Original Article

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Urology Section

Prevalence and Severity of Erectile Dysfunction as Assessed by IIEF-5 in North Indian Type 2 Diabetic Males and Its Correlation with Variables

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ABSTRACT

Introduction: The aim of this study was to assess the severity of the erectile (ED) dysfunction among type 2 diabetic men. For subjective information patients were asked to fill up the IIEF questionnaire. This study was also done to correlate ED with other variables like age, obesity, duration of diabetes, degree of diabetic control and complications of diabetes. Neuropathy was assessed objectively by using the Vibration Perception Threshold (VPT).

Material and Methods: This study was conducted on 348 patients. Age range of these subjects was 25 years to 75 years. All patients underwent routine clinical examinations which included recording of duration of diabetes, type of diabetes, Body Mass Index, previous HbA1c tests and VPT measurement.

Results and Conclusion: In the present study, it was observed that there was a significant association of ED with age, duration of diabetes, glycemic control and BMI. In fact, VPT emerged as a strong predictor of ED. We conclude that adding objectivity of VPT measurement improves the subjective predictive value of IIEF-5.

Keywords: Erectile Dysfunction, IIEF-5 Questionnaire, Type 2 Diabetes Mellitus

INTRODUCTION

Erectile Dysfunction (ED) is a common condition which is seen among men with diabetes. ED is a consistent inability of the male in achieving or sustaining an erection of sufficient rigidity, for permitting a satisfactory sexual intercourse. In diabetic men, erectile dysfunction usually occurs as a result of micro-vascular changes, neuropathy and endothelial dysfunction, which are causes of many other complications of diabetes. ED is an undiagnosed and an underreported problem. Patients tend to hide ED when they are questioned directly by their providers. Therefore, the use of validated questionnaires, those which are either self-administered in an anonymous, neutral setting or which are administered by an objective third-party interviewer, are preferred.

The aim of this study was to assess the severity of the erectile dysfunction among type 2 diabetic men who reported to diabetic clinic of a tertiary care centre. In present study, we assessed the severity of erectile dysfunction among male diabetic subjects, based upon International Index of Erectile Function (IIEF-5) questionnaire. For subjective information regarding the severity of erectile dysfunction – the patients were asked to fill up the IIEF questionnaire. Records of various medications which were taken by the patients, mainly antihypertensive drugs, cholesterol lowering drugs or any other medications, were also noted.

This study was also done to correlate ED with other variables like age, obesity, duration of diabetes, degree of diabetic control and complications of diabetes like neuropathy, nephropathy, coronary artery disease and peripheral vascular disease. Neuropathy was assessed objectively by using the Vibration Perception Threshold (VPT).

MATERIAL AND METHODS

This study was conducted on 348 patients of Type 2 Diabetes Mellitus, who reported for consultation. IIEF-5 is a well validated questionnaire which is used for the evaluation of sexual dysfunction and it was used to assess ED in diabetic men. After taking their informed consents, the patients were given the questionnaire and they were assisted in the form filling . Some bias occurred during answering of the questionnaire. Some patients misunderstood the meaning of an item and chose an improper answer. If this occurred, the OPD male nurse was requested to explain the meaning of each item and to help the patient in selecting the proper answer or choice.

The age range of these subjects was 25 years to 75 years. All patients underwent routine clinical examinations which included recording of duration of diabetes, type of diabetes, Body Mass Index (BMI), fasting blood sugar, previous HbA1c tests, blood pressure, cholesterol and triglycerides levels and diabetes-related complications. The frequencies and daily dosages of oral anti diabetic drugs /insulin were noted. Micro-vascular complications like retinopathy, nephropathy, and neuropathy (Reflexes and Vibration Perception Threshold studied by using DSL-Dhansai Lab Equipment), and macro-vascular complications such as heart disease, peripheral vascular disease and stroke were recorded. Drug prescriptions of hypertensive patients who were being treated and other medications were noted.

RESULTS

The incidence of ED in our study [Table/Fig-1] was on the higher side and this may reflect actual prevalence of ED or exaggeration of sexual symptoms by patients.

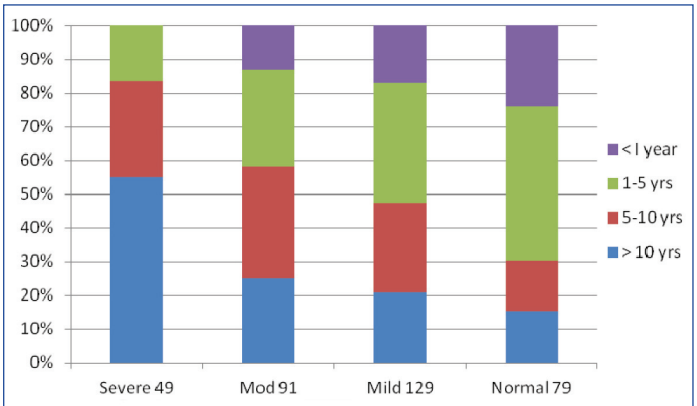
Condition of Erectile Function	Population (348)	
	Number	%
Normal Erectile Function	79	22.8
Erectile Dysfunction	269	77.2
Mild	129	37
Moderate	91	26.1
Severe	49	14

