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CLINICAL PERSPECTIVE

CASE REPORT

EDITORIAL

PUBLIC HEALTH AND CLINICAL SCIENCE A HISTORICAL PERSPECTIVE

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This editorial may be cited as: Gul R. Public health and clinical science a historical perspective. J Med Sci 2022 April;30(2):107-108

Medical students entering medical schools have a negligible idea about public health, just like me. I wanted to be a doctor to treat the sick. But during the internship, I saw children, and adults who were very sick. While looking after them, which made me wonder: why did this child end up like this in ICU who was involved in a motorbike accident? Why was this underage child driving a bike? Why was he not wearing a helmet? Why was this patient smoking when it's known to them the damage smoking can cause and can predispose them to lung cancer? The answer to these questions is always there in the textbooks of medicine under the heading of epidemiology where not only causative agent is identified but also preventive strategies are discussed. But in practice, prevention is underestimated.

As a public health expert, I observed that medical students in year 4, for the first time, are exposed to the concept of public health. They have to do the mandatory research and appear for the assessments at the end of the year. To tackle this issue, public health awareness sessions are arranged for undergraduate students. But due to a lack of awareness, only a few show interest. In our experience, by inviting clinicians, who talk about their experiences as a clinician and as public health workers, the students listen intently and at the end of the session, they either want to work with them as clinicians or as public health workers in the community. It has been observed that clinicians working in the community make them better doctors and practicing medicine makes them better clinicians.

The perception of a split or division between public health and clinical is sciences caused by differences in opinion or belief. As this drift is hundred years old rather than a decade old. But this was not always so. Medicine and public health were always joined impeccably in 1800 when physicians like John Snow identified the cause of the Cholera outbreak by using the essential tools of epidemiology. [1] When Robert Koch, a physician, and microbiologist, discovered the etiology infectious diseases like tuberculosis, cholera, and anthrax.[2] Edward Jenner, a physician, and scientist created the Smallpox vaccine.[3] The leading physicians of their time worked hand in hand with public health. But then in early 1900; the report of Abraham Flexner with a group of experts was published- "the Flexner Report", suggesting a four-year curriculum for undergraduate medical education, with two years each of basic science and clinical science. [4] As a result, more than 200 medical colleges either merged or were closed to improve the quality of medical education. But it resulted in a chockfull curriculum with very little room for public health.

So, the experts all over the world got together to educate the communities about improving their effective measures, as this opportunity was not available in medical schools. In 1915, Welch–Rose reported to have independent Public health schools as a result of which public and medical schools were established all over, and these schools grew apart in succeeding years, as they have striven for the scarce resources available. [5]

Now, the current curriculum has topics on public health right from the first year to the final year but the cold dark reality is the drift between public health and medicine is still there. Medicine still focuses on diagnosis and treatment often in for-profit settings where incentives are for more care with rising costs. Public health on other hand is focusing on prevention in non-profit settings where the goal is better health with crumbling infrastructure. This drift is a challenge for us to move forward. A physician talks to an obese patient about what can they offer medicine to treat diabetes, drugs to reduce weight, and in extreme cases surgery. But when this patient leaves the clinic, he is faced with a dilemma like how much time they spend in the car, screen time, sedentary lifestyle, and fast food which is not addressed in clinical settings.

To address this rift and bring medicine and public health together: prevention is better than cure, resulted in the growth of undergraduate public health education in accredited schools and programs that proceeded rapidly from 2003–2005. By 2005, data collected by the Associa-

tion of Schools of Public Health indicated that the majority of accredited Schools offer graduate public health education, both as majors, minors, or individual public health programs for undergraduates. [6] However, there was still much more to do to bring education for public health to the majority of undergraduates. Undergraduate education for public health has been a game-changer as the emergence of undergraduate education for public health is already shaping the view of public health in the communities.

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ORIGINAL ARTICLE

THE EFFECT OF INHALED MILRINONE ON PULMONARY ARTERIAL PRESSURE IN PATIENTS UNDERGOING CARDIAC SURGERY

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ABSTRACT

Objective: To find out the effect of inhaled Milrinone on pulmonary arterial pressure in patients undergoing cardiac surgery.

Methods: A randomized controlled trial was done at Peshawar Institute of Cardiology in 78 patients who had preoperative pulmonary hypertension and had undergone cardiac surgery between the ages of 3 months and 60 years. Divided into 2, group 1 received Intravenous (IV) Milrinone and group 2 received Inhalational (IN) Milrinone. MANOVA was used to compare the difference between two groups across six dependent variables i.e., Heart rate (HR), systolic arterial pressure (SAP), Central venous pressure (CVP), Systolic pulmonary arterial pressure (SPAP), Diastolic pulmonary arterial pressure (DPAP) and mean pulmonary arterial pressure (MPAP) at three stages; baseline, end of nebulization, and after cardiopulmonary bypass (labeled as stages 1,2 and 3). Intraoperative complications like weaning from cardiaopulmonary bypass (CPB) machine, use of vasopressor, insertion of intra-aortic balloon pump (IABP), and cardiopulmonary re-initiation were also observed in both the groups. Analysis of the data was done through SPSS-23.

Results: In a total of 78 patients (39 in each group), an insignificant change was observed regarding the effects of IN Milrinone on HR, SAP, and CVP whereas significant effects of Inhaled Milrinone on SPAP, DPAP, and MPAP were observed (P-values <0.05).

Conclusion: The use of inhaled Milrinone was beneficial in patients with pulmonary hypertension in the prevention of Intraoperative complications like difficulty in weaning from CPB, insertion of IABP, and use of vasopressors, while CPB re-initiation was observed less in patients with inhalational milrinone as compared with intravenous administration while reducing their length of stay in ICU.

Key Words: inhaled Milrinone, pulmonary artery pressure, cardiac surgery.

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INTRODUCTION

Patients who have cardiac surgery are significantly more likely to experience preoperative morbidity and mortality if they have pulmonary hypertension (PHT).[1] It has been hypothesized that PHT may account for up to 58 percent of early postoperative mortality.[2] PHT, which is brought on by high left atrial pressure, is a common and serious consequence following cardiac operations, particularly in the context of congenital heart disorders.[3] It is typically observed in people who have mitral valve disease and may be made worse by endothelial dysfunction brought on by cardiopulmonary bypass-associated lung injury following mitral valve replacement and other cardiac procedures.[4]

Nitric oxide (INO) inhalation, injectable phosphodiesterase inhibitors, and inhaled epoprostenol are used to treat PHT in clinical settings (IPGI2).[5] A type III phosphodiesterase inhibitor called milrinone affects vascular smooth muscle cells by raising the level of cyclic adenosine inside the cells. [6] Intravenous Milrinone increases the risk of systemic hypotension, increases inotropy, and increases the need for adrenaline and non-adrenaline. [7] Additionally, in developing nations like Pakistan, the routine use of inhaled nitric oxide and epoprostenol is expensive and complicated. On the other hand, Milrinone for inhalation is less expensive and more widely accessible. [8] Milrinone is demonstrated to reduce pulmonary reperfusion syndrome more effectively when inhaled than when administered intravenously before and during CPB. [9] The use of inhaled

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Milrinone in heart transplant patients undergoing cardiac catheterization has not been shown to have any significant side effects in only two investigations. [10]

In the context of cardiothoracic anesthesia, medications that reduce pulmonary arterial pressure (PAP) and pulmonary vascular resistance (PVR) while having no effect on systemic vascular resistance (SVR) are of particular therapeutic importance. [11] Inhalation as a route of PHT treatment as well as the introduction of innovative strategies to maximize drug administration has been the focus of recent studies. [12] By focusing primarily on pulmonary circulation, inhaled vasodilators may avoid potentially harmful systemic side effects.

The aim of this study was to show that inhaled Milrinone administered before CPB could be helpful in weaning patients of CPB in high-risk patients.

MATERIAL AND METHOD

After ethical approval from the hospital ethical committee, a randomized controlled trial of 78 patients undergoing cardiac surgery receiving both intravenous and inhaled Milrinone from September 2020 to November 2021 was conducted at Peshawar Institute of Cardiology (PIC). Patients were equally divided into 2 groups, where group-1 (n=39) received Intravenous (IV) Milrinone and group-2 (n=39) received Inhalational (IN) Milrinone. All patients had preoperative risk assessment by the ASA scoring system. In group 1, 46% were male, 35% were female and 17% were children, whereas group 2 had 56% male, 20% female, and 20% children under 6 years of age.

All patients were monitored by electrocardiogram, radial artery catheter, pulse oximetry, and capnography. Anesthesia was induced with fentanyl, midazolam, and rocuronium and maintained with isoflurane. Blood cardioplegia was used in all included patients. Temperature 32° C was controlled for coronary artery bypass procedures. Weaning from cardiopulmonary bypass was attempted after sustaining a temperature of >36° C.

All the cases were performed on a cardiopulmonary bypass machine (CPB). Pulmonary hypertension in the post-operative period was managed with intravenous Milrinone only in our study due to the non-availability of other products such as nitric oxide, prostaglandin, and inhaled clopidogrel used in developed countries. Intra-operative events such as hemodynamic stability, difficulty in weaning from CPB, Post-operative respiratory support, mortality, and length of ICU stay were analyzed. Intra-operative Hemodynamic instability was defined as systolic pressure < 90 mmHg, pulmonary artery diastolic pressure > 18mm Hg after weaning of CPB. High inotropic support along with the use of an intra-aortic balloon pump (IABP) was considered a difficulty in weaning from CPB.

Transthoracic echo was used to obtain PA pressures preoperatively and pressures >20mmHg were considered Pulmonary Hypertension. Left ventricular functions were noted as well. EF >50% were considered normal.

Inhaled Milrinone at a dose of 0.1mg/kg was used in group 2 patients. The drug was administered via endotracheal tube using a nebulization chamber just before the termination of CPB. Nebulization was performed with a jet nebulizer attached to the inspiratory limb of the ventilator using a flow of 10 liters of oxygen. Nebulization was initiated when the temperature reached 34° C. The minute ventilation was adjusted to achieve peak airway pressure of <30cm of water. The patients` characteristics were expressed in frequencies and percentages. Multivariate Analysis of Variance (MANOVA) was used to compare the difference between two groups (Intravenous milrinone vs. Inhalation milrinone) across six dependent variables i.e., HR, SAP, CVP, SPAP, DPAP and MPAP at three stages; baseline, end of nebulization, and after cardiopulmonary bypass (labelled as stages 1,2,3 for each variable). MANOVA analysis bring out the mean difference and statistical significance of differences among groups (Garcia, 2017). [13] It uses multivariate F-test (Pillai's trace, Wilk's Lambda, Hoteling's Trace, Roy's largest root) to check the differences in HR, SAP, CVP, SPAP, DPAP and MPAP among patients given Intravenous milrinone and Inhalation milrinone.

RESULTS

A total of 78 patients, both male and female were divided into two groups with 39 patients in each had similar preoperative characteristics as shown in table No.1. Types of cardiac surgeries in both groups are shown in Table No. 2.

Table No 3, shows that complications like difficulty in weaning from CPB, insertion of IABP, use of vasopressor, CPB re-initiation, and Intensive care in hospital were less in patients receiving inhalational milrinone as compared to patients receiving intravenous milrinone.

Hemodynamic Variables between 2 groups with their level of significance are shown in table No.4. It shows the overall and group means and standard deviations for each dependent variable. The mean and standard deviation of HR-1 for Intravenous milrinone (IVM) is 74.79 ± 6.37 and 73.59 ± 4.71 for Inhalation Milrinone (INM).

Figure 1 and table 4 shows that there is no significant effect of Inhaled milrinone and Intravenous milrinone on HR-1, HR-2, HR-3, SAP-1, and CVP-1, while the p-values of SAP-2, SAP-3, CVP-2, CVP-3, SPAP-1, SPAP-2, SPAP-3, DPAP-1, DPAP-2, DPAP-3, MPAP-1, MPAP-2, and MPAP-3 are less than 0.05 that suggest a significant effect of Inhaled milrinone and Intravenous milrinone on these variables.

Table 1: Preoperative characteristics

Preoperative characteristics	Intravenous Milrinone group		Inhaled Milrinone group	
	n = 39	%	n = 39	%
Male	18	46%	22	56%
Female	14	35%	8	20%
children	7 (6 male, and 1 female)	17%	9 (6 male, and 3 females)	23
Hypertension	25	64.1%	21	53.8%
Left ventricular dilatation	17	43.5%	23	58.5%
Left ventricular hypertrophy	27	69.5%	20	51%
ASA score	3.4	8.7%	3.4	8.7%

Table 2: Operative procedures

Types of operation	Intravenous Milrinone group 1 n= 39	Inhaled Milrinone group 2 n= 39
CABG	15	14
Aortic valve replacement (AVR)	10	7
Mitral valve replacement (MVR)	7	9
Atrial Septal Defect (ASD)	3	6
Total corrections	4	3

Table 3: intra operative complications

Complications	IV Milrinone	Inhalation Milrinone
Difficulty weaning from CPB	16	10
Insertion of IABP	9	7
Use of Vasopressor	7	5
CPB re-initiation	6	4
Hospital Stay(days)	10 days	5 days

Table 4: Hemodynamic Variables between 2 groups with their level of significance

Hemodynamic Variable	IV Milrinone (mean values with SD) n= 39	Inhaled Milrinone (mean values with SD) n= 39	P. Value
HR-1	74.79 ± 6.371	73.59 ± 4.711	.345
HR-2	70.51± 4.893	70.59 ± 5.646	.949
HR-3	81.36 ± 5.358	80.59 ± 4.296	.486
SAP-1	77.64 ± 7.325	76.90 ± 5.688	.618
SAP-2	86.41± 5.861	89.00± 4.460	.031
SAP-3	85.21± 4.311	78.21 ±6.075	.000
CVP-1	15.49 ± 3.068	15.51± 2.684	.969
CVP-2	13.79± 2.802	11.26 ± 1.390	.000
CVP-3	14..24 ± 2.192	12.00 ± 2.128	.000
SPAP-1	39.56 ± 6.958	42.95 ± 5.083	.016
SPAP-2	20.33± 3.405	23.08± 4.035	.003
SPAP-3	20.33 ± 3.405	28.67 ± 5.142	.000
DPAP-1	41.92± 6.788	36.38 ± 5.019	.002
DPAP-2	21.62 ± 3.566	19.15 ± 4.301	.000
DPAP-3	28.00± 4.707	24.62± 4.452	.002
MPAP-1	42.21± 5.786	34.59 ± 5.369	.000
MPAP-2	41.64 ± 5.728	16.23 ± 2.924	.000
MPAP-3	28.44± 3.235	22.00 ± 3.606	.000

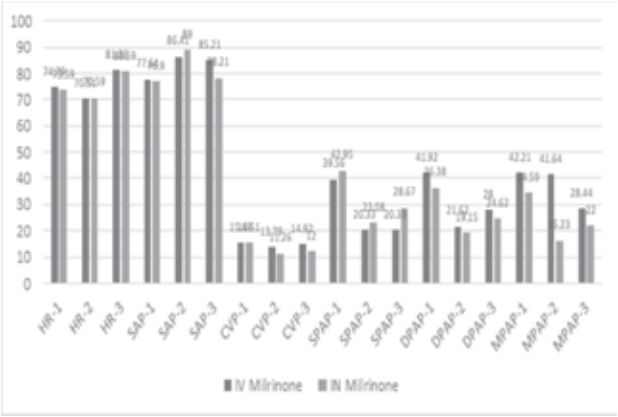

Fig 1: Hemodynamic parameters in both groups at 3 stages

DISCUSSION

The major findings of the study are that patients with pulmonary hypertension in cardiac surgery can benefit from a single dose of 0.1 mg/kg during Cardiac surgery in terms of separation from CPB, length of stay, and hemodynamic stability. The use of the inhaled route for milrinone (INM) has been described in two animal and human studies. [14, 15] In both the studies, the mean pulmonary arterial pressure (mPAP) was above 30 mmHg with 2 mg IVM in heart transplant surgery. A 1mg of inhaled milrinone was administered to patients undergoing different congenital cardiac procedures showing reduced pulmonary arterial pressure, and higher MAP over mPAP ratio before CPB. Administration of milrinone in smaller doses before and during CPB would result in uniform distribution and penetration in the lung parenchyma, protecting pulmonary vasculature during weaning from CPB when most ischemic reperfusion injury occurs. [16] Administration of the drug during CPB leading to diversion of the blood from the pulmonary arterial bed could explain this longer duration as the drug would diffuse in poorly irrigated lung parenchyma during the CPB run.

As an alternative to inhaled nitric oxide and inhaled prostacyclin, inhaled milrinone (INM) is also less expensive and does not require a complex setup and monitoring of toxic metabolites. It is readily available in operating rooms and needs no special preparation, as opposed to inhaled prostacyclin.

Administration of (INM) has the advantage of protecting pulmonary vasculature during weaning from CPB when ischemic reperfusion injury occurs through a more uniform distribution and penetration in mechanically ventilated lungs. INM Before CPB could prevent the reperfusion syndrome. [17] Our Study data support the efficacy and clinical use of inhaled milrinone in cardiac surgery, and it has the advantage over Nitric oxide, Epoprostenol, and other inhaled agents used in patients to treat pulmonary hypertension in cardiac surgery. Inhaled milrinone has the advantage of being simpler, cheaper, and easily available in operation rooms rather than other expensive inhaled medications which require a complex setup during operative procedures.

One of the limitations of the study is that it is a single-center experience, and covered many surgeries where proper group comparison might not be possible. Multicenter, large-scale RCTs are required to further validate these observations.

CONCLUSION

The use of inhaled Milrinone was beneficial in patients with pulmonary hypertension in separating them from the coronary bypass machine. Intraoperative complications like difficulty in weaning from CPB, insertion of IABP, use of vasopressor, duration in ICU, and CPB re-initiation in patients were less with inhalational milrinone, as compared to intravenous administration. Nebulized milrinone is simpler and more cost-effective than nitric oxide. This makes inhaled milrinone an attractive option in cardiac surgeries.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Anwar K: Data collection, literature search, writing up.

