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A Clinical Evaluation of Predictors of Erectile Dysfunction among Men with Type 2 Diabetes in a Tertiary Care Center

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Abstract

Background: *Erectile dysfunction (ED) is a highly prevalent sexual disorder in men with type 2 diabetes, associated with significant psychological and clinical consequences, including depression, poor quality of life, and a self-perpetuating relationship with glycemic control. The purpose of the study is to clinically evaluate key predictors of erectile dysfunction among men with type 2 diabetes in a tertiary care setting.*

Methods: *This cross-sectional study at the Departments of Dermatology & Venereology and Endocrinology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, included 382 married men (21–59 years) with type 2 diabetes. Demographic, clinical (BMI, diabetes duration, blood pressure), and biochemical (FBS, 2-hour postprandial glucose, HbA1c) data were collected, and ED was assessed using the Bengali IIEF-5. Data were analyzed with SPSS v23.0 (t-test, Chi-square, ANOVA, multiple regression, $p \leq 0.05$) after ethical approval and informed consent.*

Results: *Among 382 men with type 2 diabetes, 158 (41.4%) had ED. Those with ED were older (48.7 ± 7.39 vs. 44.3 ± 6.25 years, $p = 0.015$), had higher BMI (26.5 ± 2.70 vs. 25.9 ± 2.89 kg/m², $p = 0.042$), and longer T2DM duration (7.14 ± 2.68 vs. 5.95 ± 2.54 years, $p < 0.001$). ED severity: mild 68 (17.8%), moderate 51 (13.4%), severe 39 (10.2%). IIEF-5 score correlated negatively with age ($r = –0.131$), HbA1c ($r = –0.242$), and T2DM duration ($r = –0.359$). Significant predictors were HbA1c (OR 2.723), overweight (OR 1.503), and T2DM >10 years (OR 3.366); age >50 years was not significant (OR 1.172).*

Conclusion: *Higher HbA1c, overweight, and longer diabetes duration are key predictors of erectile dysfunction in men with type 2 diabetes.*

Keywords: *Erectile Dysfunction, Type 2 Diabetes, Predictors.*

1. INTRODUCTION

Erectile dysfunction (ED) represents one of the most prevalent forms of sexual dysfunction in men and is linked to significant psychological and clinical consequences, including depression and diminished quality of life [1]. Notably, ED, depression, and glycemic control can influence one another, creating a self-perpetuating cycle [2, 3]. Maintaining normal sexual function is an essential aspect of overall quality of life [4].

While the prevalence of ED tends to rise with advancing age in the general population, men with diabetes experience ED at a younger age [1], with greater severity and reduced responsiveness to oral treatments [5], resulting in a pronounced negative impact on their quality of life. Studies have reported that 35–85% of men with diabetes are affected by ED [6, 7], underscoring its significance as a frequent and serious complication.

Diabetes mellitus (DM) has been consistently recognized as a major risk factor for sexual dysfunction in men, including a markedly increased likelihood of ED. In this population, ED occurs two to three times more often than in men without diabetes and may manifest 10–15 years earlier than in non-diabetic counterparts [8]. Poorly controlled blood glucose contributes to both microvascular and macrovascular complications, emphasizing the clinical importance of ED in men with diabetes and the need for focused evaluation in this vulnerable group, particularly those with type 2 diabetes mellitus (T2DM). Multiple clinical and metabolic factors have been identified as contributors to ED in men with T2DM.

Advanced age and longer duration of diabetes are consistently associated with higher ED risk. Additional factors such as hypertension, obesity, dyslipidemia, smoking, and autonomic neuropathy also play a role, while combinations of metabolic risks, including elevated low-density lipoprotein cholesterol and obesity, can further exacerbate vulnerability [9-11]. These findings demonstrate that ED in men with diabetes is multifactorial, involving both vascular and metabolic pathways, although the strength of each predictor may differ among populations.

Despite its high prevalence and serious consequences, ED is frequently underdiagnosed and underreported, partly because many clinicians do not routinely ask about sexual health during consultations [12]. The contribution and intensity of risk factors may also differ across regions, and data from South-Asian countries, including Bangladesh, remain limited. Cultural norms and socio-demographic factors further contribute to the under-recognition of ED in these settings. This highlights the necessity of evaluating clinical predictors of ED specifically in men with T2DM in Bangladesh, to identify individuals at higher risk and inform targeted strategies for early detection and management.

Although erectile dysfunction is highly prevalent among men with type 2 diabetes and has been linked to multiple clinical and metabolic risk factors, most evidence comes from Western or other Asian populations, with limited data from Bangladesh and similar South-Asian settings. Variations in socio-demographic characteristics, cultural norms, healthcare access, and lifestyle may influence the prevalence and predictive strength of these risk factors, making extrapolation from other populations potentially unreliable. Moreover, few studies in this region have conducted comprehensive clinical evaluations combining demographic, metabolic, and disease-specific parameters to identify men at highest risk of ED. Therefore, there is a clear need for region-specific research to address these gaps. The purpose of the study is to clinically evaluate key predictors of erectile dysfunction among men with type 2 diabetes in a tertiary care setting.

