

## Original Research Article

# A study of various factors associated with sexual dysfunction in males with type 2 diabetes mellitus

Nagendar Reddy Jakka<sup>1\*</sup>, Jayanthi Ramesh<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Endocrinology, Kamineni Academy of Medical Sciences and Research Center, L. B. Nagar, Hyderabad, Telangana, India

<sup>2</sup>Professor, Department of Endocrinology, Andhra Medical College, Vishakhapatnam, Andhra Pradesh, India

**Received:** 29 May 2017

**Accepted:** 27 June 2017

### \*Correspondence:

Dr. Nagendar Reddy Jakka,

E-mail: [nagenderj1979@gmail.com](mailto:nagenderj1979@gmail.com)

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### ABSTRACT

**Background:** SD is very common in type 2 diabetic men. Many middle aged and older adults with diabetes are sexually active, but the rate of sexual inactivity is higher than in non-diabetic subjects. The objective of this study was to study various factors associated with sexual dysfunction in males with type- 2 diabetes mellitus.

**Methods:** A total of 60 male type 2 diabetic subjects were studied. They were divided in to two groups, 42 subjects with SD were in one group and 18 subjects with normal sexual function were in the second group. Differences between groups were assessed for statistical significance using T-test, Mann-Whitney test and Chi-square test, where ever applicable. The data were presented as Mean±Standard deviation or percentages.

**Results:** The prevalence of SD was 70%, ED was 93%, Orgasmic dysfunction was 38 %, 9 had HSDD (21%) and 22 had premature ejaculation (52%). The age ( $p = 0.335$ ), duration of DM ( $p = 0.097$ ), BMI ( $p = 0.717$ ), WC ( $p = 0.138$ ) were not significantly different between two groups. FPG ( $p = 0.000$ ), PPG ( $p = 0.000$ ) and HbA1c ( $p = 0.000$ ) were significantly higher in SD group. Non-HDL cholesterol level ( $p = 0.001$ ) and TG level ( $p = 0.021$ ) were significantly higher in SD group. The eGFR ( $p = 0.150$ ) was not significantly different between two groups. Spot urine protein creatinine ratio ( $p = 0.002$ ) was significantly higher in SD group.

**Conclusions:** It was concluded that SD is a highly prevalent problem in males with type 2 DM. ED is the most common form of SD, followed by PE, Orgasmic dysfunction and HSDD. The age, duration of DM, BMI and WC are not associated factors of SD.

**Keywords:** Premature ejaculation, Sexual dysfunction, Type 2 diabetes mellitus

## INTRODUCTION

Sexual dysfunction (SD) is defined as the various ways in which an individual is unable to participate in a sexual relationship as he or she would wish.<sup>1</sup>

Male SD includes erectile, ejaculatory and orgasmic dysfunctions and hypoactive sexual desire disorder (HSDD).<sup>2</sup> SD is very common in type 2 diabetic men.<sup>3</sup> Many middle aged and older adults with diabetes are

sexually active, but the rate of sexual inactivity is higher than in non-diabetic subjects.<sup>4</sup>

SD has health consequences on the sexual and reproductive functions, and psychological wellbeing. Importantly, some forms of SD are increasingly being recognized as markers of organic systemic disease.<sup>5</sup> The American Diabetes Association states that one of the components of the comprehensive evaluation of the diabetic patient is evaluation of the potential presence of

SD.<sup>6</sup> However, few diabetic men with SD are diagnosed and treated.<sup>7</sup>

Type 2 diabetes mellitus (DM) is one of the most common forms of chronic diseases globally. In 2010, 80% of the 285 million people having diabetes were living in less developed countries. The number of people with diabetes is expected to reach 438 million by 2030. The largest increases are predicted to be in countries with rapidly growing economies, such as India and China.<sup>8</sup> As the incidence of young onset type 2 DM is raising, number of subjects suffering from SD increases in the near future.

Most studies of SD in diabetic men have focused on erectile dysfunction (ED), and so the prevalence and risk factors of other forms of SD are not well known.<sup>2</sup> The present study was carried out to know the prevalence of SD and various factors associated with it, in males with type 2 diabetes mellitus.