Shah SSA: Data analysis

Ehtisham S: Conceived the idea

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

ORIGINAL ARTICLE

EFFICACY OF UNDERLAY VERSUS OVERLAY TECHNIQUE FOR MYRINGOPLASTY IN TERMS OF HEARING IMPROVEMENT

Muhammad Arif, Muhammad Mudassar, Allah Noor, Asmatulllah Khan, Qaisar Khan, Saeed Khan

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ABSTRACT

Objectives: To compare the efficacy of the underlay and overlay techniques for myringoplasty among patients with perforated tympanic membrane in terms of improvement in the hearing.

Material and Methods: This study was performed in the department of ENT Hayatabad Medical Complex, Peshawar from January 2019 to December 2019. A total of 164 patients were randomly allocated into two groups. In group A patients (n=82), the underlay technique was performed while in group B patients (n=82) overlay technique was performed. Temporalis fascia was used for grafting in all cases. All procedures were performed under general anesthesia. All patients were followed at 3 months to determine the effectiveness in terms of improvement in the air-bone gap of at least 10db.

Results: As per efficacy in both groups, in Group A, 70 (85.36%) patients showed effectiveness while in Group B, only 52 (63.41%) patients showed effectiveness (P-Value < 0.001).

Conclusion: The underlay technique improved the air-bone gap by at least 10dB in a significantly (P < 0.001) higher number of patients as compared to the overlay technique.

Keywords: Myringoplasty, Overlay, Underlay, Tympanic Membrane.

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INTRODUCTION

Myringoplasty is a surgical procedure performed for the reconstruction of the eardrum[1]. Perforation closure with a dry stable grafted membrane and improvement in hearing level is the aim of this procedure[2]. The concept of myringoplasty was first introduced in 1878 by Berthhold who used full-thickness skin graft to repair tympanic membrane perforation. Since then many changes in technique and material have been made[3]. Persistent perforations occur either due to improper treatment of recurrent middle ear infections or infected traumatic perforation.

There are two classical techniques of myringoplasty- the overlay and underlay techniques. The overlay technique is commonly performed through the permeatal approach while the underlay technique is carried out via the endaural approach. As no such study on this topic has been done in our population, so this study will determine the latest and updated information about the efficacy of underlay and over techniques for myringoplasty among patients with the perforated tympanic membrane.

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MATERIAL AND METHODS

All patients were randomly allocated into two groups by lottery method. Patients in group A were subjected to underlay and patients in group B were subjected to overlay technique for myringoplasty. Patients with perforation in only one quadrant of the pars tensa were termed small perforations. Perforations involving two quadrants were termed medium size while those involving all quadrants of pars tensa were termed subtotal perforations. Temporalis fascia was used for grafting in all cases. All operations were done under general anesthesia. The overlay technique was performed through the permeatal approach. Margins of perforation were debrided, and squamous epithelium was elevated from the tympanic annulus and the tympanic membrane remnant. The graft was placed lateral to the annulus. The underlay technique was carried out via an endaural approach tympanomeatal flap based on superior vascular pedicle was elevated along with the annulus. The middle ear was packed with small pieces of spongeston. The graft was placed over the handle of the malleus, medial to the annulus. Small pieces of spongeston were placed over the graft to stabilize it. Gauze pack soaked in the antibiotic ointment was placed in the meatus for 1 week. The prophylactic antibiotic cover was given for five days. Those patients with a pre-op air-bone gap (ABG) of more than 40 dB were excluded from

the study. All patients were followed at 3 months intervals to determine the effectiveness in terms of improvement in the air-bone gap of at least 10dB. Post Op patients in which graft was not taken were excluded from the final analysis.

RESULTS

We have carried out this study on 164 patients (82 in each group) at the Department of ENT, MTI-HMC, Peshawar from January 2019 to December 2019. Table 1 shows the demographic details between the two groups. Table 2 shows the efficacy of the procedures between the two groups with significant difference.

Table 1: Demographic details of the patients included in the study

	Group A	Group B
Mean (±SD) age at presentation	**31±8.37 years**	**32±6.36**
Mean (±SD) duration of disease	8±1.17	8±1.13
Number of patients with age 18-30 years	40 (48.78%)	40 (48.78%)
Number of patients with age 31-40 years	26 (31.7%)	30 (36.6%)
Number of patients with age 41-50 years	12 (14.63%)	09 (10.98%)
Number of patients with age 51-60 years	04 (4.88%)	03 (3.66%)
Male patients	48 (58.53%)	44 (53.65%)
Female patients	34 (41.46%)	38 (46.34%)
Male to Female ratio	1.41: 1	1.16:1
Small Perforation	12 (14.63%)	13 (18.85%)
Medium Perforation	35 (42.68%)	34 (41.46%)
Subtotal Perforation	35 (42.68%)	35 (42.68%)

Table 2: frequency of efficacy in the two groups (n=164)

Efficacy	GROUP A (n=82)	GROUP B (n=82)	P VALUE
Yes	70 (85.36%)	52 (63.41%)	0.001
No	12 (14.63%)	30 (36.58%)	
Total	82 (100%)	82 (100%)	

DISCUSSION

In this study, we evaluated the role of myringoplasty in the surgical management of patients presented with the perforated tympanic membrane. The demographic data of these patients were recorded, summarized, and examined to characterize any possible trends. Comparison of pre-and post-surgical audiometry (i.e., at three months follow-up) patient's hearing improvement after myringoplasty was assessed. The treatment was considered successful for hearing improvement of ≥ 10 dB.

Patients undergoing each type of myringoplasty (i.e., underlay and overlay techniques) showed improvement in hearing. However, a significantly higher number of patients (85% versus 63%: $p < 0.001$) in Group A (underlay technique) showed hearing improvement as compared to the patients in Group B (overlay technique). The high success rate of both underlay and overlay techniques may be attributed to the patient selection criteria used herein. Specifically, we excluded patients presenting with severe disease, such as signs of mastoid or ossicular pathology. Moreover, the relatively higher success rate achieved with the underlay technique seems to be contributed by many factors. In particular, the underlay technique requires reduced surgical manipulation of the middle ear structures, which ultimately leads to faster healing. Also, the underlay technique is technically easy, less time-consuming, time-consuming assessment of ossicular chain integrity/mobility, and typically has fewer minor complications.

The results of this study are consistent with that of previous studies- both reported locally and internationally. For example, a success rate of 92% (n=23/25) has been reported for the underlay technique in the Indian population[4]. Likewise, a graft uptake rate of 89.18% and a mean hearing improvement of 11.72 dB after myringoplasty (i.e., overlay technique) has been described[5]. Moreover, underlay myringoplasty was performed in 52 patients; the follow-up showed that the procedure was anatomically unsuccessful in five cases. Also, a comparison of underlay and overlay techniques demonstrated better air bone gap improvement and hearing gain in the underlay group[6]. A success rate of 91.5% in a group of 46 patients was achieved with the overlay technique, without observing lateralization of the graft in any case, and a mean air-bone gap improvement of 16.55 dB[7]. Furthermore, the graft take rate was 85% for the underlay technique at the last follow-up visit, while an air-bone gap closure was 9.3 ± 3.2 dB[8]. The underlay technique was used in 554 patients (259 males, 295 females) and resulted in an 88.8% (489 cases) success rate[9].

Overall all these studies illustrate that myringoplasty is an effective treatment for perforated tympanic membrane. The slight differences in the results of different studies may be contributed by several factors. For example, the size of the perforation has been reported as a major factor in the success of Myringoplasty[10,11]. Hyaluronic acid fat graft myringoplasty (HAFGM) has been suggested for large perforations in the tympanic membrane[12,13]. The site of the perforation is also very critical. To exemplify, anterior perforations are relatively difficult to access[14,15]. The effectiveness of the procedure is commonly reduced by the lateralization and detachment of the graft during the healing process[7].

This study only focused on the effectiveness of Myringoplasty for the treatment of perforated tympan-

ic membrane. However, the post-surgical complications (e.g., lateralization of the tympanic membrane, anterior blunting, external ear canal stenosis, delayed healing, epithelial pearls, etc.) were not included, which may be considered a limitation of this study. Another important point is that the graft thickness was not measured in our study.

CONCLUSION

The effectiveness of the underlay technique was observed in a significantly higher number of patients as compared to the overlay technique. Overall, these results support the postulate that the underlay technique may be preferred for the treatment of perforated tympanic membrane.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

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Mudassar M:	material and methods
Noor A:	Proof Reading, Discussion
Khan A:	Data Analysis
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Khan S:	Data collection

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

ORIGINAL ARTICLE

PREGNANCY OUTCOMES AFTER CHEMOTHERAPY FOR GESTATIONAL TROPHOBLAST NEOPLASIA

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ABSTRACT

Objective: To find out the outcomes of pregnancy and safety of chemotherapeutic regimen in women who conceived after chemotherapy for the treatment of Gestational Trophoblastic Neoplasia.

Materials and Methods: A Prospective cohort study was done at the Department of Obstetrics and Gynecology, Hayatabad Medical Complex, Peshawar. Ninety women were followed up for pregnancy outcomes after being diagnosed with Gestational Trophoblastic Neoplasia and treated with standard chemotherapeutic regimens between June 2005-2014. After treatment, patients were followed up for a period of five years. The patients` demographic profile, FIGO score, type of chemotherapy, treatment, and pregnancy outcomes were recorded on predesigned Performa and a computerized record was kept. Data analysis was done through SPSS-16.

Results: The mean age of patients was 28.2 years (±12.5) and the mean parity was 3.39 (±1.49). Out of 90 patients diagnosed with Gestational Trophoblastic Neoplasia, 59 (65.6%) patients were of low risk and 31 (34.4 %) were in the high-risk category. Overall survival was 100% after chemotherapy in the low-risk category and 70.58% in the high-risk category. The pregnancy rate among women with the desire to conceive was 97%. The term live birth in 42 pregnancies was 85.7%, without any congenital abnormality. Five (10.2%) women had miscarriages, 1 woman (2%) had a repeat molar pregnancy, and 4 women experienced live twin birth after chemotherapy.

Conclusions: Women who underwent treatment for Gestational Trophoblastic Neoplasia can be assured positively about their pregnancy outcomes and fertility prospects in the future. Chemotherapy regimens currently used globally are highly effective and preserve fertility.

Key Words: Gestational Trophoblast Neoplasia, FIGO Prognostic score, Pregnancy outcomes

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INTRODUCTION

Gestational trophoblastic disease (GTD) is a spectrum of disorders associated with highly abnormal trophoblastic tissue. At one end of the spectrum we have premalignant forms consisting of complete and partial hydatidiform mole, while at the other end, there are malignant forms collectively termed Gestational Trophoblastic Neoplasia consisting of invasive mole, choriocarcinoma, placental site trophoblastic tumors, and epithelioid trophoblastic tumor. Human chorionic gonadotrophin produced by trophoblast cells is a useful biomarker for monitoring response to treatment and surveillance for detecting resistance or relapse.[1]

The plateaued or increasing human chorionic gonadotrophin that occurs in 0.5–1% of Partial Moles and 15–29% of complete moles, denotes progression of previously benign molar pregnancy into gestational trophoblastic neoplasia .[2] Gestational Trophoblastic Neoplasia can occur after a molar pregnancy, term pregnancies and ectopic pregnancy. Since most women who develop gestational trophoblast neoplasia are of childbearing age, preservation of fertility becomes an important consideration.[3] Worldwide, GTNs are considered to most curable amongst all gynecologic tumours, having survival rates approaching 100%, with preservation of fertility[4, 5].

Single-agent or multiagent chemotherapy can be used empirically in the treatment of post molar gestational trophoblastic neoplasia and choriocarcinoma based on International Federation of Gynecology and Obstetrics (FIGO) prognostic scoring system.[6] This system incorporates risk factors like age, antecedent pregnancy, chorionic gonadotropin levels, number, site, and size of

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metastasis. Women scoring 0-6 receive single agent chemotherapy and those scoring ≥ 7 require multi-agent chemotherapy from the outset.[7,] It is a unique gynecologic tumor with overall cure rate approaching 100% in low-risk gestational trophoblast neoplasia and almost 90% in a high risk category.[8-11]

Our study aimed to evaluate the reproductive outcomes of women in the first pregnancy, who conceived during the first year of follow-up or afterward, and to establish the safety of the chemotherapeutic regimen used for the treatment of Gestational Trophoblastic Neoplasia in women of reproductive age.

MATERIALS AND METHODS

Ninety patients with the diagnosis of GTN were treated in the Department of Obstetrics and Gynecology, Hayatabad Medical Complex, Peshawar between June 2005-2014. Patients were diagnosed with gestational trophoblast neoplasia based on clinical, biochemical, and histopathologic criteria. International Federation of Gynecology and Obstetrics (FIGO) prognostic scoring system was used to categorize patients into low-risk and high-risk groups. Low-risk patients with a score of ≤6 were given single-agent chemotherapy comprising methotrexate and folinic acid, whereas high-risk groups with a score of ≥7 were managed with combination chemotherapy, including EMA-CO (Etoposide, Methotrexate, Actinomycin, Cyclophosphamide, and Vincristine). Falling chorionic gonadotrophin levels indicated response to treatment with patient labeled as having achieved complete remission, with weekly normal hCG levels in the first month after the last chemotherapy course. In the follow-up period, serum hCG level was measured 3-monthly in the first year with the use of oral or barrier contraception to prevent pregnancy. Patients were followed up 6-monthly in the second year after chemotherapy and then advised to follow up with serum hCG levels done every year for the rest of their life.

The clinical data about the patients` age, parity, clinicopathological diagnosis, response to treatment, conception if any during follow-up, and pregnancy outcomes were recorded on predesigned Performa and a computerized record was kept.

RESULTS

The mean age of the sample was 28 years (±12.5) and the mean parity was 3.39 (±1.49). Amongst 90 patients diagnosed and treated for GTN, 59 (65.6%) patients were low risk and 31 (34.4 %) were in the high-risk category. Overall survival was 100% after chemotherapy in the low-risk category and 70.58% in the high-risk category. The pregnancy rate among women with the desire to conceive comprised 49 women and 48 pregnancies was 97%. The term live birth in 42 pregnancies was 85.7% without any congenital abnormality. Five (10.2%) women had miscarriages, 1 woman (2%) had a repeat molar pregnancy and 4 women experienced live twin birth after chemotherapy.

Pregnancy outcome measure or variable was not applicable in 41 patients that included 9 patients that died during treatment/chemotherapy, 15 patients that developed resistance to chemotherapy, and 10 patients who had hysterectomy during treatment, while 7 patients were lost to follow-up.

Table 1: Demographic Characteristics of participants

Characteristics	Value
Mean Age (Years)	28.2 years (±12.5).
Mean Parity	3.39 (±1.49).
Mean BMI (Kg/m2)	22±3.39
Nationality	70% Pakistani
	20% Afghani

Table 2: Clinical Characteristics of participants

Clinical Characteristics	Frequency	Percentages
FIGO low risk category	59	65.6%
FIGO high risk category	31	34.4%
Survival in low risk category	59	100%
Survival in high risk category	22	70.9%
No of women pregnant in follow up period	48	97%
Pregnancy outcomes in 48 patients		
Singleton and twin live births	42	85.7%
Miscarriage	5	10.2%
Repeat Molar Pregnancy	1	2%

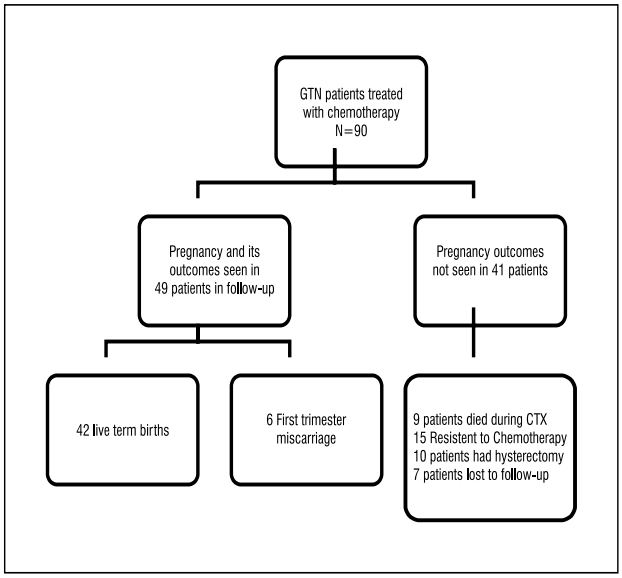

Fig 1: Follow-up and Pregnancy outcome in women treated for Gestational Trophoblast Neoplasia

DISCUSSION

Chemotherapeutic regimens used for GTN are safe and preserve fertility. [8] Worldwide survival rate of almost 100% in the FIGO low-risk category, and around 80–90 % for the high-risk category, have been reported. Our unit employed time-tested chemotherapeutic regimens that gave favorable cure rates approaching 86.7%, which are similar to local and regional figures quoted in national and international literature. However, cure rates of 100% are also being reported in western countries which are ahead of our cure rates. Lack of centralized care, late diagnosis, advanced presentation, funding, and financial constraints are the factors that impair statistics of GTN centers like ours that ran on philanthropist aid and zakat funds. Nevertheless, cure rates of 86.7% and live birth rates of 85.7% are reassuring, amidst all these constraints.