2. OBJECTIVE

- To clinically evaluate key predictors of erectile dysfunction among men with type 2 diabetes in a tertiary care setting.

3. METHODOLOGY & MATERIALS

This observational, cross-sectional study was conducted at the Departments of Dermatology & Venereology and Endocrinology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, from March 2019 to July 2020. A total of 382 married men aged 21–59 years with type 2 diabetes mellitus (T2DM), who had been in a stable sexual relationship for at least the past six months and provided written informed consent, were consecutively enrolled for the clinical evaluation of predictors of erectile dysfunction (ED).

3.1. Inclusion Criteria

- Men with type 2 diabetes mellitus who are sexually active and attending the study clinics.
- Age between 21 and 59 years.
- Active sexual relationship for at least the past 6 months.
- Able to complete a self-administered questionnaire.

3.2. Exclusion Criteria

- History of lower urinary tract, urethral, or penile surgery.
- History of pelvic fracture.
- History of spine injury or spine surgery.
- Use of medications affecting erectile function.
- Known disease of the male genitalia.
- Uncontrolled hypertension.
- Uncontrolled dyslipidemia.
- Use of medications such as beta-blockers or diuretics.
- Psychological disorders, including anxiety or depression.
- Major medical illnesses (e.g., renal, hepatic, or cardiovascular disease).
- Thyroid or other gonadal hormone deficiencies.

The study collected demographic (age, living area, education, occupation), clinical (BMI, duration of diabetes, blood pressure), and biochemical (fasting and 2-hour postprandial blood sugar, HbA1c) data, with erectile function assessed using the validated Bengali version of the International Index of Erectile Function (IIEF-5) questionnaire. After Institutional

Review Board approval and informed consent, consecutive married men with type 2 diabetes (21–59 years) attending the outpatient Departments of Dermatology & Venereology and Endocrinology were enrolled. Participants were screened for hypertension, major medical illnesses, and medication use, and relevant clinical and laboratory data were recorded. Diabetes was diagnosed per ADA 2018 criteria. ED was defined as inability to achieve or maintain an erection sufficient for intercourse, with severity classified by IIEF-5 score (severe ≤10, moderate 11–16, mild 17–25, no ED ≥26). BMI and socioeconomic status were categorized according to standard definitions. Statistical analysis was performed using SPSS v23.0; continuous variables were expressed as mean ± SD and categorical variables as percentages. Group comparisons used Student's t-test, Chi-square test, and ANOVA, and multiple regression was applied to determine independent predictors of ED, with $p \leq 0.05$ considered statistically significant.

Confidentiality and ethical standards were strictly maintained throughout the study.

4. Results

The study included 382 men with type 2 diabetes, of whom 158 (41.4%) were diagnosed with erectile dysfunction (ED) and 224 (58.6%) did not have ED.

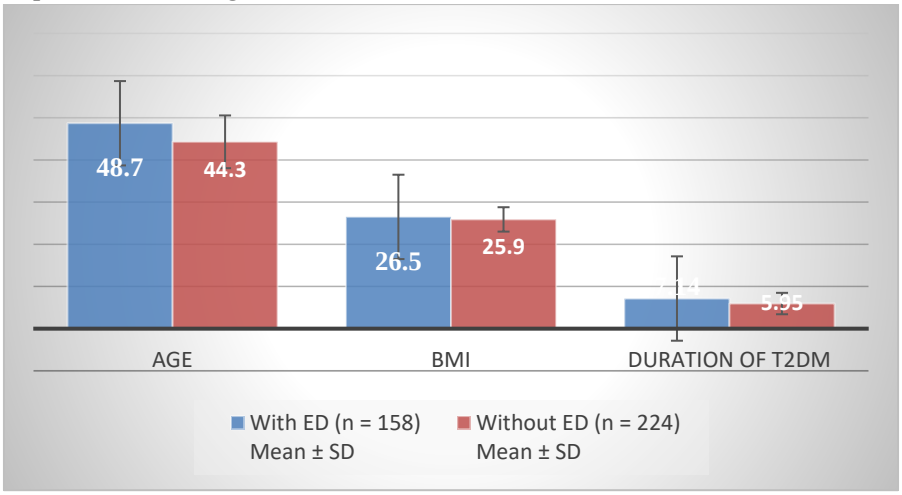

Figure 1. *Comparison of Clinical Characteristics between Men with Type 2 Diabetes, With and Without Erectile Dysfunction.*

The mean age of men with erectile dysfunction (ED) was 48.7 ± 7.39 years, which was significantly higher than the 44.3 ± 6.25 years observed in those without ED ($p = 0.015$). Similarly, participants with ED had a higher mean body mass index (BMI) of 26.5 ± 2.70 kg/m² compared to 25.9 ± 2.89 kg/m² in the non-ED group ($p = 0.042$). The mean duration of type 2 diabetes mellitus (T2DM) was also significantly longer among men with ED (7.14 ± 2.68 years) than in those without ED (5.95 ± 2.54 years, $p < 0.001$).

