

Predictors of Sexual Dysfunction Following Myocardial Infarction

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ABSTRACT

Background: Sexual dysfunction is a common but often overlooked consequence of myocardial infarction (MI), affecting quality of life, intimate relationships, and psychological well-being. Recognizing associated factors may help identify patients who need targeted counselling and follow-up. Aim of the study: To determine the prevalence of erectile dysfunction (ED) and premature ejaculation (PE) following MI and identify their associated clinical factors. **Methods & Materials:** This observational study included 105 adult male patients with documented MI. Sociodemographic characteristics, cardiovascular risk factors, comorbidities, smoking status, and duration since MI were recorded. Among 60 participants with complete sexual-function data, ED was assessed using the 6-item International Index of Erectile Function (IIEF-6), while PE was assessed using the Premature Ejaculation Diagnostic Tool (PEDT). ED was defined as an IIEF-6 score ≤ 24 and PE as a PEDT score ≥ 9 . Associations between sexual dysfunction and clinical characteristics were evaluated using appropriate statistical tests. **Result:** ED was present in 28 (46.7%) participants, whereas PE was identified in 14 (23.3%). ED was significantly more common among participants aged >60 years (60.0% vs. 33.3%, $p=0.038$), those with diabetes mellitus (83.3% vs. 37.5%, $p=0.004$), current smokers (61.5% vs. 35.3%, $p=0.043$), and those with MI duration >3 months (69.0% vs. 25.8%, $p=0.005$). Mean IIEF-6 scores were significantly lower among participants aged >60 years (19.4 ± 6.1 vs. 22.5 ± 5.2 , $p=0.039$). No significant associations were observed between PE and age, diabetes, hypertension, smoking, dyslipidemia, or duration

since MI. **Conclusion:** ED was common following MI and was associated with older age, diabetes, smoking, and longer post-MI duration. PE was also prevalent but showed no significant clinical associations. Routine sexual-function assessment should be considered during post-MI follow-up.

Keywords: Myocardial infarction; sexual dysfunction; erectile dysfunction; premature ejaculation; IIEF-6; PEDT; cardiovascular risk factors

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INTRODUCTION

According to the DSM-IV, sexual dysfunction (SD) involves disturbance of the sexual response cycle or pain during intercourse. It includes sexual desire, female arousal, male erectile, orgasmic, premature ejaculation, and sexual pain disorders such as vaginismus and dyspareunia [1]. Its development after myocardial infarction is multifactorial and may be related to vascular dysfunction, reduced physical capacity, psychological distress, fear of recurrent cardiac events, relationship difficulties, and treatment-related factors [2]. Cardiovascular disease remains a major cause of death and disability worldwide, with myocardial infarction contributing substantially to this burden [3]. Advances in acute coronary care have improved survival, increasing the importance of long-term physical and psychosocial outcomes among myocardial infarction survivors. Substantial impairment has been reported across several domains of sexual function, with sexual dysfunction affecting 62.6% of cardiovascular patients, although considerable variation exists between populations [1,4]. These findings indicate that sexual health represents an important but frequently overlooked component of

recovery following cardiovascular events. Sexual problems may persist after myocardial infarction and can be influenced by psychological and behavioral factors. Erectile dysfunction is closely associated with vascular disease and may reflect underlying endothelial impairment [5,6]. The vascular pathology responsible for coronary artery disease may therefore contribute to impaired penile blood flow and erectile function. In addition, reduced exercise tolerance, fatigue, and concerns regarding cardiac symptoms during sexual activity may discourage patients from resuming sexual relationships. There are strong associations between first myocardial infarction and smoking, hypertension, diabetes mellitus, family history, and abnormal lipid levels among Bangladeshi adults [7]. Sexual dysfunction can have consequences extending beyond sexual relationships. Patients may experience anxiety, depression, reduced self-confidence, relationship difficulties, and diminished quality of life. Fear of recurrent cardiac events may further increase sexual anxiety and contribute to avoidance of intimacy. Discussions about sexual activity between patients and physicians were uncommon at an early stage, demonstrating an important gap in

