: PTB OR preterm labor OR preterm delivery causes, reasons and effects on health were used. The search on electronic databases was conducted and unpublished studies were not included. All kinds of study schemes were considered acceptable, comprising case –control, cohort studies, experimental and cross- sectional studies. Type of studies in which women at high or low risk of PTBs were enrolled of any race, gestational age, parity, age or socioeconomic background were considered suitable to be included in this review. Moreover, information regarding the method of assessment of biological samples was also included. A data extraction form to confirm constancy and accuracy was created. A subset of 16 appropriate studies to pool causes of PTB and 10 eligible studies considering effects of PTB was collected. The following information was collected from each of the research article included in this review: design and objective, exclusion and inclusion criteria, features at baseline including race definition of the outcome phenotype, age of subject, number of participants in cases and controls studies, detail of sample collection and gestational age. All collected information was assembled in electronic datasheet.

RESULTS

The procedure of assortment, identification and addition of studies is illustrated in figure 1. Initially 1556 unduplicated references were searched out of which 455 were excluded due to irrelevant title and abstract. For full text reading, a total of 112 studies were chosen after careful selection. 91 articles were excluded due to various reasons. After

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careful screening 26 studies finally satisfied our criteria and reviewed thoroughly (Figure 2).

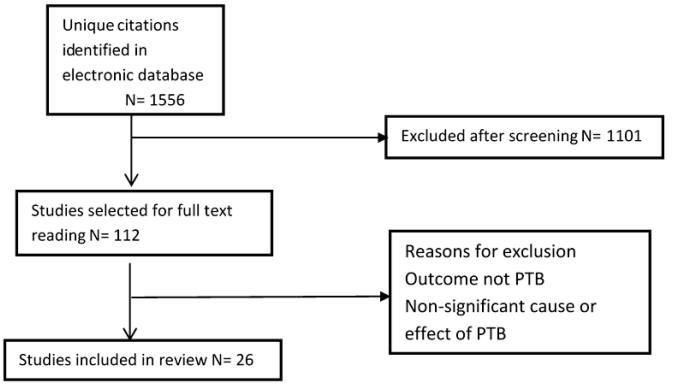

Figure 2: Identification and assortment flowchart of studies on effects and causes of preterm births

Causes of PTB

The association of Cadmium exposure and decreased gestational age was observed. Elevation in urinary Cadmium (µg/g creatinine) was associated with increased chance of PTB [13]. One study discovered the significant association of four loci EBF1, EEFSEC, AGTR2 and WNT4 with gestational period. It was analyzed that attachment of estrogen receptors was varied by WNT4. Deviation in EBF1, EEFSEC and AGTR2 depicted the strong link with preterm birth. Earlier studies have confirmed the function of these genes in maternal nutrition and uterine development [11]. Scientists described that high level of social stress predicts PTB. In logistic regression, controlling for anxiety, age and depression, the experience of difficulty in a closed relationship and a severe life incidence were the major factors predicting PTB [16]. In women, insufficiency of vitamin D greatly increase the risk of preterm birth. An inverse relation was observed in ethnic subgroups. Chances of PTB were enhanced by 4.05 times with plasma 25(OH)D concentrations of 0.03 µmol/L in mothers [17]. An independent association of hepatitis B virus in mothers with risk of developing PTB was noticed. In HBsAg positive and HBeAg negative women twenty six percent increased risk of PTB was observed. Twenty percent increased risk was in HBsAg and HBeAg positive women. Eighteen percent increased risk of PTB was in HBsAg positive and HBeAg negative women, whereas, thirty four percent higher risk of early PTB was in women positive for both HBsAg and HBeAg [20]. The vaginal microbiome richness and diversity in African American participants was examined. They observed the change during first and second trimester and concluded that decreased vaginal microbiome community leads to PTB [21]. It was experimentally confirmed that women with PTB experience high richness and variety of mollicutes occurrence. Maternal and neonatal health is highly influenced by bacterial community in lower genital tract. Seven community state types were detected by pyrosequencing [12]. Significant reduction in cervical consistency index (CCI) in women who labored at <37 weeks was noticed. They concluded that as compare to sonographic CL, CCI is better predictor of PTB [22]. Increased in gestational weight, multivitamin and iron supplementation, changes the Thallium concentration in maternal urine. Approximately three times higher creatinine corrected Tl concentration was related to 0.99-day reduction in gestational duration [23]. The trimester specific link between maternal arsenic contact and birth outcomes was checked. They determined a reduction in birth weight by 24.27g, decrease in birth length by 1.3 mm, and 25% increased risk of small gestational age by increasing the arsenic exposure in third trimester. They further reported that risk of small gestational age was factor particularly high for female infants [24]. During pregnancy exposure of high O3 level, and primary traffic air pollutants (nitrogen dioxides, nitrogen oxides, PM2.5 from traffic exhaust and traffic non-exhaust) and road traffic noise increase risk of PTB and stillbirth. High O3 level increase risk of PTB through oxidative stress and systemic inflammation [15]. The risk for PTB for all autoimmune rheumatic diseases was examined. Higher risk of PTB at early gestational age (<32 weeks) in women with systemic lupus erythematosus (SLE), systemic sclerosis (SSc), dermatomyositis and polymyositis (DM/PM) was noticed. However, at later gestational ages high risk of juvenile idiopathic arthritis (JIA) and rheumatoid arthritis (RA) was prominent [14]. Extreme PTB (<32 weeks) and low birthweight (<1500g) occurred more commonly among hospitalized neonates who were HIV exposed unaffected [18]. The link between adverse birth complications and maternal thyroid dysfunctionality was assessed. Pregnant females with free triiodothyronine (> 95th percentile) and low thyroid stimulating hormone (< 95th percentile) experienced the 4.02-fold higher risk of PTB. They also analyzed that high TSH and low FT3 faced 4.22 times greater risk of small gestational age [25]. It was analyzed that third trimester maternal plasma total protein increment was linked with 0.13 weeks gestational duration rise. Moreover, they also analyzed that the effect was stronger in pregnant female conceiving female fetus than those conceiving male fetus [26]. One study described that hospitalized pregnant females experienced cesarean, operational vaginal birth as well as PTB with symptomatic COVID-19(SAR-CoV-2)infection [27](Table 1).