**METHODS**

A cross-section study was conducted in the Ddepartment of Endocrinology, Osmania general hospital, Hyderabad. Sources of samples and data were obtained from the Department of Endocrinology, Osmania general hospital.

**Inclusion criteria**

All male patients diagnosed with type 2 DM aged between 21-60 years, who had stable heterosexual relationship, were included.

**Exclusion criteria**

- Patients with systemic illness or using medication known to cause sexual dysfunction
- Smokers and alcoholics
- Patients with thyroid disorders or hyperprolactinemia
- Patients with marital disharmony.

**Sample size**

60 male type 2 diabetic subjects, who were satisfying above criteria.

Sample size was calculated by using the formula:

$$N = 4(pq/L^2)$$

p = population proportion of positive character,  
q = 1-p and L = Allowable Error.

For this study L is 9% of p giving a power of (1-L) 91% to study, p is 14.1% as per the recent multicentric study. Informed consent was obtained from all the patients.

History and clinical examination findings were noted. Patients were screened initially with a questionnaire detailing their medical history including, smoking

history, alcohol intake and concomitant medications. Body weight with study participants in light clothing was measured to the nearest 0.1 kg and height to the nearest 0.5 cm was measured with the study participants standing upright and barefooted, with the heels put together and the head in the horizontal plane against a wall-mounted ruler. Neuropathy symptom score and neuropathy disability score was taken and graded as mild sign 3-4, moderate sign 5-6, and severe sign 7-9.<sup>9</sup>

**Beat-to-beat heart rate variation**

With the patient at rest and supine (no overnight coffee or hypoglycemic episodes), breathing 6 breaths/min, heart rate monitored by ECG, an HRV of >15 beats/min is normal and <10 beats/min is abnormal, R-R inspiration to R-R expiration >1.17.

All indices of HRV are age-dependent. Lowest normal value of E/I ratio: Age 20-24 year: 1.17; 25-29 year: 1.15; 30-34 year: 1.13; 35-39 year: 1.12; 40-44 year: 1.10; 45-49 year: 1.08; 50-54 year: 1.07; 55-59 year: 1.06; 60-64 year: 1.04; 65-69 year: 1.03; 70-75 year: 1.02.

Patients were evaluated for depression by administering the nine items PHQ-9 translated version questionnaire.<sup>10</sup>

**Patient Health Questionnaire-PHQ-9**

**Table 1: Scoring and interpretation.**<sup>11,12</sup>

GAD-7 Score	Provisional Diagnosis
0-7	None
8+	Anxiety disorder

Sexual function was assessed with translated versions of International Index of Erectile Function questionnaire (IIEF) and Premature Ejaculation Diagnostic Tool (PEDT) questionnaire.<sup>13</sup>

A total of 60 male type 2 diabetic subjects were studied. They were divided in to two groups, 42 subjects with SD were in one group and 18 subjects with normal sexual function were in the second group.

Differences between groups were assessed for statistical significance using T-test, Mann-Whitney test and Chi-square test, where ever applicable. The data were presented as Mean±Standard deviation or percentages. A p value of <0.05 was considered statistically significant. Statistical analysis was processed by Windostat version 9.2 from Indostat services, Hyderabad, licensed to Department of Plant Breeding and Genetics College of Agriculture JNKVV.

**RESULTS**

Table 2 shows prevalence of sexual dysfunction among the study subjects. The overall prevalence of sexual dysfunction in the present study was found to be 70%

among males with type 2 diabetes.

But 30% of the patients in the present study were not having any sexual dysfunction.

**Table 2: Prevalence of sexual dysfunction among the study subjects.**

Sexual dysfunction	Number	Percentage
Present	42	70
Absent	18	30
Total	60	100

Table 3 shows prevalence of various types of sexual dysfunction among those who had sexual dysfunction. Thus, this table is showing the prevalence of various types of sexual dysfunction among 42 males diagnosed as having sexual dysfunction. It was found that the erectile dysfunction was the most common i.e. 92.9% followed by orgasmic dysfunction in 38.1% of cases. This was followed by premature ejaculation in 52.4% of cases and around 21% had HSSD.

