

## Original Research Article

DOI: <http://dx.doi.org/10.18203/2349-2902.ijssurgery20191128>

# Erectile dysfunction: prevalence and determinants among T2DM men attending a tertiary care hospital in northern India

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Received: 23 February 2019

Accepted: 18 March 2019

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## ABSTRACT

**Background:** Erectile dysfunction (ED), though an important complication of T2DM is grossly under reported in this part of the world. The present study aimed to determine the prevalence and associated risk factors of ED in T2DM men in northern India.

**Methods:** A cross-sectional study was conducted from January to August 2018 among male patients with T2DM in the medical OPD of a tertiary care teaching hospital in Jammu. IIEF- international index of erectile function was the tool used in the present study.

**Results:** ED prevalence was 62.08%. Among socio-demographic variables, age was significantly associated with ED ( $p<0.05$ ) while no association was found with education, occupation and family income. Smoking as a life style and hypertension as a co-morbid condition were significantly associated with ED ( $p<0.05$ ). Duration of diabetes and type of diabetic complications were also found to be statistically significant.

**Conclusions:** Prevalence of ED in T2DM men was quiet high in this region of India. Preventive interventions, early diagnosis and detection of T2DM along with treatment adherence to prevent diabetic complications is strongly recommended. Further research is recommended to establish temporal causality of ED in T2DM.

**Keywords:** T2DM men, Erectile dysfunction, Prevalence, North India

## INTRODUCTION

Although erectile dysfunction (ED) remains a taboo topic in Asia in general and India in particular, yet a lot of related research has been reported from the developed world. ED is the persistent inability to achieve or maintain penile erection for satisfactory sexual intercourse. It is a frequently encountered problem both in developing as well as the developed world.<sup>1-4</sup>

ED is mostly associated with chronic diseases including diabetes, cardiovascular diseases and depression.<sup>5</sup> Among the diabetic population, ED is among the frequently encountered conditions with a prevalence which ranges

from 35-90%.<sup>6</sup> The wide variation in the prevalence of disease has been attributed to use of different definitions in different populations, varied study designs and use of different diagnostic tools. Despite ample evidence that ED is among the major complications in type 2 diabetes mellitus (T2DM) men, its presence remains poorly evaluated in the routine clinical practice. Reluctance on the part of T2DM men to report about ED and failure on the part of treating physicians to enquire about ED in routine diabetic care are among the probable reasons for under reporting.

As per the evidence in T2DM men- ED occurs 10-15 years earlier, it is associated with poor quality of life and

is less responsive to treatment in comparison to non diabetic men.<sup>1,7,8</sup> ED in T2DM patients has been attributed to a web of causation which includes neuropathy, vasculopathy, hypogonadism, endothelial dysfunction and psychological factors. T2DM men are likely to have comorbidities like hypertension, obesity, metabolic syndrome, atherogenic dyslipidemia etc., and each of them could be an independent risk factor in the genesis of ED.

During extensive review of literature, it was found that hardly any research had been conducted across the country and more so in the northern India. It was in this context that the present study was planned with the aim to determine the prevalence of ED and associated factors in T2DM men attending a tertiary care hospital in Jammu.

## METHODS

The current cross sectional study was conducted in Government Medical College and Hospital, Jammu which is a tertiary care centre catering to the entire Jammu province of J&K State. The study was conducted between January and August 2018. The study was duly approved by institutional ethical committee, GMC Jammu.

All the male married patients who were diagnosed cases of T2DM visiting the OPD of the medicine department during the aforesaid period were eligible for inclusion in the study. The exclusion criteria were- divorced, widowed or seriously ill male T2DM patients and those who were not willing to give informed verbal consent.

Patients were interviewed face to face in a separate room to keep the privacy. Socio-demographic data elicited from the study subjects included age, occupation, educational level and monthly income of the family. Information was collected about presence of other lifestyle attributes, co morbid conditions and disease parameters like history of smoking and alcohol intake, physical activity and duration of disease. Height and weight were also recorded to calculate Body Mass Index (BMI).

Screening for complication was done by reviewing the clinical records (clinical examination done and other appropriate tests advocated by physician according to different guidelines by ADA).<sup>9</sup> The main micro vascular complications that were frequently observed were Diabetic nephropathy, peripheral neuropathy, and retinopathy. Some cases also reported presence of two or more complications.

### For diabetic nephropathy

Diagnosis is based on measurement of urinary albumin excretion (as defined by ADA); albuminuria 30-299 mg/24 h and albuminuria >/300 mg/24 h.

### Peripheral neuropathy

Assessment included a careful history and either temperature or pin prick sensation and vibration sensation using a 128 -Hz tuning fork (large fibre fn), light touch perception using a 10-g monofilament and ankle reflexes.

### Retinopathy

Ocular examination mainly by ophthalmoscope (by using international classification of diabetic retinopathy as defined by ADA) and few other tests done in some cases.

