ORIGINAL ARTICLE

Erectile dysfunction and type 2 diabetes mellitus in northern Pakistan

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Abstract

Objective: To determine the frequency of erectile dysfunction in married male Type-2 diabetic patients.

Methods: The cross-sectional observational study was carried out at the Endocrinology, Diabetes and Metabolic Diseases Unit Hayatabad Medical Complex, Peshawar, from July 2011 to Apr 2012, comprising 217 male married Type-2 diabetic patients. Serum samples were assayed for blood glucose, lipid profile and glycated haemoglobin A1c. Body mass index and waist-to-hip ratio was calculated. Erectile dysfunction was assessed by Sexual Health Inventory for Men questionnaire. SPSS 18 was used for statistical analysis.

Results: A total of 217 patients were initially interviewed. The mean age was 43.1±8.160 years. The frequency of drectile dysfunction increased with age, duration of patients and increased body mass index. Overall, 6 (2.8%) patients had no erectile dysfunction, 37 (17.1%) had mild, 82 (37.8%) mild to moderate; 47 (21.7%) moderate; and 45 (20.7%) severe. Higher HbA1c levels and atherogenic dyslipidaemia were associated with erectile dysfunction.

Conclusion: Poor glycaemic control was associated with increased erectile dysfunction risk. Duration of diabetes, older age, increased body mass index are associated with increased incidence of the condition in patients with diabetes. Intensive lifestyle changes in the beginning can add to the better management of Type-2 diabetes and prevention of erectile dysfunction.

Keywords: Erectile Dysfunction, BMI, T2DM, Sexual Health Inventory for Men. (JPMA 63: 1486; 2013)

Introduction

Erectile dysfunction (ED) is the persistent inability to achieve or maintain penile erection for satisfactory sexual intercourse.[1] ED is a commonly reported condition among men with diabetes.[2] Prevalence of ED among diabetic men varies from 35-90%.[3] ED in men with diabetes occurs 10-15 years earlier,[4] it is more severe, associated with poor quality of life[5] and is less responsive to treatment.[6] In a recent multinational study,[7] Men's Attitudes to Life Events and Sexuality, diabetic men rated their ED as more severe and debilitating than non-diabetic men and were more likely to seek professional help for the disorder. In our population, people seek physician's consultation for ED, but generally, due to lack of awareness among the diabetics, the treatment is denied.

Chronic hyperglycaemia represents the major biochemical abnormality in the diabetic patient and it has a role in both micro-vascular and macro-vascular diabetic complications.[8] However, there is still disagreement about the role of glycaemic control as a risk factor for ED in diabetic men. Some observational studies have shown that a poor glycaemic control, as reflected by higher values of glycated hemoglobin A1c (HbA1c), was associated with higher risk of ED,[9-11] whereas other studies did not find any association.[12-14] The reasons for these divergent results are not evident.

However, diabetic men may be afflicted by a multitude of co-morbidities, including hypertension, overweight or obesity, the metabolic syndrome, atherogenic dyslipidaemia, cigarette smoking, autonomic neuropathy, and so on; all of which are by themselves risk factors for ED.[11,15,16]

There is hardly any study regarding the prevalence of ED in Type 2 Diabetes Mellitus (T2DM) patients in northern Pakistan. The current study was designed to evaluate the frequency of ED in a population of diabetic men in this region.

Patients and Methods

The cross-sectional observational study was conducted at the Hyatabad Medical Complex, Peshawar, from July 2011 to April 2012. Married T2DM male patients who attended the outpatient department (OPD) were included in the study. The inclusion criteria comprised a diagnosis of T2DM for at least 6 months, age between 28-75 years, and HbA1c of 6.5% or higher. The exclusion criteria comprised patients with concomitant chronic diseases, including kidney, liver and cardiovascular diseases, recent acute illness, and any surgical

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procedure (spinal and urological).

The study was approved by the institutional ethics committee, and all participants gave informed written consent. A pre-designed questionnaire was filled out by each participant.

Erectile function was assessed with the help of Sexual Health Inventory for Men (SHIM) Questionnaire.[17] ED was classified according to the sum score: a score of 21 or less indicated the presence of ED: mild (score 21-17); mild to moderate (score 16-12); moderate (score 11-8); and severe (score 7-1). In addition, participants were asked whether or not they had sought medical help for their problem and about previous use of medical treatment for ED.

Height and weight were measured with participants wearing lightweight clothing and no shoes. Body mass index (BMI) was calculated as weight (in kilograms) divided by standing height (in metres squared). Waist-to-hip ratio was calculated as the waist circumference in centimetres divided by the hip circumference in centimeters. Arterial blood pressure was measured three times at the end of the physical examination with the subject in sitting position. Before blood pressure evaluation, all participants were rested for at least 15 minutes. Patients whose average blood pressure levels were greater or equal to 140/90mmHg or who were under anti-hypertensive medication were classified as hypertensive.

