

Association Between Glycemic Control and Erectile Dysfunction in Men with Diabetes Mellitus

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ABSTRACT

Background: Erectile dysfunction is a common complication of diabetes mellitus that adversely affects quality of life. Chronic hyperglycemia contributes to vascular and neurological damage, which may impair erectile function. This study aimed to assess the association between glycemic control and erectile dysfunction among men with diabetes mellitus. **Methods & Materials:** This hospital-based cross-sectional observational study included 100 adult men with previously diagnosed diabetes mellitus attending the Department of Dermatology, BIRDEM General Hospital. Glycemic control was assessed using glycated hemoglobin (HbA1c) and categorized as good (<7.0%), fair (7.0–8.9%), or poor (≥9.0%). Erectile dysfunction was evaluated using the five-item International Index of Erectile Function (IIEF-5). Data were analyzed using SPSS version 25.0 and the Chi-square test was used to determine the association between glycemic control and erectile dysfunction. **Results:** The mean age of the participants was 51.6 ± 8.9 years. The mean HbA1c was $8.3 \pm 1.7\%$. Good, fair and poor glycemic control were observed in 29%, 38% and 33% of patients, respectively. Overall, 78% of participants had some degree of erectile dysfunction, with mild erectile dysfunction being the most common category (24%). A statistically significant association was observed between glycemic control and erectile dysfunction ($p < 0.001$). Erectile dysfunction was present in 48.3% of patients with good glycemic control, 81.6% with fair control and all patients with poor glycemic control. **Conclusion:** Poor glycemic control was significantly associated with a higher prevalence of erectile dysfunction among men with diabetes mellitus.

Regular assessment of erectile function and optimization of glycemic control may improve patient outcomes.

Keywords: Diabetes mellitus, erectile dysfunction, glycemic control, HbA1c, IIEF-5, sexual dysfunction.

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INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both [1]. Prolonged elevation of blood glucose leads to widespread microvascular and macrovascular complications that affect multiple organ systems and substantially impair quality of life [2]. Among these complications, erectile dysfunction has emerged as one of the most common and distressing conditions affecting men with diabetes [3]. Erectile dysfunction is defined as the persistent inability to achieve or maintain an erection sufficient for satisfactory sexual performance. Beyond its impact on sexual health, it also affects psychological well-being, self-esteem, interpersonal relationships and overall quality of life [4].

The development of erectile dysfunction in men with diabetes is multifactorial. Chronic hyperglycemia contributes to endothelial dysfunction, autonomic and peripheral neuropathy, oxidative stress and vascular insufficiency, all of which impair normal erectile physiology [5]. In addition, hormonal imbalance, obesity, hypertension, dyslipidemia, smoking and certain medications may further increase the risk of erectile dysfunction in diabetic individuals [6]. The coexistence of these

factors often results in earlier onset and greater severity of erectile dysfunction compared with men without diabetes [7]. Glycemic control plays a crucial role in reducing the risk of diabetic complications. Glycated hemoglobin (HbA1c) is widely accepted as a reliable indicator of long-term glycemic status and reflects average blood glucose levels over the preceding months [8]. Poor glycemic control has been associated with progressive vascular and neural damage, which are fundamental mechanisms responsible for erectile dysfunction [9]. Conversely, maintaining optimal glycemic control may help preserve endothelial function, reduce the progression of neuropathy and improve sexual health outcomes [10]. Despite these observations, the relationship between glycemic control and erectile dysfunction remains variable across different populations because of differences in age, duration of diabetes, associated comorbidities and lifestyle factors [11]. Early recognition of erectile dysfunction in men with diabetes is clinically important because it may serve as an indicator of generalized vascular disease and an early marker of future cardiovascular events. Routine assessment of sexual function should therefore be considered an integral component of comprehensive diabetes care. Evaluating the association between

glycemic control and erectile dysfunction may facilitate timely identification of high-risk patients and encourage interventions aimed at optimizing metabolic control and improving quality of life. The findings of this study are expected to contribute to a better understanding of the relationship between glycemic control and erectile dysfunction and support evidence-based strategies for the holistic management of men living with diabetes mellitus.

