ORIGINAL ARTICLE

Diabetes Mellitus and Glucose Intolerance: Examine the Incidence in Patients Visited Outpatients

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ABSTRACT

Aim: To determine the incidence and risk factors of diabetes mellitus and frequency of glucose intolerance in patients visited outpatient department

Study Design: Cross-sectional/observational

Place and Duration: DHQ Teaching Hospital Kohat from 1st December 2018 to 30th September 2019.

Methods: Five hundred and twenty patients of both genders with ages 20 to 70 years were enrolled in this study. Patients detailed demographics including age, sex, residence, socioeconomic status and comorbidities such as hypertension, smoking and obesity were recorded after written consent. Known cases of diabetes mellitus were excluded. Blood sample was taken from all the patients to examine the fasting blood sugar. Risk factors for type II diabetes mellitus such as gender, smoking, hypertension and obesity were analyzed.

Results: Three hundred (57.69%) patients were male while 220 (42.31%) were females. Majority of patients 160 (30.77%) and 190 (36.54%) were ages 36 to 45 years and 46 to 55 years. Majority of patients 345 (66.35%) had rural residency. Middle socio-economic status was most common in 250 (48.08%) patients. Hypertension was the most common comorbidity found in 267 (51.35%) patients followed by smoking in 210 (40.38%) and obesity in 118 (22.69%) patients. Type II diabetes mellitus was found in 51 (9.81%) patients. Impaired glucose tolerance was found in 21 (4.04%) patients and impaired fasting glucose observed in 16 (3.08%) patients. Male gender, age above 60 years, low socioeconomic status, smoking, obesity and family history were risk factors associated with diabetes mellitus with p-value <0.05.

Conclusion: The incidence of diabetes mellitus and glucose intolerance was high in patients visited outpatients. Male gender, age above 60 years, low socioeconomic status, smoking, obesity and family history were risk factors associated with diabetes mellitus.

Keywords: Type II diabetes mellitus, Glucose intolerance, Fasting glucose intolerance, Hypertension,

INTRODUCTION

Diabetes is one of the four major types of noncommunicable diseases (NCDs) that make the largest contribution to morbidity and mortality worldwide[1,2]. According to WHO global health days 2016, about 422 million people globally had diabetes, with most living in the developing countries, and unfortunately, more than 80% of diabetes deaths occur in low- and middle-income countries[3] and 80% of people with diabetes live in low- and middle-income countries.[4]

Due to resource constraints, the International Diabetes Federation (IDF) has suggested to focus more on prevention of diabetes complications in Low and Middle Income Countries (LMICs)[5]. Development of educational intervention programs intended to compact high numbers of diabetes complications will be an appropriate strategy[6]. Reduction in diabetes related deaths in developing countries can be achieved by intensified diabetes self management education[7].

National Diabetes Survey of Pakistan (NDSP-1990) reported a very high unawareness rate for diabetes, with 36.3% of the people with diabetes being unaware of their condition. Survey has revealed that knowledge relating to diabetes and its prevention is significantly low even in the urban metropolitan areas: only 40% of the people known to have diabetes treated at tertiary health care facilities in Karachi had correct knowledge relating to diabetes and its complications[8]. Data was gathered retrospectively from 210 patients with type-2 diabetes visiting outpatient department of a tertiary care hospital in Karachi Pakistan. Results of the study revealed that most significant predictors for metabolic syndrome were female gender, low HDL cholesterol levels and high systolic blood pressure. Study suggested early initiation of primary prevention strategies to cope with alarming high frequency of metabolic syndrome.[9] A study was done to evaluate the CVD-related lifestyle factors among type-2 diabetes patients in outpatient clinics in Karachi, Pakistan. Results of the study showed that majority of the patients are physically inactive and have adverse psychosocial factors. About 40% are exposed to passive smoking and 13% are active smokers.[10] The present study was

conducted to determine the incidence of diabetes mellitus and glucose intolerance also examines the risk factors of diabetes mellitus in patients visited outpatient department at our hospital.

