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TYPE 2 DIABETIC PATIENTS;
FREQUENCY OF SELF-REPORTED SEXUAL DYSFUNCTIONS AMONG MALE

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ABSTRACT... Objectives: To determine the frequency of different types of self-reported sexual dysfunction among male type 2 diabetic patients attending diabetic clinics of National Institute of Diabetes & Endocrinology (NIDE) at Karachi, Pakistan. **Study Design:** Descriptive cross-sectional. **Place and Duration of Study:** National Institute of Diabetes & Endocrinology at Dow University Hospital, Ojha Campus, Karachi. From August 2014 to January 2015. **Methodology:** This study was conducted at diabetic clinics of NIDE at Karachi from August 2014 to January 2015. Type 2 diabetic males with self-reported complaints of sexual dysfunction were selected by non-probability convenient sampling after obtaining well informed consent. Inclusion criteria was married type 2 diabetic males of age between 35 to 65 years with at least five years duration of type 2 diabetes, taking oral hypoglycemic agents, HbA1c levels between 6.5% to 9.4% and living in a stable relation with a female partner for at least one year. Patient's demographic, anthropometric, biochemical parameters and sexual history was recorded on pre-designed questionnaire. Arizona Sexual Experience Scale and Diagnostic and Statistical Manual of Mental Disorder-5th edition were used for quantification of sexual dysfunction. Data was analyzed by SPSS-18, to compute mean ± SD, frequencies and percentages. P-value of <0.05 was taken significant. **Results:** 95 Patients Type 2 diabetic male patients were recruited; who attended diabetic clinics of NIDE with different types of SD complaints. The mean age of patients was 53.92 ± 8.17 years with 11.59 ± 3.52 years mean duration of type 2 diabetes mellitus. 81% patients had HbA1c levels of more than 7.4% and overweight patients were 52.6%. 77.9% of patients were non-smokers. According to ASEX scale, 100% participants had clinically significant sexual dysfunction with mean score 17 ± 2.3. 58 patients had single sexual dysfunction and among them 26.3% had erectile dysfunction, while 36 patients had double sexual dysfunctions and among them 20% had combination of erectile dysfunction and premature ejaculation. Data analysis showed no significant differences in age, duration of type 2 diabetes mellitus, HbA1c levels and BMI with participant's sub-groups having single, double and triple sexual dysfunctions. Erectile dysfunction was the most common sexual dysfunction self-reported by 64.2% patients either as a sole complaint or in combination with other types of sexual dysfunction, premature ejaculation was reported by 38.9% participants, hypoactive sexual desire disorder was found in 22.1% patients while the least common sexual dysfunction reported was delayed ejaculation by 14.7% participants. **Conclusion:** The combination of erectile dysfunction and premature ejaculation is most frequent, followed by the combination of erectile dysfunction and hypoactive sexual desire disorder. All diabetic men should be asked carefully about the probable existence of any variety of sexual dysfunctions during their medical evaluation.

Key words: Sexual dysfunction, Diabetes mellitus type 2, Erectile dysfunction, Premature ejaculation, Delayed ejaculation, Hypoactive sexual desire disorder.

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INTRODUCTION

Diabetes Mellitus (DM) is the archetype of a universal disease, which at present, influences 382 million individuals around the world and is predicted to influence 592 million by 2035.[1] Its prevalence is rising more rapidly in developing countries.[2] Sexual problems are frequent diabetes-pertinent complications in both male and female patients that negatively affects their personal satisfaction.[3,4] As specified by the "World

Health Organization" (WHO), the term 'sexual dysfunction' (SD) is defined as "various ways in which an individual is incapable to partake in a sexual relationship according to his/her wish".[5] The debate in diabetic patients about risk factors and etiology of SD is still in progress. It includes psychological, associated renal and cardiac diseases, and autonomic neuropathy. Thus, diabetic patients are vulnerable to progress both psychogenic and organic SDs.[6]