Atherogenic dyslipidaemia was defined as the combination of triglyceride levels >200 mg dl-1 and high-density lipoprotein (HDL)-cholesterol levels <40 mg dl-1.[18] Atherogenic risk was calculated by calculator which divides the atherogenesis risk in low, intermediate and high categories.[19]

AIP <0.11 - low risk

AIP (0.11 - 0.21) intermediate risk

AIP >0.21 increased risk

Laboratory assessment was centralised. Blood glucose, HbA1c and serum lipids were measured by enzymatic assays in the hospital's chemistry laboratory.

The sample size was calculated using 75%[20] proportion of ED in DMT2, 95% confidence interval, 6.77% margin of error under the World Health Organisation (WHO) software for sample size determination. Descriptive statistics were used to characterize the study sample. Chi-square was used for comparison of numeric variables without normal distribution. Multivariate analyses were used to characterise the association between the usual risk factors for ED while adjusting for co-variates. All statistical analyses were performed using SPSS 18.

Results

A total of 217 men completed the questionnaire and their clinical characteristics were noted (Table-1).

Overall, 6 (2.8%) patients had no ED; 37 (17.1%) had mild; 82 (37.8%) mild to moderate; 47 (21.7%) moderate; and 45 (20.7%) had severe ED (Table-2).

The frequency of ED increased with age (Figure-1).

Table-1: Characteristics.

Age (Year)	43.07±8.13
BMI	27.36±3.47
Smoking	45.6%
Hypertension	43.3%
HbA1C	9.67±1.79
Total Cholesterol	211.99±25.1
HDL Cholesterol	37.21±2.86
TG	260.18±75.8

BMI: Body mass index. HDL: High-density lipoprotein. TG: Triglycerides.

Table-2: ED characteristics.

Erectile Dysfunction	Frequency	Percent
Nil	6	2.8
Mild	37	17.1
Mild to Moderate	82	37.8
Moderate	47	21.7
Severe	45	20.7

ED: Erectile dysfunction.

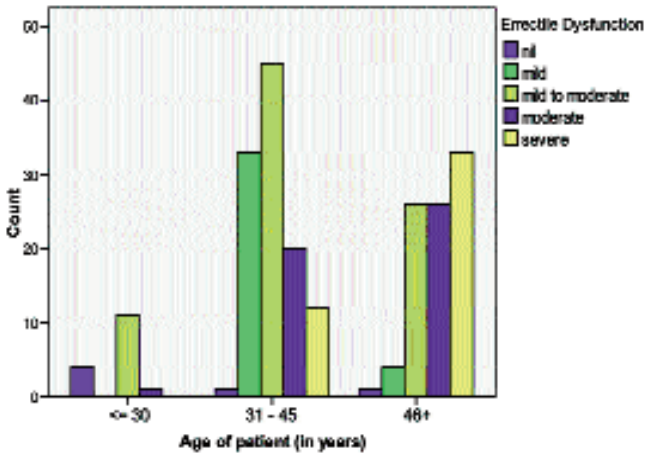

Figure-1: ED and age.

Table-3: Parametre estimates.

Errectile Dysfunction[a]		Sig.	odds ratio	95% Confidence Interval for odds ratio	
				Lower Bound	Upper Bound
Mild	Age	0.242	1.130	0.921	1.387
	Duration	0.814	1.423	0.076	26.714
	Smoking	0.350	3.936	0.222	69.821
	BP	0.993	1.016	0.032	32.058
	HbA1c	0.074	3.010	0.897	10.099
	AIP	0.851	1.809	0.004	883.490
	BMI	0.358	0.240	0.011	5.023
	Drugs	0.117	9.131	0.575	145.014
mild to moderate	Age	0.102	1.186	0.967	1.455
	Duration	0.542	2.496	0.132	47.118
	Smoking	0.107	10.657	0.599	189.596
	BP	0.586	.388	0.013	11.759
	HbA1c	0.085	2.897	0.862	9.733
	AIP	0.653	0.246	0.001	111.722
	BMI	0.094	0.076	0.004	1.553
	Drugs	0.077	12.148	0.764	193.119
Moderate	Age	0.023	1.275	1.034	1.573
	Duration	0.239	6.005	0.303	118.933
	Smoking	0.080	13.745	0.733	257.865
	BP	0.746	0.565	0.018	17.862
	HbA1c	0.298	1.918	0.563	6.533
	AIP	0.440	0.086	0.000	43.073
	BMI	0.359	0.241	0.011	5.053
	Drugs	0.062	14.563	0.875	242.323
Severe	Age	0.022	1.283	1.036	1.589
	Duration	0.038	24.699	1.187	513.779
	Smoking	0.134	9.748	0.497	191.103
	BP	0.845	0.704	0.021	23.466
	HbA1c	0.110	2.747	0.797	9.472
	AIP	0.303	0.036	6.272E-5	20.212
	BMI	0.154	0.107	0.005	2.307
	Drugs	0.031	23.547	1.325	418.532

HbA1c: Glycated haemoglobin AIc. BP: Blood pressure. BMI: Body mass index. AIP: Atherogenic index of plasma.

