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Message from Chief Editor

Dr. Mohammad Riaz Shahbaz Janjua

Chairman, HBS Medical and Dental College, Islamabad

Allah TWT says in Quran that "Saulayheen" shall have command on Earth. Most of the scholars have translated "Sualayheen" incorrectly. The actual meaning of "Sualaheen" according to the Arabic lughat (Dictionary) is a people who are competent and proficient or who possess the capability. We, as health professionals, are gifted of being "saulayheen" as are capable of gaining scientific knowledge by carrying out research.

I believe that it is on the shoulders of today's practicing doctors and teachers, to learn the essential skills necessary to be able to research in an effective clear, methodical, and time effective manner. Effective literature review, filling the gap in existing research with new information gained by one's own research endeavours and its documentation is mandatory to conduct a result-oriented research.

Launching of the Journal of HBSM & DC is a step towards fostering research and providing a new platform to publish good quality research papers based on empirical or scholarly research work encompassing the fields of Medicine and Dentistry. The Editorial board of JHBSMDC is comprised of our faculty members well known in their specialties nationally and internationally. Each member is committed to working with utmost dedication to bring this journal at par with internationally renowned impact factor journals.

I pray and hope that this journal will benefit people in the field of Medicine and Dentistry and shall unravel a chain of research questions with innovative ideas compelling the researcher to think out of the box.

I am very thankful to all the members of editorial board for their hard work in stream lining the matters of publication. I am also grateful to our national and international reviewers for giving their consent to be a part of this noble cause. I can never ignore the role of the authors who contributed to the journal.

Above all I can never thank Allah TWT enough for His Fazal and Rehmatul il Alameen, Sarwar e Qainat Hazrat Mohammad S.A.W (may peace be upon him) for his Rehmat as it is my faith that crossing this milestone could not have been possible without these blessings.

May Allah TWT make everyone contributing to this journal most capable and may He bless you all with the best of capabilities.

ORIGINAL ARTICLE

OPEN ACCESS

An Assessment of Knowledge about Medical Ethics in Doctors of Holy Family Hospital, Rawalpindi

About the Author(s)

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Abstract

Background: Medical ethics is a set of values that is critical for health and its education is imparted to medical students as a compulsory part of the curriculum. However, despite all the emphasis on ethics education, medical doctors have insufficient knowledge about medical ethics and are found to be involved in unethical practices.

Objective: To assess the knowledge about medical ethics in doctors of Holy family hospital Rawalpindi.

Methodology: A cross-sectional survey was done in Holy Family Hospital (HFH) Rawalpindi from January 2015 to April 2015. A hundred participants (Medical Officer, Postgraduate trainee, Senior Registrar or Professor) were surveyed using close-ended questionnaire. The questions asked were about their gender, qualification, and their knowledge about medical ethics.

Results: Almost half of the doctors (51%) couldn't recall the declaration of professional responsibility. The majority of doctors didn't have sufficient knowledge about the principle of confidentiality (79.3%) and disclosing information to relatives without patient consent (83.3%). However, the majority knew about abortion-related ethics. Nearly 88% of doctors realized that abortion is not ethical.

Conclusion: There were many gaps in the knowledge of doctors regarding medical ethics. More vigorous training and emphasis on ethics is required for ensuring better ethical conduct of doctors.

Keywords: Knowledge, medical ethics.

Conflict of Interest: None **Funding Source**: None

Introduction

Medical ethics is a system of moral principles that apply values and judgment to the practice of medicine.[1] "Hippocratic Oath" have been by far the most practiced principle of medical ethics. In the present day, the Geneva declaration formulated by the World Health Association is a rephrased version of the Hippocratic oath practiced the world over.[2,3] In the developed countries, medical ethics appeared as a recognizable academic discipline and became a compulsory part of the medical curriculum in 1993.[4] In developing countries, this need is being recognized and is gaining its importance as a separate discipline in the medical curriculum for undergraduates. In Pakistan bioethics is being taught as part of the "Behavioral Sciences" curriculum.[5]

Despite all these guidelines, there are still several reported incidents of unethical behavior of medical students and health practitioners with patients as well as with colleagues.[6-8] This may be partly due to a lack of practical ethical guidance during the learning phase. Hence it is not surprising that the theory and application of healthcare ethics in day-to-day practice are still not well known to many healthcare providers.[9] A study conducted in Queen Elizabeth Hospital in Barbados (2003) highlighted the need to identify professionals in the workforce who appear to be indifferent to ethical and legal issues, to devise means to sensitize them to these issues and appropriately training.[10]

This will help higher authorities to make effective policies and guidance programs to improve the knowledge about medical ethics and motivate medical personnel for observing ethical principles in their practice and refrain from unethical acts.

The present study is conducted to assess the knowledge of medical ethics among doctors working in tertiary care hospital Rawalpindi.

Methodology

This study was conducted Holy Family Hospital (HFH), Rawalpindi in duration of one month. Ethical board approval was obtained before the start of study. 100 Medical doctors working in Holy Family Hospital Rawalpindi were selected using non-probability convenience sampling. Inclusion criteria was that study

subject should be Medical Officer, Postgraduate trainee, Senior Registrar or Professor working in HFH. They were approached in their departments. Medical students and House Officers were not included as they were under training, not registered medical practitioners and could not take independent decisions.

Data was collected by researchers using questionnaires, which were filled by them after interviewing the respondents. The questionnaire was semi-structured and in the English language. Questions were related to gender, qualification, designation and their knowledge about medical ethics. Prior permission was taken verbally from study subjects and the confidentiality of patients was assured. They were asked whether they could recall a declaration of professional responsibility, and if they knew about the importance of ethics, principles of ethics in medical practice, breaking bad news, protocol of examining female patients, and abortion related ethics. Statistical analysis was done using SPSS Version 21. The variables studied were qualitative and their percentages were calculated and presented in table and graphs.

Results

In our study, the majority of doctors were Medical officers or PGTs (90-91%) as shown in figure 1. There were only 3% professors among male doctors and no professors among female doctors.

When asked about the importance of ethical conduct in healthcare delivery, the majority answered its importance for improved healthcare services (69%), a few recognized it as a professional responsibility (26%) as shown in figure 2.

Only half of the doctors (51%) were able to recall the declaration of professional responsibility as shown in table 1. The majority of doctors didn't have sufficient knowledge about the principle of confidentiality (79.3%) and disclosing information to relatives without patient consent (83.3%) as shown in table 1.

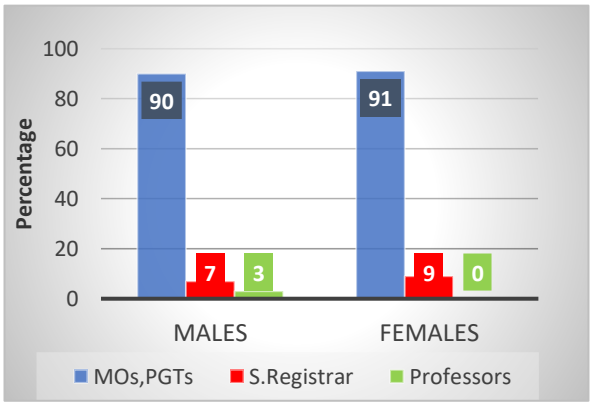

Figure 1. Designation of male and female doctors (n=100)

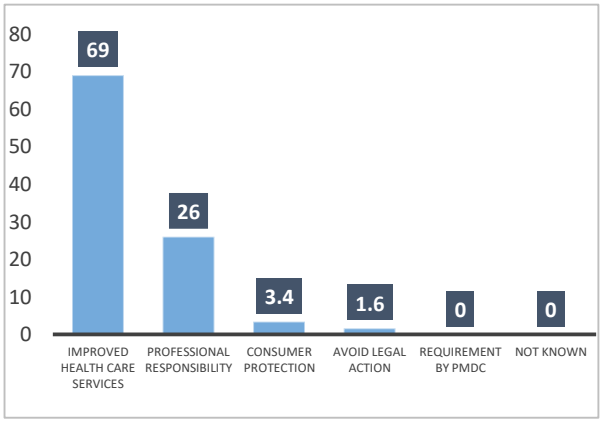

Figure 2: Importance of ethical conduct in healthcare delivery (n=100)

However, the majority knew that patients should be informed when something wrong happened (84%). Regarding knowledge of breaking bad news, only 21% of doctors knew more points. Doctors were asked if they knew that abortion is ethical or not, the majority (88%) knew that abortion is not ethical. They were asked further questions about ethics related to abortion. When asked if doctors should do best practice irrespective of

Table 1: Percentage of yes, no responses in various knowledge questions asked (n=100)

Knowledge question		Response	
		Yes (%)	No (%)
Recall declaration of professional responsibility		51	49
Knowledge about ethics principles	principle of confidentiality	20.7	79.3
	disclosing information to relatives without patient consent	16.7	83.3
	informing patient about any harm	84	16
Knowledge about important points of breaking bad news (Proper sitting & setting, what patient knows and wants to know, with empathy)		21	79
Knowledge of whether abortion is ethical or not		88	12
Knowledge of whether doctors should do best practice irrespective of patient's opinion in case of abortion		69	31
Knowledge of whether we should give priority to patient's opinion		75	25
Knowledge of protocol of examining a female patient		19	81
Right of patient to take final decision		69	31

patient's opinion, 69% said yes. When asked if we should give priority to patient's opinions 75% said yes. When asked about the protocol of examining a female patient, 19% could tell that there should be a female doctor, nurse, patient attendant and informed consent should be taken.

Discussion

The present study revealed that only 51% of the doctors could recall the declaration of professional responsibility while 49% could not. The study conducted in a teaching hospital Manipur, India, lacked adequate and detailed knowledge about the code of ethics though most of them (59.7 %) had read it once.[11] The reason may be the higher youth literacy rate in India (90.2%) as compared to Pakistan (71%).[12] This difference is very important to influence the level of knowledge.

Regarding the importance of ethical conduct in health care delivery, 69% of doctors thought it to be important for improved health care services & only 26% considered it as a professional responsibility. In response to the questions related to Principles of confidentiality, autonomy, beneficence, and informed choice, doctors in this study showed better knowledge. It was found that 83.3% of answers by the doctors did not favor the disclosure of information to relatives without the patient's consent and 89% of doctors agreed to give details about the disease to the patient. A Pakistani study conducted in Karachi also reported similar findings, where 79% of doctors knew about the principle of informed consent for patient management and 65.7% knew that confidentiality of patient information has to be ensured.[13]

In comparison to this, a study in Nigeria showed that just 55.6% of respondents knew about the principle of respect for persons (autonomy) and 48.7% were aware of the principle of beneficence. Non-maleficence was known to 40.2% of respondents, while only 31.7% knew the principle of justice.[1] Similarly, a study conducted among doctors in selected government and private hospitals in Addis Ababa, Ethiopia reflected that 75.6% of the study participants were knowledgeable about the code of ethics, and scored >75% on knowledge based questions related to medical ethics.[14] Here again, the literacy levels of the two countries are lower than Pakistan i.e. Nigeria 62.02%, and Ethiopia 51.77%.[15] Knowledge is a direct reflection of the literacy level.

Another finding of the present study was that 69% of the doctors accept the right of the patient to take the final decision. This was in contrast with the findings in Nigeria in which 23% of respondents agreed to the paternalistic view that doctors should do what is best irrespective of the patient's opinion.[9] Here not only Literacy Level is playing its role, but cultural values are more important to give these results in Nigeria.

In response to questions asked about the protocol to examine a female patient by a male doctor, 19% knew about the right protocol of examination in presence of a female doctor, nurse, and female attendant. These findings were partly in line with findings in a Nepalese study which showed that 33.9% of doctors and 52.3% of nurses agreed to the refusal to examine a female patient in absence of a chaperone.[16] These results point towards the commonality of social and cultural values about the privacy of female patients.

Conclusion

The knowledge of doctors about medical ethics was found to be inadequate. Many gaps in knowledge were identified. There is a dire need to enhance awareness through a focused approach and emphasis on its importance.

Recommendations

- Declaration of responsibility (Oath) should be displayed on the prominent places of all health facilities.
- More emphasis should be placed on ethics in formal teaching.
- Resource persons who are trained specifically in bioethics or medical ethics should be involved in medical education.
- Code of medical ethics in the form of booklets should be given to all health professionals at the time of registration by PMDC.
- Day/week of medical ethics should be celebrated by the health professionals every year

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Authors Contribution:

[1,3]Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work & Final approval of the version to be published

[2,5,6] Drafting the work or revising it critically for important intellectual content;

ORIGINAL ARTICLE

OPEN ACCESS

Maternal Outcomes and Higher Incidence of Preeclampsia Found in Younger Mothers

About the Author(s)

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Abstract

Objective: To evaluate maternal outcomes of Preeclampsia.

Methodology: Present case control study was carried out at Holy Family hospital and Rawalpindi General Hospital. It included 160 pregnant women, out of those 110 were preeclamptic who developed hypertension and protein urea after 20th week of gestation. The rest of the 50 pregnant women that had normal blood pressure during their pregnancy were taken as control group. Data was analyzed using SPSS.

Results: This study indicated that in the majority (40.9%) of cases, preeclampsia developed in the younger (16-20 year) women, and this gradually decreased with the advancing age of women and as low as 18.14% was observed in pregnant women beyond 31-35+ years of age. There was low frequency of normal spontaneous delivery (36.3%), high rate of induction (43.6%) and its failure (14.5%), with high rate of Caesarian section (20.9%) in preeclamptic patients as compared to control. The complications developed in 32 (27.8%) preeclamptic patients which were abruptio placenta (6.36%), Renal insufficiency (7.27%), Hellp syndrome (8.18%), Eclampsia (10.9%), Cerebral haemorrhage (0.90%) and Death of mother (0.90%) and the majority of complications occurred in the younger age group.