**Table 3: Prevalence of various types of sexual dysfunction.**

Types of sexual dysfunction	Number	Percentage
Erectile dysfunction	39	92.9
Orgasmic dysfunction	16	38.1
Hypoactive sexual desire disorder (HSSD)	09	21.4
Premature ejaculation	22	52.4

Table 4 shows association between diabetic retinopathy and sexual dysfunction. It was found that the 92.3% of diabetic retinopathy cases had sexual dysfunction compared to 63.8% who were not having diabetic retinopathy. This difference was found to be statistically significant ( $p < 0.05$ ).

**Table 4: Association between diabetic retinopathy and sexual dysfunction.**

Diabetic retinopathy	Sexual dysfunction		Total	Chi square	P value
	Yes	No			
Yes	12	01	13	3.933	0.047 Significant
No	30	17	47		
Total	42	18	60		

Table 5 shows association between peripheral neuropathy and sexual dysfunction. It was found that the 84.8% of peripheral neuropathy cases had sexual dysfunction compared to 51.8% who were not having peripheral neuropathy. This difference was found to be statistically significant ( $p < 0.05$ ).

Table 6 shows association between autonomic neuropathy and sexual dysfunction. It was found that the

84.8% of autonomic neuropathy cases had sexual dysfunction compared to 51.8% who were not having autonomic neuropathy. But this difference was found to be statistically not significant ( $p > 0.05$ ).

**Table 5: Association between peripheral neuropathy and sexual dysfunction.**

Peripheral neuropathy	Sexual dysfunction		Total	Chi square	P value
	Yes	No			
Yes	28	05	33	7.699	0.006 significant
No	14	13	27		
Total	42	18	60		

**Table 6: Association between autonomic neuropathy and sexual dysfunction.**

Autonomic neuropathy	Sexual dysfunction		Total	Chi square	P value
	Yes	No			
Yes	13	02	15	1.693	0.104 not significant
No	29	16	45		
Total	42	18	60		

Table 7 shows association between coronary artery disease and sexual dysfunction. It was found that the 100% of coronary artery disease cases had sexual dysfunction compared to 68.4% who were not having coronary artery disease. But this difference was found to be statistically not significant ( $p > 0.05$ ).

**Table 7: Association between coronary artery disease and sexual dysfunction.**

Coronary artery disease	Sexual dysfunction		Total	Chi square	P value
	Yes	No			
Yes	03	00	03	1.353	0.245 not Significant
No	39	18	57		
Total	42	18	60		

Table 8 shows association between peripheral artery disease and sexual dysfunction. It was found that the 76.5% of peripheral artery disease cases had sexual dysfunction compared to 67.4% who were not having peripheral artery disease. But this difference was found to be statistically not significant ( $p > 0.05$ ).

**Table 8: Association between peripheral artery disease and sexual dysfunction.**

Peripheral artery disease	Sexual dysfunction		Total	Chi square	P value
	Yes	No			
Yes	13	04	17	0.473	0.492 not significant
No	29	14	43		
Total	42	18	60		

## DISCUSSION

Present study was undertaken to find out the prevalence of SD and various factors associated with it, in males with type 2 DM.

Distribution pattern of patients in SD group in the present study: Among 42 patients with SD 39 (93%) had ED, 16 (38%) had orgasmic dysfunction, 9 (21%) had HSDD and 22 (52%) had premature ejaculation. ED was the most common domain of SD, followed by PE. A study by William KBA et al, showed ED present in 67.9% and PE present in 56.6% of SD patients.<sup>14</sup> ED is a common complication of diabetes, the reported prevalence ranges from 35 to 70%.<sup>15</sup>

Malavige LS et al, studies reported prevalence of PE 32% to 67%.<sup>16</sup> Lindau ST et al study found high prevalence of orgasm problems in men with DM.<sup>17</sup> Burke JP et al and Lindau ST et al, studies suggest that diabetes increases the risk of having HSDD.<sup>3,17</sup>

The age ( $p = 0.335$ ) and duration of DM ( $p = 0.056$ ) are statistically not significant between the two groups in this study. Veves et al. study also suggest that age is not a significant factor associated with SD.<sup>18</sup>

BMI ( $p = 0.717$ ) and WC ( $p = 0.138$ ) were not significantly different between two groups in the present study. Veves et al also showed that BMI and WC were not significantly associated with ED.<sup>18</sup> The association of obesity with other forms of SD not known.

