

ORIGINAL ARTICLE

KNOWLEDGE OF DIABETIC COMPLICATIONS IN PATIENTS WITH DIABETES MELLITUS

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Background: The prevalence of diabetes mellitus has risen exponentially over the last three decades, with resultant increase in morbidity and mortality mainly due to its complications. Limited data is available regarding the awareness and knowledge about these complications in our population. This study was carried out to evaluate the knowledge of diabetic complications in patients with diabetes mellitus. **Methods:** This cross-sectional study was conducted in the Medical B Unit of Department of Medicine Khyber Teaching Hospital, Peshawar. All admitted diabetic patients above 15 years of age with duration of diabetes mellitus more than one year were included. **Results:** Out of the 96 patients questioned, 58 were females and 38 were males. Mean age was 53.29 ± 10.821 years while the mean duration of diabetes mellitus was 9.75 ± 7.729 years. Of the total 76 (79.1%) of the patients were illiterate; 36 (37.50%) had good, 24 (25%) had average and 36 (37.50%) had poor knowledge about diabetic complications. Males and university graduate patients had slightly better knowledge. Between 50–60% patients were aware of different cardiac complications of diabetes mellitus. Awareness regarding other complications was foot ulcer/gangrene 70 (72.91%), poor wound healing 68 (70.83%), stroke 54 (56.25%), renal diseases 64 (66.66%), eye diseases 53 (55.20%), gastroparesis and other gastrointestinal problems 45 (46.87%), diabetic ketoacidosis 55 (57.29%), hypoglycaemia 50 (52.08%), lipid abnormalities 26 (27.08%) and symptoms of diabetic neuropathy ranging from 47–65%. **Conclusions:** Majority of diabetic patients are unaware of diabetic complications. Therefore, hospital and community based awareness programs should be launched to decrease the morbidity and mortality associated with diabetes mellitus.

Keywords: diabetes mellitus, awareness, complications

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INTRODUCTION

Diabetes mellitus (DM) is one of the most common non-communicable disease of the modern world, affecting 200 million people worldwide and cause an estimated 32 million deaths each year.¹ The prevalence of DM has risen exponentially around the globe in the last three decades. Only 30 million people had DM in 1985, the number increased to 285 million by 2010 which is projected to increase to 439 million by 2030.^{2,3}

Pakistan has the seventh largest population of diabetic patients in the world and by the year 2025 it will take fourth place.⁴ According to International Diabetes Federation (IDF), Pakistan had 6.2 million people with DM in 2003 and the number is expected to rise to over 14.5 million by 2025.⁴ About 10% of the adult population in Pakistan have DM while the other 10% have impaired glucose tolerance.^{5,6}

Diabetes mellitus is associated with 10 to 30% decrease in life expectancy mainly due to its complications associated and die at an earlier age than non-diabetics.^{7,8} These complications are divided into acute and chronic complications. Chronic complications are further divided into micro-vascular and macro-vascular complications. Acute complications of DM include diabetic ketoacidosis

(DKA), hyperglycaemia hyperosmolar state (HONK), hypoglycaemic diabetic coma, infections like respiratory infections and periodontal diseases. Chronic micro-vascular complications are diabetic nephropathy, diabetic neuropathy (sensory, motor and autonomic) and diabetic retinopathy, while macro-vascular complications include coronary artery disease (CAD) leading to angina or myocardial infarction (MI), peripheral vascular disease (PAD) which contributes to intermittent claudication, cerebrovascular incidence like stroke and transient ischemic attack (TIA), diabetic encephalopathy and diabetic foot (combination of sensory neuropathy and vascular damage). These complications of DM are far less common and less severe in people who have well-controlled blood sugar levels.^{9,10}

Diabetes mellitus requires a multi-dimensional management plan where patients make informed decisions about diet, exercise, weight and blood pressure control, blood glucose monitoring, and use of medications and control of different complications. Knowledge about DM and its complications enhances the ability of patients with DM to cope and adjust to their illness whereas poor knowledge about DM is associated with increased rate of hospitalization.