Conclusion: Preeclampsia is a worsening clinical condition, if not monitored carefully may result in complications of pregnancy

Key words: Preeclampsia. Pregnancy. Maternal outcome.

Conflict of Interest: None **Funding Source**: None

Introduction

Hypertensive disorders are a common complication of pregnancy that put women and their fetuses at disproportionate risk for further complications, as well as life-long sequelae. Ranging in severity, hypertensive disorders of pregnancy include chronic hypertension-systolic blood pressure (BP) ≥140 mm Hg or diastolic BP ≥90 mm Hg that predates the onset of pregnancy; gestational hypertension-hypertension diagnosed after 20 weeks gestation without concurrent proteinuria; preeclampsia-eclampsia—classically, new-onset hypertension with new-onset proteinuria; and chronic hypertension with superimposed preeclampsia—chronic hypertension with new-onset proteinuria or other signs/symptoms of preeclampsia after 20 weeks or chronic proteinuria with new onset hypertension.[1] With the greatest morbidity and mortality, preeclampsia affects 5% to 7% of all pregnant women but is responsible for over 70 000 maternal deaths and 500 000 fetal deaths worldwide every year. In the United States, it is a leading cause of maternal death, severe maternal morbidity, maternal intensive care admissions, cesarean section, and prematurity.[2-4] The complication affects as many as 1 in 10 first pregnancies.[5]

Eclampsia can be 20 times more common in developing countries, and it probably accounts for more than 50,000 maternal deaths world-wide each year.[6]

These findings emphasize the need for the prevention of eclampsia by picking up the cases of preeclampsia from the community at an early stage, vigilant antenatal care, maternal stabilization before and during transfer to the specialized unit and intensive care monitoring at the hospital. Good antenatal practices, maternal education and awareness, provision of better health facilities and their utilization will definitely improve maternal outcome.

Methodology

This case control study was conducted in the obstetric department of Holy Family Hospital and Rawalpindi General Hospital Rawalpindi on 110 preeclamptic patients visiting the out-patient department, admitted in the obstetric wards (pre-delivery and post-delivery) and from labour room.

For the description of different criteria's control and preeclamptic patients were distributed according to age. These groups were 16-20 years, 21-25 years, 26-30

years, and 31-35+ yrs. The age group 16-20 years in the control comprised of ten normal pregnant women and forty-five preeclamptics. The age group 21-25 comprised of twenty pregnant females in the control group and twenty-nine preeclamptics. In the age group 26-30 the control comprised of ten pregnant females and sixteen preeclamptics. In the age group 31-35+ the control comprised of ten pregnant females and twenty preeclamptics.

Records of systolic and diastolic blood pressure (mmHg) were maintained at four weeks intervals starting from the twentieth week of gestation, onwards till thirty-two weeks, and then at weekly intervals till delivery Arterial B.P was measured by sphygmomanometer and the technique was standardized to get consistent results.

The data was abstracted by making a proforma which includes age, parity and medical history (molar pregnancy, renal disease, diabetes mellitus, connective tissue disease). Prior history of hypertension and family history of preeclampsia was ruled out. Record of Complications in the mother such as Abruptio placenta, renal insufficiency, HELLP syndrome i.e. (hemolysis-elevated liver enzymes-low platelet count), eclampsia, cerebral hemorrhage, or death was noted. The weeks of gestation the patient delivered was important as it was directly related to the maturity of the baby, and the condition of the cervix (Bishop Score). Induction was necessary in cases of poor bishop score and was made by artificial rupture of membranes, syntocinon I/V infusion or prostaglandin vaginal pessary. In cases of failed induction or fetal distress, Caesarean sections were performed.

Mean and standard errors were calculated. Student's t-test was used to study significance for comparison of control and preeclamptic group. Significance was taken as $p<0.05$.

Results

The total number of patients who developed preeclampsia was 110, out of 1105 cases studied (9.95% incidence).

The distribution of preeclamptic patients (Figure 1) depicted that majority of patients (40.9%) were in the age group of 16-20 years (mean age 18.4±0.20 years). The age group 21-25 consisted of 26.3% of patients with preeclampsia (mean age 22±0.17 years). 14.5% of patients were in the age group 26-30 (mean age 25.6±0.15 years). The age group 31-35+ comprised 18.1% preeclamptic patients (mean age 34.6±0.71 year).

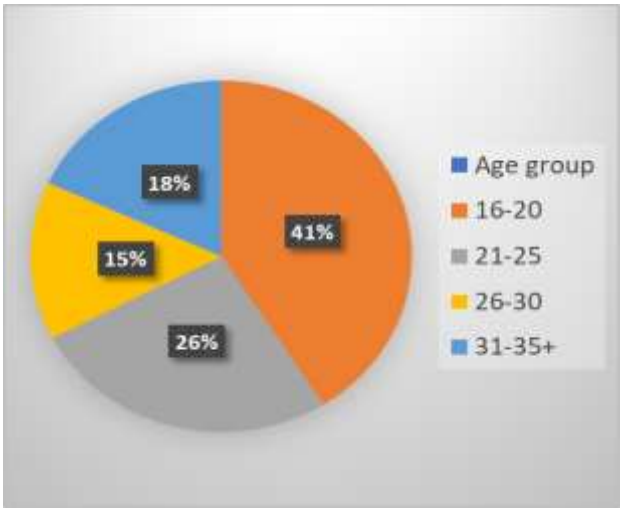

Figure 1. Frequency of preeclamptic patients of different age groups

Out of 110 patients, 68(61.8%) were primigravida who conceived for the first time. 26 patients (23.6%0 were the second gravida and 16 patients (14.5%) were multigravidas.

The frequency of spontaneous vaginal delivery, induction by Syntocinon infusion, by prostaglandin vaginal pessary, and Caesarean section in control and preeclamptic patients of different age groups is given in table I. these results indicate the low frequency of normal spontaneous delivery, high rate of induction and its failure, and the high rate of Caesarean section in preeclamptic patients.

The number and percentage of complications developed in preeclamptic patients such as Abruptio placenta, Renal insufficiency, Hellp syndrome, Eclampsia, Cerebral hemorrhage, and death of mother in different age groups

Table I: Frequency of Vaginal delivery, Induction by syntocinon or prostaglandin pessary, its failure and Caesarean section in control and preeclamptic patients of different age groups.

Age Groups (year)	Vaginal Spontaneous	Induction		
		Syntocinon	Pessary	Failure
16-20	N (%)	N (%)	N (%)	N (%)
control	5(50)	3(30)	1(10)	-
P.E	16(35.50)	11(24.4)	8(17.70)	2(10)
21-25				
Control	14(70)	4(20)	1(5)	-
P.E	11(37.90)	6(20.60)	6(20.60)	3(25)
26-30				
Control	6(60)	2(20)	-	-
P.E	6(37.50)	4(25)	3(18.70)	1(14.20)
31-35+				
Control	5(50)	2(20)	1(10)	1(33.30)
P.E	7(35)	5(25)	4(20)	1(11.10)

Table II: Frequency of Abruptio placenta, Renal insufficiency, HELLP syndrome, Cerebral hemorrhage and death of mother.

Age groups	Abruptio placenta	Renal Insufficiency	HELLP Syndrome	Eclampsia	Cerebral Hemorrhage
(yrs)	N (%)	N (%)	N (%)	N (%)	N (%)
15-20	4(8.80)	4(8.80)	5(11.10)	8(17.70)	1(2.22)
21-25	1(3.40)	2(6.80)	2(6.80)	1(3.40)	-
26-30	1(6.25)	1(6.25)	1(6.25)	1(6.25)	-
31-35+	1(5)	1(5)	1(5)	2(10)	-
Total	7(6.36)	8(7.27)	9(8.18)	12(10.90)	1(0.90)

are given in Table II. The majority of complications occurred in the age group 16-20. The deaths of two mothers occurred in the age group 16-20, due to the development of cerebral hemorrhage, and renal insufficiency as a consequence of Eclampsia.

Discussion

The incidence of preeclampsia in this study was 9.95%. The incidence in the Chinese population (9.0%)[7] English population (10.5%) have shown a similar outcome. However, in the South African population, a higher incidence of preeclampsia (15.7%) was reported.[8] This study indicated that majority (40.9%) preeclampsia cases developed in the younger (16-20 year) pregnant women. This gradually decreased with the advancing age of women and as low as 18.14% was observed in pregnant women beyond 31-35+ years of age. Similar results have been reported in South African young primigravida (<20 years) who have increased incidence of preeclampsia.[8] An analysis of 62239 singleton deliveries in the Cape Peninsula Maternity and neonatal service region in 1979-81 shows that primigravida have approximately double the incidence of preeclampsia (hypertension and of proteinuric hypertension).[9]

In this study, there was low frequency of normal spontaneous delivery (36.3%), high rate of induction (43.6%) and its failure (14.5%), with a high rate of Caesarean section (20.9%) in preeclamptic patients as compared to control. In a study in Finland, similar results were found with spontaneous vaginal delivery rate (46.8%), induction rate (41.9%) and Caesarean section rate (9.3%).[10] A higher rate of Caesarean sections (52.6%) and induction (47.4%) was found in a study in Miami and out of these induced cases 48.3% delivered per vaginum.[11] A very high prevalence of Caesarean deliveries (73.3%) was found in Chinese preeclamptics.[7] This may be due to their differences in treatment policy and a variable threshold for intervention.

The complications developed in 32(27.8%) preeclamptic patients in this study. These are Abruptio placenta (6.36%), renal insufficiency (7.27%), (HELLP) syndrome (8.18%), Eclampsia (10.9%), cerebral hemorrhage (0.90%) and death of the mother (0.90%).

The majority of complications occurred in the younger age group. The death of one mother occurred in the age group 16-20 who came in an emergency with renal insufficiency and cerebral hemorrhage as a consequence of Eclampsia.

In an American study, a high rate of complications (54%) was observed with Abruptio placenta (13.1%), HELLP syndrome (23.6%), renal insufficiency (13.1%), but progression to eclampsia was less (7.89%).[12]

The development of Abruptio placenta in preeclamptic patients was 4.7%[13] and in another study in African Americans it was 1.1% while the development of Eclampsia in whites (0.20%) and Hispanic was (1.1%) and the development of HELLP syndrome in whites (2.9%), African American (2.1%) and Hispanic was (4.3%)[14], showing lower development of complications in the last two studies.

Conclusion

It is concluded that preeclampsia sets in after the twentieth week of gestation in all age groups and it is accompanied by low hemoglobin and a low platelet count. There was a low frequency of normal spontaneous delivery, high rate of induction, and its failure with a high rate of Caesarean section in preeclamptics. However, our rates of interventional delivery appear to be lower than those quoted by most foreign studies. The complications that developed in mother in this disease are Abruptio placenta, renal insufficiency, HELLP syndrome, eclampsia, cerebral hemorrhage and death.

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Authors Contribution:

[1,2,3]Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work & Final approval of the version to be published

[3,5,6] Drafting the work or revising it critically for important intellectual content;

ORIGINAL ARTICLE

OPEN ACCESS

Assessment of Knowledge, Attitude and Practice of Health Care Workers Towards Infection Control in a General Hospital

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Abstract

Back ground: Infection control measures are vital for prevention of nosocomial infection. To reduce the incidence of nosocomial infection, there is a dire need of evaluating health care workers knowledge and practices towards infection control.

Objective: To assess the knowledge, attitude and practice of health care workers towards infection control in a general hospital.

Methodology: The study was carried out at HBS Medical and Dental College and HBS General Hospital for a duration of six months. It was a non-probability convenience sampling. Data was collected through a questionnaire and was analyzed using SPSS version 24.

Results: A total of 81 health care workers participated in this study. Health care workers had good knowledge (91.4%) and attitude (93%) toward infection control measures but practice was found to be poor (37%). No statistically significant difference was found between doctors and paramedics regarding knowledge, attitude and practices towards infection control measures.

Conclusion: Knowledge and attitude of health care workers is better than their practice and health care workers need to get well-trained. Based on these results an infection control guideline best suitable for this setup must be devised and its application should be monitored in order to develop an infection free health care setup.

Key words: Knowledge and Practices, Infection control, healthcare workers

Conflict of Interest: None **Funding Source**: None

Introduction

Hospital acquired infection is defined as the infection which a person either patient or health care worker gets from the environment, equipment or workers related to the hospital and its vicinity.[1]

According to WHO, the prevalence of hospital acquired or nosocomial infection is 7% in developed and 10% in developing countries.[2] It has been estimated that 30-40% of hospital acquired infections are related to contamination of healthcare worker hands.[3] To prevent or minimize it, WHO has formulated a guideline towards infection control.[4] In 2006, National Infection Control guidelines were made by the government of Pakistan.[5] Since then every hospital or health care center is supposed to have an Infection Control Committee. This Infection Control Committee is responsible for implementing Infection Control measures either according to the National Infection Control guidelines or it has to devise its own guidelines and to audit its performance periodically.

Infectious diseases no doubt is a major burden of diseases in developing countries like Pakistan.[6] Several knowledge, attitude, practice (KAP) based studies are being conducted in developing countries like India[7], Ethiopia[8] and Iran[9] to identify the deficiencies in infection control methods. Previously several studies have been conducted in different areas of Pakistan to determine the knowledge and practice of our health care workers. A study carried out in Karachi revealed that a medical student of a private hospital has a piece of better knowledge about infection control measures including hand hygiene, surgical scrubbing and needle stick injury as compared to students of public sector hospital.[10] Similarly a study in Lahore showed that knowledge increases with the qualification of a health care practitioner.[11]

In this study, we made an assessment of knowledge, attitude and practice towards infection control of health care workers in our setup and compare it to national and international standards according to World Health Organization (WHO). This study will help in formulating the infection control guidelines in this setup. It will also

increase the awareness of infection control among health care workers.

