Incidence of Erectile Dysfunction in Patients of Diabetes Mellitus

Abstract:

Aim: The goal of this study was to determine how frequent erectile dysfunction is in diabetic people and what factors contribute to this condition. **Methods**: In this study, type-2 diabetes patients were selected among outpatients who visited Diabetes Clinics regularly. For the first selection of patients, it was essential to have had a diagnosis of type 2 diabetes for at least six months but no more than 10 years. 1,080 male diabetic patients (with or without active ED symptoms) who visited the institute's Medicine or Psychiatry Outpatient Departments were included in the study throughout the period under consideration. The individuals' body mass index (BMI), blood sugar levels, and lipid profile were all measured. Erectile dysfunction became more common as people became older. ED was shown to be associated with elevated hemoglobin A1c (HbA1c), as well as hypertension, atherogenic dyslipidemia (low HDL-cholesterol and high triglycerides), metabolic syndrome, and depression in the study population. Male erectile dysfunction (ED) has been demonstrated to be prevented by physical activity, with men who exercised more being 10 percent less likely to develop ED than those who did not. **Results:** Erectile dysfunction was shown to be prevalent in 32.21 percent of men. Patients with erectile dysfunction had a substantially higher mean age (58.4010.96 years) than those who did not have erectile dysfunction (51.0011.16 years) (p0.001). In **conclusion**, glycemic control and other metabolic variables were linked to ED risk in people with type 2 diabetes, having a greater degree of physical activity was protective.

Introduction:

Erectile dysfunction is defined as the inability to establish or sustain a sufficiently strong erection for vaginal penetration. It is possible to have a lack of sexual desire, as well as difficulties with ejaculation or orgasm, while you are suffering from "impotence.''. (1) Erectile dysfunction (ED) is a significant medical condition that impairs sexual performance and affects self-esteem, ultimately leading to marital difficulties. In 1995, more than 152 million men throughout the world suffer from erectile dysfunction, and this figure is anticipated to climb to 322 million by 2025. (2) Chronic hyperglycemia with changes in carbohydrate, lipid, and protein metabolism are hallmarks of diabetes mellitus, which is caused by a defect in insulin production or action, or both. (3) (4) About 26 million Americans have diabetes, according to the Centers for Disease Control & Prevention (CDC). (5) Kind 2 diabetes mellitus (DM) is the most common type of diabetes in the world, accounting for more than 90% of all diabetics. Diabetes cases are expected to rise from 366 million in 2011 to 552 million by 2030, according to the International Diabetes Federation. (6) Among the world's top 10 diabetic-bearing countries are India, China, the United States, Indonesia, Japan, Pakistan, Russia, Brazil, Italy, and Bangladesh, according to the World Diabetes Report 2015. Compared to any other region in the world, the prevalence of dm as well as the negative health implications of diabetes have grown more rapidly in South Asia in recent years than in any other region on the world.(7)

The prevalence of erectile dysfunction in men with diabetes is higher than in the general population. (8) The most common underlying problems among diabetic men with erectile dysfunction are neuropathy, atherosclerosis of the penile blood arteries, and psychological issues. It is more common in males who have systemic disorders such as hypertension, ischemic heart disease, or type 2 diabetes, and it is more common in men who are over the age of fifty-five. Diabetic neuropathy and blood vessel damage that are essential for the correct function of the genital organs is probable side effects of the disease that may affect both males and females. Diabetes can cause impairment of sexual function in both men and women.

Diabetes had the highest age-adjusted relative risk of ED, ranging from 1.3 to 3 depending on the type of diabetes, according to multivariate analysis of various population-based cohorts. Multivariate analysis of multiple population-based cohorts found diabetes to be the most

significant risk factor for erectile dysfunction (ED), with an adjusted relative risk varying from 1.3 to 3 depending on the type of diabetes. (9)

Diabetes/metabolic syndrome and erectile dysfunction may have the same underlying cause: hypogonadism. Type 2 diabetes and ED are related to hypogonadism, which has been linked to poor glycemic control and aggravation of ED in males. Erectile dysfunction may be linked to type 2 diabetes/metabolic syndrome. Type 2 diabetes and ED are related to hypogonadism, which has been linked to poor glycemic control and aggravation of ED in males. There is evidence that testosterone levels are directly affected by visceral and general obesity in guys with type 2 diabetes and metabolic syndrome. To go from testosterone to estrogen, the body uses more of its aromatase, which increases the androgen conversion rate. (9) There is a connection between Men with T2D who have been shown to have a higher BMI, a larger waist circumference, and hypogonadism. (10-12) Hypogonadism is connected with several other factors as well. Metabolic syndrome symptoms, such as an abnormal lipid profile. T2D ED patients who are hypogonadal have high testosterone levels. Triglycerides are higher, while HDL cholesterol is lower. (13) Exercise and changes in one's way of life may help to enhance erectile function. Patients with diabetes and high blood pressure may benefit from precise glycemic management, which may help to avoid or reduce sexual dysfunction in these patients. (14) A study found that smoking cigarettes was an independent risk factor for heart disease. ED was shown to be significantly more common among males who were included in trials with more than 6000 participants. (2)