The objective of this study was to find out the knowledge of diabetic patients about their disease to enable the right quarters to design strategies to delay the progression of its complications as the progression or development of many of these complications can be delayed if not entirely prevented with proper management and patient education.

MATERIAL AND METHODS

This cross-sectional descriptive study was conducted in Medical B Unit of Khyber Teaching Hospital (KTH) Peshawar over a period of six months including 96 patients. Sample size calculated using WHO calculator taking 51.5% prevalence of knowledge about hypoglycaemia reported by Gulabani M, 95% confidence level and 10% absolute precision.¹¹ All patients over the age of 15 years, both male and females with more than one year history of DM were included in the study after informed consent, while those related to medical profession like doctors, medical students, nurses and paramedic staff were excluded from the study. All patients were interviewed by the researchers themselves and questionnaire was elaborated to all patients in local language. They were asked to reply with either a Yes, No or Not sure/don't know to all the questions asked. A total of 17 questions were asked from all patients and they were categorized in one of the three groups, as having Good (12 or more correct answers out of 17), Average (between 7-11 correct answers out of 17) or Poor knowledge (less than or equal to 6 correct answers out of 17).

All the information including answers to all questions and patients' demographic information were recorded in an objectively structured *pro forma*. Data was analysed using SPSS 16.0. Mean±SD were calculated for numerical variables like age, and duration of diabetes. Frequencies and percentages were calculated for categorical variables like gender, education level and knowledge (good, average and bad). Chi-square test was used to know significant differences among categorical variables with a 5% level of significance.

RESULTS

In our study total of 96 patients were included, with 58 (60.4%) females and 38 (39.6%) males. Their ages ranged from 25–80 years with mean age of 53.29±10.821 years. The mean duration of DM was 9.75±7.729 years. Descriptive statistics of the study population, the distribution of age groups and gender, duration of DM and level of education are shown in table-1. With respect to knowledge about complications of DM, 36 (37.50%) had good, 24 (25%) had average and 36 (37.50%) had poor knowledge.

Knowledge about risk factors is shown in table-2 with 70 (72.91%) knowing that DM is associated with increased risk of foot ulcer or gangrene. Further analysis showed that 50% of males had good knowledge as compared to 31.03% females but this difference wasn't statistically significant ($p>0.05$). Furthermore it was found that those with longer duration of DM had slightly better knowledge regarding DM complication but this difference wasn't significant as well ($p>0.05$). All the 3 patients with higher education, 70.58% with school or college education while only 27.63% uneducated patients had good knowledge ($p<0.05$) as shown in table-3.

Table-1: Clinical feature of the patients

Parameter	Number of patients (n=96)
Age	53.29±10.821 (min25 max80)
Less than 20 years	01
21 to 40 years	25
41 to 60 years	60
More than 60 years	20
Sex	
Male	38
Female	58
Duration of Diabetes Mellitus in years	9.75±7.729 (min1 max40)
01 to 5 years	27
06 to 10 years	34
11 to 15 years	17
More than 15 years	18
Level of education	
No formal education	76
School or college level (metric/Inter)	17
University level (Graduation or above)	03

Table-2: Knowledge about different complications of diabetes mellitus

Complication	Positive response	Negative/Not sure/Don't know response*
Hypertension	54	42
Myocardial infarction/Angina	50	46
Congestive Cardiac Failure CCF)	56	40
Renal failure (Nephropathy)	62	32
Eye problems Retinopathy/Cataracts)	53	43
Stroke/Transient Ischemic Attack	54	42
Infections (UTI, respiratory, skin)	52	44
Foot ulcers	70	26
Muscle weakness and pain (Amyotrophy)	46	50
Dyslipidemias/ hypercholestrolemias	26	70
Dental caries	40	56
Lower limbs parasthesias and numbness	62	34
Gastroparesis and other gastrointestinal problems	45	51
Death at early age	52	44
Poor wound healing	68	28
Hypoglycaemia	50	46
Diabetic ketoacidosis/ HONK	55	41

