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Prevalence of Depression among patients attending the Primary Health Care Clinics in Kuwait

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From the Editor

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This is the eleventh issue this year that has rich papers from the region including Kuwait, Iraq, Saudi Arabia, Yemen, Turkey and Libya.

Youssef H et al; tried to determine the prevalence of depression and its association with socio-demographic characteristics among patients attending mental and Primary Health care clinics in Kuwait. The authors followed a cross-sectional study in five primary healthcare regions in Kuwait for screening of adult consumers for depression between Sept 2017 and Sept 2018. The data were collected by interviewing a sample of 800(326 male and 474 female visitors, response rate 91.4%) by using the Arabic and English version of patient Health Questionnaire 9. Based on the interpretation of PHQ-9 scores, it was found that out of 800 there were 262 (32.7%) patients had no depression, 171 (21.4%) suffered from mild depression, 105 (13.1%) suffered from moderate depression, 58 (7.2%) suffered from moderately to severe depression, and 33 (4.1%) suffered from severe depression. The authors concluded that the prevalence rate of moderate to severe depression among PHC patients in Kuwait was relatively high (24.4%) and it's occurrence was more in Kuwaiti's older than 35 years, married ,females, , working participants, low educated individuals and having low monthly income . They stress of training primary health care physician in mental health illness to be able to screen , treat when there is a need, and appropriate referral to hospital.

Ali Qaim A et al; attempted to determine the prevalence of cervical intraepithelial abnormality, and invasive cervical cancer among Iraqi women. They did a cross sectional study done in Al-Alwiyaa Maternity Teaching Hospital, Women cancer Center. Data was obtained from the patient records for the years from Jan.2016-Jul.2019, information regarding the age, cytology results of the pap smear for each patient were taken. (2182) patient were studied. Abnormal cervical pap smear cytology found among 1926 (88.3%), Abnormal intraepithelial lesion is found among 508(23.3%) of total patients, 6(0.3%) patient had unsatisfactory smear, Negative for intraepithelial lesion and malignancy (NILM) was found among 1418(65%), ASCUS 245(11.2%), LISL 221(10.1%), HISL 32(1.5%), Squamous cell carcinoma 9(0.4%), Adenocarcinoma 1(0.04%). The mean age of patient with NILM was39.4±10.9, ASCUS 40.5±10.8 , LISL 38.4±11.3, HISL 44.9±12.95, squamous cell carcinoma 48±6.6. The authors concluded that higher prevalence of cervical intraepithelial abnormality and invasive squamous cervical cancer, was reported in this study than the neighboring countries, giving a clue to the argent need for the cervical cancer screening program.

Abdulaziz S et al; tried to compare haemoglobin A1c level in insulin pump versus multi daily injections users for type one diabetes mellitus. The authors collected data between May 2015 to January 2018 comparing HbA1c, lipid profile and acute complications. Data collection was done through electronic files. Data was analyzed by the Statistical Package of Social Sciences (SPSS). The independent sample't' test was used to compare continuous variables. Chi-square test was used to compare categorical variables. Of 214 patients, 137 on MDI and 77 on pump were recruited. All HbA1creadings were significantly higher in MDI users ($p<0.05$). Acute complications were higher in pump users (7.8% and 18.2%) compared to MDI users (2.9% and 6.6%) for each hypoglycaemia and DKA respectively. The occurrence of hypoglycaemia and DKA in MDI and pump users were found statistically insignificant, ($p=0.155$ and $p=0.134$) and ($p=0.790$ and $p=0.721$) respectively. The authors concluded that patients with T1DM, HbA1c was significantly higher in MDI users, conversely, DKA was significantly higher in pump users. Hypoglycemia showed a significant relation to age in MDI group. Lipid profile was statistically insignificant.

Alsayali R.M et examined the knowledge & attitude of first aid skills among medical and non-medical students at Taif University. They followed a cross-sectional study and was conducted on convenience sample of 500 female and male (Medical and Non-Medical). The data was gained by validated questionnaire in a sample of 500 participants, which were randomly selected. The mean age of the participants was 21 ± 1.5 years . 56.6% of the participants were found to have good awareness regarding first aid and BLS. The attitude towards first aid was very poor and only 8% had good attitude towards it. There was statistically significant relationship observed between attendance to first aid course and awareness, knowledge and practices. The authors concluded that the attitude and skills of the study participants were not satisfactory. Universities need to organize an effective committee to monitor and conduct first aid courses and activities. Students need to realize the public importance of such activities and make them effectively involve in theses lifesaving procedures.

Helvaci M.R et al, tried to understand some unknown functions of plasma triglycerides. The study included 875 cases (505 females), totally. Mean age increased up to the plasma triglycerides value of 200 mg/dL, and there was an increase of triglycerides about 7.8 mg/dL for each year of aging. Whereas male ratio increased parallel to the increased plasma values of triglycerides, continuously (30.9% versus 51.2%, $p<0.001$). Mean body mass indexes (BMI) were 24.6, 27.1, 29.4, 29.9, and 30.0 kg/m2 in the five groups, respectively, and it was only normal in patients with plasma triglycerides values lower than 60 mg/dL. The authors concluded that Plasma triglycerides may behave as acute phase reactants indicating disseminated endothelial damage, inflammation, fibrosis, and eventual atherosclerosis all over the body. Interestingly, parallel to the increased plasma triglycerides vaues, significant deteriorations were observed about the components of the metabolic syndrome including mean age, male gender, smoking, BMI, FPG, LDL, WCH, HT, DM, COPD, CHD, and CR

A paper from Yemen described the characteristics of the patients, to evaluate the outcome of an external fixation for tibia open fracture. The study was a retrospective study involving 92 patients who have open tibia injuries, and underwent surgical intervention for external fixation. There were 71(77.2%) male and 21(22.8%) female patients and the male to female ratio was 3.4:1. The fracture patterns were categorized according to Gustilo open fracture classification: There were 51(55.5%) type 3A fractures, 29(31.5%) type 3B, and 12(13%) type 3C. Bone union was achieved in 70(76.1%) patients and delayed union 12(13%). Mal-union was observed, in 4(4.4%) patients. There were 2(2.2%) patients exhibited a shortening of 2 cm and other 1(1.1%) exhibited of 1.5 cm. Pin track infection was observed in 7(7.6%) patients and chronic osteomyelitis in 2(2.2%) patients. Six (6.5%) patients had non-union. The author concluded that external fixation is the method of choice for the primary treatment of tibia open fracture. However, this is a small study in two private hospitals and larger studies are needed.

A paper from Libya provides a brief review on the vaping problem. It is permeating society but many instances of sudden death and serious lung disease have cast doubt on the safety of the practice. Trials are needed.

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Abstract

Background: Depressive disorder is one of the most severe mental problems, characterized by mood lowering under the influence of which there are changes in thinking, perception, physical condition, behavior and social functioning of a person.

Objectives: To determine the prevalence of depression and its association with socio-demographic characteristics among patients attending mental and Primary Health care clinics in Kuwait.

Materials and Methods: A cross-sectional study was conducted in five primary healthcare regions in Kuwait for screening of adult consumers for depression between September 2017 and September 2018. The data were collected by interviewing a sample of 800 (326 male and 474 female visitors, response rate 91.4%) by using the Arabic and English versions of Patient Health Questionnaire 9.

Results: Based on the interpretation of PHQ-9 scores, it was found that out of 800 (326 males and 474 females) there were 262 (32.7%) patients who had no depression, 171 (21.4%) suffered from mild depression, 105 (13.1%) suffered from moderate depression, 58 (7.2%) suffered from moderate to severe depression, and 33 (4.1%) suffered from severe depression.

Conclusion: The prevalence rate of moderate to severe depression among PHC consumers in Kuwait was relatively high (24.4%) and its occurrence was more in Kuwaiti 's older than 35 years, married, females, working participants, low educated individuals and having low monthly income. Trained primary health care physicians in mental health clinics should be responsible for screening, treatment and appropriate referral to hospital.

Key words: depression, primary healthcare centers

Introduction

Depression is a significant contributor to the global burden of diseases and affects people in all communities across the world (1). It is considered as a major public health issue and as the fourth leading cause of the world diseases burden (2). In 2020 the World Health Organization (WHO) in their global prediction considers depression as the second highest cause of disability after ischemic heart disease (2-3). The word "depression" comes from the Latin word deprimere–suppressed, dent or crush (4). Depression is an emotional disturbance that leads to deterioration of abilities and daily activities; and a leading predictor of functional disability and mortality (5-6). Depression if unrecognized and undiagnosed can contribute to high medical utilization in the primary care setting (7).

Depressive disorder is a highly prevalent condition among Kuwaiti patients attending the PHC setting in one study published in 2007 (8). The integration of Mental Health Services into the Primary Care Setting may significantly enhances the number of people who are actively engaged in treatment of depression as well as improve care for other medical problems (9) . Efficacious and cost-effective treatments are available to improve the health and the lives of the millions of people suffering from depression around the world (1).

A review of published studies suggests that PHC physicians fail to detect depression, which remains undiagnosed in one third to one half of the cases (8,10,11). The failure of Primary Care Physicians (PCPs) to detect depression and its causes can delay potentially life-saving treatment, therefore, they should improve their knowledge and skills for appropriate diagnosis and management of depression(10).

The Patient Health Questionnaire (PHQ-9) has been widely used in primary care to improve the recognition and treatment of depression and anxiety disorders (10,12, 13,14), It consists of nine questions designed to correspond to the nine diagnostic criteria for major depressive disorder covered in the Diagnostic and Statistical Manual of Mental Disorders (DSM–IV). Items are rated from 0 to 3 according to increased frequency of experiencing difficulties in each area covered. Scores are summed and can range from 0 to 27. The score can then be interpreted as indicating either no depression, minimal, mild, moderate, moderately severe, or severe depression (15).

The aim of this study is to determine the prevalence of depression and its association with socio-demographic characteristics among patients attending mental and Primary Health care clinics in Kuwait and to assess the existing infrastructure providing the mental health services in primary health care and importance for the need of establishing more mental clinics in the Primary Health Care in the future.

Methods

Study design, setting, and duration:
This descriptive cross-sectional study was conducted over a period of one year (September 2017 to September 2018) in five Primary Health Care regions in Kuwait by using a designed self-administered questionnaire whereas semi-structured interviews were conducted with directors. The researcher was personally responsible for the distribution and collection of all questionnaires.

The infrastructure data regarding number of doctors, nurses, social workers, number of mental health clinics, number of working hours, appointment system, referral policy and training in the mental health clinics in Primary care centers was taken from the health statistic section in primary health care, central department of the MOH.

Sample:
The study sample consisted of 800 adults male and female, Kuwaiti and non-Kuwaiti, above 18 years attending the PHCCs for any reason during the period of study.
Inclusion and exclusion criteria:

The inclusion criteria were all patients 18 years and above at the PHCs who were available at the time of the study and willing to participate, and the exclusion criteria were all patients less than 18 years and the patients who decided not to participate in the study.

Data collection Tool:
Components and details of the instrument:
Following permission from the MOH Kuwait to conduct the study with ethical approval, the questionnaire was sent to the PHC centers through the principal investigator who obtained informed verbal and written consent from eligible participants after explaining the purpose of the study and assuring them about the confidentiality of collected information, supervised by an experienced PHC physician and nurse to assist the patients.

Data was collected using validated English and Arabic versions of Patient Health Questionnaire (PHQ-9) for screening of depression. The questionnaire consisted of the socio-demographic characteristics of the patients (age, gender, nationality, occupation, education level, marital status, monthly income and the name of health region) and the scale DSM-IV criteria consisted of nine questions and additional six questions regarding (difficulties regarding any problems, any depression medication, previous hospital admission for depression, any previous attempt of suicide, any referral to psychiatric casualty and any follow up in any psychiatry clinic).

The depression severity was calculated by assigning scores of 0, 1, 2 and 3 to the response categories of "not at all", "several days", more than half the days", and "nearly every day" respectively. The depression total score for the nine items ranges from 0 to 27 points. The scores for PHQ-9 were used to determine the presence of depression and its severity and depends on the following score ranges :

(1-4) minimal depression, (5-9) mild, (10-14) moderate,(15-19) moderate to severe, and (20-27) severe. The PHQ scoring system was used to drive severity scores for each question for the presence of depression symptoms over the last 2 weeks. Each participant was given a code number instead of their names and the privacy of their information given was secured.

Data analysis:
The collected data were reviewed, coded, verified and statistically analyzed using Statistical Package for Social Sciences (SPSS) software version 25. Descriptive statistics and appropriate tests were applied according to the types of variables. For categorical variables, frequencies and percentages were used. P-value of <0.05 was considered significant.

Results

The total number of patients who were screened for depression was 875. Out of the 875 participants, 800 responded to the questionnaire and the other 75 had incomplete questionnaires and refusal to participate in the study.

The participants ages ranged from 18-24 years (5.5%), 25-34 years (31%), 35-44 years (29.6%) and 45years and above (33.9%), 474(59.3%) of the participants were females and the rest were males (40.8%).

Regarding the nationality, 481 (60.2%) were Kuwaiti and 318 (39.8%) were non-Kuwaiti. The majority of them were married (74.8%) and the rest were either single, divorced or widowed (25.3%).

Regarding their educational status, the majority of participants had Bachelor certificate (34.5%) and secondary school certificate (34%), Master (5.6%), PHD (35%) and 21.6% of them were illiterate. Out of 800 screened participants 632 (79%) were employees and 168 (21%) were non-employees. Approximately 62% of the participants had monthly income less than 1000 K.D while the rest of the participants had between 1000-3000 K.D (38%) and 5 of the participants refused to respond to this question.

According to the distribution of the participants to the health regions, (22.9%) of participants belonged to the Capital region, (16.8%) to Hawaly region, (17.8%) to Farwaniya region, (25.6%) to Ahmadi region and (17%) to Jahra region. (Table 1).

Depression was found in 45.8% (n=367) of the screened population by using the PHQ9. Based on the interpretation of PHQ-9 scores, it was found that out of 800 patients, 262 (32.7%) participants had no depression, 171 (21.4%) suffered from mild depression, 105 (13.1%) with moderate depression, 58 (7.2%) with moderate to severe depression, and 33 (4.1%) with severe depression. (Table 2).

It was found that the most common symptom was tiredness(68.2%) that happened several days to nearly every day followed by sleeping problems (63.2%), hopelessness (58.3%), little energy (55%) and eating problems (51.7%) while suicidal thoughts were reported by (17.1%) of the participants. (Table 3).

The effects of participant problem difficulties of work , taking care of things at home, or getting along with other people about (41.1%) rated from somewhat difficult to extremely difficult. The participants who had follow up at PHC centers' psychiatric clinic was around (4.4%), those who were on anti-depressant medication were (7.2%) those who attempted suicide were around (2.9%), the participants who referred to psychiatry casualty were (3.3%) and those who were admitted to hospital (2.1%) (Table 3).

The mean depression score of PHC consumers older than 35 years was significantly higher than that of the younger age groups. The age group 18-24 years had (6%) for the category of 0-4 depression score. Similarly 25-34 years had (26.4%), 35-44 years had (25.9%) and ≥45 years had (41.8%). The age group 18-24 years had(6.4%) for the category of 5-9 depression score. Similarly 25-34 years had (32.7 %), 35-44 years had (26.3%) and ≥45 years had (34.5%). The age group 18-24 years had no participants for the category of 10-14 depression score. Similarly 25-34 years had (31.4%), 35-44 years had (37.1 %) and ≥45 years had (31.4%). The age group 18-24 years had (3.4%) for the category of 15-19 depression score. Similarly 25-34 years had (31%), 35-44 had (43.1%) and ≥ 45 years had (22.4%) .The age group 18-24 years had (3%) for the category of 20-27 depression score. Similarly 25-34 years had (24.2%), 35-44 years had (27.3%) and ≥ 45 years had (45.5%) (Table 4).

It was also significantly higher among Kuwaitis than non-Kuwaitis; (56.2 %) of Kuwaitis and (43.8%) for the category of 0-4 depression score, (66.7%) of Kuwaitis and (33.3%) non-Kuwaitis for the category of 5-9 depression score. (61.9%) of Kuwaitis and (38.1 %) of non-Kuwaitis for the category 10-14 depression score and (75.9%) of Kuwaiti and(24.1%)of non-Kuwaiti for the category 15-19 depression score and (60.6%) of Kuwaitis and (39.4%) of non-Kuwaitis for the category 20-27 depression score (Table 5).

