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RESEARCH ARTICLE

A PROSPECTIVE STUDY OF EVALUATION OF ERECTILE DYSFUNCTION IN MALE DIABETIC PATIENTS

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ABSTRACT

Introduction: Erectile dysfunction (ED) is a problem getting or keeping an erection hard enough for satisfactory sexual performance. The global prevalence of ED is 3–76.5%. ED constitutes a large burden on society given its high prevalence and impact on quality of life. Diabetes is a common cause of organic ED. The pathophysiology of diabetes-induced erectile dysfunction is multifactorial. Prevalence of ED in diabetes rate range from 35 % to 85% depending on the study, versus 26% in general population. ED occurs 10-15 years earlier in men with diabetes than it does in sex-matched counterparts without diabetes. **Material and methods:** Study was conducted in male diabetic patients attending medical OPD and endocrinology OPD and those admitted in these wards of MB Hospital Udaipur from Jun 2021 to Jun 2022. It was a hospital based cross sectional study. ED was diagnosed by asking patients to complete International Index of Erectile Function (IIEF)-5 questionnaires. Then according to score patients were divided into 4 categories: Mild ED means score is between 17-21, mild to moderate ED if score is between 12-16, moderate ED if score is between 8-11 and severe ED if score is between 1-7. Now presence of ED and its severity was correlated with age, residence, duration of diabetes, glycemic status, lipid profile, complications, BMI, etc. **Results:** Prevalence of ED in male diabetic patients was found to be 67%. Among 100 cases with erectile dysfunction, 9 had mild ED (13.4%), 16 cases had mild to moderate (23.8%), 15 cases had moderate ED (22.3%) and 27 had severe ED (40.2%). Prevalence of ED was found to be proportional to age. Majority of cases in ED group are those with long standing diabetes. Correlation of ED with complication of diabetes like nephropathy and neuropathy was significant whereas not for retinopathy. Significant correlation was found between BMI and ED. **Conclusion:** ED prevalence was high among the diabetic men and it increased with age and duration of the disease. Presence of diabetic complications was significantly associated with ED. BMI was significantly associated with development of ED therefore lifestyle modification should be recommended to all patients.

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INTRODUCTION

Erectile dysfunction (ED), also referred to as "impotence," is a problem not getting or keeping an erection hard enough for satisfactory sexual performance.1ED is defined as the persistent inability to achieve and/or maintain penile erection sufficient for satisfactory sexual performance [Najari, 2016]. Age is a strong determinant of occurrence of ED and epidemiological studies indicate a strong relationship between ED and advancing age. While men aged 50–59 years have a 3.6 times higher risk of developing ED as compared to those aged 18–29 years, the risk is even higher (6–7 times) among males older than 70 years 2. Diabetes is a common cause of organic ED.

Both vascular which includes atherosclerosis of penile and pudendal arteries leading to decreased blood supply to corpus cavernosum and neurological mechanisms by autonomic neuropathy are implicated in people with diabetes. Studies of ED suggest that its prevalence in men with diabetes ranges from 35–75% versus 26% in general population and the onset of ED occurs 10–15 years earlier in men with diabetes than it does in sex-matched counterparts without diabetes 3. Diabetic neuropathy can similarly cause autonomic and somatic neural disorders which are of importance for erection. Besides diabetes can bring about disorders in relaxation of cavernous smooth muscles as a result of the nitric acid produced from endothelium, which may be a side effect of glycated products (NIH, 1993; Feldman, 1994). Recent evidence indicates that men with diabetes may be in growing danger of reduction of testosterone levels (hypogonadism) in addition to

problems related to arteries and nerves supporting the penis (Chu, 2001; Sadock, 2017). Although an exact mechanism of this effect has not been completely identified, hypogonadism in such men may indirectly mitigate levels of pituitary hormones, responsible for stimulating testosterone production in testicles (Vlachopoulos, 2007). Proper sexual functioning is one of the most important components of quality of life [de Tejada, 1989]. The presence of ED is associated with grave psychosocial and clinical consequences including poor quality of life and depression [Diaz-Arjonilla, 2009]. However, it should be noted that ED is the most treatable complication of diabetes; over 95% of cases can be successfully treated [Kapoor, 2007]. The magnitude of erectile dysfunction is usually underestimated in many developing countries because of several reasons. Firstly, ED is not a life-threatening condition,thus not reported. The second is associated with stigma attached to the problem, men with the problem rarely seeking help. There is also the problem of early detection and management of factors responsible for the development of erectile dysfunction [Morelli, 2007].

MATERIALS AND METHODS

STUDY DESIGN: The study was a hospital based cross sectional study

STUDY AREA: The study was carried out in the department of Medicine, psychiatry and Endocrinology, R N T Medical College and attached group of hospitals, Udaipur (Rajasthan).

