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Original Article

# The prevalence of erectile dysfunction among angiographically detected patients of coronary artery disease in North-India

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ABSTRACT

*Aims:* Erectile dysfunction (ED) and coronary artery disease (CAD) often coexist and recent observations have given ample evidence that ED might serve as a clinical marker for cardiovascular disease. Sparse data is available on prevalence of ED. We aimed to study the prevalence of ED in North-Indian patients undergoing coronary angiography and to assess whether the severity of ED correlates with angiographic severity of CAD.

*Methods:* It was a cross-sectional observational, single centre study, carried out from November 2011 to October 2012. All patients underwent coronary angiography and ED was assessed using the International Index of Erectile Function (IIEF-5) questionnaire. Data were presented in mean ± standard deviation and percentages. Appropriate analytic tests were used.

*Results:* A total of 243 male patients enrolled, among them ED was seen in 65.4%. ED was more prevalent in patients with multivessel CAD (MVCD) as compared to those with single vessel disease (79.48% vs. 37.85%; $p = 0.043$). The prevalence of severe ED was higher in multivessel CAD as compared to (23.60% vs. 2.44%; $p = 0.0001$) patients with SVCD. Severe ED had frequent coincident diffuse CAD than a focal disease (25.29% vs. 6.35%; $p = < 0.001$). ED predated in 95% patient with MVCD, preceding SVCD in 88%. Overall, ED was ahead of CAD by 24–36 months in both groups.

*Conclusion:* North-Indians with angiographically proven CAD frequently have ED; symptoms of ED precede that of CAD in most patients. MVCD is more common in patients with ED. A quarter of patients with severe ED have diffuse disease. ED might serve as a potential predictor of underlying significant CAD.



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## 1. Introduction

Erectile dysfunction (ED) is defined as the inability to reach or maintain erection sufficient for satisfactory sexual performance. It is a common entity but less talked about. According to Massachusetts Male Aging study,[1] this condition has been reported to afflict, to some degree, 52% of male adults between the ages of 40 and 70 years in the USA and 322 million men worldwide. Evidence is accumulating in favour of ED as a vascular disorder in the majority of patients. In fact, common risk factors for atherosclerosis have been frequently found in patients with ED, and the severity of ED has been related to the number and severity of risk factors themselves.[1,2] Moreover, abnormal sexual function has been reported in patients with vascular diseases such as coronary artery disease (CAD),[3–5] diabetes,[2,6] cerebrovascular disease,[7] and hypertension and peripheral arterial disease.[8–10] Finally, ED and vascular diseases share a similar pathology, explained by anatomical or by functional abnormality (Endothelial dysfunction).[11,12]

The underlying mechanisms involved in the association between ED and CVD are uncertain. One possible explanation is the ''artery size hypothesis''.[13] According to this hypothesis, because atherosclerosis affects all major vascular beds to the same extent, penile arteries, which are smaller in diameter than coronary arteries, are affected earlier by the same size of atherosclerotic plaque and hence ED manifests before cardiovascular events.

Data about the association of ED with CAD is lacking grossly from North-India. We therefore aimed a study to determine the prevalence of ED in CAD patients and correlated ED with CAD.

## 2. Subjects and methods

The study was conducted in the Department of Cardiology, King George Medical University, Lucknow, India.

Patients were enrolled in our study from November 2011 to October 2012 undergoing coronary angiography.

Patients were divided into two groups according to coronary angiography findings –

Group A – minimal disease or single vessel disease.

Group B – double vessel or triple vessel disease.

Significant coronary artery disease was defined as $>$ 50% luminal diameter stenosis.

Diffuse disease is defined when at least 75% of the length of the segment distal to the lesion has a vessel diameter of $<$2 mm, irrespective of the presence or absence of disease at that distal segment.

## 3. Evaluation of erectile function

Patients were evaluated for ED by interviewing them by using International Index of Erectile Function (IIEF-EFD) questionnaire.[14] Patients were subjected to IIEF questionnaire after a mean time interval of 3[2–5] days since the admission to the hospital.

Erectile function is specifically addressed by six questions that form the so called 'erectile function domain' of the questionnaire.

Each question is scored 0 to 5. In the case of ED, patient was asked to answer the following question:

IIEF-EFD questionnaire for ED Erectile function evaluation described in Table 1.

Patients were classified according to severity of IIEF-5 scores as no erectile dysfunction (22–25), mild (17–21), mild to moderate (12–16), moderate (8–11), severe ($<$7).

Patients with thyroid disorders, renal failure, liver cirrhosis, epilepsy, Parkinson's disease, cerebrovascular accidents, chronic obstructive respiratory disease, depression, and those who had undergone pelvic, penile, urethral, or prostate surgery or who were being already treated for erectile dysfunction were excluded.

The study was approved by Institutional ethics committee of the institute where work was accomplished. Informed consent was obtained from all subjects. Data were presented in mean $\pm$ standard deviation and percentages. Mann–Whitney U test, the Wilcoxon matched pairs signed-ranks test, and the chi square test was applied when they were required to analyse the data. A P value $<$0.05 for a two-sided test was considered statistically significant.

## 4. Results

The study encompassed a total of 243 patients with mean age of 60.9 $\pm$ 12.4 years. Of total 41.9% (102/243) were diabetic

**Table 1 – IIEF-EFD questionnaire for ED Erectile function.**

| |
|---|
| **(1)** Q: how often were you able to get an erection during sexual activity? A: no sexual activity (0), almost never/never (1), a few times (much less than half of the time) (2), sometimes (about half of the time) (3), most times (much more than half the time) (4), almost always/always (5). |
| **(2)** Q: when you had an erection with sexual stimulation, how often were your erections hard enough for penetration? A: no sexual activity (0), almost never/never (1), a few times (much less than half of the time) (2), sometimes (about half of the time) (3), most times (much more than half the time) (4), almost always/always (5). |
| **(3)** Q: when you attempted sexual intercourse, how often were you able to penetrate your partner? A: no sexual activity (0), almost never/never (1), a few times (2), sometimes (about half of the time) (3), most times (much more than half the time) (4), almost always/always (5). |
| **(4)** Q: during sexual intercourse, how difficult was it to maintain your erection after you had penetrate your partner? A: no sexual activity (0), almost never/never (1), a few times (2), (3), most times (much more than half the time) (4), almost always/always (5). |
| **(5)** Q: during sexual intercourse, how difficult was it to maintain your erection to completion of intercourse? A: did not attempt intercourse (0), extremely difficult (1), very difficult (2), difficult(3), slightly difficult (4), not difficult (5). |
| **(6)** Q: how do you rate your confidence that you could get and keep an erection? A: very low (1), low (2), moderate (3), high (4), very high (5). |
| Note: IIEF-5 scores as no erectile dysfunction (**22–25**), mild(**17–21**), mild to moderate(**12–16**), moderate(**8–11**), severe(**<7**). |