Impaired sexual function in men is a common complication of DM. It was first mentioned in the 10th century by the Persian physician and philosopher Avicenna describing the 'collapse of sexual functions' in diabetic males.[7] Preceding studies have revealed that males with DM are at increased risk of developing SD with a prevalence ranging from 20% to 85%.[6,8] The prevalence of SD in DM varies extensively because of the perpetual definitions and the studied population, which showed discrepancy respective to the selection of patients, sample size, socio-economic status, cultural framework, and quality of psychosexual affairs. Since the ubiquity of DM is rising globally, it is estimated that the number of patients suffering from SD will be abundant in near future.[9]

"American Diabetes Association" (ADA) asserted that evaluation of the possible presence of SD is the main constituent of the comprehensive assessment of diabetic patient.[10] SD in type 2 diabetics has a higher prevalence rate than those with other types of DM.[6,11] But only few of those patients are detected and well-treated because most physicians do not address sexual problems.[12,13] Despite of this fact, talking about sexual matter in the Pakistani community is still a taboo. Most subjects do not readily discuss their problem unless they are specifically asked to do so, which makes hard to unveil the characteristic features of many SDs.

Majority of the researches published on MSD in DM inclined to emphasize ED predominantly as it is the most frequent SD. Only few studies have reported the prevalence of PE and HSDD in DM; but the prevalence, demographics, risk factors, and pathogenesis of these SDs are still not well addressed. On the other hand, DE has scarcely been described.[9,14] This may not give a thorough description of the patient's health-related and disease-specific standard of life. MSD is a multi-dimensional paradigm consisting of desire and ejaculatory function, in addition to penile erection.

This conduct the study was to determine the different types of SD frequency among type 2 diabetic males in our population because the studies conducted internationally as well as in Pakistan are lacking in this aspect. The dearth of operational thoroughness of many researches on SD bounds the analysis of their outcomes. So, there is enormous material available on ED but not on other types of SD in particular relation with T2DM.

SUBJECTS AND METHODS

Known "diabetic patients" with nephropathy which were present at National Institute of Diabetes & Endocrinology, Dow University Hospital, Ojha Campus, Karachi Patients presenting with signs and symptoms of hypoglycemia are diagnosed cases of "diabetes mellitus with nephropathy", age 30 and above, Type-I and type-II diabetes mellitus, on oral hypoglycemic agents I insulin were included in this study. For these patients if blood sugar level was found below "45- 50mg/dl". Firstly "hypoglycemic patients" were treated. Detailed history; specific information regarding duration of diabetes and anti-diabetic drugs which were used by the patient was collected. Moreover questions regarding the time period for which patient has been using these drugs and if the patient is suffering from illness which may be acute or chronic, should be asked regarding the relavent disease & its association with hypoglycaemia be mentioned, & patients urine D/R & Serum Creatinine & Urea are measured by sending to the appropraite laboratory. Patients with severe malnutrition and starvation, chronic liver disease, alcoholics, chronic disease as tuberculosis, patients with renal diseases without diabetes, any other malignancy patients were excluded from this study.

RESULTS

Total 95 type 2 diabetic male patients were

recruited in the study, who attended diabetic clinics of NIDE with different types of SD complaints. Their mean age was 53.92 ± 8.17 years (95% CI: 52.25-55.58), ranging 35 to 65 years. All the patients had evident T2DM with mean duration of 11.59 ± 3.52 years (95% CI: 10.87-12.31). They were taking OHA and did not take any drug that can cause different types of SD. Their mean HbA1c level was 8.17 ± 0.8 % (95% CI: 8.01-8.34) and mean BMI was 25.08 ± 3.0 kg/m2 (95% CI: 24.47-25.68). According to ASEX scale, 100% participants had clinically significant SD with mean score 17 ± 2.3. They all had fulfilled at least one criteria of having SD.

Table-I shows the socio-demographic, anthropometric and biochemical parameters of the study participants. It has shown that 51.6% patients were above 55 years of age. Majority 52.6% had more than 10 years duration of T2DM and 81.1% participants had HbA1c levels of more than 7.4%. Overweight were 52.6% and intermediate or equal education were attained by 35.8% patients. Among the participants, businessmen were 43.2% while 38.9% were employed and 51.6% had monthly income of Rs. 20000 to 40000. All were married and in stable sexual relationship with an average 1.3 sex episode per week. Patients having one wife were 96.8% but no female partner accompanied her husband when he presented to the clinic. Muslims were 94.7% and they circumcised since early childhood. Their preputal skin was nicely cut and there was no excess skin removed or left behind. Regarding smoking status, 77.9% participants had no history of smoking while 7.79% were ex-smokers.