Methodology

It was an institution based cross-sectional survey carried out from 1st March 2019 to 30th September 2019 at HBS Medical College and HBS General Hospital. There are a total of 209 health care workers working in HBS Medical College and General Hospital. All the physicians, nurses, lab technicians, who fall into the category of health care workers were included in the study. Those who were on leave refused to be the part of this survey and did not return the questionnaire were excluded.

The sample size was calculated using the Creative Research Systems survey software available online. The sample size was calculated as 81 after setting a Confidence interval of 95% with 5% margin of error. It was a non-probability convenience sampling. A total of 81 Questionnaires were distributed randomly among health care workers of HBS Medical College and HBS General Hospital. Some health care workers filled and returned the questionnaire at the same time, others took one or more days to fill and return. Knowledge, attitude and practice of healthcare workers towards infection control were the dependent variables. Whereas, gender, designation, educational level, vaccination of health care workers, participation in infection control workshop, training about infection prevention, availability of isolation rooms, use of personal protective equipment, the experience of needle stick injury, and selection of appropriate bins for waste disposal were the independent variables.

Knowledge of health care workers was measured by asking 10 relevant questions. Correct answers were labeled as number "1" and incorrect as "2". Individuals scoring more than 6 were categorized as "knowledgeable" and the others with less than or equal to 6 as "not knowledgeable".

Attitude was measured by asking 7 questions. Those who scored more than 4 were considered having "positive attitude".

Regarding practice 5 questions were asked and individuals scoring more than 3 were considered having "good practice".

A self-administered questionnaire was structured, based on basic questions regarding infection control which assessed knowledge, attitude, and practice of health care workers. A questionnaire was distributed to all the participants by hand in person. Those who were willing to answer at the spot, questionnaire collected from them at the same time. Individuals who requested to fill it later were also given one or more days to fill it and return to the concerned person.

The questionnaire, the data collection tool had four major parts. The first part was about the biography (age, gender, designation, qualification, diploma in infection control, vaccination status) of the health care worker. Second part was for measuring general awareness about washing hands before and after patient examination, the transmission of infection with dirty needles, isolation rooms, personal protective equipment, bins for waste disposal. The third part measured attitude (realizing risk of nosocomial infection, transmittable diseases, the importance of infection control workshops, personal protective equipment and good disinfectants) towards infection control with questions. The fourth part checked the practices followed by health care workers regarding habit of handwashing, personal protective equipment utilization, measures taken after a needle stick injury, and disposal of hospital waste in a correct bin.

Data was entered and analyzed by using SPSS version 24. Frequencies were determined using descriptive statistics of all the dependent variables like age, gender, occupation etc. Chi- square test was applied to find any statistically significant difference between doctors and paramedics regarding knowledge, attitude and practice. P value less than 0.05 was considered significant.

Results

A total of 81 health care workers participated in this survey. The study group was divided into three categories according to their age. Among the study group females were in majority. Out of 81 participants, doctors were in majority. Only 34 (42%) participants attended workshops on infection control during their service. Maximum health care workers were vaccinated against hepatitis B. Socio-demographic characteristics of participants is given in table 1.

Table 1: Socio-Demographic characteristics of participants (N=81)

Variable	Categories	Frequency (%)
Age (years)	19-35	50(61.7)
	36-50	20(24.7)
	>50	11(13.6)
Gender	Male	36(44.4)
	Female	45(55.6)
Occupation	Doctors	55(69.1)
	Paramedics	26(30.9)
Workshop on infection control	Attended	34(42)
	Not attended	47(58)
Hepatitis B vaccination	Taken	55(67.9)
	Not taken	26(32.1)

Regarding attitude, health care workers had a positive attitude towards infection prevention as they were aware of the fact that infection control is necessary to prevent nosocomial infection. Also, 50 (89.3%) doctors and 20 (80%) paramedics were interested in conducting infection prevention workshops for their better training. Awareness to get infection from patients in doctors was disappointing because 16 (28.6%) were not aware. It was found that the attitude of paramedics towards the importance of isolation rooms is not as good as doctors response because only 17 (68%) paramedics feel that patients with transmissible diseases must be shifted to isolation rooms in contrast to 53 (94.6%) doctors. Health

Table 2: Knowledge of HCW regarding infection control practices. (n=81)

Knowledge items	Category	Response	Number	Percentage
1. Is hand hygiene important for infection control?	Doctor	Yes	56	100
	Paramedical staff	Yes	23	92
		No	1	4
		Don't know	1	4
2. Is sanitizer important for hand hygiene?	Doctor	Yes	52	92.9
		No	3	5.4
		Don't know	1	1.8
	Paramedical staff	Yes	25	100
3. Is it necessary to wash hands between patient examinations?	Doctor	Yes	51	91.1
		No	5	8.9
	Paramedical staff	Yes	25	100
4. Does dirty needle transmit infection?	Doctor	Yes	55	98.2
		No	1	1.8
	Paramedical staff	Yes	25	100
5. Which infection is transmitted via dirty needles?	Doctor	Correct	32	57.1
		Incorrect	23	41.1
		Don't know	1	1.8
	Paramedical staff	Correct	8	32
		Incorrect	12	48
		Don't know	5	20
6. Do you know about isolation room?	Doctor	Yes	53	94.6
		No	1	1.8
		Don't know	2	3.6
	Paramedical staff	Yes	23	92
		Don't know	2	8
7. Which of the following is an important component of infection control?	Doctor	Correct	55	98.2
		Don't know	1	1.8
	Paramedical staff	Correct	19	76
		Incorrect	5	20
		Don't know	1	4
8. Which bins are used in health care facilities?	Doctor	Correct	41	73.2
		Incorrect	7	12.5
		Don't know	8	14.3
	Paramedical staff	Correct	19	76
		Incorrect	6	24
9. Which is better for hand hygiene?	Doctor	Water	25	44.6
		Alcohol based Sanitizer	30	53.6
		Don't know	2	1.8
	Paramedical staff	Water	4	16
		Alcohol based sanitizer	21	84
10. Is sterilization good for infection control?	Doctor	Yes	56	100
	Paramedical staff	Yes	25	100

care workers were found to be well aware of the fact that this center can be a source of infection if standard precautions are not followed as doctors and paramedics response was 52 (92.9%) & 21 (80%) respectively. The majority of health care workers keep on advising their colleagues to use personal protective equipment in 53 (94.6%) cases by doctors and 24 (96%) cases by paramedics. 55 (98.2%) doctors and 24 (96%) paramedics agree to spend on better disinfectants for surface cleaning. (Table- 3)

Knowledge of health care workers (both doctors and paramedics) regarding hand hygiene, isolation room, infection control components, waste disposal bins, personal protective equipment use, and sterilization was good as shown in table 2. It was found that knowledge of infections transmitted by dirty needles is not adequate especially among paramedics as only 8 (32%) of paramedics answered it correctly.

Practice of health care workers regarding hand hygiene and use of personal protective equipment's is found to be good as shown in table 4. In this study group 41 (73.2%) doctors know washing hands before contact with the patient is essential. Hand washing with soap and water is preferred by 30 (53.6%) doctors and 13 (52%) paramedics. 100% doctors and paramedics agree to use PPE.

The practice of health care workers regarding needle stick injuries was assessed by asking eight questions about the steps to be taken after experiencing needle stick injury. The result showed poor practice of both doctors and paramedics regarding steps taken after getting a needle stick injury. The practice of washing hands either with soap and water or sanitizer immediately after contracting needle stick injury is found poor among doctors (48.2% and 21.4% respectively) as well as paramedics (44% and 36%). Only 46.4% of doctors and 36% of paramedics consider squeezing blood after an injury is a good practice. 17.9% of doctors and just 8% of paramedics discourage applying pressure to stop bleeding in case of needle stick injury. Here it is noted that only 16 (28.6%) doctors said that dressing

Table 3: Attitude of HCWs towards infection control. (n=81)

Attitude items	Category	Response	Number	Percentage
1. Do you think infection control is important to prevent nosocomial infection?	Doctor	Yes	54	96.4
		No	2	3.6
	Paramedical staff	Yes	20	80
		Don't know	5	20
2. Do you feel a need to conduct infection control awareness workshops?	Doctor	Yes	50	89.3
		No	5	8.9
		Don't know	1	1.8
	Paramedical staff	Yes	20	80
		No	1	4
		Don't know	4	16
3. Is there any need to transfer transmissible disease patients to isolation room?	Doctor	Yes	53	94.6
		No	1	1.8
		Don't know	2	3.6
	Paramedical staff	Yes	17	68
		No	4	16
		Don't know	4	16
4. Are you worried about getting infected while working?	Doctor	Yes	40	71.4
		No	8	14.3
		Don't know	8	14.3
	Paramedical staff	Yes	22	88
		Don't know	3	12
5. Do you think this center can be a source of infection if standard precautions are not followed?	Doctor	Yes	52	92.9
		No	2	3.6
		Don't know	2	3.6
	Paramedical staff	Yes	21	84
		No	2	8
		Don't know	2	8
6. Do you advise others to use personal protective equipments?	Doctor	Yes	53	94.6
		No	3	5.4
	Paramedical staff	Yes	24	96
		Don't know	1	4
7. Should we spend on better disinfectant?	Doctor	Yes	55	98.2
		Don't know	1	1.8
	Paramedical staff	Yes	24	96
		No	1	4

should be applied after needle stick injury. In contrast, none (0%) of the paramedics replied to this answer correctly. It is evident from the results that undergoing screening, getting prophylactic treatment and report the case to head of department is still not practiced in our setup.

In contrast to needle stick injury practice of health care workers in selection of waste bins is found to be above average. Their practice was assessed by providing them with names of 9 different items (gloves, urine bag, needle sharps, sputum, human organs, toxic drugs, room waste and food items) and they were supposed to select the suitable bin (red, yellow or blue) for them. Results showed that more than 50% of health care workers are correctly practicing waste disposal methods.

Health care workers have shown an overall good knowledge (91.4%) and attitude (93%) toward infection control practices but the practice was found to be not safe enough (37%).

A total of 52 (92.9%) out of 56 doctors and 22 (88%) out of 25 paramedics were found knowledgeable as shown in Figure 1. There was not a statistically significant

Table 4: Health care workers practice regarding infection control. (N=81)

Practice items	Category	Response	Number	Percentage
1. Do you wash hands before contacting patient?	Doctor	Yes	41	73.2
		No	12	21.4
		Don't know	3	5.4
	Paramedical staff	Yes	22	88
		No	1	4
		Don't know	2	8
2. What do you prefer for hand hygiene?	Doctor	Water only	12	21.4
		Anti-mirobial soap and water	30	53.6
		Alcohol-based Hand sanitizer	14	25
	Paramedical staff	Water only	1	4
		Soap and water	13	52
		Hand sanitizer	11	44
3. Do you use personal protective equipments?	Doctor	Yes	56	100
	Paramedical staff	Yes	25	100

difference between the knowledge of doctors and paramedics (p-value= 0.472). Similarly, 93% of doctors and 92% of paramedics had a good attitude and this difference was again not statistically significant (p-value= 0.892). In contrast to knowledge and attitude, practice was not adequate among health care workers being safe among only 32% doctors and 48% paramedics. Although not statistically significant difference is there but it has been observed that paramedics are practicing safer than the doctors in this setup (p-value= 0.172). Here is a bar chart showing the results (Figure 1).

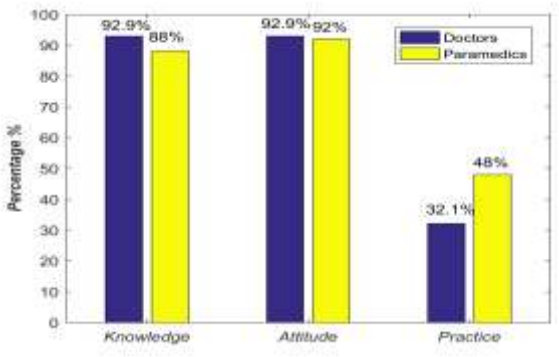

Figure 1. Bar graph showing the comparison of knowledge, attitude and practice towards infection control among doctors and paramedics.

Discussion

According to a study of all the patients admitted to hospitals, 8.4% get infected and suffer from hospital acquired infection.[12] It is the responsibility of health care workers to take preventive measures to reduce this frequency of hospital acquired infections. Training plays a vital role in improving the knowledge and practice of health care workers and in keeping their knowledge up to date. Several studies have proved the positive outcome of training the hospital staff and doctors.[13] In our study we came to know that our majority (58%) health care workers have never attended any workshop or training courses. Trained personnel should get engaged in the training of health care workers regarding preventive measures for infection control.

If all health care workers get hepatitis B vaccination, chances of getting infected become low at least among the health care facilitators.[14] Awareness about this vaccination must be spread and should be given free of cost in every health care centre. In this study we found 67.9% health care workers vaccinated. Rest of the health care workers must be vaccinated to reduce the risk of getting infected.

