



Research Brief

Concurrence of erectile dysfunction and coronary artery disease among patients undergoing coronary angiography at a tertiary Medical College Hospital in Goa

Manjunath Desai ^a, Guruprasad Naik ^a, Umesh S. Kamat ^{b,*}, Jagadish A. Cacodcar ^b

^a Department of Cardiology, Goa Medical College, Bambolim, Goa, India

^b Department of Preventive and Social Medicine, Goa Medical College, Bambolim, Goa, India

ARTICLE INFO

Article history:

Received 4 September 2019

Accepted 28 March 2020

Available online 15 April 2020

Keywords:

Erectile dysfunction

Coronary artery disease

Prevalence

Patterns

ABSTRACT

The paper is based on the data from 92 males less than 45 years of age who underwent coronary angiography at Goa Medical College during the period July 2018 to February 2019. The objectives include to estimate the prevalence of erectile dysfunction (ED) and its risk factors, and to evaluate the pattern of coronary artery disease (CAD) among these patients. The ED prevalence was 46.2%. Diabetes, hypertension and alcohol intake showed significant association with ED; and these patients were almost three more likely to have a coronary blockade compared to those not reporting ED. This concurrence between ED and CAD makes a strong ground for routine inquiry in sexual history of young males with one or more cardiovascular risk factors.

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1. Introduction

Erectile dysfunction (ED) and coronary artery disease (CAD) share a common pool of risk factors.^{1–3} Atherosclerosis, inflammation and endothelial dysfunction mark the pathophysiological cascade that underlies these disorders. Patients with ED tend to have a severe CAD with multiple vessel involvement compared to those without ED.^{1,4,5} Given the fact that ED precedes the clinical presentation of CAD, routine enquiry in this aspect of the personal history of a young male with one or more conventional cardiovascular (CV) risk factors could aid in early diagnosis of CAD. This paper is based on the data from the patients who underwent coronary angiography (CAG) in Goa Medical College Hospital and aims to estimate the prevalence of ED and its risk factors, and to correlate ED with the severity of CAD based on the number of vessels involved.

2. Materials and methods

An observational descriptive study was launched in July 2018 at the Department of Cardiology, Goa Medical College

Hospital, to study the sociodemographic, clinical and laboratory correlates of the patients undergoing CAG. Till February 2019, 972 patients were worked up, 92 of which were males aged less than 45 years. The data pertaining to these 92 patients was analysed in fulfilment of the objectives of this research paper. The patients were explained about how cardiovascular disease (CVD) and ED shared a common pool of risk factors and the role of ED as a surrogate marker for the extent of vascular damage/endothelial dysfunction. The patients were explained that ED was not uncommon among young males with conventional CVD risk factors, and having built a rapport with the patient to open up on the sensitive topic a direct question was put—“Do you get a penile erection sufficient to enjoy sexual intercourse to your satisfaction?” The answer to this question was taken as Yes or No on most of the occasions in previous 6 months to, respectively, indicate the absence or presence of ED in the patient. The outcome of CAG was categorized as normal, that is, blockage not necessitating a coronary intervention; single vessel disease (SVD); double vessel disease (DVD) and triple vessel disease (TVD).

The data were entered and analysed in SPSS for windows, version 22. The percentages were calculated and compared using the chi-square test (χ^2) of significant difference in proportion at 95% confidence interval (CI) level.

* Corresponding author. UT-A, Volla Homes, St Caitan, Mercas, Tiswadi, Goa, 403005, India.

E-mail address: neetumesh@rediffmail.com (U.S. Kamat).

3. Results

3.1. Prevalence of ED and its risk factors (Table 1)

Prevalence of ED was 46.2% (43 of 92). Diabetes mellitus (DM), Hypertension (HT) and alcohol consumption were significantly associated with the presence of ED.

3.2. Patterns of CAD (Fig. 1)

Those with ED were 2.98 times (1.1–8.08) more likely to have an adverse outcome on CAG compared to those not reporting ED. The prevalence of DVD and TVD was higher among the patients reporting ED as compared to those not reporting ED, but the figures just fell short of statistical significance ($\chi^2 = 7.2585$, $p = 0.064$).