Frequency of single, double and triple SD complaints with combinations given by the study participants is shown in Table-II. In the sub-group of patients with single SD, ED was accounted by 26.3% patients followed by PE. While in other sub-group of patients with double SD, 20% patients were having combination of ED and PE followed by the combination of ED and HSDD. Triple SD was reported in 1.1% patient with combination of ED, PE and HSDD.

Table-III shows the grouping of age, duration of T2DM, HbA1c levels and BMI among study participants by number of SD. It shows that mean age of the patients having single and double SD was 53.1 ± 8.3 years and 54.9 ± 7.8 years respectively. Mean interval of T2DM was 11.7 ± 3.5 years and mean HbA1c level was 8.2 ± 0.7 % in single SD patients while mean BMI in patients with double SD was 25.2 ± 2.8 kg/m2. Data analysis showed no significant differences among age, duration of T2DM, HbA1c levels and BMI with participant's sub-groups having single, double and triple SDs ($p > 0.05$).

Frequency of types of SD according to age shows in table-4. ED was found to be frequent (50%) in participants with age group 56-65 years, PE and DE found to be more common (32.1% and 14.3% respectively) in patients with age group 35-45 years, and most frequency of HSDD (17.1%) was found in participants with age group 56-65 years. This table also shows that frequency of ED and HSDD increases gradually with increasing age among the study participants.

Table-IV shows the frequency of types of SD according to duration of T2DM. It has observed that ED was found to be more common (48.3%) in patients with more than 15 years duration of T2DM, most frequency of PE and HSDD (28.1% and 17.2% respectively) was found in participants with 5 to 10 years duration of T2DM, and DE was frequent in patients with 11 to 15 years duration of T2DM. This table also shows that frequency of ED among study participants increases with increasing duration of T2DM while other types did not show such relation. Frequency of types of SD according to HbA1c level has shown in table-4.6. Most frequency of ED (46.9%) was found in participants having HbA1c level 8.5%-9.4%, PE was found to be more common (30.8%) in patients having HbA1c level 6.5%-7.4%, and DE and HSDD found to be frequent (11.6% and 16.3% respectively) in participants having HbA1c level between 7.5%-8.4%. This table also shows that frequency of ED increases with increase in HbA1c level among study participants while other types did not show such relation. Table-IV shows

the frequency of types of SD according to BMI. It has observed that ED was found to be more common (47%) in obese patients, PE and DE were found to be frequent in participants having normal BMI (28.6% and 14.3% respectively), and most frequency of HSDD (16.9%) was found in overweight patients.

Characteristics	Types	Patients No. (%)
Age (Years)	35 y – 45 y 46 y – 55 y 56 y – 65 y	21 (22.1%) 25 (26.3%) 49 (51.6%)
Duration of T2DM (Years)	5 y – 10 y 11 y – 15 y > 15 y	45 (47.4%) 30 (31.5%) 20 (21.1%)
Education Status	Middle Matric Intermediate Or Equal Graduation And Above	13 (13.7%) 29 (30.5%) 34 (35.8%) 19 (20%)
Occupation	Employee Business Unemployed Retired	37 (38.9%) 41 (43.2%) 05 (5.3%) 12 (12.6%)
Monthly Income (RS)	Low (< Rs.20000) Middle (Rs.20000 – Rs.40000) Higher (> Rs.40000)	31 (32.6%) 49 (51.6%) 15 15.8%)
No. Of Wives	One Wife Two Wife	92 (96.8%) 03 (3.2%)
Sex Episodes	Per Week	1.3
Smoking Status	Non-Smoker Smoker Ex-Smoker	74 (77.9%) 14 (14.7%) 7 (7.4%)
Religion	Muslim Hindu Christian	90 (94.7%) 03 (3.2%) 02 (2.1%)
BMI (Kg/m^2)	Normal BMI=18.5-23 kg/m^2 Overweight BMI= 23-27.5kg/m^2 Obese BMI= >27.5 kg/m^2	21 (22.1%) 50 (52.6%) 24 (25.3%)
HbA1c (%)	6.5% - 7.4% 7.5% - 8.4% 8.5% - 9.4%	18 (18.9%) 32 (33.7%) 45 (47.4%)