STUDY PERIOD: The study was carried out over a period of 12 months from June 2021 to June 2022.

STUDY POPULATION: The study population comprised of Male Diabetic patients attending Medical endocrinology and psychiatry OPD as well as admitted in these wards after taking informed consent.

***INCLUSION* CRITERIA:** Male diabetic subjects age > 18 years and those who were sexually active.

EXCLUSION CRITERIA

- Ischemic heart disease, Cirrhosis, Chronic kidney disease
- Endocrine disorders other than Diabetes like Thyroid disorder, Addison disease, Acromegaly
- History of pelvic trauma, pelvic surgery (hernia, hydrocele)
- Neurogenic causes like spinal cord injury, Multiple sclerosis.
- Men with debilitating disease e.g TB, HIV
- Men with unfavourable penile anatomy for sexual act.

RESULTS

Present study was a hospital based cross sectional study, carried out in the department of Medicine, psychiatry and Endocrinology, R N T Medical College and attached group of hospitals, Udaipur (Rajasthan) enrolled total 100 male diabetic patients. Out of 100 cases, 67 were found to have ED whereas 33 had no ED. Therefore, prevalence of erectile dysfunction in male diabetic patients was found to be 67%. Among 67 cases with erectile dysfunction, 9 had mild ED (13.4%), 16 cases had mild to moderate ED (23.8%) and 15 had moderate ED (22.3%) And 27 had severe ED (40.2%)

Table 1. Age wise distribution of ED among diabetic patients

Age group	Non -ED	ED	Total
≤ 40 years	17 (85%)	3 (15%)	20
41-50 years	4 (30.8%)	9 (69.2%)	13
51-60 years	5 (20%)	20 (80%)	25
>60 years	7 (16.7%)	35 (83.3%)	42

Above table depicts Distribution of ED with respect to age. Among ED group, maximum patients are present in elderly age group i.e> 60 years (52.2%) and among non-ED group maximum patients are among younger age group i.e≤40 years (51.5%).

Prevalence of ED in < 40 years group is 15% whereas in 51-60 years age group is 80% and in >60 years age group is 83.3%.

Table 2. Distribution of ED among according to type of Diabetes mellitus

Type of DM	Non -ED	ED	Total
Type 1 DM	5 (71.4%)	2 (28.6%)	7
Type 2 DM	28 (30.1%)	65 (69.9%)	93

Above table depicts distribution of ED according to type of diabetes. Out of total 100 cases, 7 were suffering from type 1 diabetes and rest 93 cases by type 2 diabetes. In type 1 DM group prevalence of ED was 28.6% and in type 2 DM, prevalence of ED was 69.9%

Table 3. Distribution of groups according to duration of Diabetes mellitus

Duration of Diabetes mellitus	Non -ED	ED	Total
<5 years	18 (58.1%)	13 (41.9%)	31
5- 10 years	9 (26.5%)	25 (73.5%)	34
>10 years	6 (17.1%)	29 (82.9%)	35

Above table depicts Distribution of ED with respect to duration of diabetes mellitus. Prevalence of ED in <5 years duration was 41.9% whereas in 5-10 years of duration group was73.5% and in >10 years age group is 82.9%. As duration increases risk of having ED increases.

Table 4. Association of ED with Diabetic neuropathy

Diabetic neuropathy	Non -ED	ED	Total
Absent	29 (39.2%)	45 (60.8%)	74
Present	4 (15.4%)	22 (84.6%)	26
p value			0.03

Total 26 cases developed diabetic neuropathy. Prevalence of ED in subjects without diabetic neuropathy was60.8% whereas in subjects with diabetic neuropathy was84.6%.When we compare diabetic neuropathy group to diabetic non neuropathy group it was found statistically significant (P value 0.03)

Table 5. Association of ED with Diabetic nephropathy

Diabetic nephropathy	Non -ED	ED	Total
Absent	31 (37.3%)	52 (62.7%)	83
Present	2 (11.8%)	15 (88.2%)	17
p value			0.04

Total 17 cases developed diabetic nephropathy. Prevalence of ED in subjects without diabetic nephropathy was62.7% whereas in subjects with diabetic nephropathy was88.2%.When we compare diabetic nephropathy group to diabetic non nephropathy group it was found statistically significant (P value 0.04)

Table 6. Association of ED with Diabetic retinopathy

Diabetic retinopathy	Non -ED	ED	Total
Absent	33 (35.1%)	61 (64.9%)	94
Present	0	6 (100%)	6
p value			0.17

Diabetic retinopathy was developed in 6 cases. Prevalence of ED in subjects without diabetic retinopathy was64.9% whereas in subjects with diabetic retinopathy was100%. P value was found to be statistically non-significant.(P value 0.17)

Table no. 7 depicts comparison of mean values of different biochemical and haematological parameters among ED and non-ED group.Correlation for Mean BMI was significantly higher in erectile dysfunction group (22.07±2.18 kg/m^2) compared to non-ED group (20.98±2.53 kg/m^2).