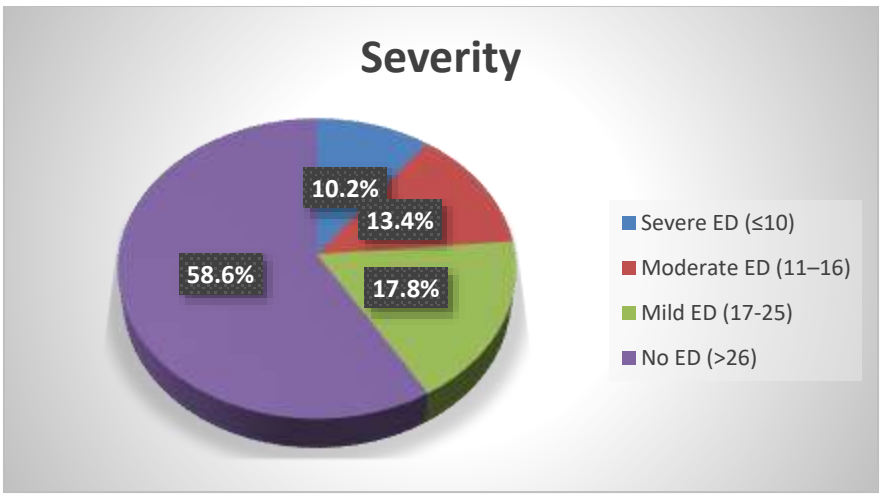

Figure 2. *Distribution of Erectile Dysfunction Severity in Men with Type 2 Diabetes*

Among the 382 participants, 158 (41.4%) were found to have erectile dysfunction (ED), while 224 (58.6%) had no ED. Of those with ED, 68 (17.8%) had mild ED, 51 (13.4%) had moderate ED, and 39 (10.2%) had severe ED. Overall, the majority of participants (58.6%) did not exhibit ED.

Table 1. *Pearson Correlation of Clinical Variables with IIEF-5 Score*

Severity Category	Number of Respondents	Percentage of Patients
Severe ED (≤10)	39	10.2%
Moderate ED (11–16)	51	13.4%
Mild ED (17-25)	68	17.8%
No ED (>26)	224	58.6%

Pearson correlation analysis revealed a significant negative correlation between IIEF-5 score and age ($r = –0.131$, $p = 0.011$), indicating that older participants tended to have lower erectile function scores. Duration of T2DM demonstrated a stronger negative correlation with IIEF-5 score ($r = –0.359$, $p < 0.001$). HbA1c was also negatively correlated with IIEF-5 score ($r = –0.242$, $p < 0.001$), suggesting that poorer glycemic control was associated with worse erectile function. BMI showed a weak negative correlation ($r = –0.085$) that was not statistically significant ($p = 0.095$).

Table 2. *Multivariate Logistic Regression Analysis of Predictors of Erectile Dysfunction in Men With Type 2 Diabetes*

Variable	p-value	OR	95% CI	
			Lower	Upper
Age (> 50 years)	0.471	1.172	0.761	1.806
HbA1c	0.012	2.723	0.562	3.930
BMI (Overweight)	0.003	1.503	0.320	2.790
Duration of T2DM (>10 years)	0.002	3.366	0.191	5.699

Multivariate logistic regression identified higher HbA1c (OR = 2.723, 95% CI: 0.562–3.930, $p = 0.012$), being overweight (OR = 1.503, 95% CI: 0.320–2.790, $p = 0.003$), and T2DM duration exceeding 10 years (OR = 3.366, 95% CI: 0.191–5.699, $p = 0.002$) as significant predictors of ED. Age above 50 years was not a significant predictor (OR = 1.172, 95% CI: 0.761–1.806, $p = 0.471$).

5. Discussion

Erectile dysfunction (ED) is a common complication among men with type 2 diabetes mellitus (T2DM), significantly affecting sexual health, psychological well-being, and overall quality of life. The development of ED in diabetic men is influenced by multiple clinical and metabolic factors, including age, glycemic control, body mass index, and duration of diabetes. The findings of this study demonstrate that higher HbA1c, overweight status, and prolonged T2DM duration are significant predictors of ED, highlighting the multifactorial nature of sexual dysfunction in this population. These results underscore the importance of early identification and management of high-risk individuals to mitigate the impact of ED and improve quality of life among men with T2DM.