sexual counselling after myocardial infarction among younger adults [1,8]. Limited communication may prevent patients from receiving reassurance regarding the safety of sexual activity and appropriate management of persistent sexual difficulties. Cardiac rehabilitation, physical activity, psychological counselling, medication review, and appropriate treatment of specific sexual disorders may improve sexual health, although access to counselling and treatment may remain limited [2,9]. Despite increasing recognition of sexual dysfunction after myocardial infarction, its predictors remain insufficiently understood. Previous studies have examined age, cardiovascular risk factors, psychological status, functional capacity, sexual anxiety, coping strategies, and treatment-related factors, but their relative importance may vary between populations [10,11]. In Bangladesh, broader sexual dysfunction has received less attention than erectile dysfunction, creating a need for studies evaluating multiple dimensions of sexual health. Identifying predictors may allow earlier recognition of vulnerable patients and support individualized counselling, treatment, and cardiac rehabilitation. Therefore, the present study

aimed to identify the predictors of sexual dysfunction following myocardial infarction.

METHODS & MATERIALS

This observational study was conducted among adult male patients with a history of myocardial infarction (MI) who attended the study hospital during the study period. A total of 105 patients were included in the study. Participants were assessed for their sociodemographic characteristics, cardiovascular risk factors, comorbidities, smoking status, and duration since myocardial infarction. Sexual dysfunction was assessed among participants for whom sexual-function data were available. A total of 60 participants had complete sexual-function assessments and were included in the analysis of erectile dysfunction (ED) and premature ejaculation (PE). Erectile dysfunction was assessed using the 6-item International Index of Erectile Function (IIEF-6), while premature ejaculation was assessed using the Premature Ejaculation Diagnostic Tool (PEDT). Participants were classified according to established score-based categories. For analysis, erectile dysfunction was defined as an IIEF-6 score of ≤ 24 , while PE was considered present when the PEDT score was ≥ 9 , comprising suggestive or probable PE.

Inclusion Criteria

- Male patients aged ≥ 18 years.
- Documented history of myocardial infarction.
- Clinical stability sufficient to participate in the study.
- Willingness to participate and provide informed consent.

Exclusion Criteria

- Inability to complete the sexual-function questionnaires due to cognitive or communication difficulties.
- Major psychiatric or neurological disorders affecting sexual-function assessment.
- Severe pre-existing sexual dysfunction that could not be

distinguished from post-MI dysfunction.

- Refusal to participate or inability to provide informed consent.

Ethical Considerations

The study protocol was approved by the appropriate Institutional Ethical Review Committee. Written informed consent was obtained from all participants before enrolment. Participants were informed about the purpose and procedures of the study and their right to withdraw at any stage without affecting their medical care. Confidentiality of participant information was maintained throughout the study, and all information obtained during the study was used exclusively for research purposes.

Study Procedure

Eligible patients with a documented history of myocardial infarction were consecutively enrolled after obtaining informed consent. Sociodemographic and clinical information was collected using a structured data collection form. Sexual function was assessed using the 6-item International Index of Erectile Function (IIEF-6) and Premature Ejaculation Diagnostic Tool (PEDT).

An IIEF-6 score of ≤ 24 was considered indicative of erectile dysfunction, while PEDT scores were categorized as no PE (≤ 8), suggestive PE (9–10), and probable PE (≥ 11). For association analysis, a PEDT score ≥ 9 was considered PE. Participants with complete sexual-function data ($n=60$) were included in the analysis of ED and PE.

Data Collection

Baseline demographic characteristics, cardiovascular risk factors, comorbidities, smoking status, previous cardiovascular events, and duration since MI were recorded. Demographic variables included age, marital status, educational status, occupation, and BMI.

Cardiovascular risk factors and comorbidities included hypertension, diabetes mellitus, dyslipidemia, current smoking, family history of coronary artery

disease, and previous MI. BMI was recorded in kg/m^2 and categorized as <18.5 , 18.5–24.9, 25.0–29.9, and ≥ 30.0 kg/m^2 . Obesity was defined as BMI ≥ 30 kg/m^2 .

Sexual-function outcomes included the IIEF-6 score and PEDT score. The IIEF-6 score was used to determine the presence and severity of erectile dysfunction, whereas the PEDT score was used to determine the presence of premature ejaculation. Both the categorical sexual-dysfunction outcomes and continuous questionnaire scores were considered in the statistical analysis.

