SEXUAL FUNCTION IN MEN WITH TYPE 2 DIABETES MELLITUS

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ABSTRACT: Background: Sexual dysfunction is one of the most common complications of diabetes in men because of several factors including neurological, endocrine, vascular and psychological factors due to the use of medication or a combined effect of some of these factors. Male sexual dysfunction in diabetics may include erectile dysfunction (ED), ejaculatory problems and libido disorders. In this study, we aimed to evaluate the prevalence of erectile dysfunction (ED) in type 2 diabetic men in addition to evaluate the association of effective and associated factors in these patients. Method and result: In this cross-sectional study, 101 diabetic men visiting Shahid Beheshti Hospital of Qom, Iran were evaluated. The Participants enrolled the study consecutively from November 2011 to March 2012. The 5 items form of the International Index of Erectile Function (IIEF) was used to measure sexual dysfunction in men. The mean age of 46.65±5.39 years were evaluated. With the mean duration of 7.39±5.29 years. Of these men, 52(51.5\%) had sexual dysfunction. The mean age of patients, diabetes duration, BMI, The mean HBA1c level were not statistically significant in both groups but a significance association was found between albuminuria and sexual dysfunction (p<0.001). retinopathy and diabetic neuropathy with sexual dysfunction (p=0.04 and p=0.02 respectively). Also was no statistically significant different between SD and hypertension (p=0.29). Conclusion: Sexual dysfunction is a common complication in diabetic men and should be considered by physicians. A significant association was found between erectile dysfunction and diabetic microvascular complications including nephropathy, retinopathy and neuropathy but sexual dysfunction was not associated with hypertension and coronary artery diseases.

Keywords: Sexual Dysfunction, Type 2 Diabetes Mellitus, Men.

INTRODUCTION

Among diabetic patients, hyperglycemia can cause several complications from short to long-term effects. Effective control of the blood sugar level can avoid or delay these complications. Sexual health is an important but neglected part of diabetes care that affects these patients in addition to their quality of life significantly. According to the WHO, sexual dysfunction is defined as “the various ways in which a person is unable to participate in a sexual relationship as he/she would wish”. Sexual dysfunction is one of the most common complications of diabetes in men (1). Psychogenic and organogenic sexual dysfunction can develop in diabetic patients because the probability of developing vascular and neurological complications in addition to psychological problems is high in them (2). Sexual dysfunction in diabetic patients have several factors including neurological, endocrine, vascular and psychological factors due to the use of medication or a combined effect of some of these factors (3,4). Male sexual dysfunction in diabetics may include erectile dysfunction (ED), ejaculatory problems and libido disorders. All three forms of sexual dysfunction can significantly affect diabetic patients and their quality of life (1).
Previous studies have shown that diabetic men are at increased risk for sexual dysfunction at an earlier age in compare with the general population and its incidence is 20-85% (5,6). Erectile dysfunction is defined as a persistent inability for over 6 months to achieve and maintain an erection sufficient for satisfactory sexual performance (7). By the year 2025, approximately 322 and 380 million people worldwide are projected to develop erectile dysfunction and diabetes respectively with the largest increases in the developing countries (1). In this study, we aimed to evaluate the prevalence of sexual dysfunction in type 2 diabetic men in addition to evaluate the association of effective and associated factors in these patients.

METHODS
In this cross-sectional study, 101 diabetic men visiting Shahid Beheshti Hospital of Qom, Iran were evaluated. The Participants enrolled the study consecutively from November 2011 to March 2012. The subjects were assigned into two groups of diabetic men with or without sexual dysfunction. Inclusion criteria were as follows: sexually active, being married for at least 2 years before enrollment in the study, age 30 years or older and history of diabetes for five years or longer, having at least two HbA1c analyses in their records. Exclusion criteria included: existence of sexual disorders in patients' spouse, prostate and pelvic surgeries, benign prostate hypertrophy (BPH), prostate cancer, anemia, Peyronie's disease and presence of sexual disorders before getting diabetes.

A detailed self-designed semi-structured questionnaire was administered to each consented study participant for informed including. Body weight of study participants was measured in light clothing to the nearest 0.1kg on a bathroom scale (Beurer GmbH & Co, made in Germany). Also, height was measured to the nearest 0.5cm and the participants were standing upright with bared foot, the heels put together and the head in the horizontal plane against a wall-mounted ruler. Body mass index (BMI) was calculated by dividing weight (kg) by the height squared (m^2). Systolic and diastolic blood pressures were measured by a Richter manometer, made in Germany. Men were considered hypertensive if they had a diastolic blood pressure of ≥90 mmHg, or systolic blood pressure of ≥140mmHg. Subjects under antihypertensive medication were obviously considered hypertensive patients. People who exercised at least 150 minutes aerobic exercise per week in the last two months were considered as exercise positive.

