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EDITORIAL

The global polio eradication initiative in Pakistan: Lessons learnt and prospects for success

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Poliomyelitis commonly called polio is a highly infectious disease caused by three sero types of polio virus 1, 2 and 3, which attacks the nervous system.[1] The virus is transmitted mostly through feco-oral route, less often it is transmitted through polluted food or water. Since there is no treatment or cure to poliomyelitis, this disease can be prevented only. The World Health Assembly in 1988 set the target to eradicate polio globally by the year 2000 through multiple doses of childhood vaccinations that protect a child for whole life.[2]

The global polio eradication initiative partnership was launched in 1988 and is led by five organizations: World Health Organization, United States Centers for Disease Control and Prevention, United Nations Children's Fund, Rotary International, and the Bill and Melinda Gates Foundation. This program follows four strategies: routine infant immunization, supplementary immunization activities (SIAs), in at-risk middle- and low-income countries, surveillance for acute flaccid paralysis (AFP), and mop-up campaigns.[3]

Two types of polio vaccines are available; live attenuated oral polio vaccine (OPV) and injectable inactivated polio vaccine (IPV). Efficacy of OPV is affected by enteric pathogens which has high prevalence in Pakistan, this raises concern regarding its use locally.[4] Since the overall cost of IPV is far more than OPV, therefore IPV was not added to the program until 2015. The WHO Strategic Advisory Group of Experts (SAGE) on immunization recommended introduction of ≥1IPV dose into the EPI schedule. In Pakistan, one dose of IPV is given at 14 weeks of age in addition to OPV at birth and 6, 10, and 14 weeks of age.[5] The primary objective of the National Emergency Action Plan for polio eradication is to protect children from polio-paralysis, this focusses on a four-pronged strategy.[6]

- Routine immunization: accelerated catch-up activities using IPV in areas at risk and across the country
- Supplementary immunization: rapid response with at least two rounds of mOPV2 in areas with confirmed cVDPV2 circulation; and, strategic use of IPV in high risk areas
- Communication: focused on risk mitigation and in support of routine immunization
- Surveillance: enhanced early detection

High Risk Areas Affected by the Poliovirus have been divided into 4 tiers. These include Tier 1 with 11 core reservoirs in which the goal is to interrupt persistent local transmission using multiple strategies. Tier 2 with 30 high risk districts with a goal to Interrupt virus transmission, and if transmission is ongoing, decrease vulnerability. Tier 3 includes 32 vulnerable districts with a goal to decrease vulnerable districts, while Tier 4 has 79 low risk Districts and has a goal to maintain high population immunity.[6] Till the end of 2019, wild type 1 poliovirus (WPV1) disease is confined to two neighboring countries, Pakistan and Afghanistan. The number of cases has declined from 306 in 2014 to 54 in 2015, 20 in 2016, 8 in 2017 and 12 in 2018. So far in 2019, 136 cases have been reported including 92 cases from Khyber Pakhtunkhwa (KPK), 08 cases from Punjab, 11 cases from Baluchistan and 25

cases from Sindh province. As of 2020, only one case of WPV1 has been reported in KPK in Pakistan.[7]

CHALLENGES TO ERADICATION [2,6,7,8]

1. Lack of internal political stability and commitment.
2. Lack of stability in this geographical region.
3. Religious and cultural opposition, resulting in lack of social mobilization.
4. Poor Quality campaign.
5. Community based immunization through workers with minimal incentive and life threat due to lack of appropriate security.
6. Surveillance gaps leading to virus circulation in the local environment.
7. Slow response to outbreaks.
8. Low OPV efficacy resulting from lack of maintenance of cold chain.
9. Hostility towards western funded projects due to repeated neighborhood western intrusion and anti-west feelings.
10. Extensive internal population.
11. Single epidemiological block of Pakistan and Afghanistan favoring vector transmission across borders.

A Cross border collaboration is needed to eradicate the epidemic of poliomyelitis in the two countries. This can be achieved through improving the current strategies and implementing strict surveillance while intensifying the health education and awareness campaigns.

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ORIGINAL ARTICLE

Comparison of standard and low-pressure pneumoperitoneum; reduction in frequency and intensity of post-operative shoulder pain

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Author`s Contribution

[1] Original Idea, manuscript writing
[2] Manuscript writing, Conception
[3] Data collection, Decimation writing
[4] planning of research and manuscript writing
[5, 6] Review of article, Statistical Analysis, Result writing.

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A B S T R A C T

Background: Laparoscopic cholecystectomy is now gold standard and depends on good exposure of the peritoneal cavity. It is achieved by insufflation of the abdominal cavity with CO_2. Operating at lower intraabdominal pressure (<12 - 15mmHg) has been associated with fewer pulmonary and hemodynamic complications and lesser postoperative pain.

Objective: To ascertain the advantages of low-pressure pneumoperitoneum over standard pressure pneumoperitoneum. Our study focused on assessing postoperative pain frequency and intensity. None of the other parameters of low-pressure pneumoperitoneum were evaluated in this study.

Methodology: Our study was quasi experimental study conducted at Department of surgery, KRL Hospital over period of 4 years from 2013 to 2016. SPSS version 20 was used to calculate p value. A p value of less than 0.05 was taken as significant.

Results: A total of 456 patients with symptomatic gallstones were equally divided in two groups assigned to undergo low pressure (7-8mm of Hg) pneumoperitoneum or standard pressure (12-14mm of Hg) pneumoperitoneum laparoscopic cholecystectomy. The average age of patients was 46.2+/-13.6yrs in group A compared to 43.5 +/- 12.9 in group B. There were 60 (26.3%) male and 168 (73.7%) female patients in group A compared to 53 (23.2% and 175 (76.85) in group B respectively. It was found that group A 14 (6.1%) had no postoperative pain, 26 (11.4%) had VAS (visual analogue score 1 – 10) between 1– 7 and 188 (82.5%) had VAS of 8 – 10 where as in group B, 164 (72.6%) patients reported no shoulder tip pain postoperatively, 42 (18.6%) had VAS of 1 – 7 and 20 (8.8%) had VAS of 8 – 10. The difference was statistically significant (p-value = <0.001).

Conclusion: It is concluded that reducing the pressure of pneumoperitoneum to 7 – 8 mm of Hg tends to produce lower incidence of postoperative shoulder tip pain.

Keywords: *Laparoscopy, pain syndrome, cholecystectomy, pneumoperitoneum*

Introduction

Laparoscopic cholecystectomy depends on good exposure of the peritoneal cavity. It is achieved by insufflation of the abdominal cavity with CO_2.[1] Laparoscopic cholecystectomy has become standard procedure for gall stone disease because it achieves greater exposure with smaller incisions averting upper abdominal incision. In addition, advantages of laparoscopic cholecystectomy include decreased post-operative pain and early mobilization and return to routine life.[2] Despite its many advantages laparoscopic

cholecystectomy is associated with some degree of distress and pain. Although patients undergoing laparoscopic cholecystectomy do not suffer from wound pain as much as patients undergoing open cholecystectomy but they do infrequently complain of abdominal pain and shoulder tip pain postoperatively[3]. The exact pathophysiology of post laparoscopy pain is still under debate. The exact mechanism of pain related to pneumoperitoneum has not been clarified. Many etiological factors have been postulated to contribute to post cholecystectomy pain syndrome, with CO_2 absorption from the peritoneum, diaphragmatic irritation by high intra-abdominal pressure caused by pneumoperitoneum, the raw area created after removal of gall bladder on liver and pain coming from the incision sites[4]. Multiple researchers have observed that with low-pressure pneumoperitoneum there was a significant reduction in frequency and severity of postoperative pain syndrome (abdominal pain and shoulder tip pain).[3, 4, 5]

Operating at lower intraabdominal pressure (<12 - 15mmHg) has been associated with fewer pulmonary and hemodynamic complications and lesser postoperative pain.[6,7] Intraoperative safety of the procedure in decreased surgical space in low pressure laparoscopic cholecystectomy is not well recognized and is still debatable.[8] In either general or regional anesthesia, there were no problems of visibility of operative field using low-pressure pneumoperitoneum. Surgeons while using four ports for standard dissection of clot's triangle for cholecystectomy, did not experience any additional difficulty in low pressure pneumoperitoneum when compared to standard or high-pressure pneumoperitoneum.[9, 10, 11]

In recent years a lot of focus has been given to improve surgical techniques to reduce frequency and intensity of post-laparoscopy pain in general surgery as well as gynecological surgeries. Several techniques have been introduced to improve post-operative pain. Intra-peritoneal local anesthetic instillation, removal of residual CO_2 before closure, peritoneal washout with saline, ultrasound guided transverse abdominis plane block with local anesthetic agents like lidocaine and Bupivacaine are some of the techniques that have been investigated.[9, 11]

It is assumed that shoulder tip pain is caused by over stretching of diaphragmatic muscle fibers due to high pressure pneumoperitoneum.[7] Slow insufflation with CO_2 (1-2 L) at the beginning of procedure and complete evacuation of pneumoperitoneum at the end of surgery can decrease the occurrence of postoperative shoulder tip pain. There is no consensus amongst researchers regarding use of low or standard pressure pneumoperitoneum in terms of procedure safety and postoperative pain. However, most studies support low pressure but locally, there is almost no literature comparing the two said interventions. The advantages of low-pressure pneumoperitoneum over standard pressure pneumoperitoneum have yet to be ascertained in our local settings. This study was planned with thought that it would provide evidence-based results.

Methodology

This Quasi experimental study was conducted at department of surgery Kahuta Research Laboratories hospital Islamabad over period of 3 years from 2013 to 2016. A total of 456 patients were selected by non-randomized convenience sampling technique. Sample size was calculated using Slovin's formula. It is computed as n = N / (1+Ne2). Whereas: n = no. of samples, N = total population, e = error margin / margin of error. All patients more than 18 years of age, of either gender, ASA physical status grade 1 and 2, undergoing elective laparoscopic cholecystectomy were included. The patients having gall stones but, clinically diagnosed and confirmed by ultrasound and CT scan of having acute cholecystitis, cholangitis, empyema gall bladder, acute pancreatitis, obstructive jaundice, or suspicion of malignancy were excluded. Patients with history of previous abdominal surgery, bleeding disorders and those with ASA Physical grade 3 or above were also excluded.

The study was started after obtaining approval from hospital ethical committee. Informed consent was obtained from all patients prior to inclusion in the study. All findings were recorded on a study proforma. We assigned patients to two groups either A or B. Group A patients had standard pressure i-e 12 – 14mm of Hg pneumoperitoneum cholecystectomy and Group B patients had low pressure i.e. 7 – 8 mm of Hg pneumoperitoneum cholecystectomy. Post-operative shoulder tip pain presenting within first 24 hours of surgery was assessed according to VAS (1 – 10) and

then defined as 0 = no pain, 1 = mild to moderate pain but does not require analgesia and 2 = severe pain that requires intravenous analgesia (VAS 8 – 10). These were recorded on proforma. Appropriate analgesia was instituted according to severity and patients were discharged accordingly.

Statistics analysis**:** Data was collected and analyzed on SPSS version 23 Descriptive statistics were used for demographic variables. Quantitative data including variables as age, VAS, frequency and percentage was analyzed for mean and standard deviation. Frequencies were calculated for qualitative variables as drug used for analgesia. The effect modified as age, gender and diagnosis of patient ASA 1 and 2 were controlled by stratification. A p-value of less than 0.05 was taken as significant.

Results

A total of 456 patients were included in the study. Standard pressure pneumoperitoneum Group A had 228 patients and low-pressure pneumoperitoneum Group B also had 228. Tables 1 mention age details of patients in the two groups. Mean age in group A was 46.2±13.6 and in group B it was 43.5 ± 12. In group A 60 (26.3%) were males and 53 (23.2%) males were in group B. Among females 168 (73.7%) were in group A and 175 (76.8%) were in group B. Table 2 shows patients' presentations. Comparison of postoperative shoulder tip pain among study groups is shown in table 3. Out of 228 patients in group A 96 were of ASA grade 1 and 132 were grade 2. Among group B 153 were of ASA grade 1 and75 were ASA grade 2. The post-operative shoulder tip pain was significantly associated with standard pressure group whereas low pressure group was statistically significantly associated with no pain (p value = < 0.001).

Table 1: Age of Patients in Two Study Groups

Age (Years)	Group A (n=228)	Group B (n=228)
Up to 20	3 (1.3%)	9 (3.9%)
21 to 30	29 (12.7%)	28 (12.3%)
31 to 40	51 (22.4%)	63 (27.2%)
41 to 50	60 (26.3%)	62 (27.2%)
51 to 60	45 (19.7%)	45 (19.7%)
61 or above	40 (17.5%)	21 (9.2%)
Mean ± SD	**46.2±13.6**	**43.5 ± 12.9**

Table 2: Diagnosis of Patients in Two Study Groups

Diagnosis	Group A (n=228)	Group B (n=228)
Symptomatic Cholelithiasis	227 (99.6%)	225 (98.7%)
Acute Cholecystitis (on laparoscopy)	1 (0.4%)	2(0.8%)
Interval Cholecystectomy	0 (0%)	1 (0.4%)

Table 3: Comparison of postoperative shoulder tip pain among study groups

Shoulder tip pain (VAS)	Group A (n=228)	Group B (n=228)
0 (no pain)	14 (6.1%)	164 (72.6%)
1 (VAS 1 – 7)	26 (11.4%)	42 (18.6%)
2 (VAS 8 – 10)	188 (82.5%)	20 (8.8%)

Discussion

Laparoscopic cholecystectomy has replaced open cholecystectomy as the main surgical technique for cholelithiasis[12]. Superiority of laparoscopic procedures over open procedures has been established on the basis of lesser hemorrhage, better cosmetic results, less postoperative pain, shorter hospital stay and quick recovery and return to routine life.[12] Laparoscopic procedure depends on insufflation of peritoneal cavity with CO_2 to improve visibility. This results in increased intraabdominal pressure that has adverse effects of on cardiac output and pulmonary system during laparoscopic procedures. High intraperitoneal pressures during laparoscopic cholecystectomies cause postoperative pain.[13,14] Most surgeons perform laparoscopic surgery at a pressure level of 12 mmHg with upper limit set at 15mmHg. Pressure exceeding 15mm Hg is considered as a high pressure and is strictly contraindicated.[13] Increased intraabdominal pressure created by CO_2 gas insufflation produces changes in regional blood flow to intraperitoneal viscera. There is a risk of splanchnic ischemia at high intraabdominal pressure. Reports of disturbances in hepatic, splanchnic and renal blood flow from high intraabdominal pressure have been mentioned in

literature.[15] Systematic reviews by Gurusamy et al and Behnaz F et al established that low pressure laparoscopic cholecystectomy can be completed successfully using low pressure in approximately 90% of patients.[8,12] In comparison to a study done by Sandhu et al comparing low pressure pneumoperitoneum and standard pressure pneumoperitoneum laparoscopic cholecystectomy, where the average age of patients was 54 and 55.2 respectively while our patients' average ages in group A and B were 46.2 and 43.5 respectively.[7] In a similar study by Goyal et al the age of patients varied between 21 and 75 years.[16] Nabi S et al compared low and standard pressure laparoscopic cholecystectomy.[17] In their study Nabi S et al described statistically significant difference (p value < 0.05) in occurrence of shoulder tip pain between SPLC and LPLC.

