Original Research Article

Incidence of Erectile dysfunction in patients of diabetes mellitus

Abstract:

This study was designed to evaluate the prevalence and correlates of ED in a population of diabetic men. Consecutive patients with type 2 diabetes were recruited among outpatients regularly attending Diabetes Clinics. Inclusion criteria for the initial selection of patients were a diagnosis of type 2 diabetes for at least six months but less than ten years. All the male patients with diabetes mellitus (with or without active complaints of ED) attending Medicine or Psychiatry OPD of the institute during the study period were enrolled in the study. They were investigated for their body-mass index (BMI), blood sugar, and lipid profile. The prevalence of severe ED increased with age. Higher hemoglobin A1c (HbA1c) levels were associated with ED; similarly, the presence of metabolic syndrome, hypertension, atherogenic dyslipidemia (low levels of HDL-cholesterol and high levels of triglycerides), and depression was associated with ED. Physical activity was protective of ED; men with higher levels of physical activity were 10% less likely to have ED than those with the lowest level. In conclusion, among subjects with type 2 diabetes, glycemic control and other metabolic covariates were associated with ED risk, whereas a higher level of physical activity was protective.

The prevalence of erectile dysfunction was 32.21%. The mean age in patients with erectile dysfunction was significantly high (58.40±10.96 years) compared to those without erectile dysfunction (51.00±11.16 years) ($p<0.001$).

Introduction:

Erectile dysfunction is the inability to attained or maintain an erection sufficient enough for vaginal penetration. Another word, "impotence," can also describe a lack of sexual desire and

problems with ejaculation or orgasm. This clinical disorder was characterized in early historical records, with descriptions of poor penile erection in men found in ancient Egyptian scriptures more than 5000 years old. [1]

In erectile dysfunction, diabetes is the most common comorbidity. The prevalence of ED among diabetic men varies from 35 to 90%.2 In male aging study, three men with treated diabetes had more than three times the probability of having ED than men without diabetes; moreover, the annual, age-adjusted incidence of ED in diabetic men was twice that in non-diabetic men. [2]

Diabetes is classified into two types: those with little or no endogenous insulin secretory capacity (IDDM or type 1 DM) and those with endogenous insulin secretory ability but a combination of insulin resistance and an insufficient compensatory insulin secretory response (NIDDM, or type 2 DM). ED is a prevalent problem in diabetic men.9-14. [3] The primary underlying reasons for ED in diabetic men include neuropathy, atherosclerosis of penile blood vessels, and psychosocial issues. [4]

In normal sexual desire, ED increases mental stress, disrupts interpersonal relationships, and interferes with sexual life. As a result, ED may be a key factor of quality of life (QOL) in diabetes. [5] Previous research has focused chiefly on patient evaluation and partner satisfaction, with little emphasis paid to QOL. Because mild to moderate instances of ED might be caused by a variety of unclear factors, including psychological aspects, they were omitted to be more specific in our selection of just those individuals with ED caused by diabetes. [6, 2]

According to the population investigated and the terminology and methodologies utilized, the prevalence of erectile dysfunction varies. So far, only a few research have been conducted to determine the frequency and prevalence of this syndrome in diabetic individuals. In addition, epidemiological data on the majority of ED in diabetics is limited. [7]

The body mass index (BMI) was calculated. Blood sugar (fasting and postprandial), HbA1c, lipid profile (serum triglyceride [TG], low-density lipoprotein [LDL], very low-density lipoprotein [VLDL], high-density lipoprotein [HDL]), blood urea, serum creatinine, serum bilirubin, SGOT, and SGPT were all measured. [8]

Furthermore, mood problems, particularly depressive symptoms common in diabetes patients, may play a significant role in DMED. In the diabetic population, the prevalence of moderate to severe depression symptoms ranges from 22 to 60% and is more effective in those with DM related issues. [9]

This study intends to know the difference between organic, relational, and intrapsychic contributions to the pathogenesis of ED in diabetic and non-diabetic patients, using the structured Interview on Erectile Dysfunction (SIEDY#) a brief, multidimensional instrument designed explicitly for their simultaneous assessment and quantification. [10]
Erectile dysfunction is a prevalent medical condition that primarily affects males over the age of 40. According to the Consultation Committee for Sexual Medicine on Definitions/Epidemiology/Risk Factors for Sexual Dysfunction, the prevalence in males under the age of 40 was 1–10%. In men between the ages of 40 and 49, most erectile dysfunction ranges from 2% to 9%. In men aged 60–69 years, it rises to 20–40 percent. The prevalence of erectile dysfunction in males over 70 ranges from 50% to 100%. [4]

The EDIC (Epidemiology of Diabetes Interventions and Complication) is a long-term cohort follow-up study for the diabetic control and complication experiment, in which T1D patients were randomly assigned to conventional or intensive glycemic control. [11] **Methodology:**

A total of 300 patients who visited the respected Clinic for Sexual Dysfunction at relevant hospital were studied. Our exclusion criteria were a history of pelvic trauma, pelvic surgery (hernia, hydrocele, etc.), mental problem (in acute or treatment phase), and disabling disease (tuberculosis, AIDS, etc.). The SIEDY structured interview was used to interview patients before starting any therapy and before any special diagnostic tests. [12]

Comment [A1]: What about the inclusion criteria?

