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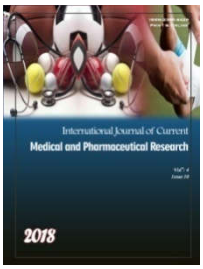

A STUDY OF SEXUAL DYSFUNCTION AMONG PATIENTS OF TYPE-2 DIABETES MELLITUS IN A TERTIARY CARE HOSPITAL

Udayan Bhaumik., Monisha Madhumita., Ashwin Kulkarni*., Anil Kumar.T and Rashma. R

Ramaiah Medical College, Bangalore

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ABSTRACT

Introduction: Diabetes is an important lifestyle-related disease in the current scenario. It causes multiple organ damage with myriad complications. Sexual dysfunction with limitation of sexual functioning is an important long-term consequence seen in males and females alike. The cause of dysfunction is also multifactorial.

Material and Methods: 37 patients attending Medicine OPD for follow up of Diabetes Mellitus which was diagnosed for more than 6 months were recruited for the study and compared with 37 inpatients not diagnosed with diabetes. Other end organ damage like neuropathy, nephropathy and retinopathy, was evaluated along with quality of glycaemic control using glycosylated Hemoglobin (HbA1c). Quality of Sexual life was assessed on Arizona Sexual experiences Scale (ASEX) and data was analysed.

Results: 67.2% of the study population reported having impaired quality of sexual experiences. Dysfunction related to both orgasm and penile erection/vaginal lubrication was highest at 32.4%.Poor glycaemic control and duration of diabetes mellitus were the most important correlates in the study with longer duration of illness being associated with poorer quality of sexual life.

Conclusions: Sexual dysfunction is a very frequent complication of Diabetes Mellitus. The cause of sexual dysfunction is multifactorial. It is important to enquire about and rule outdiabetes-associated sexual impairment in patients early on as early intervention indicates a better prognosis.

INTRODUCTION

Diabetes mellitus(DM) is one of the most common chronic lifestyle related diseases in the current world. Rising at a rapid rate, diabetes currently affects 246 million people worldwide and is expected to affect 380 million by 2025[1].The largest increase in the prevalence of diabetes is anticipated in the developing countries. Diabetes has been associated with sexual dysfunction both in men and women. An established risk factor for sexual dysfunction in men, a threefold increased risk of erectile dysfunction (ED) was documented in diabetic men compared to nondiabetic men[2,3]. Among women, the evidence regarding the association between diabetes and sexual dysfunction is less conclusive. Most studies report a higher prevalence of female sexual dysfunction (FSD) in diabetic women as compared with nondiabetic women[4,5]. Diabetes also shares association with other risk factors for sexual dysfunction, smoking, hypertension, hyperlipidaemia, metabolic syndrome, depression, lower urinary tract symptoms and poor health state. Although multifactorial, widespread neuropathy appears to be the main contributory factor for diabetes-related erectile dysfunction[6]. ED in the presence of normal or diminished sexual desire leads to increase in mental stress, disordered marital relationship, and interference with sexual life. ED may be a major determinant of quality of life (QOL) in diabetes mellitus[7]. Research shows a prevalence of 20%-85% for diabetes-related erectile dysfunction occurring with a greater frequency and at an earlier age compared to general population[8]. Many men are, however, embarrassed to admit and reluctant to disclose difficulties in achieving erection even with their doctors. Hence, precise estimation of the problem is difficult[9]. Our primary aim in this study was to presence of sexual dysfunction in diabetics compared to non-diabetics in our population.

MATERIAL AND METHODS

This is a case-control study with sample recruited from the married patients attending the Out patientDepartment of Medicine Department, Ramaiah Medical College and Hospital for the follow up of Diabetes. Following are the inclusion and exclusion criteria.

Inclusion Criteria

Cases were males and females more than 18 years of age diagnosed with diabetes mellitus for at least 6 months. They were matched with age and sex matched controls who were

Corresponding author:* **Ashwin Kulkarni
Ramaiah Medical College, Bangalore

non-diabetics outpatients from similar biosociocultural background.

Exclusion criterion

1. History of mental illness
2. Congenital or acquired anatomical cause of sexual dysfunction(eg: post stroke quadriplegia)
3. Patients on drugs that can cause sexual dysfunction like Beta blockers, Alpha blockers.
4. Known cases of Chronic kidney disease, Chronic Liver disease.
5. Chronic Ethanol abuse.