Shoulder tip pain was noted in 15 (37.5%) of patients in SPLC group whereas in LPLC group only 5 (12.5%) patients complained of shoulder tip pain.[17] Our study results are comparable to results of these systematic reviews, post-operative shoulder tip pain in our study was significantly associated with standard pressure group (82.5% had it between 8 – 10) whereas low pressure group was statistically significantly associated with no pain between VAS 8 – 10 (p value = < 0.001). Clinically significant difference in pain score ranging from 1.0 to 1.5 points on a 0–10 pain scale has been mentioned in literature in LPLCs.[18,19] Effects of low-pressure pneumoperitoneum were evaluated in four blinded clinical trials.[19] Comparison of intensity of pain on first post-operative day between SPLC and LPLC showed clinically significant difference between the two groups. Warlé et al has published the only blinded study comparing postoperative pain beyond 24 hours after surgery and observed a difference of 0.8 in overall pain score on a 0–10 scale up to 4th postoperative day[20]. Out of two studies assessing shoulder pain one revealed a difference of approximately two points up to postoperative day one.[18] While in the other study mean pain scores of 0.7 and 0.9 were observed.[18,20,21] Randomized controlled trials describing comparison between standard and low pressure non-cholecystectomy procedures (i.e., laparoscopic donor nephrectomy and laparoscopic gynecologic procedures) also showed that low-pressure pneumoperitoneum is associated with less postoperative pain.[18, 22] Most of the studies have shown that keeping low pressure pneumoperitoneum during laparoscopic cholecystectomy significantly reduces post-operative shoulder pain.[23,24] The results of Singh R et al also show a significant reduction in frequency and intensity of post-operative pain after laparoscopic cholecystectomy.[23] The Mean VAS score came down to 0.08 at 24 hours in low pressure group, whereas it was 1.00 in standard pressure Group. The results from our study are similar to the observations from different studies present in systemic review and meta-analysis by Hua et al in 2014.[23,25] In their results Singh R et al and Donatsky et al established that pain score decreased at almost all intervals 0-6 hours, 7-12 hours and 13-24 hours in low pressure pneumoperitoneum cholecystectomy patients.[21,23]

The limitations of this study were that we used non-probability convenience sampling technique for data collection, there was no blinding and we studied only one outcome i.e. shoulder tip pain. The perioperative details in terms of operative time and post-operative stay in hospital were not documented. Further studies should be conducted to compare all these parameters.

Conclusion

It is concluded that decreasing the pressure of pneumoperitoneum to 7 – 8 mmHg results in significantly lower frequency and intensity of post-operative shoulder tip pain. There is need to conduct further experimental studies using rigorous research methods with large randomized samples.

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ORIGINAL ARTICLE

Evaluation of factors associated with acceptance of post-partum intrauterine contraceptive device in a tertiary care hospital

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Author`s Contribution

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A B S T R A C T

Objective: The post-partum intrauterine contraceptive device (PPIUCD) is a highly effective, long acting, reversible, economical and easily accessible family planning method. The aim of the study was to estimate the proportion of pregnant women aware of immediate post-partum intrauterine contraceptive device and to analyze the factors associated with acceptance.

Methodology: This is a cross sectional study in which 300 pregnant were selected who were visiting the antenatal clinics and admitted in early labor in labor ward. Their awareness and acceptance for PPIUCD was assessed through a structured questionnaire. Factors associated with acceptance were analyzed and the reasons for acceptance or refusal were determined.

Results: In this study the awareness of PPIUCD was found to be 46% and the acceptance rate of PPIUCD was 18%. The major reason for refusal was that women don't think they need contraception immediately after delivery and secondly, they need to talk to their partners for the decision. Most common reasons for acceptance of PPIUCD was that it is long acting and reversible.
Gravidity (p= 0.006), parity (p< 0.001), unplanned pregnancy (p= 0.002) and inter pregnancy interval (p= 0.004) were the factors significantly influencing the acceptance of PPIUCD.

Conclusion: This study revealed that awareness regarding PPIUCD is increasing in women but acceptance is still poor. It was due to misconception that no contraception is needed in postpartum period. Provision of adequate knowledge regarding convenience and effectiveness of post-partum contraception in preventing unintended pregnancies can play vital role to increase its acceptance.

Keywords: *Long acting reversible contraception, intrauterine devices, postpartum period, patient acceptance.*

Introduction

Access to safe, voluntary family planning is a fundamental human right. A woman's ability to plan and space her pregnancies has a direct impact on her health and wellbeing. All individuals should have the information, education and means to do so. Despite of large-scale family planning programs in many countries, increase in population growth is alarming, especially in developing countries. Pakistan is one of the most densely populated countries with a growth rate of 2.1.1 In 2017 world population ranking, Pakistan was at 6th place with over 197 million people and the United Nations has projected that in 2050 its population is expected to exceed 300 million.[1] The country's high fertility rate is a major contributor to this situation. The recent data in the Pakistan Demographic and Health Survey (PDHS) 2017-2018 shows that decline in fertility rates is minimal in the recent period from 3.8 births per woman as reported in the 2012-13 PDHS to 3.6 births per woman in the 2017-18 PDHS.[2] These figures indicate a high unmet need for contraceptives, although family planning programs have

been in place in Pakistan for a long time. Ignorance, lack of adequate knowledge or wrong information and beliefs are common hurdles in acceptance of contraception.[3, 4]

Many women desire to control their pregnancy but fail to use effective contraception. This has resulted in high levels of unintended pregnancies leading to adverse health consequences such as maternal mortalities and morbidities.[5] According to a study done in Karachi, 88% of induced abortions are result of unwanted pregnancies or contraceptive failure.[6] In Pakistan, approximately 2.25 million induced abortions take place annually, with an abortion rate of 50 per 1000 women aged 15 – 49 years.[7] Due to restrictive laws of abortion in our country, it is usually carried out by unskilled and untrained providers under secret settings which results in severe outcomes ranging from lifetime morbidity to mortality, thus increasing the prevalence of maternal mortality.[8]

Pregnancy provides a unique opportunity for health care providers to counsel the women and their partners for contraception and its health benefits. Most of the women in developing countries are unable or resistant to follow up for postnatal check-ups and contraception. This is may be due to lack of education and awareness, social pressure, and inaccessibility to facilities nearby.[9] Delay in decision of contraception by couples during postpartum period may lead to many unwanted pregnancies resulting in increased number of unsafe abortions.[10]

The PPIUCD is a highly effective, long acting, reversible, economical and easily accessible family planning method.[11] It can be inserted within 48 hours after birth before they leave hospital and the woman or couple needs not to return specially for contraception. Thus, couple has been protected before they assume sexual activity.[12] Cochrane review also provides evidence of safety and feasibility of PPIUCD insertions.[13]

Awareness has been highlighted as a key indicator of success in any program. For implementation of any contraceptive method at the community level, first step is to make the public aware and well informed about that method. Therefore, it is necessary to know the level of awareness and acceptance of that method in the community. Additionally, information related to the demographic profile of women who accept PPIUCD is also required as the dynamics of their decision-making process may vary from region to region. To address this need, we conducted this cross-sectional study to determine the recent trend in awareness and acceptability of PPIUCD and reasons for acceptance or refusal in our community.

Methodology

This study was approved by institutional review board and ethics committee of Shifa International hospital, Islamabad, Pakistan. This was a cross sectional study conducted from August 2018 to January 2019 in the department of obstetrics and gynecology in Shifa International hospital and its community health care center in Islamabad, Pakistan. A total of 300 antenatal women were selected by non-probability convenient sampling. Minimum sample size required was calculated by WHO sample size calculator by taking 95% confidence interval, 5% absolute precision and population size 600, i.e. estimated number of antenatal women presenting during six months.[14]

Pregnant women visiting the antenatal clinics and admitted in early labor in labor ward who agreed to participate were included in this study. Patients in severe pain and distress or presenting with acute emergencies and those who were not psychologically stable or not consenting were excluded from the study.

Data collection was done through a structured questionnaire. Confidentiality of the participants was maintained during data collection and analysis. After taking written informed consent from the participants, the interviewers collected data about socio-demographic characteristics (age, number of children, education, occupation and income), previous obstetrical history (previous mode of deliveries, last child birth), planned or unplanned pregnancy and previous methods of contraception. They were asked about their choice of contraception after delivery and awareness and acceptance of immediate postpartum intrauterine contraceptive device. The reasons for the acceptance or refusal to the PPIUCD insertion were also recorded.

We analyzed the data using SPSS version 22.0 (Statistical Package for Social Sciences) software. Descriptive and inferential statistics were applied. Chi-square test was used to determine association between

the acceptance of PPIUCD and other variables. P value < 0.05 was considered significant.

Results

A total of 300 women were included in this study, out of which less than half i.e. 139 women (46.3%) were aware of PPIUCD. Out of 139 women, 63 (45%) women heard of PPIUCD from antenatal clinic. Other sources of information regarding PPIUCD were relatives, media and family planning clinics respectively as presented in Figure 1.

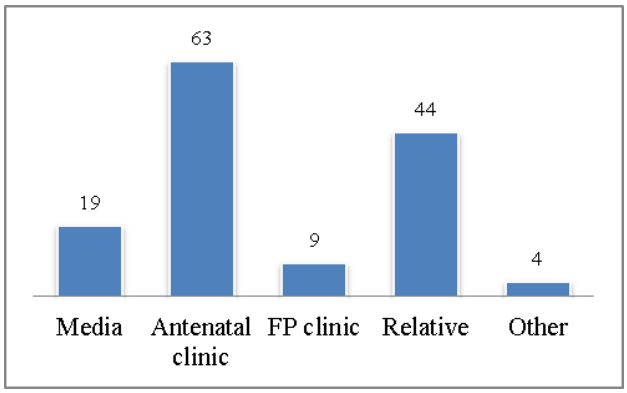

Figure 1: Source of information

Table 1 presents the association between the level of awareness and the acceptance rate in these women. Only 55 women accepted PPIUCD while 245 refused thus the overall acceptance rate of PPIUCD was 18.3%. The proportion of women accepting PPIUCD was significantly higher in those who were previously aware than those who were not aware regarding PPIUCD i.e. 40 women (28.8%) compared with 15 women (9.3%) with statistically significant p-value of <0.001.

Table 1: Level of Awareness and Acceptance for PPIUCD

Awareness	Acceptance		Refusal		Total	p-value
	N	%	N	%		
Yes	40	28.8	99	71.2	139	p<0.001
No	15	9.3	146	90.7	161	
Total	55	18.3	245	81.7	300	

The socio-demographic characteristics of the participants and association of these factors with the acceptance of PPIUCD are listed in Table 2. Majority of women were more than 30 years of age (46.0%), had received education till college level (34.3%) and were housewives (88.0%). The rate of acceptance was higher in the advanced age groups, 54.5% in more than 30 years and 40.0% in 25-30 years as compared with only 3.6% in 20-25 years but was not statistically significant, p-value=0.097.

Both gravidity and parity were found to be associated with participant's acceptance of PPIUCD. In the women accepting PPIUCD, significantly higher proportion were multigravida (76.4%) and multipara (67.3%) with p values of 0.006 and <0.001 respectively. There were also a greater proportion of women with unplanned pregnancy opted for PPIUCD than those with planned pregnancy, 54.5% vs. 45.5% with p-value calculated as 0.002. Highest acceptance was seen in women with less than 2 years of duration since last birth (47.3%) with statistically significant p-value of 0.004.

Table 2: Socio-demographic Characteristics

Socio-demographic Characteristic	Total (N=300)		Acceptance (N=55)		Refusal (N=245)		p-value
	N	%	N	%	N	%	
Age in years							
< 20	13	4.3	1	1.8	12	4.9	0.097
20 – 25	37	12.3	2	3.6	35	14.3	
26 – 30	112	37.3	22	40.0	90	36.7	
>30	138	46.0	30	54.5	108	44.1	
Education							
No Formal education	28	9.3	4	7.3	24	9.8	0.282
School	93	31.0	19	34.5	74	30.2	
College	103	34.3	23	41.8	80	32.7	
University	76	25.3	9	16.4	67	27.3	
Occupation							
Housewife	264	88.0	52	94.5	212	86.5	0.098
Employee	36	12.0	3	5.5	33	13.5	
Gravidity							
Primigravida	64	21.3	3	5.5	61	24.9	0.006
Multigravida	187	62.3	42	76.4	145	59.2	
Grand multigravida	49	16.3	10	18.2	39	15.9	
Parity							
Nullipara	71	23.7	3	5.5	68	27.8	<0.001
Primipara	88	29.3	15	27.3	73	29.8	
Multipara	141	47.0	37	67.3	104	42.4	
Duration since last child							
< 1	72	24.0	3	5.5	69	28.2	0.004
1-2	114	38.0	26	47.3	88	35.9	
3-5	89	29.7	19	34.5	70	28.6	

>5	25	8.3	7	12.7	18	7.3	
Mode of delivery							
SVD	105	35.0	25	45.5	80	32.7	0.009
Instrumental	89	29.7	7	12.7	82	33.5	
C-Section	106	35.3	23	41.8	83	33.9	
Planned pregnancy							
Yes	192	64.0	25	45.5	167	68.2	0.002
No	108	36.0	30	54.5	78	31.8	

There were 145 (48.3%) women who reported use of some form of contraception in past, out of which 69 (47%) had used male condom, 30 (21%) withdrawal method and 22(15%) had used contraceptive pills. Out of 145 women, 40 (27.6%) expressed dissatisfaction with their past method of contraception. Figure2 shows that among women refusing PPIUCD, majority said they did not want contraception immediately (20%) or needed to talk to their partners (18.4%) while some reported fear of complications (14.3%) or preferred other methods of contraception (13.9%).

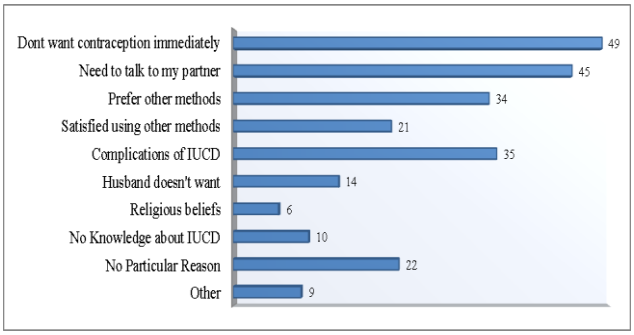

Figure 2: Reasons for PPIUCD refusal

The main reasons for acceptance was awareness regarding long acting method (70.9%) and reversibility (25.45%) shown in Figure 3.

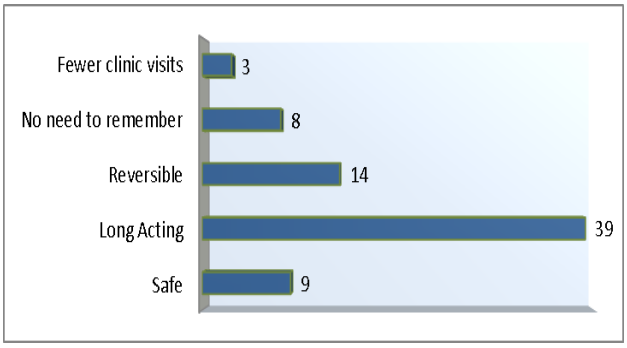

Figure 3: Reasons for PPIUCD acceptance

Discussion

We found that 46% of pregnant women were aware of PPIUCD in our study. This suggests that although less than half of the women were aware of PPIUCD but this percentage is continuously improving as compared to of 25% and 36.4% awareness reported in the previous studies conducted by Asghar et al and Sultana et al in 2016 and 2017 respectively.[15, 16] This shows that in recent years a trend of increased level of awareness regarding PPIUCD in Pakistan.