The mean depression score was significantly higher among females than males; (55.7%) of females and (44.3%) of males for the category of 0-4 depression score, (66.7%) of females and (33.3%) of males for the category of 5-9 depression score, (61.9%) of females and (38.1%) of males for the category 10-14 score , (75.9%) of female and (24.1%)of male for the category of 15-19 depression score and (60.6%) of females and (39.4 %) of males for the category 20-27 score. (Table 6)

The mean depression score was significantly higher among working participants compared with non-working; (81.1%) of the participants who were currently working,

(8%) who were a house wife, (10.4%) of those who were retired and (0.5%) of the others had 0-4 depression score. (78.4%) of the current working, (14.6%) of the house wives ,and (7%) retired had 5-9 depression score. (77.1%) of the current working,(13.3%) of the house wives and (9.5%) of the retired had 10-14 depression score. (75.9%) currently working (12.1%) for the house wives (8.6%) for the retired and (3.4%) of the others had 15-19 depression score (60.6%) for the current working, (30.3%) for the house wives and (9.1%) for the retired had 20-27 depression score (Table 7).

It was the highest among low education level than higher levels of education; (29.9%) for the high school educated, (34.8%) for the Bachelors, (6%) for the Masters (4.5%) for those with PHD and (24.9%) for the others had 0-4 depression score; (31.6%) for the high school educated, (36.3%) for the Bachelors, (5.3%) for the Masters, (4.7%) for those with a PHD and (22.2%) of the others had 5-9 depression score; (39%) for the high school educated, (31.4%) for the Bachelors,(6.7%) for the Masters, (5.7%) for those with PHD and (17.1%) for the others had 10-14 depression score. (45.6 %) for the high school graduates, (33.3%) for the Bachelors,(1.8 %) for the Masters, (1.8 %) for the PHD holders and (17.5%) of the others had 15-19 depression score. (39.4%) for the high school educated, (24.2%) for the Bachelors, (6.1%) for the Masters, no one with a PHD and (30.3%) of the others had 20-27 depression score (Table 8).

The mean depression score was significantly higher in married than non-married participants; (11.4%) of the single, (82.6%) of the married, (3%) of the divorced, (3%) of the widowed had 0-4 depression score; (16.4%) of the single, (77.2%) of the married, (3.5%) of the divorced, (2.9%) of the widowed had 5-9 depression score. (12.4%) of the single, (81%) of the married, (2.9%) of the divorced and(3.8%) of the widowed had 10-14 depression score. (25.9%) of the single(63.8%) of the married(5.2%) of the divorced and (5.2%) of the widowed had 15-19 depression score. (15.2%) of the single(72.7%) of the married, (6.1%) of the divorced and (6.1%) of the widowed had 20-27 depression score (Table 9).

The mean depression score was significantly higher in low income than in middle or high income; score 0-4 for the salary less than K.D; 1000 (61.5%), 1000-2000 (56.7%),2000-3000 (6.7%),>3000 (3.4%), Score 5-9 for the salary less than 1000 K.D; (56.7%), 1000-2000 (34%), 2000-3000 (6.7%), > 3000(2.7%), Score 10-14 for the salary less than 1000 K.D (61.5%), 1000-2000 (26 %), 2000-3000(9.4%), > 3000(3.1%), Score 15-19 for the salary less than 1000 K.D (66%), 1000-2000 (30.2%), 2000-3000 (3.8%), > 3000(0%), Score 20-27 for the salary less than 1000 K.D (63%), 1000-2000 (29.6%), 2000-3000 (3.7%), > 3000(3.7%). (Table 10)

The difficulties of these problems for the participants who work, taking care of things at home or getting along with other people ranged from not difficult at all to extremely difficult. (84.3%) of the participants did not have any difficulty at all, (15.7%) had somewhat difficulty and no one had very difficult or extremely difficult for the 0-4 depression score . (58%) had no difficulty at all, (40.8%) had somewhat difficult, (1.2%) had very difficult and no one had extremely difficult for the 5-9 depression score. (46.7%) did not have any difficulty at all, (48.6%) had somewhat difficulty, (4.8%) had very difficult and no one found it extremely difficult for the 10-14 depression score. (31%) had no difficulty at all, (53.4%) had somewhat difficulty, (13.8%) very difficult and (1.7%) extremely difficult for the 15-19 depression score. (39.4%) did not have any difficulty at all, (33.3%) had somewhat difficulty, (18.2%) very difficult and (9.1%) extremely difficult for the 20-27 depression score (Table 11).

The association between participants who received medication for depression and depression severity scoring was as follows: (3.5%) of patients who were on depression medication had 0-4 depression severity score, (4.7%) of them had 5-9 depression severity score, (9.5%) of them had 10-14 depression severity score, (15.5%) of them had 15-19 depression severity score and (12.1%) of them had 20-27 depression severity score (Table 12).

The association between participants admission to psychiatric hospital and depression severity score were as follow: (0.5%) of patients who were admitted to psychiatric hospital had 0-4 depression severity score, (0.6%) of them had 5-9 depression severity score, (3.8%) of them had 10-14 depression severity score, (8.6%) of them had 15-19 depression severity score and none of patients had 20-27 depression severity score (Table 13).

The association between participants who had attempted suicide and depression severity score was as follows: (0.5%) of patients who attempted suicide had 0-4 depression severity score, (0.6%) of them had 5-9 depression severity score, (2.9%) of them had 10-14 depression severity score, (3.4%) of them had 15-19 depression severity score and (6.1%) of them had 20-27 depression severity score. (Table 14)

The association between participants who referred to psychiatric casualty and depression severity scoring was as follow :(1%) of patients who referred to psychiatric casualty had '0-4' depression severity score, (0.6%) of them had '5-9' depression severity score, (5.7%) of them had '10-14' depression severity score, (10.3%) of them had '15-19' depression severity score and (9.1%) had '20-27' depression severity score. (Table 15)

The association between participants who had follow up to primary care psychiatric clinic and depression severity scoring were as follows: (2%) of patients who had follow up to primary care psychiatric clinic had 0-4 depression severity score, (1.8%) of them had 5-9 depression severity score, (5.7%) of them had 10-14 depression severity score, (8.6%) of them had 15-19 depression severity score and (12.1%) of them had 20-27 depression severity score. (Table 16)

Table 1: Association between socio-demographic characteristic of primary care attendees and presence of depression

Socio-demographic characteristics	Depression score				P-value
	frequency	valid %	Mean	SD	
Age in years					
18-24	44	5.5%	66.1%	45.4%	
25-34	248	31%	82.7%	49.3%	0.002
35-44	237	29.6%	78.8%	56%	
45 and above	271	33.9%	96.2%	55.3%	
Gender					
Male	326	40.8%	90.3%	56.9%	0.001
Female	474	59.3%	81.7%	51.4%	
Nationality					
Kuwaiti	481	60.2%	79.8%	54%	0.001
Non-Kuwaiti	318	39.8%	93.5%	52.6%	
Occupation					
Currently working	632	79%	81.5%	52.3%	
House wife	90	11.3%	95.4%	54.5%	0.001
Retired	73	9.1%	105.2%	59.7%	
Others	5	0.6%	84.6%	71.9%	
Academic qualification					
High school	271	34%	82%	53.9%	
Bachelor	275	34.5%	83.9%	51.1%	0.001
Masters	45	5.6%	96.4%	56.8%	
PHD	35	4.4%	78.1%	56.1%	
Others	172	21.6%	90.5%	54.5%	
Marital status					
Single	145	18.1%	75.4%	54.6%	0.001
Married	598	74.8%	86.9%	53.4%	
Divorced	31	3.9%	84.6%	53.1%	
Widow	26	3.3%	102.6%	55.8%	
Monthly income(KD)					
≤ 1000	437	62%	82.8%	50.7%	
1000-2000	203	28.8%	85.7%	56.9%	0.006
>2000-3000	41	5.8%	83.5%	57.4%	
≥ 3000	24	3.4%	78.9%	61.9%	
Refused to respond	5	0.62%			
8. Health regions					
Capital	183	22.9%	102.4%	62.8%	1.00
Hawaly	134	16.8%	63.7%	41.4%	
Farwaniya	142	17.8%	78%	41.9%	
Ahmadi	205	25.6%	100.4%	58.4%	
Jahra	136	17%	67.9%	39.8%	

Table 2: Distribution of primary care attendees according to their depression

Diagnosis of Depression	Total (n= 800)	
	Frequency	Valid %
A. No depression(0-4)	262	32.7%
B. Level of depression severity:		
- Mild depression (5-9)	171	21.4%
- Moderate depression (10-14)	105	13.1%
- Moderately severe depression (15-19)	58	7.2%
- Severe depression (20-27)	33	4.1%

Table 3: Distribution of depressive symptoms experienced nearly every day during the last 2 weeks by gender among depressed PHC consumers according to PHQ-9 questionnaire.

(PART 1: The Second half of this table is on the following page)

Symptoms	Depression score				P value
	frequency	valid %	Mean	SD	
Little interest					
-Not at all	360	45%	83.7	55.6	0.001
-Several days	273	34.1%	88.5	50.2	
-More than half the days	124	15.5%	80.6	56.4	
-Nearly every day	43	5.4%	90.5	53.9	
-Total	800	100%	85.2	53.8	
Hopelessness					
-Not at all	334	41.8%	86.6	57.1	0.001
-Several days	296	37%	85	52.07	
-More than half the days	127	15.9%	79.1	48.08	
-Nearly every day	43	5.4%	93.7	56.5	
-Total	800	100%	85.2	53.8	
Sleeping problems					
-Not at all	295	36.9%	87.9	56.4	
-Several days	248	31%	84	54.7	0.001
-More than half the days	170	21.3%	82.3	51.4	
-Nearly every day	87	10.9%	85.3	47.2	
-Total	800	100%	85.2	53.8	
Little energy					
-Not at all	254	31.8%	82.8	58.7	
-Several days	314	39.3%	86.4	52.2	0.001
-More than half the days	154	19.3	86.5	51.8	
-Nearly every day	77	9.6%	85.3	48.3	
-Total	799	100%	85.2	53.8	
Poor appetite or overeating					
-Not at all day	387	48.4%	87.7	55.7	
-Several days	207	25.9%	88.8	52.7	
-More than half the days	146	18.3%	75.3	50.3	0.001
-Nearly every day	60	7.5%	81.1	51.5	
-Total	800	100%	85.2	53.8	
Feeling bad about yourself					
-Not at all	506	63.2%	85.5	55.2	
-Several days	166	20.8%	85.4	48.6	0.001
-More than half the days	78	9.8%	76.6	52.5	
-Nearly every day	50	6.3%	95.1	58	
-Total	800	100%	85.2	53.8	

(TABLE 3: Distribution of depressive symptoms experienced nearly every day during the last 2 weeks by gender among depressed PHC consumers according to PHQ-9 questionnaire. PART 2)

Trouble concentrating					
-Not at all	449	56.3%	85	55.7	
-Several days	214	26.8%	83	52.2	
-More than half the days	95	11.9%	91.8	47.8	0.046
-Nearly every day	40	5%	87.6	54.1	
-Total	798	100%	85.4	53.8	
Moving or speaking slowly or fidgety					
-Not at all	561	70.2%	86.6	54.8	
-Several days	138	17.3%	82.2	49.5	
-More than half the days	73	9.1%	81.9	56.1	
-Nearly every day	27	3.4%	83	51.7	0.281
-Total	799	100%	85.3	53.9	
Suicidal thoughts					
-Not at all day	663	82.9%	85.7	54.9	
-Several days	85	10.6%	82.3	47.4	
-More than half the days	37	4.6%	83.4	52.7	
-Nearly every day	15	1.9%	86	48.5	0.927
-Total	800	100%	85.2	53.8	
Difficulty of problems on patient's life					
-Not difficult at all	467	58.8	84.6	56.3	0.002
-Somewhat difficult	286	36%	85.2	49.3	
-Very difficult	34	4.3%	82.4	56.8	
-Extremely difficult	7	0.9%	97.1	45	
-Total	794	100%	84.8	53.7	
Anti-depressant medication					
-No	58	7.2%	85.8	53.8	
-Yes	742	92.8%	77.6	53.7	0.001
-Total	800	100%	85.2	53.8	
Hospital admission					
-No	783	97.9%	85.5	54.1	
-Yes	17	2.1%	72	36.5	0.290
-Total	800	100%	85.2	53.8	
Any suicidal attempts					
-No	777	97.1 %	85.3	54	0.803
-Yes	23	2.9%	81.7	48.9	
-Total	800	100%	85.2	53.8	
Psychiatry casualty referral					
-No	774	96.8%	85.4	54.2	
-Yes	26	3.3%	80.7	42.1	0.038
-Total	800	100%	85.2	53.8	
PHC psychiatric clinic FU					
-No	35	4.4%	84.8	54.4	
-Yes	765	95.6%	95.3	37.7	
-Total	800	100%	85.2	53.8	0.032

Table 4: Association between Age in years of primary care attendees and depression severity

Age in years	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
18-24	12	6	11	6.4	0	0	2	3.4	1	3	0.062
25-34	53	26.4	56	32.7	33	31.4	18	31	8	24.2	
35-44	52	25.9	45	26.3	39	37.1	25	43.1	9	27.3	
≥ 45	84	41.8	59	34.5	33	31.4	13	22.4	15	45.5	
Total	201	100	171	100	105	100	58	100	33	100	

Table 5: Association between participants' genders and depression severity

Patient gender	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
Male	89	44.3	66	38.6	38	36.2	16	27.6	12	36.4	0.001
Female	112	55.7	105	61.4	38	36.8	42	72.4	21	63.6	
Total	201	100	171	100	105	100	58	100	33	100	

Table 6: Association between participants' nationality and depression severity

Nationality	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
Kuwaiti	113	56.2	114	66.7	65	61.9	44	75.9	20	60.6	0.017
Non-Kuwaiti	88	43.8	57	33.3	40	38.1	14	24.1	13	39.4	
Total	201	100	171	100	105	100	58	100	33	100	

Table 7: Association between participants' occupation and depression severity

Patient job	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
Currently working	163	81.1	134	78.4	81	77.1	44	75.9	20	60.6	0.573
House wife	16	8	25	14.6	14	13.3	7	12.1	10	30.3	
Retired	21	10.4	12	7	10	9.5	5	8.6	3	9.1	
Others	1	0.5	0	0	0	0	2	3.4	0	0	
Total	201	100	171	100	105	100	58	100	33	100	

Table 8: Association between participants' education level and depression severity

Academic qualification	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
High school	60	29.9	54	31.6	41	39	26	45.6	13	39.4	0.383
Bachelor	70	34.8	62	36.3	33	31.4	19	33.3	8	24.2	
Master	12	6	9	5.3	7	6.7	1	1.8	2	6.1	
PHD	9	4.5	8	4.7	6	5.7	1	1.8	0	0	
Other	50	24.9	38	22.2	18	17.1	10	17.5	10	30.3	
Total	201	100	171	100	105	100	57	100	33	100	

Table 9: Association between participants' marital status and depression severity

Marital status	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
Single	23	11.4	28	16.4	13	12.4	15	25.9	5	15.2	0.001
Married	166	82.6	132	77.2	85	81	37	63.8	24	72.7	
Divorced	6	3	6	3.5	3	2.9	3	5.2	2	6.1	
Widow	6	3	5	2.9	4	3.8	3	5.2	2	6.1	
Total	201	100	171	100	105	100	58	100	33	100	

Table 10: Association between participants' marital income and depression severity

Monthly income	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
<1000	110	61.5	85	56.7	59	61.5	35	66	17	63	
1000-2000	51	28.5	51	34	25	26	16	30.2	8	29.6	
2000-3000	12	6.7	10	6.7	9	9.4	2	3.8	1	3.7	0.992
>3000	6	3.4	4	2.7	3	3.1	0	0	1	3.7	
Total	179	100	150	100	96	100	53	100	27	100	

Table 11: Association between participants with difficulty of problems and depression severity

Difficulties of problems	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
Not difficult at all	166	84.3	98	58	49	46.7	18	31	13	39.4	0.001
Somewhat difficult	31	15.7	69	40.8	51	48.6	31	53.4	11	33.3	
Very difficult	0	0	2	1.2	5	4.8	8	13.8	6	18.2	
Extremely difficult	0	0	0	0	0	0	1	1.7	3	9.1	

Table 12: Association between participants who take anti-depressant medication and depression severity

Anti-depressant medication	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
Yes	7	3.5	8	4.7	10	9.5	9	15.5	4	12.1	0.001
No	194	96.5	163	95.3	95	90.5	49	84.5	29	87.9	

Table 13: Association between participants who were admitted to psychiatric hospital and depression severity

Admission to psychiatric hospital	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
Yes	1	0.5	1	0.6	4	3.8	5	8.6	0	0	0.001
No	200	99.5	170	99.4	101	96.2	53	91.4	33	100	

Table 14: Association between participants who attempted suicide and depression severity

Suicide attempts	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		
	n	%	n	%	n	%	n	%	n	%	
Yes	1	0.5	1	0.6	3	2.9	2	3.4	2	6.1	0.001
No	200	99.5	170	99.4	102	97.1	56	96.6	31	93.9	

Table 15: Association between participants who referred to psychiatric casualty and depression severity

Referral to psychiatric casualty	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		0.001
	n	%	n	%	n	%	n	%	n	%	
Yes	2	1	1	0.6	6	5.7	6	10.3	3	9.1	
No	199	99	170	99.4	99	94.3	52	89.7	30	90.9	

Table 16: Association between participants who had FU to primary care psychiatric clinic and depression severity

FU to primary care psychiatric clinic	Depression severity										(p-value)
	'0-4'		'5-9'		'10-14'		'15-19'		'20-27'		0.001
	n	%	n	%	n	%	n	%	n	%	
Yes	4	2	3	1.8	6	5.7	5	8.6	4	12.1	
No	197	98	168	98.2	99	94.3	53	91.4	29	87.9	

Discussion

According to this study about 24.4% of PHC consumers had moderate to severe depression (using the PHQ9 as a screening tool) and about 17.1% of depressed patients had suicidal thoughts from several days to nearly every day. By reviewing the literature, it was found that the rate was higher than that reported in Saudi Arabia (16-20%) (2-11) , Riyadh (20%) (14), Kuwait (20.5%) (8-10) ,Qatar (13.5 -27.8%) (2-16) , Bahrain (19.3%) (2) and European countries (16.5%-22.8%) (11-17-19) . Comparing our study results with a study done in the United States, we found our rates to be higher: mild cases (21.4% vs 9.9%), moderate (13.1% vs 3.7%), moderate to severe (7.2% vs 1.4%), severe (4.1% vs 0.5%) (23).