Infections that can be transmitted by used needles are mainly Hepatitis B, Hepatitis C and Human Immuno deficiency Virus (HIV). In this study health care workers were asked about this question and found very less that is 68% of paramedics answering it correctly even though they are practicing phlebotomy and injecting on regular basis. Our results support an old study carried out in two districts of Pakistan where health care workers especially non-MBBS HCWs had poor knowledge regarding blood borne diseases.[15] Reason behind all this is the stress we put more on the skills of nurses. Skills no doubt are the dire need for a better result but the basic knowledge behind the skills must be given prime importance too. Before hiring any health care provider, written tests including a section of infection prevention must be taken. Secondly, after hiring the staff their training must be ensured so that while working in such a busy routine they remain aware of the facts regarding infection control. In contrast, a study carried out in Ethiopia showed good knowledge of HCWs about blood borne diseases especially 86.8% of nurses were aware of these blood borne diseases.[16]

The attitude was found good overall but again here we see a gap because of again lack of basic knowledge regarding transmissible diseases either from patient to patient or patient to doctor. If regular assessments are arranged among all doctors and technicians aiming to update their basic knowledge about epidemiology, mode of transmission and methods of prevention from different microorganisms would be of great help.

The majority of health care workers prefer washing hands with antimicrobial soap showing better hand hygiene practice. Till now WHO has not classified a gold standard for hand washing while comparing handwashing and hand rubbing and hand rubbing is considered an equally beneficial act in absence of water. This study clearly shows that water and sinks are available in this setup. On the other hand, health care workers are not familiar with hand sanitizers hence hand sanitizers need to be placed in water-free or sink free areas.

Dressing the wound after a needle stick injury is one of the most important steps to follow. But none of the paramedics know it, raising the need of educating the staff.

According to a study carried out in Sindh Province, the prevalence of NSI is 64% among health care workers.[17] which is close to 53% found in this study group. Determining the rate of incidence of NSI can be a step towards beginning a surveillance program aiming to reduce the infections transmitted through sharp injuries.

Regarding waste disposal bins knowledge and practice is found good reason being in our setup bins are placed everywhere in each department which are properly labelled. So, health care workers using those bins in routine responded correctly. Still teaching about toxic and non-toxic waste is a must to further improve their practices. The Color of waste bins is different in every setup so HCWs should be familiar with the respective colours of bins of the setup they are working in.

We found good knowledge and attitude but a poor practice regarding infection control measures in this study that supports several international studies carried out in Ethiopia[18,19], Zambia[20], Nigeria[21], Saudi Arabia[22] and India[23] A local study carried out in a hospital of Khairpur also support this study where nurses had poor

practice regarding infection control measures.[24] In contrast a study carried out in Trinidad revealed practice (44%) better than their knowledge[25] (20.3%). An Indian study had similar results too where 58.75% of health care workers were practicing safely.[26]

No such study has been carried out in Pakistan which assesses the knowledge, attitude along practice of Health care workers. There is a study done in Rawalpindi[27] in 2008 and recently in 2016 in Karachi.[28] In both these studies just the knowledge regarding needle stick injury was assessed that was quite poor.

Conclusion

This study concludes that the majority of health care workers in this setup are knowledgeable but specifically knowledge about blood borne diseases is inadequate and needs to be addressed.

The attitude of health care workers towards infection prevention is positive and are interested in getting training about infection control measures. The majority of health care workers especially doctors are not practicing safely. Based on these findings infection control guidelines must be formulated for this health care setup.

LIMITATIONS AND RECOMMENDATIONS

The study group was small and to assess the KAP status of Health care workers at the national level similar studies in nearby health care centers with a large sample size should be carried out. Workshops related to infection prevention can be arranged and KAP should be assessed afterward to see the impact of workshops' knowledge, attitude, and practice of health care workers.

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Authors Contribution:

[1-4]Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work & Final approval of the version to be published, Drafting the work or revising it critically for important intellectual content;

ORIGINAL ARTICLE

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Comparison Between Effects of Light and Occasional Smoking on Serum Lipid Profile of Young Male Smokers and Non-Smokers

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Abstract

Objective: To observe changes in lipid profile of young male healthy, light and occasional cigarette smokers and compare it with healthy non-smoker males of the same age group.

Methodology: Comparative observational study was conducted in the department of Chemical Pathology at Shaheed Zulfiqar Ali Bhutto Medical University (PIMS), Islamabad for a period of six months i. e. August 2015 to January 2016. A total of Ninety-Eight healthy young males, between the ages of 20-30 years were included in the study. They were divided into two groups of smokers and non-smokers. Lipid profile including Total Cholesterol, High Density Lipid, Low Density Lipids and Triglycerides were measured and compared.

Results: Total Cholesterol amongst smokers and non-smokers show significant difference (p-value<0.05). Other parameters of lipid profile show insignificant association between young male light and occasional smokers and non-smokers.

Conclusion: Light and occasional cigarette smoking brings about a small change in Lipid profile of young healthy males when smoking has been continued for a short duration of time.

Keywords: Coronary Artery Disease, Dyslipidemia, Lipid profile, Non-Smokers, Smokers, Total Cholesterol.

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Introduction

Lipids are organic substances, potentially related to fatty acids. Insoluble in inorganic solvents, these have to be carried in combination with proteins called lipoproteins, compounds containing lipids, and Apo-proteins. These are classified based on their densities on ultra-centrifugal separation. Apo-proteins serve as a transporter for lipids. Lipid profile normally estimated, contains total cholesterol, HDL-C (good Cholesterol), LDL-C (Bad cholesterol) & triglycerides which are the simplest form of lipids. Accumulation of LDL is attributed to contributing to obesity, coronary heart diseases & atherosclerosis whereas increased levels of HDL-C is considered healthy.[1]

Smoking is a major risk factor in its different forms for atherosclerosis, coronary heart disease and cerebrovascular disease. There is a dose response relationship between the number of cigarettes smoked and cardio-cerebro-vascular events. Various mechanisms are found to be involved in lipid profile's alteration e.g. Nicotine stimulates the sympathetic adrenal system leading to increased secretion of catechol amines resulting in an increased lipolysis, hence increased free fatty acids.

Cigarette smoke contains free radicals and further promotes the generation of free radicals, capable of damaging almost all types of biomolecules. Free radicals cause oxidation of LDL and oxidized LDL promotes atherosclerosis and coronary heart diseases.[2] Hyperinsulinemia is found in smokers, this leads to increased lipid profile parameters due to decreased activity of the enzyme lipoprotein lipase, the action of which is to separate lipoprotein from triglyceride and make it available for the cell to be utilized.[3] Amount and duration of smoking also influences dyslipidemia. The rapid reduction in risks of cardiac events after cessation of smoking makes it obvious that reduction in smoking will have large benefits for reducing cardiovascular mortality.[4]

On average, cigarette smoking increases the risk of Coronary heart disease (CHD) by 70% compared with not smoking.[5] Oxidised low-density lipoprotein is taken up by the macrophages and results in the formation of foam cells and therefore aggravates the process of atherosclerosis.[6] Recent studies suggest that long-term cigarette smoking increases the heart rate as well as

blood pressure throughout the day.[7] Cigarette smoking (CS) has effects on coronary blood flow which appears to be catecholamine mediated.[8]

Ambulatory lifestyle has its effects on smokers as it has on non-smokers. Smokers who take more steps per day have a better profile of biomarkers that are related to various outcomes compared to smokers who took fewer steps per day. However, the relationship between objectively measured ambulation, blood pressure, TC, HDL-C, LDL-C, LDL particle number and size, TG, C-reactive protein (CRP) are observed and the health outcomes observed in smokers are similar to those observed in non-smokers.[9] Smoking abstinence has its positive impacts on human health. During the initial stages of smoking abstinence, insulin resistance increases and insulin sensitivity decreases due to elevated body weight and fat composition.[10] It is important to educate individuals to stop smoking and about the necessity of weight control during smoking cessation programs.[11]

Methodology

The study was conducted in the Department of Chemical Pathology at Shaheed Zulfiqar Ali Bhutto Medical University (PIMS), Islamabad from August 2015 to January 2016. After getting approved from the ethical committee sample collection was started. Participants of the research were informed about the whole procedure and their consent was taken.

Participants' enrolment was done through proformas and after taking complete history & performing general physical examination, phlebotomy was performed ensuring all aseptic measures. 3 millilitres of blood sample were collected in vacutainer with gel as a serum separator (Greiner bio-one, Germany). The sample size has been calculated using WHO calculator[12]. The sample size was 98 healthy individuals.

Inclusion Criteria: Young healthy male (age ranging between 20 to 30 years) who are light or occasional smokers, consuming between 5-15 cigarettes/day for the last 06 months & young healthy non-smoker males.

Exclusion criteria: Young healthy male (age ranging between 20 to 30 years) cigarette smokers consuming more than 15 cigarettes/day for the last 06 months or more & young un-healthy, male non-smokers.

Analysis of the said parameters was carried on the fully automated Chemistry Analyzer Modular-P-800 (Roche, Germany) and Modular E-170 (Roche, Germany) as per manufacturer's instructions. Reagent kits were provided by Cobas Roche Diagnostics Manheim, Germany.[13]

For TC, Cat. No. 11491458 216 was used.

For HDL, Cat. No. 04713257 190 was used.

For TG, Cat. No. 11730711 216 was used.

Total Cholesterol analysed by enzymatic calorimetric test, determined enzymatically using cholesterol esterase and cholesterol oxidase.[14]

HDL Cholesterol analysed by enzymatic calorimetric method.[15]

LDL Cholesterol calculated by Friedewald's formula.[16]

[LDL-C] = [TC] - [HDL-C] - [TG]/5

Triglycerides were analysed by enzymatic calorimetric test.[17]

Data analysis done by using Statistical Package for Social Sciences Software (SPSS Version 21). Categorical Variables i.e., Gender analysed as frequency and percentages. Continuous numerical variables i.e., Age, height, weight was measured as mean, standard deviation (SD), and ranges. The proportion of deranged lipid profile was compared between smokers and non-smoker population using Pearson's chi-square ($\chi 2$) test or Fisher's exact test (Where an expected test count was less than 5) for categorical variables and unpaired Student T-test for continuous variables. p-Value < 0.05 was considered significant and all of the p-values have 2 sides.

QC Materials: Human serum with chemical additives and materials of biological origin (human) in lyophilized form were used for all the three parameters i.e., TC, HDL-C and TG.

QC Procedures: Internal QC and College of American Pathologists (CAP) proficiency testing were used.

Results

A total of 98 male participants took part in the study, out of which 49 healthy male smokers were incorporated in one group while the rest of 49 males were incorporated in the other group of healthy non-smokers.

Table 1 shows the values of the lipid profile in smokers and non-smokers. Minimum values of Total cholesterol, HDL, LDL, and TG have come out to be 100, 20, 16, and 38 while the maximum values for TC, HDL, LDL, and TG are 232, 60, 151, and 345, with a mean of 163.43, 39.94, 92.80 and 146.78, respectively in smokers' group. Whereas, Minimum TC, HDL, LDL, and TG for non-smokers were found to be 91, 27, 39, and 41 and maximum values as 194, 60, 119, and 351 with a mean of each as 141.27, 39.55, 78.53, and 127.59, respectively in Non-smokers.

Table 2 shows p-value of 0.001 i.e a significant association between smoking and raised Total

cholesterol (TC) values amongst smokers. 7 out of 49 smokers showed raised TC while none of the non-smokers had higher TC values.

Table 3 shows a p-value of 0.33, so the difference between the two coefficients of smokers and non-smokers is not significant.

Table 4 shows p-value of 0.06 which describes no significant difference between the coefficients of smokers and non-smokers.

Table 1: Values of TC, HDL, LDL & TG in Smokers & Non-smokers

Group	PM	Total (N)	Minimum	Maximum	Mean	SD	CV%
Smokers	**TC**	49	100	232	163.43	±31.63	19.35
	HDL	49	20	60	39.94	±9.67	10.33
	LDL	49	16	151	92.80	±29.62	31.90
	TG	49	38	345	146.78	±63.65	43.36
	Valid (N)	49					
Non-smokers	**TC**	49	91	194	141.27	±28.10	19.89
	HDL	49	27	60	39.55	±8.02	20.27
	LDL	49	39	119	78.53	±21.51	27.39
	TG	49	41	351	127.59	±70.21	55.02
	Valid (N)	49					

Note: PM=Parameter, N=Total number, SD=Standard Deviation, CV%=Coefficient of variation

In case of TG-Status, as is shown in Table 5 by the p-value of 0.38, no significant difference observed between the two coefficients of smokers and non-smokers.