[Table/Fig-1]: Prevalence of Erectile Dysfunction in population studied

Severity IIEF	Severe	Moderate	Mild	Normal
Severe 49	33(67.5)	10(20.3)	6(12.2)	-
Moderate 91	20(21.9)	38(41.7)	26(28.6)	7(7.7)
Mild 129	16(12.4)	38(29.4)	45(34.9)	30(23.2)
Normal 79	5(6.3)	11(13.9)	30(38)	33(41.8)
Total 348	74	97	107	70

[Table/Fig-2]: Vibration Perception Threshold

The most important indicator that emerged in present study was Vibration Perception Threshold (VPT), which was taken as the average VPT of left and right sides. This was compared with severity of IIEF-5 questionnaire [Table/Fig-2]. The results suggested that higher the degree of Erectile Dysfunction (ED) as measured by lower IIEF-5, higher was the VPT score, which indicated a higher degree of neurological involvement (p-value 0.00004-Significant).



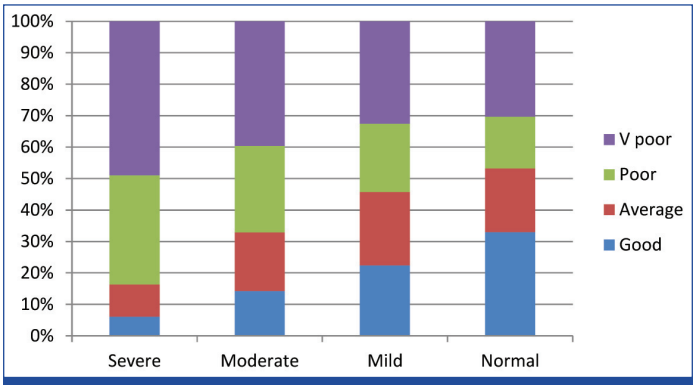
[Table/Fig-3]: Duration of diabetes in years as compared to severity of ED

Duration of diabetes seemed to have an important correlation with severity of ED. As the years with glycaemia increased, the prevalence of ED also increased, as was indicated in subjects with severe ED [Table/Fig-3]. Duration of diabetes had a significant correlation with ED (p-value 0.000034 -Significant).

Severity IIEF	20-29	30-39	40-49	50-59	60-69	70-79
Severe 49	-	4(8.1)	10(20.4)	20(40.8)	14(28.6)	1(2)
Moderate 91	-	7(5.4)	40(31)	34(37.3)	7(7.7)	3(3.3)
Mild 129	5(3.8)	29(22.4)	45(34.8)	37(28.6)	11(8.5)	2(1.5)
Total ED 269	5	40	95	91	32	6
Normal 79	1(1.2)	18(22.7)	33(41.7)	19(24)	8(10)	-
Total 348	6	58	128	110	40	6

[Table/Fig-4]: Age groups in years

269 out of total 348 interviewed subjects (77.3 %) had some degree of ED which ranged from mild to severe [Table/Fig-4]. A majority of subjects were in age group of 40 to 59 years (186 out of 269 I.e.69.1%). This indicated a strong correlation between age and ED. An interesting pointer was higher percentages of men in age groups



[Table/Fig-5]: Glycemic Control status as assessed by HbA1c

of 50-59 years and 60-69 years, who suffered from severe ED, which indicated that severity increased with advancing age (p-value 0.00740-Significant).

More than 82% of the subjects with severe ED had a poor or very poor diabetic control, as compared to 48 % of the normal subjects [Table/Fig-5]. These pointed to a direct correlation between degrees of glycaemic control status, as was assessed by HbA1c and degree of ED which were assessed by IIEF-5 (p-value 0.00799 - Significant).

Severity IIEF	G3	G2	G1	Overweight	Normal	Lean
Severe 49	2(4)	3(6.1)	4(8.1)	25(51)	12(24.5)	3(6.1)
Moderate 91	1(1)	5(5.4)	25(27.4)	39(42.8)	15(16.4)	6(6.5)
Mild 129	1(.8)	7(5.4)	19(14.7)	71(55)	29(22.4)	2(1.5)
Normal 79	-	5(6.3)	21(26.6)	28(35.4)	24(30.4)	1(1.2)
Total 348	4	20	69	163	80	12

[Table/Fig-6]: Severity of IIEF and Body Mass Index

A correlation between Body Mass Index and severity of ED, as was assessed by IIEF, was seen (p-value 0.01960-Significant) [Table/Fig-6]. Probably the study population did not have a high proportion of morbid obese patients. A majority of patients were however overweight or Grade 1 obese.