The overall acceptance of PPIUCD in our study was only 18%. Similarly, acceptance was also found to be poor in the studies conducted by Sharma et al, Alukal et al and Katheit et al and the results were consistent with our study.[17,19] This shows that acceptance rate was not significantly improved over the period of time, which has to be readdressed. It also indicates that there is a gap between awareness and acceptance probably because it is still emerging as a new concept in our society and its effectiveness is questionable to most women. This is supported by the study conducted by Kanmani and colleagues, which showed more than double fold increase in acceptance of PPIUCD by removing these misconceptions and myths and explaining that effectiveness is not altered by insertion in immediate postpartum period.[20] The rate of acceptance was significantly higher in the women having awareness of PPIUCD (28%) as compared to women who had no previous knowledge of PPIUCD (9.3%). These findings are similar to the study conducted by Deshpande et al which revealed 64% acceptance rate in women with awareness and 23.3% acceptance rate in women who were unaware of PPIUCD.[21]

The present study demonstrated that major source of information regarding PPIUCD was antenatal clinic (45.3%). These findings are similar to the studies conducted by Sharma et al. and Deshpande et al.[17, 21] In this study the rate of acceptance was highest in the advanced age groups i.e. 54.5% in women more than 30 years of age. The study conducted by Malchuru and colleagues also demonstrated the highest rate of acceptance among the women in age group of 30-39 years.[22] This study revealed significant association between acceptability of various factors with PPIUCD

such as parity, duration since last child birth, previous mode of delivery and planned or unplanned pregnancy. Acceptance was more in multipara and in women who had less than 2 years of duration since last delivery. These findings are similar to results observed by Sharma et al, Deshpande et al and Gujju et al.[17, 21, 23] This finding suggests that the mothers with a higher number of births and less inter-pregnancy interval are more receptive to this contraceptive method.

Higher acceptance was also seen in women who had previous vaginal deliveries which is similar to the observations in the study done by Ranjana and colleagues demonstrating higher acceptability rate after post-placental IUCD insertion than intra-caesarean insertions (52.9 versus 42.6%).24 This suggests that fear of complications is less in women having normal vaginal deliveries than caesarean section. Acceptability was also significantly increased in women with unplanned pregnancy. Alukal et al also stated similar finding with 74.1% acceptance in women having unplanned pregnancy.[18] This indicates that women who had unplanned pregnancies either due to non-use of contraception or due to previously failed contraception are more motivated for PPIUCD insertion.

The main reasons for acceptance in this study were because it is long acting (70.9%) and reversible method (25.5%). The studies conducted by Sharma et al and Deshpande et al also showed the main reasons for acceptance to be long acting method and its reversible nature.[17, 21]

Our study revealed that major reason for refusal was that they did not want contraception immediately (20%) or needed to talk to their partners (18.4%). Valliappan and colleagues also stated that most of the women required more time to think and discuss with partners.[25] So, they recommend that there should be continued health counselling to the pregnant women and their partners, especially in the last trimester and in every visit to reinforce about contraception and PPIUCD. A study conducted by Vidyarama et al in a tertiary care hospital also suggested there is a need to strengthen counselling services and motivate the trained personnel to improve the acceptance rate.[26]

Conclusion

The present study concluded that acceptance of PPIUCD among the pregnant women was very poor despite of improved awareness. Although antenatal clinics are providing family planning awareness, but currently they are unable to create a significant impact on acceptance of PPIUCD. The medical and paramedical staff providing family planning services needs to be updated on recent developments in contraceptive services, so they can promote health education highlighting the advantages of PPIUCD and eliminating apprehension about the use of this method. Integration of adequate and comprehensive counseling services at antenatal and delivery units can increase the level of awareness and acceptance of this highly effective contraceptive method.

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ORIGINAL ARTICLE

Histopathological spectrum of duodenal biopsies: Experience at a tertiary care hospital

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A B S T R A C T

Objective: Endoscopic duodenal biopsies constitute a significant load of specimens in the histopathological section of a tertiary care hospital. Most of these diseases comprise non-neoplastic lesions causing significant morbidity. The purpose of this study was to see the frequency of these diseases in our patient population and to compare and analyze our results with similar other studies.

Methods: In this retrospective study records of all duodenal biopsies reported from Feb 2017- Jan 2018 were retrieved. Both non neoplastic and neoplastic conditions along with biopsies with unremarkable findings were included. Various histological parameters like villous blunting, IEL count per 100 enterocytes, crypt hyperplasia, inflammation in lamina propria, and presence of microorganisms, any dysplasia or malignancy were studied. Data was statistically analyzed using SPSS v.23.

Results: A total of 159 duodenal biopsies were included in the study. Normal duodenal morphology was noted in 85 (53.45%) cases while 74 (46.83%) cases revealed abnormal duodenal pathology. There were 46 (28.93%) cases consistent with celiac disease. Twenty eight (17.61%) cases were of other duodenal pathologies of which non-specific duodenitis was most common. There were 22 (13.83%) cases of duodenitis and 2 (1.26%) cases were of duodenal ulcer. One case (0.62%) each was seen of Brunner gland hyperplasia, adenocarcinoma, signet ring carcinoma and one case was of metastatic adenocarcinoma.

Conclusion: In our study we found a significant percentage of 46.83% exhibiting abnormal duodenal pathology. Cases consistent with celiac disease were 28.93% while 13.83% of the cases had duodenitis. The percentage of malignant cases was minimal (1.88%).

Keywords: *Duodenal biopsy, Celiac disease, duodenitis*

Introduction

Patients presenting with a wide range of symptoms like epigastric pain, dyspepsia, nausea, vomiting or chronic diarrhea are subject to esophagogastroduodenoscopy (EGD). This method enables the visualization of the internal surface of the endoscoped organ thus enabling pathological sampling from the lesion so that a definitive diagnosis can be made.[1]

Some of the common inflammatory conditions affecting duodenal mucosa are celiac disease, refractory and tropical sprue, peptic duodenitis, inflammatory bowel disease and autoimmune enteropathy. These entities have overlapping features including symptomology, serology and histologic findings. The aim of the current retrospective study is to find the prevalence of various diseases of duodenum in our setup and to analyze and

compare the histopathological findings with studies done in other countries.

Microscopic findings like raised intraepithelial lymphocyte (IEL) count with normal villous architecture occur in 1-3% of duodenal biopsies and generate differential diagnosis of numerous duodenal pathologies.[2,4] Celiac disease is a common cause of malabsorption syndrome. Marsh classification is commonly used to classify it into different stages of severity. Following is the Marsh classification of celiac disease presented in Table 1.[1,5]

Table 1: Marsh classification of celian disease

Marsh-Stage	IEL/100 enterocyte / duodenum*	Crypt hyperplasia	Villi
0	<30	Normal	Normal
1	>30	Normal	Normal
2	>30	Increased	Normal
3a	>30	Increased	Mild atrophy
3b	>30	Increased	Moderate atrophy
3c	>30	Increased	Complete atrophy

IEL/100 enterocytes*- Intraepithelial lymphocytes per 100 enterocytes (epithelial cells in duodenum).

The aim of this study is to document the spectrum of duodenal biopsies in our setup.

Material and Methods

In this retrospective study, the records of all duodenal biopsies reported from Feb 2017- Jan 2018 were retrieved. Approval from the internal review board & ethics committee was taken. Both non neoplastic and neoplastic conditions as well as biopsies with unremarkable findings were included. Endoscopic findings and various histological parameters like villous blunting, IEL count per 100 enterocytes, crypt hyperplasia, inflammation in lamina propria, presence of microorganisms, and dysplasia or malignancy were studied. Data was entered and statistically analyzed using in SPSS v.23 (IBM corp., Armonk, NY, USA).

Results

A total of 159 duodenal biopsies were reported from Feb 2017 to Jan 2018. There were 72 male and 87 female patients. The age range was 2-90 years. Normal duodenal morphology was noted in 85 (53.45%) cases while 74 (46.83%) cases revealed abnormal duodenal pathology. There were 46 (28.93%) cases consistent with celiac disease which were further stratified into different stages according to Marsh classification (stage 1, 2 and 3). Marsh 1 stage was assigned to 24 (15.09%) cases and 5 (3%) amongst these had additional finding of the giardia lamblia organism. There were 4 (2.51%) cases of Marsh stage 3a, 15 (9.43%) cases of stage 3b and 3 (1.88%) cases of stage 3c. No case was assigned Marsh stage 2. Twenty eight (17.61%) cases were of other duodenal pathologies of which non-specific duodenitis was the most common. There were 22 (13.83%) cases of duodenitis and 2 (1.26%) cases were of duodenal ulcer. One case (0.62%) each was seen of Brunner gland hyperplasia, adenocarcinoma, signet ring carcinoma and one case was of metastatic adenocarcinoma. Pattern of villous architecture and a comparison of villous architecture with intraepithelial lymphocytes is done in Table 2.

Table 2: Villous architecture and intraepithelial lymphocyte count (IEL) count- Histological evaluation

Villous architecture	No of cases (%)	IELs	
		<30	>30
Normal villi	129 (85.43)	102	27
Mild atrophy	2 (0.013)	1	1
Moderate atrophy	13 (0.086)	2	11
Severe atrophy	7 (0.046)	0	7
Total	151	105	46

Discussion

The age range in our study is from 2 years to 90 years with a mean of 40.01 years and standard deviation of 19.50. Various studies have shown a mean age in the range of 34.3-37.5 years which is comparable to the current study.[6] Duodenal biopsy findings with raised intraepithelial lymphocytes of 30 or more IEL per 100 enterocytes, some degree of villous blunting and lymphoplasmacytic inflammation in lamina propria were suggestive of celiac disease. Such cases were further advised for serological workup for celiac disease. Cases with raised IEL count and normal villous architecture that is Marsh [1] have a differential of early celiac, tropical

sprue, drug induced, post infectious or autoimmune duodenitis. A mixed inflammatory infiltrate comprising lymphocytes, plasma cells, neutrophils and eosinophils in lamina propria, normal IEL count and normal villous architecture were given a diagnosis of nonspecific duodenitis.

The most common duodenal disease in western population is Celiac disease, Crohn's disease and cystic fibrosis. While in developing countries tropical sprue, parasitic infestations, intestinal tuberculosis and primary immunodeficiency syndromes are common. Tropical sprue forms an important differential diagnosis with celiac disease in a study in India.[7] Celiac disease is found to be prevalent in areas where wheat and its products are the staple diet. Rapid mobilization of people and consequently changing diet patterns is having a change in spectrum of duodenal pathologies as seen in biopsy specimen.[8] In our study 46 (28.93%) cases were consistent with celiac disease. This pattern is indicative of quite a significant proportion of our population having gluten sensitive enteropathy. Being a major wheat producing country and wheat being a staple diet it could be very hard to manage a diet plan for these people with gluten sensitivity especially if they belong to lower economic strata.

The Marsh 1 lesion of increased lymphocytosis and normal villus to crypt ratio is Celiac disease of stage Marsh 1 if serology and history have supportive findings. In our study 24 (15.09%) cases had only raised intraepithelial lymphocytes and were assigned type 1 Marsh stage. This histologic feature is shared by many diseases of different etiologies like infections, tropical sprue, drug/food allergies including early Celiac disease and further workup has to be done like serology. A negative serology becomes questionable if the patient has IgA deficiency thus placing a greater emphasis on histologic picture. Antibody titers can be also be low or negative in cases with minimally destructive lesions like Marsh 1. Many cases are assigned a gluten modified diet trial. A study by Wahab et al[9] showed 37% of the Marsh 1 lesions improve under gluten modified diet. Other most common associated diseases associated with raised intraepithelial lymphocytosis are H pylori gastritis, parasitic infestations like Giardia lamblia, non-steroidal anti-inflammatory drug use, bacterial overgrowth, tropical sprue and certain autoimmune diseases.[10,16] These diseases can be further differentiated by doing more specific tests. This relatively subtle histological finding is important to be recognized and reported as it can have important implications for the patient.[4]

Excluding cases suspected of celiac 46 (28.93%), 28 (17.61%) were of other duodenal pathologies of which non-specific duodenitis was most common. There were 22(13.83%) cases of duodenitis and 2 (1.26%) cases were of duodenal ulcer. One case (0.62%) each was seen of Brunner gland hyperplasia, adenocarcinoma, signet ring carcinoma and one case was of metastatic adenocarcinoma. Manjusha had studied 50 duodenal biopsies over a period of one year in a tertiary care hospital and he found 28% celiac disease and 4% tropical sprue cases.[17] The percentage of celiac disease in his study almost exactly corresponds with our figures. A study done by Tariq [18] comprised of 100 cases over a six month duration revealed 46% celiac disease, 38% nonspecific duodenitis and 2% giardiasis with 14% normal cases. In our study there were 5 cases of giardiasis (3%).

The study done by Dutta[19] involved 124 patients presenting with malabsorption. Tropical sprue was the commonest etiology (29%) followed by Celiac and Cohn's (15.3% each). Other important etiologies were parasitic infestations (9.7%) and immune deficiency disorders (5.6%). A comparison of pattern of villous architecture and IEL count is done with some other studies in table 3. Malignant tumors of the duodenum are very uncommon being 0.3% of all gastrointestinal tumors but up to 50% of the small bowl malignancies. Most frequent duodenal tumor is adenocarcinoma followed by other primary malignancies like lymphomas, leiomyosarcomas, carcinoid tumors, gastrinomas and stromal tumors.[20,21] In our study malignant tumors were few with a single case of adenocarcinoma, signet ring carcinoma and metastatic adenocarcinoma and their percentage was (1.88%).

Table 3: Comparison of villous architecture and IEL of present study with some other studies

Study	Total cases	Villous architecture		IEL	
		Normal	Atrophy	<30	>30
Dutta et al[17]	162	142	20	138	14
Ghoshal U et al[6]	226	106	120	100	126
Manjusha et al[16]	50	20	23	26	24
Present study	159	129	22	105	46

Conclusion

It can be concluded that the cases included in the current study had a significant percentage of abnormal duodenal pathology (46.83%) consisting mainly of celiac disease (28.93%) and duodenitis (13.83%), while the number of malignant cases was minimal (1.88%).

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ORIGINAL ARTICLE

Use of e-learning tools in integrated clinical biochemistry

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A B S T R A C T

Objective: To evaluate usefulness of e-learning tools in teaching integrated clinical biochemistry.

Methodology: The study was carried out on the 1st year medical students of Shifa College of Medicine, Shifa Tameer-e-Millat University. Students were given questionnaire to fill. Statistical procedures were performed with the SPSS software. The qualitative data is presented in the form of frequency and percentages.

Results: More than half of the students were already aware of some form of e-learning tool. Most beneficial tool was YouTube followed by Dropbox, WhatsApp. Most of the students wanted recorded video lectures, more online books and more handouts. Majority students wanted a combination of both forms of learning.

Conclusion: e-learning means learning which involves technology. It aids in understanding concepts. The best form is blended learning, which is a combination of e-learning and traditional learning. Students found e-learning to be effective and economical. Students of Pakistan are using smart phones, iPads, computers, etc. Their integration will require development of computer systems and training of faculty members. Different institutes may select different modalities depending on their requirement, faculty training and financial resources.