Table 2: Comparison between TC amongst smokers and non-smokers

TC Status	Smokers	Non-smokers	Total	p-Value
Increased	07	0	07	
Normal	30	23	53	0.001
Decreased	12	26	38	
Total	39	49	98	

Note: p-value = Significant (S) i.e., p-value<0.05

Table 3: Comparison between HDL amongst smokers and non-smokers

HDL-Status	Smokers	Non-smokers	Total	p-Value
Normal	42	45	87	
Decreased	07	04	11	0.33
Total	49	49	98	

Note: p-value = Not significant (NS) i.e., p-value > 0.05

Table 4: Comparison between LDL amongst smokers and non-smokers

LDL-Status	Smokers	Non-smokers	Total	p-Value
Normal	26	17	43	
Decreased	23	32	55	0.06
Total	49	49	98	

Note: p-value = Not significant (NS) i.e., p-value>0.05

Table 5: Comparison between TG amongst smokers and non-smokers

TG-Status	Smokers	Non-smokers	Total	p-Value
Increased	08	08	16	
Normal	40	37	77	0.38
Decreased	01	04	05	
Total	49	49	98	

Note: p-value = Not significant (NS) i.e., p-value>0.05

Discussion

According to the Pakistan national Health Policy Draft 2009, more than 40% of Males in Pakistan are smokers.[18] Consumption of cigarettes in Pakistan was estimated as 90,000,000,000 cigarettes in 2005.[19] Current study evaluates the effects of short-term cigarette smoking in young male otherwise healthy light and occasional smokers and non-smokers. In past, studies have been carried out in this regard. In a study conducted by Waqar A[20] on 100 individuals, significant associations amongst smokers and non-smokers were observed in TC, HDL, LDL, and TG levels. In chronic smokers, irrespective of the number of cigarettes smoked, HDL level is significantly low, while the serum levels of TC, VLDL, LDL, and TG are significantly increased in the individuals smoking 11-20 cigarettes/day compared to the ones smoking 1-10 cigarettes/day thereby increasing the risk of CVD.[21]

The ones smoking more than 15 cigarettes per day showed rise in all the components of lipid profile. The incidence of CAD is seen to be directly related to the number of cigarettes smoked.[22] In another study carried out in China[23], no significant difference was seen amongst smokers and non-smokers in their lipid profile and cigarette smoking habits were not found to be linked with the development of dyslipidemia. In the current study carried out on 98 subjects, split into two groups i.e., smokers and non-smokers, each group comprising of 49 individuals, TC shows a significant increase in smokers compared to Non-smokers as shown in tables above (Table 2). P<0.01 is seen in the student T-test applied for TC which is highly significant. These findings are following the studies performed in the past.[20-22,24] All of these studies were carried out on young males but the age limit was not defined except in a few of them. None of these studies had women participants as in the current study. It was also seen that HDL, which is considered to be 'Good Cholesterol', was found to be in the normal range amongst 45 of the non-smokers compared to the smokers whereas the total number of smokers is higher in whom it is found to be reduced compared to Non-smokers.

Majos D[25], showed no change in TG levels amongst smokers. Our findings for HDL, LDL, and TG are following the findings of the study carried out by Zhang Y L,[22] where no significant association was observed between smoking and raised HDL, LDL, and TG levels. The current study included young males between the age

of 20-30 years who either have not been constant smokers or had just been smoking for 6 months. All the studies carried out in the past had their subjects smoking for a longer duration of time or were of age greater than 30 years.

The findings for Total Cholesterol (TC) in the present study are quite similar to the results of Guedes,[26] who found increasing levels of TC in smokers. Our study shows that smoking does bring about an increase in TC values even when carried out for a shorter period or the dose is reduced as shown in our findings. Our findings for TG i.e. p-value 0.38 (insignificant) are quite similar to the findings of a study carried out in Japan on young male smokers, where no significant changes were observed between smoking and TG levels.[27]

STUDY LIMITATIONS

Though it has been tried in the study to genuinely cover some of the aspects of the relationship between smoking and lipid profile it had certain limitations to mention. Only males were incorporated in the study no woman took part. Geographical distribution was common, no individual outside the capital territory took part. No ethnicity was considered while sampling and no genetic factors were studied. Lipid peroxidation products were not studied which could have shown more conclusive findings. The study would have been more generalized, had it been able to overcome these shortcomings. Moreover, the information provided was subjected to personal/individual variance.

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Conclusion

Light and occasional cigarette smoking bring about a small change in the Lipid profile of young healthy males when smoking has been continued for a short duration of time.

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Authors Contribution:

[1-4]Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work & Final approval of the version to be published, Drafting the work or revising it critically for important intellectual content;

ORIGINAL ARTICLE

OPEN ACCESS

Problem Based Learning: Comparison of Effectiveness of Resident Tutors and Experienced Faculty to Conduct PBL Sessions

About the Author(s)

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Abstract

Background: In most of the institutions for modern medical education system tutor to student ratio is low and all sessions of PBL tutorials cannot be covered by faculty solely as the workload is very high. To combat this limitation, inexperienced faculty like students and residents have been chosen as tutors. Researchers have described that undergraduate medical teaching also improves the learning of residents as it is a bidirectional process.

Objective: The objective of this study was to monitor the effectiveness of using resident students as facilitators in PBL sessions.

Methodology: A quantitative study was performed at Islamic International medical college Rawalpindi from January 2017 to June 2017. All the medical students of 2nd year were included through convenience. A total of 100 students were divided into 10 groups. All the groups were exposed to both expert faculty tutors and resident tutors. At the end of each session of every PBL, students evaluated their tutor's performance on a closed ended questionnaire having the qualities of a good facilitator, categorize according to Likert's scale ranging from strongly agree 5 to strongly disagree1.

Results: Timing of the session and regarding how both the tutors groups keep the student group on the tract, it was found that both residents and faculty keeps the students on tract equally good. Students feel more comfortable with resident tutors than faculty. There is no significant difference in providing feedback to the students.

Conclusion: The impact of resident tutoring on student performance in tutorials, group dynamics, time management, provision of comfort and feedback is positive. Resident tutors can be used to conduct PBL sessions.

Key Word: PBL, problem based learning, resident tutors, expert faculty tutors

Conflict of Interest: None **Funding Source**: None

Introduction

In Problem Based Learning (PBL) the students first come across a problem, followed by a student-centered inquiry process.[1] Newfield and Barrows, Norman and Schmidt emphasized that Problem-based learning is designed to evoke clinical reasoning skills among students. Clinical reasoning skills include acquisition, integration, application of knowledge, and evaluation.[2] McMaster University was first in the queue to adopt the PBL based curriculum in 1969. Over the next 20 years, 50 medical schools had acquired the PBL based curriculum.[3] Barrows and colleagues described in a better way than PBL based curriculum was being more enlightening for medical students to learn clinical problems in small groups and develop more relevant critical thinking skills. This methodology got widespread and gained positive acceptance and finally recognition by the Association of Medical Colleges and the World Federation of Medical Education.[4, 5.]

Many types of PBL have been developed during the past fifty years but it's core elements have always been the same.[5] In PBL the students first face the problem without any advance readings. PBL deals with a major change in the way teachers dominating teaching methodology, the 'knowledgeable' teachers are no more dominating in learning, and in this system students and teachers become equal partners. In PBL the teacher starts asking questions and stops lecturing.[6] Teachers not only promote critical thinking but also evoke self-directed learning. He also promotes teamwork, monitor progress and generates a productive learning environment.[7]

Barrows and Tamblyn in 1980 and Maudsley in 1999 described that the quality of tutoring is one of the key factor for a successful PBL session.[8] However students' perception for the qualities of the tutoring and the effectiveness of a tutor is of extreme importance. Tutoring has two components: facilitation skill and content knowledge. Students think that qualified tutors

are the mainstay to conduct PBL. In contrast medical educationist consider that the facilitation skills of tutors is the main strength.[9] Tutors play a vital role in conducting PBL and his role facilitate the students in achieving their learning objectives. The qualities of effective tutoring include group dynamics, awareness of students' learning strategies, provision of appropriate and timely feedback, tutors' communication and interpersonal skills. It is also believed that the tutor's communication skills and expertise has significant effects on outcomes of problem based learning. The content expert tutors usually interfere in students' discussion and suggests them solutions for their issues. On the other hand focus of process expert tutors is to continue the discussion with minimal interference in the discussion and he also encourages the students to think a solution and apply their problem solving skills with clinical reasoning.[10]

In some countries such as Europe or Asia tutor to student ratio is low and all sessions of PBL tutorials cannot be covered by faculty solely as the workload would very high.[11] To combat this limitation, inexperienced faculty and sometimes even senior students and residents have been chosen as tutors. Several trials have started in many medical schools even in developed countries using residents as PBL tutors. In a survey in the United States showed that just 20% of residency programs had included the teaching skills in their training programs, despite the reality that residents are imparting 62% role in indoor teaching of medical students.[12.] Researchers have described that undergraduate medical teaching also improves the learning of residents as it is a bidirectional process. It is globally accepted that on completion of the training, the residents becomes specialist and are expected to share the teaching responsibilities for both the medical students and the residents in their own institutions. Therefore it is not surprising that there is a sheer need of a training program for the residents and acknowledgment of the residents' role as a teacher in medical schools.[13].

Our medical school has adopted a PBL based curriculum for the last eight years. We are also short of faculty as compare to number of students. Faculty members are over burdened due to increase demands in the patient care and their administrative duties. To address this problem, the residents from all departments were selected to conduct small group PBL sessions. This activity would develop teaching and facilitation skills among residents who are the future faculty. It would partially cover the shortage of faculty for such assignments. Research in medical education shows that residents play an important role in medical teaching. Residents are the role model as teachers and team leaders for the junior residents and medical students. Both nationally and internationally residency programs do not provide formal training in teaching and leadership skills. Residents would have better teaching and facilitation skill if they got some training in teaching skills.[14]

The objective of our study is to compare the effectiveness of resident tutors and experienced faculty in conduction of PBL session in undergraduate medical education.

Methodology

This quantitative cross sectional action study was performed at department of Islamic International medical college from January 2017 to June 2017 with the approval of the college's Institutional Review Board. All the medical students of 2nd year were included through convenience sampling and consent was taken to participate in the study. During the research period, eight PBL case scenarios with two sessions each were carried out with 2nd year medical students. Total of 100 students of 2nd year were divided into 10 groups ranging from groups A to J. Each group had 10 students. Resident student tutors of different specialties had facilitated half of the groups and experienced faculty tutors had facilitated the other half groups for case scenario 2. Both the tutors were rotated among the groups.

At the end of each session of every PBL, students evaluated their tutor's performance on a closed ended questionnaire having the qualities of good facilitator, categorizes according to Likert's scale ranging from strongly agree 5 to strongly disagree 1. Students completed their proformas and send them to Student Affairs department. Reassurance was given to them that their evaluation proformas would not be shared with the tutors and would not affect their academic results. The response rate will be calculated as well.

The sampling strategy was non probable convenience sampling. Total of 100 medical students of 2nd year have participated. These were divided into 10 groups each group contains 10 students ranging from groups A to J.

Data was collected on a close ended Questionnaire. The questionnaire pertained with four main qualities of good facilitator including timing of the sessions, kept the group on tract, comfort with the facilitator and provision of feedback. The questionnaire had been

designed according to Likert scale ranging from strongly agree 5 to strongly disagree 1. The reliability of the questionnaire was calculated by cronbach's alpha showing 0.986 and validity is assessed by running ANOVA showing correlation of 0.36 showing significant validity. Now this can be used in large-scale study.

The questionnaire scores were put into SPSS 11. Data were presented as means SD of each variable. The differences between faculty led tutorials and resident-led tutorials of each parameter were analyzed using the independent samples t-test. The degree of correlation between students' scores given to faculty and residents were tested using Pearson correlation. A p-value less than 0.05 was considered statistically significant.

Results

Statistical analysis is done by applying correlation, t test and to assess the significance of the difference. The timing of the session depicts that there is no significant difference between resident student-lead tutorship and faculty led tutorship as the P value in the case is 0.10 which is greater than 0.05. It means that performance of student resident tutors and faculty tutors has no significant differences in term of their performance in problem based tutorials. Regarding how both the tutors kept the group on tract has P value of 0.12 which is again greater than 0.05, it means both the students and faculty keeps the students on tract equally good. Students feel more comfortable with resident tutors facilitator than the senior faculty as P value, in this case, is 0.04 which is less than 0.05. There is no significant difference in providing the feedback to the students because the P value is 0.05 which is the same as its normal value. (Table 1)

Discussion

In PBL, there is no advance readings, lectures and preparation. Usually, five to ten students work collaboratively under the supervision of their facilitator, to understand problems, identify outcome, develop hypotheses, and explore existing knowledge. Key component of PBL is to formulate the questions that have to be work out and find answers through self-directed learning. Problem based learning requires a major change in the way teacher deals with the students, as the students and teachers are equal partners in this learning process.[15,16,17]

In our study performance of resident tutors and faculty, tutors has no significant differences in term of their performance in problem based tutorials. This is similar with various studies. Steele et al. (2000), also found that there were no differences between expert faculty tutors and junior/resident tutors about the knowledge based examination or group process work. Some studies tended to give junior tutors slightly higher evaluations than faculty tutors regardless of the latter's specialty and have given considerable important reasons to explain why this imbalance may have been observed.[18,19]

Regarding how both the tutors kept the group on tract our study showed both the residents and faculty kept the students on tract equally good. This was because that resident tutors had exposure to the PBL sessions during their studentship and they were having the full concept and orientation regarding PBL. However there are number of studies having different results.[11,20] They have valuable arguments for the role of expert tutors in conduction of PBL. Some have shown positive relationship for expert tutors to promote positive learning outcomes upon the basis of their knowledge, experience and specialty. Some have found both groups equally good and some have found even resident tutors are better as compared to expert faculty. According to them junior tutors might be good in creating an environment more suitable for group discussions and might be good facilitator for students because as students they themselves had recently experienced the same PBL sessions as they are conducting now and are more empathic and have more consideration for students. [18] Michael Grover came up with the idea that both content knowledge and process-facilitation skills both are necessary but not individually sufficient for effective tutorials.[10,21,22] Appropriate tutoring techniques and management of group dynamics and self-learning are different than the learning outcome of PBL and the students' maturity.[23]

In our study students feel more comfortable with resident tutors facilitator than the senior faculty which is consistent with most of the studies. In one study, De Grave et al. suggested that resident tutors might be better in understanding the student's problems, assessing their previous knowledge, and might be better in explaining the concepts using a language and examples that students might understand better as compared to the faculty tutors.[9,24,25] In another study, Steele et al. observed that resident-tutor-led groups might be able to take shortcuts in the learning process. Similarly, Matthes et al. also reported that self-learning time of the students also tended to be shorter in such groups.

Both the groups are equally good in providing the feedback in our study which is consistent with most of

Table:1 Comparison of students' evaluation of the tutoring skills of tutors in resident -led tutorials (RLT) and faculty-led tutorials (FLT).