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Study Country and year	Total participants	Gestational age	Sample	Cause of PTB	Method of analysis	Results
Yang et al., China, 2016 [13]	5364 pregnant females	NA	Urine	Cadmium exposure	Inductively coupled plasma mass spectrometry	OR=1.78; 95% CI: 1.45, 2.19 for all infants. 1.97; 95% CI: 1.46, 2.65 for boys. 1.67; 95% CI: 1.24, 2.25 for girls.
Zhang et al., England, 2017 [11]	PTB (n=3331) Term (n=37803) after Term(n=2434)	(37 to 42) Term, (<37 weeks) PTB, after term (>42 weeks)	Extracted DNA	Four loci (EBF1, EEFSEC, AGTR2, and WNT4)	Gene sequencing	Variants at the EBF1, EEFSEC, and AGTR2 loci cause PTB
Owen et al., UK, 2017 [16]	PTB (n=42) Term (n=73)	24-28 weeks	Pregnant women were interviewed	severe life incidence	ELISA	OR ¼15.6; 95%CI: 3.0 to 80.8
Tabatabaei et al., Canada, 2017 [17]	PTB (n=120) Term (n=360)	8-14 weeks	Plasma 25-hydroxy-vitamin D	Vitamin D deficiency	Liquid chromatography mass spectrometry	95% CI: 1.16, 14.12; P = 0.028
Jue Liu et al., China, 2017 [10]	489965 females	NA	Maternal serum	Pre-pregnancy infection with HBV	ELISA kits	HBsAg and HBeAg are associated with increased risk of PTB
Stout et al., USA, 2017 [21]	PTB (n=24) Term (n=53)	NA	Vaginal swabs	Decrease of vaginal microbial community	Sequencing of V1V3 region of the 16S rRNA gene	Increased vaginal microbiome instability was observed in PTB
Freitas et al., Canada, 2018 [12]	PTB (n= 46) Term (n=170)	11-16 weeks	Maternal vaginal swabs and maternal and infant blood	Intrauterine infection	PCR amplification and pyrosequencing	Women with PTB had higher richness of Lactobacillus crispatus dominated, Lactobacillus gasseri dominated, Lactobacillus iners dominated, Gardnerella vaginalis subgroup B or mix of species, G. vaginalis subgroup A dominated,G. vaginalis subgroup C dominated and Lactobacillus jensenii dominated.
Núria Baños et al., Spain, 2018 [22]	82 high PTB risk women	19-24 weeks	Sagittal view of cervix	Cervical Consistency Index	Image acquisition	For <37 weeks, AUC was 0.73 and 0.51. For < 34 weeks, AUC was 0.68 and 0.49
Jiang et al., China, 2018 [23]	7173 mother infant pair	NA	Urine	Creatinine-corrected Thallium	Inductively coupled plasma mass spectrometry	Tl concentrations higher than 0.80 mg/g cause PTB
Liu et a Liu et al., a al China, 2018 [24]	1390 pregnant females	Third trimester	Urine	Arsenic	Inductively coupled plasma mass spectrometry	increased risk by 25% (95% CI: 1.03-1.49)
Smith et al., 2020 [15]	total births =578238 PTB=33712	<37 weeks	birth certificate records	ozone, primary traffic air pollutants and road traffic noise	NA	For O3 exposure was (OR 1.1595%CI: 1.11, 1.18) For PM2.5 caused 3% rise in PTB.
Kolstad et al., USA, 2020 [14]	2481516 deliveries were assessed	20–36 weeks	birth certificate records	systemic autoimmune diseases	NA	SLE (RR 3.27, 95% CI 3.01–3.56), RA (RR 2.04, 95% CI 1.79–2.33), SSc (RR 3.74, 95% CI 2.51–5.58), JIA (RR 2.23, 95% CI 1.54–3.23), DM/PM (RR 5.26, 95% CI 3.12–8.89).
Anderson et al., South Africa, 2021[18]	466 HUU infants	24-37 weeks	Interviews; clinical assessments; electronic data and laboratory test results.	HIV exposed pregnant females	NA	P value 0.092 HUU 53(11%) HEU 70(15%)
	463 HEU infants	<37 weeks				P value 0.045 HUU 8 (2%) HEU 18(4%)
Yuan et al., China, 2021 [25]	11564 pregnant females	28-41 weeks	Maternal blood samples	Hypothyroidism	Electrochemilu-minescence immunoassays	OR: 1.56, 95% CI: 1.10–2.22
				Hyperthyroidism		OR: 2.41, 95% CI: 1.83–3.17
Xiong et al., China 2021 [26]	6860 pregnant females	3382 2nd trimesters 3478 3rd trimester females	Maternal blood samples	Maternal plasma protein	data from Tongji Maternal and Child Health Cohort (TMCHC) study	third-trimester MTP level, not the second-trimester MTP level, was inversely associated with the risk of PTB
Vousden et al., UK 2021 [19]	722 pregnant Females with COVID-19 symptoms	<37 weeks	Hospitals data from 1st March to 31 August 2020	COVID-19	NA	Iatrogenic preterm birth OR 11.43, (95% CI 5.07-25.75) Spontaneous preterm birth OR0.57(95% CI 0.32-1.01)