The participant's weight and height were measured to the closest 0.5cm and 100g, respectively while wearing light clothes and no shoes. Body mass index was calculated by dividing weight (in

kilos) by standing height (in meters squared). The waist-to-hip ratio was obtained by dividing the waist circumference by the hip circumference in centimeters. The subject's arterial blood pressure was taken three times at the end of the physical examination while he was seated. Before the blood pressure test, all participants rested for at least 15 minutes. Patients were classed as hypertensive if their average blood pressure was more than or equal to 140/90mmHg or taking antihypertensive medication. The metabolic syndrome was diagnosed by the Adult Treatment Panel III guidelines for males. [14]

Comment [A2]: When? Time 1… time 2…time 3…

In the hospital's chemistry laboratory, blood glucose and serum lipids were determined using enzymatic assays, HbA1c using nephelometry, and serum insulin using radioimmunoassay. [15] For all measurements, the inter-assay coefficient of variation was less than 6%. The mean of the two home blood glucose tests is fasting glucose. Predesigned semi-structured socio-demographic factors were used to assess patients. [16] Participants with severe ED (those who scored ten or fewer points on the International Index of Erectile Function [IIEF] in the erectile function domain) were considered ED cases, those who scored more than 25 had no ED and were non-ED cases, and participants with mild to moderate ED were exempted from the study to make sure that participants are more representative of their respective groups. [17] A general physical, systemic, and cognitive state assessment was performed, and the body mass index (BMI) was calculated. Blood sugar (fasting and postprandial), HbA1c, lipid profile (serum triglyceride [TG], low-density lipoprotein [LDL], very low-density lipoprotein [VLDL], high-density lipoprotein [HDL]), blood urea, serum creatinine, serum bilirubin, SGOT, and SGPT were all measured.
[18]

The following criterion will be utilized to make metabolic syndrome diagnosis for men:

(1) abdominal adiposity as defined by a waist circumference of 4102 cm; (2) low serum HDL-cholesterol (o40mgdl–1); (3) high triglyceride levels (X150mgdl–1); (4) elevated blood pressure as defined by a blood pressure of at least 130/85mmHg; and (5) abnormal glucose homeostasis as defined by a fasting plasma The presence of at least three of the criteria mentioned above qualify for a metabolic syndrome diagnosis. [19]

Results:

We enrolled a total of 184 male DM patients for this study, and 67.4 percent (124/184) of the participants were found to have ED, with 42.4 percent having severe ED. This is consistent with an earlier study on diabetic people. [20] In the current study, we discovered a significant relationship between the prevalence of severe ED and the participant's age. Prevalence rises from 10.3 percent 40 years old to 54.6 percent in patients 40–59 years old and 100 percent in patients over 60 years old. [21]

Table 1: Socio demographic profile

Age	Frequency	Percent	Erectile dysfunction	
			Severe ED	Absent ED
18-29	7	5.1	0	7
30-39	22	15.9	3	19
40-49	47	34.1	16	31
50-59	28	20.3	25	3
60-69	21	15.2	21	0
>70	13	9.4	13	0
Total	138	100.0	78	60

In the present study prevalence of erectile dysfunction was higher in patients with HbA1c levels between 7.0 to 8.5 (32.76%) and >8.5 (37.07%) compared to those who had HbA1c <7.0 (14.71%). This difference was statistically significant (p=0.049). [22]

Table 2: Glycemic control and ED

HbA1c	Erectile dysfunction		
	Present	Absent	Total

	No	%	No	%	No	%
< **7.0**	5	14.71	29	85.29	34	100
7.0 to 8.5	19	32.76	39	67.24	58	100
> **8.5**	43	37.07	73	62.93	116	100
Total	67	32.21	141	67.79	208	100
P= 0.0499						

Table 2 shows the relationship between ED risk and diabetic factors. When males with NIDDM were compared to men with IDDM, the OR for ED was 0.7 (95 percent CI 0.6–0.8). The frequency increased with diabetes duration, and in contrast to men with diabetes lasting less than five years, the ORs for ED were 1.3 and 2.0 for men with diabetes lasting 6–10 and 11–30 years, respectively. Compared to males with high metabolic control, the ORs for ED in men with adequate and poor management were 1.7 and 2.3, respectively. Diabetes-related vascular, renal, or retinal disorders and neuropathy were linked to an elevated risk of ED. [23] Table 2 shows the distribution of research individuals based on the occurrence of ED and diabetic features.

Table 3—Distribution of study subjects according to presence of ED and characteristics of diabetes.