MATERIALS AND METHODS

This cross-sectional study was conducted at DHQ Teaching Hospital Kohat and the duration of this study was 10 months from Dec 2018 to Sep 2019.Total 520 patients of both genders with ages 20 to 70 years were enrolled in this study. Patients detailed demographics including age, sex, residence, socioeconomic status, family history of diabetes mellitus and comorbidities such as hypertension, smoking and obesity were recorded after written consent. Known cases of diabetes mellitus, patients with renal failure, patients with cardiac diseases and those without consent were excluded.Blood sample was taken from all the patients to examine the fasting, random and postprandial blood glucose. Diabetes mellitus was examined according to the WHO criteria for diagnosis diabetes mellitus. Incidence of type II diabetes mellitus and glucose intolerance were examined. Glucose intolerance was considered as 2 hours postprandial values of 150-200mg/dl and abnormal fasting glucose 100-130mg/dl. Incidence of abnormal fasting glucose and glucose intolerance were examined and recorded. Risk factors such as age, gender, residence, socioeconomic status, hypertension, obesity, smoking and family history of diabetes mellitus were examined. All the data was analyzed by SPSS 24.0. Chi-square test was applied to examine the association of risk factors with type II diabetes mellitus with p-value <0.05 was taken as significant.

RESULTS

Table 1: Demographic information of the patients

Variable	No.	%
Gender		
Male	300	57.69
Female	220	42.31
Age (years)		
20 – 35	80	15.38
36 – 45	160	30.77
46 – 60	190	36.54
>60	90	17.31
Residence		
Urban	345	66.35
Rural	175	33.65
Socioeconomic status		
Low	200	38.46
Middle	250	48.08
High	70	13.46
Clinical presentation		
Hypertension	267	51.35
Obesity	118	22.69
Smokers	210	40.38
Family history of DM		
Yes	110	21.15
No	410	78.85

Out of 520 patients 300 (57.69%) patients were male while 220 (42.31%) were females. 80 (15.38%) patients were ages 20 to 35 years, patients 160 (30.77%) and 190 (36.54%) were ages 36 to 45 years and 46 to 60 years, and 90 (17.31%) patients had ages above 60 years.

Majority of patients 345 (66.35%) had rural residency and 175 (33.65%) had urban residency. 200 (38.46%) patients had low socioeconomic status, 250 (48.08%) patients had middle and 70 (13.46%) patients had high socioeconomic status. Family history of diabetes mellitus was found in 110(21.15%). Hypertension was the most common clinical presentation found in 267 (51.35%) patients followed by smoking in 210 (40.38%) and obesity in 118 (22.69%) patients respectively (Table 1). Type II diabetes mellitus was found in 51 (9.81%) patients while 469 (90.19%) had not found diabetes mellitus (Fig. 1)

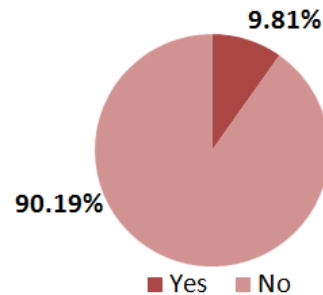Fig. 1: Incidence of type II diabetes mellitus among all the patients