In this study, the significant factors associated with depression among primary care attendees were age, gender, nationality, working participants, marriage, low education and low monthly income.

Regarding the age in the present study, a high prevalence of depression was observed in middle age/older (above 35 years) comparable to other studies that reported the highest prevalence in young adults as in Qatar (18-34 years) (20), US general population (15-24 years) (21).

All over the world, depression is much more common in women than in men. From the results of our study females were more likely to suffer from depression. This finding is consistent with many previous studies (5-16). However, many attributed this disparity to the various stresses women face as a result of their gender and different responsibilities within their families.

With regard to the association between marital status and prevalence of depression, the majority of depressed participants were among the married group. Our result is similar to the previous other studies (5-8). One explanation may be due to marital disharmony, increased marital responsibilities and their consequences. This result was not similar to previous studies (21).

The significant correlation between depression and nationality could be attributed to the higher number of participants of Kuwaiti nationality, in comparison to the non-Kuwaiti.

79% of the participants who are working were more prone to depression than the non-working as p value is highly significant (0.001). The work stress to which the participants may be exposed may be responsible for this result. The highest prevalence of depression was among the working population, with a lower prevalence for non-working and lowest for the retired. Our result is similar to the previous results of other studies (8-14). A possible explanation may be due to the work stress in which people are faced with numerous physical, psychological and social roles which changes their sense of self capacity to live happily and the employees may be exposed to the possibility of lack of job satisfaction.

The association between level of education and prevalence of depression shows that the prevalence of depression increases with low level of education. This goes along

other studies, in which patients with lower educational levels were more likely to have clinically significant depressive symptoms (22). This however differs in results that found the opposite, that depression was more likely to be associated with higher educational level(3).

The prevalence of depression among adults decreased as family income levels decreased similar to the previous other studies (24).

The symptoms of depression that were highly significant were little interest, hopelessness, sleeping problems, little energy, poor appetite and feeling bad about themselves, with a p value (0.001).

The referral rate from Primary care centers to psychiatry hospital casualty was found to be low (2.25%) with least significant p value (0.038) and for hospital admission (1.3%) with non-significant p value (0.290) compared with other studies (14- 19).

This study showed that the estimated number of moderately to severely depressed patients was 196 (24.5%), and those having suicidal thoughts (17.1%) and about (1.12%) of depressed patients had suicidal attempts. As the report mentioned it might take only 10 minutes or less between the suicidal thoughts and actual suicidal attempts in about half of the depressed patients (21).

Participants with depressive symptoms report greater impairment in function in doing work, home duties or taking care of things or getting along with other people with a significant p value (0.002), which is similar to the previous other studies (24).

As depression is a disease that can be reliably diagnosed and treated in primary care, now, the question is ‘‘Are we ready to deal with such a burden of disease?’’ The Ministry of Health established a National Mental Health Committee in Kuwait for integrating mental health in primary care. There are 17 mental health clinics in PHC centers in Kuwait distributed in the 5 health regions (10 in Capital, 3 in Farwaniya, 2 in Ahmadi, 1 in Jahra and 1 in Hawaly); working 7 hourly, each mental health clinic is run by a trained physician and a trained nurse. There was continuous training of primary care physicians on mental health issues and diagnosis of common mental disorders, enabling physicians to identify and treat people with common and severe mental disorders, aiming to provide at least one trained physician in each primary care center.

Importantly, all antidepressants were exempted from the controlled drug list and available for those clinics so that they could be prescribed by primary care physicians. Each mental health clinic had an appointment system and referral policy.

Conclusion

We conclude from this study that prevalence rate of depression among primary care attendees in Kuwait was relatively high. Gender, marital status, nationality, occupation, and academic qualification, were the main significant predictors for depression. Therefore, it is recommended that screening and early detection of mental health problems, in general, and depression in particular, should be implemented by PHC physicians during their routine daily activity.

This study highlights the importance of primary care physicians as a cornerstone in screening for underlying depressive disorder and initiating appropriate referral or treatment and proper communication between the primary care referral source and the psychiatrists to allow for better understanding and follow-up of patients from the primary care referral sites (10).

However, a body of evidence suggests that the quality of primary care can be enhanced through better integration of services and encouragement of patient self-management and concordance with evidence-based treatments. Approaches such as collaborative care, stepped care and case management offer improved outcomes which consider the clinical implications of depression comorbidity including increased risk of suicide, increased risk of psychiatric hospitalization, increased disability, decreased compliance with treatment of medical illness, and markedly increased utilization of medical services.

Further investigations and studies need to be done to ascertain the association between depressive symptoms and chronic diseases in the studied population and to assess other comorbidities (anxiety/somatoform disorders) in primary care (17).

Recommendation

1. Identify the real underlying causes of such an increase in the prevalence of depression in Kuwait.
2. Improve the recognition and management of depression in primary health care by:

-Developing a practice guideline which is accompanied by a range of interventions to implement them along with educational strategies.
-Improving knowledge and attitudes of PHC physicians in depression management.
-Train nurses in depression management, ongoing support, and brief medication counseling.
-Introduce support workers such as case managers, actively follow up treatment, support through joint consultation and follow up.
3. Collaborative and stepped care with improved and integrated working relationships between primary care and secondary services by incorporation of patient education and shared care between the primary care physician, psychiatrists and psychologists.

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Prevalence of cytological abnormality of cervical papanicolaou smear

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Abstract

Background: Cervical cancer is the 2nd leading cause of female death. Little is known about cervical cancer and intraepithelial abnormality prevalence in Iraq. This study aims to determine the prevalence of cervical intraepithelial abnormality and invasive cervical cancer among Iraqi women.

Patient and methods: A cross sectional study done in Al-Alwiyaa Maternity Teaching Hospital, Women cancer Center. Data was obtained from the patient records for the years from January 2016-July 2019; information regarding the age and cytology results of the Pap smear for each patient were taken. (2,182) patients were studied.

Results: Abnormal cervical Pap smear cytology was found among 1,926 (88.3%), Abnormal intraepithelial lesion was found among 508 (23.3%) of total patients; 6 (0.3%) patients had unsatisfactory smear. Negative for intraepithelial lesion and malignancy (NILM) was found among 1,418 (65%), ASCUS 245 (11.2%), LISL 221 (10.1%), HISL 32(1.5%), Squamous cell carcinoma 9 (0.4%), Adenocarcinoma 1 (0.04%). The mean age of patients with NILM was 39.4±10.9, ASCUS 40.5±10.8 , LISL 38.4±11.3, HISL 44.9±12.95, and squamous cell carcinoma 48±6.6.

Conclusion: Higher prevalence of cervical intraepithelial abnormality and invasive squamous cervical cancer was reported in this study than in the neighboring countries, giving a clue to the urgent need for a cervical cancer screening program.

Key words: Pap smear, cervical cancer, cervical intraepithelial abnormality, CIN

Introduction

Most of the burden of cervical cancer is found in developing countries. In Iraq the age standardized mortality rate is 1.3 per 100,000/per year and morbidity is 1.9 per 100,000. The number of susceptible females aged above 15 years in Iraq is 11.4 million, with age standardized incidence of cervical cancer.[1]

Cervical cancer is common in the 4th decade of women's life, and rarely found below 20 years.[2] Risk factors for cervical cancer are poor living conditions, lack of hygiene, early age of first intercourse, multiple sexual partners, and human papillomavirus (HPV) infections.[3]

Cervical cancer generally develops slowly over a period of 10-15 years. It is preceded by detectable and treatable precursor conditions in which certain cells in the cervix develop abnormal characteristics, but are not yet cancerous [4].Screening Pap test is done to ever-married Iraqi women 25-45 years age, having one or more of the following: History of inter-menstrual or post coital bleeding, personal or husband history of sexually transmitted infections (STI), early marriage and pregnancy or married more than once, abnormal vaginal discharge, history or presence of genital warts, continuous use of oral contraceptive pills for 3 or more years, women who smoke, grand multipara, low socioeconomic status and malnutrition. Testing can also be done to married women having no symptoms, but whose cervix is abnormal looking on examination [5].

The Bethesda System is a modern reporting system for cervical cytological Pap smear results, revised in 2001[6]. The Descriptive diagnoses are either Negative for intraepithelial lesion or malignancy (infection, reactive or atrophic changes), or Epithelial cell abnormalities (squamous or glandular cell abnormality), or others such as endometrial cells in postmenopausal women not on hormone replacement.

The squamous cell abnormalities include four types:

1- ASC (Atypical Squamous Cells): either of undetermined significance (ASC-US), or that cannot exclude high-grade squamous intraepithelial lesion (ASC-H).
2- LSIL (Low-grade squamous intraepithelial lesions): cells show definite minor changes unlikely to progress into cancer, including human papilloma virus (HPV) infection, mild dysplasia, and cervical intraepithelial neoplasia (CIN 1).
3- HSIL (High-grade squamous intraepithelial lesions): cell changes having higher likelihood of progressing to cancer, including presence of moderate to severe
dysplasia, carcinoma in situ (CIS), CIN 2 and CIN 3, or changes suspicious for invasive cancer.
4- Squamous cell invasive cancer [6].

The Glandular cell abnormalities include three types:
The AGUS (Atypical glandular cells of undetermined significant borderline cell) between reactive changes to premalignant / malignant process, Adenocarcinoma in situ, and Adenocarcinoma [6].

This study aimed to determine the prevalence of cervical intraepithelial abnormality, and invasive cervical cancer among Iraqi women.

Materials and Methods

A cross sectional study done in Al-Alwiyaa Maternity Teaching Hospital, Women cancer Center.

Al-Alwiyaa Maternity Teaching Hospital, Women cancer Center, is one of the major cervical cancer early detection centers, and drain areas of the Al Rusafa part of Baghdad city, as well as some patients referred from the Salahaddin and Al Anbar governorates.

Data was obtained from the patient records for the years from January 2016-July 2019. Information regarding the age and cytology results of the Pap smear for each patient were taken.

Any record with deficient information, or without Pap Smear cytology results was excluded from the study.

No ethical concerns were present. All efforts were made to assure data confidentiality and the research publication is only for the purpose of improving services.

The center usually uses the conventional method of pap smear, using Ayre's spatula which was rotated five times in the clockwise direction, with the central longer bristles in the canal. All efforts were made to obtain quality samples around mid-cycle to ensure reliability of the test. The spatula with the sample was rapidly but lightly stroked, thinly and evenly across the surface of the slide and cytology spray fixatives were used without any delay. All slides were evaluated at the cytology laboratory of the hospital using light microscopy.= [7]. Smears were prepared by cytotechnologists and all slides were read by the consultant histopathologist. All reports gave the complete diagnosis despite some being non-uniform in pattern; with no specific classification scheme in the reporting of these smears.

Results

Analysis of (2,182) pap smear results was studied from the patient registries (Table 1).

Abnormal cervical pap smear cytology was found among 1,926 (88.3%), Abnormal intraepithelial lesion was found among 508 (23.3%) of total patients, 6 (0.3%) patient had unsatisfactory smear (Table 2).

Negative for intraepithelial lesion and malignancy (NILM) was found among 1,418 (65%), ASCUS 245 (11.2%), LISL 221 (10.1%), HISL 32 (1.5%), Squamous cell carcinoma 9 (0.4%), Adenocarcinoma 1 (0.04%), as shown in Table 3.

The mean age of patients with NILM was 39.4±10.9, ASCUS 40.5±10.8 , LISL 38.4±11.3, HISL 44.9±12.95, squamous cell carcinoma 48±6.6. This difference was statistically significant, as shown in Table 4.

Table 1: Number of patients by year

	Frequency	Percent
2016	527	24.2
2017	771	35.3
2018	657	30.1
2019 (Mid)	227	10.4
Total	2182	100.0

Table 2: Common findings in all the Pap smears

	Frequency	Percent
Normal	250	11.5
Abnormal	1926	88.3
NILM	1418	65.0
Abnormal intraepithelial lesion	508	23.3
Unsatisfactory	6	0.3
Total	2182	100.0

Table 3: The patient distribution according to the Pap smear cytology results and year of diagnosis

	Year of registration				
	2016.00	2017.00	2018.00	2019.00	Total
Normal	34	78	98	40	250
	6.5%	10.1%	14.9%	17.6%	11.5%
NILM	421	508	374	115	1418
	79.9%	65.9%	56.9%	50.7%	65.0%
ASCUS	21	83	110	31	245
	4.0%	10.8%	16.7%	13.7%	11.2%
LISL	46	82	55	38	221
	8.7%	10.6%	8.4%	16.7%	10.1%
HISL	3	15	12	2	32
	0.6%	1.9%	1.8%	0.9%	1.5%
Sq. cell ca.	1	1	6	1	9
	0.2%	0.1%	0.9%	0.4%	0.4%
Adenocarcinoma	1	0	0	0	1
	0.2%	0.0%	0.0%	0.0%	0.04%
Unsatisfactory	0	4	2	0	6
	0.0%	0.5%	0.3%	0.0%	0.3%
Total	527	771	657	227	2182
	100.0%	100.0%	100.0%	100.0%	100.0%

Table 4 The mean age of the patient according to cytological results

	N	Mean	Std. Deviation	Minimum	Maximum
Normal	240	40.99	11.9	18.00	84.00
NLM	1418	39.4	10.9	17.00	82.00
ASCUS	244	40.5	10.8	17.00	80.00
LISL	219	38.4	11.3	18.00	77.00
HISL	32	44.9	12.95	18.00	67.00
Sq. cell ca.	9	48.0000	6.6	43.00	63.00
Adenocarcinoma	1	55.0000	.	55.00	55.00
Unsatisfactory	6	45.0000	11.36662	32.00	63.00
Total	2169	39.7570	11.10888	17.00	84.00

ANOVA test F=3.6, df=7, P value= <0.001

Discussion

It is accepted that invasive cervical cancer is considered as a preventable disease as it is preceded by effectively treatable, long standing pre-neoplastic and pre-invasive states (8-10).

Therefore, its prevention depends on early diagnosis and treatment of these pre-invasive lesions.

Negative for intraepithelial lesion or malignancy (NILM) was found among (65%). This was supported by previous studies done in Iraq; Barzanjy B K et al (11) (88.4%), Mezaal MI,(12) (31.1%).

In Saudi Arabia Magdy Hassan Balaha et al(13) found (48.3%) NILM.

Abnormal intraepithelial lesion was found among 508 (23.3%) of total patients. This percentage resembles what was found previously by Abdulraheem A F, and Khudhairi J M(14) 2014 in Baghdad, HSIL (20%), squamous carcinoma (1%), and with Abdulla K N et al (15) 2016 which found HSIL(29%), and LSIL (48%) among patients with unhealthy cervix attending a gynecology clinic.

But these figures were higher than that found by Barzanjy B K et al(11) (11.3%) and invasive carcinoma (0.1%) and Al-Rubaiee et al 2006(16), who found (3.6%) of the sample was HSIL, and LSIL (33.7%).and that found in Saudi Arabia (4.95%) (13).