Table 1: Studies that observed the main reasons for induction of PTB

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Effects of PTB

It was proved experimentally that children with PTB may face risk of type 2 diabetes mellitus as they have decreased insulin sensitivity as compare to controls. Premature children had an elevated acute insulin release [27]. Another study experimentally concluded that adult population which survived preterm birth may have future cardiovascular risk. It was found that high brachial and aortic blood pressure, thin and weak abdominal aorta and reduced peripheral skin blood flow is faced by preterm girls. High vascular resistance and increased blood pressure was experienced by preterm girls [28]. On Wechsler Scales of Intelligence, It was found that a full scale IQ of verbal IQ and performance IQ of children with PTB. After all psychometric tests they noticed the decrease of 6 to 14 points in preterm children than term controls. On the Clinical Evaluation of Language Fundamentals, 22% to 24% of preterm children scored abnormal (<70) than 2% to 4% of controls. More school services are required for preterm children in reading, writing and mathematics than controls [29]. The results of one study proved the disruption of cerebral development due to PTB. The cerebral grey and white matter defects and cognitive injuries are associated with PTB. Brain damage by PTB is linked with changed thalamic development. Decreased gestational age was linked with reduced volume in the thalamus, hippocampus, orbitofrontal lobe, posterior cingulate cortex, and centrum semiovale [30]. The strong association of heart failure (HF) with PTB (< 32 weeks) was described in one study. They found the inverse relation between gestational age and risk of HF. Adjusted frequency of relative risk of HF was 17.0 after extremely preterm birth and 3.58 after very preterm birth [31]. It was found that the association of 20-30% increased risk of CKD from birth to mid adulthood was present with PTB and extremely PTB (<28 weeks) respectively. Strongest association was found at ages 0-9 years and again at ages 10-19 and 20-43 years between PTB and CKD [7]. Prematurity was associated with lower Forced Vital Capacity /Forced Expiratory Flow (FEV1/FVC) and Forced Expiratory Volume 25–75% (FEF), indicating preterm birth may impair airway development, which suggests increasing vulnerability to obstructive lung diseases [8]. It was reported in one study that 141 different types of cancers in preterm neonates. The overall risk factor was increased for extremely preterm children. They also identified that the risk of germ cell tumor, retinoblastoma and acute myeloid leukemia was increased for preterm as compare to term. They noticed that germ cell tumor was diagnosed at younger age among preterm [32]. It was examined that the link of birth size and gestational age with patent ductus arteriosus with cardiac complications and bronchopulmonary dysplasia in neonates. Significant smaller width of right ventricles, smaller right atria and increased pulmonary vascular resistance than term neonates [33]. One study discussed that adult born preterm (average gestational age 29 weeks) higher oxygen consumption with significant rates of non-ATP-linked mitochondrial respiration. They also noticed the lower lung function in preterm adults as well [34] (Table 2).