Keywords: *e-learning, traditional learning, blended learning*

Introduction

Modern day technology has introduced different e-learning tools in medicine. E-learning is defined as use of technology to enhance learning. E-learning is also called web-based learning, online learning, distributed learning, computer-based instruction or internet-based learning. E-learning modes are broadly classified as distance learning and computer-based learning. Distance learning is used to give education to learners who are remotely located and their direct access is difficult. Computer based learning uses computers for learning and teaching.[1] In both modes of learning, internet becomes the point of integration. E-learning uses text, graphics, animation, audio or video, to produce content that learner's access via computer. Traditional learning involves the use of lectures and face-to-face learning. Blended learning is a combination of e-learning technology with traditional learning, for example, a lecture or demonstration is supplemented by graphics, animation, audio or video.[2]

The advantages of e-learning include easily accessible information, personalized learning, the content is standardized, can be easily updated and is easily distributed.[3] Accessibility means the student is able to access what is needed whenever it is needed. Improved and easy access to educational materials is vital, as each student has a unique routine of learning. It is easier to update than updating the printed material. It allows educators to review their content simply and quickly.[4] Students have control over the learning material, time, order of learning, pace of learning and media which lets them meet their personal learning objectives.[5]

Content delivery may be either synchronous or asynchronous. Synchronous delivery refers to same content of information being given at the same time by an instructor. There is direct communication with other learners such as teleconferencing, WhatsApp, etc. In asynchronous delivery, the information is received and given at different times so the learners have their own pace of learning. There has to be a centrally placed distributor who sends the information to the instructors and students such as e-mail or other feedback technologies, Facebook and Dropbox.[5]

Course of content and delivery is standardized in e-learning as compared to a lecture given to different groups by separate instructors. It allows learning to be individualized which is known as adaptive learning and promotes interactions with others also referred to as collaborative learning. Internet lets the widespread distribution of digital content to many users concurrently.[6] e-learning can be designed to include assessments such as quizzes, multiple choice questions, electronic Problem Based Learning. Most of the formative assessments are limited to Multiple Choice Questions.[7]

Methodology

The study was carried out on the 1st year medical students from Shifa College of Medicine, STMU (Shifa Tameer-e-Millat University), Islamabad, Pakistan, class of 2023. There were 106 students. It was carried out in the first block, Y-1 which included modules of Essentials of Medicine, Cell Structure and Function, and Hematology and Lymphoid System for duration of four months. Students were given a questionnaire to fill after which qualitative and quantitative analyses were performed. All statistical procedures were performed with the SPSS software version. The qualitative data is presented in the form of frequency and percentages. There were no side effects or any potential hazards of this study.

Results

Of the 106 eligible participants, 100 students responded to the survey and completed the survey in full. One participant was excluded from data analysis as the participant did not make any choices.

The students were asked about the e-learning facilities that they were already aware of. 93% of them knew about YouTube, 85% knew about WhatsApp, 75% knew about Dropbox, 66% knew about Google Drive, 47% knew about Facebook and 14 % knew about other e-learning tools. This shows that more than 50% of the students were aware of the e-learning tools as presented in figure 1.

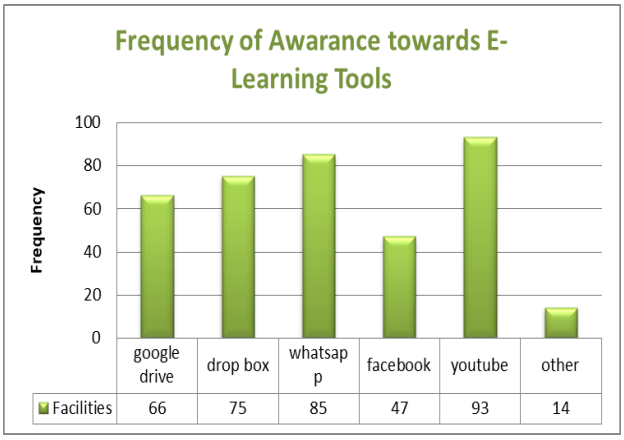

Figure 1: Frequency of awareness regarding different e-learning tools

Students were questioned about the usefulness of e-learning tools. Most useful tool was YouTube (94%) followed by Dropbox (92%), WhatsApp (64%), Google Drive (34%), Facebook (8%) and other apps (10%). This is shown in figure 2.

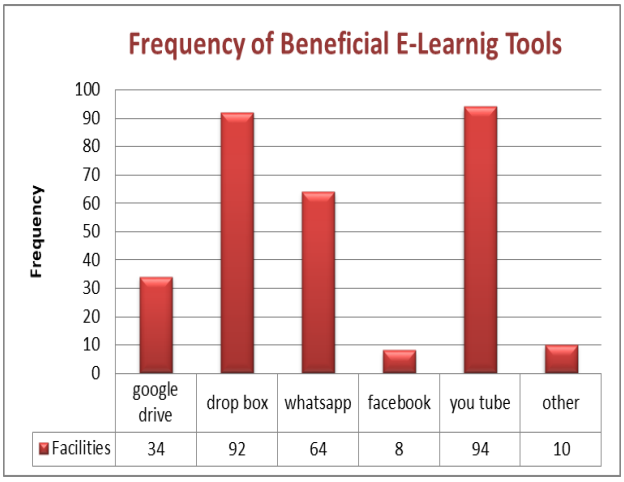

Figure 2: Frequency of useful e-learning tools.

Students were asked which material they would want to be provided online. 91% of the students wanted other materials. 69% wanted more online books. 43% wanted more handouts. 18% wanted more slides. 3% wanted more online quizzes as shown in figure 3.

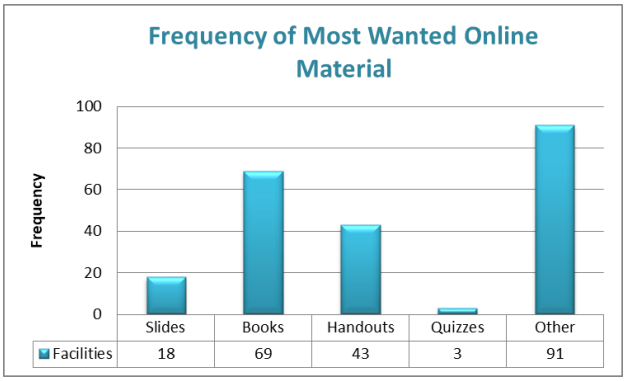

Figure 3: Frequency of most wanted online material.

YouTube videos are made by people of different nationalities. The students found that American videos are most conceptual followed by European videos, Pakistani videos and Indian videos. Videos of other nationalities are also helpful. The data is presented in figure 4.

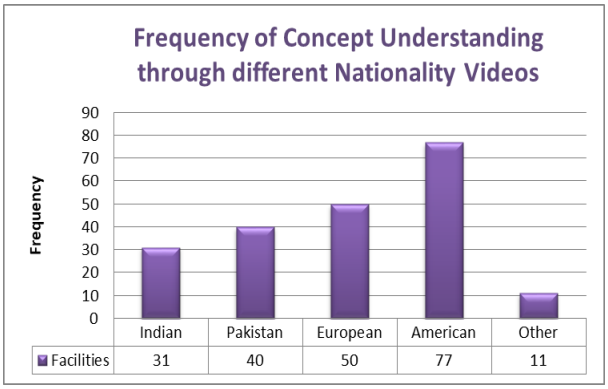

Figure 4: Frequency of Concept Understanding Through Different Nationality Videos.

Students were asked which medium of learning was better. 94% of the students found blended learning to be useful. 6% of students were in favor of traditional learning. None of the students was in favor of only e-learning as is shown in figure 5.

87% of the students wanted the lectures to be videotaped. 13% were not in favor of it as shown in figure 6. 56% of students found mobile to be more useful while 44% of them found laptop to be more useful electronic device as shown in figure 7.

The students were asked about the cost effectiveness of different learning methods. 12% found books more economical, 26% found e-learning more economical while 62% found blended learning more economical as shown in figure 8.

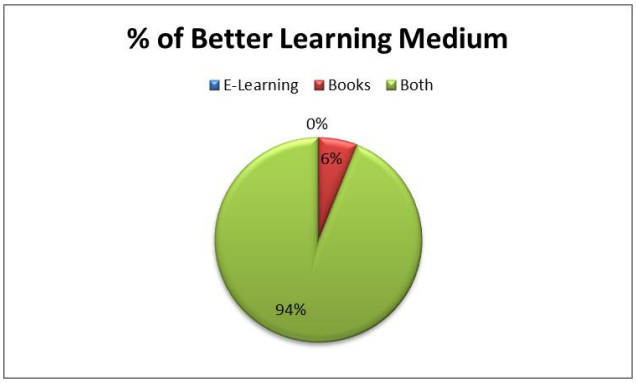

Figure 5: Better learning medium

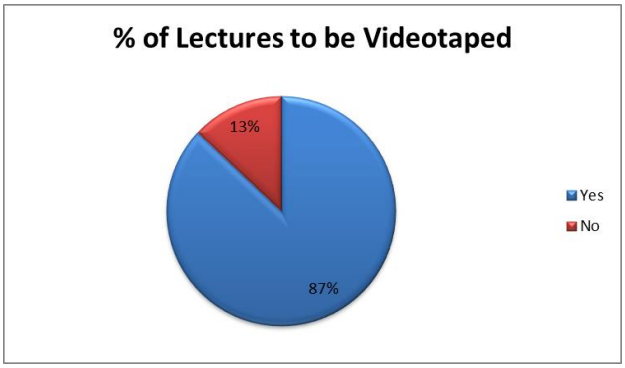

Figure 6: Lectures to be videotaped.

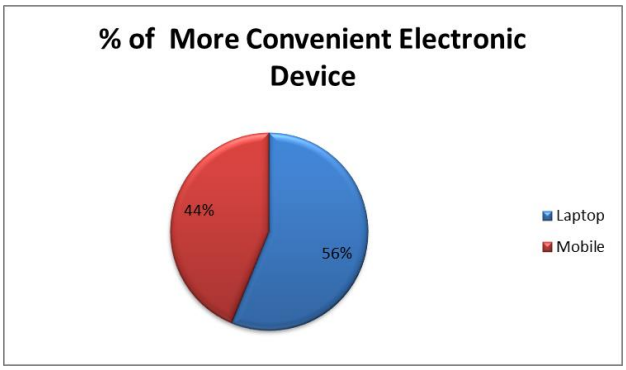

Figure 7: More Convenient Electronic Device.

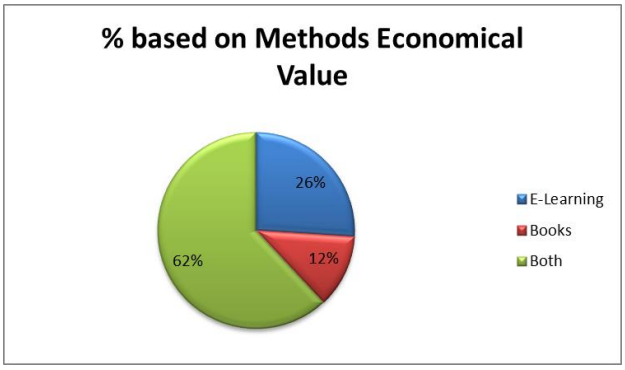

Figure 8: Comparison of cost-effectiveness of different learning methods.

Suggestions regarding the e-learning package highlighted the benefits of using a blended learning approach and showed the interest of students regarding e-learning. There were a number of suggestions by the students. Six students suggested that "Lectures should be videotaped." One student suggested that "Credible online courses such as HarvardX should be provided." Four students suggested that "Online assessments or quizzes or multiple-choice questions practice sheets should be provided." Three students suggested that "More handouts, summaries, concept maps and diagrams should be uploaded in the Dropbox." One student suggested that "There should be more online YouTube lectures." Four students suggested that "Demonstrations and Shifa Clinical Integrated Learning examinations should be videotaped." One student suggested that "e-Books should be uploaded in Dropbox."

Discussion

Our goal in this study was to determine whether the students were aware of e-learning. In case they were aware, which tools of e-learning were effective, which tools would they want to access more online; did they find it economical and what form of learning did the students prefer, e-learning, traditional learning or a blend of both. We hypothesized that students were already aware of e-learning to some extent and our results also suggest that. Students found different tools to be beneficial. They wanted more material to be made available online and they found e-learning easier and economical. They also pointed out that videos from some nationalities were more helpful than others.

This study is consistent with the finding of other studies in the context of preference for blended learning instead of traditional learning only or e-learning only. E-learning has been found to augment or support traditional learning since replacing traditional learning is not an option. Both modes of learning have their own benefits.[8] Blended learning can be more helpful for postgraduate learners who need to be lifelong learners to keep up-to-date. Another study on Internet-based learning in health professionals found it to be favorable and effective compared with no intervention and showed a similar effectiveness as traditional methods.[9 10, 11]

It was found that more than half of the students were already aware of some form of e-learning tool. The students had been using YouTube, Dropbox, WhatsApp, Facebook, Google Drive and other apps. They found Dropbox and YouTube to be most beneficial followed by Google Drive and WhatsApp. The undergraduate student found YouTube videos helpful for understanding concepts.[10, 11] On an enquiry regarding online availability of materials, the students responded that most frequently available material were lecture slides followed by books, handouts and quizzes. They wanted more books, handouts and other material such as video lectures to be made available online. One half of the students found laptop to be more convenient while the others found the mobile phone to be more convenient e-learning tool. This showed that it had more to do with personal preference.

More than half of the students found it more economical when traditional learning was mixed with e-learning. The students wanted to buy the books because it allowed them to underline and add stuff, whereas they wanted the reference books to be available online because it saved them the cost of buying the books or saved them the hassle of borrowing books from the library. Also, it saved them the cost of photocopying. It also allowed the material to be easily exchanged using Drop Box, WhatsApp or Facebook. This also allowed standardization of the content as the same material was being distributed to all the students. Previously, when the students had to be given additional notes, they had to be photocopied and distributed, utilizing a lot of paper. With the use of these e-learning tools the notes are easily distributed using Drop Box, WhatsApp etc. and thus save lots of paper. One study suggested that it was more economical for the student, but development of these e-learning modalities such as online libraries, etc. will require finances and heavy investment, but the long-term results would be worthwhile. The institute will also need to recruit qualified and experienced faculty members and install related computer systems. There will also be a need to train faculty and students on how to use the system in order to use it efficiently and effectively.[12]

Most of the students wanted the lectures to be videotaped. This is very convenient for the teacher as well as the student. The teacher can record the lecture carefully and easily. If there are any mistakes, they can be

edited. For the students, it would allow them to decide when to watch it and the number of times they want to watch it. Each student has his or her own pace of learning. These tools are especially useful before exams when they can be revisited. The disadvantage is that the active interaction in the lectures and especially the demonstration will be lost. In a study by Tang and Qureshi, 45 articles were retrieved from databases, including MEDLINE, PsycINFO, Education Source, FRANCIS, ERIC, and ProQuest, from 2006 to 2016 to find reviews related to online lecture use in undergraduate medical education. They found that online lectures were well received by the students and they were effective in improving learning outcome.[13]

The videos of American nationality followed by European, Pakistani, Indian and others were found by students to be helpful. This shows that America and Europe being more developed nations are many steps ahead of the developing nations in using e-learning tools and thus have developed better videos. This also shows that the world in general and developed countries in particular are developing and including more and more of these tools in medical education. This also gives advantage to the students because they are not limited by their nationality and can learn from the videos of people from other nationalities, as well.