The figure in Iraq is higher than in China (3.12%)(17), in Belgium (3.7%)(18) and found in India (5.64%) (19).

The prevalence of HSIL is a precancerous cervical cytology and was (1.5%). This was in line with the literature done in Belgium (18) which was (1.1%). It is higher than in China(17) (0.41%), and India(19) (0.34%). It is lower than found in North of Iraq by Barzanjy B K et al(11) (2.1%), Abdulraheem A F, Al-Rubaiee et al 2006(16) (3.6%),and Khudhairi J M(14) in 2014 in Baghdad (20%).

Invasive squamous cell carcinoma was (0.4%) which is equal to that found in Belgium (0.4%)(18), and in India(19) (0.41%). This figure was higher than Barzanjy B K et al(11) (0.1%), in China(17) (0.02%), Kuwait(20) (0.02%), and in Turkey (0.08%)(21).

The high figure of abnormal intraepithelial lesions, is due to the fact that there is no cancer screening program(22), and the cervical clinic receives patients with significant complaints referred by the gynecologist, for pap smear for diagnosis. From another viewpoint maybe it is a marker of increasing cervical abnormalities in the last years as many socioeconomic and cultural factors, and destruction of health infrastructure that has been faced by the country. This high figure is an alerting sign for the future increasing cervical cancer rates if this problem is not taken seriously. The invasive squamous cell carcinoma was higher than found in China, Kuwait, and Turkey, and may be due to their presence of a good health care system and cervical cancer screening program, which reduces the cervical cancer rates.

The mean age of women with invasive squamous cell carcinoma was 48±6.6. This goes along with a study done in neighboring and other developing countries (13,20,23,24), and goes with the fact that most cervical cancer in the developing countries is diagnosed in the mid-forties or fifties of women's age, though some women are diagnosed much earlier (25,26).

In the USA it is diagnosed at an earlier age and commonly at (25-34) years, and decreased among women aged over 34 years due to implementation of a cervical cancer screening program(27). Early age of diagnosis was associated with early age at first intercourse, though the

effect appeared to be modified by number of sex partners before age 20. And the change in age at marriage and many socio-cultural, and sexual habits during the last decades of multiple wars and conflicts may have a finger print.

The higher rate of invasive squamous cancer in Iraq indicates the necessity of implementation of an effective cervical cancer screening program in Iraq.

Conclusion

Higher prevalence of cervical intraepithelial abnormality and invasive squamous cervical cancer, was reported in this study more than the neighboring countries, giving a clue to the urgent need for a cervical cancer screening program.

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Comparison of haemoglobin A1c level in insulin pump versus multi daily injections users for type one diabetes mellitus

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Abstract

Background: Saudi Arabia has the 3rd highest rate of type one diabetes in the world.

Objectives: To compare HbA1c, lipid profile and acute complications in Continuous Subcutaneous Insulin Infusion (CSII) with multiple daily injections (MDI) users for type one diabetes (T1DM) in Taif city, Saudi Arabia.

Settings and Design: Sampling was done for all patients with T1DM and managed either by MDI or CSII.

Methods: We recruited all results from May 2015 to January 2018 comparing HbA1c, lipid profile and acute complications. Data collection was done through electronic files. Data was analysed by the Statistical Package of Social Sciences (SPSS). The independent sample 't' test was used to compare continuous variables. Chi-square test was used to compare categorical variables.

Results: Of 214 patients, 137 on MDI and 77 on pump were recruited. All HbA1c readings were significantly higher in MDI users ($p<0.05$). Acute complications were higher in pump users (7.8% and 18.2%) compared to MDI users (2.9% and 6.6%) for each hypoglycaemia and DKA respectively. The occurrence of hypoglycaemia and DKA in MDI and pump users were found to be statistically insignificant, ($p=0.155$ and $p=0.134$) and ($p=0.790$ and $p=0.721$) respectively.

Conclusions: In patients with T1DM, HbA1c was significantly higher in MDI users, conversely, DKA was significantly higher in pump users. Hypoglycemia showed a significant relation to age in MDI group. Lipid profile was statistically insignificant.

Key words: Comparison, haemoglobin, insulin, pump, injections, diabetes

Introduction

Insulin pump or Continuous Subcutaneous Insulin Infusion (CSII) aims to lower the risk of acute complications (1). Insulin pump works according to blood glucose status of the patient and predicted variations of the meals. Pump users can adjust their basal and bolus doses more accurately, which is needed for better compliance (1). The suitable selection of an insulin pump is important to meet the requirements and circumstances of every patient (physiologically and financially) (2). The aim of the study was to compare (CSII) and (MDI) concerning HbA1c, lipids profile, and complications including DKA and hypoglycemia in type-1 diabetes.

Subjects and Methods

Study design and setting: The study was conducted retrospectively at diabetes and endocrinology center, King Abdul-Aziz Specialist Hospital in Taif, Saudi Arabia.

Sampling and study instrument: Data were recruited from electronic files and were eligible if their ages were from 1-40 years , and were on either insulin pump or multiple daily insulin injection regimens, and on a stable insulin regimen for at least one month prior involving either use of an insulin pump or multiple daily injections consisting of insulin glargine and insulin lispro or insulin as part or any new or other type of insulin.

Inclusion criteria: Patients with normal thyroid function, not on other medications or anti-inflammatory agents, steroids before, during, or after the study were involved in the study. Also, with no recent history of infectious, inflammatory, or immune diseases. Insulin pump patients were using MINIMED PARADIGM® 515/715, 515/722, and veo 754 INSULIN PUMPs.

Exclusion criteria: Patients were excluded if they had any heart disease, liver disease, kidney disease, high blood pressure, rheumatic disease, stroke, tuberculosis TB, epilepsy, HIV, an active infection, and tumour (cancer) history or if they were terminally or mentally ill; and if they were currently using glucocorticoid or beta-blockers or had any recent surgery.

After applying the exclusion criteria, the total number of patients was 214, 137 on MDI and 77 on the insulin pump.

Ethical approval: Research Ethics Center at King Abdul-Aziz Specialist Hospital (KAASH) approved the study. Since there was no contact with the patients (electronic files) and the data was anonymous, consent was not needed.

Statistical analysis

Data of this research were entered and analysed using the Statistical Package of Social Sciences (SPSS) Ver 23. The independent sample 't' test was used to compare the values of MDI and Insulin Pump group based on the normality of data. A significance value, $P<0.05$, was considered as statistically significant. Pearson Chi-square test was used as a statistical test for finding an association between categorical variables in the study.

Results

A total of 214 patients were involved in the study after the exclusion of 28 patients; 137 were on multiple daily injections, and 77 on an insulin pump. The mean age was 14.2±1.76 in the MDI group and 18.5±6 in the pump group (Figure 1). Females were higher in the insulin pump group (59.7%) compared to the MDI group, which was nearly equal (48.9 males vs. 51.1 females) (Figure 2).

Four HbA1c results were taken retrospectively in an interval of three months for each patient. Mean of first HbA1c results (10.40±1.95 vs 8.88±1.82, p <0.01), second (9.99 ± 2.02 vs 8.36 ± 1.68, p <0.01), third (10.21 ± 1.74 vs 8.08 ± 1.53, p <0.01) and final results (10.40± 1.80 vs 8.18± 1.39, p <0.01) were all significantly higher in MDI users compared to pump users. In addition, lipid profile including HDL (53.2439±15.48 vs 52.0851±13.24, p = 0.668), LDL (112.75±44.89 vs 105.27±25.31, p = 0.301), Triglyceride (97.27±75.9 vs 88.46±67.8, p = 0.574) and cholesterol (180.31±52.6 vs 167.44±32.0, p = 0.128) showed no significant difference between MDI versus pump users. (Table 1).

The frequency and percentage of DKA were significantly higher in the insulin pump group compared to the MDI group, 14 patients vs. nine patients, respectively (18.2% vs. 6.6%, p value= 0.008). However, there was no significant difference in the frequency and percentage of hypoglycemia between the two groups, six patients vs. four patients, respectively (7.8% vs. 2.9%, p value= 0.105). (Table 2).

We also studied the relationship between the age and the complications of both DKA and hypoglycaemia in MDI and pumped patients. The results of DKA in relation to age in MDI and pump users were not significant (p value=0.705 vs. p value=0.812) respectively, however, the results of hypoglycemia in relation to duration in MDI and pump users showed a significant relation in MDI group only (p value<0.05 vs. p-value= 0.295), respectively (Table 3).

Figure 1: Distribution of the studied patients according to their age groups

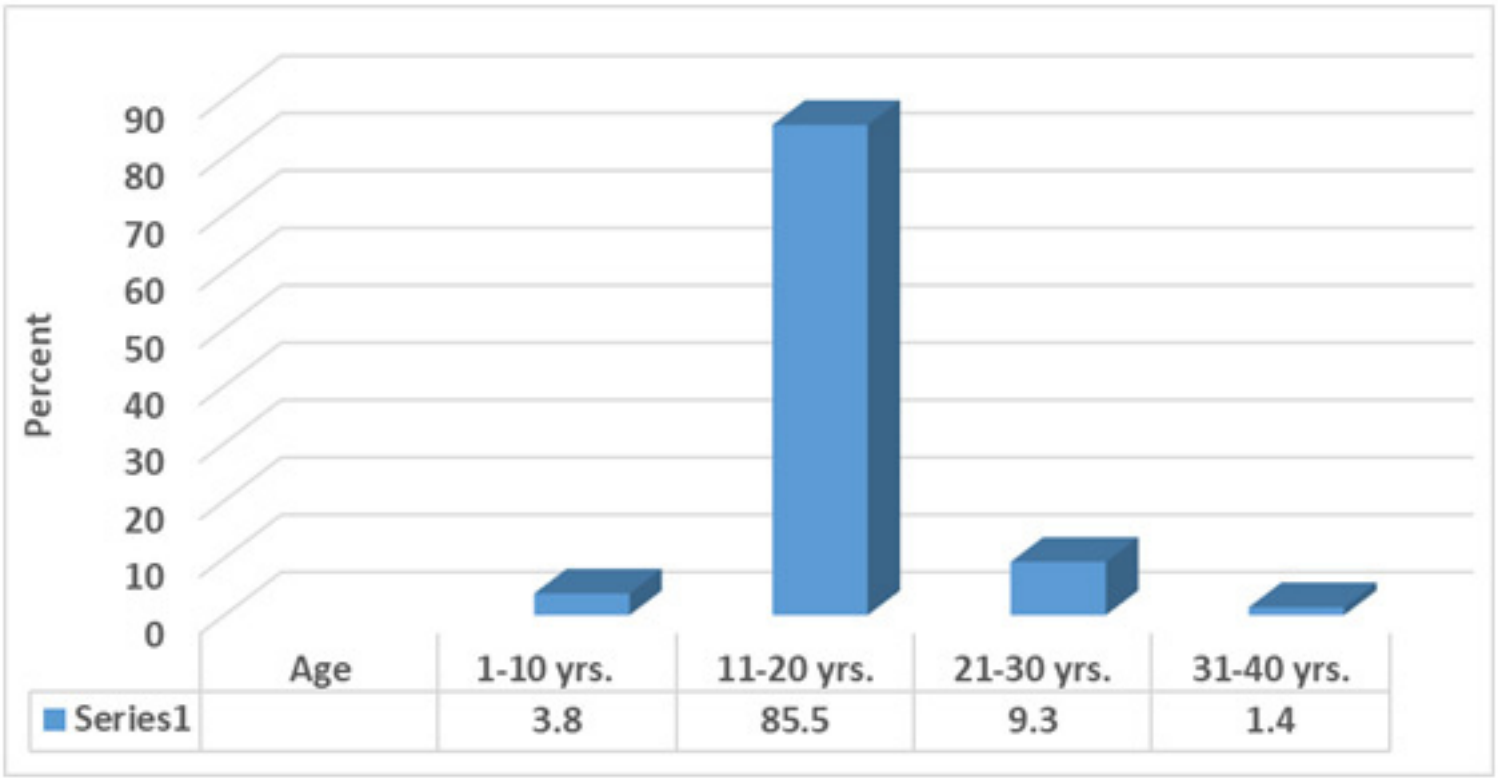

Figure 2: Gender in both MDI and insulin pump groups

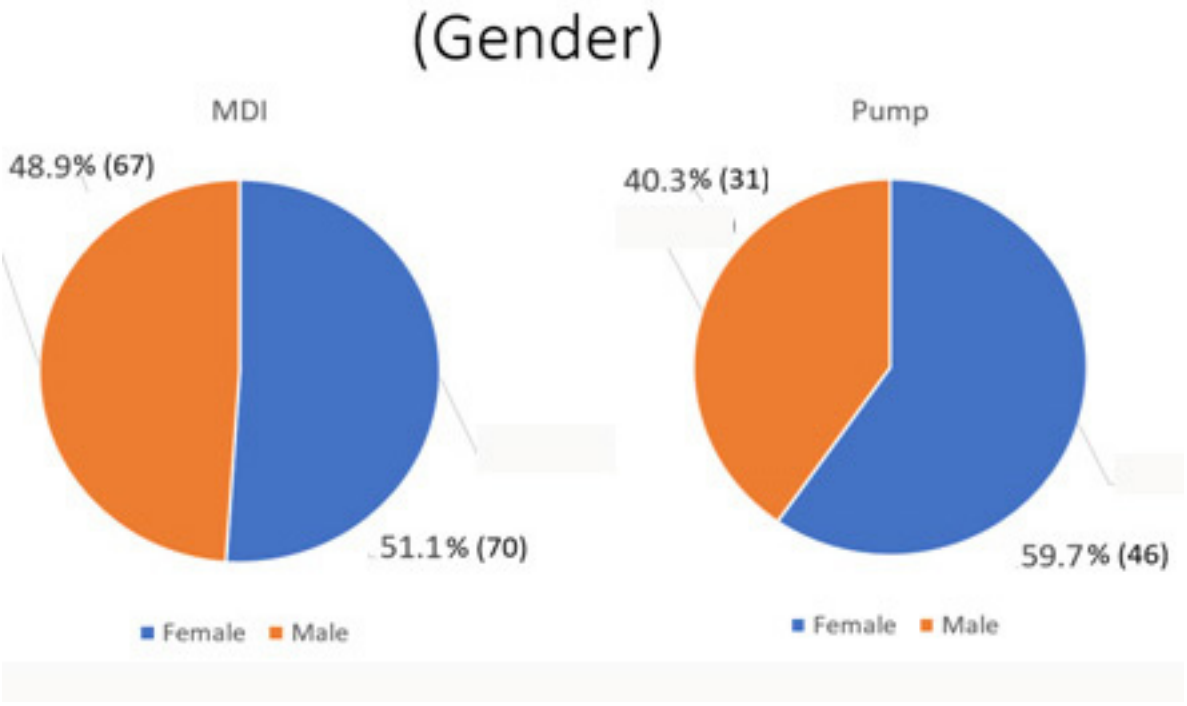

Table 1: HbA1c results in all four quarters of one year, and lipid profile including HDL, LDL, Total cholesterol and triglyceride results of MDI group compared to insulin pump group

Variable	Group	Mean ± SD	t-test	p value
A1c-1	MDI	10.4008±1.95791	5.274	.0001*
	PUMP	8.8818±1.82848		
A1c-2	MDI	9.9919±2.02436	5.409	.000*
	PUMP	8.3646±1.68860		
A1c-3	MDI	10.2171±1.74142	7.794	.000*
	PUMP	8.0879±1.53297		
A1c-4	MDI	10.4052±1.80452	7.013	.000*
	PUMP	8.1857±1.39717		
HDL	MDI	53.2439±15.48281	.431	.668
	PUMP	52.0851±13.24818		
LDL	MDI	112.7512±44.89962	1.039	.301
	PUMP	105.2783±25.31447		
Total cholesterol	MDI	180.3140±52.37315	1.534	.128
	PUMP	167.4468±32.00191		
Triglyceride	MDI	97.2740±75.97665	.564	.574
	PUMP	88.4688±67.87559	.431	.356

Table (2): Comparison between MDI and pump group according to DKA and hypoglycaemia

Variable			DKA		Hypoglycaemia	
			present	absent	present	absent
GROUP	MDI	n (%)	9 (6.6%)	128 (93.4%)	4 (2.9%)	133 (97.1%)
	PUMP	n (%)	14 (18.2%)	63 (81.8%)	6 (7.8%)	71 (92.2%)
Total		n (%)	23 (10.7%)	191 (89.3%)	10 (4.7%)	204 (95.3%)
P value			0.008*		0.105	

Table 3: Relationship between DKA and hypoglycaemia to age

Variable			1-10 yrs.	11-20 yrs.	21-30 yrs.	31-40 yrs.	Total	p-value
DKA	MDI	Present (n)	0	9	-	-	9 (6.6%)	0.705
		Absent (n)	2	126	-	-	128 (93.4%)	
	PUMP	Present (n)	1	9	4	0	14 (18.2%)	0.812
		Absent (n)	4	39	16	4	63 (81.8%)	
Hypoglycaemia	MDI	Present (n)	1	3	-	-	4 (2.9%)	0.000*
		Absent (n)	1	132	-	-	133 (97.1%)	
	PUMP	Present (n)	1	2	3	0	6 (7.8%)	0.295
		Absent (n)	4	46	17	4	71 (92.2%)	

Discussion

Saudi Arabia is ranked as the 3rd country in the world regarding the rate of type 1 diabetes (T1DM) (2), therefore, our aim was to conduct a study comparing HbA1c, lipid profile (HDL, LDL, Triglyceride, cholesterol) and complications including both hypoglycemia and diabetic ketoacidosis specifically in Taif city, Western region (3).