In our study, the mean age of patients was 28±12.5 years which seems similar to what is published in the western studies. [12] In this age group, women have to confront potentially life-threatening diagnoses, delays in future childbearing, and overall anxiety and negative perceptions on fertility and conceiving again in the future. [9, 10] All women treated in our study were advised to avoid pregnancy for at least 12 months after clinical remission to avoid the expected teratogenicity, and circumvent confusion between a new pregnancy and relapsed disease as the cause of rising chorionic gonadotrophin values, by using combined oral contraceptive pills or barrier methods. Contraceptive failure, lack of compliance, and psychosocial pressure for early conception were factors that led to conception in 9 women within the first year of follow up but reproductive outcomes were good and comparable to what is being reported by William J. [13]

Overall, 48 out of 90 patients with GTN conceived after treatment. 50.8% of the low-risk category and 45% of the high-risk category conceived, in contrast, to a study by Wong JM[14] that reported 85% conception in the low-risk category and 53% in the high-risk category. But live birth rates were more than 70% in both studies. A Brazilian study also showed no difference in subsequent pregnancies in patients who received single-agent methotrexate or combination chemotherapy. [15]

In our study, 48 out of 90 GTN patients that conceived after successful treatment, 42 (85.7%) had live term births that also included 4 live twin births as well without any newborn showing congenital abnormality. Live term birth rates in women in our study are more than what is reported in Berkowitz RS study of 68.6%, and 70% by Gadduci A, possibly due to differences in knowledge, attitude, and practices regarding contraception use, family size, in western and eastern or developing country women. [16 and 17]

An Indian case series showed 9 out of 52 patients with GTN conceived after treatment, in contrast to our results. [18] In contrast to our study, documented lower fertility rate in Indian study is likely due to completion of the family at a younger age in their community and effective adherence to contraceptive advice. The possibility of ineffective follow-up for a long time can't be ruled out in this study. In contrast to our study, the New England Trophoblastic Disease Center showed a 1.3% increase in stillbirth in a subsequent pregnancy after treatment for GTN. [19]

Our study showed that five women (10.2%) had a spontaneous miscarriage and one had a repeat molar pregnancy for which she underwent suction and curettage. A Saudi Arabian study showed abnormal pregnancies in 18 % of patients who conceived after treatment. [20] Another study by Lan Zet al showed that 4 out of 22 that conceived had a miscarriage, one repeat molar pregnancy, and one stillbirth. This Japanese study showed that 11.3% of pregnancies after chemotherapy for GTN end in spontaneous miscarriage. [21]

A few limitations of this study should be considered. The sample size was small and it was a single-centre study involving only the Pathan population. The study was dependent on verbal information about pregnancy outcomes in the follow-up period. Further multicenter studies should validate the safety of chemotherapy in such patients. Such patients should be followed up lifelong and properly registered in a specialized and centralized treatment center at provincial levels.

CONCLUSIONS

Current chemotherapeutic regimens used in the management of Gestational Trophoblastic Neoplasia are highly effective, safe, and preserve fertility. Women should be counseled to expect normal reproductive outcomes comparable with the general population after chemotherapy for gestational trophoblast neoplasia.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Bangash AG: Data collection, literature search, writing up.

Tabassum S: Data analysis

Afridi F: Conceived the idea

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

ORIGINAL ARTICLE

THE PATIENTS' EXPERIENCES IN GYNAE/OBSTETRICAL WALK-IN SERVICES IN LADY READING HOSPITAL PESHAWAR

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ABSTRACT

Objective: To assess the patients` experiences regarding the provision of outdoor health care services in Lady Reading Hospital Peshawar.

Materials and Methods: This cross-sectional study was conducted in Gynecology/Obstetrics OPD (outpatient department), Lady reading hospital (LRH), Peshawar from 1st December 2019 to 29th February 2020. A total of 500 patients were selected by the non-probability convenience sampling method. Results were calculated as frequencies, percentages, and Mean ± SD used for continuous variables. A questionnaire was filled out after taking verbal consent regarding the patient's experience in OPD.

Results: Patients from 12-73 years were included, 92.8% were married, 7.2% were unmarried, and 77.4 %attended the OPD less than 4 times. Seventy-seven percent mentioned OPD staff cooperation, 73.8% were satisfied with over-crowd handling, 26.4% referred cases from other hospitals, and only 5.8% failed to receive medical advice on the day of visit. Eighty-six percent were satisfied with laboratory staff behavior and 24 were not happy with receiving reports on the same day. Most of the patients were satisfied with the in-time availability of the consultant's skills, and treatment. Eighty percent were guided adequately by clinical assistants and 70.2% mentioned their good behavior.

Conclusion: Making clinical well-being care and better administration arrangements are considered very crucial for patient satisfaction regarding the provision of better services in OPD.

Keywords: - Health care services, outpatient department, patient experience.

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INTRODUCTION

The patients` feedback form regarding medical services is one of the best ways to evaluate the quality of care, detect problems and bring improvement to the existing health system. It includes patients' expectations and perceptions of the health system. Nowadays patients are more aware of health care services and demand proper health plan quality. [1] In general, patient satisfaction has been defined as an evaluation that reflects the perceived differences between the expectations of the patient to what is received during the process of care. [2]

The out-patient department (OPD) is the first place in the hospital where the clinical staff should communicate with the patient. It provides the best, most efficient administrative and clinical care, which in turn is reflected by patients' impressions and satisfaction. [3] The patient's satisfaction is affected by multiple determinants that may be clinical like the doctor's interpersonal communication and treatment skills or administrative related including the provision of basic facilities and infrastructure. The hospitals providing standard clinical care do follow-ups and satisfy patients. In return, they will be more likely to come for visits and follow the recommendations of the clinicians whom they trust. So, the better patient experience scores could indicate that a hospital has stronger teamwork, organizational leadership, and commitment to improvement. [4] It is obligatory to distinguish blemishes within the regulatory and patient well-being care facilities, help the decision-makers to bring changes, and encourage the advancement in existing administration services.

The main aim of conducting this study is the assessment of patients' experiences regarding the provision of clinical and administrative services in OPD, which is very crucial for improving policies and recommending the same hospital walk-in services to other patients.

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MATERIALS AND METHODS

This Cross-sectional study was conducted in Gynecology and Obstetrics outpatient department in Lady reading hospital Peshawar from 1st December 2019 to 29th February 2020 after taking permission from the hospital's Institutional research ethical board. For sample size calculation, the WHO calculator was used and 500 patients were selected by the non-probability convenience sampling method. After giving verbal consent, the questionnaire was filled out by the patients regarding the availability of clinical, and administrative services, including the difficulties while getting the registration slips, waiting for the duration, proper handling of overcrowding, drinking water facility, and overall discipline maintenance. Data were also collected regarding the provision of laboratory services, staff behavior, experience, and satisfaction with consultants, junior doctors, and other allied clinical staff. Patients who did not have any formal education were facilitated by their attendant or trained personnel from the healthcare system.

Data were analyzed using (SPSS) version 20.0 and presented in figures and tables. It was described using frequencies and percentages. Mean ± SD was used for continuous variables.

RESULTS

Patients of different age groups ranging from 12 to 73 years with a mean age group of 30.4 years were selected. Among them, 92% were married 65.2% were un-educated, 23.2% had primary education, and 11.6% had secondary and above education. Most of them belong to poor socioeconomic status, 51.8% were very poor and they earned about less than 20,000 rupees per month. Three-fourth of patients attended the OPD less than 4 times, while 4.4% had more than 7 visits in total 3 months duration.

Regarding the OPD facilities, more than 50% of patients were satisfied, and only 5.8% failed to receive medical advice on the same day of the visit. The majority of patients were satisfied with laboratory services. Only 24.8% had not received investigation results on the same day. In our study majority of patients had a good experience with their receptive behavior, examination skills, treatment, and documentation. Regarding patients' experience with clinical assistants, 70.2% mentioned the good behavior of staff members.

DISCUSSION

The provision of the best walk-in services in hospitals is of utmost importance to present the quality performance of hospital clinical and administrative staff. These services and their development are usually ignored by administrative authorities of hospitals in many countries. Patients expect a respectable place, availability of quality clinical services, provision of free-of-cost medicines, proper guidance, and responsive and acceptable behavior of doctors and staff. The provision of proper well managed health care services is reflected by the patient's experiences and satisfaction regarding her disease diagnosis and treatment. [5]

The results of our study showed that the majority of patients were satisfied with the cooperative behavior of staff, discipline maintenance, and proper rules for crowd control. Some of the patients had issues regarding receiv-

Table 1: Data regarding services available in OPD

OPD services	Sample size n=500	Percentages %
Displayed direction boards		
Yes	201	40.2
No	299	59.8
Identified reception area-		
Yes	406	81.2
No	94	18.8
Cooperative reception staff		
Yes	385	77
No	115	23
Difficulty in getting OPD slips		
Yes	281	56.2
No	219	43.8
Time spent in the queue to get the OPD slip		
1/2 hour to1 hour	308	61.6
More than 1 hour	192	38.4
Discipline maintenance		
Yes	386	77.2
No	114	22.8
Proper handling of the crowd by administration staff		
Yes	369	73.8
No	131	26.2
Sufficient waiting area		
Yes	299	59.8
No	201	40.2
Drinking water facility		
Yes	233	46.7
No	266	53.3
Provision of written information regarding disease		
Yes	77	15.4
No	423	84.6
Referred from other hospitals		
Yes	132	26.4
No	368	73.6
Failed to seek medical advice		
Yes	29	5.8
No	471	94.2

Table 2: Data regarding laboratory services

Laboratory services	(Sample size) (n) = 500)	Percentage%
Sufficient staff		
Yes	423	85.2
No	77	24.8
The behavior of laboratory staff		
Yes	433	86.6
No	67	13.4
Time spent while receiving reports		
1-2 hours	292	58.4
3-4 hours	173	34.6
Received next day	35	7.0
Failed to receive the investigation reports on the same day		
Yes	124	24.8
No	376	75.2

Table 3: Data regarding patients' experiences with consultants and junior doctors

Data about patient experience	(Sample size) (n) = 500)	Percentage%
Satisfaction with the availability of doctors on time		
Yes	432	86.4
No	68	13.6
How long do you wait to be seen by a doctor?		
Right away	246	49.2
Wait for 1-2 hours	167	33.4
Wait for 3-4 hours	56	11.2
Wait for more than 4 hours	31	6.2
Receptive behavior		
Yes	446	88.8
No	54	10.8
Satisfied with examination skills and keeping privacy		
Yes	445	89.0
No	55	11.0
Showing interest in treatment and documentation		
Yes	451	90.2
No	49	9.8
Inviting me to ask questions about my disease		
Yes	423	84.6
No	77	15.4
Giving sufficient information regarding the disease, co-morbidities, investigations, and medicines		
Yes	413	82.6
No	87	17.4
Discuss treatment options and consider my wishes		
Yes	460	92.0
No	40	8.0
Easy hospital admission if needed		
Yes	337	67.4
No	163	32.6

Table 4: Data regarding patient experience with allied clinical health assistants

Data about patient experience	(Sample size (n) = 500)	Percentage%
Properly guidance		
Yes	401	80.2
No	99	19.8
The behavior of staff members		
Good	351	70.2
Satisfied	97	19.4
Bad	52	10.4

ing the registration slip. They had to wait in queue for a long time. The study conducted by Javed, S.A et al.[6] mentioned the problems faced by patients in public sectors regarding the registration services. They have to wait and stand for long times to avail each service, which negatively affects the patient's experience. Another study conducted by Sun et al. [7] also mentioned the negative impact of prolonged waiting time for receiving a proper prescription and pharmacy services. The problem for those patients who spend more than 1 hour in the queue was because of fewer counters or more patient load. Some of them were also not satisfied with the proper direction of the board's display, availability of a proper waiting area, and drinking water facilities, which affect the administrative services. Even some of the patients were left unattended, which in turn provoked them to react badly against the services. Solanki NV et al.[8] mentioned that 80% of patients felt overcrowding in the waiting area, but still, it was cleaned and only 50% of patients knew about drinking water facilities in OPD. In addition, on part of the administration, the patients facing these problems may be because of their lack of education. The government and hospital administration should focus on the provision of basic facilities, and adequate medical and trained ancillary staff to avoid the existing problems. Proper patient referrals and improvement of basic health facilities will help to reduce the burden on tertiary care hospitals. Facilities like proper and sufficient waiting areas, drinking water facilities, and displaying boards in more than one language should be there.

Regarding the provision of laboratory services, 86% of patients were satisfied with the good behavior of the staff and giving adequate information about the collection of specimens. But 58.4% of patients and their relatives complained about receiving delayed reports and even some of them had not received the report results on the same day, for which they were advised to come on

the next day. The study conducted by Bogale AL et al. [9] and another study by Abera RG et al. [10] mentioned about 52.6% and 59.7% satisfaction rates which are almost consistent with our results. According to both studies, it might be due to overcrowding and increased referrals from other hospitals, which have a significant impact on the overall satisfaction of patients towards the laboratory working capacity in outpatient services in hospitals.

The proper treatment by consultants and young doctors has a crucial role in the health care system and is a key determinant of patient satisfaction. In our study, the majority of patients were satisfied with the good behavior and treatments of doctors. A study conducted by Mukhtar F et al. [11] mentioned that 94% of the patients who visited the OPD were satisfied with their doctor. The results of this study are more or less consistent with our study outcome. A study conducted by Khalid, F et al. [12] validated the problems of waiting for a long time to have proper consultation, examination, and investigations. A study conducted by Sun et al. [7] included the association of waiting time for consultancy with patient satisfaction levels.

In Pakistan, because of the overburdened population and excessive workload in OPD, the health staff face problems in consultation, proper physical examination, and giving sufficient information regarding the disease, co-morbidities, investigations, and medicines.[13] A study conducted in India mentioned an 81% satisfaction level regarding doctors' proper treatments and competence. [14.]

Our study results suggest that most of the patients were satisfied with services provided by paramedical staff and allied clinical assistants. A study done by Conway J and Kearin M. [15] showed the role of clinical health assistants in general assistance, housekeeping duties, and providing physical assistance to all medical staff in handling patients. Another survey done by Lin, I et al. [16] mentioned their role in administration duties and health promotion. Regular training and teaching of ancillary staff should also be focused on, as it has a great impact on the overall image of hospital services.

This small descriptive study helped us in understanding the patient's problems in OPD while focusing on the strength and weaknesses of government, hospital administration, and clinical services in OPD. Further large-scale studies auditing such services is needed to evaluate the hospitals.

CONCLUSION

To maintain the best outdoor patient services, the government and hospital administration should make proper health services promoting policies. To get positive feedback, they should involve the clinical staff in solving their problems, develop a proper patient referral system, and develop online telemedicine appointment services for avoiding overcrowding.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Wahab S: conceived, designed, and drafted the initial manuscript, and data analysis su pervised the project and was responsible for the authenticity and integrity of the research work.

Wahab A: Data collection, and analysis carried out a bibliography, critical appraisal

Zahoor F: Data collection and analysis carried out a bibliography, and did the critical appraisal.

Qazi Q: Did data collection, and analysis carried out a bibliography, and did the critical appraisal,

Razzaq A: Did data collection, and analysis carried out a bibliography, and did the critical appraisal

Zaib L: Did data collection, and analysis carried out the bibliography and critical appraisal and helped in data collection.

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

ORIGINAL ARTICLE

MATERNAL AND PERINATAL OUTCOMES IN OBSTETRIC CHOLESTASIS – DATA OF A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: To find out the maternal and perinatal outcome of intrahepatic cholestasis of pregnancy.

Material and Methods: The study was conducted in the Gynae and Obstetric department of Khyber Teaching Hospital Peshawar, Pakistan. This was a retrospective data review extending over two years period (from March 2018 to March 2020). Antenatal patients having clinical and investigative findings suggestive of intrahepatic cholestasis were enrolled in the study. With a sample size of 82, patients having cholestasis due to other pathologies were excluded. Outcome measures were mean age, mean parity, and mean gestational age at diagnosis and at delivery. Type of labor, whether induced or spontaneous, mode of delivery, and indications of cesarean delivery were observed. Maternal and perinatal complications encountered like post-partum hemorrhage, preterm labor, intrauterine growth restriction, meconium aspiration, nursery, and neonatal intensive care unit admissions were noted.

Results: Mean age was 29.6±4.64, mean parity 2.8±1.68, while the mean period of gestation at diagnosis 33.46±2.67, and the mean period of gestation (POG) at delivery 37.6±2.56. Patients who delivered vaginaly were 59 (71.91%) and via cesarean delivery were 23 (28.09%). Out of 23 patients who had cesarean delivery main indications were fetal distress in 11 patients, meconium-stained liquor (MSL) found in 16(19.51%) patients, preterm labor in 3(3.65%), and preterm premature rupture of membranes (PPROM) in 3 (3.65%). Primary postpartum hemorrhage (PPH) was observed in 4(4.87%). Babies born with Apgar score less than 7 were 12(14.65%) and those admitted in nursery and NICU were 14(17%).

Conclusion: Intrahepatic cholestasis of pregnancy has a significant association with perinatal morbidity and mortality. The study found MSL in 16(19.51%) cases and fetal distress encountered in 13(15.85%) cases. 14(16.27%) newborns got admitted to nurseries and NICU. Close monitoring in the antenatal period and induction of labour at 37- 38 weeks improve the perinatal outcomes.

Keywords: Obstetric Cholestasis, Intrahepatic Cholestasis of Pregnancy, Liver Function Test.

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INTRODUCTION

Intrahepatic cholestasis of pregnancy (ICP) is a complication in 0.2-2% of pregnancies. It leads to pruritus, increased serum bile acids (BA), liver transaminases, and bilirubin[1]. Pathogenesis is unclear but hormonal changes, and the multi-drug resistance (MDR) 3 mutation gene may influence it. With a good maternal prognosis after delivery, symptoms and abnormal liver function tests are reversible. Pregnancy complications include fetal distress, spontaneous and iatrogenic preterm birth, and still birth[2,3].

None of the antenatal fetal monitoring modalities cardiotocography (CTG), ultrasound, and doppler scans are reliable in predicting or preventing fetal death in obstetric cholestasis (OC). Placental insufficiency, intrauterine growth restriction (IUGR), and oligohydramnios are not features of the disease. Similar poor outcomes cannot be predicted by biochemical results and delivery decisions shouldn't be based on lab results alone[4,5].

According to Royal College of Gynecologists (RCOG) guidelines no sufficient data exists to practice early (at 37 weeks period of gestation) induction of labour with the objective to reduce the incidence of stillbirths. Many advocate deliveries at 38 weeks of gestation except in cases of severely deranged liver biochemical parameters where early delivery is advised [6,7].

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MATERIALS AND METHODS

The study was conducted in Gynae and Obstetric department, Khyber Teaching Hospital Peshawar, Pakistan from March 2018 to March 2020. It is a retrospective observational hospital-based study. The sample size was 82. All admitted women diagnosed with OC who were de-

livered at the hospital were included in the study. Patients were identified from the medical record maintained at the department. Data was collected on a structured proforma where all the necessary patient data including the clinical details such as age parity, symptoms like itching, rash, the color of urine and stool, and appetite collected from patients' files and registers. Recorded family history of intrahepatic cholestasis and drug history especially use of oral contraceptive pills. Detailed general physical examination (GPE) and systemic examination of patients were also noted. Investigations were full blood count (FBC), urine routine examination (R/E), liver function tests, viral serology hepatitis B, C, D, and E, abdominal ultrasound, obstetrical scan, and doppler scan also carried out.