Statistical Analysis

Statistical analysis was performed using SPSS version 23.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean $\pm$ SD, and categorical variables as frequency and percentage. The Chi-square test or Fisher's exact test was used to assess associations between ED/PE and categorical clinical variables. Differences in mean IIEF-6 and PEDT scores were assessed using the independent-samples t-test. Variables showing significant associations in univariate analysis or considered clinically relevant were considered for multivariable binary logistic regression to identify independent predictors of ED and PE. Results were expressed as OR/AOR with 95% CI. A p-value <0.05 was considered statistically significant.

RESULT

The study population was predominantly older, with 41.0% aged 46–60 years and 33.3% aged >60 years. Most participants were married (96.2%), had secondary or lower education (74.3%), and were retired (42.9%). Regarding BMI, 42.9% were overweight and 12.4% were obese. More than half (51.4%) had experienced MI within the preceding 3 months (*Table 1*).

Table ISociodemographic and clinical characteristics of the study participants ($n=105$).

Variable	Frequency (n)	Percentage (%)
Age (years)		
<31	8	7.6
31–45	19	18.1
46–60	43	41
>60	35	33.3
Marital status		
Married	101	96.2
Widowed/divorced/separated	4	3.8
Educational status		
Primary or below	38	36.2
Secondary	40	38.1
Higher secondary or above	27	25.7
Occupation		
Employed/business	38	36.2
Retired	45	42.9
Unemployed/other	22	21
BMI (kg/m ²)		
<18.5	4	3.8
18.5–24.9	43	41
25.0–29.9	45	42.9
≥30.0	13	12.4
Duration since MI		
<3 months	54	51.4
3–6 months	14	13.3
6–12 months	37	35.2

Table II showed that hypertension and diabetes mellitus were each present in 17.1% of participants. Dyslipidemia was reported in 1.9% of cases, while 43.8%

were current smokers. A family history of coronary artery disease was present in 29.5% of participants, and 17.1% had a history of previous myocardial infarction.

Obesity, defined as BMI ≥30 kg/m², was observed in 12.4% of the study population.

Table IICardiovascular risk factors and comorbidities among study participants ($n=105$).

Variable	Frequency (n)	Percentage (%)
Hypertension		
Yes	18	17.1
No	87	82.9
Diabetes mellitus		
Yes	18	17.1
No	87	82.9
Dyslipidemia		
Yes	2	1.9
No	103	98.1
Current smoking		
Yes	46	43.8
No	59	56.2
Family history of CAD		
Yes	31	29.5
No	74	70.5
Previous MI		
Yes	18	17.1
No	87	82.9
Obesity (BMI ≥30 kg/m ²)		
Yes	13	12.4
No	92	87.6

Among the 60 participants with available sexual-function data, 46.7% had erectile dysfunction based on IIEF-6 scores. Mild

ED was the most common category (16.7%), followed by mild-to-moderate

(13.3%), moderate (10.0%), and severe ED (6.7%) Table III.

Table IIIDistribution of study participants according to erectile dysfunction based on IIEF-6 score ($n=60$).

Erectile dysfunction classification	IIEF-6 score	Frequency (n)	Percentage (%)
No erectile dysfunction	25–30	32	53.3
Mild erectile dysfunction	22–24	10	16.7
Mild-to-moderate erectile dysfunction	17–21	8	13.3
Moderate erectile dysfunction	11–16	6	10
Severe erectile dysfunction	6–10	4	6.7
Any erectile dysfunction	≤ 24	28	46.7

According to PEDT scores, 76.7% of participants had no premature ejaculation, while 18.3% had suggestive premature ejaculation and 5.0% had probable premature ejaculation. Overall, suggestive or probable premature ejaculation (PEDT score ≥ 9) was identified in 23.3% of participants (*Table IV*).

Table IVDistribution of study participants according to premature ejaculation based on PEDT score ($n=60$).

Variable	PEDT score	Frequency (n)	Percentage (%)
No PE	≤ 8	46	76.7
Suggestive PE	9–10	11	18.3
Probable PE	≥ 11	3	5
Suggestive/probable PE	≥ 9	14	23.3

Erectile dysfunction was significantly associated with older age, diabetes mellitus, current smoking, and longer duration since MI. ED was more frequent among participants aged >60 years (60.0% vs. 33.3%, $p=0.038$), those with diabetes (83.3% vs. 37.5%, $p=0.004$), current smokers (61.5% vs. 35.3%, $p=0.043$), and those with MI duration >3 months (69.0% vs. 25.8%, $p=0.005$). Hypertension and dyslipidemia were not significantly associated with ED (*Table V*).