For those with diabetes, EDIC (epidemic of diabetes intervention and complications study) is a follow-up to the diabetic control and complications experiment, which randomized patients to either conventional or intensive glycemic control. The impact of stringent glycemic management on the future risk of ED was examined in the UroEDIC, an auxiliary investigation of urological consequences. (15) ED was considerably less prevalent in those allocated to intensive control than in those assigned to standard treatment in the secondary intervention group.

The incidence of Erectile Dysfunction is determined by the population analyzed, as well as the definition and methodologies used. Few research has been conducted to determine the frequency and prevalence of this illness in diabetic individuals. As a result, the goal of this research was to find out how common ED is among diabetics and what characteristics are linked to it.

The study's goal was to find out how common erectile dysfunction is in diabetic people and what variables are linked to it.

Methodology:

Inclusion criteria

Patients over the age of 30 with type 1 or 2 diabetes mellitus (self-reported diabetes patients on medication) and a sexually active, stable heterosexual relationship for at least two years met the inclusion criteria.

Exclusion criteria

Pelvic trauma, pelvic surgery a mental disease, and a disabling sickness were all regarded to be exclusion criteria for the study (tuberculosis, AIDS, etc.).

Data collection procedure

The research looked at 300 people who went to the reputed Clinic for Sexual Dysfunction at the relevant institution for treatment of sexual dysfunction.

Patients were questioned utilizing the SIEDY structured interview method before beginning any therapy or undertaking any specific diagnostic tests, as described above.

The participant's weight and height were checked to the nearest 0.5 centimeters & 100 g, and the results were averaged. BMI was calculated by multiplying the weight (in kilograms) by the height (in meters), and then dividing the result by two (in meters squared). We were able to solve the waist-to-hip ratio by dividing the waist circumference by the hip circumference in centimeters. After the physical examination, the subject's arterial blood pressure was taken three times while sitting in a chair. The blood pressure test was conducted after each participant had taken a minimum of 15 minutes of rest, using a standard sphygmomanometer)

The term hypertensive was used to describe a patient with an average blood pressure more than or equal to 140/90mmHg and who was also taking an antihypertensive drug. The metabolic syndrome was diagnosed based on the guidelines of the Adult Treatment Panel III for males

(ATP III). Patients with a history of hypertension have a substantially higher incidence of erectile dysfunction than those without such a history (59.7 percent; p0.001). (16)

Enzymatic assays measure blood sugars and serum lipids, nephelometry was used to estimate HbA1c, and radioimmunoassay was used to evaluate serum insulin in the hospital's chemistry department. For all parameters, the inter-assay coefficient of variation was less than 6%. The average of the two home glucose tests is used to calculate fasting glucose. Semi-structured pre-designed socio-demographic factors were used to evaluate patients. A severe ED was defined as a score of 10 or below on the International Index of Erectile Function [IIEF] in the erectile function area, while non-ED patients were defined as those who had a score of more than 25 on the IIEF in the erectile function area. Individuals with mild to severe erectile dysfunction (ED) were removed from the study to guarantee that the results were more representative of their respective groups. After a thorough physical, systemic, and cognitive evaluation, the body mass index (BMI) was calculated for each participant. Blood urea, serum creatinine, serum bilirubin (SGOT and SGPT), and fasting and postprandial blood sugar levels were all measured. HbA1c, lipid profile (serum triglycerides [TG], low-density lipoprotein (LDL), very low-density lipoprotein [VLDL], and high-density lipoprotein [HDL]) were also measured.

For men, the following criteria were used to diagnose metabolic syndrome:
(1) abdominal adiposity, as measured 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 measured by a blood pressure of at least 130/85mmHg; and
(5) abnormal glucose homeostasis, as measured by a fasting plasma(17)

Results:

For this study, we included a total of 184 male DM patients, and we discovered that 67.4% (124/184) of them had ED, with 42.4 percent having severe ED. We established a link between severe ED and the age of the participants in the current investigation. Patients 40–59

years old have a prevalence of 54.6 percent, while patients over 60 years old have a majority of 100 percent.