OC was diagnosed if the patient had persistent pruritis and abnormal liver function tests in absence of other liver diseases. Cases with other causes of pruritis during pregnancy like hepatitis and liver involvement due to pre-eclampsia were excluded. Other liver diseases like hepatitis, biliary cirrhosis, symptomatic cholelithiasis, Wilsons disease, Acute Fatty Liver of Pregnancy (AFP) and coagulopathies, and liver tumors were also excluded. Outcomes measured were mean age, mean parity, mean POG, labour - whether spontaneous or induced, mode of delivery - vaginal or operative, maternal complications like PPH and fetal complications like preterm labour, IUGR, meconium aspiration syndrome (MAS), and NICU admissions were also noted. Intrauterine deaths and neonatal deaths were also noted. All data were collected and analyzed using descriptive statistics focusing on frequency, mean, and percentages.

RESULTS

The study included 82 antenatal patients with obstetric cholestasis. The mean gestational age at diagnosis was 33.46 ± 2.67 weeks and the mean gestational age of the patient at delivery was 37.6 ± 2.64 weeks. The mean age of the patient was 29.6 ± 4.64 and the mean parity was 2.8 ± 1.68.

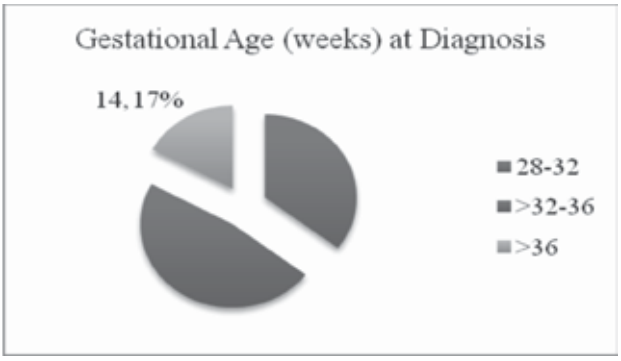

Fig 1: Percentage distribution of gestational age at diagnosis of Obstetric Cholestasis

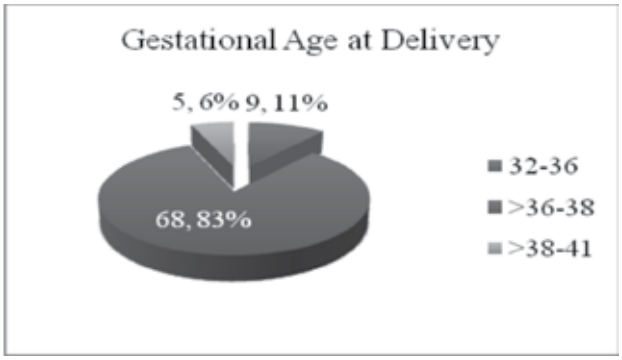

Fig 2: Percentage distribution of gestational age at delivery

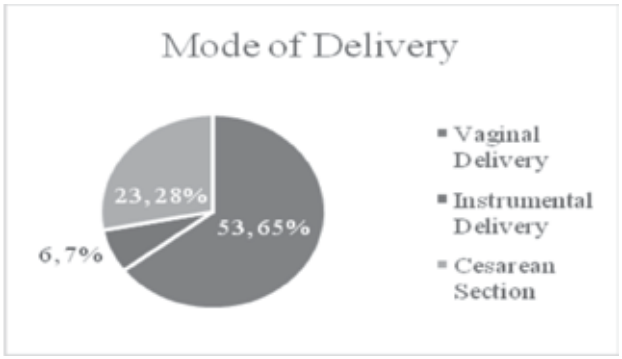

Fig 3: Percentage distribution of Mode of Delivery

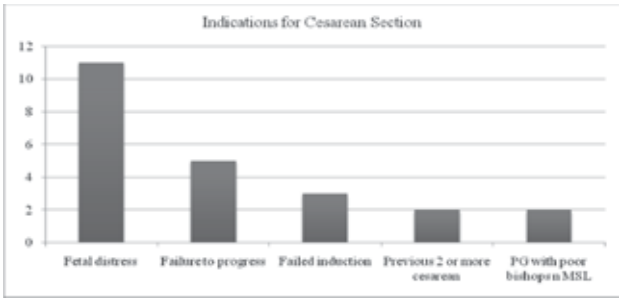

Fig 4: Indication of Cesarean Section (N = 23)

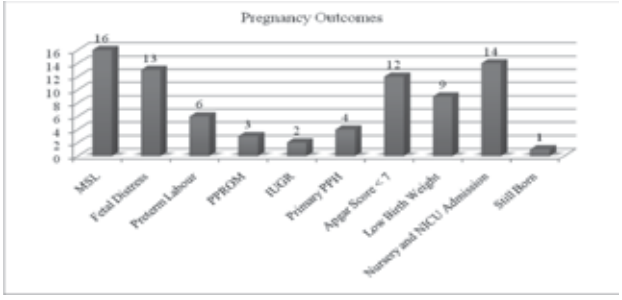

Fig 4: Outcome of Obstetric Cholestasis of Pregnancy (N=82)

Table 1: Risk Factors of Obstetric Cholestasis

Risk Factor	Cases	Percentage
History of Pruritis in previous pregnancy	17	20.70
Family history	6	7.31
Previous use of oral contraceptive Pills	5	6.09
Multiple pregnancy	4	4.87
History of gall stones	2	2.43
Co-existent diabetes	4	4.87
Associated mild hypertension	7	8.5
Diabetes and hypertension both	1	1.22

DISCUSSION

Genetic and environmental factors are related to the causation of obstetric cholestasis which has varied incidence in different parts of the world. Various studies reported the incidence of obstetric cholestasis as 0.7 _ 1.8%[8]. Prevalence of OC in a population of the South Birmingham area reported an overall prevalence of 0.7% [9].

In our study prevalence was 1.6%. Mean age was 28.6±4.64, mean parity 2.1±1.43, mean POG at diagnosis of OC 33.46±2.67, and mean POG at delivery was 37.4 ±2.76. In a study on obstetric cholestasis Asma Afzal found out that the mean age of patients was 24.79 years, the mean POG at delivery was 38.4 and 2/3rd patients were primi gravidas [9]. In another study by Nira Singh mean age of patients was 26.59 years and the mean POG was 32.53 weeks at diagnosis.

Obstetric cholestasis usually presents in the second trimester with a history of pruritis which is typically worst at night, pale stools, dark urine, and jaundice may also occur. Nira Singh found that 89.25% of patients had itching over the abdomen and over palms and soles [10]. In another study, itching was noted over the abdomen by 75% of patients and over the palms and soles by 25% of patients[11]. Factors which increase the risk of OC are personal or family history of OC, multiple pregnancies, hepatitis carriers, presence of gall stones, and women of Indian and Pakistani descent are a twofold increase in risk[11]. In our study history of pruritis in previous pregnancies was present in 17(20.7%) and a family history of OC was present in 6(7.31%) patients

In a study by Chloe Arthius 11.4% had a positive family history, 8.6% of patients had a history of OCPs intake, and 2.8% cases had gall stones[12]. In a study on OC patients Nira Singh observed that OC was complicated by Diabetes in 17.85% cases, hypertensive disorders of pregnancy in 15.47%, 13% cases delivered preterm, 10% had twin delivery and PPH occurred in 4% of patients.[10]

The preterm labour mechanism in OC is not well defined. However, an increased response of myometrial strips is found to oxytocin and when incubated with cholic acid there was increased oxytocin receptor expression. [13] Prevalence of OC was significantly higher among women with morbid obesity, Gestational Diabetes Mellitus (GDM), and preeclampsia[14,15] There is a relationship between bile acid, cholesterol, and glucose homeostasis. Primary bile acid receptor Fernicsoid X receptor (FXR) influences normal glucose homeostasis. Martineau and Rakor compared the effect of metformin versus Ursodeoxy Cholic Acid (UA) and advocated the use of both medicines for improving neonatal outcomes[16]. In our study coexistent diabetes was present in 4(4.87%) patients, associated with mild hypertension seen in 7(8.5%) cases, and both diabetes and hypertension are seen in one patient only.

Naga found an association between mild preeclampsia 31.6% GDM 20%, Pregnancy Induced Hypertension (PIH) 6.6%, hyperbilirubinemia 5% preterm delivery 23%, and PPH in 1.6% of cases of OC [8]. Women with obstetric cholestasis should have their liver function tests (LFTs) monitored weekly. Clotting studies should also be carried out. The pregnancy-specific reference range of liver function tests is 20% lower than the non-pregnant range[16,17]. In our study mean bilirubin was 1.06±56.72 and mean SGPT was 26.79 ±37.46 iU/ml. Naga also found out that transaminase was mostly elevated in 85% of cases of OC. Urine bile salts and pigments were detected in 8.3% of case[8.]

Ruth reported a significant relationship between OC and multiple births. In the study, multiple births were found in 4(4.87%) cases. Various studies suggested that estrogens are involved in pathogeneses of OC. Also, the predominant appearance of OC in the 3rd trimester is correlated with high estrogen production. OC is four times higher in twin pregnancy and also in women using oral contraceptives with high estrogen content [14].

Medical therapies such as the use of Vitamin K, topical emollients, anti-histamines, and Ursodeoxycholic Acid (UDA) are advised. A low-fat diet is also advised. UDA is highly effective in decreasing liver enzymes and bile acid concentration. With the use of UDA, Shultz and Chappel found fewer occurrences of premature births reduced fetal distress and fewer admissions in ICU.[18,19]

Regarding mode of delivery Shirestha found out that 60.69% of patients delivered via C section, 39.27% delivered vaginaly [10]. 51.15% of labour induction was carried out at 38 weeks of gestation. Indications of cesarean section were failed induction 33% fetal distress and non-progress of labour 26%. Perinatal complications were MSL 25%, fetal distress, and abnormal CTG 70%, and 30% of babies were admitted to NICU. In another study, spontaneous delivery was (28.3%) and 71.7% were induced. Out of which 41.7% had an emergency cesarean section. Indications of cesarean section were fetal distress 71.6%, cephalopelvic disproportion (CPD) 16%, failed induction 16%, and non-progress of labour 12% [8]. Chloe Arthius observed that 82.9% had term vaginal delivery, 22.9% had cesarean section and 50% of cases were associated with adverse neonatal outcomes. Fetal distress occurred in 20% of cases. Preterm delivery was found in 12.8% cases[2.4]

In Gabzedyl's study intrauterine death occurred in 0.4% of cases[20]. Asma Afzal's observations were sponta-

neous onset of labour in 50.67% of cases of OC [9].

In this study of 82 patients with obstetric cholestasis 53 (64.63%) cases were of normal vaginal delivery, 6(7.31%) instrumental delivery and 23 (28.04%) patients underwent cesarean sections. Out of 23 patients who had caesarian sections main indications were fetal distress in 11 cases, failure to progress in 5, and failed induction in 3 patients.

The newborn risk of respiratory distress syndrome was found 2.5 times higher than in control infants (28.6 vs 14%). Raised bile acid level has a direct effect on neonatal lungs which could be a bile acid pneumonia.[20]

Prevalence of OC was significantly higher among women with morbid obesity, Gestational Diabetes Mellitus (GDM), and preeclampsia[14,15] There is a relationship between bile acid, cholesterol, and glucose homeostasis. Primary bile acid receptor Fernicsoid X receptor (FXR) influences normal glucose homeostasis. Martineau and Rakor compared the effect of metformin versus Ursodeoxy Cholic Acid (UA)and advocated the use of both medicines for improving neonatal outcomes[16]. In our study coexistent diabetes was present in 4(4.87%) patients, associated with mild hypertension seen in 7(8.5%) cases, and both diabetes and hypertension are seen in one patient only.

Naga found an association between mild preeclampsia 31.6% GDM 20%, Pregnancy Induced Hypertension (PIH) 6.6%, hyperbilirubinemia 5% preterm delivery 23%, and PPH in 1.6% of cases of OC [8]. Women with obstetric cholestasis should have their liver function tests (LFTs) and bile acids monitored weekly. Clotting studies should also be carried out. The pregnancy-specific reference range of liver function tests is 20% lower than the non-pregnant range[16]. Asma Ansari found out that serum Glutamic Pyruvate Transaminase (SGPT) level was significantly elevated is 10.66% patients (> 300mg /dl), 38.67% (100-200 mg/dl) and (900-600mg /dl) in 29.3% patients [17.] In our study mean bilirubin was 1.06±56.72 and mean SGPT was 26.79 ±37.46 mg/dl. Naga also found out that transaminase was mostly elevated in 85% of cases of OC. Urine bile salts and pigments were detected in 8.3% of case[8.]

Ruth reported a significant relationship between OC and multiple births. In the study, multiple births were found in 4(4.87%) cases. Various studies suggested that estrogens are involved in pathogeneses of OC. Also, the predominant appearance of OC in the 3rd trimester is correlated with high estrogen production. OC is four times higher in twin pregnancy and also in women using oral contraceptives with high estrogen content [14].

In this study of 82 patients with obstetric cholestasis 53(64.63%) cases were of normal vaginal delivery, 6(7.31%) instrumental delivery and 23(28.04%) patients underwent cesarean sections. Out of 23 patients who had caesarian sections main indications were fetal distress in 11 cases, failure to progress in 5, and failed induction in 3 patients. Obstetrician decision regarding timing of delivery depends on monitoring the liver biochemistry, serum bile acid, and trying to extend gestational age up to 38 weeks[22]. In our study induction of labour was done at 38 weeks of gestation in 16(19.5%) cases. Many advise induction of labour when bile acids concentration > 40 mic mol/L at 37 weeks of gestation. Serum bile acid levels >10mic mol are the most sensitive and specific marker[23]

CONCLUSION

Intrahepatic cholestasis of pregnancy has a significant association with increased perinatal morbidity and mortality. In our study, MSL was found in 16(19.51%) cases and fetal distress was encountered in 13(15.85%) cases. 14(16.27%) newborns got admitted to nursery and NICU. Close monitoring in the antenatal period and induction of labour at 37- 38 weeks can improve the perinatal outcome. Various studies advocate delivery at 38 weeks of gestation except in cases of deranged liver biochemical parameters where early delivery is advised.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Mazhar T,: Data collection, literature search, writing up.

Niaz H: Data analysis

Bukhari N: Conceived the idea

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

ORIGINAL ARTICLE

THE IMPACT OF A SERIES OF LAPAROSCOPIC SURGERY WORKSHOPS IN GYNECOLOGY PRACTICES- OBSERVATIONS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Objectives: To determine the impact of a series of Laparoscopic Surgery Workshops in Gynecology practices in a tertiary care hospital in Peshawar

Material and Methods: This was a cross-sectional descriptive study performed in the Department of Obstetrics and Gynecology at Lady Reading Hospital, Peshawar, Pakistan. From January 2018 to December 2018, four advanced laparoscopic workshops (of 3 days' duration) were arranged by the Department of Obstetrics and Gynecology. These workshops were designed to train practicing gynecologists on the fundamentals of various diagnostic and therapeutic laparoscopic procedures like visualization (of tubes, ovaries, uterus, and dye test), hysterectomy, cystectomies, salpingectomies, and adhesiolysis. Data related to the type, number of procedures, and complications (significant bleeding, re-opening, urological trauma, and gut perforation) were recorded before the introduction of the workshops (January to December 2017) and after the workshops (January to December 2019). The data were analyzed using SPSS- 23.

Results: In total, 391 laparoscopic procedures were done in 2018, of which 40 (10.23%) were therapeutic and 351 (89.76%) were diagnostic. After attending 4 workshops, the data from 2019 showed an increased number of both diagnostic and operative procedures. A total of 442 laparoscopic procedures were done, of which 66 (14.93%) were therapeutic and 376 (85.06%) were diagnostic. There was a 15% increase in the number of these procedures. The number of laparoscopic hysterectomies increased from 0 before to 16 after the training. No significant complications were observed before and after all these diagnostic and therapeutic procedures.

Conclusion: Advanced laparoscopic workshops provide an effective platform for training the gynecologists about minimally invasive surgical techniques. In our observation, the practicing gynecologists significantly increased the number of both diagnostic and therapeutic procedures after these advanced laparoscopic workshops.

Key Words: Advanced laparoscopic workshops, Therapeutic laparoscopic procedures, Laparoscopic hysterectomy

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INTRODUCTION

Over the past decade, laparoscopic surgery has become the gold standard for various surgical procedures. It has certain advantages, like the capability to reduce surgical trauma, reduce post-operative surgical pain, shorten the length of hospital stay and provide a safe and esthetically satisfying substitute to conventional open surgical methods[1]. Indeed, laparoscopic surgery is considered the procedure of choice for cholecystectomy, appendectomy, colectomy, hysterectomy, and many more. It is linked with diminished postoperative pain, shorter hospital stays, quick recovery, and better cosmetics[2].

Many surgeons are interested in practicing laparoscopic techniques, but most of them lack expertise related to these procedures. Certain obstacles, such as recent technology, insufficient availability of training, concerns regarding the complications, and a lack of passion to negotiate learning curves make the transition to minimally invasive procedures challenging.

To teach practicing surgeons recent techniques, the concept of the workshops was introduced in 1977[3]. Workshops increase cognitive and psychomotor abilities. Regarding the introduction of laparoscopic techniques, the initial concerns over the adequacy of training grew after several reports of serious complications following the rapid and expansive adaptation of laparoscopic cholecystectomy[4, 5]. Furthermore, due to the concerns regarding the suitability of laparoscopic procedures, short training courses need to be planned,

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especially to teach new surgical techniques. Expeditious development in surgical techniques, as well as extensive application of endoscopic surgical skills, are needed to supplement the existing gynecological surgical techniques. The Royal Australian College of Obstetricians and Gynecologists and the Australian Gynecological Endoscopy Society have suggested that all gynecologists be appropriately trained in laparoscopic surgery.[6]

There are universally proven benefits of laparoscopy in terms of short hospital stays and early recovery. The need for laparoscopy is imminent in our setup to reduce hospital stays and prevent complications. This study is aimed to determine the impact of advanced laparoscopy workshops. The results of this study will have an impact on the need for further training in the field of laparoscopic techniques in gynecological setups.