3.3. Doctor–patient dialogue on ED

Only 11.6% (5 of 43) had reported the matter to their treating doctor, and in none of the instances was there a primary inquiry about the condition from the medical care provider. Embarrassment was the universally cited reason for not opening up the topic with their doctor. Although 44.1% (19 of 43) resorted to over the counter phosphodiesterase inhibitor (PDEI) treatment as and when required, 11.6% (5 of 43) used PDEI recommended by their medical care provider, and 30.2% (13 of 43) resorted to traditional healers

and AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy) practitioners for relief.

4. Discussion

We used the single question–based diagnosis of self-reported ED in our study, as advocated by O'Donnell et al⁶ for research studies. Our study population composed of young males with one or more conventional CV risk factors, thereby accounting for the prevalence estimate of 46.2%. Similar studies in India⁴ and abroad⁷ have estimated comparative figures to be 50–70%, the eligible patients being all males without an age bar thus accounting for higher prevalence of ED. None of the study subjects had any history of previous coronary intervention or IHD.

The proportion did not differ significantly across the socio-demographic variables (Table 1). DM and HT seemed to be significantly associated with ED (Table 1), the respective odds ratio (OR) being 2.906 (1.127–7.491) and 2.61 (1.11–6.12), and the prevalence of ED further increased with the duration of DM and HT. The patients reporting ED had a higher average fasting and random blood sugar levels, HbA1c level, systolic blood pressure and diastolic blood pressure levels, but the sample size constrained the statistical significance. No statistically significant link could be deduced between dyslipidaemia and ED. All the patients with dyslipidaemia were already on statin therapy, and reaped the benefits of its pleiotropic effects. Use of alcohol (Table 1) beyond the acceptable limit was significantly associated with ED compared to its use in acceptable limits or no use (OR = 3.39; 95% CI 1.35–8.49). Alcohol in small amounts improves erection and increases libido because of its vasodilatory effect and anxiety suppression; however, its long-term use can cause hypogonadism and polyneuropathy leading to sexual dysfunction.⁸ Use of tobacco (Table 1), although seemed to be associated, failed to demonstrate a statistically significant relationship with ED ($p = 0.052$). An adverse effect of tobacco on erectile function is well documented in medical literature, and is predominantly mediated through smoke-induced inhibition of neuronal and endothelial nitric oxide synthase (NOS), damage to the vascular endothelium, and impaired NOS-mediated vasodilation.⁹

The patterns of CAD differed among these patients based on the presence or absence of ED (Fig. 1). The prevalence of CAD among those with ED and without ED was, respectively, 83.7% and 63.3% ($p = 0.056$). Half of the CAG–documented CAD patients in our study had ED, whereas 35% of the non-CAD patients reported an ED. This is lower than the ED prevalence of 88.5% and 64.2% in CAD and non-CAD patients as estimated by Salem et al.¹⁰ The difference in prevalence could be attributed to the relatively younger age group in our study, as explained before. Patients with ED were almost three times more likely (OR = 2.98; 1.1–3.08) to have coronary vessel blockade involving at least one coronary compared to the non-ED patients. A similar study by Greenstein et al.⁵ estimated that of the 40 men who underwent CAG, 37.5% had an SVD, 20% had a DVD and 42.5% had a TVD; the comparative figures in our study being 39.5%, 18.6% and 25.6%, respectively. It may be noted that the average age of the study participants in Greenstein's study was 56.6 years (SD 1.3), whereas in our study it was 39.91 years (SD 20.9); and the study by Greenstein et al. did not have a normal coronaries category.

Physician inertia in proactive routine enquiry into the sexual history of patients surfaced up once again through this study. Despite there being a conclusive evidence linking ED with endothelial dysfunction—penis, the barometer of endothelial health as it was pronounced by McCollough¹¹—the routine questioning on this

Table 1
Sociodemographic and clinical correlates of ED.