Quality of Fascilitator	Score	P value
Timing of the session		
a. Resident student led tutorial	4.37+0.90	0.10
b. Faculty led tutorial	4.28+0.92	
Keep the group on tract		
a. Resident student led tutorial	4.41+0.61	0.12
b. Faculty led tutorial	4.28+0.69	
Comfort with the facilitator		
Resident student led tutorial	4.50+0.68	0.04
b. Faculty led tutorial	4.06+0.95	
Feedback		
Resident student led tutorial	4.01+0.52	0.05
b. Faculty led tutorial	4.32+0.87	
$p < 0.05$ is considered statistically significant.		

the studies. Some researchers have also concluded that resident tutors would be more effective if they have given some training to improve their teaching skills especially in those institutions facing a shortage in expert faculty.[18,26,27]

Conclusion

Our study concludes that the impact of resident tutoring on student performance in tutorials, group dynamics, time management, provision of comfort and feedback is positive. Resident tutors can be used to conduct PBL sessions however proper training of residents to improve teaching skills would be more effective in institutions facing shortage of expert faculty. This practice will definitely improve the knowledge of residents and promote their teaching skills as they are forthcoming teachers.

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ORIGINAL ARTICLE

OPEN ACCESS

Prevalence of Congenital Anomalies and Its Association with Consanguinity in Pakistan

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Abstract

Objectives: The Prevalence of congenital anomalies its significant relationship between consanguineous marriages and birth of anomalous neonates and find out the type of congenital anomalies prevalent in neonates from consanguineous marriages.

Methodology: This is a case control study. Duration of Study was six months, from October 2013 to May 2014. The study was conducted in two hospitals, Maternal and Child Healthcare Center (MCH) located at PIMS (Pakistan Institute of Medical Sciences, Islamabad).and Family Medical Complex, Islamabad. It is a private clinic located in sector E 11 and has a large local catchment area. It is well equipped for primary maternal and neonatal care.

Various congenital anomalies in Pakistani neonates were studied for their prevalence and relationship to consanguinity. One hundred consecutive anomalous infants were compared with hundred consecutive normal infants for the presence of consanguineous marriages among their parents, in two local hospitals in Islamabad.

Results: The prevalence of congenital anomalies was found to be 4.69 percent which is similar to most third world countries but higher than most developed countries in the world. Most prevalent congenital anomalies in the region were musculoskeletal and neural tube defects comprising 46%. Among the anomaly group consanguineous marriages were 63 (63%) which was statistically significant compared to normal neonates' parents i.e. (33 = 33%) ($p = 0.024$).

Conclusion: Consanguineous marriages were found to be significantly related to musculoskeletal defects, kidney/urinary tract defects, cardiovascular anomalies, cleft lip and palate anomalies.

Key Words: Congenital anomalies, Prevalence of congenital anomalies, Consanguinity

Conflict of Interest: None **Funding Source**: None

Introduction

A birth defect is defined as an abnormality of structure and/or function that is present at birth and when severe, it can either be fatal or result in physical or mental disability. For centuries, birth defects were seen as warnings or divine omens and children with birth defects were often confused with mythological beings. Interest in affected children who were referred to as "monsters," can be traced back to ancient Egypt. Later these so called "monsters" became collector's items. Most museums of pathology collected them as an interesting specimen and the majority still possess a collection of them, although recently this has come to be regarded as unethical and inappropriate. The Carnegie Collection, the Blechschmidt Collection, the Hinrichsen Collection and the Kyoto Collection are reported as the four famous compendiums of human embryos in the world.[1]

Birth defect can involve a single or multiple body parts. If a single cause is responsible for many defects, the condition is known as a 'Syndrome'. So far more than 7,000 different birth defects have been identified.[2] Depending upon the severity, these developmental anomalies can be divided into two main categories:

1. Major anomaly: if the developmental defect causes stillbirth or infant death in more than 50% of cases or if without medical intervention the congenital anomaly causes disability.

2. Minor anomaly: if the congenital abnormality requires medical intervention but life expectancy is good.

Major congenital abnormalities are one of the leading causes of infant mortality in different ethnic/minority groups even in developed countries[2]. The causation of congenital anomalies is complex and often multifactorial including consanguineous marriages, chromosomal

abnormalities, viruses[3,4], bacteria, parasites, drugs[5], toxins, hormones[6], exposure to radiation[7] and intra uterine mechanical problems.

The basis of CM is genetic (30-40%) and environmental (5 to 10%). Among the genetic etiology, chromosomal abnormality constitutes 6%, single gene disorders 25% and multifactorial 20-30%; however, for nearly 50% of CM, the cause is yet to be known.[8]

Consanguineous marriages have been described as an important factor contributing to increased congenital malformations. Marriage is called consanguineous by the degree of relatedness between the spouses: first cousins, first cousins in two generations, half first cousins, second cousins and third cousins. Genetic effects of consanguinity are because such an individual may carry two copies of a gene that was present as a single copy in the common ancestor of the parents. A recessive gene may thus come to light for the first time in this descendant after having remained hidden for generations.

The survival rates for the most severe anomalies, such as trisomies 13 and 18, anencephaly, grade four meningomyeloceles and severe congenital heart defects, are nil by the child's first birthday.[9]

Although less severe birth defects are often surgically correctable, the economic and emotional drain on the family and society cannot be overlooked. Families and health care providers are often left wondering over questions regarding the causes, preventive measures and risk of recurrence.[10,11]

Congenital anomalies contribute a significant proportion of infant morbidity and mortality, as well as neonatal mortality in Pakistan. Due to lack of countrywide surveillance data on birth defects and their causes, the exact percentage of each defect and its possible causal factors is not known[11]. It is important to have basic epidemiological information on congenital anomalies since it can give clues to some important preventable causes like consanguineous marriages. The present study is an effort to discover the cause and effect relationship between consanguineous marriages and the prevalence of congenital anomalies among the neonate births attending two hospitals in Islamabad.

Methodology

Current study is a case control study on the prevalence of congenital anomalies and their relationship with consanguineous marriages, in Pakistani neonates. Consanguinity was checked among 100 anomalous and 100 normal neonates. Marriage was considered Consanguineous if the husband and wife were first/second cousins or parents' first cousin. A total of 2131 neonates were born in these two hospitals, during the study period. They were all examined for the presence or absence of congenital anomalies.

Inclusion and Exclusion Criteria: All neonates with visible congenital anomalies were selected. Neonates were not checked for metabolic disorders because these disorders manifest later in life.

First one hundred normal born neonates were selected for comparison of consanguinity among their parents.

The duration of Study was six months, from October 2013 to May 2014. The study was conducted in two hospitals, Maternal and Child Healthcare Center (MCH) located at PIMS (Pakistan Institute of Medical Sciences, Islamabad). This center is equipped with advanced medical technology. It receives a large number of patients from Rawalpindi, Islamabad, Bhara Kahu, Malpur, Kahuta, Chakwal, Murree, Taxila, Wah Cantt., Azad Jammu and Kashmir and many other adjoining suburban populations and Family Medical Complex, Islamabad. It is a private clinic located in sector E 11 and has a large local catchment area. It is well equipped for primary maternal and neonatal care.

Data was collected on pre-designed proformas, by the doctors attending the case. Before the start of the study, permission was obtained by the ethical review board of PIMS and the director of Family Medical Complex, Islamabad. Parents' consent was obtained on the proformas, for the inclusion of the photographs in the study.

Results

A total number of births during the study period was 2131, out of which there were 100 neonates with various anomalies (4.69%) and prevalence was =46.9 cases per 1000 births. For comparison of consanguinity, the first 100 normal neonates during the study period were selected. Musculoskeletal anomalies were the most prevalent i.e., 27 cases (27%), followed by neural tube defects 19 cases (19%). Urinary system anomalies comprised 12 cases (12%), gastrointestinal and abdominal wall anomalies, 10 cases (10%) and facial clefts, 10 cases (10%). Cardiovascular defects, 4 cases (4%). There were 3 neonates (3%) each with Down syndrome and Intrauterine growth retardation, 2 each (2%) for eye and ear defects and sexual ambiguity. Single cases of anomalies not falling in any of the above categories were grouped as miscellaneous, 6 cases (6%) (Harlequin baby, CDH with talipes, cleft lip and palate, Microcephaly, pulmonary agenesis & visceromegaly, cystic hygroma, hare lip, nasal deformity & polydactyly in all limbs, sinus in lumbosacral region) Table 1.

Among the parents of anomalous neonates, consanguineous marriages were observed in 63 (63%). Among normal neonates' parents, consanguinity was significantly lower (33 = 33%) ($p = 0.024$) (Fig. 1). Consanguinity was significantly related to musculoskeletal defects, cardiovascular anomalies, orofacial clefts, kidney/urinary tract defects, intrauterine growth retardation and miscellaneous anomalies (Fig. 2).

Table 1: Prevalence of various congenital anomalies among neonates in Northern Pakistan

Types of anomalies	No	%	Proportion	Percentage of anomaly out of total births (2131)	Prevalence per 1000 births
Musculoskeletal defects	27	27.0	0.27	1.26	12.6
Neural tube defect	19	19.0	0.19	0.88	8.8
Kidney/urinary tract defects	12	12.0	0.12	0.55	5.5
GIT, Resp. & abdominal wall defects	10	10.0	0.1	0.47	4.7
Cleft lip/palate	10	10.0	0.01	0.47	4.7
Cardiovascular defect	4	4.0	0.04	0.2	2.0
Small for dates	3	3.0	0.03	0.14	1.4
Down syndrome	3	3.0	0.03	0.14	1.4
Eye defects	2	2.0	0.02	0.1	1.0
Ear defects	2	2.0	0.02	0.1	1.0
Sexual ambiguity	2	2.0	0.02	0.1	1.0
Miscellaneous anomalies	6	6.0	0.06	0.28	2.8
Total	100	100.0	1	4.69	46.9

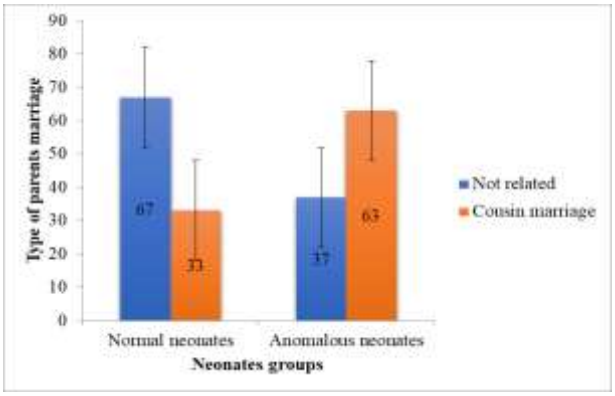

Figure 1: Frequency of parents' consanguineous marriages in anomalous and normal groups

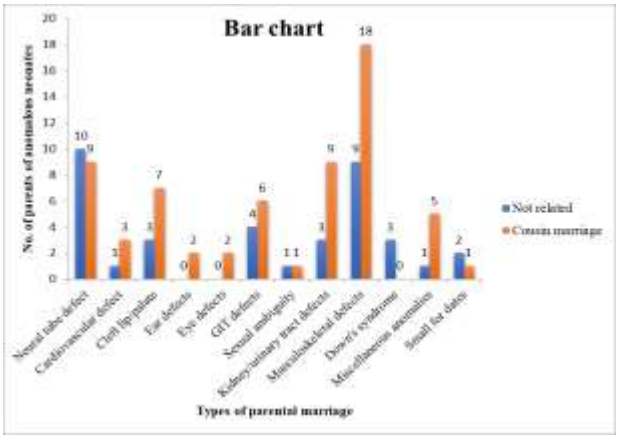

Figure 2: Frequencies of various anomalies in consanguineous and non-consanguineous marriages

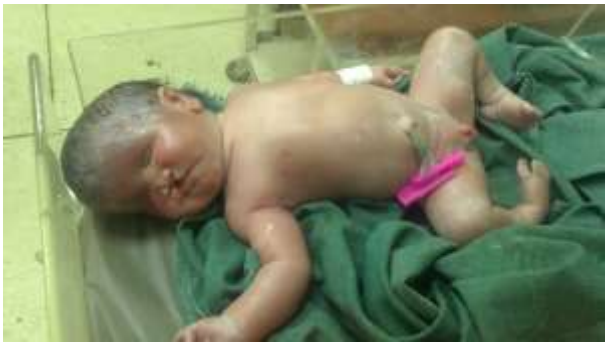

Figure 3: Photograph of a neonate with hare lip, cleft palate, CDH and bilateral talipes

Figure 4: Photograph of a neonate with sirenomelia

Figure 5: Photograph of a neonate with congenital icthyosis (Harlequin Fetus)

Discussion

Out of 450 million disabled persons in the world, 80% are living in the developing world including Pakistan which has around 4 million disabled children[12,13]. Being a developing country, a woman of child bearing age are exposed to disease, nutritional deficiencies and lack of maternal and child care services[13], causing 'Developmental Anatomy to misbehave'. Consanguineous marriages have been incriminated as one of the leading, genetically related cause of congenital defects worldwide. Every year, an estimated 7.9 million children, which constitutes six percent of total births worldwide, are born with a serious birth defect of genetic or partially genetic origin. Data shows that worldwide, at least 3.3 million children under five years of age die from birth defects each year and an estimated 3.2 million of those who survive, may suffer with a lifelong disability.[10] Although birth defects are a global problem, the brunt is particularly born by middle and low-income countries of third world, where more than 95 percent of children with serious birth defects do not survive. This may be partially due to the much higher absolute number of births, but the sharp differences in maternal health and a greater frequency of consanguineous marriages in these countries plays their role. Culturally there is high proportion of consanguineous marriages in Pakistan and surrounding countries, which predisposes to congenitally acquired birth defects.[11,14] Evidence based awareness about the potential threat posed by cousin marriage is particularly lacking among low and middle class income groups.