MATERIAL AND METHODS

This was a cross-sectional descriptive study was done in the Department of Obstetrics and Gynecology at Lady Reading Hospital (LRH), Peshawar, Pakistan. LRH is one of the largest hospitals (1700 beds) in the province of Khyber Pakhtunkhwa. From January 2018 to December 2018, four advanced laparoscopic workshops (of 3 days' duration) were arranged by the Department of Obstetrics and Gynecology. These workshops were designed to train practicing gynecologists on the fundamentals of various diagnostic and therapeutic laparoscopic procedures like visualization (of tubes, ovaries, uterus, and dye test), hysterectomy, cystectomies, salpingectomies, and adhesiolysis. Data related to the type, number of procedures, and complications (significant bleeding, re-opening, urological trauma, and gut perforation) were recorded before the introduction of the workshops (January to December 2017) and after the workshops (January to December 2019). Data related to the previous laparoscopic procedures were retrieved from the department`s registries, and a comparison was made with prospective data for the next year after the training. Data were analyzed using IBM SPSS-23.

RESULTS

In this study, we compared laparoscopic procedures before and after workshops. Before workshops in 2018, in our department, a total of 391 laparoscopic procedures were performed, of which 40 (10.23%) were therapeutic and 351 (89.76%) were diagnostic. Details of therapeutic procedures are given in Table-I. After conducting the workshops, there was an increased number of both diagnostic and therapeutic procedures. A total of 442 laparoscopic procedures were performed, of which 66 were therapeutic and 376 were diagnostic. There was a 15% increase in the number of laparoscopic procedures. Table II shows different therapeutic procedures done after these workshops.

By looking into Table II, there is an increase in number as well as the addition of new procedures like laparoscopic hysterectomy, stage 4 endometriotic cystectomy, and dermoid cystectomies. Previously, we had patients who were candidates for total laparoscopic hysterectomies and other indications, but these procedures were performed less frequently because of a lack of expertise even though the latest laparoscopic equipment was available

Table 1: Therapeutic laparoscopic procedures before workshops. (n=40)

Procedure	Frequency	%
Salpingectomies	6	15%
Cystectomies	25	62.5%
Cyst aspiration	3	7.5%
Laparoscopic Ovarian Drilling	6	15%

Table 2: Therapeutic laparoscopic procedures after workshops. (n=66)

Procedure	Frequency	%
Salpingectomies	8	12.12%
Salphingoopherectomies	2	3.03%
Cystectomies	27	40.90%
Laparoscopic hysterectomies	16	24.24%
Cyst aspiration	2	3.03%
Biopsy	1	1.51%
Gonadectomy	1	1.51%
Plasma rich proteins ovarian injections	1	1.51%
Adhesiolysis	1	1.51%
Laparoscopic ovarian drilling	7	10.60%

DISCUSSION

Doctors in the field of surgery need to be knowledgeable and skillful, and they need to continuously develop and improve their skills to provide up to date care to patients[7]. A fundamental shift in the field of surgery occurred in the middle of the 1990s. A lot of surgeons realized the real benefits of laparoscopy and worked to upgrade their skills in this field. Many surgeons were of the view that laparoscopy was inferior to current open techniques and failed to convert their practices towards this goal. Learning new procedures is a part of surgical innovation and improvement, as well as the training of new surgeons. Training is certainly very important for learning laparoscopic skills. However, there are other aspects, and surgeon aptitude is one of these. Coaching is an important factor in influencing

the learning curve for laparoscopic training[8]. According to past research, post-residency training is very effective when using SAGES criteria[9]. Both didactic, as well as hands-on practices, are included in SAGES. According to Forgione et al.[10] it is a combination that is effective in facilitating the acquisition of new surgical skills. According to O Cawich et al. there was an increase in the number and level of the surgical procedure after the introduction of a laparoscopic trained team, which is equitant to our results.[11] The difference in the study results was shown to be higher than ours. It could be because they were not performing laparoscopic surgeries before. Exposure and hands-on training under direct observation of experts played a pivotal role in improving the skills and confidence of our doctors. Our study showed the importance of providing training to surgeons in advanced laparoscopic techniques early in their careers to facilitate the acquisition. Based on theresults of our study, it is recommended that surgical skills workshops continue to be a regular part of the curriculum in surgical residency programs. Laparoscopic skills are optimally acquired on an interval training schedule, which we also observed in our study[12]. These workshops allow the residents to perform and master psychomotor skills repeatedly in a non-threatening environment without fear of failure or causing harm to the patients. Laparoscopic surgery has been replacing the open standard technique in several procedures. Advanced laparoscopic workshops provide an efficacious instrument for educating surgeons on minimally invasive surgical techniques. Participating surgeons significantly increased the number of procedures that they performed but also increased the number of other laparoscopic surgeries. Although, it is a single-center study which might limit its generalizability but still can be a starting point in introducing laparoscopy training programs in the hospitals for the continuous training of consultants and residents.

CONCLUSION

Advanced laparoscopic workshops provide an effective platform for training the gynecologists about minimally invasive surgical techniques. In our observation, the practicing gynecologists significantly increased the number of both diagnostic and therapeutic procedures after these advanced laparoscopic workshops.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Authors Contribution

Raees M: Conceived the idea, designed the study, did data collection, and manuscript writing

Hussain SS: Literature review, statistical analysis, editing

Zeb L: Supervised the study, final approval of the manuscript, bibliography

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

ORIGINAL ARTICLE

COMPARISON OF EXERGAMES VERSUS TRADITIONAL BALANCE EXERCISE TO IMPROVE BALANCE AND REDUCE RISK OF FALLS IN CHRONIC STROKE PATIENTS

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ABSTRACT

Objective: The objective of the study was to compare the effects of exergames versus traditional balance exercise to improve balance and reduce the risk of falls in chronic stroke patients.

Materials and Methods: A randomized control trial was conducted on 40 chronic stroke patients. Patients were randomly divided into an exergaming group (n=20) and a control group (n=20), using the coin and toss method. Patients in the control group performed traditional balance exercises while the exergaming group performed supervised exergames along with traditional balance exercises. The treatment duration for both groups was 35-40 minutes/3 times a week for 6 weeks, with 5 minutes of warm-up and cool-down before and after the intervention.

The demographics were recorded, and assessment was done using the Berg balance scale, Time Up and Go test, and Dynamic gait index at baseline and after 6 weeks of intervention. Data were analyzed using SPSS 24.

Results: Of the 46 patients assessed, 40 (86.9%) were included in the study. The overall mean age was 57.78±5.38 years, there were 20 (54.1 %) males and 17 (45.9 %) females. Significant improvements were seen between the groups for the Berg balance scale, Time Up Go test, and Dynamic gait index after six weeks of intervention ($p<0.05$).

Conclusion: Exergames are found to be effective in improving balance and reducing the risk of falls in chronic stroke patients.

Keywords: Exergaming, Stroke, Rehabilitation, Virtual Reality, Exercise training

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INTRODUCTION

Stroke or cerebrovascular accident is the 2nd leading cause of mortality and a first common cause of disability among middle and low-economy countries. [1] Approximately, 13 million stroke cases were annually reported worldwide by World Stroke Organization. [2] In Pakistan, the incidence rate of stroke is 250 per 100,000 population annually, and it is also observed that stroke prevalence is more in the young age group. [3]

Globally, the mortality rate due to stroke has been reduced, however, the number of individuals suffering from post-stroke chronic symptoms is dramatically increasing. [4] This may occur as a result of the absence of neuronal signals from the brain to muscles or due to the disuse of muscle after cerebral injury leading to further atrophy. [5] Stroke is associated with multiple deficits that include impairment of sensory and motor function, dysphagia, speech problems, memory problems, loss of balance, and postural control which increases the risk of fall. [6] The report has shown that falls occurred in 40% of stroke survivors within 12 months after the onset of stroke which leads to delay in recovery of rehabilitation, furthermore, the use of walking aid in the early stage increases fall risk. [7]

Stroke rehabilitation is a multidisciplinary approach, progressive and goal-oriented with the purpose to assess impairment, and disability and engaging a stroke person in a rehabilitation program to achieve the optimum level of function. [8] Among older adults, stroke is considered the most common cause of falls. This is due to the fact that balance disorders, which are a frequent complica-

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tion of stroke that affect activities of daily living (ADL) and increases the risk of falls in stroke patients. [9] Balance training is one of the key components in stroke rehabilitation with the purpose to improve static and dynamic balance. The primary concern in stroke rehabilitation is to prevent falls among patients. For this reason, balance training is included in a rehabilitation program. [10] Different rehabilitation approaches used with the purpose to improve functional outcomes in stroke survivors are Proprioceptive Neuromuscular Facilitation (PNF) [11], Bobath therapy[12], dual-task training on balance [13], Circuit class therapy [14]. Literature showed that traditional exercise programs seemed boring for patients as they involved repetition of similar tasks which result in decreased motivation among them. Exergames using Xbox Kinect-360 is an effective way to motivate and engage stroke patients to improve balance, gait, and motor activity through interactive video games after stroke. [15] Exergames improve sensory, motor, cognitive and mental function through an environment in which an individual performs tasks that feel like in the real world. The virtual environment generated through the game can promote neuroplasticity in various areas of the brain, thereby resulting in improved motor learning and performance. [16] The current study aimed to compare the effect of exergames versus traditional balance exercise to improve balance and reduce the risk of falls in chronic stroke patients. This study will provide a better understanding of which intervention to perform for improving dynamic and static balance control in a stroke patient.

MATERIALS AND METHODS

The study was a randomized control trial conducted at Iqbal Memorial Hospital, Wah Cantt from June 2018 to November 2018 after being reviewed and approved by the Committee for Ethical Review of Research involving Human Subjects. The sample size was calculated using the open epi tool. The sample size was 40 (20 in each group). Participants were recruited through the non-probability purposive sampling technique. Those included were 50 to 70 years old, chronic stroke patients (06 months after onset), both genders, able to stand for 30 seconds, and willing to participate. Those excluded were patients having cognitive impairments, a Brace score >40, severe spasticity, and abnormal synergies. After taking informed consent, participants were randomly divided by tossing a coin into two groups: the exergaming group (EG) and the control group (CG) respectively.

In the EG group, patients performed exergames using Xbox-360 Kinect along with traditional balance training exercises for 35-40 minutes and 3 days per week for 6 weeks. Before the start of the intervention, patients were given an orientation session, which made them familiar with the equipment and games. Total 4 games were included to target the static, dynamic, and anticipatory balance of patients. River rush, water leaks, reflex ridge, and gold rush were performed starting from the basic level and difficulty was increased depending upon the performance of the patient. Games were performed under the supervision of a trained physiotherapist to ensure the safety of and avoid health hazards. Participants of the control group performed traditional balance exercises like tandem walking, heel standing, stepping in a forward direction, side-stepping, crossing over obstacles of varying height, single leg stance, and double leg stance. The treatment duration for the control group was 35-40 minutes/3 times a week for 6 weeks. Both groups performed 5 minutes of warm-up and cool-down before and after the intervention. The demographics of each participant were recorded. Berg balance scale (BBS), Timed Up and Go test (TUG), and Dynamic gait index (DGI) was taken as outcome measures at baseline and after 6 weeks of intervention.

Berg Balance Scale is a 14-item test used for the evaluation of functional balance in older adults and the stroke population. Each item is scored on an ordinal scale, ranging from 0 to 4 (0 = unable to perform, 4 = normal performance). The maximum score is 56 points. The BBS presents excellent values for test-retest (ICC= 0.91) and intra-evaluator reliability (ICC= 0.97). [17]

The TUG is a widely used test of objective clinical measure of functional mobility, balance, and risk of falling. The TUG involves participants standing from a seated position, walking 3 meters, turning around, and returning to sit in the chair. The time to complete this task is recorded using a stopwatch. Among chronic stroke individuals, TUG has been reported Test-retest reliability (ICC=0.95).[18] The DGI is used to evaluate the dynamic balance during walking. It is comprised of 8 items that require participants to maintain balance during normal walking and walking in different situations. Each item is scored from 0 to 3 points and the maximum score is 24. A higher score indicates a higher level of independent functional mobility.[19]

All analyses were carried out using the Windows-based SPSS statistical Package 24.0. Descriptive statistics were used for qualitative and quantitative variables and data was presented as frequencies, percentages, mean and Standard deviation. The normality test was conducted to assess the data distribution for all variables. The p-value of the Shapiro Wilk test for all variables measures was >0.05, an independent sample t-test was used for between-group analysis and paired sample t-test was used to measure within-group analysis. A P-value less than 0.05 was considered significant.

RESULTS

Of the 46 patients assessed, 40 (86.9%) were included and, of them, there were 20 (50%) in each of the two groups (Figure-1). Figure 1: Consort diagram for patient allocation and analysis Overall, the mean age was 57.78±5.38, there were 20 (54.1 %) males and 17 (45.9

%) females. The mean age of subjects in the exergaming group was 57.72±5.67, males 10 (55.6%) and females 8 (44.4%), whereas the mean age of subjects in the control group was 57.84±5.25, males 10 (52.6%) and females 9 (47.4%). Demographic data are presented in Table 1.

Between group analysis showed significant improvement $p<0.05$ in BBS, TUG and DGI after six weeks of intervention (Table 2). In the EG group, BBS mean score at baseline was 36.00±3.57 and after 6 weeks of intervention, the score was 43.38±2.42. TUG mean score was initially 27.39±3.71 and after treatment score was 18.04±3.09. Moreover, DGI means score at baseline was 9.83±1.04 and 14.72±1.63 after 6 weeks of intervention with exergames. In the EG group BBS, TUG and DGI showed significant improvement from baseline to 6 weeks of intervention $p<0.05$ (Figure-2). Figure 2: Within-group Analysis of BBS, TUG, and DGI in the Exergaming group at baseline and after 6 weeks of Intervention Figure 3 showed that in the control group BBS at baseline was 35.31±2.38 and after 6 weeks mean score was 36.15±2.31. Initially, the TUG mean score was 26.71±1.78 and after treatment score was 24.91±2.37. The mean score of DGI at baseline was 9.94±1.31 and the score was 11.05±1.80 after 6 weeks of intervention. In addition, the control group showed a non-significant difference in outcomes measures from baseline to 6 weeks of intervention $p>0.05$. Figure 3: Within-group Analysis of BBS, TUG, and DGI in the Control group at baseline and after 6 weeks of Intervention

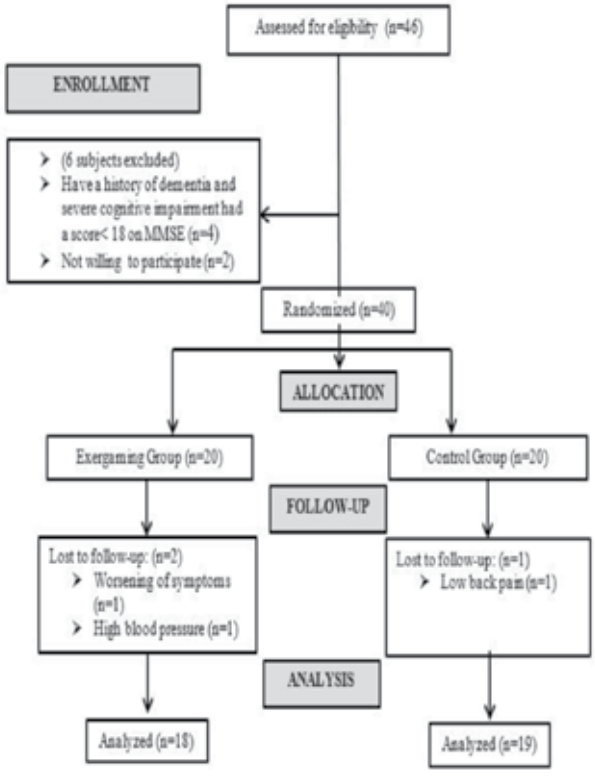

Fig 1: Consort diagram for patient allocation and analysis

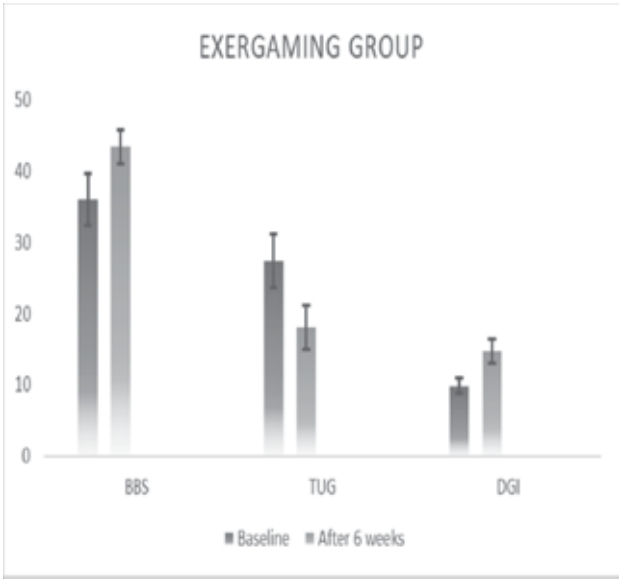

Fig 2: Within-group Analysis of BBS, TUG, and DGI in the Exergaming group at baseline and after 6 weeks of Intervention

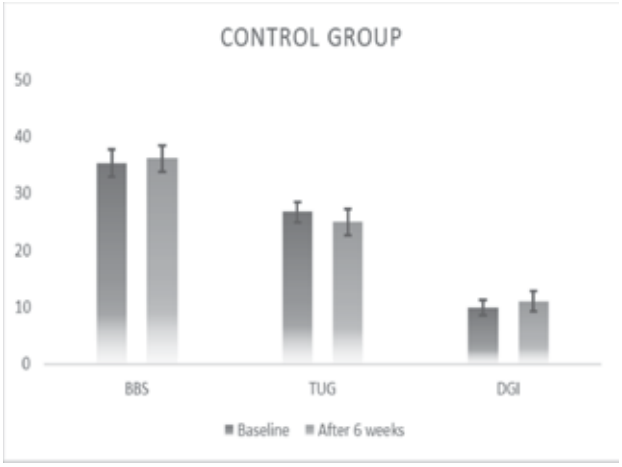

Fig 3: Within-group Analysis of BBS, TUG, and DGI in the Control group at baseline and after 6 weeks of Intervention

Table 1: Demographic data

VARIABLES	n (%) n=37	Between groups	
		EG n=18	CG N=19
Gender			
Male	20 (54.1%)	10 (55 .6 %)	10 (52.6 %)
Female	17 (45.9%)	8 (44.4 %)	9 (47.4%)
Type			
Infarct	28 (75.7%)	14 (77.8 %)	14 (73.7 %)
Hemorrhage	9 (24.3%)	4 (22.2%)	5 (26.3 %)
Hemiplegia			
Right	21 (56.8%)	10 (55 .6 %)	11 (57.9 %)
Left	16 (43.2%)	8 (44.4 %)	8 (42.1 %)