METHODS & MATERIALS

This hospital-based cross-sectional observational study was conducted in the Department of Dermatology, BIRDEM General Hospital, from January 2025 to June 2025. A total of 100 adult male patients with previously diagnosed diabetes mellitus who attended the outpatient and inpatient departments during the study period were enrolled using purposive sampling after obtaining written informed consent. The study aimed to assess the association between glycemic control and erectile dysfunction. Glycemic control was evaluated using the most recent glycated hemoglobin (HbA1c) level and participants were categorized as having good (HbA1c <7.0%), fair (7.0–8.9%), or poor (≥9.0%) glycemic control. Erectile dysfunction was assessed using the validated five-item International Index of Erectile Function

(IIEF-5) questionnaire and severity was classified according to standard scoring criteria. Demographic characteristics, duration of diabetes, body mass index, smoking status, comorbidities and relevant clinical information were collected using a structured data collection form and hospital records.

The inclusion criteria were adult men aged 30 years or older with confirmed diabetes mellitus who were sexually active and willing to participate in the study. The exclusion criteria included patients with a history of pelvic surgery or trauma, neurological disorders affecting sexual function, severe psychiatric illness, end-

stage renal or hepatic disease, known hormonal disorders such as hypogonadism, current use of medications primarily associated with erectile dysfunction unrelated to diabetes and those who declined participation.

Data were checked for completeness, coded and entered into the Statistical Package for the Social Sciences (SPSS) version 25.0 for analysis. Descriptive statistics were presented as frequencies, percentages, means and standard deviations. The association between glycemic control and erectile dysfunction was assessed using the Chi-square test, while continuous variables were compared

using the independent sample t-test where appropriate. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Table I presents the age distribution of the 100 study participants. The mean age of the cohort was 51.6 ± 8.9 years, with ages ranging from 31 to 69 years. The largest proportion of patients (34%) fell within the 50–59-year age group, followed closely by those aged 40–49 years (31%). Patients aged 30–39 years and those aged ≥60 years accounted for 17% and 18% of the sample, respectively.

Table I
Distribution of Patients by Age Group (n=100).

Age Group (years)	Frequency (n)	Percentage (%)
30–39	17	17
40–49	31	31
50–59	34	34
≥60	18	18
Total	100	100
Mean ± SD	51.6 ± 8.9 years	
Range	31–69 years	

Table II summarizes the glycemic control status of the 100 study participants based on their HbA1c levels. The overall mean HbA1c was 8.3 ± 1.7%, indicating suboptimal glycemic control in the

majority of patients. Fair glycemic control (HbA1c 7.0–8.9%) was observed in the largest proportion of patients (38%, n=38), while poor control (HbA1c ≥9.0%) was seen in 33% (n=33) of the cohort. Only

29% (n=29) of patients achieved good glycemic control with HbA1c levels below 7.0%.

Table II
Distribution of Patients According to Glycemic Control (HbA1c) (n=100).

Glycemic Control (HbA1c)	Frequency (n)	Percentage (%)
Good (<7.0%)	29	29
Fair (7.0–8.9%)	38	38
Poor (≥9.0%)	33	33
Total	100	100
Mean HbA1c	8.3 ± 1.7%	

Table III illustrates the distribution of erectile dysfunction severity among the 100 study participants, as assessed by the IIEF-5 score. Mild ED was the most common category, affecting 24% (n=24) of

patients, followed closely by no ED in 22% (n=22) and mild to moderate ED in 21% (n=21). Moderate ED was observed in 19% (n=19) of the cohort, while severe ED accounted for the smallest proportion at

14% (n=14). Overall, more than three-quarters of the patients (78%) had some degree of erectile dysfunction.

Table III
Distribution of Erectile Dysfunction Severity According to IIEF-5 Score (n=100).

Severity of Erectile Dysfunction	Frequency (n)	Percentage (%)
No ED	22	22
Mild ED	24	24
Mild to Moderate ED	21	21
Moderate ED	19	19
Severe ED	14	14
Total	100	100

Table IV demonstrates the association between glycemic control and the presence of erectile dysfunction among the 100 study participants. The relationship was highly significant, with a p-value of <0.001. Among patients with good

glycemic control (HbA1c <7.0%), more than half (51.7%, n=15) had no ED, while 48.3% (n=14) had ED. In contrast, among those with fair control (HbA1c 7.0–8.9%), the proportion with ED rose sharply to 81.6% (n=31). Notably, all patients (100%,

n=33) with poor glycemic control (HbA1c ≥9.0%) had ED, with none in this group being free of the condition. Overall, erectile dysfunction was present in 78% (n=78) of the total cohort.

Table IV
Association Between Glycemic Control and Erectile Dysfunction (n=100).