Table 2: Incidence of glucose intolerance and abnormal fasting glucose

Incidence	No.	%
Glucose intolerance	21	4.04
Abnormal Fasting Glucose	16	3.08

Table 3: Risk Factors associated with diabetes mellitus among study variable

Variable	With DM	Without DM	P value
Gender			
Male (n=300)	38 (74.51)	262(55.86)	0.032
Female (n=220)	13 (25.49)	207(44.13)	N/S
Age (years)			
20-35 (n=80)	4 (7.84)	76 (16.20)	N/S
36-45(n=160)	8 (15.69)	152(32.41)	N/S
46-60 (n=190)	15 (29.41)	175(37.31)	N/S
>60 (n=90)	24 (47.06)	66 (14.07)	0.002
Residence			
Urban (n=345)	30 (58.82)	315(60.58)	N/S
Rural (n=175)	21 (41.18)	154(32.83)	N/S
Socioeconomic status			
Low (n=200)	33 (64.71)	167(35.61)	0.025
Middle (n=250)	14 (27.45)	236(50.32)	N/S
High (n=70)	5 (9.80)	65 (13.86)	N/S
Clinical Presentation			
Hypertension(n=267)	8 (15.69)	259(55.22)	N/S
Obesity (n=118)	20 (39.22)	98 (20.90)	0.04
Smokers (n=210)	23 (45.10)	187(39.87)	0.04
Family history of DM			
Yes	38 (74.51)	72 (15.35)	0.001
No	13 (25.49)	397(84.65)	N/S

Impaired glucose tolerance was found in 21 (4.04%) patients and impaired fasting glucose observed in 16 (3.08%) patients (Table 2). According to the risk factors associated with diabetes mellitus we found that male gender, age above 60 years, low socioeconomic status, smoking, obesity and family history of diabetes mellitus were the significant associated risk factors of diabetes mellitus with p-value <0.05 (Table 3.)

DISCUSSION

Diabetes mellitus and glucose intolerance are the most common life threatening disorders with high morbidity and mortality rate[11]. In general population people are not much aware about these conditions and hazards of these clinical manifestations, this phenomenon tends to increase the frequency of type II diabetes mellitus and glucose intolerance.[12] We conducted this study with aimed to determine the incidence of diabetes mellitus and glucose intolerance in patients presented with general diseases in the outpatient department. In this regard 520 patients were analyzed. We found that the incidence of type II diabetes mellitus was 9.81% (51) patients. A study conducted by Habtewold et al[13] reported that the prevalence of type II diabetes mellitus was 0.34% in patients with general diseases. These results were quite low as compared to our finding. This may be due to the environmental change and life style of population in this area. A community based survey conducted in Pakistan regarding prevalence of diabetes mellitus among general population and they reported that the incidence of type II diabetes mellitus was 16.98% and they majority of patients were ages 50 to 60 years. In this survey they reported obesity, female gender, family history of DM and older age were the significant associated risk factors for type II diabetes mellitus.[14] These results showed similarity to our study in which obesity, family history and older age were the risk factors associated with diabetes mellitus (p=<0.05).

A meta-analysis conducted by Meo et al[15] regarding prevalence of type II diabetes mellitus in Pakistan, in which they reported that the prevalence of type II diabetes mellitus was 11.7% and incidence rate was high in males and urban population. In our study males were the predominant risk factors of type II diabetes mellitus.

A multicentre study conducted by Mahmood et al[16] regarding prevalence of undiagnosed diabetes mellitus in Pakistan, they reported the prevalence of undiagnosed diabetes in patients visiting primary care physicians for any reason was 525(6.4%).

In present study glucose intolerance was found in 21 (4.04%) patients and abnormal fasting glucose observed in 16 (3.08%) patients. These results were similar to the study conducted by Ansari et al[17] in which prevalence of impaired fasting glucose was 2.67% and impaired glucose tolerance was 3.48%. They also reported male patients were on high risk for developing diabetes mellitus as compared to females.

In our study we found that male gender, age above 60 years, low socioeconomic status, smoking, obesity and family history of diabetes mellitus were the significant associated risk factors of diabetes mellitus with p-value <0.05. These results were similar to many of other studies in which male gender, older age, family history, obesity and low income were the risk factors significantly associated with type II diabetes mellitus[18-20]

CONCLUSION

The incidence of diabetes mellitus and glucose intolerance was high in patients visited outpatients. Male gender, age above 60 years, low socioeconomic status, smoking, obesity and family history were risk factors associated with diabetes mellitus.

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