International index of erectile function (IIEF) was used to assess sexual functions. It consists of 15 questions grouped into five domains viz. erectile function, intercourse satisfaction, orgasmic function, sexual desire and overall satisfaction. The tool - IIEF was translated into Hindi version and then back translated. It was then administered to 20 diabetic married men who were not part of the final study sample. The feedback so obtained was incorporated into the final version of IIEF.<sup>10</sup>

Scores in all the domains of sexual function was calculated and used to classify the severity of dysfunction as no dysfunction, mild, moderate and severe dysfunction.

### Statistical analysis

The data obtained was evaluated using statistical software open epi info version 6.0. Data were expressed as frequency and percent. Statistical tests like Chi-square test was applied for qualitative data and values <0.05 were considered to be statistically significant.

## RESULTS

During the course of the study, a total of 348 T2DM men were interviewed. The results revealed that 216 T2DM men had ED thus giving a prevalence of 62.08% (216/348). When ED was further graded, the results have shown that maximum T2DM men (27.01%) had mild to moderate ED while only 12.06% were having severe type of ED (Table 1).

**Table 1: Prevalence and distribution of severity of erectile dysfunction among patients of type2 diabetes mellitus.**

Erectile dysfunction and its severity	Number	%
<b>Nil</b>	132	37.93
<b>Mild</b>	31	8.90
<b>Mild to moderate</b>	94	27.01
<b>Moderate</b>	49	14.08
<b>Severe</b>	42	12.06
<b>Total</b>	348	100

**Table 2: Socio demographic profile and its association with ED among patients of type2 diabetes mellitus.**

Socio demographic variables	ED absent (n=132)	ED present (n=216)	Total (n=348)	X <sup>2</sup>	P value
	N (%)	N (%)	N (%)		
<b>Age in years</b>					
<40	23 (17.42)	10 (4.62)	33 (9.48)		
40-60	45 (34.09)	141 (65.27)	186 (53.44)	36.53	0.00*
≥60	64 (48.48)	65 (30.09)	129 (37.06)		
<b>Education</b>					
Illiterate	15 (11.36)	17 (7.87)	32 (9.19)		
Up to sec level	73 (55.30)	137 (63.42)	210 (60.34)	2.56	0.27
Higher sec and above	44 (33.33)	62 (28.70)	106 (30.45)		
<b>Occupation</b>					
Unemployed	6 (4.54)	12 (5.55)	18 (5.17)		
Employed	86 (65.15)	148 (68.51)	234 (67.24)	0.86	0.64
Retired	40 (30.30)	56 (25.92)	96 (27.58)		
<b>Family income/ month</b>					
<25000	46 (34.84)	95 (43.98)	141 (40.51)		
25000-50000	65 (49.24)	97 (44.90)	162 (46.55)	3.47	0.17
≥ 50000	21 (15.90)	24 (11.11)	45 (12.93)		

\*p&lt;0.05

**Table 3: Lifestyle variables and co morbidities and their association with ED among patients of type2 diabetes mellitus.**

Variables	ED absent (n=132)	ED Present (n=216)	Total (n=348)	X <sup>2</sup>	P value
	N (%)	N (%)	N (%)		
<b>Smoking</b>					
Yes	26 (19.69)	92 (42.59)	118 (33.90)		
No	106 (80.30)	124 (57.40)	230 (66.09)	19.16	0.00*
<b>Alcohol</b>					
Yes	98 (74.24)	145 (67.12)	243 (69.82)		
No	34 (25.75)	71 (32.87)	105 (30.17)	1.96	0.16
<b>Physical activity</b>					
Mild	87 (65.90)	141 (65.27)	228 (65.51)		
Moderate to severe	45 (34.09)	75 (34.72)	120 (34.48)	0.01	0.90
<b>HTN</b>					
Yes	53 (40.15)	184 (85.18)	237 (68.10)		
No	79 (59.84)	32 (14.81)	111 (31.89)	76.49	0.00*
<b>BMI</b>					
<18.5	14 (10.60)	24 (11.11)	38 (10.91)		
18.5-25	90 (68.18)	147 (68.05)	237 (68.10)	0.02	0.98
≥25	28 (21.21)	45 (20.83)	73 (20.97)		

\*p&lt;0.05

Maximum number of ED cases was found in 40-60 years of age group followed by ages 60 years and above. The relationship between ED and age was found to statistically significant (p<0.05). Among other socio-demographic variables like education, occupation and family income per month, no statistical significant association was found (p>0.05) (Table 2).

Among the various lifestyle factors, smoking was found to be statistically significantly associated with the disease

(p<0.05) whereas no such association was found with alcohol intake (p>0.05). Similarly no association was found to exist with physical activity and BMI (p>0.05), but hypertension as a co morbid condition was found to be statistically significant in association with ED (p<0.05) (Table 3).