Table 2: Independent sample T-test between group Analysis

Variable	Group (n=37)	Mean±SD	p-value
BBS-pre	Exergaming group (n=18)	36.00±3.57	0.312
	Control group (n=19)	35.31±2.38	
BBS-post	Exergaming group (n=18)	43.38±2.42	0.003***
	Control group (n=19)	36.15±3.67	
TUG-pre	Exergaming group (n=18)	27.39±3.71	0.250
	Control group (n=19)	26.71±2.78	
TUG-post	Exergaming group (n=18)	18.04±3.09	0.008***
	Control group (n=19)	24.91±2.37	
DGI-pre	Exergaming group (n=18)	9.83±1.04	0.772
	Control group (n=19)	9.94±1.31	
DGI-post	Exergaming group (n=18)	14.72±1.63	0.005***
	Control group (n=19)	11.05±1.83	

DISCUSSION

The present study suggests that exergames are effective in improving balance and reducing the risk of falls in chronic stroke patients. Exergames seemed more interesting and fun for patients in comparison to traditional balance exercises by improving significant improvements in scores of BBS, TUG, and DGI. Literature also suggests that this innovative technology enhances patient motivation and improves motor learning in a playful manner. [16] Hsin-Chieh Lee et al in their study on fifty chronic stroke patients found significant improvement in scores of BBS (P = 0.000) and TUG (P = 0.005) in their virtual reality balance training group as compared to the traditional exercise group. They concluded that balance training by using X-box Kinect and traditional method had beneficial effects on the balance of chronic stroke patients. They also reported that patients in the virtual reality group found a pleasurable experience with this newer technology. [20] The same findings were observed in the latest study conducted by Patrícia P.B. Henrique et al. on post-stroke patients concluded that exergames were an effective alternative for maintaining balance and upper limb motor function. There were significant improvements in values of BBS scores (P < .001) from pre-intervention to post-intervention. In a recent trial exergaming also showed significant improvement from baseline to 6 weeks of intervention having p <0.05 in BBS and TUG. Dae-SungPark PT and colleagues in their trial on twenty hemiplegic stroke patients found that 30 minutes of virtual training using Xbox Kinect-based games plus conventional physical therapy treatments showed a significant difference in BBS, TUG, and 10MWT (*P* <0.05) after 6 weeks of intervention as compared to control group. [22] While in our study control group showed a non-significant difference in outcomes measures from baseline to 6 weeks of intervention (p >0.05). Roghayeh Mohammadi et al in their review found significant improvements in the inter-group analysis of virtual reality and conventional physical therapy treatment groups on outcome measures that include BBS and TUG with medium effect size in comparison with the conventional treatment only. Their review also concluded that virtual reality plus conventional therapy is moderately beneficial in improving balance in chronic stroke patients[23]. While the results of our study showed marked improvement in Exergames by improving the balance impairments and functional disabilities as both BBS and TUG showed significant p-value (<0.05). Nikita Girishbhai Shobhana and Shweta Rakholiya in their study found significant improvement in BBS, 6MWT, and gait parameters in the VR group. They proposed that virtual reality training by using X-box 360 Kinect platform was an effective therapeutic approach along with physical therapy in stroke patients' rehabilitation for improving balance and gait as compared with the only physical therapy intervention. They further added that the VR group experienced higher pleasure as compared to the conventional physical therapy group. [24] This study also correlates the findings of our study by improving balance scores in post-stroke patients.

The study has certain limitations such as small sample size and we included only patients with the first instance of stroke. Hence, the findings of this trial may not be generalizable to those patients who have undergone multiple episodes of strokes. Another non-negligible factor that we noticed in our study was that certain patients suffered from poor muscle tone and lack of motivation. Therefore, we recommended a multicenter trial should be conducted including large sample size and intrinsic motivation inventory to promote the outcomes of exergaming. We also recommended the use of rehabilitation and other tools for objective assessment in multiple episodes of stroke patients.

CONCLUSION

Exergames along with traditional balance exercises are found to be effective in improving balance and reducing the risk of falls in chronic stroke patients.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Khattak GH: Concept, Study design, Data collection, Manuscript writing.

Arshad H: Data collection, Statistical Analysis, inter pretation, Manuscript writing.

Anwar K: Literature search

Majeed Y: Data collection, Bibliography

Malakandi HB: Critical review of Manuscript

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

ORIGINAL ARTICLE

SONOGRAPHIC GUIDED HYDROSTATIC REDUCTION OF INTUSSUSCEPTION-OUTCOME AND ITS DETERMINANTS

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ABSTRACT

Objective: The objective of this study was to determine the success rate of hydrostatic reduction of intussusception and its determinants by using saline enema under ultrasound guidance.

Material and methods: This descriptive study was carried out in the Department of Pediatrics Surgery, Khyber Teaching hospital, Peshawar. A total no of 55 patients, meeting the inclusion criteria were included in the study and sonographic guided reduction was attempted with a saline enema. The outcome was labeled successful in cases where intussusception got reduced without complications and unsuccessful in case of failure or complications. Age, duration of symptoms, procedure time and number of attempts being continuous data were reported as mean and standard deviation. Gender, palpable abdominal mass, bleeding per rectum and air-fluid levels on x-rays were expressed in frequencies and percentages.

Results: In this study, the mean age was 1 year with SD of ± 1.24. Sixty-two percent of patients were male and 38% of patients were female. Moreover, the success rate of hydrostatic reduction of intussusception by using saline enema was 78%.

Conclusion: In selected patients, the success rate of hydrostatic reduction of intussusception is a non-invasive acceptable option.

Keywords: Hydrostatic reduction of intussusception, Saline enema, Ultrasound guidance.

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INTRODUCTION

Intussusception is intestinal obstruction resulting from the invagination of a portion of the intestine into an immediately adjacent part of gut in continuity. This mechanical condition affects the infants but the age of presentation may vary anywhere between 3 months and 6 years[1]. Cosmopolitan in distribution, it occurs everywhere sparing no race. Approximate incidence of intussusception is 1 in 2000 children though 1.5 to 4 per 1000 live births have also been reported.[2] Predominantly affecting the males, it is the leading cause of acute intestinal obstruction in children as far its incidence is concerned[3,4]. Anatomically ileoileal, ileocolic, and colocolic variants have been described where ileocolic is the commonest anatomical type[5,6]. History of episodic pain abdomen, bilious vomiting and sometimes bleeding per rectum are classic. The examination may reveal a palpable mass per abdomen and a prolapsing mass or empty rectum on per rectal examination. In case of complete obstruction, abdominal distention is a frequent finding[7, 8].

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In majority of cases, intussusception is idiopathic but it may be secondary to a disease or pathologic lead point. A specific lead point that draws the proximal intestine and its mesentery inward and propagates it distally through peristalsis, is identified in only 5% of cases and is most commonly found in cases of ileoileal intussusception. Specific lead points are more commonly found in children older than 3 years and almost always in adults with intussusception. Meckel diverticulum is the most common lead point, followed by polyps, such as are seen with Peutz-Jeghers syndrome, and intestinal duplications or lymphomas. Postoperative jejunoileal or ileoileal intussusception, which has no specific lead point in most cases, accounts for approximately 1% of intussusceptions in children of all ages.[3,9,10,11]

Regarding investigations, a plain abdominal radiograph is recommended for all patients suspected of having intussusception. Plain abdominal radiography reveals signs that suggest intussusception in only 60% of cases[12]. However, ultrasound is the standard diagnostic investigation for intussusception, with sensitivity and specificity reaching up to 97.9% and 97.8%, respectively.[13]

Depending on presentation and workup findings intussusception is either treated surgically or via non-surgical maneuvers. Non-surgical methods include hydrostatic reduction with saline or barium enema and pneumatic[14] reduction guided by ultrasound. Fluoroscopic reduction

is also a type of non-surgical techniques[15]. Hydrostatic reduction with sonographic guidance is an established and successful intervention for the reduction of intussusceptions and has been widely accepted and adopted in the recent past. Literature has reported different experiences of different centers but the overall success of sonographic reduction technique ranges from 75%[16] to 96%[17].

Previously intussusception was treated surgically everywhere and surgical exploration is still the most commonly practiced treatment in this part of the world. We initiated the sonographic guided hydrostatic reduction with saline enema and observed acceptable results with the benefit of less cost and less trauma, thus limited morbidities in selected patients. This study was initiated to evaluate the success rate of hydrostatic reduction of intussusception with saline enema under ultrasound guidance. In selected cases, the causes of failed attempts of reduction were also observed and noted per operatively for future reference.

MATERIAL AND METHODS

This descriptive study was initiated in the department of paediatric surgery Khyber Teaching Hospital, Peshawar, after formal ethical approval from institutional review board. Through non-probability consecutive sampling 55 patients of either sex in age range of 3 months to 6 years were included. Patients with signs and symptoms of peritonitis like fever, generalized tenderness, guarding, and abdominal distension (which may indicate/suggests gangrene or gangrene of the gut and needs open surgical treatment) or those with radiographic evidence of complications like perforation were excluded. All data were analysed by using SPSS Version 20. Age, duration of symptoms, procedure time and number of attempts was reported as mean and standard deviation. Palpable abdominal mass, bleeding per rectum and air-fluid levels on x-rays were expressed in frequencies and percentages. The success rate was stratified among the age, gender, duration of symptoms, palpable abdominal mass, bleeding per rectum, air-fluid levels on x-rays, number of attempts, to see the effect modifiers. All the results were presented as tables.

Table 1: Success rate of Hydrostatic Reduction of Intussusception (n=55)

Succeess Rate	Frequency	Percentage
Yes	43	78%
No	12	22%
Total	55	100%

RESULTS

Among 55 patients 45(82%) patients were in the age range 3 months to 1 year and 10(18%) patients were in the age range 1-2 years. Thirty-four (62%) patients were male and 21(38%) patients were female.

Of sample 40(73%) patients had a duration of symptoms <72 hours and 15(27%) patients had a duration of symptoms >72 hours. The mean duration of symptoms was 72 hours with SD ± 4.88. Palpable abdominal mass was recorded in 39(71%) patients while 16(29%) patients didn't have palpable abdominal mass. Bleeding per rectum was reported in 47(85%) patients and 8(15%) patients didn't have bleeding per rectum. Air fluid levels were seen on x-ray erect abdomen of 42(76%) patients, while 13(24%) patients didn't have air-fluid levels on x-rays.

Intussusception reduced in 41(75%) patients with one attempt while 14(25%) patients had to undergo two attempts. The mean number of attempts was one time with SD ± 0.45. (Table No 2)

The success rate of hydrostatic reduction of intussusception by using saline enema was found 78% (43 patients). (Table No 1)

Stratification of success rate for age, gender, duration of symptoms, palpable abdominal mass, bleeding per rectum and air-fluid levels on x-rays, number of attempts is given in Tables.

Table 2:Stratification of success rate of hydrostatic reduction of intussusception with respect to the age, gender and number of attempts

		Number of patients (n=55)	Number of patients with Successful reduction (n=43)	Number of patients with unsuccessful reduction (n=12)	P-value.
Age	3 months to 1 year	45	37	8	0.199
	1-2 years	10	6	4	
Gender	Male	34	29	5	0.177
	Female	21	14	7	
Number of attempts	First attempt	41	34	7	0.259
	Second attempt	14	9	5	

*Test of significance: Fisher's Exact Test.

**Level of significance: P ≤ 0.05.

Table 3:stratification of success rate of hydrostaticreduction of intussusception with respect to the preoperative clinical and radiological features.

Duration of symptoms	**Less than 72 hours**	**40**	**36**	**4**	**0.001****
	More than 72 hours	15	7	8	
Palpable abdominal mass		39	32	7	0.300
Bleeding per rectum		47	36	11	0.670
Air fluid level on radiograph		42	32	10	0.709

*Test of significance: Fisher's Exact Test.

**Level of significance: $P \leq 0.05$.

DISCUSSION

Our study shows that mean age was 1 year with SD ± 12.09. Sixty two percent patients were male and 38% patients were female. More over the success rate of hydrostatic reduction of intussusception by using saline enema was 78%. Similar results were observed in another study conducted by Mensah Y et al[18,] in which the ages of the patients ranged between two months and forty-one months. The mean age was 11.7 months and a standard deviation of 2.6 months. Eight patients (40%) were between ages seven and twelve months, followed by seven (35%) patients aged zero to six months, two patients (10%) each aged between 13 to 18 and 19 to 24 months and one patient aged more than 24 months. Two of the children had recurrent intussusception. One occurred a day after the procedure and the other was three and half months later. In eight of the patients (40%) the intussusception was seen at the transverse colon, five patients (25%) at the descending colon, four patients (20%) at the hepatic flexure, two patients (20%) at the sigmoid colon and only one patient (5.9%) had the intussusception in the ascending colon. The duration of the procedure ranged between two minutes and thirty minutes, with majority being under ten minutes from when the normal saline was infused. Seventy-five percent of the intussusception cases were reduced successfully.

Similar results were observed in another study conducted by Hameed S et al[19,] in which 24 out of 25 (96%) intussusceptions were successfully reduced. Average time taken was 15 minutes. All the patients were reviewed after 24 hours for recurrence. None of them showed recurrence within 24 hrs. No complications were observed.

Similar results were observed in another study conducted by (rephrase the sentence) Talabi AO et al[20,] in which the age range was 3 months to 48 months with a mean of 10.8 ± 9.1 months. Forty percent ($N = 18$) presented after 24 h of onset of symptoms. The success rate of hydrostatic reduction with saline enema was 84.4% ($N = 38$). Two (4.4%) perforations occurred during the procedure. Three (7.5%) patients had recurrent intussusception within six months. The duration of symptoms greater than 24 hours, age and sex of patients did not influence successful reduction $p > 0.05$. The duration of admission between those who had successful non-operative reduction and those who subsequently had operative reduction and or resection attained statistical significant difference, $p = 0.001$. There was no mortality. We achieved a 68% decrease in the operative reduction of intussusception using USGHR as the primary modality of treatment.

CONCLUSION

Our study concluded that the success rate of hydrostatic reduction of intussusception was 78% by using saline enema under ultrasound guidance.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Ali S:	Data collection, literature search, writing up.
Naeem T:	Data analysis
Imran M:	Conceived the idea
Uzair M:	Bibliography

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

ORIGINAL ARTICLE

DETERMINING THE INDICATIONS OF C- SECTION BASED ON WHO ROBSON CLASSIFICATION—AN EXPERIENCE IN A TERTIARY CARE HOSPITAL IN PESHAWAR

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ABSTRACT

Objective: To determine the frequency of various groups of patients undergoing C- section in a tertiary care hospital in Peshawar, using WHO Ten Group ROBSON Classification of C sections

Material and Methods: A descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Khyber Teaching Hospital Peshawar from January-March 2019 on patients delivered in the facility. The patients were classified into 10 groups based on WHO Robson's criteria and the C- section rate determined in each group. The data was analyzed in MS excel.

Results: Out of the total 1364 deliveries during this period, 330 were by C sections, making the C- section rate 24%. The biggest contributor to the overall C- section rate was Group 5 (38%) followed by Group 2 (15%), Group 4 (12%), and Group 1 (11%).

Conclusion: Robson classification is a useful tool to classify and analyze C- section rates. Although the rate of C sections in our setup is not very low, it can be further lowered by devising strategies to curtail sentinel C sections and performing interventions like induction of labor and pre-labor C sections, only if they are evidence-based.

Key Words: C section, WHO Ten Group ROBSON Classification

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INTRODUCTION

C- section rates are sky-rocketing by the day. [1] According to a global survey, the C- section accounts for nearly half of the deliveries in countries like Brazil, Mexico, Turkey, and Egypt and nearly one-third in the USA and Australia.[1, 2, 3] In Pakistan, C- section rates are consistently on the rise, with the C- section rate increasing from 3.2% to 20% over the last three decades.[4] Although the C- section can be a life-saving procedure for both mother and the baby, its unjustified use can be associated with increased maternal and perinatal morbidity and mortality. [5] The rising incidence of the morbidly adherent placenta (placenta accreta) in patients with repeated C sections has added to the life-threatening complications of C sections. [6] Therefore, efforts are needed to decrease C- section rates without compromising maternal and perinatal outcomes. [7]

In order to tackle the rising C- section rate, Robson devised a classification system, endorsed by WHO, which classifies women into ten groups based on parity, presentation, the onset of labor, previous C-section, and period of gestation.[8]

This system of classification allows an objective comparison and audit of C- section rates in different health care facilities and within the same facility over time.[9] The objective of this study was to determine the frequency of various groups of patients undergoing C- sections in a tertiary care hospital in Peshawar, using the WHO Ten Group ROBSON Classification of C-sections. Classifying the C- section into various groups depending on certain variables will help to determine the major contributor to the C-sections. Strategies can be devised to bring down C- section rates in that particular group/group, hence contributing to the overall reduction in the C- section rate and its complications.

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MATERIALS AND METHODS

A descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Khyber Teaching Hospital Peshawar from January -March 2019. The sample size was 330, based on WHO software for sample size determination, taking the frequency of the C-sections as 20%, using a 95% confidence interval and 5% margin of error. [4] The sampling Technique was Non-probability consecutive sampling.

Table 1: 10 Group Robson Classification

Group	Description
1	Nulliparous, single cephalic, >37 weeks, in spontaneous labor
2	Nulliparous, single cephalic, >37 weeks, induced (2a) or C- section before labor (2b)
3	Multiparous, single cephalic, >37 weeks, in spontaneous labor
4	Multiparous, single cephalic, >37 weeks, induced (4a) or C- section before labor (4b)
5	Previous C section, single cephalic, > 37 weeks. Previous 1 C- section (5.1) Previous 2 or more C- sections (5.2)
6	Nulliparous breech
7	Multiparous breech
8	Multiple pregnancies (including previous C- sections)
9	Abnormal/transverse lie (including previous C- sections)
10	Single, cephalic, <36 weeks (including previous C-section)

All women admitted through OPD or Emergency and delivered either via vaginal route or C- section during the study period were included. Women undergoing delivery or C- section elsewhere and referred to our hospital after delivery were excluded. All the eligible women` data was entered into a proforma and were classified into ten groups based on parity, previous C section, presentation, period of gestation, and labor onset.