Serum total cholesterol, triglyceride, and HDL-cholesterol were measured using enzymatic techniques. Fasting plasma glucose was measured and glycosylated hemoglobin (HbA1c) percentage was determined by ion-exchange method. Insulin level was determined by a kit of Dia Metra (Made in Italy). Insulin resistance was calculated by Homeostasis Model of Assessment. Insulin Resistance (HOMA-IR) was calculated using the following US Formula: (Fasting Glucose(mg/dL)×Fasting Insulin(µU/mL)/405). All measurements were done under standard conditions by one technician and with the same device.

The micro-vascular complications included recording of retinopathy (ophthalmology visit), nephropathy, (24 hour urine analysis), and neuropathy (peripheral, autonomic), monofilament and the diapason therapeutic examination. All patients were entered into the study after an informed verbal consent. Diabetic men were informed by male interviewers and were assured regarding the confidentiality of the information.

Data was presented as mean±SD or percentages. Logistic regression was used to assess the simultaneous influence of different variables in sexuality. In all statistical tests, a value of p <0.05 was considered being statistically significant. The 5 items form of the International Index of Erectile Function (IIEF) was used to measure sexual dysfunction in men (8).

RESULTS
In this study 110 diabetic men on hypoglycemic medication with age range of 30-55 years and the mean age of 46.65±5.39 years were evaluated. The minimum and maximum duration of diabetes was 5 and 20 years respectively with the mean duration of 7.39±5.29 years.

Of these men, 52(51.5%) had sexual dysfunction. The mean age of patients was 46.56±5.46 in sexual dysfunction group and 46.76±5.37 years in healthy patients and it was not statistically significant in both groups.
As shown in table 1, diabetes duration had no statistically difference in both groups (p=0.05). The mean BMI was 27.8±4.15 and no difference was found in both group (p=0.86). Also the abdominal circumference had no difference in both groups (p=0.51) (table 1).

In analysis of lipid profile, the mean HDL in patients with and without SD was 62.92±30.64 and 64.72±25.1 mg/dL respectively and it was not statistically significant (p=0.74). Also, as you see in table 1, there was no difference between LDL, TG and Cholesterol level of both groups.

For glycemic control, serum insulin, HbA1c, FBS and insulin resistance were measured. The mean blood sugar (BS) in patients with and without SD was 185.88±74.81 and 170.87±58.48 mg/dL respectively. Although mean BS was higher in patients with SD, but it was not statistically difference in both groups (p=0.26). The mean HbA1c level in patients with and without SD was 8.19±1.57 and 8.07±1.73 mg/dL respectively and it was not statistically difference (p=0.71). As you see in table 1, fasting insulin and insulin resistance was not statistically different in both groups (p=0.14 and p=0.84 respectively). There was no association between exercise level and SD (p=0.99).

Of the studied patients, 32(31.7%) had microalbuminuria and 10(9.9%) had macroalbuminuria. Sexual dysfunction was detected in 18(34.6%) of patients without diabetic nephropathy but 25(48.1%) had microalbuminuria and 9(17.3%) had macroalbuminuria and a significance association was found between albuminuria and sexual dysfunction (p<0.001). As you see in table 2, a statistically significant difference was found between retinopathy and diabetic neuropathy with sexual dysfunction (p=0.04 and p=0.02 respectively). Sixty three (62.4%) had hypertension and there was no statistically significant different between SD and hypertension (p=0.29). Eventually, as shown in table 2, coronary artery disease was not associated with sexual dysfunction (p=0.32).

**DISCUSSION**

In this study 52(51.5%) of diabetics had sexual dysfunction. This prevalence was close to other studies. The prevalence of erectile dysfunction in diabetic men was over 50% in Selvin et al.’s study in US (9) which is similar to Amaral et al.’s study on diabetics that the prevalence of sexual dysfunction in diabetic men approached 50% (10). However, this value was higher in some studies. Studies from Saudi diabetic patients reported moderate to severe erectile dysfunction among 80-90% of the patients (11,12). Ziaei-Rad et al.’s study found a higher prevalence of SD among men (77% of men) (13). In Sharifi et al.’s study a significant number of patients had Erectile Dysfunction (59%) (14). In some studies, this value was lower. A study from the Netherlands discovered that the prevalence of erectile dysfunction in patients with type 2 diabetes was about 41.3% (15), but according to other studies, it is estimated that the prevalence of erectile dysfunction among diabetic men varies from 35 to 90% (15, 16).

One of these factors that may play a role in prevalence of sexual dysfunction in diabetic patients is age and this association was statistically significant in some studies. The effect of increased age on prevalence of sexual dysfunction in diabetic patients of both genders is well documented (14, 17). El-Sakka in 2003 reported that 32% of diabetic men younger than 50 years had erectile dysfunction compared to 67.6% incidence in patients over 50 years (19). On the contrary, Ziaei-Rad et al.’s study didn’t find any statistically significant association between age and SD. However higher age groups experienced elevated rates of SD (13). We found this finding in our study somehow that patients with and without SD had no statistically significant difference regarding age (p=0.85) and the mean age in patients with SD was 46.56±5.46 years versus 46.76±5.37 years in patients without SD.