In Pakistan, infant mortality rate (IMR) has dropped from 82.49 to 62.7/1000 births during 2000 to 2007 but the current IMR is still higher than surrounding countries10 (50/1000 in India[15] and 41.1/1000 in Iran.[16] The essential principles for determining a cause and effect relationship between a causative factor and congenital anomalies are; an assessment of the strength of association and consistency of the findings with other studies.[17]

The prevalence rate of 46.9 birth defects per 1000 births in our study is comparable to another study conducted in Abbottabad[18] (42.3/1000), and other regional studies conducted in India[19] (43.2/1000), and Iran[20], (41.8/1000). Prevalence rates in other neighboring countries namely Saudi Arabia[21] (32.9/1000) and Turkey[22] (37.6/1000) are lower. Keeping in mind their better socioeconomic conditions, this is an expected finding. Prevalence rates in these two countries are just a little higher than in Europe (30.5/1000 births[23] and USA (22.8/1000 births.[24] Unlike most developed countries, surprisingly, the highest prevalence is quoted by an Australian study (47.3/100 births.[25]

A study conducted by the Pakistan Institute of Development Economics, (PIDE)109 (1992) shows that 61.2% of marriages in Pakistan among uneducated and less educated families are consanguineous, mostly first cousins. Pakistan Demographic Health Survey (PDHS) also concludes that Pakistan has one of the highest rates of consanguineous marriages throughout the world[11]. Rate of Consanguineous marriages in India varies between 20-60% in various regions.[26] North Africa also has a high rate of Consanguineous marriages (20 to over 50%).[27] As a result of consanguineous marriages, a recessive gene, acquired from the common ancestor becomes active due to its presence in both parents. Thus, consanguineous marriages have been described as an important factor contributing to increased congenital malformations like musculoskeletal defects, neural tube defects, orofacial clefts, eye and ear anomalies, urinary tract anomalies, and chromosomal defects.[28,20]

Our study also shows a significant correlation between above mentioned anomalies and consanguinity. Lack of education and ignorance about the side effects of consanguinity are the main reasons. A study conducted by Jaber and Romano et al. on Israeli Arabs concludes the same.[29]

Recommendations Based on Discussion

Health authorities should arrange National level campaigns to educate women of child bearing age regarding the hazardous outcomes of consanguineous marriages, especially for more than one generation in a row, in order to reduce the prevalence of congenital anomalies.

Health authorities should improve the facilities for early anomaly scanning of all pregnant females with options for termination of pregnancy in case of early detection of severe anomalies which are incompatible with life.

There should be larger studies on the prevalence and causes of individual birth anomalies in order to develop program for their prevention.

Conclusion

Prevalence of congenital anomalies in Pakistan is similar to surrounding regions.

Most prevalent congenital anomalies in Consanguineous marriages are musculoskeletal defects, kidney/urinary

tract defects, cardiovascular anomalies, cleft lip and palate anomalies.

Congenital anomalies in Pakistan are significantly related to consanguinity which is technically a preventable cause through effective media campaign.

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Authors Contribution:

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REVIEW ARTICLE

OPEN ACCESS

Review of Online Assessments During Covid Pandemic "Linking Evidence and Experience"

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Abstract

Online learning or remote teaching, before COVID pandemic, restricted to the periphery of higher education has emerged as a central component of institutional strategies due to COVID 19. Along with teaching, there is a need for a valid and reliable online assessment to measure the desired learning outcomes delivered by remote teaching. The need of this narrative review is to compile the strategies, guidelines, and suggestions of different universities, governments, and global organizations to maintain smooth learning in this emergency thus minimizing long term socioeconomic impact. Different search engines are used for extracting information from authentic sites. This review will guide the institutions in innovating the assessments in Post COVID era to build improved systems for accelerated and meaningful learning especially as the students, globally, have developed a familiarity with online learning.

Keywords: Online assessments, Remote learning; Technology advance assessment, COVID 19.

Conflict of Interest: None

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Introduction

The latest pandemic of Coronavirus (COVID-19) having high morbidity and mortality rates has affected the academic functioning worldwide. Potent pathogenicity and transmissibility of SARS-CoV-2 lead to the lockdown of educational institutes. There was an abrupt transition to online teaching followed by online assessments as the period of disease lingered on. Referring to UNESCO's rapid global analysis report, released in April 1, 58 out of 84 surveyed countries had postponed or rescheduled exams, 23 introduced alternative methods such as online or home-based testing, 22 maintained exams, while in 11 countries, they were cancelled altogether.

Assessment is the measurement of learning, measuring knowledge, skill, and attitude, for establishing the attainment of learning outcomes by the students in any course. They are categorized as low, mid and high stake assessments and also as formative or summative. Formative assessments are *assessments for learning* used for giving feedback and to understand the learning needs of every student. They are meant to customize the learning material accordingly. Summative assessments are *assessments of learning* for making decisions of pass or fail by determining the achievement of expected learning outcomes with the acquisition of appropriate knowledge, skill, and attitude [2] Whatever is the type of assessment it needs to be valid, reliable, acceptable, feasible, and fair. [3]

COVID pandemic has imposed a global experiment in remote learning and assessments which lead to a swarm of literature on online tools, guidelines and measures of imparting education with quality and validity closest to the pre COVID era.

The purpose of this narrative review is to see the culture adopted by different institutes for their upcoming assessments in the current pandemic, to view the tools and formats used for online assessments worldwide, to see the difference between developed and less developed countries in adapting online assessments and the barriers faced while implicating them and sort the steps taken by national Higher Education Commission (HEC) and universities. The collected information will be summarized as guidelines in the end. This review research will help the students and the decision makers of the institutes to plan what works out best for them in the post COVID era.

Methodology

Complying with the PRISMA statement, search engines like Google Scholar, Pub MED, Bing, and Yahoo were used to review literature which included University websites, World organizations websites, Newspaper articles, Government documents, original articles, short communications and blogs. The included literature is restricted to the English language and is evaluated according to the information and statistics they provided to identify patterns and trends so as to synthesize literature, giving a holistic overview of the concerned

topic. Due to the evolving nature of COVID situation, the initial plans and innovations suggested by universities and governments regarding teaching and learning are changing at a fast pace too, so by the time this review is published the above information's might have changed.

After WHO declaration of COVID 19 as a pandemic in March 2020[4], all the educational institutes including schools and higher education institutes (HEI) were closed as a measure to restrict the further spread of disease. Most of the spring breaks were extended globally. Faculty got overloaded in getting acquainted with technical and administrative aspects of online teaching. Remote learning started as early as in one week's time on average.[5] Getting comfortable with online teaching, in May came the challenge of how to assess the learning outcomes online, keeping in view all the five parameters of assessment. Feasibility and equity of assessment were big questions along with how to create, administer, and score the exams. Also, there is no specific tool to measure cheating in online exams and those available have their limitations.

Tools Used for Online Teaching and Assessment

The flourishing innovative technologies and learning management systems provided utilizable solutions for educators and policy makers to optimally utilize the available information technology for covering the course work and assessments during lockdowns. Online platforms such as Zoom, Google Classroom, Moodle, Skype, Blackboard systems became a part of education delivery. Facebook updated its features regularly to facilitate teaching via live streaming. Software like Socrative app, Google Forms, video conferencing via Zoom or Skype are becoming part of assessments with Human proctoring companies proliferating and becoming high in demand in developed countries.[6-9]

Approaches to Assessments Internationally

In Asia, as COVID was detected early, China, Hong Kong and Singapore lead to early implementation of remote learning and assessments before the rest of the world. Planning was quite tiresome as a big university having international students cannot implement a single standardized test to cover a broad range of disciplines. According to news reports of *higher education times* some high stake exams were postponed for one semester while others like GRE and TOFEL, in Asia, were planned to be administered online but the dates were extended. National University of Singapore (NUS) gave students the choice of "pass/fail" options over letter grades.[10]

High stake exam of Hong Kong, required for entering higher education, was initially postponed for a month but then after consultation with parents, students, teachers and medical experts it was launched on campus while observing all the precautions as the director of assessments wanted it to be fair.[1]

Some universities in Hong Kong piloted different ways of online assessments to make them credible. Varied valid assessments were launched with a variety of proctoring online including live and video recording of the student, jamming of student browsers, webcam based invigilation by faculty. However, there was no possible solution sought out for a comprehensive assessment including skill and attitude assessment in online exams. In the latter half of April, Singapore high tech universities launched their online assessments for under and postgraduates after administering a mock test to make the students aware of the method and to recognize any technical problems. The students were guided about the policies in case of misconduct. The integrity of assessment was maintained by uploading short videos of surroundings of assessment venues before the start of the exam, blocking students' browsers; use of webcam for online proctoring by faculty during exam and use of an artificial intelligence algorithm to track their eye movement. Some courses were assessed by assignments only which were checked by plagiarism software.[11]

United Kingdom (UK) Board exams for public qualifications like GCSE, Cambridge exams were halted within the UK and worldwide too. These measures had long reverberations as they are conducted internationally affecting a big cohort of students.[12] The students were assessed on predicted grades sent by schools based on a criteria set by the Boards.

Uganda Ministry of education issued orders to hold the summative exams till the campuses open again while adopting use of formative assessments including self-assessments and home based assessments as a filler for the lost up days in campus. According to the UNESCO webinar report, countries like Beirut having power shortages and inaccessibility to the internet as main issues opted for either condensing the curriculum or extending the academic year.[1]

Institutes mainly concerned with on field and vocational training faced the biggest hurdle in assessing them online. Most of them switched to assessment based on previous performance records of the student's training sessions and school work.[13]

The University of Edinburgh continued its assessments in an adapted form. Mostly the exams were changed to open book take-home exams with extended hours for submission to cater for international students keeping in view different time zones. The duration of MCQ format based assessments were extended by one hour. The deadlines of submission of projects and assignments already scheduled were extended. Summative assessments were based on the concept of "help to hinder" that is on non- detrimental basis, thus not producing a downfall in results. Re-sit exams were cancelled, but replaced by additional assignments in summer to compensate for their deficiency.[14]

Similar replacements of usual on campus exams were seen in universities of Canada.[15] Their web pages

concerned with assessment policies were updated within few weeks of lockdown.

According to the World Bank report[16], most developing countries had found a way to make education available to the majority of their lower and upper secondary schools during COVID by using televisions, radios, and telecommunication companies' support. However, most of them deferred their assessments till the opening of schools. Egypt, claiming provision of remote learning to all their K-12 students, divided their assessment strategies according to the grades, replacing the summative exams for grade 3 to 7 with research projects to be completed on electronic platforms while pilot exams were administered to 9th and 10th class students followed by computer based home exams.

In Indonesia, all national exams were cancelled .The graduation exams for higher education and tertiary education were replaced with aggregate of all five semesters while for lower secondary classes online assignments and tests were preferred. [17]

Assessment Protocol in Pakistan

Higher Education Commission (HEC) Pakistan has been continuously active in guiding the public and private Higher education institutes (HEIs) about the remote learning adaptation, during COVID, starting from March till the current month so as to standardize learning nationally. According to the Quality Assurance report of HEC 84% of HEIs in Pakistan are online ready, based on the data collected from 63% of universities in April. [18]

The guidelines on assessment are very comprehensive and are based on ground reality after giving due importance to the feedback of students about the barriers they are facing during e- learning such as connectivity issues due to non-availability of 3G in certain provinces peripheries; poor streaming and interruptions, inability to recharge internet cards, reloading balance issues. [19]

HEC allowed the universities to form assessment policies of their own according to the guidelines and to make them public by 1st of June 2020. They were guided to replace usual closed book exams with open book format with time frame; skill and attitude to be tested by video conferencing or PowerPoints while giving consideration to connectivity issues and modifying the format where necessary.

In Pakistan, online learning and assessment is facilitated by Google Meet, Moodle, Class Marker, Google forms, Microsoft team, video conferencing by Zoom and Skype. Use of Messengers/ WHATS App for oral exams is also in use. [20]

Shifa Tameer-e-Millat (STMU) university arranged a series of virtual workshops for faculty training, on e-learning and assessment, on Google Meet from March till April. They used Class Marker, an online testing website, for their formative tests along with Google forms. [21]

Pakistan Engineering Council (PEC) updated its existing assessment policy making provisions for both graduating batches and non- graduating batches.[22] Following the guideline of HEC they have introduced different assessment methodologies including assignments, self-assessments, open book take home exams, quizzes, group discussions etc. Final year psychomotor domains are to be assessed by simulation software or video conferencing. For the graduating class capstone projects are designed which are to be assessed by a rubric to help students complete their academic pursuit.

Issues of Academic Integrity

Academic integrity associated with online testing is threatened by undetected cheating. Use of proctoring soft wares has flourished in COVID lockdown in advanced countries; the proctoring is done by either the faculty or by proctoring agencies where their agents invigilate the exam. According to a news report of Times higher education, 54 % of institutions were using online proctoring till April as active or passive surveillance; however, proctoring companies hiring is costly for the institutes; secondly most of the students and even faculty are concerned about the privacy issues associated with them. Students' complaints ranged from technical to emotional concerns and high test anxiety with proctoring.[23]

Suggestions for Online Assessments

While conducting a literature review for this article, a plethora of advice on pedagogical preparedness of university teachers were sighted; however few articles guiding about affective online assessments were found.