In our study, we found that the mean of HbA1c in pump users group is significantly lower than the mean of the MDI users. Regarding complications, DKA was significantly higher in the pump group compared to the MDI group; however, there was no significant difference in hypoglycemia between the two groups. Also, there is no significant difference regarding the lipid profile between the two groups.

In a study conducted in Prince Sultan Military Medical City (PSMMC), Riyadh, Saudi Arabia, there was a significant decrease in the frequency of hypoglycemia as well as reduction in the level of HbA1c in pump users (4). The frequency of hypoglycemia among female patients was significantly reduced as well as patients who had a shorter duration of T1DM at six months duration when compared to the baseline (1.50 ± 1.40 versus 2.63 ± 0.92) (p-value <0.05) (5).

Also, a study conducted by Bin-Abbas et al. (2015) found patients who had T1DM for six years as a mean duration (6). The age of the patients ranged from 4-18 years, and the patients were followed on insulin pump therapy for a mean duration of 10 months. They found a significant decrease in HbA1c, frequency of hypoglycemic episodes, and frequency of diabetic ketoacidosis (DKA) events during insulin pump therapy (6). Both previous research (5,6) had almost the same outcome as our research regarding the results of HbA1c. On the other hand, complications results were not the same as our study.

A retrospective study on 326 subjects using pump insulin therapy compared with 328 patients on multiple daily insulin injections regimen, was conducted in Kuwait in 2015 and showed a decrease of HbA1c results in six months to 5 years follow up (p-value<0.001) in insulin pump users compared to the MDI group. These results were unlike the baseline results which showed no significant difference (p=0.741) which is consistent with our study (7).

In addition, pump users group showed a significant decrease in hypoglycaemic episodes (9.7 to 4.1 episode per 100 patients per year, p<0.05). On the other hand, the MDI group showed an increase in hypoglycaemic episodes (7.7 to 19.7 episodes per 100 patients per year, p<0.05), which is different compared to our research (8). There was no significant difference in DKA episodes either at the beginning or at the end of the study between the two groups (p=0.08) in contrast to our study, which showed a significant difference (8).

A meta-analysis was done in London in 2008 on 22 studies. In general, the study showed an overall rate ratio of severe hypoglycaemic episodes of 4.19 in both randomized controlled trials (RCTs) and before/after studies (9).

Glycaemic control was also studied in this research, and it revealed that HbA1c difference was lower in RCTs compared with before/after studies (0.21% vs. 0.72%, p=0.042) (10).

Regarding severe hypoglycaemic episodes, all studied research in this meta-analysis were in favour of insulin pump therapy except two studies, Maniatis et al. (2001) and Sciaffini et al. (2003) which were more in favour of MDI users compared to insulin pump users which is consistent with the results of our research (11,12). In glycaemic control, all studies were in favour of insulin pump users, which is similar to the results of our research, except the study of Kaderman et al. (1999) (13).

A retrospective case-control study during a two year period conducted in Sweden compares 216 patients starting insulin pump with a control group on MDI. The study shows an improvement of HbA1c in insulin pump patients after 6 and 12 months compared with the MDI group. Regarding the complications, DKA was higher in the insulin pump group compared with the MDI group (2.8 vs. 0.5/100 person-yr) and the hypoglycaemic episodes were 3 per 100 persons-year in the insulin pump group versus 6 in the MDI group (p < 0.05). This study shows a similar outcome to our study regarding both HbA1c and DKA; however, it is not consistent with our study regarding hypoglycaemic episodes (11).

In the present study, no significant relationship was found between age and frequency of DKA and hypoglycaemia in both MDI and pump users patients except for hypoglycaemia in MDI group which showed a significant relation (p-value <0.05).

Limitations

Limitations of our study could be the difficulty of generalizing our findings, as the target population didn't cover the whole Saudi population as it was an online survey.

Conclusion

In a patient with T1DM, HbA1c was significantly higher in MDI users compared to pump users. Lipid profile, including HDL, LDL, Triglyceride, and cholesterol was statistically insignificant. However, DKA was significantly higher in pump users; however, there was no significant difference in regard to hypoglycaemia. There was no significant relationship between complications and age except for hypoglycaemia which showed a significant relation.

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Triglycerides may behave as acute phase reactants in the plasma

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Abstract

Background: We tried to understand some unknown functions of plasma triglycerides.

Methods: Patients with plasma triglycerides lower than 60 mg/dL were put into the first, lower than 100 mg/dL into the second, lower than 150 mg/dL into the third, lower than 200 mg/dL into the fourth, and 200 mg/dL or higher into the fifth groups, respectively.

Results: The study included 875 cases (505 females), totally. Mean age increased up to the plasma triglycerides value of 200 mg/dL, and there was an increase of triglycerides about 7.8 mg/dL for each year of aging. Whereas male ratio increased parallel to the increased plasma values of triglycerides, continuously (30.9% versus 51.2%, p<0.001). Mean Body Mass Index (BMI) was 24.6, 27.1, 29.4, 29.9, and 30.0 kg/m2 in the five groups, respectively, and it was only normal in patients with plasma triglycerides values lower than 60 mg/dL. Fasting plasma glucose (FPG), hypertension (HT), diabetes mellitus (DM), smoking, chronic obstructive pulmonary disease (COPD), and chronic renal disease (CRD) increased parallel to the increased triglycerides, continuously. Whereas low density lipoproteins (LDL), white coat hypertension (WCH), and coronary heart disease (CHD) increased just up to plasma triglycerides value of 200 mg/dL.

Conclusions: Plasma triglycerides may behave as acute phase reactants indicating disseminated endothelial damage, inflammation, fibrosis, and eventual atherosclerosis all over the body. Interestingly, parallel to the increased plasma triglycerides values, significant deterioration was observed regarding the components of the metabolic syndrome including mean age, male gender, smoking, BMI, FPG, LDL, WCH, HT, DM, COPD, CHD and CRD.

Key words: Triglycerides, acute phase reactants, smoking, male gender, excess weight, aging, chronic endothelial damage, accelerated atherosclerosis

Introduction

Chronic endothelial damage may be the most common type of vasculitis, and the leading cause of aging in human beings (1-4). Much higher blood pressure (BP) of the afferent vasculature may be the major underlying cause by inducing recurrent injuries on endothelium, and probably whole afferent vasculature including capillaries are mainly involved in the process. Thus the term of venosclerosis is not as famous as atherosclerosis in the literature. Secondary to the chronic endothelial damage, inflammation, edema, and fibrosis, vascular walls thicken, their lumens narrow, and they lose their elastic nature which reduces blood supply to terminal organs and increases systolic BP further. Some of the well-known components of the inflammatory process are physical inactivity, animal-rich diet, overweight, smoking, alcohol, hypertriglyceridemia, hyperbetalipoproteinemia, impaired fasting glucose, impaired glucose tolerance, white coat hypertension (WCH), chronic inflammatory or infectious processes, and cancers. Some of the irreversible consequences of the chronic destructive process include obesity, hypertension (HT), diabetes mellitus (DM), cirrhosis, peripheric artery disease (PAD), chronic obstructive pulmonary disease (COPD), chronic renal disease (CRD), coronary heart disease (CHD), mesenteric ischemia, osteoporosis, and stroke (5-7). Although early withdrawal of the causative factors may delay terminal consequences, after development of cirrhosis, COPD, CRD, CHD, PAD, or stroke, endothelial changes cannot be reversed completely due to their fibrotic nature. The underlying causes and terminal consequences were researched under the titles of metabolic syndrome, aging syndrome, or accelerated endothelial damage syndrome in the literature, extensively (8-13). Although its normal limits have not been determined yet, higher triglycerides values may be significant indicators of the metabolic syndrome (14). Due to the strong association between higher plasma triglycerides and prevalence of CHD, Adult Treatment Panel (ATP) III adopts lower cutpoints for triglycerides abnormalities than did ATP II (15, 16). Although ATP II determined the normal value of plasma triglycerides as lower than 200 mg/dL in 1994, World Health Organisation in 1999 (17) and ATP III in 2001 reduced its normal limit as lower than 150 mg/dL (16). Although these cutpoints are usually used to define limits of the metabolic syndrome, there are suspicions about the safest upper limit of plasma triglycerides in the literature. We tried to understand some undetermined functions of plasma triglycerides in the present study.

Material and Methods

The study was performed in the Internal Medicine Polyclinic of the Dumlupinar University between August 2005 and March 2007. Consecutive patients above the age of 15 years were included into the study. Their medical histories including HT, DM, COPD, and already used medications were learnt, and a routine check up procedure was performed including fasting plasma glucose (FPG), creatinine, liver function tests, markers of hepatitis viruses A, B, C, and human immunodeficiency virus, plasma triglycerides, low density lipoproteins (LDL), high density lipoproteins (HDL), an electrocardiogram, an abdominal ultrasonography, and a Doppler echocardiogram just in required cases. Current daily smokers with six pack-months and cases with a history of three pack-years were accepted as smokers. Patients with devastating illnesses including type 1 DM, malignancies, acute or chronic renal failure, ascites, hyper- or hypothyroidism, and heart failure were excluded to avoid their possible effects on weight. Additionally, anti-hyperlipidemic drugs, metformin, or acarbose users were excluded to avoid their possible effects on blood lipid profiles and body weight (18, 19). Body mass index (BMI) of each patient was calculated by measurements of the Same Physician instead of verbal expressions. Weight in kilograms is divided by height in meters squared (16). Cases with an overnight FPG level of 126 mg/dL or greater on two occasions or already using antidiabetic medications were defined as diabetics (16). An oral glucose tolerance test with 75-gram glucose was performed in cases with a FPG level between 110 and 126 mg/dL, and diagnosis of cases with a 2-hour plasma glucose level of 200 mg/dL or higher is DM (16). CRD is diagnosed with a persistently elevated serum creatinine level of 1.3 mg/dL in males and 1.2 mg/dL in females. Additionally, office blood pressure (OBP) was checked after a 5-minute rest in seated position with a mercury sphygmomanometer on three visits, and no smoking was permitted during the previous 2 hours. A 10-day twice daily measurement of blood pressure at home (HBP) was obtained in all cases after brief education about proper BP measurement techniques (20). An additional 24-hour ambulatory blood pressure monitoring was not required due to its similar effectivity with the HBP measurements (3). Eventually, HT is defined as a mean BP of 135/85 mmHg or greater on HBP measurements, and WCH as an OBP of 140/90 mmHg or greater but a mean HBP measurement of lower than 135/85 mmHg (20). An exercise electrocardiogram was performed just in cases with an abnormal electrocardiogram and/or angina pectoris. Coronary angiography was taken just for the exercise electrocardiogram positive cases. So CHD was diagnosed either angiographically or with the Doppler echocardiographic findings as the movement disorders in the cardiac walls. The spirometric pulmonary function tests were performed in required cases, and the criterion for diagnosis of COPD is post-bronchodilator forced expiratory volume in one second/forced vital capacity of less than 70% (21). Finally, patients with plasma triglycerides values of lower than 60 mg/dL were put into the first, lower than 100 mg/dL into the second, lower than 150 mg/dL into the third, lower than 200 mg/dL into the fourth, and 200 mg/dL or greater into the fifth groups, respectively. The mean age, female ratio, smoking, BMI, FPG, plasma triglycerides, LDL, HDL, WCH, HT, DM, COPD, CHD and CRD were detected in the five groups and compared in between. Mann-Whitney U test, Independent-Samples T test, and comparison of proportions were used as the methods of statistical analyses.

Results

The study included 875 cases (505 females and 370 males), totally. The mean triglycerides values were 51.0, 78.3, 122.2, 174.1 and 325.8 mg/dL in the five groups, respectively. The mean age increased just up to the plasma triglycerides value of 200 mg/dL, and there was an increase of triglycerides, about 7.8 mg/dL for each year of aging. Male ratio increased parallel to the increased plasma triglycerides values, continuously (30.9% versus 51.2%, p<0.001). Beside that the mean BMI values were 24.6, 27.1, 29.4, 29.9 and 30.0 kg/m2 in the five groups, respectively. As another definition, only the cases with plasma triglycerides values lower than 60 mg/dL had a normal mean BMI value. FPG, HT, DM, COPD, and CRD increased parallel to the increased plasma triglycerides values, continuously. Whereas LDL, WCH, and CHD increased just up to the triglycerides value of 200 mg/dL. Although the prevalence of smoking increased parallel to the increased triglycerides values, continuously (16.6% versus 38.3%, p<0.001), the most significant increase was seen just after the plasma triglycerides value of 200 mg/dL, and there was no significant difference about the effects of aging or excess weight on this step. On the other hand, the mean HDL values were similar in all of the five groups; interestingly (p>0.05 between all) (Table 1).

Discussion

Excess weight may lead to structural and functional abnormalities of many organ systems in the body. Adipose tissue produces leptin, tumor necrosis factor-alpha, plasminogen activator inhibitor-1, and adiponectin-like cytokines which act as acute phase reactants in the plasma (22, 23). Excess weight-induced chronic low-grade vascular endothelial inflammation may play a significant role in the pathogenesis of accelerated atherosclerotic process all over the body (1, 2). Additionally, excess weight may cause an increased blood volume as well as an increased cardiac output thought to be the result of increased oxygen need of the excessive fat tissue. The prolonged increase in the blood volume may lead to myocardial hypertrophy terminating with a decreased cardiac compliance. Beside that, the prevalence of high FPG and total cholesterol increased parallel to the higher values of BMI (24). Combination of these cardiovascular risk factors will eventually terminate with an increase in left ventricular stroke work, higher risks of arrhythmias, cardiac failure, and sudden cardiac death. Similarly, the prevalence of CHD and stroke increased parallel to the higher BMI values in another study (25), and risk of death from all causes including cancers increased throughout the range of moderate to severe weight excess in all age groups (26). The relationships between excess weight, increased BP, and plasma triglycerides were described in the metabolic syndrome (14), and clinical manifestations of the syndrome included obesity, hypertriglyceridemia, hyperbetalipoproteinemia, HT, insulin resistance, and proinflammatory and prothrombotic states (10). Similarly, prevalence of smoking (42.2% versus 28.4%, p<0.01), excess weight (83.6% versus 70.6%, p<0.01), DM (16.3% versus 10.3%, p<0.05), and HT (23.2% versus 11.2%, p<0.001) were all higher in the hypertriglyceridemia group in another study (27). On the other hand, although the prevalence of hyperbetalipoproteinemia was similar both in the hypertriglyceridemia (200 mg/dL or higher) and control groups (18.9% versus 16.3%, p>0.05, respectively) in the above study (27), the mean LDL values increased up to the plasma triglycerides value of 200 mg/dL but not more in the present study. Beside that, the mean BMI values increased just up to the plasma triglycerides value of 150 mg/dL, significantly (p<0.05 for each step).