Severity IIEF	Yes	No
Severe 49	28(57.1)	21(42.9)
Moderate 91	47(51.6)	44(48.4)
Mild 129	54(41.8)	75(58.1)
Normal 79	29(36.7)	50(63.2)

[Table/Fig-7]: Severity of ED associated with Hypertension

In this study 57.1% of the subjects with severe ED had associated Hypertension, whereas about 36.7% subjects with no ED had hypertension [Table/Fig-7]. This could be because severe ED was seen in older subset of patients who had suffered from diabetes for long durations (p-value 0.05415 - Not Significant).

DISCUSSION

An abridged, 5-item version of The International Index of Erectile Function IIEF-5, also known as the Sexual Health Inventory for Men (SHIM), as an inventory for diagnosis of ED, has not been commonly used in Indian patients and its use by patients may be helpful for them in being more forthcoming about the problem of ED.

In study of Kumar et al., [1] done in southern India, the prevalence of ED was reported to be 58%. Also, 94% of subjects with ED had an unsatisfactory blood sugar control (HbA1c>7%). Viswanathan et al., [2] reported that 44.4% of diabetic patients had sexual dysfunction, and that severe ED was associated with duration of diabetes, a poor glycaemic control and high blood pressure.

Neurological deficit, as is assessed by VPT, is an important parameter which is correlated with severity of ED. The results of present study were consistent with findings of Amano T et al., [3], where measurement of VPT was considered to be a simple and a useful indicator for diagnosing ED in DM patients. In multiple regression analysis, age and VPT were considered as independent risk factors for predicting ED in DM patients.

In study of Viswanathan et al., [2] done in south India, it was seen that 44.4% of diabetic patients had sexual dysfunction. They found that severe ED was associated with longer durations of diabetes, a poor glycaemic control and high blood pressure. Amano T et al., [3] also concluded that severity of ED in diabetic patients depended on duration of DM.

In study of Kumar et al., [1] done in southern India, increase in age to above 45 years was found to significantly increase the prevalence of

ED.E L Rhoden et al., [4] observed a high rate of severe degree and a decrease in frequency of mild degree of ED with aging. Ponholzer A et al., [5] concluded that age was an important risk factor for ED. Severe ED (IIEF-5 score 5-7) increased from 0.4% (20-30 years) to 0.5% (41-50 years), 1.3% (51-60 years) and to 9.6% in those who were aged 71-80 years in this study. Miyata Y et al., [6] also identified aging as an independent factor in both ED and severe ED.

In a study done by Weinberg AE et al., [7], a poor glycaemic control, impaired insulin sensitivity, and the metabolic syndrome were associated with a heightened risk of ED. Glycaemic control is independently and inversely associated with ED in men with diabetes type 2, as was concluded by Awad H et al., [8]. Domenico Fedelea et al., [9], in which they quoted various studies that had re stressed that a poor metabolic control was associated with an increased risk of ED, both in Type 1 and Type 2 subjects. This underlined the possible benefit of glycaemic control in the prevention of ED. Viswanathan et al., [2] found that severe ED was associated with duration of diabetes, a poor glycaemic control and high blood pressure.

Giugliano F et al., [10] also pointed that among subjects with type 2 diabetes, glycaemic control and other metabolic covariates were associated with a risk for ED. Duration of diabetes and HbA1c levels have been pointed out by Meena BL [11] and Al-Hunayan A as increased risk factors for ED [12]. Lu CC et al., [13] reported that a better glycaemic control would probably reduce the prevalence of ED and its severity among younger men with type 2 DM.

Viswanathan et al., [2] Al-Hunayan A et al., [12] and Veronelli A et al., [14] have all reported that increased BMI had an association with a higher incidence of ED. This same result was reported by Tamler R. et al., [15] In a study done by Viswanathan et al., [2] it was found severe ED was associated with high blood pressure. Giuliano FA [16], as well as Ponholzer A [5], Al-Hunayan A [12], have all reported that patients with hypertension had a high prevalence of bothersome, untreated ED. Tomohode Yamada et al., [17] have reported that ED was associated with an increased risk of CV events in diabetic patients. Fiona Jamieson et al., [18], by using multi-variate analysis, have also found a significant association with hypertension.

CONCLUSION

In the present study, it was concluded that ED had significant association with age (p-value 0.00740), duration of diabetes (p-value 0.00034), glycaemic control with ED (p-value 0.00799) and BMI (p Value 0.01960), as was assessed by studying HbA1c levels. In fact, VPT emerged as a strongest predictor of prevalence of severe ED, as was assessed by studying IIEF-5 scores (p-value 0.00004). However, in this study, hypertension did not seem to have any strong predictive value (p-value 0.05415 - Insignificant). We conclude that adding objectivity of VPT measurement improves the subjective predictive value of IIEF-5.

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