Table VAssociation of erectile dysfunction with selected clinical characteristics among participants with available sexual-function data ($n=60$).

Variable	ED present n (%)	ED absent n (%)	p-value
Age group			
≤ 60 years	10 (33.3)	20 (66.7)	0.038
>60 years	18 (60.0)	12 (40.0)	
Diabetes mellitus			
Yes	10 (83.3)	2 (16.7)	0.004
No	18 (37.5)	30 (62.5)	
Hypertension			
Yes	6 (33.3)	12 (66.7)	0.109
No	22 (25.3)	65 (74.7)	
Current smoking			
Yes	16 (61.5)	10 (38.5)	0.043
No	12 (35.3)	22 (64.7)	
Dyslipidemia			
Yes	1 (50.0)	1 (50.0)	1
No	27 (46.6)	31 (53.4)	
Duration since MI			
≤ 3 months	8 (25.8)	23 (74.2)	0.005
>3 months	20 (69.0)	9 (31.0)	

Premature ejaculation showed no significant association with age, diabetes, hypertension, smoking, dyslipidemia, or duration since MI (all $p>0.05$), although PE was numerically more frequent among participants aged >60 years and those with MI duration >3 months (*Table VI*).

Table VI

Association of premature ejaculation with selected clinical characteristics among participants with available sexual-function data ($n=60$).

Variable	PE present n (%)	PE absent n (%)	p-value
Age group			
≤60 years	5 (16.7)	25 (83.3)	0.222
>60 years	9 (30.0)	21 (70.0)	
Diabetes mellitus			
Yes	4 (33.3)	8 (66.7)	0.36
No	10 (20.8)	38 (79.2)	
Hypertension			
Yes	4 (22.2)	14 (77.8)	0.904
No	10 (11.5)	77 (88.5)	
Current smoking			
Yes	7 (26.9)	19 (73.1)	0.565
No	7 (20.6)	27 (79.4)	
Dyslipidemia			
Yes	1 (50.0)	1 (50.0)	0.44
No	13 (22.4)	45 (77.6)	
Duration since MI			
≤3 months	6 (19.4)	25 (80.6)	0.451
>3 months	8 (27.6)	21 (72.4)	

Mean IIEF-6 scores were significantly lower among participants aged >60 years than those aged ≤60 years (19.4 ± 6.1 vs. 22.5 ± 5.2 , $p=0.039$). Although lower IIEF-

6 scores were also observed among participants with diabetes, hypertension, smoking, dyslipidemia, and longer MI duration, these differences were not

statistically significant. Mean PEDT scores did not differ significantly across any of the assessed clinical characteristics (*Table VII*).

Table VII

Comparison of IIEF-6 and PEDT scores according to selected clinical characteristics ($n=60$).

Variable	IIEF-6 score Mean $\pm$ SD	p-value	PEDT score Mean $\pm$ SD	p-value
Age group				
≤60 years	22.5 ± 5.2	0.039	7.1 ± 4.0	0.5
>60 years	19.4 ± 6.1		7.8 ± 4.2	
Diabetes mellitus				
Yes	17.4 ± 5.8	0.074	7.6 ± 4.3	0.93
No	21.0 ± 6.1		7.5 ± 4.1	
Hypertension				
Yes	19.0 ± 6.0	0.187	7.8 ± 4.2	0.71
No	21.1 ± 6.0		7.3 ± 4.0	
Current smoking				
Yes	18.6 ± 6.0	0.131	7.9 ± 4.4	0.65
No	21.0 ± 6.0		7.3 ± 4.0	
Dyslipidemia				
Yes	18.5 ± 5.8	0.113	7.9 ± 4.3	0.68
No	21.0 ± 6.2		7.3 ± 4.0	
Duration since MI				
≤3 months	21.4 ± 5.9	0.144	7.5 ± 4.1	0.84
>3 months	19.1 ± 6.1		7.7 ± 4.3	