Potential limitations of this study included the small participant numbers. Larger number of students would get us a more comprehensive view. Secondly it was carried out on students who had not yet given their professional examination. The analysis of utilization of e-learning facilities during the professional exam would give us more information. Thirdly we did not take in the gender opinion. Generally, males are more interested in using technology as compared to females.

Conclusion

E-learning is a relatively new form of learning. It supports traditional learning not replacing it. The best form is a combination of these two i.e. blended learning. The students of Pakistan are using smart phones, iPads, computers and other electronic devices but it seems they are mostly used for entertainment purposes and less for academic purposes. They have just started using them for academic purposes. It was found that more than half of the students were already aware of some form of e-learning tool. Their integration will require development and installation of computer systems and training of faculty members. Different institutes may select different modalities depending on their requirement, faculty training and financial resources.

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ORIGINAL ARTICLE

Perspective of medical students towards experimental biochemistry

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A B S T R A C T

Objective: The simple curriculum of Medical science has the complex biochemical theories which are hard to grasp. To address this problem, practical knowledge and change in approach to study is relevant to have a better foundation in clinical years; where this information has to be applied.

Methodology: Modifications were made in experimental biochemistry and genetics to focus on more applied knowledge through experiments and problem-based learning. A seven-item questionnaire to check the students' perspective of biochemistry was distributed among second year students, 89 out of 104 responded.

Results: 42 were males and 47 were females. The results were positive between 60% and 70% for all the items. 70% was highest, which was for component, which they still hope for better courses in the future.

Conclusion: Numerous strategies have been applied to promote teaching results and increase the effectiveness of teaching to undergraduate clinical students in biochemistry.

Keywords: *Biochemistry, teaching methods, medical students, integrative medicine*

Introduction

Inside the simple curriculum of Medical science, the complex biochemical theories are hard to understand. Incorporating practical knowledge in these theories is important for bridging the gap between basic sciences and clinical work. This emphasis is for every subject that has been part of the syllabus including one of the least focused basic science subjects - biochemistry. From advancements at the molecular level to their application in the clinics and integration in the curriculum; biochemistry and Medicine are inseparable.[1]

Hence, the importance of sound and practical knowledge in the education of clinical college students has become inevitable to ignore especially in Biochemistry.[2] Genetics is an integral part of Biochemistry. The research and advancements in genetics make it impossible to ignore in clinical medicine.[3] Biochemistry is considered to have minimum relevance in practical life of a physician.[4,5] Upcoming physicians need to be equipped with the necessary skills and knowledge which is required in their clinical practice. In terms of medical treatment, it will also be beneficial for their transition in the fields of genomics, molecular biology and Bioinformatics.[6]

The Biochemistry and genetics have major elements of rote memorization and among students' the concept-based learning methodology is usually ignored in the majority of colleges.[1] Most students focus on simply memorizing chemical pathways or rare disorders for professional examinations. It is also one of the least studied subjects as its practical importance is not emphasized. Also, physicians who have been taught through this conventional system, lack competency

compared to the ones who were taught through the newer teaching or learning approaches.[7]

Although, in the past three to four decades, crucial changes have been made in the biochemistry curriculum across the globe.[7] However, the rate of progress required to standardize teaching has not been seen in Pakistan. Considering the difficulties faced in the experimental biochemistry and genetics teaching techniques, in past 4 years, Shifa College of Medicine has designed an integrated teaching methodology which has improved instructors' delivery of Biochemistry contents to students. The primary aim of this study was to determine the perceptions of medical students towards the introduction of this new teaching approach. Our objective is to evaluate new students' attitude after introduction and implementation of improved strategies in teaching of experimental Biochemistry.

Material and Methods

This study was conducted in Shifa College of Medicine after approved by an Institutional Review Board. The focus was on experimental techniques and practical labs of first year students. The integration was possible for around 70% of the course. After successful integration and changes made in experimental Biochemistry and genetics curriculum; we evaluated perceptions of the same students at the start of the second-year session at our institute. The new curriculum is summarized in Table 1. A questionnaire was distributed in the class of 104 students. The questionnaire had seven items which are shown in Table 2. Data was analyzed using SPSS 21 and Microsoft Excel 2016.

Results

Out of 104 students, 89 students responded to the questionnaire. Among them, 42 were males and 47 were females. The results have been summarized in Table 3. Overall, in all seven categories, the most positive feedback was that they will expect for more interesting courses in the future which was 70 %. However, 8 % amongst students disagreed with it. According to 59 % of students, the integrated methodology was interesting and practical. 23 % were neutral and 16 % were disappointed with this. Their attitude towards biochemistry in improving their theoretical knowledge as mentioned in item 5 has been positive of about 67 %, while lesser had neutral attitude and disagree with it, that being 20 % and 10 %, respectively. This has been further helped by practical to improve their grasp in basic knowledge; which is 68% almost equal to mentioned earlier.

In practical knowledge, the approach of practical to each individual is better for 69% of students, even though the confidence that the skills improved is relatively low of around 19%. The most significant tool, is if they think it will help them in future years is only positive for around half of the class. 32% were unsure and 15% disagreed.

Discussion

In the present curriculum of medicine, biochemical theories are as backbone on which further knowledge has been built. The need to find the most effective way to deliver the content is a huge challenge. Throughout the past few years, many changes have been made to achieve this goal. Conventional approaches focused more on theoretical and abstract knowledge and that's how practical skills are taught. Usually, teachers provide students with answers. Conceptual thinking and skills need to tackle a problem were not encouraged.[8] As the education system improved, more focus is on practical based knowledge. An effective approach to build a medical community equipped with knowledge in biochemistry and modern genetics is a foundation made by providing the basics of these fields in a student's undergraduate and preclinical years. Moreover, it should be supplemented with evidence-based practices that are standardized.[9] It effectively helps to implement the knowledge in their clinical years.

One of our approach was to prioritize learning through practical skills and problem-based learning. The lectures were being linked with practical knowledge or rationale of why this topic is important. Hence, it helps students to understand the importance and increase their ability to grasp the concept easily. This approach has been proven to be effective in the James A. L. Brown study.[10] In one study, students of second, third and final years were engaged in discussion to recall anatomy and physiology. The percentage of students that can recall anatomy were 65.7% and physiology were 65.3%. While, this percentage was comparatively low for biochemistry of about 40%.[11] According to Afshar et al. study, most

common problems with biochemistry were that it is repetitive, content had been from outside the required basic text, and irrelevant from examination point of view. All of these factors make it more difficult to retain the relevant information. It has been a struggle for medical students to understand how to study and to differentiate the relevant material from irrelevant.[1] According to study conducted by Alam A, only 19% students retain biochemistry course.[12]

In our practice, efforts have been made to minimize unrelated courses and integrate each topic with the importance and rationale in the curriculum through problem-based approach. So, to decrease such issue even within each topic, that has to be studied. Lijan You et al study has been targeting to teach Biochemistry with a more practical approach and it has shown to have very positive feedback with above 90%. Our study has shown results better than we expected, but the achieved target was lower compare of our study compare to this study; that is between 60% and 70%.[13]

Shifa Tameer-e-Millat University (STMU) has tried to adapt international clinical education curriculum inside the subsequent 5-year developmental plan. The BP Koirala University of Health Sciences in Nepal and India is known for its academic excellence. It has three main focus that a system of studies should be centered to students, it should be practically based and integrated in Phase I, which is in basic sciences years.[14] The same pattern has been encouraged by our institute. Within the future, we will continue to modify teaching techniques to have a better future in the field of experimental biochemistry and genetics. Certain advices have been summarized in Table 4 to improve teaching.[15,16]

Table 1: Integrated Clinical Biochemistry Content

Clinical Biochemistry Integration themes	Integrative Biochemistry Modules
Principles of Biomedical Sciences	Essentials of Medicine Introduction to use of Laboratory facilities/ Equipment (Centrifuge, PH Meter, Pipetting, Micro Lab, Elisa, Chromatography HPLC/GC, Spectrophotometer), Collection and Preservation of Clinical Specimen, Basic Techniques and Fundamental Information Cell Structure and Function / Genetics DNA Extraction, Gel Electrophoresis, Gel Documentation
Foundations of Clinical Medicine I-II	Hematology Photoelectric Calorimeter, Plasma Protein Estimation, Liver Function Test, Plasma Bilirubin Estimation Locomotor System Estimation of Uric Acid Respiratory PH meter Cardiovascular System Total Plasma Cholesterol Estimation, Lipoprotein Estimation Nutrition and Metabolism Basal Metabolic Index, Basal Metabolic Rate, Total Caloric Requirement, History Taking, General Physical Examination, Fluids/ Preparation of Solutions, Parenteral Nutrition, BMI Calculation & Growth Charts Gastrointestinal System Salivary Amylase, Liver Function Test, Bilirubin Kidney, Ureter, Bladder Serum Creatinine, Creatinine Clearance Test, Chemical Analysis of Urine Normal and Abnormal Specimens, Urine Microscopy, Uric Acid, 24 Hours Urinary Protein, Electrolyte Estimation, PH meter Endocrine and Reproduction Blood Glucose Estimation, Oral Glucose Tolerance Test, Urine Analysis
Future Plans:	
Core Rotations of Clerkship	Laboratory Medicine plays a significant role in the diagnostic process used daily during clinical experiential rotations.
Clinical Electives Course	Applied biochemistry and laboratory medicine are included in presentation/ disease specific sessions

Table 2: Items of questionnaire

Integrated Experimental biochemistry is interesting and practical
Integrated experiments improve my understanding in biochemistry lectures
The procedures of individual experiment are great
Experimental classes improve my operation skills
Experimental classes expand my scope of knowledge
Biochemistry courses are indispensable for my future clinical practice
I expect more interesting courses in the future

Table 3: Students perceptions regarding Experimental Biochemistry Teaching

Question Items	Strongly Agree %(n)	Agree % (n)	Neutral % (n)	Disagree % (n)	Strongly Disagree %(n)
Integrated Experimental biochemistry is interesting and practical	26.4 (24)	33 (30)	23.1 (21)	9.9 (9)	7.7 (7)
Integrated practical improves my understanding in biochemistry lectures	27.5 (25)	40.7 (38)	19.8 (20)	3.3 (6)	7.7 (2)
The procedures of individual practical are great	28.6 (26)	40.7 (37)	19.8 (18)	3.3 (3)	7.7 (7)
Biochemistry improves my practical skills	18.7 (17)	31.9 (29)	33.0 (30)	13.2 (12)	3.2 (3)
Biochemistry classes expand my scope of knowledge	28.6 (26)	38.5 (35)	22.0 (20)	5.5 (5)	5.5 (5)
Biochemistry courses are indispensable for my future clinical practice	25.3 (23)	27.5 (25)	31.9 (29)	11.0 (10)	4.4 (4)
I expect more interesting courses in the future	35.2 (32)	38.5 (35)	17.6 (16)	4.4 (4)	4.4 (4)

Table 4: Tips to enhance quality during our teaching Process

Students	Evaluate Material to ensure it is for the caliber of an undergraduate medical student
	Standardize experimental and clinical skills all over the institutions
	Activate the enthusiasm for learning among students
Teachers	Actively prepare for the class
	Enrich the teaching Resources
	Build up communication and understand struggle of even below average student
	Approach to be: problem-based learning

Conclusion

Several techniques with a focus on experimental knowledge and problem-based learning had been utilized in integrated curriculum at STMU. Positive perspective of students has been between 60% and 70%. The purpose is to have a relevant and stronger grasp in clinical biochemistry and genetics to build a strong foundation in their clinical years. Within the study, we are able to improve our teaching methods. Although, there always room for modifications that will be considered in future.

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ORIGINAL ARTICLE

Awareness about peripheral diabetic neuropathy among physical therapists in twin cities

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Author`s Contribution

[1] Substantial contributions, conception of design, acquisition, analysis and interpretation of data
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A B S T R A C T

Objective: The main purpose of this study was to create awareness of holistic Screening approach about Peripheral Diabetic Neuropathy among Physical Therapists in Twin Cities. A descriptive cross-sectional study conducted at hospitals of Rawalpindi and Islamabad for of 6 months.

Methodology: A descriptive cross-sectional survey was carried out and non-probability purposive sampling technique was used to collect data from 110 Physical Therapists (58.1% females and 41.8% Males. A specified semi structured questionnaire was used to collect data from Physical Therapists.

Results: This study was carried out on 110 Physical Therapists. Results of our study showed that 94 (85.5%) Physical Therapists screened patients with different modalities such as 7 (6.4%) used touch perception, 6 (5.5%) used pain perception, 2 (1.8%) used vibration perception and only 1 (.9%) used ankle deep tendon reflex. 97 (88.2%) Physical Therapists assessed pain by different methods such as Pin prick method was used by 67 (60.9%) therapist, VAS was used by 15 (13.6%) therapists, 87 (79.1%) Physical Therapists assessed touch sensation. 21 (19.1%), used cotton ball, 5 (4.5%) used manual touch while 41 (37.3%) were having no specific response.

Conclusion: It is concluded that Physical Therapists of twin cities are aware of basic screening steps for Peripheral Diabetic Neuropathy and they utilize appropriate tool/modalities for assessing sensations and motor reflexes. This highlight the up to date evidence-based knowledge of PT working in twin cities.