Another factor that may affect the sexual function of diabetics is duration of diabetes. For example, in El-Sakka and Tayeb's study, patients with a history of diabetes higher than 10 years were 3 times as likely to report erectile dysfunction as those with a history of less than 5 years (12). Also, in Chuang et al.’s study, diabetes duration was significantly associated with ED (OR= 4.49) (20). On the contrary, no statistically significant association was found between duration of diabetes with SD in Ziaei-Rad et al's study (13). In our study there was no difference between duration of diabetes in both groups (p=0.50) and no association was found between duration of diabetes and SD. Some studies have suggested that improved glycemic control decreases the incidence of sexual dysfunction (12), but others did not confirmed it (13).
In our study, although FBS level was higher in patients with SD, but it was not statistically significant (p=0.26). Also, the mean HBA1c in patients with SD was 8.19±1.57 versus 8.07±1.73 in patients without SD and it was not statistically significant (p=0.71). We found no significant association between SD and hypertension (p=0.29). It was confirmed in other studies but some others did not confirm it (13, 14). Ziaei-Rad et al. showed that hypertension is related to elevated incidence of SD in male diabetic cases (13).

In this study, the mean BMI was 27.8±4.15 and had no difference in both groups (p=0.86) as well as abdominal circumference (p=0.51). Nevertheless, some researchers consider obesity as a biologic factor affecting sexual dysfunction (21). On the contrary, some researchers do not consider any association between BMI and SD (13).

Effect of other chronic diabetic complications like retinopathy and nephropathy on SD and considering them as risk factors for this complication is an important issue. Some studies consider some of diabetic complications as the risk factor for sexual dysfunction (20, 22, 23). Neuropathy is one such complication. Theoretically, sexual dysfunction is affected by diabetic neuropathy, but clinical studies are contradictory (24, 25). This association has not been observed in Henis et al.'s study (26).

In our study, a significant association was found between SD and diabetic neuropathy (p=0.02, OR=2.52). The criterion for the diagnosis of diabetic neuropathy was therapist's examination and the patients have not undergone NCV. Diabetic nephropathy is a chronic complication of diabetes associated with SD (21).

In our study, a significant association was found between SD and diabetic nephropathy (p<0.001 (OR=8.13 in microalbuminuria and OR=20.5 in macroalbuminuria). Another finding of our study was the association between SD and retinopathy (p=0.04), which was confirmed in Henis et al's study (26).

In conclusion, in this study, we found that the prevalence of sexual dysfunction in the form of erectile dysfunction is 51.5% and was not associated with age, duration of diabetes, BMI and abdominal circumference in addition to lipid profile, serum insulin, HbA1c, FBS and insulin resistance. A significant association was found between erectile dysfunction and diabetic microvascular complications including nephropathy, retinopathy and neuropathy but sexual dysfunction was not associated with hypertension and coronary artery diseases.

CONFLICT OF INTERESTS
The authors declare that they have no conflict of interests.

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Table 1: Characteristics and laboratory findings of both groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>SD+</th>
<th>SD-</th>
<th>Total</th>
<th>Odds ratio</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>46.56±5.46*</td>
<td>46.76±5.37</td>
<td>46.65±5.39</td>
<td>0.99</td>
<td>0.85</td>
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<td>Duration</td>
<td>7.73±5.00</td>
<td>7.02±5.61</td>
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<td>Abdominal circumference</td>
<td>102.02±10.04</td>
<td>103.47±12.31</td>
<td>102.72±11.16</td>
<td>0.98</td>
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<tr>
<td>HDL</td>
<td>62.92±30.64</td>
<td>64.72±25.10</td>
<td>63.79±27.99</td>
<td>0.99</td>
<td>0.74</td>
</tr>
<tr>
<td>LDL</td>
<td>112.66±64.79</td>
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<td>109.22±54.47</td>
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<tr>
<td>TG</td>
<td>236.38±119.29</td>
<td>243.43±128.54</td>
<td>239.77±119.66</td>
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<td>0.77</td>
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<tr>
<td>Cholesterol</td>
<td>204.00±85.64</td>
<td>199.66±51.35</td>
<td>201.92±70.96</td>
<td>1</td>
<td>0.76</td>
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<tr>
<td>FBS</td>
<td>185.88±74.81</td>
<td>170.87±58.48</td>
<td>178.68±67.55</td>
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<td>0.26</td>
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<td>HBA1c</td>
<td>8.19±1.57</td>
<td>8.07±1.73</td>
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<td>Serum insulin</td>
<td>4.28±2.74</td>
<td>5.93±6.49</td>
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<td>BMI</td>
<td>27.86±4.55</td>
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*Mean±SD

<table>
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<th>Variables</th>
<th>SD+ N(%)</th>
<th>SD- N(%)</th>
<th>Total N(%)</th>
<th>Odds ratio</th>
<th>P Value</th>
</tr>
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<td>Nephropathy</td>
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<td>18(34.6)</td>
<td>41(83.7)</td>
<td>59(58.4)</td>
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<tr>
<td></td>
<td>Micro</td>
<td>25(48.1)</td>
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<td>Macro</td>
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<td>1(2)</td>
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<td>28(57.1)</td>
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<td>35(34.7)</td>
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<td>Neuropathy</td>
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REFERENCES