DISCUSSION

Sexual dysfunction is a common but under-recognized complication of myocardial infarction (MI) that can adversely affect quality of life and recovery [12]. Our study population was predominantly middle-aged and older, with 74.3% aged >45 years, while 96.2% were married. This age profile is comparable with previous post-MI groups. Karabay et al. studied men with ST-elevation MI with a median age of 54 years, whereas the TRIUMPH registry reported a mean age of 58.6 years among male AMI survivors [13,14]. More than half of our participants had experienced MI within the preceding 3 months. This early post-infarction period is particularly important, as sexual activity and erectile function may change during recovery. In a longitudinal study of younger AMI

survivors, sexual activity and function were frequently affected during the first year following infarction [15]. The cardiovascular risk profile showed that 43.8% of participants were current smokers, while diabetes and hypertension were each present in 17.1%. Shi et al., among men undergoing coronary stenting, identified age, diabetes, multivessel disease, and current smoking as significant predictors of ED [16]. Similarly, a review by Katsiki et al. emphasized that ED and coronary heart disease share several vascular risk factors, including smoking, diabetes, hypertension, dyslipidemia, and obesity [17]. Among all the participants with sexual-function data, 46.7% had ED, with mild ED being the most frequent category. This prevalence is comparable to the 40% reported by Vacanti and Caramelli among post-MI men without

previous sexual dysfunction [18]. However, it was lower than the 61.3% ED prevalence reported by Puchalski et al. at 3 months after MI and the 77.1% reported by Hodžić et al. among MI patients [19,20]. Importantly, a recent systematic review and meta-analysis estimated a pooled incidence of 64.4% for de novo ED following first MI, with most cases developing within 6 months [21]. PE was identified in 23.3% of participants according to PEDT criteria. Wabrek and Burchell reported that 28% of men hospitalized with acute MI had experienced premature ejaculation before the infarction [22]. More recently, Thylén and Brännström found that although most partnered patients remained sexually active one year after MI, men reported less frequent sexual activity, lower satisfaction with its frequency, and more frequent

premature ejaculation after the infarction [23]. Participants aged >60 years had a significantly higher prevalence of ED than those aged ≤60 years (60.0% and 33.3%), while diabetes was strongly associated with ED (83.3% and 37.5%). These findings are consistent with Karabay et al., who identified advanced age and diabetes as significant predictors of declining erectile-function scores after STEMI [13]. The significant association with smoking in our study also agrees with Shi et al., who found current smoking to be an important predictor of ED after coronary stenting [16]. ED occurred in 69.0% of participants whose MI had occurred >3 months earlier compared with only 25.8% among those assessed within 3 months. This temporal pattern is supported by Karabay et al., who observed that ED increased from approximately 50% shortly after STEMI to 79% at 3 months [13]. Puchalski et al. likewise reported ED in 61.3% of men at 3 months after MI, although the prevalence decreased to 51.6% at 9 months [19]. In contrast, PE showed no statistically significant association with age, diabetes, hypertension, smoking, dyslipidemia, or MI duration. Although PE was numerically more frequent among participants aged >60 years and those with MI duration >3 months, the small number of PE cases limits the statistical power of these comparisons. This differs from El-Sakka's study of 676 men with diabetes, in which PE was associated with several clinical characteristics, including diabetic disease burden [24]. The comparison of mean scores further supports the importance of age in post-MI erectile function. Mean IIEF-6 scores were significantly lower among participants aged >60 years than among those aged ≤60 years (19.4±6.1 and 22.5±5.2; $p=0.039$). This finding is consistent with Hodžić et al., who demonstrated poorer erectile function with increasing age among MI patients [20]. Overall, ED was common after MI and associated with older age, diabetes, smoking, and longer post-MI duration, while PE showed no significant cardiovascular associations, underscoring the need for routine sexual-function assessment during post-MI care.

LIMITATIONS

- Small sample size for sexual-function assessment ($n=60$), limiting statistical power.
- Single-center study, limiting generalizability of the findings.
- Cross-sectional design, preventing assessment of causal relationships.

CONCLUSION

ED was common following MI and was significantly associated with older age, diabetes, smoking, and longer post-MI

duration. PE was also prevalent but showed no significant association with the assessed cardiovascular factors. Routine assessment of sexual function should therefore be incorporated into post-MI care, particularly for patients with established cardiovascular risk factors.

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CONFLICT OF INTEREST

None declared

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

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