The Primary Outcome Measures were, the percentage contribution of each Robson group to the overall C- section rate and the rate of C-sections in each group (number of C-sections in a group/total number of deliveries including C-sections in that group).

Before the start of the study, permission was taken from the ethical committee of the hospital. Data was analyzed in MS excel and results were presented as tables and graphs.

RESULTS

Out of the total 1364 deliveries during this period, 330 were by C sections, making the C- section rate 24%. The biggest contributor to the overall C- section rates were patients with previous scar (Group 5) followed by Group 2 (15%), Group 4 (12%), and Group 1 (11%). Table 1 and 2 shows the 10 group Robson classification and the total number of deliveries and C-sections in each group and the absolute and relative contribution of each group to the C- section rate. respectively.

Table 2: Robson Report Table

Robson Group	No. of CS in Group	Total N In Group	Group Size (%)	Group CS rate (%)	Absolute Group contribution to Overall CS rate (%)	Relevant Group contribution to Overall CS rate (%)
1	36	318	23	11	3	11
2	48	57	4	87	4	15
2a	25	34	2	74	2	8
2b	23	23	2	100	2	7
3	16	568	42	3	1	5
4	39	50	4	74	3	12
4a	10	21	2	48	1	3
4b	29	29	2	100	2	9
5	125	185	13	76	9	38
5.1	68	128	9	53	5	21
5.2	57	57	4	100	4	17
6	18	31	2	58	1	5
7	21	41	3	51	2	6
8	4	31	2	13	0	1
9	10	10	1	100	1	3
10	13	73	5	18	1	4
Grand Total	330	1364	100		24	100

DISCUSSION

Khyber Teaching Hospital is one of the three largest public sectors, tertiary care hospitals in Peshawar, Pakistan. It is 1800 bedded hospital that not only caters to patients in the vicinity but also receives referred and complicated cases from tribal areas as well as neighboring war-torn country Afghanistan. The Obstetrics and Gynaecology Department consists of three units with more than 15000 deliveries per year.

During the study period, a total of 1364 deliveries took place out of which 330 were by C- section making the overall C- section rate 24%. This rate is comparable to the national C- section rate of 20% in Pakistan. [3] However, studies conducted in tertiary care hospitals in Rawalpindi, Islamabad, and Karachi showed a much higher C- section rate of 54%, 33%, and 49% respectively.[10, 11, 12] Also a study conducted in five hospitals in five countries in South Asia revealed a collective C-section rate of 36%. [13]

The major contributor to the overall C- section rate was Group 5 comprising 38% of the total C sections. This result is similar to the studies performed in Gilani S et al, Ansari A et al and Hassan L et al. [10, 11, 13] These findings are also consistent with studies performed in Sri Lanka and France. [14, 15] However, this is in contrast to a study conducted in Multan, in which Group 10 was the major contributor to the C section. [16] In our study, about 47% of patients with a previous 1 C- section (group 5.1) underwent vaginal birth after a C- section (VBAC). This is less than the 66.7% VBAC rate reported in PIMS, Islamabad. [11] This is because induction of labor is offered in very limited cases of previous scar owing to the risk of scar rupture. Also, induction in such patients needs one-to-one close monitoring which is usually not possible in this very busy setup.

The second and third highest contribution to C-section rate was by groups 2 and 4 respectively which comprise nulliparous and multiparous patients with induced labor / pre-labor C- section respectively. These groups contributed 15% and 12% of the total C sections respectively. A study done in Australia also showed that rates of C- section are greater in induced as compared to spontaneous labor. [17] Being a tertiary care hospital, usually, patients with bad obstetric history and precious pregnancies (no alive issues despite many years of marriage) are referred here for C- section and neonatal care, which may partly explain the high rates of pre-labor C section. However, evidence-based protocols should be devised to reduce pre-labor C sections performed for a fetal cord around the neck diagnosed on ultrasound. Also, induction of labor should be medically indicated and justifiable. The absolute rate of C- section in the induced groups (2a and 4a) is very high (74% and 48%) which might be due to missing data regarding induction in patients who deliver vaginally. [8] Group 1 contributed 11% of the total C section, which is comparable to the 10% rate suggested by Robson for this group. [8] The C sections in this group can further be reduced by one-to-one supportive care and reviewing labor care protocols including replacement of the traditionally used Partogram by the WHO Labor care guide. [18]

Groups 1-5 contribute to the majority (79%) of C sections. Clinical protocols should be devised in order to curtail C-sections in these groups and re-audits performed using Robson classification to determine the impact of the interventions on the C- section rate. [19]

The strength of the study lies in the fact that it is one of the few studies done in this province and in a tertiary care hospital, which receives patients from diverse backgrounds, both booked and un-booked. Also, the subgroups of groups 2, 4, and 5 were analyzed, which has been done in very few studies so far. This can contribute further to our understanding of the indications of the C section. The limitations of the study are that it was a single-center study and was non-randomized. Further studies should be conducted to evaluate maternal and fetal outcomes in the various Robson Groups. [20] Also, a system should be devised within the Robson classification whereby the exact indication of the C- section within Groups 1-4 and Group 10 can be reported.

CONCLUSION

Robson classification is a useful tool to classify and analyze C-section rates. Although the rate of C sections in our setup is not very low, it can be further lowered by devising strategies to curtail sentinel C sections, and performing interventions like induction of labor and pre-labor C sections, only if they are evidence-based.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Afridi F:	Topic Selection, article writing
Akhtar Z:	material and methods
Afridi A:	Proof Reading, Discussion
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ORIGINAL ARTICLE

PERCEPTIONS OF POSTGRADUATE STUDENTS ABOUT PATIENT SAFETY AS PART OF THE CURRICULUM AT UNDERGRADUATE AND POSTGRADUATE LEVEL

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ABSTRACT

Objectives: To explore the perceptions and attitudes of postgraduate trainee medical officers towards patient safety in undergraduate and postgraduate medical curricula.

Materials and Methods: A cross-sectional study was conducted through a self-administered questionnaire by a simple random sampling technique. The target population for this study consisted of all postgraduate training residents working in two selected teaching hospitals in Peshawar. The total sample size was 80 and data was analyzed by using SPSS software version 20.

Results: Out of the total 80 participants 16% were female and 84% were male having clinical experience of 2-5 years. 17(21.3%) strongly agreed that making errors in medicine is inevitable, while 52(65%) participants said that consciousness after encountering errors could reduce the occurrence. About one-third reported that competent physicians do not make medical errors and 55 (68.8%) agreed that patient safety is our moral responsibility. However, there is a lack of a proper reporting system which acts as a barrier. Less than half of the participants were in support of routinely reporting medical errors while 58 (72.5%) disagreed.

Conclusion: The Postgraduate medical students of selected tertiary care hospitals had a positive attitude toward patient safety to be part of undergraduate and postgraduate medical curricula in Pakistan. They were aware of medical errors being inevitable but the magnitude may vary from situation to situation

Key Words: Patient safety, post-graduate trainees, medical curriculum

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INTRODUCTION

Recently, patient safety has emerged as a distinct discipline of health care services and raised considerable public concerns at the global level. A large number of studies have been conducted on this issue since the publication of the landmark report on patient safety issues by the Institute of Medicine, 'To err is human'.[1] Though, there is insufficient research done on patient safety in Pakistan, however, the media have reported a significant number of patients being harmed and even dying due to medical errors, thus emphasizing the need for patient safety[2, 4].

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Patient safety, especially in tertiary care hospitals in developing countries including Pakistan demonstrates a high prevalence of adverse events, an excessive rate of death and disability, and high preventability. [2] But there is a slow and steady increase in the level of awareness of the risk of unsafe healthcare practices among policy-makers and practitioners. The risk of healthcare-associated infections in some developing countries is as much as 20 times higher than in developed countries. [2] Even in developed countries like the US, Medication Errors (MEs) are reported to be responsible for as high as 7000 deaths per year. [3, 4]

In the healthcare system of Pakistan, there is a lack of trans-disciplinary, evidence-based strategies for patient safety. Furthermore, there is also a lack of incident reporting systems and risk management strategies in our health care system, especially at public hospitals. [1, 2] Riaz and Hashmi conducted a study in two different hospitals in Lahore. In the study, it was discovered that the outpatient departments of both hospitals had 44% and 39% errors

respectively while in the emergency department alone, it was found to be 60% and 73.5% respectively. Only prescription errors ranged from 39% in the outpatient departments and 73.5% in the emergency department in one hospital. [3]

Calculating the medical error rate at the national level is a challenging task due to factors such as lack of standardization in hospital practices and variations in data collection and information management systems. [5] Universal benchmarking is generally very difficult. Even for individual organizations, it is difficult to have a true rate as most systems rely on voluntary reporting of actual events or near-miss events. The problem with voluntary reporting is that the actual number of events could be much higher than the reported events. [6] In addition, organizations having good reporting systems have a high number of events and can be safer as compared to organizations having fewer reported incidents which could be due to poor reporting system. [7]

Regarding the contributing factors, literature has reported patient safety concerns and adverse events over the last decade in health care. [4, 5] These adverse events occurred not because of incompetent healthcare professionals who are intentionally harming patients, but rather due to the complexity of healthcare systems, where successful treatment and outcomes depend on many factors in addition to the competence of healthcare professionals. [4, 5] This study aimed to explore the perceptions and attitudes of postgraduate trainee medical officers towards patient safety issues in undergraduate and postgraduate medical curricula.

MATERIALS AND METHODS

This was a cross-sectional study, conducted through a self-administered questionnaire. The target population for this study consisted of all postgraduate(PG) trainee residents working in two selected teaching hospitals in Peshawar. All PG residents working in the two institutes for the past two years were included in the study (medicine and allied and surgery and allied) by simple random sampling technique. There were 120 PG trainees working at one private and around 300 trainees working at a public-sector hospital at the time of data collection in 2016. All PGs from the two selected tertiary care hospitals having experience of more than two years were included in the study. A modified integrated self-administered tool developed by Madigosky et al. was used to assess students' perceptions of patient safety. [6] A total of 80 residents were included in the study by simple random sampling from the two medical institutes. Data were entered and analyzed using the SPSS version 20 and presented in terms of frequencies and percentages.

RESULTS

Out of 80 residents who participated in the study, there were 13 females (16%) and 67 males (84%). The age of the participants ranged from 24 years to 37 years (Mean age = 29.4 years ± 2.8 SD). The findings indicate that some of the participants 17 (21.3%) strongly agreed and 35 (43.8%) agreed and expressed that making errors in medicine is inevitable. However, 14 (17.5%) and 13 (16.2%) showed disagreement and strong disagreement respectively. Regarding the accident of medical errors, 52(65%) and 20 (25%) of the participant showed agreement (strongly agree and agree respectively) that after an error occurs, an effective strategy is to work harder to be more careful. Table 1 shows details of the responses of participants. A positive attitude has been reported regarding evidence-based practice. They were of the view that error occurs because there is a gap between what we know as 'best care' and what we provide on a day-to-day basis.

Table 1: Perceptions of post graduate residents towards patient's safety

Perceptions	Strong agree	Agree	Neutral	Disagree	Strong disagree
1. Making errors in medicine is inevitable.	17(21.3%)	35(43.8%)	1(1.3%)	14(17.5%)	13(16.2%)
2. After an error occurs, an effective strategy is to work harder to be more careful.	52(65.0%)	20(25.0%)	0(0.0%)	5(6.3%)	3(3.8%)
3. Competent physicians do not make medical errors that lead to patient harm.	29(36.3%)	14(17.5%)	0(0.0%)	28(35%)	9(11.3%)
4. The culture of medicine makes it easy for providers to deal constructively with errors.	12(15.0%)	46(57.5%)	2(2.5%)	16(20%)	4(5.0%)
5. Physicians should routinely spend part of their professional time working to improve patient care.	55(68.8%)	14(17.5%)	0(0.0%)	7(8.8%)	4(5.0%)
6. Reporting systems do little to reduce future errors.	11(13.8%)	17 (21.3%)	0(0.0%)	24 (30.0%)	28(35.0%)
7. There is a gap between what we know as 'best care' and what we provide on a day to day basis	31(38.8%)	29(36.3%)	0(0.0%)	9(11.3%)	11(13.8%)
8. In my clinical experiences so far, faculty and staff communicate to me that patient safety is a high priority	29(36.3%)	29(36.3%)	1(1.3%)	18(22.5%)	3(3.8%)

DISCUSSION

As health care institutions constantly endeavor to improve health and health care, establishing a culture of safety got a significant value and recognition recently. [7, 9] The World Health Organization in 2009, introduced the Patient Safety Curriculum Guide for Medical Colleges/ Schools. A group of experts from various universities was commissioned to develop a curriculum that should contain the topics from the WHO Patient Safety Curriculum Guide for Medical Colleges. [10]

In recent years, medical incidents have become an important educational resource, and the introduction of patient safety in the medical curriculum signifies a major change in health care strategies in many teaching hospitals and their associated medical colleges. [11] There is a wide range of patient safety literature addressing the importance of the topic since its emergence in the mid-1990s; however, there has been little reported in the literature on an evidence-based patient safety education program in academic medical curricula, especially in developing countries, and little research documenting that such a program has improved health outcomes. However, few medical universities have successfully implemented a comprehensive and multidisciplinary safety curriculum to address the "Accreditation Council for Graduate Medical Education's (ACGME's) core competencies and to establish a culture of safety for sustainable improvement in healthcare through the integration of safety into the students' daily activities. [12]

The current study found a number of vital findings, which may inform the decision-makers to make room for the change in the undergraduate and postgraduate medical curriculum. The result indicates that the majority of PG residents agreed that medical errors are inevitable, more than one-fourth of the students were of the view that "after an error occurs, an effective strategy is to work harder to be more careful". A similar finding was also reported by Leung GK, Patil NG [13] and about half of them were of the opinion that competent doctors do not make errors, which indicated a fundamental misconception about the nature and pattern of human errors. [14] A major proportion of participants agreed that physicians should routinely spend part of their professional time working to improve patient care. Literature also proposed such strategies and an evidence-based model has been prepared. A "unit-based Patient Safety Leadership Walk-rounds (PSWR)" model was found very effective in patient safety and quality health improvement. In this model, physicians spare time for the quality health improvement and continuous assessment of patient safety measures in multiple units of the hospital to identify patient safety issues in the clinical micro-system. [15] The vote for reporting system was also high which showed the importance of incident reporting in hospitals. Research also revealed that properly reporting errors will reduce the occurrence of future medical errors. According to Shaw et al., the introduction of medical errors (medication) reporting system in a pediatric unit has significantly improved patient safety and quality of health care. [16] They also reported that the gap in knowledge and real practice is one of the important factors contributing to medical errors. The same has been reported by Ghalandar poorattar et al.[17] According to them, there is a clear gap between physicians' knowledge and actual practices concerning patient safety. Hence an evidence-based suggestion emerged that "education in medical error management to professionally support error disclosure might help reduce the gap". [17]

One of the limitations of our study was the small sample size. Future studies with a larger sample size are advisable. More research is recommended at a national level to define the scope of the problem, and measure its magnitude with renewed precision to elicit the appropriate policy and clinical solutions fully.

CONCLUSION

The Postgraduate medical students of selected tertiary care hospitals have a positive attitude toward patient safety to be part of undergraduate and postgraduate medical curricula in Pakistan. They were aware of medical errors and that these are inevitable aspects of healthcare that vary from situation to situation. There was however poor response in terms of agreement regarding incidence reporting.

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Following authors have made substantial contributions to the manuscript as under

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Gul R: Literature searching & Writing References.

Akhtar A: Data Collection.

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ASK YOURSELF WHY: THE MINI CEX FROM THE LENS OF A TRAINEE

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I handed over the patient's daily progress file to our staff nurse and followed her to chamber number 8. Come on, dear! You do these daily in your routine practice but let's add a new flavour to it today. In a few moments, we were both standing at bed number 8 B and I received a command to take the patient as my long case and proceed- heard the timer started clicking.

Tangled mind and strained nerves but in no time, I found myself on the right side of the patient. Composed myself and then after greeting him I started to ask all the relevant questions in history. While my supervisor keenly observed my every move, I began to examine the patient physically. After the general steps, I moved to examine the chest. Inspect, Palpate, and percuss were the spinal reflexes while I kept on writing down the needful. Finally, what is called the heart of examination of Chest, I proceeded to auscultate the patient, looked for my lucky lavender stethoscope, and here you go I'm almost done. I summed up all my examinations at the eleventh hour and we came out of that room after thanking and greeting the patient. It indeed was a game of nerves or a pressure test, couldn't think of a better word.

See me in my office in half an hour, looking at the watch he commanded, over a cup of coffee. I nodded.

Mini CEX is a very well-accepted and practical form of assessment that helps us undertake license and certificate examinations. The concept of workplace-based assessment is most helpful for the medical residents who in the setting of our country particularly in the public sector would rarely get any chance to spare time for self-learning. The mini CEX provides a real-time experience while we encounter the patient and the best part is immediate feedback and reflection from the assessor. I heard of all this process in an online session on Medical Education.

Living in the era of COVID-19, if anything that has suffered the most on part of a resident and for instance Myself, would be the learning process that has slowed down. Our Postgraduate training is directed not merely at the attainment of knowledge, attitude, and skills but also at observable responsiveness and appropriate functioning in real-life situations. The medical education began with apprenticeship and transformed into competency-based assessment over a period of time. The training used to be confined in the walls of training halls and lecture theatres before but now has glorified the hands-on, simulations, distant learning, feedback, and instant assessments.

I Spent 30 minutes waging my internal battle with all my insecurities and fears coming into reality. With all the steps, I took towards his office, I gathered my confidence back, knocked on the door, and heard a "come in please".

So, let's see what you have cooked for us today? he smiled and pointed out to the chair in front of him. I followed the command, got myself seated, and started to narrate the whole case right from scratch of history, systemic review, and examination findings and I moved step by step to conclude my case with what we call a differential diagnosis. The room had pin drop silence, it was only me who was heard speaking. Are you done? he asked. Oh yes! I suppose I said. He had a paper placed in front of him and I knew he marked me in six different areas. Let's not look at it, the paper was folded and placed in a drawer after he saw me curious about it. You ask yourself a 'WHY' about what happened to you in the last one hour. I responded instantly 'because I was supposed to be assessed'.