Type of diabetes	Subject with ED	MH	MLV
IDDM	361 (26.1)	1†	1†
NIDDM	3,135 (37.4)	0.7 (0.6–0.8)	0.7 (0.6–0.9)
Duration of diabetes (years)			
1-15	816 (26.2)	1†	1†
6-10	899 (33.7	1.3 (1.2–1.5)	1.2 (1.1–1.4)
Nephropathy	252 (54.8)	2.3 (1.9–2.8)	2.0 (1.9–2.5)

Discussion:

Surprisingly, over 40% of diabetic males had sought medical counsel for sexual problems, and 32% had recently taken PDE-5 inhibitors. This study also discovered that glycemic control, as measured by HbA1c, was a risk factor for ED in diabetic males. Previous research has found that glycemic control is both favorably and substantially linked with ED. [12] Increasing age and having diabetes for a more extended period have been proven to increase the risk of ED, which our data confirms. According to our data, poor glycemic control, as shown by elevated FBS, PPBS, and HbA1c, was more prevalent in ED patients. [24]

Table 4: Comparison of the socio demographic and clinical parameters among the erectile dysfunction and non-erectile dysfunction patients

Characteristics	Erectile dysfunction (mean, SD)			
	Severe ED	Absent	t	p
Age of patient with diabetes diagnosed	53.3077±8.13	39.2000±7.25	10.582	0.000*
Total diabetes duration since diagnosed	70.6795±14.95	23.7333±6.70	22.619	0.000*
Duration of untreated diabetes since diagnosed	34.0641±8.51	6.3000±3.74	23.545	0.000*
BMI	30.7437±2.19	27.6631±1.55	9.635	0.000*
Systolic BP	136.8974±15.98	135.2333±13.94	0.640	0.523
Diastolic BP	86.4359±10.09	87.7000±8.16	−0.791	0.430
Current glycemic control RBS	217.7308±14.33	167.0833±39.36	10.502	0.000*
FBS	133.4231±4.50	114.6167±11.44	13.244	0.000*
PPBS	233.8077±21.02	172.1667±14.26	19.509	0.000*
HbA1c	8.0141±0.37	7.2500±0.33	12.453	0.000*
Lipid profile (TG)	141.3974±22.18	119.8500±7.80	7.184	0.000*
LDL	74.2692±12.86	64.7667±4.62	5.455	0.000*
VLDL	63.7692±9.73	54.8667±3.15	6.811	0.000*
HDL	66.7051±11.06	64.4667±5.60	1.432	0.155
Blood urea	25.5641±3.34	26.5667±2.56	−1.927	0.056
Serum creatinine	0.9872±0.81	0.9400±0.13	0.444	0.657

AGEs, which are formed by a non-enzymatic interaction between reducing sugars and free amino groups of proteins, lipids, or nucleic acids, have been linked to the etiology of diabetes.[25]

Depression is more common among diabetic patients than in the general population, according to research. In this study, 42.02 percent of the 119 patients with diabetes for one to five years had erectile dysfunction, while 66.67 percent of the three patients with diabetes for more than five

years had erectile dysfunction (p0.001). These data imply that erectile dysfunction worsened with diabetes duration.

The prevalence of Erectile Dysfunction is significantly higher in patients with a history of hypertension (59.7 percent; p0.001), cerebrovascular disease (32.80 percent; p0.001), a positive family history of erectile dysfunction (21.05 percent; p=0.025), and prostate surgery (83.58 percent; p=0.006) in the current study. Because ED is quite common in diabetic patients, treating physicians must keep an eye on them and adequately educate them so that they can discuss the problem with their physicians and the progression of this severe disabling disorder, which is responsible for deteriorating the general health and QOL of diabetic patients, can be halted at an early stage.

Conclusion:

Diabetes mellitus patients had a 32.21 percent prevalence of ED. 12.98% of these individuals had mild to moderate ED, 9.62% had mild, 6.25% had moderate, and 3.37% had severe erectile dysfunction. Erectile dysfunction was substantially associated with age, diabetic length of diabetes, history of hypertension, cardiovascular illness, glycemic management, and hypertriglyceridemia in individuals with diabetes mellitus.

In conclusion, diabetic individuals seeking therapy for erectile dysfunction have a more severe condition and are more likely to have an organic component than an intrapsychic component. Impaired sexual desire is less common in these people, implying that the need for medical care in diabetes patients with ED may be greater than in non-diabetic patients. Given the increased frequency of obesity-related decreases in testosterone levels in DMED, screening for and treating hypogonadism may enhance the success of ED medication in diabetic patients.

This study discovered that diabetic guys with severe ED are substantially older and have poorer glycemic control. Due to their overall inclination to disregard their symptoms and postpone

treatment-seeking, the age at which DM was initially identified, and duration of untreated DM were considerably higher in ED patients, which might explain their worse glycemic control. Because ED is quite common in diabetic patients, treating physicians must keep an eye on them and adequately educate them so that they can discuss the problem with their physicians and the progression of this severe disabling disorder, which is responsible for deteriorating the general health and QOL of diabetic patients, can be halted at an early stage.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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Comment [A3]: ?

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