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

Patients with erectile dysfunction had a substantially higher mean age (58.4010.96 years) than those without erectile dysfunction (51.0011.16 years) in this research (p0.001).

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						

In this study, individuals with HbA1c values between 7.0 and 8.5 (32.76 percent) and >8.5 (37.07 percent) showed a greater prevalence of erectile dysfunction than those with HbA1c levels below 7.0. (14.71 percent). This was a statistically significant difference (p=0.049).

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)

Table 4 compares the sociodemographic and clinical characteristics of individuals with erectile dysfunction with those with non-erectile dysfunction.

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	133.423 1±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	0.058
Serum creatinine	0.9872 ±0.81	0.9400±0.13	0.444	0.657

AGEs, Non-enzymatic interactions between reducing sugars and amino groups in proteins, fats, and nucleic acids have been related to the development of type 2 diabetes. (18) Given the high prevalence of ED in diabetic patients, treating physicians must keep a close eye on them and provide adequate education so that they can discuss the problem with their doctors and the progression of this severe disabling disorder, which is responsible for deteriorating diabetic patients' overall health and quality of life, can be halted early

Discussion:

ED is a male-specific condition that is exceedingly stressful and discouraging since the sense of lacking manhood sends a shiver of terror down the spine of the majority of men. (19) Diabetes mellitus is an independent risk factor for ED. Sexual dysfunction is more common in those with diabetes. With age, the risk of ED rises. As the world's population continues to expand and age, the incidence of ED is predicted to rise, with an estimated 322 million men suffering from the disease by 2025. (20) According to this study, the incidence of erectile dysfunction was much greater in the age groups of 71 to 80 years (75 percent) and 61 to 70 years (35.90 percent) than in any other age group (p0.001). Patients with erectile dysfunction had a significantly greater mean age when compared to those who did not have erectile dysfunction (58.4010.96 years vs. 51.0011.16 years; p0.001). The findings of an epidemiological study indicate that 35 percent of males between the ages of 40 and 70 years suffer from moderate or severe erectile dysfunction, with another 25 percent suffering from less severe forms of ED. (21) According to comparable research from Kochi, 58 percent (85/147) of the participants with a history of ED were between 30 and 70 years old, with a mean age of 528 years, and 89 percent (76/85) of them were over 45 years old. (22) The study also discovered that once people reach the age of 45, the prevalence of ED rises significantly. According to comparable research from Rajasthan, the incidence of erectile dysfunction rose with age. (18)

Surprisingly, over 40% of diabetic males sought medical assistance for sexual problems, and 32% had just recently begun using PDE-5 inhibitors. Glycemic control was also shown to be a risk factor for ED in diabetic males in this study, as measured by HbA1c. In earlier studies, glycemic control is favorably and substantially linked with ED. (23) It has been demonstrated that being older and having diabetes for a longer length of time increases the risk of ED, which our data supports. According to our findings, poor glycemic control, as evidenced by increased FBS, PPBS, and HbA1c, was more common in ED patients. (15)

Conclusion:

Patients with diabetes mellitus showed a prevalence of ED of 32.21 percent. 12.98 percent of these people had mild to moderate erectile dysfunction, 9.62 percent had mild, 6.25 percent had moderate, and 3.37 percent had severe ED. In people with diabetes, erectile dysfunction was linked to age, diabetic duration of diabetes, history of hypertension, cardiovascular disease, glycemic control, and hypertriglyceridemia.

To summarize, people with diabetes seeking erectile dysfunction treatment have a more severe problem and are more likely to have a biological component than an intrapsychic component. Impaired sexual desire is less prevalent in these persons, meaning that diabetes patients with ED may require more medical attention than non-diabetic patients. Screening for and treating hypogonadism may improve the efficacy of ED treatment in diabetic patients, given the greater prevalence of obesity-related declines in testosterone levels in DMED.

Diabetic males with severe ED, according to this research, are more older and have worse glycemic control. In ED patients, the age at which DM was initially detected and the duration of untreated DM were considerably higher, which might explain their poor glycemic control. Because ED is so common in diabetic patients, treating physicians must keep a close eye on them and provide appropriate education so that they can discuss the problem with their doctors and the progression of this severe disabling disorder, which is responsible for diabetic patients' overall health and quality of life deteriorating, can be halted early.

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