He smiled and said we undergo assessment all our lives one way or the other. Right now, you only might be thinking of your CPSP exam assessment but there is a golden rule to find out answers to all of these assessments you come across and to facilitate your learning. You carry so many tools to examine your patients but there are some tools of learning, I call them sincere friends of Hominid. If you learn to apply those tools to your history taking, examination and all the exercise you just did you will feel the difference. Note them down, the honestly serving men they are!

'Why What How When Where And Who'

Keep these alive in your day-to-day life and let them work for you. And once they do, you have your way out. The next twenty minutes were spent discussing the case that I narrated and was reflected back there and then. I left the room very satisfied because I did not come out alone, I have my 6 tools to help me out in the next Mini CEX which was scheduled next week as I heard him speak while closing the door.

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HEPATOVENOCAVAL SYNDROME - A RARE CAUSE OF ASCITES IN THE YOUNG POPULATION

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ABSTRACT

Hepatovenocaval syndrome involves obliteration of the intra-hepatic portion of inferior vena cava. It is a separate entity from Budd-Chiari syndrome with which it is usually confused; however, Budd-Chiari Syndrome involves obliteration of hepatic venous outflow. This case describes a young male patient who presented with a longstanding history of abdominal pain and ascites. His viral screen was negative for Hepatitis B and C. Ascitic fluid routine examination was transudate and an ultrasound scan of the abdomen revealed features of chronic liver disease. He had received anti-tuberculous treatment on a presumption of suffering from abdominal tuberculosis. However, there had been no improvement despite 12 months of therapy. He was thoroughly re-evaluated and a series of advanced investigations were carried out. A computerized tomographic scan of the abdomen revealed solid lesions in the liver suggesting malignancy. Subsequent biopsy was however reported as negative for malignancy. Screening for autoimmune liver disorders and Wilson disease was also negative. The Thrombophilia profile was normal. It is only after the multiphasic magnetic resonance imaging of the abdomen that occlusion of the intra-hepatic portion of inferior vena cava was spotted and a diagnosis of hepatovenocaval syndrome was made. The patient remained on antibiotics and diuretics and reported improvement in condition during hospitalization. Physicians and hepatologists are not much familiar with hepatovenocaval syndrome as a separate entity from Budd-Chiari Syndrome. However, it is of utmost importance to make a correct diagnosis because the management of both conditions differs markedly.

Key Words: Hepatovenocaval syndrome; Budd-Chiari Syndrome; Ascites; Liver.

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INTRODUCTION

Hepatovenocaval syndrome (HVCS) is one of the conditions causing hepatic venous outflow obstruction (HVOO)[1]. It involves mostly idiopathic occlusion of the intra-hepatic portion of inferior vena cava (IVC) and has emerged as an entity slightly different from Budd-Chiari Syndrome (BCS) that involves occlusion of hepatic veins mostly due to congenital or acquired thrombophilias[2]. Correct diagnosis is important because the management of HVCS is different from that of BCS. We outline a case of HVCS that remained undiagnosed for 3 years, partly because of the sub-clinical presentation of the disease and partly because of unfamiliarity with the condition on behalf of practitioners.

CASE REPORT

A 13-year-old male patient presented to the medical ward diagnosed with a case of chronic liver disease on the background of a long history of abdominal distension and bilateral paroxysmal right hypochondrium region pain spanning over 3 years. The pain had started gradually, was dull, and did not radiate elsewhere. However, the intensity of both pain and abdominal distension had progressed over these 3 years. There was no history of fever, abnormal bowel and bladder symptoms, nausea, vomiting, or weight loss. The patient had empirically received anti-tuberculous treatment (ATT) for 12 months based on a suspicion of abdominal tuberculosis. No investigations to diagnose or confirm tuberculosis was performed at that time. The patient achieved only mild improvement in symptoms after initiation of ATT; symptoms returned soon after completion of ATT. The patient's father also gave a history of splenectomy 3 months before presenting to our ward. The reason could not be identified but as per collateral history, the surgery was performed due to intractable pain from a very large spleen.

Clinical examination of the patient revealed gross ascites and visibly distended veins over the abdomen filling from below upwards on obliteration. There was no clinical evidence of jaundice, clubbing, palmar erythema, hepatic flap, lymphadenopathy, jaundice, or pedal edema. Routine and specialized investigations were carried out to reach an ultimate diagnosis, which is tabulated in Table 1.

An ultrasound abdomen performed for evaluation of ascites revealed hepatomegaly (13cm), with coarse

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echotexture and irregular margins. The portal vein measured 8.0mm. Of note was a hypoechoic to the isoechoic area, measuring 6.0 x 5.5cm located at porta hepatis (at the junction of the portal vein and its branches). Gross ascites was also noticed. Further diagnostic modalities were planned. The ascitic fluid routine examination was transudate and predominantly lymphocytic. A computerized tomographic (CT) scan of the abdomen was carried out, which detected multiple nodular areas in both lobes of the liver, the largest measuring 5.0 x 5.2cm in the right lobe of the liver. This aroused the suspicion of malignancy. Alpha-fetoprotein (AFP) as a tumor marker for liver malignancy turned out to be within normal limits ie 1.1ng/ml (<9.0ng/ml). An ultrasound-guided liver biopsy from the suspicious lesions with concomitant esophagogastroduodenoscopy (OGD) was performed under general anesthesia. OGD was inconclusive. Biopsy revealed scanty portal inflammation, fibrous expansion of one of the portal tracts, ballooning degeneration of hepatocytes, and scanty lobular inflammation. There was no evidence of Budd-Chiari Syndrome or malignancy in the biopsy specimen.

An echocardiogram to rule out cardiac causes of ascites was reported as structurally and functionally normal. Doppler ultrasound for portal hypertension showed a portal vein measuring 9.0mm, lifted anteriorly by the hypertrophied caudate lobe. The flow was noted in the hepatic veins and inferior vena cava (IVC) but appeared obliterated. A suspicion of Budd Chiari Syndrome was made. Negative liver biopsy leads to a search for other causes of such presentation. A referral was made to the ophthalmologist to look out for Kayser Fleischer (KF) rings as a manifestation of Wilson's disease; however, they were not present. Subsequent Magnetic Resonance Imaging (MRI) of the brain for CNS manifestations of Wilson disease was also reported as normal. Autoimmune liver profile was also negative. Thrombophilic profile including protein C and S levels, homocysteine levels, anti-thrombin III levels, anti-phospholipid antibodies, and factor V Leiden mutation as a screening test for procoagulant conditions leading to Budd-Chiari Syndrome was reported as normal.

A multiphasic MRI abdomen and pelvis was planned to confirm Budd-Chiari Syndrome. The MRI revealed compression and narrowing of intra-hepatic inferior vena cava (IVC). Portal veins were of normal caliber. Mild compression was noted in left and middle hepatic veins, however, right hepatic vein appeared normal (fig.1). A diagnosis of Hepatovenocaval syndrome was therefore made. The patient was started on antibiotic treatment to improve upon his condition.

DISCUSSION

The hepatovenocaval syndrome (HVCS) is a rare entity usually seen in children and adolescents. It involves complete obliteration of the intra-hepatic portion of the inferior vena cava (IVC). This is as opposed to Budd-Chiari Syndrome (BCS) which involves hepatic venous outflow obstruction[1]. The terms 'Obliterative Hepato-cavopathy', coarctation of inferior vena cava, and 'membranous obstruction of IVC (MOVC)' have also been used for HVCS[2,3]. BCS is a commoner entity in the West, whereas HVCS is more common in Nepal, India, China, and South Africa. A low socio-economic state associated with poor hygienic measures is thought to be the cause of its occurrence in Asia and Africa[4]. Post-partum state, surgery, long-standing fever, diarrhea in nutritionally deprived populations, or alcoholics can lead to HVCS.

The etiology of HVCS is predominantly idiopathic, whereas BCS mostly occurs due to hypercoagulable states. HVCS is believed to occur from recurrent attacks of thrombophlebitis due to repeated bacterial infections which initially cause partial occlusion of the intra-hepatic portion of IVC and ultimately leads to complete obliteration of the intra-hepatic IVC[1].

During an acute attack of thrombophlebitis, a thrombus is deposited at the intra-hepatic IVC, which either gets resolved later on leading to fibrotic bands or may organize causing stenosis of the vein. The process is mostly subclinical so not noticed by the patient or clinician initially. With occlusion or stenosis of the vein, cavo-caval collaterals with upward flow develop, therefore obstructive signs are not evident soon[5]. This is in contrast to BCS, where clinical manifestations of liver failure and decompensation occur rapidly after occlusion of the hepatic vein/s. Liver functions show mild derangement at this stage. Recurrence of such attacks can cause ischemic damage to the liver, ultimately leading to liver cirrhosis and failure[6]. Recurrent loss of hepatocytes from injury due to

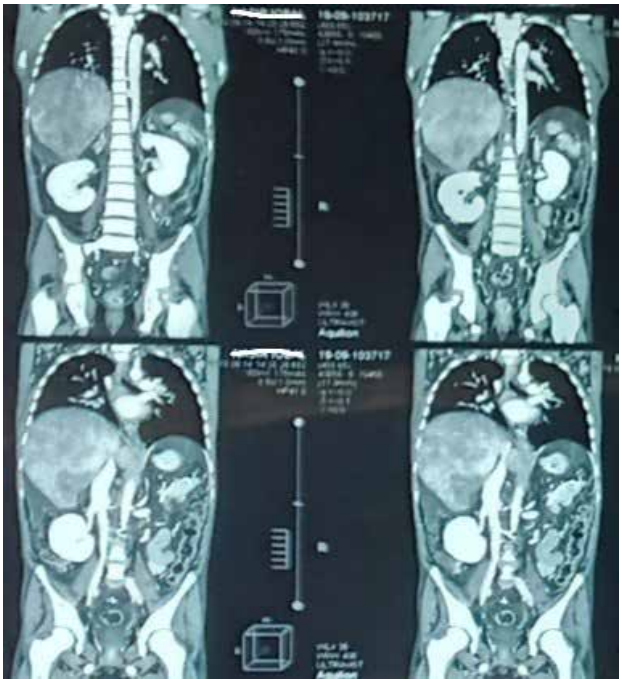

Fig 2: Karyotyping revealed a genotype of 46 XY.

Table 1: Routine and specialized investigations of patients with HVCS

Investigations	Results	Normal Range
Hemoglobin (Hb)	7.6g/dl	12-15g/dl
Blood smear	Microcytic, hypochromic anemia	
Total leucocyte count (TLC)	15,000/cmm	4,000-11,000/cmm
Platelet count	728,000/cmm	150,000 400,000/cmm
Alanine transaminase (ALT)	34U/l	15-40U/l
Aspartate transaminase (AST)	45U/l	15-45U/l
Total bilirubin	1.4mg/dl	0.7-1.5mg/dl
Alkaline Phosphatase (ALP)	1325U/l	300-720U/l
Serial Serum albumin	3.2g/dl, 2.87g/dl	3.5-5g/dl
Prothrombin time (PT)	15 sec, 28 sec	12-16 sec
Serial Activated partial thromboplastin time (APTT)	44.3 sec, 56 sec	30-40 sec
International Normalized Ratio (INR)	1.13, 2.8	0.9-1
Blood urea	32 mg/dl	12-45 mg/dl
Serum creatinine	0.8 mg/dl	0.3-0.7 mg/dl
Hepatitis B Antigen (HBsAg by ELISA)	Non-reactive	
Anti Hepatitis C Antibodies (Anti HCV Abs by ELISA)	Non-reactive	
Lactate dehydrogenase (LDH)	349U/l	225-450U/l
Serum calcium	8.84mg/dl	8.0-10.0mg/dl

thrombophlebitis leads to fibrosis and the development of regenerative nodules. This could be a possible explanation for the multiple nodules seen on radiographs of the patient that had been mistaken for malignancy. Repeated acute exacerbations of thrombophlebitis also lead to splenomegaly or hypersplenism. HVCS has shown an association with hepatocellular carcinoma (HCC)[2]. The development of liver cirrhosis and HCC is directly associated with the severity and frequency of acute exacerbations of thrombophlebitis attacks.

HVCS usually presents with features of chronic liver disease (CLD). Abdominal pain, ascites with pleural effusion, and fever are common presentations. This is characterized by mild elevations in hepatic transaminases[7]. Vascular spiders, palmar erythema, and coagulopathy are uncommon in HVCS-related CLD. Diagnosis can be made by Doppler ultrasound of the IVC. Other advanced tests include inferior vena-cavogram and MRI scans[8,9]. Ascitic fluid usually reveals an exudative predominantly neutrophilic picture. A liver biopsy shows features of CLD with no evidence of HCC[10]. It is diagnosed by real-time ultrasonography and Doppler examination of the liver and IVC. HVCS was previously considered a congenital venous anomaly and treated with surgery or endovascular procedures. It has also been treated on the lines of BCS, however, management of the two conditions is different[11]. Cava-caval shunts (cavo-atrial, meso-atrial, Meso-caval) and surgical procedures have also been instituted in the past but not too many benefits. Currently, treatment mainly aims to reduce the frequency and prevent attacks of acute exacerbation of thrombophlebitis. The treatment involves prolonged antibiotic therapy, diuretics, and other supportive therapy. Thrombolytics and anti-coagulants play no role in the management of HVCS[12]. Circulatory equilibrium is attained in chronic patients by the formation of extensive collaterals; therefore, the need for surgical and/or endovascular procedures is not felt. Liver transplantation has been tried in a few patients with good results, though the cost is the major limiting factor.

HVCS is a rare disease that if not kept in mind might either be missed or confused with BCS. However, both disease conditions have clear differences in their management options.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Badshah A: Did literature search, article formatting, and compilation.

Humayun M: Conceived the idea, final review.

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

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

3 Authorship

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

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

4 Submission of manuscript

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

4.1: The abstract should be structured with word count of not more than 250 words.

4.2: The fonts should be Calibri, with size 12, and spacing of 1.5, with justified margins in MS office format.

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

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

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

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

5 Institutional research and Ethics board (IREB) certificate

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

6 Conflict of interest

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

7 Confidentiality

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

8 Correction and retraction of articles

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

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

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

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

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

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

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

9 Correspondence

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

10 Fee submission process

The editorial board in a recent meeting has fixed a fee of 7000/- Rs (Pakistani), for local authors and 250 $ (US) for international authors. The fee should be submitted as bank draft/online payment through account (IBAN) no: PK56NBPA0388004048685170 (Branch code: 0388 / National Bank of Pakistan, University campus branch, Peshawar, Pakistan) as follows:

1) Article processing fee of 3000/- PKR at the time of submission of article after acceptance for preliminary / initial triage, open review by the Chief Editor. This amount will be non-refundable.

2) Article publication fee of 4000/- PKR at the time of acceptance of article after external review. This amount will be refundable if the article is rejected for any reason.

3) For international authors, the amount of 250 US dollars will be accepted after both internal and external review. Researchers belonging to countries other than Pakistan are advised to submit the fee after the whole process of review is completed and the article is accepted for publication.

11 Roles of editorial board, editors and members

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

11.1: The roles of the Editorial Board are:

11.1.1: To offer expertise in their specialist area

11.1.2: To review submitted manuscripts

11.1.3: To advise on journal policy and scope

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

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

11.1.6: To attract new and established authors and articles

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

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

11.2: The Patron:

The Patron is usually the Dean of the institute, and is overall incharge of the journal, who needs to be kept informed of the decisions taken by the editorial board. The patron is the final authority to approve the decisions and policies of the editorial board.

11.3: The Chief Editor:

11.3.1: The criteria for selection of Chief Editor are:

i. Expertise and experience in the specialist field related to the journal

ii. Publication record of a number of articles and /or books (usually in / related to the specialist field)

iii. Being a reviewer for an international peer reviewed journal

iv. Senior research position with equivalent experience in research and scholarship

v. Enthusiasm to undertake the Editor role

vi. Preferably a diploma, master or doctoral degree in Education and Research. It is not necessary to fulfill all the criteria to become a chief editor

11.3.2: The roles of Chief Editor are:

i. The key role of a journal`s chief editor is to promote scholarship in the specialist field associated with the journal, whilst also promoting the journal as the best journal to publish in. For any journal, the editor will need to encourage new and established authors to submit articles and set up a reliable panel of expert reviewers. Editors are also responsible for offering feedback to reviewers when required and ensure that any feedback to authors is constructive.

ii. An editor should also familiarize themselves with the Committee on Publication Ethics (COPE) 'Code of Conduct and Best Practice Guidelines for Journal Editors'.

iii. Depending on how the journal is managed and how it is structured, an Editor may have to make all the decisions regarding which articles to accept or reject for publication.

11.3.3: Managing editor:

The roles of manging editor are:

i. To help the chief editor to achieve the above-mentioned goals

ii. To communicate with the authors, reviewers, publishers and other agencies for smooth running of the journal

iii. To regularly evaluate the research work

iv. To communicate with funding and regulating agencies (HEC and others) for grants and accreditations.

11.3.4: Executive editor:

The roles of executive editor are:

i. To evaluate the research articles presented for publication

ii. To help the editorial board in policy making

iii. The help the editorial board in smooth publishing

iv. To communicate with reviewers and collaborate with external agencies for relevant purposes

11.3.5: Section editors:

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

i. Bibliography

ii. Proof-reading

iii. Academic writing reviewing, grammar and spell checking

iv. Dissemination of articles for review

v. Contact with publishers under the supervision of senior editorial team

vi. Training of future reviewers, young members and other faculty members

vii. others

11.3.5: Editorial advisory board:

Editorial advisory board members consist of national and international senior academicians, researchers, clinicians and others to help the current editorial board in designing, implementing and evaluating policies regarding upgrading the quality of research work. These people also share best practices to help the editorial team to refine their research work.

12. POLICY REGARDING RECRUITMENT AND CONTINUATION OF EDITORIAL BOARD

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

13. Plagiarism policy

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

14 Contact information

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

REFERENCES

1. ICMJE recommendations
2. COPE guidelines
3. SCOPUS

This document is prepared in January 2020 to be used by editorial board, reviewers, researchers and faculty as a guide to make them aware of policies and procedures of publishing, conducting, writing, reviewing and evaluating the research published in JMS. This document is developed by including the recommendations of ICMJE (2019) and COPE guideline and in case of any conflict, lack of clarity and ambiguity, the recommendations of latest ICMJE recommendation and COPE will prevail.

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