Glycemic Control	No ED n (%)	ED Present n (%)	Total	p-value
Good (n=29)	15 (51.7)	14 (48.3)	29	<0.001
Fair (n=38)	7 (18.4)	31 (81.6)	38	
Poor (n=33)	0 (0.0)	33 (100.0)	33	
Total	22 (22.0)	78 (78.0)	100	

DISCUSSION

The present study evaluated the association between glycemic control and erectile dysfunction (ED) among men with diabetes mellitus. The mean age of the participants was 51.6 ± 8.9 years, with the majority belonging to the 50–59-year age group (34%), followed by the 40–49-year age group (31%). This age distribution is comparable with the findings of Siddique et al. and Gupta et al., who reported that erectile dysfunction was more commonly observed among middle-aged and older men with type 2 diabetes, reflecting the cumulative effects of aging and long-standing metabolic abnormalities on vascular and neural function [12,13]. Assessment of glycemic status revealed a mean HbA1c of $8.3 \pm 1.7\%$, while only 29% of participants achieved good glycemic control. Fair glycemic control was observed in 38% of patients, whereas 33% had poor glycemic control. These findings indicate that suboptimal glycemic control is common among diabetic men and are consistent with the observations of Siddique et al., who demonstrated that inadequate glycemic control was strongly associated with erectile dysfunction [12]. Similarly, the systematic review and meta-analysis by Alkathiri et al. concluded that poor glycemic control is one of the most important modifiable risk factors for ED in men with diabetes [14]. In the present study, 78% of participants had some degree of erectile dysfunction, while only 22% had normal erectile function. Mild erectile dysfunction was the most frequent category (24%), followed by mild-to-moderate (21%), moderate (19%) and severe ED (14%). These findings closely resemble those reported by Omar et al., who documented a high prevalence of erectile dysfunction among men with type 2 diabetes and identified advancing age and poor glycemic control as major contributing factors [15]. Comparable results were also reported by Gobena et al., who found that erectile dysfunction affected the majority of diabetic men attending follow-up clinics and was associated with several clinical and metabolic factors [16]. The most important finding of this study was the highly significant association between glycemic control and erectile dysfunction ($p<0.001$). Among patients with good glycemic control, more than half (51.7%) had no erectile dysfunction, whereas only 48.3% experienced ED. In contrast, erectile dysfunction was present

in 81.6% of patients with fair glycemic control and all patients with poor glycemic control had erectile dysfunction. These findings strongly support the hypothesis that deterioration in glycemic control is accompanied by a progressive increase in erectile dysfunction prevalence. Similar observations were reported by Kamiński et al., who demonstrated that long-term metabolic control was significantly associated with erectile dysfunction and diabetic complications [17]. Zamponi et al. also reported that poorer glycometabolic compensation was directly related to greater severity of erectile dysfunction, emphasizing the importance of sustained metabolic control [18]. Our findings are further supported by Chen et al., who demonstrated a significant association between erectile dysfunction and hyperglycemia in adults, suggesting that erectile dysfunction may represent an early manifestation of metabolic and vascular dysfunction [19]. Likewise, Cao et al. reported that patients with erectile dysfunction generally exhibited poorer metabolic profiles and less favorable glycemic control than diabetic patients without erectile dysfunction [20]. The present findings also agree with therapeutic studies highlighting the importance of optimizing glucose control for improving sexual health. Defeudis et al. concluded that appropriate dietary measures together with effective antihyperglycemic therapy may improve erectile function by enhancing metabolic control [21]. Similarly, Cannarella et al. observed improvement in erectile function among diabetic patients receiving optimized antihyperglycemic treatment, further supporting the close relationship between glycemic control and sexual function [22].

LIMITATIONS

This study had several limitations. It was conducted at a single tertiary care hospital with a relatively small sample size, which may limit the generalizability of the findings. The cross-sectional design precluded the establishment of a causal relationship between glycemic control and erectile dysfunction. In addition, erectile dysfunction was assessed using a self-reported questionnaire, which may have been influenced by recall bias or participants' reluctance to disclose sensitive information.

CONCLUSION

The present study demonstrated a significant association between poor glycemic control and erectile dysfunction among men with diabetes mellitus. The prevalence of erectile dysfunction increased with worsening HbA1c levels, highlighting the importance of maintaining optimal glycemic control. Routine assessment of sexual function and regular monitoring of glycemic status should be incorporated into the comprehensive management of diabetic men to facilitate early detection, timely intervention and improved quality of life.

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CONFLICTS OF INTEREST

There are no conflicts of interest.

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