Study Country and year	Participants with PTB	Effect of PTB	Gestational age	Results
Paul et al., New Zealand, 2004 [27]	22 children with term and 50 with PTB	Insulin resistance	32 weeks	insulin sensitivity decreased by; 14.2¬10-4 / minute / milliunit / lit (95%CI: 11.5 to 16.2);
Anna -Karin et al., Sweden, 2005 [28]	34 with and 32 with term birth	vascular resistance and hypertension	< 30 weeks	Increased blood pressure and resistance in the vascular tree and have future cardiovascular risk.
Mai Luu et al., Portland, 2009 [29]	375 Children with PTB	Neurological defects	23–34 weeks	PTB children have 6-14 IQ points less in all psychometric tests
Ball et al., UK, 2012 [30]	71 Children with PTB	Thalamocortical system defects	23- 35 weeks	Reduced thalamic volume, cortical volume, frontal and temporal lobe volume, hippocampus, and reduced parietal and occipital lobes. reduced fractional anisotropy in the corticospinal tracts and corpus callosum
Carr et al., Sweden, 2017 [31]	Out of 156879, 501 were with PTB	Heart failure	<28 weeks	17.0 (95%CI: 7.96 to 36.3)
			8 to 31 weeks	3.58 (95% CI: 1.57 to 8.14)
			32 to 36 weeks	1.36 (95% CI: 0.87 to 2.13)
Crump et al., USA, 2019 [7]	4186615 PTB	Chronic kidney disease	<37 weeks	1.94 (95% CI: 1.74 to 2.16)
			22-27 weeks	3.01 (95% CI: 1.67 to 5.45)
			28-33 weeks	2.22 (95% CI: 1.79 to 2.75)
			34-36 weeks	1.84 (95% CI: 1.62 to 2.08)
			37-38 weeks	1.30 (95% CI: 1.20 to 1.40)
			39-41 weeks	1.00 (95% CI)
			≥42 weeks)	0.98 (95% CI: 0.88 to 1.09)
He et al., 2020 [8]	3030 PTB	Lung function impairment	≤ 34 weeks	Lower FEV1/FVC and FEF25–75%. Indicating airway impairment
		Lower birth weight		Lower birth weight in boys was observed
Seppälä et al., Finland, 2020 [32]	12,222 PTB Diseased: n = 2,029 Controls n = 10,103	Cancer	early (<32)	n = 113 (OR 1.28, 95% CI: 1.06-1.57)
			late preterm (32-36)	n = 113 (OR 1.28, 95% CI: 1.06-1.57)

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			term (≥37 weeks)	n = 1,888 The risk of AML, retinoblastoma and germ cell tumors was increased among the preterm compared to term.
Mohlkert et al., Sweden, 2021[33]	176 PTB	altered cardiac phenotype	< 27 weeks	PTBs have smaller right atria, right ventricles with smaller widths, higher relative wall thickness and higher estimated pulmonary vascular resistance (PVR)
Kumari et al., UK, 2021[34]		Cardio metabolic disease	29 weeks	higher basal and non-ATP-linked mitochondrial respiration

Table 2: Studies that observed the effects of preterm birth which manifest in early childhood and adulthood