Keywords: *Peripheral diabetic neuropathy, physical therapists, musculoskeletal, neuromuscular, visual analogue scale*

Introduction

Globally, Diabetes is the major healthcare problem in the 21st century. Worldwide people affected by diabetes is predicted to become twice between 2000 to 2030 and expected to reach up to 366 million.[1] Diffuse damage to peripheral nerve fibers occurs due to Peripheral Neuropathy. Quality of life is commonly affected by Peripheral Diabetic Neuropathy and studies suggest that it affect one out of every five patients. In spite of high number, it remains underdiagnosed and undertreated. Furthermore, 31 - 92% of the patients with diabetes suffer from Peripheral Diabetic Neuropathy. Researches stated that 16 - 34% of patients with diabetes have neuropathic symptoms in peripheries. Regarding the type of diabetes, the type 2 diabetes is more prevalent among females.[2] Symptoms and severity of diabetes vary from patients to patients but commonly involved symptoms are abnormal hot and cold sensation in distal to proximal with stock and glove pattern, altered sensations like numbness, paresthesia and tingling. These symptoms have debilitating effects that can alter the quality of life and sleep pattern.[3] Diabetic foot ulcer is a major risk factor in a diabetic patient and the most common complications are

diabetic neuropathy and peripheral vascular disorder. In Western countries, diabetes is the most common cause of neuropathy in 50 % of type 1 and type 2 diabetic patients. 15% of patients with a smoking history, genetically poor glycemic control has diabetic foot ulcers and also suffer from diabetic retinopathy.[4,5]

Neuropathic Pain Scale helps in the diagnosis and is also used to identify the severity of Diabetes. Different instruments like MNSI "The Michigan Neuropathy Screening Instrument" and screening tools like "Neuropathy Disability Score" are widely used for Peripheral Diabetic Neuropathy. Management to control any type of diabetes and its symptoms usually involves risk factors control, pain management and good glycemic control. Peripheral Diabetic Neuropathy is a foremost challenge in health sector to deal with and that's why 39% of cases are untreated. Symptomatic treatment basically focuses to modify the severity of pain and to improve the standard of living by improving physical activity. Nerve fibers involvement are also associated with Peripheral Diabetic Neuropathy.[3]

The management of foot ulceration is associated with the risk factors, educating patients and regular follow up. Various instruments such as 10 grams of monofilament, vibration via 128 Hz of tuning fork are used to assess foot ulcers/deformities. Previous medical/surgical history, pin prick method, vascular assessment methods like pulse palpation, ankle reflexes and Ankle Brachial Index (ABI) are also helpful in finding foot involvement in diabetes.[4] Modification in diet and exercise are used as preventive measures to control progression and severity of diabetes. Worldwide studies suggest that swimming had beneficial effects on Peripheral Diabetic Neuropathy and help to improve activity of daily livings (ADLs).Weight loss is a key factor to control progression of symptoms of diabetes such as thermal hyperalgesias and tactile allodynia.[6,7] In 2013, study conducted on risk factors associated with diabetic foot ulcers by Hajieh Shahbazian concluded that advancing age , prolonged duration of diabetes, lack of training/physical activity, increase level of HbA1c are common risk factors in Peripheral Diabetic Neuropathy.[4]

In 2014, a study conducted In India, at a tertiary care hospital on prevalence and associated risk factors of type 2 Diabetes described that type 2 Diabetes is more common in North India such as (29.2%).This study also suggested that timely screening along with preventive measures would be helpful for early intervention.[8] Another study conducted in Malaysia showed high prevalence of diabetic end stage complications, it also evaluate awareness of diabetes peripheral neuropathy among certain specialists such as physical therapist.[9] A cross sectional survey conducted by Carlos Tomas Ibarra et.al; on type 2 diabetes to identify the ratio of peripheral symptoms among type 2 diabetes and identified that approximately 70% of patients have symptoms of Peripheral Diabetic Neuropathy and these symptoms have a direct relationship with disease's duration.[10] Therefore, in our study, we have made an attempt to assess the awareness of Peripheral Diabetic Neuropathy among Physical Therapists in twin cities.

Methodology

A descriptive cross-sectional survey is carried out and non-probability purposive sampling technique is used to collect data from 110 Physical Therapists (PTs). Sample selection was done on the basis of their availability and accessibility. Sample size was calculated through the standard software "Rao soft". A specified semi-structured questionnaire was designed based on 5 demographic questions and 12 questions of rapid assessment of PTs to collect data from PTs. Pilot study was conducted to assess the validity of Questionnaire. Questionnaires distributed among the PTs of Twin cities hospitals. The study conducted in accordance with the research ethics. The confidentiality of the participant's data was maintained throughout the research.

Questionnaire tells about the awareness of basic screening steps for peripheral diabetic neuropathy and how PTs utilize appropriate tool/modalities for assessing sensations and motor reflexes. This highlight real time evidence-based knowledge of PTs working in twin cities. Visual analogue scale (VAS) was used to measure the intensity of pain. Pain was the most common sensation being screened for Peripheral Diabetic Neuropathy and pinprick found to be most commonly applied method for assessing pain. Likewise, pain (by pin prick, VAS), touch (by brush), temperature and vibration (by tuning fork), proprioception (by specific movements) and ankle reflexes (by hammer) were also screened for Peripheral Diabetic Neuropathy.

Data analysis was done through Statistical package for social sciences (SPSS) version 20.0 to obtain values of frequencies, mean, and standard deviation of descriptive analysis conducted. The questions regarding awareness of Peripheral Diabetic Neuropathy and screening of pain, touch, temperature, vibration, proprioception and ankle reflexes for Peripheral Diabetic Neuropathy were also included in the questionnaire.

Results

This study was carried out among 110 PTs. out of 110 PTs, 64 (58.2%) were females, whereas 46 (41.8%) were males. Out of 110, 32 (29.1%) were working in Govt. setup, 31 (28.2%) were in semi Govt. setup and 47 (42.7%) were having their own private clinical setups. This survey showed the clinical experience of the PTs. Out of 110 PTs, 15 (13.6%) were having experience of 1 to 6 months, 30 (27.3%) were working from 7 to 12 months, 3 (2.7%) had experience from 13 to 18 months, 23 (20.9%) were having experience from 19 to 23 months and 39 (35.5%) had worked for more than 2 years.

53 (48.2%) PTs out of 110 assess 5 Diabetic patients per day. 45 (40.9%) PTs assess 5 to 10 diabetic patients per day and 12 (10.9%) PTs assess more than 10 patients per day.104 (94.5%) out of 110 PTs said 'Yes' and 6 (5.5%) PTs said 'No' regarding the patient referral.19 (17.3%) patients were with musculoskeletal complications, 55 (50.0%) patients were with neurological complications and 36 (32.7%) patients were with other complications (Table 1).

Table 1: Diabetic's patient complications, assessment and referral to physical therapists

Variables		Frequency	Percentage
Patient assessed per day	5	53	48.2
	5-10	45	40.9
	> 10	12	10.9
Diabetic patient referral to Physical therapists	Yes	104	94.5
	No	6	5.5
Complications of patients with diabetic neuropathies	Musculoskeletal problem	19	17.3
	Neurological problem	55	50.0
	Others	36	32.7
Total		100	100

About 94 (85.5%) out of 110 PTs screen patients with all sensory motor modalities, whereas 7 (6.4%) use touch perception, 6 (5.5%) use pain perception, 2 (1.8%) of them use vibration perception and 1 (.9%) uses ankle deep tendon reflex (Figure 1).

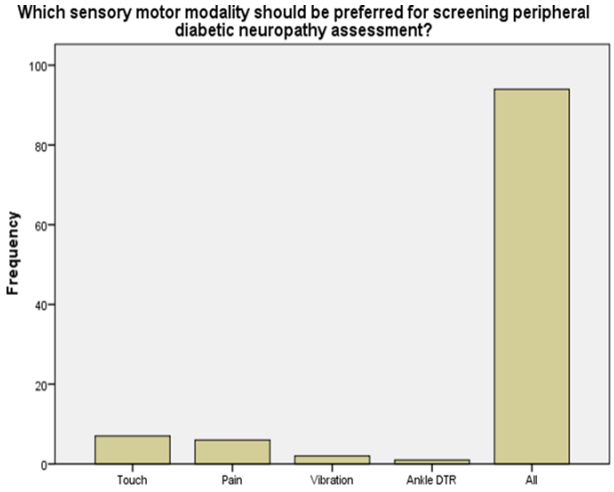

Figure 1: Screening of Diabetic Neuropathy

Pin prick method used by 67 (60.9%) out of 110 PTs to assess pain perception, VAS is used by 15 (13.6%) of them and remaining 28 (25.5%) have given no specific response (Figure 2). 43 (39.1%) out of 110 use any object to assess touch perception, cotton ball is used by 21 (19.1%), 5 (4.5%) use manual touch whereas 41 (37.3%) were having no specific response (Figure 3).

Most of the PTs, 102 (92.7%) out of 110 don't have any specific response. 4 (3.6%) assess by ankle proprioception through standing and specific toe movement respectively (Figure 4).

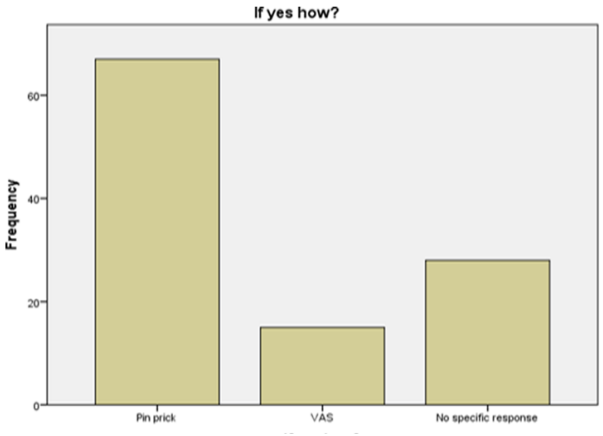

Figure 2: Assessment of pain perception of Diabetic Neuropathy

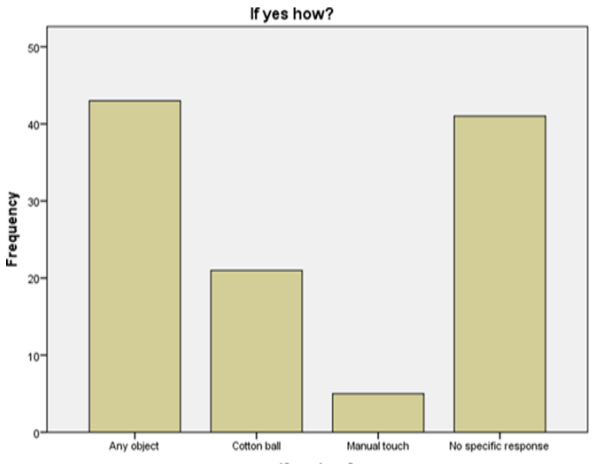

Figure 3: Sensory assessment of Diabetic Neuropathy

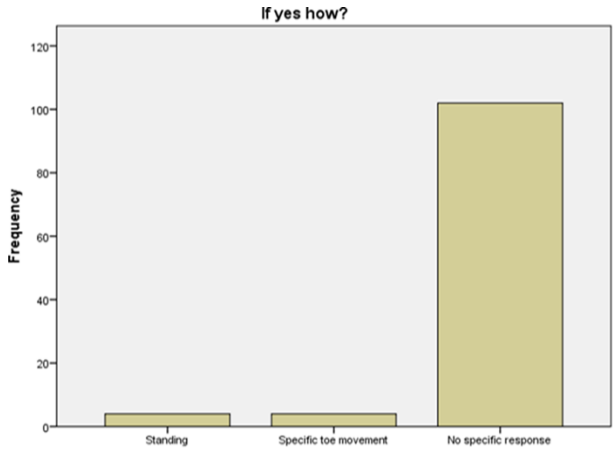

Figure 4: Proprioceptive gait assessment

Vibration sensation is assessed by 71 (64.5) PTs, whereas 39 (35.5%) PTs they don't use it (Figure 5).

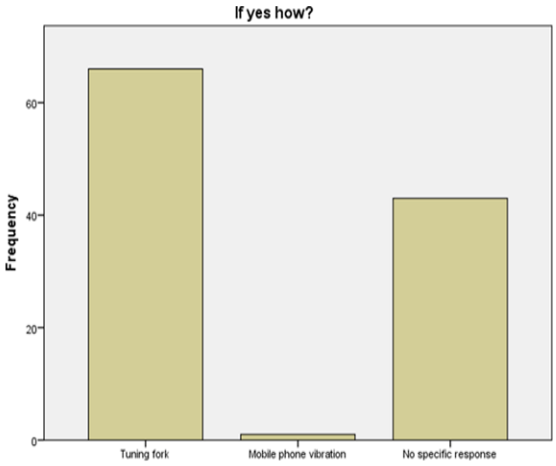

Figure 5: Assessment of Vibration sensation of Diabetic Neuropathy

Discussion

The recent study concluded that 52 (47.3) PTs screened diabetic patients daily. About 94 (85.5%) screened patients with all sensory motor modalities, whereas 7 (6.4%) used touch perception, 6 (5.5%) used pain perception, 2 (1.8%) of them used vibration perception and only 1 (0.9%) used ankle deep tendon reflex. 97 (88.2%) PTs assessed pain. Pin prick method was used by 67 (60.9%) Therapist to assess pain perception, VAS was used by 15 (13.6%) PT, 87 (79.1%) PTs assessed touch sensation. 43 (39.1%) used any object to assess touch perception, cotton ball was used by 21 (19.1%), 5 (4.5%) used manual touch whereas 41 (37.3%) were having no specific response.

In Canada, a study conducted by Bruce A. Perkins et al; on examination of peripheral neuropathy suggests that pain can be screened by vibration and superficial sensation.[11] Regarding the sensation of pain and diagnosis electrophysiological tests can be used, but superficial diagnosis also played its role. Their results also support the recent study such that pain is most common screening tool and physiotherapist assessed it by vibration and pin prick method.[11] Another research conducted in UK by Tom Cash, et al concluded that in busy diabetic clinics noninvasive methods to asses pain played vital role.[12] Their findings support the recent study

as in twin cities PTs also used noninvasive methods like vibration, pin prick to assess pain. These methods are helpful in early screening of symptoms and formulation of treatment plan.[12] In USA, Jennifer J. Brown et.al; concluded that superficial screening methods are used worldwide for the early screening and management of diabetic neuropathy. Vibration by tuning fork is useful but certain other tools are required to differentiate pain. Same findings are obtained in present research.[13]

In Brazil, a study conducted to assess the role of PTs in diabetic clinics. Findings showed that early recovery of patient can be achieved by early screening and involvement of physical therapy interventions. Proprioceptive sensations are easily investigated by thermal and tactile methods. These methods are cheap, avoid further neuronal damage and well understood by patients and therapist itself. Our results also showed the same finding.[14] Researches enlightened that symptoms of peripheral diabetic neuropathy can be facilitated by physical therapy interventions. Early mobilization and sensory alterations can be achieved successfully through physical therapy management. In Pakistan, there is a lack of certain studies so it is a need of hour to conduct further studies to evaluate the effects of physical therapy on peripheral diabetic neuropathies.[15] We highly recommend further studies on Peripheral Diabetic Neuropathy.

Conclusion

It is concluded that PTs of twin cities are aware of basic screening steps for Peripheral Diabetic Neuropathy and utilize appropriate tools/modalities for assessing sensations and motor reflexes. This highlight the up to date evidence-based knowledge of PTs working in twin cities. Pain is the most common sensation being screened for PDN and pinprick found to be most commonly applied method for assessing pain. Likewise touch, temperature, vibration, proprioception and ankle reflexes are also screened for PDN.

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REVIEW ARTICLE

Vitamin D deficiency: It's contributing factors and prevention

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A B S T R A C T

Vitamin D deficiency is prevalent across the globe. The most important role of vitamin D is in strengthening the bones. Besides this, vitamin D is likely to be associated with prevention against different types of cancers and chronic diseases like cardiovascular diseases, hypertension, diabetes mellitus and stroke as well as osteoporosis. It also has role in preventing many neurological diseases like depression, chronic fatigue syndrome and neuro-degenerative diseases including Alzheimer's disease autoimmune diseases, birth defects and periodontal diseases. Main source of vitamin D is sunlight, also called sunshine vitamin. People with old age, dark skinned and obese cannot produce sufficient amount of Vitamin D. Food sources include fatty fish, animal liver, egg yolk and dairy products, though these are poor sources. Vitamin D deficiency is endemic in Pakistan, India, Sri Lanka as well as Middle Eastern Countries. Though it's sunny there all the year round, still the bulk of population is vitamin D deficient due to limited sun exposure in extremes of high temperature and socio religious reasons. Similarly, population in Europe and America are also affected. Pregnant mothers and infants are more at risk. Population at risk should be screened and treated. Appropriate health policies, public awareness, and fortification of dairy products can definitely prevent as well as address this huge burden of disease.