Table-I. Socio-Demographic, Anthropometric and Biochemical Parameters of the Study Participants (N=95)
T2DM - Type 2 diabetes mellitus
BMI - Body mass Index
HbA1c - Glycosylated hemoglobin

S. No.	Types of Sexual Dysfunction	Patients No.
	Single Sexual Dysfunction	**n=58**
01	Erectile Dysfunction (ED)	25 (26.3%)
02	Premature Ejaculation (PE)	16 (16.8%)
03	Delayed Ejaculation (DE)	07 (7.4%)
04	Hypoactive Sexual Desire Disorder (HSDD)	10 (10.5%)
	Double Sexual Dysfunctions	**n=36**
01	Erectile Dysfunction + Premature Ejaculation (ED+PE)	19 (20%)
02	Erectile Dysfunction + Hypoactive Sexual Desire Disorder (ED+HSDD)	09 (9.5%)
03	Premature Ejaculation + Hypoactive Sexual Desire Disorder (PE+HSDD)	01 (1.1%)
04	Delayed Ejaculation + Erectile Dysfunction (DE+ED)	07 (7.4%)
	Triple Sexual Dysfunctions	**n=01**
01	Hypoactive Sexual Desire Disorder + Premature Ejaculation + Erectile Dysfunction	01 (1.1%)

Table-II. Frequency of Single, Double and Triple Sexual Dysfunctions Complaints with Combinations among the Study Participants

S. No.	No. of Sexual Dysfunction (SD)	No. of Participants (%)	Age (y)	T2DM Duration (y)	HbA1c (%)	BMI (kg/m²)
1	1 SD	58 (61%)	53.1 ± 8.3	11.7 ± 3.5	8.2 ±0.7	25.1± 3
2	2 SDs	36 (37.9%)	54.9 ± 7.8	11.2 ± 3.3	8.0 ± 0.8	25.2± 2.8
3	3 SDs	01 (1.1%)	61.00	17.00	8.60	24.9
p-value			0.996	0.902	0.723	0.065

Table-III. Grouping of age, duration of type 2 diabetes mellitus, hba1c levels & BMI by number of sexual dysfunction among the study participants (n=95).

T2DM - Type 2 diabetes mellitus BMI - Body mass Index HbA1c - Glycosylated hemoglobin

Variables		TYPES OF SEXUAL DYSFUNCTION			
		Erectile Dysfunction (ED)	Premature Ejaculation (PE)	Delayed Ejaculation (DE)	Hypoactive Sexual Desire Disorder (HSDD)
AGE YEARS	FREQUENCY OF TYPES OF SEXUAL DYSFUNCTION ACCORDING TO AGE				
	35 – 45	11 (39.3%)	9 (32.1%)	4 (14.3%)	4 (14.3%)
	46 – 55	15 (42.9%)	11 (31.4%)	4 (11.4%)	5 (14.3%)
	56 – 65	35 (50%)	17 (24.3%)	6 (8.6%)	12 (17.1%)
AGE YEARS	FREQUENCY OF TYPES OF SEXUAL DYSFUNCTION ACCORDING TO DURATION OF TYPE 2 DIABETES MELLITUS				
	5 – 10	28 (43.8%)	18 (28.1%)	7 (10.9%)	11 (17.2%)
	11 – 15	19 (47.5%)	11 (27.5%)	5 (12.5%)	5 (12.5%)
	>15	14 (48.3%)	8 (27.6%)	2 (6.9%)	5 (17.2%)
HbA1c %	FREQUENCY OF TYPES OF SEXUAL DYSFUNCTION ACCORDING TO HbA1c LEVEL				
	6.5%-7.4%	11 (42.3%)	8 (30.8%)	3 (11.5%)	4 (15.4%)
	7.5%-8.4%	20 (46.5%)	11 (25.6%)	5 (11.6%)	7 (16.3%)
	8.5%-9.4%	30 (46.9%)	18 (28.1%)	6 (9.4%)	10 (15.6%)
BMI Kg/m²	FREQUENCY OF TYPES OF SEXUAL DYSFUNCTION ACCORDING TO BMI				
	Normal	12 (42.8%)	8 (28.6%)	4 (14.3%)	4 (14.3%)
	Overweight	33 (46.5%)	20 (28.2%)	6 (8.4%)	12 (16.9%)
	Obese	16 (47%)	9 (26.5%)	4 (11.8%)	5 (14.7%)