DISCUSSION

To our knowledge, this is the first comprehensive review that summarize the potential causes and effects of PTB. Preterm birth is the commonest reason of death and disease in newborns, particularly in low-income countries [35]. Collectively greater than malaria, AIDS and tuberculosis, the largest contributor to neonatal mortality is premature birth [36]. Severe previous tragic events and significant social problems are experienced by women laboring prematurely. One of the dominating causes of PTB in women includes unstable microbiome community as indicated by the analysis of serial vaginal samples of pregnant women [21]. The particular channel of events leading to PTB are linked with the pro-inflammatory immune response against bacterial infection. The advanced culture independent gene amplification technology has estimated the proportion of infection related PTB to be higher than 50% [36]. The vaginal microbiota dominated by lactobacilli prevents the spread of bacterial pathogens. The vaginal pH ≥ 4.7 is the strong indicator of deficiency of lactobacilli. Therefore, to prevent at risk pregnancy, females should screen their vaginal pH [37, 38]. Most studies have reported that intrauterine infection ultimately leads to dermatitis, early onset sepsis, bronchopulmonary dysplasia, psychiatric disorders, long lasting neurodevelopmental disorders such as cerebral palsy, mental retardation, periventricular leukomalacia, retinopathy of Prematurity, respiratory distress syndrome, necrotizing enterocolitis, intraventricular hemorrhage and fetal growth restriction [39-41]. Presence of hepatitis B viral DNA in placenta and trophoblast cells can predict the future link between maternal HBV infection and PTB, which ultimately leads to inflammatory reactions in placenta, a well-known contributor to PTB [20]. The presence of clinically important proteins, HBV surface antigen (HBsAg), HBV envelop antigen (HBsAg) and HBV core antigen (HBcAg) indicate infection. Out of this HBV surface antigen (HBsAg) is responsible for PTB [42]. Previous investigations have indicated that thallium exposure causes inflammation and oxidative stress. Which ultimately changes the mitochondrial functionality, increases the production of reactive oxygen species, results in peroxidation of liposomal membranes and disintegrates the membrane potential of mitochondria [23]. Thallium exposure during pregnancy decreases the gestational duration which ultimately leads to PTB [43, 44]. Vitamin D insufficiency is associated with a greater risk of preterm birth [17]. The action of activated form of vitamin D, 1, 25-dihydroxyvitamin D, is affected by decreased concentration of circulating 25(OH) D. which ultimately increases inflammatory reactions, immune system dysregulation and activate genes playing role in placental functions. These are some of the physiologic ways for the pathogenesis of preterm birth [45, 46]. Genomic variations at many loci are linked with gestational age and ultimately cause PTB through their formerly recognized roles in maternal nutrition, vascular control and uterine development [11]. In 3rd trimester maternal arsenic level have significant impact on birth outcomes [24]. Pregnancy is a period of vibrant growth. Sensitive windows of prenatal chemical exposure are established to ensure proper fetal growth. Arsenic can easily cross the placenta. The prenatal exposure to arsenic can impair fetal growth, cause spontaneous abortion and neonatal mortality [47]. Very preterm birth and low birth weight are more common in HIV exposed unaffected neonates. Low gestational age cause immature development of gastrointestinal, metabolic and respiratory and immune system. HIV exposure and additional complications poses amplified burden on health care system [18]. An autoimmune pregnant female experience greater risk of PTB but there is an inadequate understanding of the reasons behind these obstetric complications linked with these diseases. Many autoimmune diseases are linked with immune system dysfunction and vascular complications with ultimately cause obstetrics complications [14]. High ozone level increase risk of PTB through oxidative stress and systemic inflammation. The road traffic noise increase risk of PTB and stillbirth by causing hypertension [15]. Thyroid hormones are very essential for fetal growth as the fetal supply of thyroid hormone do not get started until 20 weeks of pregnancy so fetus depends entirely on maternal thyroid hormone supply. The Past studies indicated that maternal thyroid dysfunctionality in first and second trimester of pregnancy can cause dangerous outcomes like low birth weight and preterm birth [25]. Maternal protein status is