A panel of four experts in online teaching thought to use continuous assessment as the main part of grading with main emphasis on self- assessment. Self- assessment can be done by making the students to maintain e-portfolios and writing of self- reflections. Students involvement in asynchronous learning without real-time interaction like recorded presentations, use of discussion boards, blog writings, emails, group assignments followed by collaborative document writing all contribute to continuous assessment but all such activities should be barred by time line and clear instructions should be conveyed to students about the marking scheme.[24]

After the conduction of online exams in most of the countries the question of whether students are gaining what is required of them and can they exhibit the required skills effectively still standby. On the World Bank blog[25], the author suggested using formative assessments as a main mode of assessing the learning outcomes of a desired course. Such assessments will not only help students but will direct planners to direct the learning resources where they are needed to be focused. They can be communicated to students via Google classrooms, Moodle (Learning Management system) through questions, tasks, quizzes. Even making use of messaging platforms like WHATS app or messengers can be used as a venue of formative assessments.

Monitoring an online learning portfolio will make the assessment more reliable and valid. [26]

Conclusion

COVID 19 pandemic has acted as a catalyst to modify the educational strategies world over which can prove beneficial in the unpredictable fragile society. After reviewing the formats for online assessments currently in action globally, we summarize a few guidelines which can help in designing future online courses to be used in routine as an adjunct with conventional assessments to widen the horizon of the students.

Guidelines for Online Assessments

1: Formative and continuous assessment should be a necessary part of every course.
2: Multiple assessments, with different formats, having more weightage than summative exam should be preferred over single format assessments.
3: Asynchronous mode of assessments such as assignments and projects should be promoted to cater for connectivity problems.
4: Quality timely feedback via email or WHATS app messaging or dashboard usage ensures the achievement of desired learning outcomes.
5: Cheating can be overcome by continuous assessment with collaborative projects or by giving quality open book tests.
6: The policies about misconduct during exam should be conveyed to students before exams.
7: Universities should invest more in professional development of their faculty including tech education

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CASE REPORT

OPEN ACCESS

Simultaneous Herpes Simplex and Fungal Infection in Immunocompetent Individual; A Case Report

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Abstract

We report a 22-year-old young man who was diagnosed with fungal esophagitis superimposed on disseminated herpes simplex infection. Previous history had not revealed any risk factors for immune-compromise; however, the progressive changes in his clinical picture and response to treatment helped confirm the diagnosis.

Keywords: Herpes simplex; Fungal infection; Immunocompetence.

Introduction

Herpes Simplex is one of the common viral infections found in our population but rarely does one see a simultaneous infection with a fungus. Usually immune-compromised patients suffer from fungal infections and a small proportion gets co-infected with other pathogens.[1] Post-transplant patients are particularly prone to these kinds of infections, as well as those with Acquired Immune Deficiency Syndrome.[2] We present a case in which an immune-competent patient developed simultaneous herpes Simplex and fungal infections.

Case Presentation

Our patient was a 22 years old young man who presented initially to ENT outpatient department of HBS General Hospital with fever, sore throat, aphthous ulcers, odynophagia and a rash involving his limbs. The patient first experienced a high grade fever 12 days before presentation, which was associated with rigors and chills and partially improved with oral antibiotics. After almost a week of being febrile the patient developed sore throat and odynophagia. He also noticed ulcers involving his lips and cheeks. 3 days before presentation the patient noticed a rash which appeared on all of his limbs but spared his trunk, back, head and neck.

An initial diagnosis of acute tonsillitis was made, the patient was admitted and intravenous penicillin and metronidazole were started. After 48 hours of treatment no improvement was seen in the symptoms of the patient. Medical review of the patient was requested. A detailed review of the patient's history did not reveal any additional complaints apart from headache and myalgias associated with the fever. The patient had a history of depression and was on anti-depressants 3 years back. He was not a smoker but did chew tobacco. He did not have a history of intravenous drug abuse or promiscuous sexual activity.

Detailed examination of the patient was undertaken. He was lying in bed with a toxic look and was febrile at 102 F and tachycardia at 110 beats/minute. He had crusted vesicular eruptions on lower lips and corners of mouth with whitish oral ulcers involving the upper, lower lips, buccal mucosa and gums. His throat was congested and tonsils were enlarged. There was a maculopapular rash involving the forearms, hands, calves and feet which was itchy. This rash did not involve the trunk, back, neck and head. No other significant findings were observed on detailed general and systemic examination. The patient had leukocytosis of 14.9 /mm^3 with neutrophilia and hemoglobin of 13.4 g/dL. Liver and renal functions of the patient were normal. Viral Serology of the patient was negative for hepatitis B, C and HIV. Chest radiograph and abdomino-pelvic sonogram were normal as well. A throat culture did not yield any growth.

Based on the history and the findings of examination and investigations a diagnosis of disseminated herpes simplex infection was made and the patient was commenced on intravenous acyclovir at 5 mg/kg every 8 hours which was later increased to 10 mg/kg every 8 hours. Initially the fever of the patient improved and after an increase in the antiviral dose the patient became afebrile. The patient remained afebrile for 48 hours after increasing the dose of Acyclovir. On the 4th day of admission he started having temperature to 102 F. his rash had improved but his odynophagia had gotten worse. He now had difficulty speaking and was not able to take anything orally. A suspicion of fungal infection was raised and the patient was given intravenous fluconazole. This resulted in the patient becoming afebrile after 24 hours. The fluconazole was continued for 5 days and was then switched to oral route. The

patient remained afebrile for these 5 days and his symptoms resolved completely. A final diagnosis of disseminated herpes simplex infection complicated by fungal esophagitis was made. The patient was discharged on 2 weeks oral antifungal therapy. He made a complete recovery and follow up visits revealed no further complications.

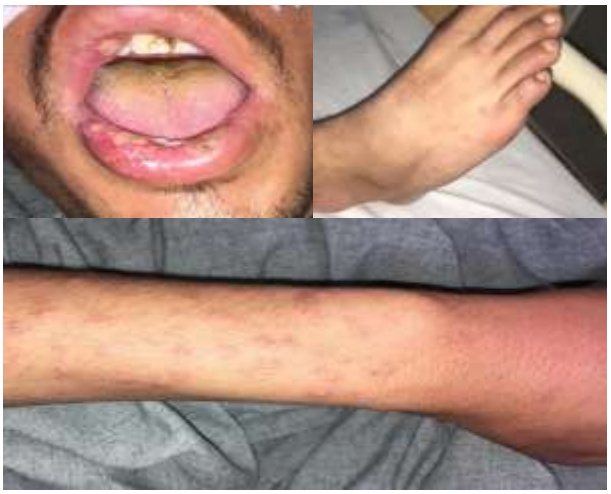

Figure 2. Pictures depicting the Oral Ulcerations as well as the Maculopapular rash on the limbs of the patient

Discussion

Opportunistic fungal infections are usually seen in immune-compromised patients particularly those who have had organ transplantation or suffer from Immune deficiency syndrome.[3] Our case is different in this regard as our patient was not in an immune-compromised state.[4] Our suspicion of fungal esophagitis complicating systemic herpes simplex infection was confirmed after 2 doses of antifungal therapy resolved our patient's fever and improved his symptoms.[5]

The presentation of infectious esophagitis includes difficulty swallowing (37.5%), odynophagia (60.7%), chest pain (46.4%) and heart burn/ nausea.[1] The most common organism responsible for fungal esophagitis is Candida. Esophageal and oropharyngeal candidiasis usually occur in conjunction.[6] oropharyngeal candidiasis commonly presents as a pseudomembranous infection with white plaques on the oropharynx, tongue, palate and buccal mucosa. Herpes simplex virus is also one the most common pathogens causing infectious esophagitis, second perhaps only to candida.[7] Different types of gastrointestinal pathologies may be caused by HSV ranging from mild ulcerations to hepatitis, esophagitis and colitis. Usually both these agents infect immune-compromised hosts but this was not the case in this particular instance.

Conclusion

This case report indicates that it is possible for an immune-competent patient to get simultaneously infected with herpes and fungal pathogens. A thorough history, physical examination and lab investigations are mandatory in patients with unusual presentation or lack of response to medications to rule out such co-infections. References

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CASE REPORT

OPEN ACCESS

Primary Hydatid Cyst of the Broad Ligament

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Abstract

Hydatid disease is not an uncommon health problem in our part of the world and is caused by the tapeworm of genus Echinococcus. Cystic lesions of the female pelvis are common. Clinically symptomatic lesions are most often of ovarian origin and neoplastic. An important diagnostic dilemma can arise if clinical, radiologic, and serum markers cannot be used to classify the origin and nature of these cysts.

Introduction

Hydatid disease is not an uncommon health problem in our part of the world and is caused by the tapeworm of genus Echinococcus. Infected humans exhibit the cyst stage of the disease. The liver is the most frequently affected organ, the lung being the second commonly involved site.[1]

While any organ can be affected, the involvement of the female genital tract is relatively uncommon, and in most cases secondary to the liver or other abdominal organ diseases.[2] Primary broad ligament hydatid cyst is very rarely encountered. One such case is reported.

Case Presentation

A nineteen-year-old female from Azad Kashmir presented in the Gynecology out-patient department of HBS hospital with lower abdominal pain for the last one year. The pain was dull and more towards the left side. Frequent use of analgesics had failed to provide permanent relief. She had no urinary or bowel complaints. The menstrual cycle was normal with average blood loss and no dysmenorrhea. She had been married a year back, had no issue, and belonged to the lower socio-economic class. There was nothing significant in the past medical, surgical or family history.

On examination, she was of a thin lean built. Vital signs were normal and examination of cardiovascular, respiratory and central nervous systems unremarkable. Abdomen was soft with no visceromegaly. On bimanual pelvic examination, uterus was anteverted and of normal size. There was fullness in left fornix.

All baseline investigations were within normal limits. However, pelvic ultrasound showed a large, fluid-filled cyst with multiple mural deposits up to 20 mm in size. No internal flow was seen on Doppler studies.

CT scan was advised, which revealed a large adnexal cyst of 9.2x9.7x10.3 cms with a nodular thickening. A provisional diagnosis of serous cystadenoma was proposed by the radiologist.

Reports of tumor markers, LDH (194 u/l), alpha-fetoprotein (1.5 ng/ml), CEA (0.209 ng/ml), CA 125 (17.7 u/ml) and beta- hCG (1.75 milli units/ml) were in normal range.

Staging laparotomy was performed. The abdomen was opened by a midline incision and peritoneal washings were taken. Uterus, right fallopian tube and ovary were normal. A 10x8 cms cyst was found occupying the left broad ligament that could not be exteriorized. Approximately 250 ml straw-coloured fluid was aspirated. Since the cyst was also extending to the lateral pelvic wall, surgeon was also consulted. The cyst wall was dissected. It appeared as an egg-white, membrane-like structure. Left ovary and fimbrial end of the left fallopian tube were embedded in the cyst wall. A clinical diagnosis of hydatid cyst of broad ligament was made. Few small cysts were also present at the base. An attempt was made to excise the cyst wall in its entirety. However, the adherent bed of the cyst wall had to be marsupialized. A wide bore drain was placed and the abdomen closed.

Postoperatively, broad spectrum antibiotics were given. Tab. Mebendazole 500mg twice daily was started on first postoperative day. The patient made an uneventful recovery. Histopathology report of the excised specimen confirmed the diagnosis of hydatid cyst.

Discussion

Primary hydatid cyst formation in the pelvic organs of females is rarely seen[3]. Bickers reviewed 532 cases of hydatid cyst from an endemic area over a twenty-year period. Only 12 had pelvic hydatid cyst, of which only two (0.37%) had hydatid cysts in the broad ligament[4]. Bellil et al in their study of 265 cases of extrapulmonary

hydatid disease spanning 18 years, from 1990 to 2007, identified only one case of primary broad ligament hydatid cyst[5.] Roychoudhury et al [6] and Arora et al [7] have also documented few isolated cases of broad ligament hydatid cyst in India.

Relatively high vascularity of the female genital organs may be the reason why they are the most common site in the pelvis.[8] The patient may present with abdominal pain or swelling, menstrual irregularities, infertility or pressure symptoms from involvement of rectum, bladder, ureters and adjacent vascular structures.[9] Our patient presented with pain in lower abdomen, with no urinary or bowel complaints and had a normal menstrual cycle.

Hydatid cyst in the broad ligament is difficult to diagnose. It may sometimes simulate an ovarian or paraovarian tumour and is only picked up preoperatively.[10] Ultrasound examination and CT scan in our patient failed to consider the possibility and instead suggested a thick walled serous cystadenoma. Staging laparotomy was done and the clinical diagnosis was made preoperatively. This was later confirmed on histopathology.

While surgical resection with complete cyst removal is the preferred technique, the adherent bed of the cyst wall may not allow this. Such patients are managed with puncture aspiration and marsupialization of the remnant adherent wall as was done in our patient. Marsupialization of the edge was also practiced by Abebe et al in thirty-eight (90.5%) of their patients with intra abdominal hydatid cysts.[11]

Bhattacharya et al, in their single case of a 35-year-old housewife with primary hydatid cyst of broad ligament, additionally performed a total abdominal hysterectomy and bilateral oophorectomy.[8] This was because no definite proof of the origin and nature of the mass could be ascertained by clinical examination and laboratory or radiological investigations. Laparotomy in their case was done on the suspicion of a malignant ovarian cyst. We had also considered this possibility pre-op. However, careful inspection and dissection in our case, and collaboration with a surgical colleague, with aspiration of clear fluid and presence of an albuminous, egg-white structure pointed to the diagnosis and led to conservation of the reproductive organs in our young patient.

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