Table-IV. Sexual Dysfunction According To Different Variable

DISCUSSION

Sexuality meets somatic and emotional needs that not only improve the identity but also provide importance to the person's life. In Pakistan, there is a significant lack of studies reporting the frequency of different types of SD and even less focused on different types of SD among males with T2DM. However, it is worth mentioning that this trend has also been observed in other countries as well. DM is a medical problem which has its great implications on MSD and is often neglected and untreated.[6,9,15]

Demographic, biochemical and anthropometric factors can play a fundamental role in psychopathology of SDs. In the present study, 77.9% participants were above 45 years of age, 52.6% had >10 years duration of T2DM and 81.1% had HbA1c level higher than 7.4%. This is in accordance with the several studies which established that progression of SD among type 2 diabetic men increases with the increasing age, duration of T2DM, and poor glycemic control.[6,9,11] 77.9% participants were either overweight or obese while 22.1% were ex- or present smokers. It is well known that both body weight and smoking habit also represent vital risk factors for development of SD[6,16,17] 13.7% participants had low education status and 32.6% participants had low monthly income. This comes in line with some studies which demonstrated the same demographics in T2DM men with different SDs.[18,19]

In the current study, 100% participants had fulfilled at least one criteria of having SD according to ASEX scale with mean score 17 ± 2.3. Thus, they all had clinically significant SD. Although, this scale was used by few researchers to evaluate SD in women with T2DM[20,21] but no study has ever been conducted which uses ASEX scale to evaluate SD in type 2 diabetic men.

ED was the most common SD seen in the present study. It was either reported as a sole complaint or in combination with other types of SD, giving an overall frequency of 64.2%. This frequency was lower than the studies directed by Al-Mogbel et al[22] (83%), Ahmed et al[23] (80%) and Malavige et al[24] (73.1%), but similar to the results of Khatib et al[25] (65.4%) and Cho et al[26] (62%). The frequency of ED in the current study was higher than Shaikh et al[27] (55%). This may be due to the difference in sample size, methodology, and other factors associated with ED. The age groups in this current study showed gradual increase in the frequency of ED as it increases by years; where the frequency was 39.3% in age group less than 45 years and it was increased up to 50% in age group above 55 years. This result is consistent with other studies done in type 2 diabetic men which showed strong association of ED with increasing age.[22,23,24] This may be due to the difference in sample size and study population. However, Ziaei-Rad et al[11] in the study of SD in both genders with DM did not find any statistically significant association of ED with age. The frequency of ED in this study has increased with increase in the duration of T2DM; with 5-10 years duration (43.8%), 11-15 years duration (47.5%) and more than 15 years duration (48.3%). This association is similar to many studies which clearly proposed that increased duration of T2DM augmented the risk of ED.[28,29] In the current study, poor glycemic control showed an association with ED, which is similar with the studies conducted by MaCulloch et al,[30] Khatib et al,[25] While Al-Mogbel et al,[22] and Yamasaki et al[31] in their studies did not find any association between ED and poor glycemic control. This may be due to the difference in cut-off values and methods to measure HbA1c. Also in this study, the frequency of ED is high (47%) in those participants who were obese. This result is in accordance with Ahmed et al,[23] which also revealed a positive correlation of ED with obesity. Other findings in the present study were that 20% patients reported combination of ED with PE while 9.5% patients reported combination of ED with HSDD. These associations are in contrast with the studies conducted by Salama[14] and Malavige et al,[28] in which they found strong association of ED with PE and ED with HSDD. Although, the frequency of these associations in this current study was not high as compared to those studies but considering the small sample size and different methodology, these have clinical significance.