Keywords: *Vitamin D, Sunshine vitamin, Prevention of vitamin D.*

Introduction

Vitamin D deficiency and insufficiency is an important health issue worldwide in all age groups. With the recent medical advances globally, vitamin D deficiency is still prevalent. Approximately a billion people worldwide are either vitamin D deficient or insufficient.[1] Vitamin D, also called "Sun Shine Vitamin" is a steroid with hormone like activity. Unlike other vitamins, vitamin D functions like a hormone and every cell of human body has receptors of it and is necessary for growth and development. There are two forms of vitamin D. Vitamin D2 and vitamin D3.[2] Bulk of vitamin D is produced by sun light following exposure of skin to ultraviolet rays. The usual healthy diet contains very little vitamin D. Important dietary sources are fatty fish as salmon, mackerel and oils from fish, including cod liver oil, fortified dairy products, egg yolk, liver of animal.[3] Human body needs enough stores of vitamin D for prevention of diseases. Studies show a link between vitamin D deficiency and CV diseases including stroke and myocardial infarction. Besides type 2 diabetes mellitus, dementia, different type cancers, multiple sclerosis, irritable bowel syndrome and obesity.[4,5]

Vitamin D levels can be diagnosed by testing blood for 25-hydroxyvitamin D or 25(OH)D. Normal levels of vitamin D is defined as a 25(OH)D concentration greater than 20 ng/mL (50 nmol/L), insufficiency is 12 to 20 ng/mL (30 to 50 nmol/L) while deficiency is <12 ng/mL (30 nmol/L).[6] For prevention of vitamin D deficiency, the best way is to have sun light exposure at noon for two hours daily, with 40% of body exposed without applying sunscreen. Dark-skinned persons, obese, elderly, those live inside home majority of time and smokers cannot produce sufficient amount of vitamin D. Since it is difficult to get enough exposure to vitamin D through sunlight and food sources, it is recommended to consume 1,000 to 2,000 IU of vitamin D3 supplement daily.[7]

Studies have reported in the United States, about 50% to 60% of people residing in nursing home and

hospitalized patients had vitamin D deficiency.[8] Similarly 61% of the elderly population is vitamin D deficient in United States. In Turkey 90% population, in India 96%, 72% in Pakistan, and 67% in Iran were found vitamin D deficient or insufficient.[9] A retrospective review was done in Scotland confirmed that cardiomyopathy is reversible with quick identification and vitamin D supplementation. In this regard public health policy in the United Kingdom lacks in preventing the children who are Vitamin D deficient or insufficient.[10] Globally middle eastern countries have sunshine almost whole of the year, allowing vitamin D synthesis, but the population of these countries have lowest levels of vitamin D on global perspective. Vitamin D deficiency affects individuals across all life stages but most vulnerable are pregnant women, neonates, infants, children under five years of age and the elderly. Furthermore, while rickets is almost eliminated from developed countries, it is still prevalent in several of the Middle East countries.[11]

In a study carried out in Qassim province of Saudi Arabia reported 28% study subjects were vitamin D deficient, 39% were vitamin D insufficient and 33% had normal vitamin D level. Main symptom of vitamin D deficiency were bone pain and fatigue.[12] Irrespective of age and gender of study subjects, results of a study carried out in a tertiary care setting of Abbottabad demonstrated high prevalence of vitamin D deficiency.[13] It was also found in a study carried out in Karachi significant decreased levels of Vitamin D in patients complaining of generalized body ache even without any other health problem. The affected mainly the middle-aged female population.[14] Similarly, prevalence of vitamin D deficiency was 78.3% in 1244 healthy individuals in Sindh Province in Hyderabad city of Pakistan.[15] Daily doses of vitamin D supplements decreased total mortality rates as indicated in Meta-analysis of 18 randomized controlled among 57,000 study subjects.[16] In the Women's Health Initiative, calcium and vitamin D supplementation decreased the risk of breast cancer and colorectal cancer.[17] Long term strategies to address this deficiency problem should include public awareness campaigns, national health policy for better screening facilities of population at risk and prevention through food fortification. In developed countries cooking oil is fortified with Vitamin A & D, on same manner dairy products as milk, yoghurt etc. should also be fortified. Vitamin D supplementation program should be initiated for vulnerable population as pregnant women, infants, children under five years of age and elderly population.[18, 19]

In conclusion vitamin D deficiency is prevalent worldwide, no country exception to this. Keeping in mind the role of Vitamin D in the prevention of a large number of diseases, this issue is addressed with due attention and concrete steps at all levels of health care delivery.

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CASE REPORT

Treatment of unexplained thin endometrium with autologous platelet-rich plasma in a frozen embryo transfer cycle

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A B S T R A C T

Inadequate endometrial proliferation is a known cause of implantation failure in assisted reproductive technology cycles. It is generally agreed that >9 mm endometrial thickness is associated with higher implantation. Several strategies have been explored to enhance endometrial proliferation. However, the results are either poor, inconsistent or subject to safety concerns. A 34-year old woman presented with unexplained thin endometrium in successive frozen embryo transfer (FET) cycles. Autologous platelet-rich plasma (PRP) was infused in the uterine cavity on day 10 of second FET cycle enhancing endometrial thickness, which post-PRP infusion measured 10.9 mm. Blastocyst-stage embryos were transferred resulting in a successful pregnancy. Autologous intrauterine infusion of PRP positively impacts endometrial proliferation and implantation which is safe, low resource and minimally invasive.

Keywords: *Frozen Embryo Transfer, Thin Endometrium, platelet-rich plasma, endometrial thickness*

Introduction

Endometrium plays a critical role in the establishment and maintenance of a normal pregnancy. In humans, the endometrium becomes receptive to implantation six days following ovulation, when the embryo reaches the blastocyst stage.1 Implantation is a highly coordinated, complex event, between the intrauterine factors and the embryo, regulated by ovarian steroids, progesterone, and estrogen.2 Moreover, mediated by various molecular modulators such as growth factors and cytokines, functioning in a spatio-temporal manner thus, facilitating endometrial decidualization, blastocyst attachment, and invasion.1 Despite significant advances in Assisted Reproductive Technologies (ART), implantation failure due to inadequate endometrial receptivity is a major cause of failure in ART cycles.[1]

In clinical practice, ultrasound evaluation of the endometrial thickness is an important marker for endometrial receptivity. There is a general consensus that endometrial thickness of at least 7 mm (and preferably >9mm) favors higher implantation.[2] Over the years, several strategies have been implored to enhance endometrial thickness and quality such as extended high estrogen therapy, low dose aspirin, tocopherol, pentoxifylline, arginine, vaginal administration of sildenafil citrate, electroacupuncture, intrauterine perfusion of Granulocyte colony-stimulation factor (G-CSF)[3] and stem cell therapy.[2,4,5] However, the results have either been poor, unknown, inconsistent or subject to safety concerns.

Autologous platelet-rich plasma (PRP) is considered a safe alternative approach. Moreover, demonstrated to

stimulate mitogenesis and proliferation of the endometrial cells, in turn, activating endocrine-paracrine pathways facilitating endometrial remodeling, embryo maternal crosstalk therein promoting implantation and pregnancy.[1]

Here we present for the first time in Pakistan the utility of intrauterine infusion of autologous PRP in a case of unexplained thin endometrium during a frozen embryo transfer (FET) cycle, resulting in a successful pregnancy.

Case report

A 34-year old woman, married for 5 years presented at our clinic with unexplained infertility. The baseline hormonal profile revealed all parameters within normal limits.

Table 1: Baseline hormonal profile of the female partner

Hormonal Test	Result
Anti-Mullerian Hormone (AMH)	3.52 ng/mL
Day 3 Follicle Stimulating Hormone (FSH)	6.67 mIU/mL
Prolactin	25.7 ng/mL
Triiodothyronine (T3)	1.7 nmol/L
Thyroxine (T4)	8.1 µg/dL
Thyroid Stimulating Hormone (TSH)	1.68 µmIU/mL

Gynecologic findings revealed bilateral patent tubes, both ovaries normal in size and echotexture with right ovary measuring 3.4 by 2.5 cm and left ovary measuring 3.8 by 3.0 cm, respectively. Additionally, no ovarian mass or cyst was observed. The male partner was 35 years old with normozoospermia, reported no history of medical or surgical interventions. Screening tests of HEP B, C, HIV, and VDRL were normal for both partners. Intrauterine Insemination (IUI) cycle was proposed as the first line of treatment. Two attempts of IUI were undertaken both proving to be uneventful. In both IUI cycles, the measured endometrial thickness was >9 mm on day 11 of the menstrual cycle.

The couple was now recommended an in vitro fertilization (IVF) cycle. Standard long agonist protocol was followed.6 15 oocytes were collected, 8 fertilized normally following Intracytoplasmic sperm injection (ICSI). Day 3 embryo transfer was scheduled with three embryos of top quality, 7 10 cell grade 1 transferred successfully. The remaining 5 embryos of top quality were vitrified. The endometrial thickness prior to embryo transfer was 14.3 mm in the fresh IVF cycle. Two weeks following embryo transfer βHCG test revealed an unsuccessful pregnancy. Frozen embryo transfer (FET) cycle was advised to the couple. Preparation of endometrium as described previously by hormonal replacement therapy (HRT) protocol was initiated.6 In the first FET cycle due to insufficient endometrial response (<7mm), the cycle was abandoned. In the proceeding menstrual cycle, the patient was scheduled for the second FET cycle, using the same regime.

Table 2: Ultrasound and hormonal assays of the patient on day 10-11 of the menstrual cycle, during respective frozen embryo transfer cycles.

Parameter	First FET Cycle	Second FET Cycle
Endometrium Thickness	5.8 mm	3.5 mm
Estradiol level	113.2 pg/mL	103.2 pg/mL
Progesterone	<0.05 ng/mL	0.18 ng/mL
Luteinizing Hormone (LH)	9.80 mIU/mL	13.4 mIU/mL

On day 10 of the second FET cycle, due to inadequate endometrial response. Intrauterine autologous PRP was administered. PRP was prepared by drawing 10mL venous blood in an Ethylenediaminetetraacetic acid-coated tube and subjected to a single-step centrifugation process at 1200 rpm for 12 minutes. Following centrifugation, the overlaid plasma was isolated in a sterile tube for infusion. Approximately 5 ml of PRP was infused into the uterine cavity with an IUI catheter. Four days post-PRP administration the endometrium thickness measured 10.9 mm.

Three embryos of quality 7 cell Grade 1, 6 cell Grade 1 and 9 cell Grade 1 were thawed 72 hours after beginning vaginal progesterone (cycle day 12) and cultured till day 5. On day 5 embryos progressed to Blastocyst 3Ab, 3Bc and Morula stage, according to Gardner and Schoolcraft grading system 7 and were

transferred. Two weeks following embryo transfer serum βHCG was 1068 mIU/mL, a single intrauterine gestational sac was observed.

Discussion

On a cellular level, endometrial PRP in humans has been demonstrated to promote the migration of primary endometrial epithelial cells, endometrial stromal fibroblasts and mesenchymal stem cells (MSC). Additionally, the enhanced migration of bone marrow-derived MSC has also been identified, following the infusion of intrauterine PRP.8 Moreover, the high amounts of growth factors such as platelet-derived growth factor (PDGF), epidermal growth factor (EGF), fibroblast growth factor (FGF) also anti-inflammatory cytokines such as IL-10, stimulates endometrial proliferation and tissue regeneration.[9]

Endometrial PRP infusion has been reported to improve fertility treatment outcomes in patients with a thin endometrium,[1,9] also with a history of recurrent implantation failure.[10] However, its utility concerning unexplained thin endometrium has not been previously reported. Here we report for the first time the use of intrauterine PRP infusion in a patient with an unexplained cause of thin endometrium and its beneficial effect on endometrial growth, resulting in a successful pregnancy. Autologous PRP is a relatively safe technique with minimal risk of disease transmission, immunological reaction, and cancers.[4] With respect to endometrial PRP, it is a low resource and minimally invasive procedure. Our case report highlights that intrauterine PRP infusion is a beneficial strategy to cope with cycle cancellation due to poor endometrial response in FET cycles and to enhance the treatment outcomes.

Conclusion

In our opinion, this is the first report of successful pregnancy utilizing endometrial PRP in a woman with unexplained thin endometrium despite acquiring adequate endometrial response in prior cycles. Our case report highlights, the beneficial impact of autologous endometrial PRP in order to enhance implantation.

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LETTER TO EDITOR

Registries in healthcare

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The Registries provide clinically relevant human data to healthcare professionals and researchers for increasing our understanding of a clinical condition and for treating or counselling patients. Planning healthcare without reliable data from disease registries may prove to be a futile exercise resulting into loss of resources. Hence disease Registries are vital for monitoring the incidence, prevalence and mortality rates, the effectiveness of national disease prevention and control initiatives, resource allocation, and public policy related to the specific disease control.

Sweden has been collecting epidemiological health data for over two centuries and owns more than 100 National level Government supported disease registries.[1] Swedes established their Cancer registry in 1958 that allowed them a life-long follow-up and examine exposure to the internal and external factors that lead to complications and adverse effects decades later. Registries thus enable medical professionals to engage in continuous learning from the transparent data and considerably reduce the incidence of various disease or postoperative complications and the healthcare spending by employing best clinical practices. An international study of thirteen registries from Australia, Denmark, Sweden, the United Kingdom, and the United States also corroborated the fact that registries facilitate improved health outcomes, often at lower cost.[2]

We are observing ageing population and falling birth rate in the developed world. Improved healthcare has resulted in less mortality, higher morbidity and accompanied disability which will increase the dependency on the healthcare system. Hence, a tailor-made healthcare system based on the demographic trends is needed. Registries will play a pivotal role in addressing this challenge and policy making.

Unlike Swedes, US and some other European countries, cancer and other diseases registration is a prevailing issue in the developing and under developed countries. Registries help to address the core challenge of not having a standardized strategy of data collection and global researchers benefit from the transparency and active dissemination of the data. Registries also support adoption of best clinical practices among the healthcare professionals in a cohesive manner to provide quality care, alleviate global disease burden and incurring healthcare cost. Registries datasets cater the Policy-makers, the medical industry and researchers around the globe. There is a dire need to establish National level population-based registries in Pakistan to strengthen our National Healthcare System.

References

1. Mattsson T. Quality Registries in Sweden, Healthcare Improvements and Elderly Persons with Cognitive Impairments. *Eur J Health Law* [Internet]. 2016; 23(5):453–69. DOI: https://doi.org/10.1163/15718093-12341429.
2. Larsson S, Lawyer P, Garellick G, Lindahl B, Lundström M. Use of 13 disease registries in 5 countries demonstrates the potential to use outcome data to improve health care's value. *Health Aff*. 2012; 31(1):220-7. DOI: https://doi.org/10.1377/hlthaff.2011.0762

EDITORIAL POLICIES

It is policy of the Journal of Shifa Tameer-e-Millat University (JTMU) to publish articles pertaining to different fields of medical sciences (Medicine, Dentistry, Pharmacy, Applied Health Sciences and Nursing, etc.) providing sufficient contribution to medical knowledge. The articles may include new experimental methods of medical importance; new results obtained experimentally; new interpretation of existing results or data pertaining to clinical problems; or epidemiological work giving substantial scientific information pertaining to medical sciences.

All such articles should aim for development of medical concepts rather than mere recording of facts. Incomplete studies will be discouraged.