Smoking may be found among one of the most common causes of vasculitis all over the world. It is a major risk factor for the development of atherosclerotic endpoints including CHD, PAD, COPD, cirrhosis, CRD, and stroke (12, 13). Smoking causes a chronic inflammatory process on the vascular endothelium, particularly on the respiratory tract and lungs, terminating with an accelerated atherosclerosis, end-organ insufficiencies, early aging, and premature death. Thus smoking should be accepted as one of the major components of the metabolic syndrome. Strong and irreversible atherosclerotic effects of smoking are the most obviously observed in Buerger's disease. It is an obliterative vasculitis characterized by inflammatory changes in the small and medium-sized arteries and veins, and it has never been reported in the absence of smoking in the literature. Beside the strong and irreversible atherosclerotic effects of smoking, smoking in humans and nicotine administration in animals may be associated with a decreased BMI (28). Evidence revealed an increased energy expenditure during smoking both on rest and light physical activity (29) and nicotine supplied by patch after smoking cessation decreased caloric intake in a dose-related manner (30). According to an animal study, nicotine may lengthen intermeal time and simultaneously decrease amount of meal eaten (31). Additionally, BMI seems to be the highest in former and the lowest in current smokers (32). Smoking may be associated with a postcessation weight gain (33). Similarly, although CHD was detected with similar prevalence in both genders in a previous study (34), prevalence of smoking and COPD were higher in males against the higher BMI, LDL, triglycerides, WCH, HT, and DM in females with CHD. This result may indicate both the strong atherosclerotic and appetite decreasing roles of smoking (35). Similarly, the incidence of myocardial infarction is increased six-fold in women and three-fold in men who smoke 20 cigarettes per day (36). In another definition, smoking is more dangerous for women probably due to the associated higher BMI and its consequences in them. Parallel to the above results, the proportion of smokers is consistently higher in men in the literature (19). So smoking is a powerful atherosclerotic risk factor with suppressor effects on appetite. Smoking-induced appetite loss may be related with the vascular endothelial inflammation all over the body, since loss of appetite is one of the major symptoms of disseminated inflammation in the body. Physicians can understand healing of their patients by means of normalizing appetite. Several toxic substances found in cigarette smoke get into the circulation by means of the respiratory tract and cause a vascular endothelial inflammation until their clearance. But due to the repeated smoking habit, the clearance

Table 1: Characteristic features of the study cases according to the plasma triglycerides values

Variable	Lower than 60 mg/dL	p-value	Lower than 100 mg/dL	p-value	Lower than 150 mg/dL	p-value	Lower than 200 mg/dL	p-value	200 mg/dL or higher
Number of cases	84		207		235		148		201
Age (year)	*35.6 ± 16.4 (17-79)*	*0.000*	*43.6 ± 17.5 (16-83)*	*0.009*	*47.7 ± 15.3 (16-82)*	*0.018*	*51.2 ± 12.6 (19-82)*	Ns*	49.8 ± 12.3 (19-88)
Male ratio	*30.9%*	*0.05>*	*39.1%*	Ns	*40.4%*	Ns	*43.9%*	*0.05>*	*51.2%*
Smoking	*16.6%*	Ns	*21.7%*	Ns	*26.3%*	Ns	23.6%	*0.001>*	*38.3%*
BMI† (kg/m²)	*24.6 ± 5.3 (16.7-45.9)*	*0.002*	*27.1 ± 5.9 (16.7-49.3)*	*0.000*	*29.4 ± 6.1 (18.4-51.0)*	Ns	*29.9 ± 4.8 (19.2-49.0)*	Ns	*30.0 ± 5.0 (21.0-51.1)*
FPG‡ (mg/dL)	*96.5 ± 35.3 (71-377)*	*0.016*	*106.6 ± 48.7 (59-400)*	Ns	*106.8 ± 35.1 (71-335)*	*0.006*	*117.3 ± 47.8 (68-386)*	Ns	*124.3 ± 55.3 (74-392)*
Triglycerides (mg/dL)	*51.0 ± 7.5 (27-59)*	*0.000*	*78.3 ± 10.8 (60-99)*	*0.000*	*122.2 ± 145 (100-149)*	*0.000*	*174.1 ± 142 (150-199)*	*0.000*	*325.8 ± 160.4 (200-1.350)*
LDL§ (mg/dL)	*98.6 ± 23.3 (56-161)*	*0.000*	*114.6 ± 33.0 (31-269)*	*0.000*	*131.1 ± 31.7 (56-228)*	*0.033*	*137.5 ± 32.4 (50-237)*	*0.020*	*129.0 ± 40.8 (10-239)*
HDL ‖ (mg/dL)	44.9 ± 12.3 (24-77)	Ns	48.8 ± 11.6 (33-91)	Ns	46.4 ± 10.5 (27-80)	Ns	43.7 ± 9.0 (22-67)	Ns	43.1 ± 9.1 (25-70)
*WCH***	*17.8%*	*0.05>*	*24.1%*	*0.05>*	*31.0%*	Ns	*35.1%*	Ns	32.3%
*HT****	*8.3%*	*0.001>*	*15.9%*	*0.05>*	*21.2%*	Ns	*22.2%*	Ns	*26.3%*
*DM*****	*2.3%*	*0.001>*	*11.1%*	Ns	*13.6%*	Ns	*18.2%*	*0.05>*	*24.3%*
*COPD******	*4.7%*	*0.01>*	*9.1%*	*0.01>*	*14.0%*	Ns	12.8%	*0.05>*	*18.4%*
*CHD*******	*4.7%*	*0.001>*	*10.1%*	Ns	*11.4%*	Ns	*14.8%*	Ns	11.9%
*CRD********	0.0%	Ns	1.9%	Ns	*0.4%*	*0.01>*	*2.0%*	*0.01>*	*4.9%*

*Nonsignificant (p>0.05) †Body mass index ‡Fasting plasma glucose
§Low density lipoproteins ‖High density lipoproteins
**White coat hypertension ***Hypertension ****Diabetes mellitus
*****Chronic obstructive pulmonary disease
******Coronary heart disease *******Chronic renal disease

never terminates. So the patients become ill with loss of appetite, permanently. In another explanation, smoking-induced weight loss is an indicator of being ill instead of being healthy (30-32). After smoking cessation, appetite normalizes with a prominent weight gain but the returned weight is their physiological weight, actually.

Although the obvious consequences of excess weight on health, nearly three-quarters of cases above the age of 30 years have excess weight (37). The prevalence of excess weight increases by decades, particularly after the third decade (37), and 30th and 70th years of age may be the breaking points of life for weight. Aging may be the major determiner factor of excess weight. Probably, relatively decreased physical and mental stresses after the age of 30 years and debility and comorbid disorders-induced restrictions after the age of 70 years may be the major causes for the changes of BMI. Interestingly, the mean age and BMI values increased just up to the plasma triglycerides values of 200 mg/dL and 150 mg/dL, respectively, in the present study. So smoking remained as the major causative factor for the hypertriglyceridemia above the plasma triglycerides value of 200 mg/dL. Beside that the mean BMI values were 24.4, 27.0, 29.3, 29.9 and 30.1 kg/m2 in the five study groups, respectively. In other words, only the cases with the plasma triglycerides values of lower than 60 mg/dL had a normal BMI. On the other hand, the mean age and triglycerides value of the first group were 35.6 years and 51.0 mg/dL, respectively. They were 43.6 years and 78.3 mg/dL in the second, 47.7 years and 122.2 mg/dL in the third, and 51.2 years and 174.1 mg/dL in the fourth groups, respectively. In another definition, the triglycerides values increased about 7.8 mg/dL for each year of aging up to 200 mg/dL in the plasma. So aging alone may be another risk factor for chronic low-grade inflammation on vascular endothelium all over the body.

Although ATP III reduced the normal upper limit of plasma triglycerides as 150 mg/dL in 2001 (16), whether or not much lower limits provide additional benefits for health is unknown (38). Similar to a recent study (39), prevalence of smoking was the highest in the highest triglycerides having group in the present study that may also indicate inflammatory roles of smoking in the metabolic syndrome, since triglycerides may actually be acute phase reactants in the plasma. FPG, BMI, HT, DM and COPD increased parallel to the increased plasma triglycerides from the first up to the last groups, gradually. As one of our opinions, significantly elevated mean age by the increased plasma triglycerides may be secondary to aging-induced decreased physical and mental stresses, which eventually terminates with onset of excess weight and its consequences. Interestingly, although the mean age increased up to the triglycerides value of 200 mg/dL, it then decreased. The similar trend was also seen with the mean LDL value. These trends may be due to the fact that although the borderline high triglycerides values (150-199 mg/dL) are seen together with physical inactivity and overweight, the high triglycerides (200-499 mg/dL) and very high triglycerides values (500 mg/dL or higher) may be secondary to both genetic factors, smoking, and terminal consequences of the metabolic syndrome including obesity, DM, HT, COPD, cirrhosis, CRD, PAD, CHD and stroke (16). But although the underlying causes of the high and very high plasma triglycerides may be a little bit different, probably risks of the terminal endpoints of the metabolic syndrome do not change in them. For example, prevalence of HT, DM, COPD, and CRD were the highest in the highest triglycerides having group in the present study. Eventually, although some authors reported that lipid assessment can be simplified by measurements of total cholesterol (40), the present study and most of the others indicated a causal relationship between higher triglycerides and terminal consequences of the metabolic syndrome (41).

As a conclusion, plasma triglycerides may behave as acute phase reactants indicating disseminated endothelial damage, inflammation, fibrosis, and eventual atherosclerosis all over the body. Interestingly, parallel to the increased plasma triglycerides values, significant deteriorations were observed regarding components of the metabolic syndrome including mean age, male gender, smoking, BMI, FPG, LDL, WCH, HT, DM, COPD, CHD and CRD in the present study.

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Awareness, knowledge, attitude and practices of first aid skills among medical and non-medical students at Taif University

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Abstract

Background: First aid is the initial assistance or treatment given at the site of accident to someone who is injured or suddenly taken ill, before the arrival of ambulance.

Objectives: The study aimed to examine knowledge and attitude of first aid skills among medical and non-medical students at Taif University.

Materials and Method: This was a cross-sectional study and was conducted on a convenience sample of 500 female and male (Medical and Non-Medical) students. The research proposal was approved by the Research Committee of the Taif University. The data was gained by validated questionnaire in a sample of 500 participants, who were randomly selected. The questionnaire included two parts: part 1 had Sociodemographic details of the participants and part 2 had items related to Knowledge, awareness, attitude and practices regarding first aid skills.

Results: The mean age of the participants was 21 ± 1.5 years. 56.6% of the participants were found to have good awareness regarding first aid and Basic life Support (BLS). The attitude towards first aid was very poor and only 8% had a good attitude toward it. There was a statistically significant relationship observed between attendance to first aid course and awareness, knowledge and practices.

Conclusion: The attitude and skills of the study participants were not satisfactory. Universities need to organize an effective committee to monitor and conduct first aid courses and activities. Students need to realize the public importance of such activities and ensure they effectively involve in these lifesaving procedures.

Key words: Awareness, medical, first, aid, emergency, Taif,

Introduction

First aid is the initial assistance or treatment given at the site of an accident to someone who is injured or suddenly taken ill, before the arrival of the paramedics. A first aid provider should be able to assess the situation quickly and calmly, and deal with life-threatening conditions outside the facilitated environment of a hospital [1]. The goals of a first aid provider include preserving life, alleviating suffering, preventing further illness or injury, and promoting recovery [2].

First aid and Basic life support consist of simple, sometimes lifesaving, medical techniques, which an individual, either with or without a formal medical background can be trained to perform with minimal equipment. Non-fatal injuries that predominantly happen in daily life may have strong effects on wellbeing, effectiveness and costly treatment and rehabilitation of preventable complications [3].

First aid of the minor injuries and accidents that any one of the general population may face at any time and in any place is one of the most important public demands [4]. The adequate knowledge required for handling an emergency out of the hospital setting at the site of the accident or emergency may not be sufficient as most medical schools do not have formal first aid training in the teaching curriculum [5].

In Saudi Arabia, the number of road traffic accidents have tremendously increased and citizens may encounter life-saving situations at the place of accidents before the victim is taken to the hospitals for medical management and 80% of the deaths in hospital happen due to road traffic injuries [6]. Citizens may find it difficult to provide first aid during accidents due to less confidence as they lack proper knowledge and skills in this area. Some of the most commonly used first aid techniques include cardiopulmonary resuscitation (CPR), control of bleeding, burn and fracture management. [7].

Studies report that past experiences in first aid during emergency situations are associated with better awareness and knowledge [8,9]. Attending courses on first aid has helped students to increase their knowledge regarding first aid skills and helped them to confidently manage life-threatening situations (1,2). Another study conducted in Saudi Arabia reported that students, when encountered with an emergency like CPR, were not able to perform it because of lack of knowledge [10].

Today's children are the future of the country and the government has the responsibility to increase the awareness and knowledge of its citizens regarding first aid practices as it could save many lives. There is a need to understand the levels of knowledge of students as this may help to plan some courses for students in first aid and Basic life support skills as the students can effectively manage such situations in many places. No study has been done in Saudi Arabia that compared the attitude, knowledge, attitude and practices regarding first aid skills between medical and non-medical students. This study aimed to assess the awareness, knowledge, attitude and practices regarding first aid skills among university students pursuing different courses at the Taif University, Saudi Arabia.

Methodology

Study design and setting: This cross-sectional study was conducted at Taif University (TU) in Taif City, Kingdom of Saudi Arabia.

Sampling methodology: The university students were divided into two educational categories, which are Medical and non-medical. A minimum sample size of 428 was calculated for our study considering a confidence interval of 95%, power of the study (β) at 80% and an 'α-value of 5%. We finally included a total of 500 participants for our study which included both males and females.

Study instrument: A modified pre-tested validated questionnaire was used to collect the data, which was distributed by data collectors (university students) to the participants. The consent was taken from the original author to use the questionnaire (11). We included participants of Saudi nationality only to reduce the country of origin effect or nationality bias in our study.

The first part of the questionnaire consisted of socio-demographic details of the participants and the second part had items related to awareness, knowledge, attitude and practices regarding first aid.

Ethical considerations: Ethical approval was obtained from the Ethics and research committee of Taif University. Written and informed consent was taken from all participants before participating in the study.

Data Analysis: Data analysis was done by the Statistical Package for the Social Sciences (SPSS) program version 25. Qualitative data was presented as number and percentage and Chi Squared test was performed to assess the relationship between variables. A p-value of less than 0.05 was considered as statistically significant.

Results

Our study included 500 student participants who are studying different programs at Taif University. We had 160 (32%) of participants from Scientific, 126 (25%) from Literary and 214 (43%) from Medical departments (Figure 1). In our study, only 31% of the students reported that they had attended courses on first aid before the study.

The mean score of awareness items in our questionnaire was found to be 10.10 ± 3.80 (Min 0- Max 25). (Table 1).

The awareness of participants regarding first aid was found to be 56.6% 'Good' and 43.4% 'Poor'. The presence of the first aid group or a committee in their university as reported by the participants was 26.2% and we found a

statistically significant association of this with awareness. 51.4% of the participants reported that their university had a first aid box and the awareness was comparatively 'good' in students who had a first aid box in their institution which was statistically significant (p<0.001). (Table 2)

We also noted that awareness was good among students when teachers, compared with other staff, taught the first aid courses. Of the students who attended the course(s) (31%) had better awareness regarding first aid skills and practices. (Table 2).

There was no statistically significant relationship of awareness scale observed with departments of participants, house type, parent's education level. When we assessed the knowledge items, it showed a mean score of 9.59 ± 3.45 (Min 0- Max 30). (Table 1). Our study showed that 50% of the participants had 'Good' knowledge and the knowledge was comparatively better among scientific students than medical and literary, p<0.05. (Table 3).

The attitude items showed a mean score of 7.06 ± 3.86 (Min 0- Max 20). The assessment showed that 92% of the participants had a poor attitude towards first aid. We found that there was a statistically significant association between attitude and presence of the first aid group at their institution, p<0.05. Participants who reported that they had a first aid group or committee had a better attitude than others who did not. There was no association observed between attitude and previous attendance to first aid courses. (Table 4)

The practice and skills items showed a mean score of 16.6 ± 6.26(Min 0- Max.5) (Table 1). The assessment showed that only 36% of participants had good practices and skills in first aid. Those who had learned about first aid from multiple options had better practice than from a single option. (Table 5)

In our study, 36.2% (n=181) reported that they had information related to first aid in their school curriculum and it was found that practices and skills related to first aid were better among these participants compared to those who had no information in the curriculum p<0.001 (Table 5).