PE was the second most common SD self-reported by 38.9% study participants either as a single SD or in combination with other SDs. It was higher than that reported by Shaikh et al[27] (20%) in the same community while Salama[14] reported 22.4% prevalence of PE but this difference can possibly be due to change in the sample size and methodology. However, it was little lower than that revealed by El-Sakka[32] (40.2%) and Malavige et al[28] (40.2%). This difference may be related not only to the differences in duration of DM and the degree of success of its metabolic control but also to the ethnic difference of the studied patients in different studies and socio-cultural attitude along with lack of knowledge about norms in ejaculation capability among current study participants. In addition, it is important to note that the prevalence of PE in diabetic men reported in both studies was same (40.2%).[28,32] Although, the materials revealing this common prevalence were different**.** El-Sakka[32] included only the acquired cases of PE which started after diagnosis of DM while Malavige et al[28] recruited diabetic men with both acquired and life-long PE. On the other hand, Basile Fasolo et al[33] found no association between DM and PE; but they attributed the low prevalence to non-assignment of many of their diabetic patients to have PE as they were not engaged in steady sexual relations. In this current study, the frequency of PE was not associated with increase in age, duration of T2DM and poor glycemic control. These findings were contrary with the results revealed by Salama,[14] El-Sakka[32] and Malavige et al.[28] The reason could be due to small sample size, different studied population, and difference in methodology in the present study. 78.3% of the patients with PE were either overweight or obese, and high BMI was reported to be a risk factor for PE.[28] One patient had combination of PE and HSDD, which may be due to depression and lack of personal well-being. He was 53 years old, overweight, un-employed with poor glycemic control, and 9 years duration of T2DM, and all of these are the risk factors of both PE and HSDD in diabetic men.[28,32] In the literature no study evaluated this association in men with T2DM. So, the exact frequency is not known.

In the current study, the frequency of patients presented with DE was 14.8%. Among them, 7.4% patients had DE as a single SD while 7.4% patients had combination of DE and ED. In the literature no study has investigated this problem in diabetic men, so far. Therefore, the real prevalence of DE in diabetic men is still difficult to be defined. Even in general population, scarce studies investigated this problem. Corona et al[34] reported it in 3.8% of 1632 men while Rowland et al[35] claimed it to be present in 2% among 1400 men.

Overall frequency of HSDD among male type 2 diabetic patients in this present study was about 22.1%. This was lower than that reported by Nakanishi et al[36] (55.7%), Corona et al[37] (29.6%) and Malavige et al[28] (25%) but higher than Shaikh et al[27] (15%). Again the difference observed in current study from others can possibly be due to change in sample size, methodology, and type of recruited diabetic patients. The difference in prevalence of reduced libido between different populations was previously documented by Masumori et al[38] in a community-based study, which showed that low sexual desire was more frequently reported by Japanese than American men. Beside the ethnic differences, several factors which have an important influence on male sexual desire in diabetes should be considered among different studied populations.[27,28] In this study, the frequency of HSDD increased with increasing age, this is similar to the outcomes of Malavige et al.[28] An interesting finding in the current study was that one patient reported triple SD combination i.e. HSDD-ED-PE. This finding comes in accordance with different studies[28,29] about the frequent concomitant presence of HSDD, ED and PE among type 2 diabetic men.

CONCLUSION

In conclusion, DM is associated with different types of SD. Among them, ED is the most common self-reported sexual problem in type 2 diabetic male patients consulting the diabetic clinics of NIDE. The study also showed that the combination of ED and PE is most frequent, followed by the combination of ED and HSDD.

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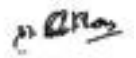
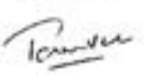
1	Dr. Muhammad Umar Khan	Conception & Design, Statistical expertise, Critica revision of the article for important intellectual content	
2	Dr. Muhammad Tanveer Alam	Data Collection	
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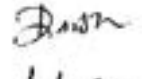
4	Syed Muhammad Adnan	Data Collection	
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