Objectives

1. To publish original, well documented, peer reviewed clinical, allied and basic health/medical sciences manuscripts.
2. To inculcate the habit of medical writing.
3. To enable medical professionals to remain informed in multiple areas of medical and health sciences, including developments in fields other than their own.
4. To share the experience and knowledge for benefit of patients in particular and humanity in general.
5. To document medical problems and challenges pertinent to community.
6. To achieve the highest level of ethical medical journalism and to produce a publication that is timely, credible, and authentic to read.

Editorial Freedom

The Editor-in-Chief has full authority over the editorial content of the journal and the timing of publication of its content. The Editor-in-Chief is supported by the editorial board which consists of highly competent individuals who have expertise in research including associate editors and international advisors. The editorial team makes decisions on the authenticity and validity of the submitted manuscripts in light of the journal's aims and scope. The publisher is not involved in any step of the manuscript review and decision-making process.

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Authorship is based on the following four criteria:

1. Substantial contributions to concept and design of study, or acquisition of data or analysis and interpretation of data
2. Drafting the article or revising it critically for important intellectual content.
3. Final approval of the version to be published.
4. Agreement 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.

It is important to note that:

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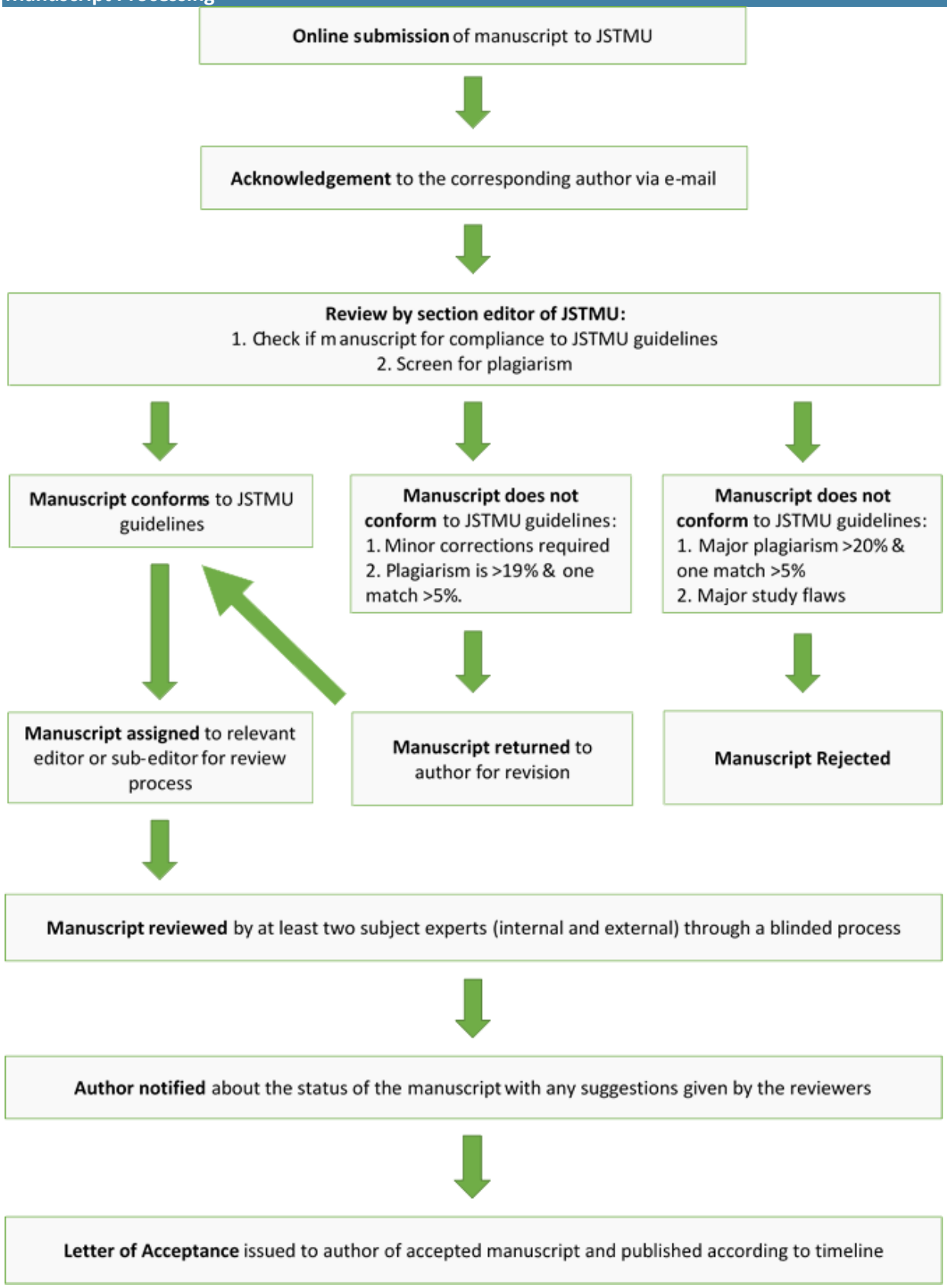
Manuscript Processing



Manuscript Withdrawal by Author

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Once the article is submitted, the author grants the editorial board full publishing rights and it is the absolute right of the editorial board to decide on article withdrawals. For genuine withdrawal, the corresponding author should submit a request which must be signed by all co-authors explaining the reason of withdrawing the manuscript. The request will be processed by the editorial board and only serious genuine reasons will be considered if possible. The decision of the editorial board will be final and not negotiable.

Unethical withdrawal or no response from the authors to editorial board communication will be subjected to sanction a ban of 4 years to all authors, and their institute will also be notified.

Peer Review Process / Policy

Peer review is the unbiased critical assessment of manuscripts submitted to JSTMU by experts who are not part of the editorial staff. Each article submitted to JSTMU for publication is reviewed by at least two specialists of the concerned specialty as a double-blinded process. Reviewers are therefore required to respect confidentiality of the peer review process and not reveal any detail of the manuscript or its review, during or after the peer review process, beyond the information released by the journal. If reviewers wish to involve a colleague in the peer review process, they should first obtain permission from the journal. The editor(s) should be informed of the names of any individuals who assisted in the review process when the report is returned. JSTMU shall not share manuscripts with third parties except in cases of suspected misconduct.

Reproducibility and Robustness

We believe that the research we publish should adhere to high standards of transparency and robustness in their methods and results. This, in turn, supports the principle of reproducibility, which is a foundation of good research, especially in natural sciences. We achieve this by developing editorial processes and checklists to provide clarity for authors and supporting authors in the reporting of their work. We support the Transparency and Openness Promotion guidelines.

Conflict of Interest

Conflict of interest statement for Authors:

All manuscripts for articles, original research reports, editorials, comments, reviews, book reviews, and letters that are submitted to the journal must be accompanied by a conflict of interest disclosure statement or a declaration by the authors that they do not have any conflicts of interest to declare. All articles that are published in the journal must be accompanied by this conflict of interest disclosure statement or a statement that the authors have replied that they have no conflicts of interest to declare. To facilitate this policy, all authors must disclose 'ALL their potential conflicts of interest' to the editors of the journal at the time of submission. These include all financial and non-financial interests and relationships (see definitions provided a little later in the text), direct employment with a private sector entity (whether full or part-time), and service on private sector and non-profit Boards and advisory panels, whether paid or unpaid. Authors should also disclose any conflict of interest that may have influenced either the conduct or the presentation of the research to the editors, including but not limited to close relationships with those who might be helped or hurt by the publication, academic interests and rivalries, and any personal, religious or political convictions relevant to the topic at hand. In the article, the authors must include a draft statement that discloses all relevant conflicts of interest and affiliations. The relevance of financial conflicts of interest with private firms is defined as a relationship of any value with a firm that has a stake in the subject of the manuscript or its competitors. Relevance for patents is defined as any invention or pending invention connected in any way to the subject.

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Authors should ensure that their citations are accurate (i.e. they should ensure the citation supports the statement made in their manuscript and should not misrepresent another work by citing it if it does not support the point the authors wish to make).

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Authors should avoid citing work solely from one country.

Authors should not use an excessive number of citations to support one point.

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Initial decision to review	1-2 weeks after submission
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Time to online publication	1-2 months after acceptance
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Each original article must contain:

Title page *

Title page should contain the following information:

1. Complete title of the article
2. Name(s) of author(s)
3. Department(s)
4. Institution(s) at which work was performed
5. Official phone/fax number, mobile phone number, personal e-mail address of the corresponding author, and institutions address.

Abstract

The abstract should be structured and NOT more than 250 words. The abstract must be written under the following subheadings:

1. Introduction
2. Objectives
3. Methodology
4. Results
5. Conclusion

Text

Text must be arranged under the following headings:

1. Introduction
2. Methods
3. Results
4. Discussion
5. Conclusion(s)
6. Acknowledgements (if any)

Introduction: Should provide brief review of relevant literature in such a way that it highlights the importance of the study and that the purpose of the study should be clearly stated. The articles used in the review of literature should be properly referenced by Vancouver Style.

Methods: Should include the setting(s), the subjects (participants), sampling methods and sample size, if used, type of study design used, and other procedures that were conducted. The Methods section should be brief, crisp and detailed enough to enable the reader to replicate the study in another setting. Commonly used procedures and methods need not be described but require a reference to the original source.

Results: Should include the factual findings of the research study done and, presented in the form tables or figures. Each table and figures should be properly labelled with headings and numbers (e.g. Table

No. 1, Figure No. 1) on separate pages. The write-up of results in the text should highlight the important findings without duplication of presentations displayed in the tables or figures. *Explanation of the findings should be reserved for the Discussion section.*

Discussion: Should highlight the important findings comparing and contrasting the study's results with that of other similar researches published and it should be appropriately referenced. Discussion should be concise and supported by the presented data.

Conclusion: Is restricted to the study and is drawn from the results and discussion.

Acknowledgements: If any, should be placed at the end of the text and before references.

References: *

References should be cited consecutively in SUPERSCRIPT as NUMERICAL without parentheses and should appear AFTER the punctuation marks (. , ; : ? ! ” etc.) in the text/sentence. The final bibliography should be in the order in which they are quoted/cited in the text and written in *Vancouver Style*.

Citation Example:

Equal amounts of dietary carbohydrates have variable blood glucose response considerably as a function of specific food ingested.[1]

Bibliography/References Example:

1. Wolever TMS, Yang M, Zeng XY, Atkinson F, Brand-Miller JC. Food glycemic index, as given in Glycemic Index tables, is a significant determinant of glycemic responses elicited by composite breakfast meals. *Am J Clin Nutr* 2006; 83(6):1306–12.
   DOI: https://doi.org/10.1093/ajcn/83.6.1306

B. Meta -Analysis/ Systematic Reviews

Meta-analysis are systematic, critical assessments of literature and data sources pertaining to clinical topics, emphasizing factors such as cause, diagnosis, prognosis, therapy, or prevention, and that includes a statistical technique for quantitatively combining the results of multiple studies that measure the same outcome into a single pooled or summary estimate. All articles or data sources should be searched for and selected systematically for inclusion and critically evaluated, and the search and selection process should be described in the manuscript. Inclusion and exclusion criteria must be mentioned. Details of searching articles and search engines used should be clearly stated. The specific type of study or analysis, population, intervention, exposure, and tests or outcomes should be described for each article or data source. These should be described in the Method section. The data sources should be as current as possible, ideally with the search having been conducted within several months of manuscript submission. Authors of reports of meta-analyses of clinical trials should submit the PRISMA flow diagram and checklist. Authors of meta-analyses of observational studies should submit the MOOSE checklist. Follow EQUATOR Reporting Guidelines. The text **should NOT exceed 6000 words** excluding abstract, references, tables and figures.

Each of the sections of these articles should include specific sub-sections as follows:

Structured Abstract: (Not exceeding 250 words):

1. Objectives
2. Methodology
3. Results
4. Conclusion

Text should be organized under the following headings:

Introduction:

1. Rationale
2. Objectives
3. Research question

Methods:

1. Study design
2. Participants, interventions, comparators
3. Systematic review protocol
4. Search strategy
5. Data sources, studies sections and data extraction
6. Data analysis

Results:

1. Provide a flow diagram of the studies retrieved for the review
2. Study selection and characteristics
3. Synthesized findings

Discussion:

1. Summary of main findings
2. Risk of bias
3. Limitations
4. Conclusions

** For all other information including title page, typing and reference style, please follow the original articles instructions.*

C. Systematic Review (without meta-analysis): Review articles

Systematic Reviews/ review article are critical evaluation and assessments of scientific literature and other sources of data relating to health sciences topics, emphasizing factors such as cause, diagnosis, prognosis, therapy, or prevention. Systematic Reviews without meta-analysis are published as Review articles; those with meta-analysis are published as Original Investigations.

Systematic Reviews should include the following:

1. Abstract (Unstructured abstract of no more than 350 words)
2. Introduction (150-250 words)
3. Methods (150-250 words)
4. Results (1000-1250 words)
5. Discussion (1000 words)
6. Conclusions (2-3 sentences)

Maximum length: **Should NOT exceed 3500 words of text** (not including abstract, tables, figures, acknowledgments, references), with no more than a total of 5 tables and/or figures and no more than 50-75 references.

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D. Case Reports/Case Series

The journal will consider only those case report/series that represent very rare case(s), or epidemic diseases that are new or emerging, or first observation(s) of some emerging phenomenon or disease. They should have clinical significance and may also include observation of new adverse effect(s) of a drug, vaccine, or procedure or other unique observations, etc. Informed written consent of the patient or next of kin (if patient is not alive or comatose/disabled) should be obtained before submission of the manuscript. A covering letter from the authors that convincingly describe the merits of the case in the light of the mentioned criteria and it's educational or scientific merits should be sent along with the manuscript.

Case Report /case series should contain a single paragraph abstract and text **should NOT exceed 1000 words** (excluding abstract, references, tables and figures) with maximum 10 bibliographic references and either three figures or three tables. Each case report must contain:

1. Abstract (unstructured - should not exceed 120 words)
2. Introduction
3. Case Presentation
4. Discussion
5. Conclusion
6. Competing interest
7. Patient consent

** For all other information including title page, typing and reference style, please follow the original articles instructions.*

E. Rapid/Special /Short Communications

Rapid/Special/Short communication should be complete work, such as COMPLETE results of a short RESEARCH study, NOT a preliminary report and **should NOT exceed 1500 words** with one figure and/or one table. An editorial decision will be provided rapidly without reviews.

F. Letters to Editor

Letters should only be written on a specific article in the most recent publication of journal. The letter should be objective and provide constructive opinions offer some academic or clinical interest to the readers.
Letters **should NOT exceed 400 words** of text and 5 references, 1 of which should be to the recent article. It should not have more than 3 authors. The text should include the full name, academic degrees, and institutional affiliation for author and the email address for the corresponding author. Letters considered for publication shall be forwarded to the author of the cited article for possible response. The editor reserves the right to shorten these letters, delete objectionable comments, make other changes, or take any other suitable decision to comply with the style and policies of the journal. For writing and references style, follow the same instructions listed above.

Letter in Reply

Replies by authors should not exceed 500 words of text and 6 references. They should have no more than 3 authors.

G. Editorial

The topics of the editorial are decided by editorial board and/or Editor-in-Chief. Editorial is written either by one member of the editorial board or some expert on that topic invited by the Editor-in-Chief. As a convention, the editorial addresses relevant areas of interest that may pertain to a range of areas influencing health and health care sciences.

** For all other information including title page, typing and reference style, please follow the original articles instructions.*