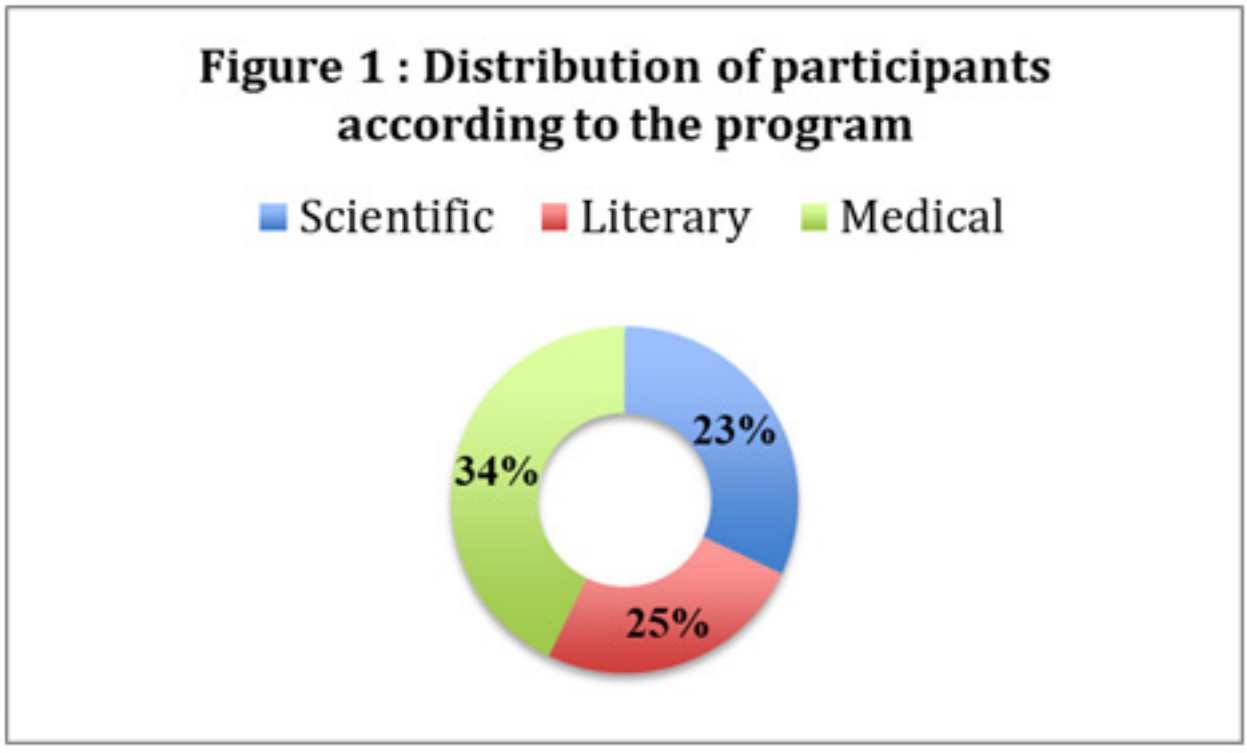

Table 1: Mean scores of different components

Variable	N	Mean	Std. Deviation	Minimum	Maximum
Awareness	500	10.1050	3.80624	1.00	20.00
Knowledge	500	9.5980	3.45286	3.00	19.00
Attitude	500	7.0620	3.86886	2.00	25.00
Practices	500	16.6740	6.26404	1.00	38.00

Table 2: Awareness regarding first aid and its relationship with associated variables

Variables		Attention				Chi square value	P value
		Good		Poor			
		N	%	N	%		
Academic	Scientific	92	32.5%	68	31.3%	4.037	.133
	Literary	62	21.9%	64	29.5%		
	Medical	129	45.6%	85	39.2%		
House	Owner	220	77.7%	162	74.7%	.648	.421
	Rent	63	22.3%	55	25.3%		
Father's education	Illiterate	11	3.9%	8	3.7%	6.021	.421
	Primary	29	10.2%	25	11.5%		
	Intermediate	30	10.6%	31	14.3%		
	Secondary	70	24.7%	56	25.8%		
	Bachelors	106	37.45%	60	27.6%		
	Phd and Masters	37	13.1%	37	17.05%		
Mother's education	Illiterate	27	9.5%	24	11.1%	10.878	.092
	Primary	47	16.6%	44	20.3%		
	Intermediate	41	14.5%	28	12.9%		
	Secondary	49	17.31%	41	18.9%		
	Bachelors	95	33.56%	49	22.58%		
	Phd and Masters	24	8.5%	31	14.3%		
Does the university have committee or group for first aid?	No	41	14.5%	85	39.2%	83.421	<0.001
	Yes	115	40.6%	16	7.4%		
	I do not know	127	44.9%	116	53.5%		
Are there first-aid boxes at the university?	No	34	12.0%	114	52.53%	126.09	<0.001
	Yes	204	72.7%	53	24.4%		
	I do not know	45	15.9%	50	23.0%		
Person in-charge of first aid	Lecturers	13	4.6%	3	1.4%	12.281	<0.05
	Administrators	41	14.5%	21	9.7%		
	Students	9	3.2%	3	1.4%		
	Nurses	41	14.5%	24	11.1%		
	I do not know	179	63.3%	166	76.5%		
Where did you learn about first aid?	Book or magazine	32	11.3%	25	11.5%	13.288	<0.05
	TV or radio	34	12.0%	36	16.6%		
	Folder or poster	19	6.7%	7	3.2%		
	Teacher	61	21.6%	55	25.3%		
	Family member or Friend	43	15.2%	46	21.2%		
	Multiple choice	94	33.2%	48	22.1%		
Did the school curriculum contain information related to first aid?	No	172	60.78%	147	67.7%	4.059	0.131
	Yes	111	39.22%	70	32.3%		
Have you attended a first-aid course?	No	183	64.7%	164	75.6%	6.886	<0.05
	Yes	100	35.3%	53	24.4%		

Table 3: Knowledge regarding first aid and its relationship with associated variables

Variables		Knowledge				Chi square value	P value
		Good		Poor			
		N	%	N	%		
Academic	Scientific	95	38.0%	65	26.0%	10.442	<0.05
	Literary	64	25.6%	62	24.8%		
	Medical	91	36.4%	123	49.2%		
House	Owner	182	72.8%	200	80.0%	3.594	.058
	Rent	68	27.2%	50	20.0%		
Father's education	Illiterate	13	5.2%	6	2.4%	9.405	0.152
	Primary	27	10.8%	27	10.8%		
	Intermediate	33	13.2%	28	11.2%		
	Secondary	66	26.8%	60	24.0%		
	Bachelors	70	28.4%	95	38.0%		
	Phd and Masters	39	15.6%	34	13.6%		
Mother's education	Illiterate	35	14.0%	16	6.4%	11.650	.070
	Primary	40	16.0%	51	20.4%		
	Intermediate	37	14.8%	32	12.8%		
	Secondary	46	18.4%	43	17.6%		
	Bachelors	62	24.8%	80	32.4%		
	Phd and Master	29	12%	26	10.4%		
Does the university have committee or group for first aid?	No	73	29.2%	53	21.2%	7.254	<0.05
	YES	70	28.0%	61	24.4%		
	I DO NOT KNOW	107	42.80%	136	54.40%		
Are there first-aid boxes at the university?	No	83	33.2%	65	26.0%	5.539	0.236
	I do not know	49	19.6%	47	18.8%		
	Yes	118	47.2%	138	55.2%		
Person in-charge of first aid	Lecturers	11	4.4%	5	2.0%	6.758	0.239
	Administrators	32	12.8%	30	12.0%		
	Students	9	3.6%	3	1.2%		
	Nurses	35	14.0%	30	12%		
	I do not know	164	65.6%	182	73.2%		
Where did you learn about first aid?	Book or magazine	28	11.2%	29	11.6%	9.634	0.86
	TV or radio	39	15.6%	31	12.4%		
	Folder or poster	6	2.4%	20	8.0%		
	Teacher	56	22.4%	60	24.0%		
	Family member or Friend	44	17.6%	45	18.0%		
	Multiple choice	77	30.8%	65	26.0%		
Did the school curriculum contain information related to first aid?	No	153	61.2%	167	66.8%	1.705	0.426
	Yes	97	38.8%	83	33.2%		
Have you attended a first-aid course?	No	161	64.4%	186	74.4%	5.886	0.015
	Yes	89	35.6%	64	25.6%		

Table 4: Attitude regarding first aid and its relationship with associated variables

Variables		Attitude				Chi square value	P value
		Good		Poor			
		N	%	N	%		
Academic	Scientific	16	41.0%	144	31.2%	11.384	0.003
	Literary	16	41.0%	110	23.9%		
	Medical	7	17.9%	207	44.9%		
House	Owner	25	64.1%	357	77.4%	3.548	0.060
	Rent	14	35.9%	104	22.6%		
Father's education	Illiterate	4	10.3%	15	3.3%	8.464	0.206
	Primary	7	17.9%	47	10.2%		
	Intermediate	4	10.3%	57	12.4%		
	Secondary	9	23.1%	118	25.6%		
	Bachelors	12	30.8%	154	33.4%		
	Phd and Masters	3	7.7%	70	15.2%		
Mother's education	Illiterate	8	20.5%	43	9.3%	8.432	0.208
	Primary	8	20.5%	83	18.0%		
	Intermediate	5	12.8%	64	13.9%		
	Secondary	9	23.1%	81	17.6%		
	Bachelors	7	17.9%	137	29.7%		
	Phd and Masters	2	5.1%	53	11.5%		
Does the university have group of first aid	No	17	43.6%	109	23.6%	12.168	0.002
	YES	13	33.3%	118	25.6%		
	I DO NOT KNOW	9	23.10%	234	50.80%		
Are there first-aid boxes at the university?	No	16	41.0%	132	28.63%	3.867	0.424
	I do not know	4	10.3%	92	19.96%		
	Yes	19	48.7%	237	51.41%		
Who is the person in charge of first aid at the university?	Lecturers	2	5.1%	15	3.25%	4.151	0.528
	Administrators	6	15.4%	57	12.36%		
	Students	2	5.1%	10	2.17%		
	Nurses	2	5.1%	61	13.23%		
	I do not know	27	69.2%	318	69.0%		
Where did you learn about first aid?	Book or magazine	1	2.6%	56	12.1%	19.680	0.001
	TV or radio	5	12.8%	65	14.1%		
	Folder or poster	0	0.0%	26	5.6%		
	Teacher	3	7.7%	113	24.5%		
	Family member or Friend	14	35.9%	75	16.3%		
	Multiple choice	16	41.0%	126	27.3%		
Did the school curriculum contain information related to first aid?	No	20	51.3%	299	64.86%	3.079	0.215
	Yes	19	48.7%	162	35.14%		
Have you attended a first-aid course?	No	24	61.5%	323	70.1%	1.231	0.267
	Yes	15	38.5%	138	29.9%		

Table 5: Skills and practice regarding first aid and its relationship with associated variables

Variables		Practice				Chi square value	P value
		Good		Poor			
		N	%	N	%		
Academic	Scientific	63	35.0%	97	30.3%	1.186	0.553
	Literary	44	24.4%	82	25.6%		
	Medical	73	40.6%	141	44.1%		
House	Owner	139	77.2%	243	75.9%	0.105	0.745
	Rent	41	22.8%	77	24.1%		
Father's education	Illiterate	10	5.6%	9	2.8%	6.67	0.245
	Primary	13	7.2%	41	12.8%		
	Intermediate	22	12.2%	39	12.2%		
	Secondary	51	28.3%	76	23.8%		
	Bachelor	59	32.8%	107	33.4%		
	Phd and Masters	25	13.9%	48	15.0%		
Mother's education	Illiterate	19	10.6%	32	10.0%	4.76	0.444
	Primary	27	15.0%	64	20.0%		
	Intermediate	28	15.6%	41	12.8%		
	Secondary	30	16.7%	59	18.4%		
	BA	59	32.8%	85	26.6%		
	Phd and Masters	17	9.4%	39	12.2%		
Does the university have group of first aid	No	59	32.8%	67	20.9%	16.866	<0.001
	YES	55	30.6%	76	23.8%		
	I DO NOT KNOW	66	36.70%	177	55.30%		
Are there first-aid boxes at the university?	No	55	30.6%	93	29.1%	4.962	0.291
	I do not know	30	16.6%	66	20.6%		
	Yes	95	52.8%	161	50.3%		
Who is the person in charge of first aid at the university?	Lecturers	8	4.4%	8	2.5%	7.587	0.181
	Administrators	15	8.3%	49	15.3%		
	Students	6	3.4%	6	1.9%		
	Nurses	23	12.8%	40	12.5%		
	I do not know	128	71.1%	217	67.8%		
Where did you learn about first aid?	Book or magazine	26	14.4%	31	9.7%	17.838	<0.05
	TV or radio	16	8.9%	54	16.9%		
	Folder or poster	5	2.8%	21	6.6%		
	Teacher	36	20.0%	80	25.0%		
	Family member or Friend	32	17.8%	57	17.8%		
	Multiple choice	65	36.1%	77	24.1%		
Did the school curriculum contain information related to first aid?	No	77	42.8%	242	75.6%	55.484	<0.001
	Yes	103	57.2%	78	24.4%		
Have you attended a first-aid course?	No	119	66.1%	228	71.3%	1.433	0.231
	Yes	61	33.9%	92	28.8%		

Discussion

Awareness and knowledge regarding first aid play a crucial role in undergraduate students, especially those who are pursuing a medical career, as they are tomorrow's lifesavers. There is an increasing possibility in a medical students' life they will encounter a life-saving situation both inside and outside the college that requires doing a first-aid intervention, which could help improve the medical condition of the patient before transferring to the hospital.

The findings of our study showed that awareness regarding first aid was found to be 56.6% good and 43.4% poor among 500 participants. The common people always have the expectation that junior doctors or medical students should be competent in giving basic life support including cardio-pulmonary resuscitation in case of any emergency [12].

In our study, we found that awareness was found more in medical students compared to literary students or students pursuing other science courses. A study done in Kuwait by Al-Khamees reported that the awareness regarding first aid was more in health sciences students than literary students [8]. The reason for increased awareness among medical students could easily be explained based on factors such as the acquaintance or association of them with the profession, which makes them realize the importance of first aid more than others. Today's world requires students to have awareness of first aid in order to help others or themselves in event of any accidents or emergencies (13).

We noticed that there was a statistically significant relationship observed between the presence of first aid group /committee with the awareness, knowledge, attitude and practices scores. An institution needs to provide resources to increase the awareness of first aid among its students as this could help the students to understand the importance of basic life support that should be given to any person.

In our study, 25.2% of the participants reported that they didn't have a first aid group in their institutions and 19% reported that they don't have an idea of its presence. A similar study was done in Saudi Arabia that also reported that one quarter of students didn't have an idea regarding the presence of a first aid group in the institution (11). Institutions need to form a first aid group or committee as this may not only help to improve the knowledge but also could create increased awareness regarding first aid.

The presence of a first aid box at institutions is very important, as every student should know the purpose of this, the contents in it and also how to use them. In our study, the scores regarding knowledge of first aid were more among scientific students. This contrasts with other studies, which showed that medical students have better knowledge regarding first aid than non-medical students (5, 13,14).

We also considered factors like parent's educational levels and their relationship on the awareness, knowledge, attitude and practices of first aid among students. We didn't find any relationship with any of the parameters in our study. In our study, we found that the person-in-charge for first aid in the institution was mostly nurses and administrators. There was also a statistically significant relationship found with the type of person-in-charge for first aid with awareness, knowledge, attitude and practice scores. The person-in-charge of first aid is usually responsible for the maintenance of the first aid boxes and also for calling the emergency services. He/she should have a certificate in first-aid treatment and thus the institution could utilize these persons to conduct courses of first aid for their employees or students (15).

It is always suggested that a person who has good communication skills, knowledge and experience in first aid should be given responsibility in any institution (16). 23.2% reported that they learned first aid through teachers. School and its environment is the best place to impart awareness and knowledge regarding first-aid in students (17,19). Teachers need to undergo training in first aid services as it can strengthen the health care services in schools and colleges which could help the students to increase the awareness and knowledge towards the same (20).

The results of our findings showed that students who had first aid information or contents in the school curriculum had good knowledge and practices regarding the same. This finding suggests that when planning to teach first aid in the school curriculum, it should not only be restricted to lectures only but should also include more hands-on practices (21).

Many studies reported that schools have failed to provide enough education and training in first aid and Basic Life Support services (BLS); skills that may reduce the confidence of young doctors or graduates to get involved in a life-saving situation (22-25).

In our study, 63.8% of participants reported that their school curriculum contains information related to first aid. It is recommended that the curriculum of schools should be revised and give more importance to first aid and BLS so that students or young doctors would become more confident in acting in a real life-saving situation. Even though the government of Saudi Arabia has already made it mandatory to attend courses on first aid and BLS in some groups, reports show that knowledge regarding this is weak (26,27).

It is essential that people who provide First aid and BLS need to recognize and assess the injury or any emergency situation before performing the required pre-hospital medical management (28). For this, there is a need to attend courses on First aid and BLS to make the management more effective. The findings of our study showed that only 30.6% of the participants have attended first aid courses in any form. This is similar to another study done in Saudi

Arabia by Al-Johani et al., which reported attendance of 34.5% (26). Another study done in the Kingdom reported that 65.3% of female university students couldn't provide first aid because of the lack of knowledge and other issues (29). Courses on First aid and BLS should be made mandatory in universities and this should be done through lectures coupled with hands-on practices to make it more effective. Countries like England have made BLS courses mandatory in the school curriculum and research showed that 86% of school children effectively demonstrated performing CPR correctly (30).