Among the T2DM patients with ED, majority (164/216) had developed diabetes at or after the age of 40 years though it was statistically insignificant (p>0.05). Majority

of ED cases were found in those T2DM men who had diabetes with ten or more years of duration. The duration of T2DM was found to be significantly associated with ED ( $p<0.05$ ). Presence or absence of complications was found to be statistically insignificant ( $p>0.05$ ). Among

the complications majority of patients with ED had two complications combined followed by one complication in the form of nephropathy. The association between type of complications and ED was found to be statistically significant ( $p<0.05$ ) (Table 4).

**Table 4: Diabetes related variables and their association with ED among patients of type2 diabetes mellitus.**

Variables	ED absent (n=132)	ED Present (n=216)	Total (n=348)	$\chi^2$	P value
	N (%)	N (%)	N (%)		
<b>Age(in years) of onset of diabetes mellitus</b>					
<40	29 (21.96)	52 (24.07)	81 (23.27)		
$\geq 40$	103 (78.03)	164 (75.92)	267 (76.72)	0.20	0.65
<b>Duration of diabetes mellitus in years</b>					
$\leq 5$	49 (37.12)	12 (5.55)	61 (17.52)		
5-10	38 (28.78)	55 (25.46)	93 (26.72)	64.8	0.00*
$\geq 10$	45 (34.09)	149 (68.98)	194 (55.74)		
<b>Complications</b>					
Present	91 (68.93)	152 (70.37)	243 (69.82)		
Absent	41 (31.06)	64 (29.62)	105 (30.17)	0.07	0.77
<b>Type of complications</b>					
Retinopathy	12 (13.18)	19 (12.5)	31 (12.75)		
Neuropathy	21 (23.07)	15 (9.86)	36 (14.81)		
Nephropathy	23 (25.27)	39 (25.65)	62 (25.51)	10.23	0.03*
Any two	18 (19.78)	50 (32.89)	68 (27.98)		
Any three	17 (18.68)	29 (19.07)	46 (18.93)		

\* $p<0.05$ .

## DISCUSSION

In the present study, the prevalence among T2DM men attending the OPD was found to be 62.06% (216/348). Only 12% had severe form of ED while 27% had mild to moderate ED.

These results are in agreement with those reported by Givigliano et al from Italy and Khatib et al from Jordan.<sup>11,12</sup> In contrast, higher prevalence rates were reported by Naseer et al in T2DM men from Bahrain.<sup>13</sup> The lower prevalence rates to the tune of 55% and 31% were reported by Mitagaywa et al and Al-Hynayan et al respectively.<sup>14,15</sup>

The results further revealed that only 12% had severe ED and these findings are congruent to what was reported by Naseer et al from Bahrain.<sup>13</sup> In contrast Givigliano et al and Ahmed reported 23% and 20.7% severe ED in their respective studies.<sup>11,16</sup> Among the socio-demographic variables, age was found to be statistically significant and majority of cases were found in 40-60 years of age in the present study. Influence of age on prevalence of ED is well established in both normal as well as T2DM men.<sup>17-19</sup> Khatib et al also reported that prevalence and severity of ED increased with age.<sup>12</sup>

Among the lifestyle factors, an association between smoking and risk of ED was reported which might be due

to positive association of cigarette smoking with atherosclerosis. These results are well supported by Al-Hunayan et al from Kuwait.<sup>15</sup> Among the medical conditions, hypertension was found to be significantly associated with ED in the present study. It has been attributed to direct effect of elevated blood pressure as well as the effect of antihypertensive medication on the microcirculation. Our results are in line with those reported by Givigliano et al and Al-Hunayan et al.<sup>11,15</sup> However in contrast, Naseer et al reported no association of hypertension with ED in a study from Jordan.<sup>13</sup>

Advancing age and longer duration of diabetes have been consistently documented to increase the risk of ED a finding that is confirmed by the results of the present study.<sup>20-22</sup> Presence of complications in the form of neuropathy, retinopathy etc. was significantly associated with ED in the present study and these results are similar to those reported by Naseer et al, Khatib et al and Mutagaywa et al.<sup>12-14</sup> Since the complications in T2DM are commonly linked to duration of disease, ED may occur in these cases due to ageing as well as prolonged effects of impaired glucose tolerance.

In conclusions, ED prevalence was high among the T2DM men and it increased with age and duration of the disease. Smoking, hypertension and presence of diabetic complications was significantly associated with ED. Authors recommend screening of all T2DM men for ED

since it is a neglected medical problem and also a culturally sensitive matter.

### Limitations

Since the present study was conducted among convenient sample in a tertiary care hospital, the results lack generalizability. The study being a cross sectional one, causal inference can't be deduced from the results.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Langer R, Sharma E, Langer B, Gupta RK, Kumari R, Majeed M. Erectile dysfunction: prevalence and determinants among T2DM men attending a tertiary care hospital in northern India. *Int Surg J* 2019;6:1115-9.