Fasting plasma glucose ( $p = 0.000$ ), post prandial plasma glucose ( $p = 0.000$ ) and HbA1c ( $p = 0.000$ ) were significantly higher in SD patients, and glycemic control is independently associated with the ED in men with type 2 diabetes, similar to findings from other studies.<sup>14,19</sup> Poor glycemic controls are strongly associated with the PE in males with type 2 DM.<sup>20</sup> The role of glycemic control in Orgasmic dysfunction and HSDD is not known.<sup>2</sup> Studies with a larger number and long duration of follow up are required to know that strict glycemic control in SD diabetic patients alone is enough to improve the condition.

The presence of mixed dyslipidemia, the so called diabetic or atherogenic dyslipidemia, is a significant and independent risk factor for ED.<sup>2</sup> Elevated serum cholesterol and reduced high density lipoprotein cholesterol levels are associated with an increased risk of ED.<sup>21</sup> In the present study it was found that dyslipidemia is significantly associated with SD and Non - HDL Cholesterol level ( $p = 0.001$ ) and TG level ( $p = 0.021$ ) were significantly higher in SD group. We chose Non - HDL cholesterol level as it is a simple and practical marker of atherogenic dyslipidemia in the Indian setting.

In the present study spot urine protein creatinine ratio ( $p = 0.002$ ) was significantly higher in SD group whereas

the eGFR ( $p = 0.150$ ) was not significantly different between two groups. Proteinuria is strongly associated with ED.<sup>22</sup> Classic diabetic nephropathy is a chronic condition developing over many years, characterized by gradually increasing urinary albumin excretion (UAE) and BP. Declining GFR is a relatively late event. As nephropathy progresses, the risk of other chronic complications of diabetes increases.<sup>23</sup> There are no published studies on association of nephropathy with other forms of SD other than ED.

DR ( $p = 0.047$ ) was significantly higher in SD group in the present study. Similarly, Garg S et al study, found that DR is associated with ED.<sup>24</sup> The association of DR with other forms of SD not known.

In the present study, peripheral neuropathy disorder ( $p = 0.006$ ) was significantly higher in SD group. Kolodny RC et al study showed peripheral neuropathy was associated with SD.<sup>25</sup> The neurologic factor, long felt to be important in the pathogenesis of erectile difficulties in diabetic males, and has been recently re-emphasized by the many studies.<sup>14</sup> Garg S et al study, found that peripheral neuropathy ( $p < 0.001$ ) is a strong risk factor for ED.<sup>24</sup> Autonomic neuropathy ( $p = 0.104$ ), was not significantly different between two groups in our study. Study by Vinik AI et al, suggests that diabetic autonomic neuropathy is associated with ED.<sup>26</sup> Diabetic autonomic neuropathy, play an important role in PE.<sup>26</sup> Role of autonomic neuropathy in other forms of SD is clearly not known.

CHD ( $p = 0.245$ ), PAD ( $p = 0.492$ ) and CVA were not significantly different between two groups in the present study. Moat et al, studied 310 male diabetic patients and observed that ED showed a positive correlation PAD, but it was not correlated to type of diabetes mellitus, duration of diabetes <10 years and CHD.<sup>27</sup>

## CONCLUSION

SD is a highly prevalent problem in males with type 2 DM. ED is the most common form of SD, followed by PE, Orgasmic dysfunction and HSDD. The age, duration of DM, BMI and WC are not associated factors of SD. Poor glycemic control and dyslipidemia are significantly associated with SD. DR, peripheral neuropathy and proteinuria are associated factors of SD. Autonomic neuropathy, CHD, PAD and CVA are not associated with SD.

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**Cite this article as:** Jakka NR, Ramesh J. A study of various factors associated with sexual dysfunction in males with type- 2 diabetes mellitus *Int J Adv Med* 2017;4:1083-7.