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crucial for newborn's health past studies depicted that mother with proper intake of protein diet faces very less risk for preterm birth. Protein play key role in protective mechanisms against infection and inflammatory responses are controlled by proteins. Ultimately protein deficiency causes infection and inflammatory responses [26]. In pregnant females with no obvious signs COVID-19 (SARS-CoV-2) virus may cause preterm labor. Its biological evidence is that female reproductive tract express angiotensin converting enzyme type 2 (ACE-2) receptor. Its expression is highly increased during mid to end of gestational period and provide vasodilatory effects stimulated by its products named angiotensin 1 to 7. Basically ACE-2 is the enzyme which COVID-19 uses to enter into cell and once it reaches the reproductive tract, it causes the decrease in vasodilation by down regulating the ACE-2 receptors which highly stimulate the vasoconstriction by angiotensin II and leads to stimulation of uterine contractions and ultimately causes preterm birth [19]. Newborns surviving preterm birth have significant chance of subsequently developing major health problem. One of the lethal outcomes of PTBs includes 3 to 17 times amplified risk myocardial infraction. Cardiomyocytes which play an important role in cardiac growth develop immaturely after PTB which ultimately lead to extra uterine conditions that affect normal cardiac functioning. Echocardiographic study showed delayed maturation of myocardium and left ventricular diastolic dysfunction in preterm infants [33]. Altered brain development is evidenced in preterm infants. Decreased cortical and gray matter volumes, evidenced by tissue segmentation causes neurodevelopmental and neurocognitive disabilities forecast by decreased cortical surface area. At 12 year of age delay in cognitive abilities are evidenced in preterm children as a result of which they continued to require numerous educational supports [29]. Gestational age of about 32 weeks or less causes the decrease in insulin sensitivity in children. Similar reduction in 24- or 32-weeks' gestation indicate the presence of specific time period during which insulin sensitivity is eternally changed. The reduction in diameter of abdominal aorta in spite of high pressure indicates the structural basis of difference which is due to ceased aortic development after PTB [27]. Most active fetal nephrogenesis take place during third trimester and PTB interrupts the kidney maturation which ultimately leads to advanced kidney disease and hypertension [7]. Extreme preterm neonates may face airways obstruction which cause them to be highly prone to asthma. First 1000 days of pregnancy are the crucial period for respiratory health. PTB may damage airway development which indirectly cause cardiovascular related risk factors. Previous studies have reported that birth weight is affected by prematurity and it is inversely associated by restrictive lung functions [8]. Preterm infants face high level of oxidative stress which along with causing retinopathy and dysplasia, is highly carcinogenic. One other reason for the association of preterm birth with cancer is that premature infants are excessively exposed to X-rays for diagnostic purposes during early life which is the potential risk factor for cancer [32]. Constrained fetal growth in uterus effects numerous organ systems which could raise the risk factor for hypertension and coronary heart diseases later in life [48, 49]. The developmental programming of blood pressure involved many central, vascular and renal regulation [50]. Towards the end of gestational period, the placental estrogen and progesterone elevates significantly [51]. The untimely delivery causes the abrupt ending of placental steroids. Previous studies have reported that abnormal retinal vascularization is due to irregular supply of estrogen [52]. During angiogenesis, a preterm cut in estrogen supply can hinder the expression of estrogen receptors, recent studies have paroposed its link with atherosclerosis [53].

CONCLUSION

By summarizing causes and effects of PTB, this review will help clinicians to overcome the major causes of birth mortalities and to improve the outcomes of at-risk pregnancies.

Conflicts of Interest

The authors declare no conflict of interest.

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Commentary

Causes and Precaution of Breast Cancer Among Women

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ABSTRACT

Cancer is one of the severe health problems recognized around the globe. As a primary health concern, causes and precautionary measures are still unknown to the public. Therefore, the purpose of this study was to review the available literature to unpin the causes and precautionary measures of breast cancers among women. The available literature indicates that heredity, ageing, obesity, alcohol use, smoking, radiation exposure and hormone replacement therapy are the common causes of breast cancer among women. The literature also suggests that avoiding the use of alcohol, smoking, physical inactivity, maintaining weight, limiting postmenopausal hormone therapy etc., are the best precautionary measures for consumers among women.