Table 7. Comparison of different biochemical and clinical parameters between groups

Parameter	Groups	N	Mean	SD	P value
HBA1c	Non-ED	33	8.291	2.40	0.09
	ED	67	9.284	2.92	
BMI	Non-ED	33	20.98	2.53	0.01
	ED	67	22.07	2.18	
TG	Non-ED	33	142.27	46.443	0.98
	ED	67	154.84	65.966	
LDL	Non-ED	33	107.55	41.550	0.75
	ED	67	110.49	46.834	
HDL	Non-ED	33	41.42	10.607	0.68
	ED	66	42.08	11.260	
TC	Non-ED	33	177.424	49.6085	0.75
	ED	67	179.131	61.3133	

DISCUSSION

In our study, Out of 100 cases, 67 were found to have ED whereas 33 had no ED. Therefore prevalence of erectile dysfunction in male diabetic patients was found to be 67%. ED was found in 59.39% of diabetic men in Parmar RS et al(11) study. In study by Dave M et al(12), out of 152 cases, 110 were found to have ED, whereas 42 had no ED. The differences between the estimations found in the cited studies may be due to cultural differences in the perception and attitude towards ED among the respective populations. Further more, the differences may also result from the methodology used in the studies since the techniques and definitions employed were not standardized. In present study, out of 67 cases with erectile dysfunction, 13 had mild ED (19.4%), 29 cases had moderate ED (43.3%) and 25 had severe ED (37.3%). Similar proportion of severity of ED was detected by Garg S et al(13) in their study, they classified ED into 3 categories, of which 3(6%) had mild ED, 18 (36%) patients had moderate and 18 (36%) patients had severe ED.Tamrakar D et al(14) also reported mild, mild to moderate, moderate and severe ED in 49.6%, 35.8%, 8.9% and 5.6% respectively while Mehiret G et al(15) reported that 13.3% had severe ED, 35.1% had moderate ED, and 11.3%had mild ED.

Age was significantly associated with development of ED. As age increases risk of having ED also increases. Prevalence of ED in < 40 years group is 15% whereas in 51-60 years age group is 80% and in >60 years age group is 83.3%. P value was found to be significant. As age increases risk of having ED increases.Most of the earlier studies had also reported significant correlation between ED and age. .In study by Parmar RS et al(16), ED was found to be significantly associated with higher age. Similar finding had been reported in studies by Sharifi et al(17) and Shi MD et al.(18). The duration of diabetes and the magnitude and degree of ED had a strong relationship, longer duration of DM could be associated with poor glycemic control, and its connection with ED has been well documented by several trials. Consistent with previous studies, a positive association between the duration of DM and the magnitude of ED was found in the present study, which showed that Prevalence of ED in < 5 years duration was 41.9% whereas in 5-10 years of duration group was 73.5% and in >10 years age group is 82.9%. P value was found to be significant. As duration increases risk of having ED increases. Study by MehiretG et alalso reported that as the duration of diabetes increases, the odds of having ED increased significantly,where men with a history of DM >10 years were six times more likely to report ED than those with a history of <10 years. Study by Walle B et al also found that Men who were living with DM for more than10 years were four times more likely experienced erectile dysfunction as compared with those who are living withit for 5 years and less. In our study, presence of complications in the form neuropathy and nephropathy were significantly associated with ED but no such significance was found between retinopathy and ED. Garg S et al in their study found out that retinopathy was significantly present in only 1 patient without ED and 13 patients with ED. Statistically significant neuropathy was present in all 25 patients with ED.

The frequency of nephropathy in patients with ED as compared to those without ED was not significantlydifferent. In our study, EDSS score showed significant negative correlation with HbA1C (r value = -0.21; p value 0.03) and BMI (r value = -0.26; p value <0.01).In Parmar RS et al study, SBP, DBP, BMI, FBS, serum cholesterol, and serum creatinine showed a weak correlation with potency score. Sharifi et al in 2012reported almost similar findings and reported weak correlation with SBP ($r = -0.18$), FBS ($r = -0.17$), HbA1c ($r = -0.2$) and serum creatinine ($r = -0.2$). In present study, Mean BMI was significantly higher in erectile dysfunction group (22.07±2.18 kg/m^2) compared to non-ED group (20.98±2.53 kg/m^2). Mean PC in non-ED group was 2.41±0.95 and in ED group was 3.02±1.27. Mean ALC in non-ED group was 2.21±0.76 and in ED group was 1.95±0.76. In study by Parmar RS et al, BMI was significantly lower in the diabetic males with ED ($P < 0.001$).

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