*Not sure/ don't know response was recorded as a negative response in *pro forma*

Table-3: Cross tabulation: Level of knowledge and sex, duration of diabetes mellitus and age groups

Parameter	Level of Knowledge			Total	p
	Good	Average	Bad		
Sex					
Male	19	07	12	38	0.121
Female	17	17	24	58	
Level of education					
No formal education	21	21	34	76	0.047
School or college level(metric/Inter)	12	03	02	17	
University level(Graduation or above)	03	00	00	03	
Duration of Diabetes Mellitus in years					
01 to 5 years	10	05	12	27	0.575
06 to 10 years	11	11	12	34	
11 to 15 years	05	05	07	17	
More than 15 years	10	03	05	18	

DISCUSSION

Diabetes Mellitus is a complex metabolic disorder characterized by inappropriate hyperglycaemia as a result of either an absolute or relative deficiency of insulin and/or insulin resistance.¹¹ DM is a common problem worldwide with increasing prevalence over time and is greatly affecting the economic resources of all, especially the poor and developing countries like Pakistan. DM and its diverse complications can cause many co-morbid illnesses. To increase the community well-being and thus decrease the economic burden of DM, it is essential to educate the population in general and diabetics in particular to help proper monitoring and management of this disease.

About 79.16% patients had no formal education contrary to other studies done in different parts of the world where majority of patients were educated.¹² This difference is explained by the very low literacy rates in Khyber Pakhtunkhwa especially in women.

In our study only 37.5% patients had good knowledge of complications of DM while study conducted by Kiberenge MW *et al.* in Kenya reported as 26% having good knowledge.¹³

In our study 72.91% patients were aware that DM is associated with foot ulcers (diabetic foot) while Muninarayana C *et, al.*¹² also reported it to be most common complication known to 74.2% responders in the diabetic arm of their study. About 55.20% were aware that DM can lead to visual problems and blindness in our study compared to 49.8% reported by Mwangi MW *et, al.*¹⁴

Knowledge about different cardiovascular complications like angina, myocardial infarction, hypertension and CCF ranged from 50–60% comparable to 64.4% reported by Gulabani M *et al.*¹¹

About 52.08% were aware that hypoglycaemia does occur in DM, comparable to the Indian study in which 51.5% knew about hypoglycaemia or hypoglycaemic symptoms.¹¹ Regarding renal problem the knowledge of patients is reported between 10.9–90% in different studies.¹⁵ While in our it was 66.66%. One possible explanation of this difference may be that most of our study population was unable to differentiate between episode of hypoglycaemia and TIA or stroke. About 41.66% were aware that diabetic patients are more prone to dental caries and other dental problem compared to 54% in a study.¹⁵

In our study positive response regarding questions about different types of neuropathy ranged from 47-65% while a study conducted in nurses in Benin City, reported that 86.4% nurses answered that numbness and tingling can result from DM.¹⁶ This difference may be explained by the difference in the characteristics of study population between the two studies.

Female patients were far less aware of the complications of DM when compared with the male patients, but this difference was not statistically significant ($p>0.05$). Similar findings were observed by other researchers as well.¹⁷ On the other hand all the responders with university level education had good knowledge regarding the complications of their disease ($p<0.05$).

Our study had few limitations, firstly we included only admitted diabetic patients in our study and more extensive community based studies should follow before we generalize these findings to the general population. Secondly, due to high rate of illiteracy in our province majority of patients and especially female patients had the tendency to reply yes to every question asked, this attitude may have slightly overestimated the true level of knowledge in spite of very careful approach adopted by the interviewers.

CONCLUSIONS

Diabetes mellitus is the most common non-communicable disease of the modern world and it is on the rise in developing countries as well. Disease itself and complications related to it have become a major problem in our community. We found that many patients especially women and uneducated patients are unaware of these complications; as a result seek medical help very late in the course of illness. In order to manage DM effectively, delay the development and slow down the progression of these complications, we need to educate our community in general focusing on diabetic patients and their families in particular to diagnose these complications early, treated properly to preclude mortality and long term morbidity.

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