INTRODUCTION

Pakistan is one of the repaid growing countries in Asia. Likewise, breast cancer is also a significant health issue in Pakistan. In rural areas of Pakistan, due to inherited diseases, the problem of breast cancer is developing rapidly among young females. Likewise, ovarian, cervical and uterine cancers are common problems faced by rural and urban women in Pakistan [1]. Breast cancer is a universal health problem among women; thus, every year, many women are detected with breast cancer. Cancer starts when cells begin to grow out of control. Tissues of the breast are made up of milk-manufacturing glands known as "lobules"; thus", they connect the lobules to the nipple. In addition, the breast also comprises lymphatic, connective and fatty tissues [2]. Studies show that heredity, ageing, obesity, alcohol use, smoking, radiation exposure and hormone replacement therapy are the common causes of breast cancer among women. Smoker women have a great risk of breast cancer. The study also showed that females who have been smoking for ten years are 10 % higher risk of breast cancer [3-5]. As per the report, in 2015, 1.1 billion individuals around the globe smoked tobacco. The prevalence of adult smoking in the UK, as per a survey in 2016, was 16%. Thus the ratio was found more in males as compared to women. In addition, the most severe problem, i.e. cancer, is considered associated with smoking [6, 7]. Research evidence shows that breast cancer is associated with smoking. To avoid breast cancer or to prevent breast cancer, it is essential, particularly for affected females of breast cancer, to reduce or to change their lifestyle patterns, particularly

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smoking and other drugs usages [8]. Epidemiology of common cancers indicates that breast cancer is totally related to family history means that breast cancer is associated with heredity. Family history is being viewed during prostate cancer [9]. As breast cancer is considered linked with heredity, parents having breast cancer are always at a great threat of breast cancer than the general population and thus it's called the history of cancer. Similarly, relatives of first degree such as mothers, sisters and daughters having the problem of breast cancer, approximately double the risk of breast cancer. It is higher in that parent where breast cancer is developed under the age of 50 years [10-13]. The problem of cancer has been monitored since 1973 in the United States. Many health problems are concerned with age. It means that health problems, including breast cancer, are developed almost at age 55. As per the survey of the Epidemiology and End Results Program (SERP) of the National Cancer Institute (NCI), ratio of breast cancer has augmented by about 15% over the past three decades in the US. In this ratio, the age factor is considered responsible [14]. According to World Health Organization (WHO), physical inactivity has profound health implications among people. Thus it was estimated by WHO that Approximately 2 million deaths per year are caused by physical inactivity. The WHO report also highlighted that physical inactivity is one of the ten leading causes of death [15]. Physical active women have a lower risk of breast cancer than physically inactive women. The result of a study conducted by [16] concluded that physically active women have 12 to 21% lower risks of breast cancer than physically inactive women. Physical activity has been related to similar decreases in breast cancer risk among premenopausal and postmenopausal women. Women with high levels of physical activity have a lower risk of breast cancer [17, 18].Despite a family cancer history, Women who engage in low as well as moderate-intensity exercise for more than three hours per week have 30 to 40% lower risk of breast cancer [19]. Ionizing radiation refers to the radiation of a particular wavelength. It has enough energy, which damages DNA and causes certain types of cancer. Ionizing radioactivity comprises radon, gamma rays, x-rays, and other natures of high-energy radioactivity [20]. Harmon replacement therapy (HRT) that used for reducing the symptoms of menopause (Menopause is a point or stage in time twelve months subsequently a woman's last menses period). Hormones are chemical messengers, and they affect growth, fertility and mood. During the period of menopause, the ovaries produce less amount of oestrogen. During this period, females may experience menopausal symptoms, such as hot flashes and mood changes. To reduce the symptoms of menopause, HRT can help. Long-term use of HRT may cause cancers among females [21-24]. Obesity is a health problem. It is the state where the fats collect in excessive amounts in the body. Obesity may cause different health problems such as diabetes, high blood pressure, cardiovascular disease, stroke, and at least 13 types of cancer, as well as having a high risk of death from all causes [25-28]. Multiple types of cancers such as breast (post-menopausal), colorectal, endometrial, oesophagal (adenocarcinoma), gall bladder, gastric cardia, kidney (renal cell), liver, meningioma, multiple myeloma, ovary, pancreas, and thyroid are associated with obesity. International Agency for Research on Cancer (IARC) reported that up to 20% of cancers are due to obesity [29, 30].

CONCLUSIONS

Based on analysis of previous epidemiological studies indicated that cancer is a serious health problem associated heredity, ageing, obesity, alcohol use, smoking, radiation exposure and hormone replacement therapy are the common causes of breast cancer among women. The literature also suggests that avoiding the use of alcohol, smoking, physical inactivity, maintaining weight, limiting postmenopausal hormone therapy etc., are the best precautionary measures for consumers among women.

Conflicts of Interest

The authors declare no conflict of interest

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