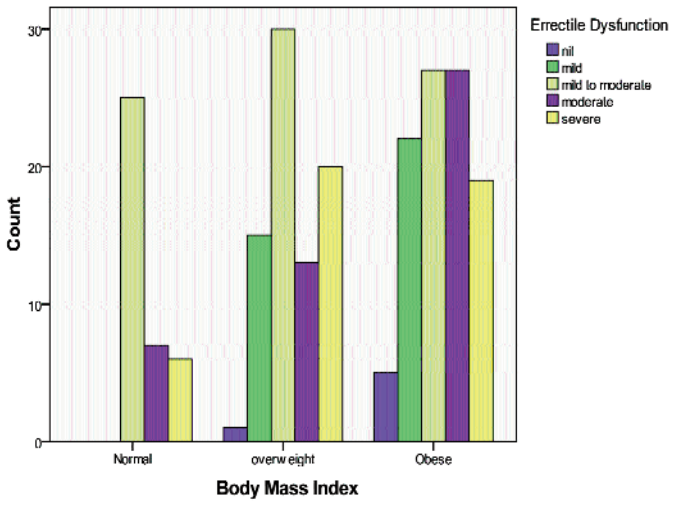

Figure-2: Ed and BMI.

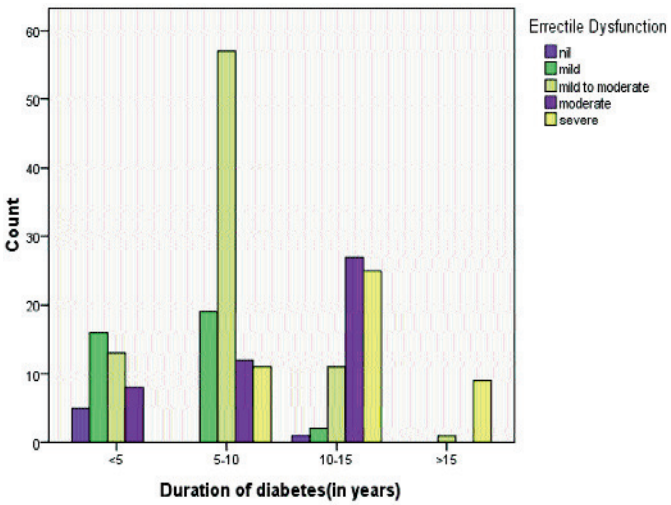

Figure-3: ED and T2DM duration.

(T2DM: Type 2 Diabetes Mellitus)

The frequency of ED increased as the BMI of Patients increased (Figure-2).

As the duration of diabetes increased, so did the frequency of ED (Figure-3).

The contribution of Drugs like B blockers, age, duration of diabetes, HbA1c,body mass index , hypertension, Atherogenic dyslipidaemia and smoking status score to risk of ED, based on multivariate logistic regression, is shown in Table-3.

Discussion

In this study, 211 of the 217 diabetic men had some degree of ED; out of which 45 had severe ED. Besides, 44% of the patients had sought medical advice and 29% had used phosphodiesferase-5 (PDE-5) inhibitors in the past. The study shows the frequency of ED in 80.3% of patients with diabetes aged > 45 years of age comparable to a study published locally.[21] The study shows that glycemic control, as assessed by HbA1C, is a risk factor for ED in diabetic men which are also endorsed by studies published internationally. In previous studies glycaemic control was reported to be positively and significantly associated with ED.[9-11,22] In disease population of 792 diabetes men, as assessed by a study,[23] HbA1c was an independent risk factor for severe ED.

Advancing age and increased duration of diabetes have consistently been shown to increase the risk of ED.[9,21,24] The prevalence increased with age, from 4.6% in men aged 20-29 to 45.5% in those aged ≥60 years, while the prevalence in our study increased from 2.5% to 41.7% as the age increased. In a study in Korea, it was mentioned that with increased duration of diabetes, ED increased as shown in our study.

Hyperlipidaemia[9,25] by high cholesterol and/or low HDL-cholesterol levels, hypertension[15] and obesity[16] are conditions that coexist with diabetes, and all of them may be independent risk factors for ED among diabetic men.

A study showed that high cholesterol level is associated with ED,[25] as also shown in our study. We found that the presence of mixed dyslipidaemia, the so-called diabetic or atherogenic dyslipidaemia, was an independent risk factor for ED as shown in observational studies done in the United States and China.[22,23] This form of dyslipidaemia is particularly present in the diabetic patient and is characterised by high triglyceride levels and low HDL-cholesterol levels.

A study[16] mentioned that obesity increased the risk of ED by 30-90%. Our study also showed similar findings.

In terms of limitations, the cross sectional nature of our study did not allow us to make inference above cause and effect and potential for a residual confounder by uncontrolled co-variates. The major strength of our study is the validated measure of sexual dysfunction and relatively large number of subjects.

Conclusion

Among T2DM subjects, glycaemic control was associated with increased risk of ED. Increased age, increase duration of diabetes and BMI were significant risk factors for developing ED. An intensive lifestyle modification in the initial management of T2DM, is recommended.

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