In any universities announcements for first aid, courses should be made through the entire campus and attendance should be made mandatory irrespective of the fields of study. This could help the students to confidently act during any life-threatening situation.

Limitations

One of the limitations of this study was using self-reported questionnaires that may be prone to recall bias. The use of a cross-sectional study showed the relationship between variables without disclosing a cause-effect relationship.

Conclusion

The study showed that half of the participants exhibited good knowledge regarding first aid and BLS, but the practices and skills related to this were very poor. There was better knowledge and awareness in participants who attended first aid courses, and this was statistically significant. Proper knowledge regarding different techniques, materials used in first aid and BLS play a crucial role in effective management of victims at a place of emergency. Institutions should give predominant importance to first aid and BLS skills of their students by conducting courses on a regular basis.

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Open tibia fracture treated by external fixation: Our experience in two private hospitals, in Aden, Yemen

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Abstract

Background: The aim of this study was to describe the characteristics of the patients, to evaluate the outcome of an external fixation for tibia open fracture.

Materials and method: The study was a retrospective study involving 92 patients who have open tibia injuries, and who underwent surgical intervention by external fixation during the period January 2014 to December 2016, in Aden, Yemen.

Results: There were 71(77.2%) male and 21(22.8%) female patients and the male to female ratio was 3.4:1.

The fracture patterns were categorized according to Gustilo open fracture classification: There were 51(55.5%) type 3A fractures, 29(31.5%) type 3B, and 12(13%) type 3C.

The mean age of all patients was, at the time of the injury, 37.3±10.3 years (range 18–57 years). The mean age of male patients was 36.5 ± 11.1 years and the mean age of females was 40.1 ± 6.6 years. The difference between means showed no statistical significance ($p > 0.05$).

Bone union was achieved in 70(76.1%) patients and delayed union 12(13%). Mal-union was observed, in 4(4.4%) patients. There were 2(2.2%) patients who exhibited a shortening of 2 cm and another 1(1.1%) exhibited a shortening of 1.5 cm.

Pin tract infection was observed in 7(7.6%) patients and chronic osteomyelitis in 2(2.2%) patients. Six (6.5%) patients had non-union.

Conclusion: External fixation is the method of choice for the primary treatment of tibia open fracture. However, this is a small study in two private hospitals and larger studies are needed.

Key words: Tibia, open fracture, external fixation, results, Aden

Introduction

Open tibia fractures are common long bone fractures, often resulting in extensive bone and soft tissue damage [1,2].

It's incidence has increased because of motor vehicle accidents and war injuries [3].

The subcutaneous location of the tibia as well as its poor blood supply makes it susceptible to non-unions and infections [4,5]. Injuries to the neurovascular structures are also a known complication [1].

The goals of open fracture management are prevention of infection, soft tissue coverage, achievement of bony union and restoration of function. Important principles involve antibiotic utilization, timing of initial surgical intervention, thorough debridement, type of wound closure and fixation of fracture after proper alignment [6,7].

The standard treatment for open tibial fractures has been external fixation particularly in fractures associated with severe soft tissue injuries [8,9].

Although there are controversies over the use of external fixation, it has to be used in severe open fractures. The U.S. Army termed the external fixator a "non-union machine" because the incidence of non-union is about 6% to 41%. This incidence varies according to the severity of the trauma, soft tissue injury, early bone grafting, and the quality of reduction [10].

Accordingly, surgeons have tried to find a method of treatment that is safer, less expensive, less complicated, more effective, and has less union time for the treatment of open tibial fracture. They use external fixation as a primary treatment until soft tissues have been healed and then employ another technique to secure union [8,11,12].

The objective of this study was to describe the characteristics of the patients, to evaluate the outcome of an external fixation for open tibia fracture as a primary and definitive treatment.

Materials and Method

The study was a retrospective study involving 92 patients who have open tibia injuries, and who underwent surgical intervention by external fixation during the period January 2014 to December 2016, in two private hospitals in Aden, Yemen.

Inclusion criterion was an open fracture corresponding to Gustilo Type 3A, 3B, 3C.

External fixators from different manufacturers were used, and determined by availability. The collected data were tabulated and statistical analysis was done by estimating rates, means and standard deviations, paired sample t-test was used and p-value < 0.05 was considered as statistically significant. The statistical software package SPSS version 17 was used.

Results

We analyzed the medical records and collection data of the 92 patients' management by external fixation for tibia. There were 71(77.2%) male and 21(22.8%) female patients and the male to female ratio was 3.4:1.

The fracture patterns were categorized according to Gustilo open fracture classification: There were 51(55.5%) type 3A fractures, 29(31.5%) type 3B, and 12(13%) type 3C. Two (2.2%) of the study sample were diabetic patients (Table 1).

Table 2 revealed the following variables: the mean age of all patients was, at the time of the injury, 37.3±10.3 years (range 18–57 years). The age range of female patients was 30 – 54 years. The mean age of male patients was 36.5 ± 11.1 years and the mean age of females was 40.1 ± 6.6 years. The difference between means showed no statistical significance ($p > 0.05$).

Table 3 summarizes the follow up outcome of external fixation for tibia fracture managements. Bone union was achieved in 70(76.1%) patients, delayed union 12(13%). Mal-union was observed, in 4(4.4%) patients - 2(2.2%) varus angulation, 1(1.1%) valgus angulation and 1(1.1%) recurvatum. Other complications were 2(2.2%) patients exhibited a shortening of 2 cm and another 1(1.1%) exhibited shortening of 1.5 cm.

Pin tract infection was observed in 7(7.6%) patients and chronic osteomyelitis in 2(2.2%) patients. Six (6.5%) patients had non-union.

Table 1: Sex distribution of patients, Gustilo classification and comorbidity (n=92)

Variables	No	%
Sex:		
Males	71	77.2
Females	21	22.8
Gustilo open fracture classification:		
Type 3A	51	55.5
Type 3B	29	31.5
Type 3C	12	13.0
Comorbidity:		
DM	2	2.2
Non	90	97.8

Table 2: Distribution of the age range and the mean age of the study patients (n=92)

Variables	Range (years)	Mean ± SD	p-value
Mean age of all patients *Age range of all patients*	18 – 57	37.3±10.3	
Age range of female patients	30 - 54		
Mean age of male patients *Mean age of female patients*		36.5 ± 11.1 40.1 ± 6.6	P > 0.05

Table 3: Distribution of, and other complications outcome variables (n=92)

Variables	No	%
Outcome of tibia fracture orthopedic surgery:		
Bone union	70	76.1
Delay bone union	12	13.0
Nonunion	6	6.5
Varus angulation	2	2.2
Valgus angulation	1	1.1
Recurvatum	1	1.1
Other complications:		
Shortening 2 centimeter	2	2.2
Shortening 1.5 centimeter	1	1.1
Pin tract infection	7	7.6
Osteomyelitis	2	2.2

Discussion

It has become a standard practice in traumatology to use external fixation as a temporary means of treatment for severely injured patients who cannot tolerate extensive surgery, such as bomb blast victims, to treat their open limb injuries. It may also serves as a stop gap procedure for the heavily contaminated limb injuries, in situations where the expertise and facilities to do open reduction and internal fixation and flap cover or other appropriate soft tissue cover is made on the same sitting or at a later date [13,14]. The patients who need this staggered treatment protocol are those who need expeditious stabilization due to vascular injuries or those who are multiply injured. It has become a technique of evacuating army service personnel with minimal physiologic insult allowing the surgeon maximal options for definitive treatment of such fractures. There is no consensus as to how long an external fixator should be left on the patient before it is converted to other definitive treatment [15].

Matter et al [16] mentioned that despite the improvements in surgical techniques in the last century, the optimum treatment for open type III tibial shaft fractures, fracture with severe soft tissues injuries, threatened compartment syndrome, and tibial fractures in multiply injured patients remains controversial and major problems with infection, malunion and nonunion have persisted.

In recent years, there has been increased interest in managing open fractures, even type IIIB, with reamed or unreamed nails [17]. In the belief that immediate

intramedullary nailing increases the risk of septic complications, nonunion and pulmonary dysfunction, a sequence in management using external fixation initially and then delayed reamed IM nailing has been advocated—particularly for the treatment of type-III open fractures and in polytrauma patients [18,19].

External fixation has seen renewal in modern trauma management and new articles have appeared in the literature concerning the military use of external fixation in multiply injured or for the control of soft tissue problems in casualties of war (Croatia 1991,1992, Iraq 2003) [20,21,22]. Several reports of patients treated only by external fixation have been published with different and conflicting results [23,24,25].

Our study included 92 individuals who had seen, admitted and who underwent orthopedic surgery “external fixation” for open tibia fracture and who were postoperatively evaluated on the outcome and the complications.

The male patients were predominant 71(77.2%) while female patients were 21(22.8%). The male to female ratio was 3.4:1.

These findings are in accordance with the findings of Yusof [26], Court-Brown et al [27] and Ikem et al [28] who in their studies also had males predominance.

The mean age of the patients in our study was 37.3±10.3 years (range 18 - 57 years). A similar finding was reported by Beltsios et al [29] from Greece who found in their study the mean patients’ age at the time of the injury was 36 years.

We found at the end of the one year follow up, bone union was achieved in 70(76.1%) patients, delayed union in 12(13%) and 6(6.5%) patients exhibited non-union. Valazev and Fleming [30] reported 12.5% of delayed union. Giannoudis et al [19] in 536 open fractures treated by external fixator of which 82% were Grade III open injuries, the incidence of delayed union was 24%.

In the present study we observed that mal-union was in 4(4.4%) patients - 2(2.2%) varus angulation, 1(1.1%) valgus angulation and 1(1.1%) recurvatum; also, we observed pin tract infection in 7(7.6%) patients and osteomyelitis in 2(2.2%) patients.

Similar findings were reported by Michail Beltrios et al [31] from Greece of 87.27% union, 18 nonunion, 21 delayed union and 4 mal-unions, pin-tract infection 26.36% and osteomyelitis in 3 cases (1.36%) in their study of 212 patients treated with external fixator as a definitive treatment.

Kumar et al [32] mentioned that in their study of 37 patients, 36 fractures united and there were 8 patients with pin-tract infection (24%) and one case of non-union (2.75%) and also, one case of chronic osteomyelitis (2.7%).

We found also in our study 2(2.2%) patients exhibited a shortening of 2 cm and another 1(1.1%) exhibited shortening of 1.5 cm. Beltsios et al (29d) found in their study that 5 tibia (2.27%) had 1.5 cm shortening.

Conclusion

Tibia open fractures can produce a huge disability in patients. External fixation is the method of choice for the primary treatment of tibia open fracture.

This study provides a reference for future intervention and the improvement of the quality of care for the management of open tibia fractures in the public and private hospitals in Aden. However, this was a small study in two private hospitals and larger studies are needed.

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Vaping

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A brief review

It seems nowadays the trend wherever you go, is that you will be hit by a large whitish cloud in front of your face, no matter what you do to avoid it. You will see the heavy whitish-thick cloud is created and emitted by people who vape, and it seems that no one is not using it. Vaping is mostly the realm of youngsters and you will observe a halo of smoke billowing around them in the air. Additionally, as it is an open practice in many instances, you will see people smoke in normally forbidden places, like children's play grounds, big stores and on the buses without being confronted.

The vapour stinks and suffocates and you cannot pass or avoid it at certain times. Though, it is a common tool utilized by everyone on the assumption it is harmless, science is still wary and there is a long away to go to prove that. Sales for Juul, the company that created it, are going quite well.

In the USA, seven cases of sudden death have been reported with 530 cases experiencing severe unexplained lung injuries and on questioning those affected people, vaping was linked and connected to its use prior to the illness. Most of them were men of different age groups who attended with symptoms of breathlessness, cough, chest pain, shortness of breath, nausea, vomiting, diarrhea, fever, weight loss and fatigue, prior to their hospital admission. The undertaken investigations found that the vaping mixture contained the psychoactive ingredient in cannabis; tetrahydrocannabinol and cannabidiol oil (inhaling oils), with significant amounts of vitamin E, which caused the inflammation.

Some have used vitamin E acetate in the fluid which is extremely toxic to the lung. Furthermore, the vapour created contains fine aerosols with heavy metals such as lead, nickel and flavouring chemicals like diacetyl which can cause serious lung disease called popcorn lung, and cancer. The affected cases' X-ray displayed glass opacities bilaterally, with macrophages lipid laden in bronchiolar lavage.

Vaping is an epidemic and gaining much popularity among the younger age group, on the context of being harmless; it has attractive fruity flavours, ease of use, concealment and as a substitute to the traditional smoking of cigarettes. The assumption is that it avoids the most harmful combustion products of cigarette smoke and vaping is less risky. The idea of vaping to help quit smoking is debatable in the first place.

The reports of widespread outbreaks of acute toxic lung injury and disease linked to vaping would leave a considerable number of users to revert back to smoking. Most commercial vaping sales are water soluble liquids which contain propylene glycol, glycerol, nicotine and flavourings. The liquid is heated by the vaping device to generate the mist which is inhaled into the lung, however, other substances can be used in the vaping devices. In the USA it has been found that the amount the oils have been increased (dabbing) recently, and some have gone further to add the legalized recreational and medicinal cannabis, which is circulating among people. The cannabis vaping liquids are mostly oil based, unlike the nicotine vaping liquids, which are found on the black market, and could be contaminated with pesticides, fungi and heavy metals that constitute and pose serious risks to the lungs. Additionally, vitamin E oil is under question as it is highly toxic to the lungs, though the mechanism is not yet fully understood.
It is not however, the first incidence with vaping, as in 2009, there were concerns on 18 brands of e-cigarettes in the USA, when diethylene glycol, an anti-freeze ingredient, was found in 1% in one cartridge. Furthermore, some cases developed irreversible lung diseases (bronchiolitis obliterans), a serious lung disease, due to diacetyl trace in the flavouring, which gives the buttery taste in some vaping liquids. The incurred disease was called popcorn lung, after a factory worker in microwave popcorn factory developed the condition as he was exposed to airborne diacetyl. However, cigarette smokers are more exposed to diacetyl compared to vaping. Other potential harmful chemicals that were found in vaping are metals, acrolein and formaldehyde, and yet again, they are in abundance in cigarette smoking, along with more than 5,000 carcinogenic products whereas, in the UK, a single case was linked to e-cigarette after ten years of use.

Second hand smoking and bystanders can suffer as well as the smokers themselves and it has been linked to many diseases as the Centre for Disease Control has declared. It can cause premature death, heart attacks, strokes and ultimately lung cancer and severe asthmatic attacks in children.

Australia has adopted the no smoking policy in the outdoors followed by Swede and Spain in some cities like Catalonia and Barcelona, whereas in the UK, it is only around some NHS premises. In this context, it has been found in 18 studies that smoking in the outdoors near indoor vicinities can cause a considerable concentration of smoke in both localities.

Yet the whole story is still bizarre and unknown as no vaping liquid was left in the vaping device to test in those affected cases in the USA, and in many instances people have used different substances in their vaping liquid and will not admit to such.

The vaping appliances have been created in different shapes, colours and sizes to appeal to the user; it has generated much profit consequently. The device can be recharged by a small battery to heat up the fluid, and refilled to the maximum capacity of 2 ml. The volume of liquid containing nicotine in one refill is 10 ml with nicotine strength of 20mg/ml. The fluid usually has nicotine, flavouring, chemicals and in some, marijuana products are included.

The investigation so far has looked at those affected cases and it was found that it could be associated with faulty devices or contaminates used in the USA vaping behaviour. However, in the UK, the system is quite strict about the fluid used and no cases have yet been reported, neither in Canada nor Australia. It also uses the yellow card scheme to report any bad experiences or unknown symptoms that may arise. On the other hand, the Indian government has issued a ban on e-cigarettes, which covers all electronic nicotine delivery systems and prohibits manufacturing, importing, selling, advertising, and distributing any of those products.

The sales of vaping have greatly risen and the profit seems to be the prevailing consideration. It falls under the umbrella of smoking cessation, but in reality is creating revenue for something else; generating profitability. The acute lung injury remains yet a mystery, to date unexpectedly.

Although vaping is promoted to be a safe thing in comparison to smoking, certainly it is neither a benign activity, nor a harmless practice.

Additionally, for those who vape, it would make sense to avoid mixing, adding, modifying substances to the products purchased in stores and to avoid buying illicit substances from the streets.

In terms of the huge emitted whitish clouds, people should be wise about it and what it might cause to their health and to the health of those surrounding them.

Vaping is becoming a real public health crisis, and we are still far from learning about the health effects of vaping in the longterm.

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