ED (Erectile dysfunction)	N	ED + (%)	χ^2	p
Age group (years)				
31–35	9	5 (55.6%)	1.205	0.547
36–40	39	20 (51.3%)		
41–45	44	18 (40.9%)		
Education				
Illiterate	4	4 (100%)	6.874	0.076
Primary	4	2 (50%)		
Up to tenth	46	17 (37%)		
Graduate	38	20 (52.6%)		
DM				
Present	26	17 (65.4%)	5.061	0.024
Absent	66	26 (39.4%)		
Duration of DM (years)				
1–5	16	8 (50%)	2.76	0.09
6–10	10	9 (87.5%)		
HT				
Present	38	23 (60.5%)	4.94	0.02
Absent	54	20 (37%)		
Duration of HT (years)				
1–5	28	15 (53.6%)	2.15	0.14
6–10	10	8 (80%)		
Dyslipidaemia				
Present	26	15 (57.7%)	1.747	0.186
Absent	66	28 (42.4%)		
Tobacco				
Yes	16	11 (68.7%)	3.77	0.052
No	76	32 (42.1%)		
Alcohol				
Yes	30	20 (66.7%)	7.101	0.007
No	62	23 (46.8%)		
BMI				
Underweight	6	1 (16.7%)	2.411	0.492
Normal	32	15 (46.9%)		
Overweight	14	7 (50%)		
Obese	40	20 (50%)		

BMI = body mass index. All values less than 0.05 in the last column are statistically significant, and represented in bold.

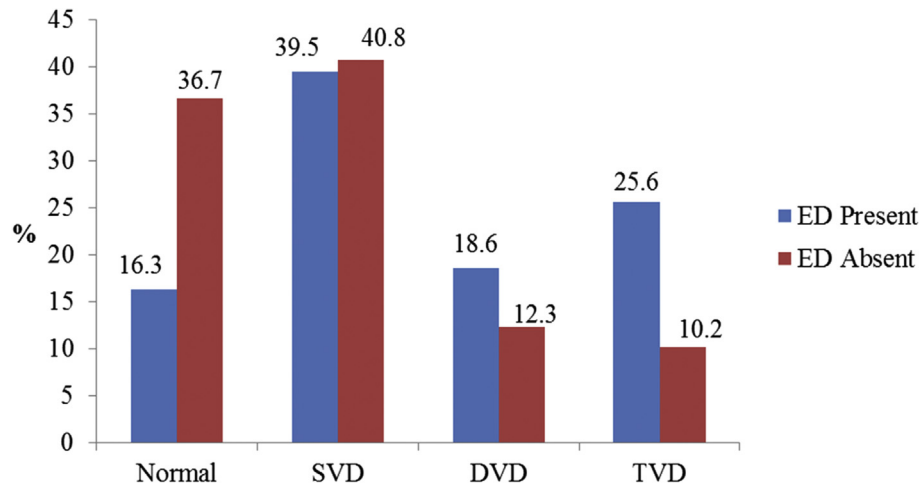


Fig. 1. Patterns of CAD among the patients with/without ED.

aspect does not seem to happen in clinical settings. As many as 62% of the primary care physicians in Nigeria would not elicit a sexual history unless the patient brought it up,¹² and in our study, this percentage was nil.

5. Conclusion

This is one of the very few studies in India, which correlates ED with angiographically substantiated CAD, not just the risk factors for CAD. Restriction of study population age group to less than 45 years resulted in a limited sample size. However, considering the aim of the study—to evaluate ED as a predictor of otherwise silent CVDs—with the intention to encourage medical care providers to proactively seek history of ED to facilitate screening (early identification) of those at risk of CVDs, restriction of the age group to less than 45 years was thought to be more specific and relevant. Increasing burden of CVDs, high concurrence of ED and CAD, and a common pool of risk factors for both (ED and CAD) makes a strong case in support of the routine inquiry about ED in young males with one or more CV risk factors.

Funding

The study did not involve any external source of funding.

Ethical permission

The data used for the paper were extracted from the parent study on clinicosocial and laboratory characteristics of patients undergoing CAG at the Department of Cardiology, GMCH, which was approved by the Institutional Ethics Committee of Goa Medical College, Bambolim, Goa.

Declaration of competing interest

All authors have none to declare.

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