The present study demonstrated that men with erectile dysfunction (ED) were significantly older, had higher body mass index (BMI), and a longer duration of type 2 diabetes mellitus (T2DM) compared to those without ED. These findings are in line with previous research emphasizing the influence of both metabolic and disease-related factors on sexual dysfunction. Bacon et al. [13] reported that the risk of ED increased with longer duration of diabetes, highlighting the cumulative effect of chronic hyperglycemia on vascular and endothelial function. Similarly, Nutalapati et al. [14] found that men with ED had a significantly longer diabetes duration than those without ED (8.1 ± 4.9 vs 4.4 ± 3.5 years; $p < 0.001$), reinforcing the role of prolonged disease exposure in the development of ED. In addition, Giugliano et al. [15] observed a high prevalence of ED (approximately 60%) in diabetic men, with higher HbA1c, features of metabolic syndrome, and longer diabetes duration being closely associated with erectile dysfunction, often overlapping with BMI as a contributing factor.

Together, these studies corroborate the present findings, confirming that advancing age, elevated BMI, and prolonged diabetes duration are consistent and significant predictors of ED in men with T2DM.

In this study, 41.4% of men with type 2 diabetes were diagnosed with erectile dysfunction (ED), with 17.8% exhibiting mild, 13.4% moderate, and 10.2% severe ED. These findings are consistent with prior research demonstrating a substantial burden of ED among men with T2DM. Asaduzzaman et al.[16] reported a prevalence of 45.3% (68/150) using the same IIEF-5 questionnaire in a comparable population, closely aligning with our results. Similarly, Parmar et al.[17] observed a 59.4% prevalence of ED among 357 diabetic men, highlighting that approximately 40–60% of men with T2DM commonly experience ED. Collectively, these studies support the notion that erectile dysfunction is a frequent and clinically significant complication in this population, emphasizing the need for routine screening and early intervention.

The Pearson correlation analysis in this study revealed a significant negative relationship between IIEF-5 score and key clinical variables, indicating that older age, longer duration of type 2 diabetes, and poorer glycemic control were associated with more severe erectile dysfunction (ED). Specifically, 10.2% of participants had severe ED, 13.4% moderate, and 17.8% mild ED. These findings are broadly in line with those of Nisahan et al. [18], who reported a 62.9% prevalence of ED among diabetic men, with approximately 22% classified as having severe ED. While the proportion of severe ED in our cohort was somewhat lower, the overall trend of graded severity correlating with clinical risk factors is consistent, reinforcing the importance of age, disease duration, and metabolic control in predicting ED severity among men with type 2 diabetes.

The multivariate logistic regression analysis in this study identified higher HbA1c, being overweight, and longer duration of type 2 diabetes mellitus (T2DM) as significant predictors of erectile dysfunction (ED), while age above 50 years was not statistically significant. Although dyslipidemia was not included as a variable in our regression model, previous studies support its role in ED pathophysiology. Azad et al. [19] found that abnormal HDL and LDL levels were significantly more prevalent among men with ED, with increased odds of dysfunction in those with dyslipidemia.

Similarly, Huang et al.[20] reported a strong association between elevated remnant cholesterol and ED, indicating that lipoprotein abnormalities contribute to ED risk. Li et al. [21] further demonstrated that higher LDL-C and lower HDL-C were linked to arteriogenic ED, reinforcing the vascular and metabolic connections underlying sexual dysfunction. Collectively, these findings suggest that while glycemic control, BMI, and diabetes duration are key clinical predictors, lipid abnormalities may further modulate ED risk in men with T2DM, highlighting the multifactorial nature of the condition.

6. Limitations Of The Study

The study had a few limitations:

- The cross-sectional design limits the ability to establish causality between the studied variables and erectile dysfunction (ED).
- Reliance on self-reported data, including ED severity, may introduce recall bias and social desirability bias.
- Objective measures of ED, such as clinical assessments or diagnostic tests, were not used.
- The study was conducted in a single medical center, which may limit generalizability to broader populations.
- Psychological factors, lifestyle choices, and medication use, which can influence ED, were not comprehensively explored.
- Potential confounding variables affecting the relationship between diabetes and ED could not be fully accounted for.

7. Conclusion

This study demonstrated that erectile dysfunction among men with type 2 diabetes is strongly associated with poor glycemic control, overweight status, and longer duration of diabetes, whereas age was not a significant predictor. These findings underscore the importance of early identification and

management of modifiable risk factors, including blood sugar control and weight management, to prevent or reduce the risk of ED in this population. Awareness of disease duration can further guide clinicians in targeting high-risk patients for timely interventions.

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