Convenient sample was used for selection. Informed consent was taken from all patients prior to assessment. Data was recorded on a pre-designed questionnaire which included duration of illness, history of other lifestyle diseases or comorbid substance abuse and medications of the patient at time of assessment. Physical examination was done to note presence of obvious sensory, motor or autonomic dysfunctions. Details of investigations recorded included Glycosylated Haemoglobin (HbA1C) levels, Renal Function Tests, Fasting Lipid Profile and Electrocardiogram (ECG) to diagnose R-R interval abnormalities. History of sexual experiences was assessed using Arizona Sexual Experiences Scale (ASEX). Developed by McGhuey et al, it is a questionnaire used commonly in clinical trials to assess sexual functioning. It assesses five global aspects of sexual dysfunction: drive, arousal, penile erection/vaginal lubrication, ability to reach orgasm and satisfaction derived from orgasm. Each item is rated on a score of 1 to 6 using specific anchor points, with 1 signifying least dysfunction and 6 signifying the maximum. Total score obtainable ranges from 6-30. It considers the experience of past 1 week. Impaired quality of sexual experience or sexual dysfunction is defined as: total score of 19 or more,5 or more on any item or 4 or more on any 3 items. It is easy to administer and can be self-rated. The scale has high internal consistency, reliability, validity, sensitivity, specificity and predictive values. Blood pressure was measured once during the inteview on right arm and also examined for postural hypotension. Quality of diabetes control was assessed through latest Glycosylated haemoglobin (HbA1C) report. A cut off of 8.0% was considered for poor glycaemic control. Patients were evaluated for diabetic autonomic neuropathy by checking pupillary reactivity to light, postural hypotension and R-R interval on electrocardiogram. Diabetic nephropathy was screened through latest renal function test (RFT) results and any value greater than 1.2 mg/dl was considered abnormal. Funduscopic examination was done to screen for retinopathic changes. Therafter patients were rated on ASEX scale. Data was analysed on SPSS 18.0 software.

RESULTS

37 diabetic and 37 non diabetic patients were enrolled in the study. Among cases, 31 were males, 6 were females. Among controls 32 were males, 5 were females. Median age of the study population was 45 years with mean ages of cases being 48.75 years and controls being 47.25 years. The mean duration of diabetes among the cases was 2.93 years. Evidence of autonomic neuropathy was found in 8.1% (9). Nephropathy was noted in 14.9% (11) and retinopathy in 5.4% (4) of the diabetic participants. Impaired Quality of Sexual Experience was found in 25(67.5%) of the cases and 7 (18%) of the controls. This difference was statistically significant ($p<0.001$). Of them, dysfunction related to both orgasm and penile erection/vaginal lubrication was highest at 32.4% (24), with 8.1% (6) having only erectile dysfunction(males) and 5.4%(4 males) complaining of reduced desire for intercourse. The relationship of quality of sexual experiences and its relationship with diabetes mellitus has been tabulated below:

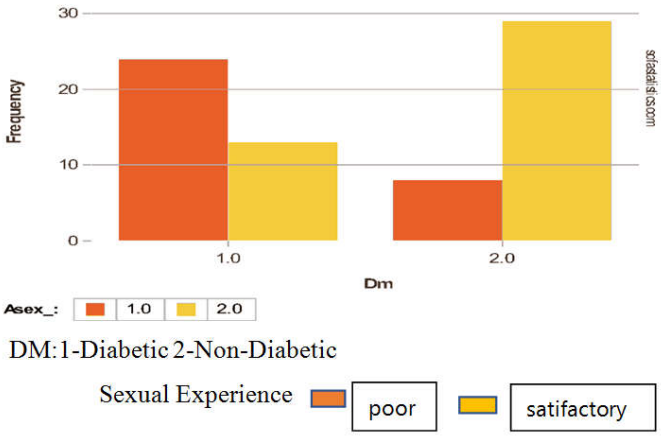

Figure 1 Diabetes mellitus vs Quality of Sexual Experience

Mann-Whitney U test was employed and the relationship between presence of diabetes mellitus for at least 1 year was found to have significant association with Quality of Sexual Experiences on ASEX scale.($p<0.001$),thus showing significant impact of presence of diabetes mellitus on deteriorating quality of sexual experiences. Spearman's Correaltion test was done to find association of duration of diabetes mellitus with Quality of Sexual Experience on ASEX and found to correlate negatively but was not found to be of significance.

Table 1 Prevalence of Poor Sexual Experience in the Study Population (cases and controls)

	Cases (Diabetics)	Controls (Nondiabetic)
Male	23	7
Female	2	0

Table 2 Nature and Prevalence of Poor Sexual Experience in the Study Population amongst Diabetics

Nature of Poor Sexual Experience	Number of Cases	Prevalence (%)
Erectile Dysfunction with dyfunction in orgasm and vaginal lubrication	24	32.4
Isolated Erectile Dysfunction	6	8.1
Decreased desire for intercourse	2	5.4

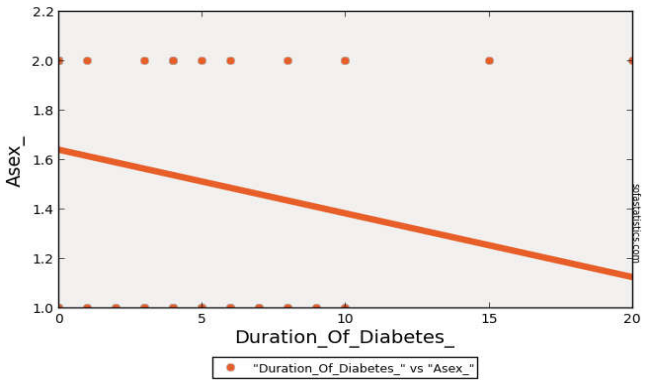

Fig 1 Plot of Diabetes duration vs Quality of Sexual Experience

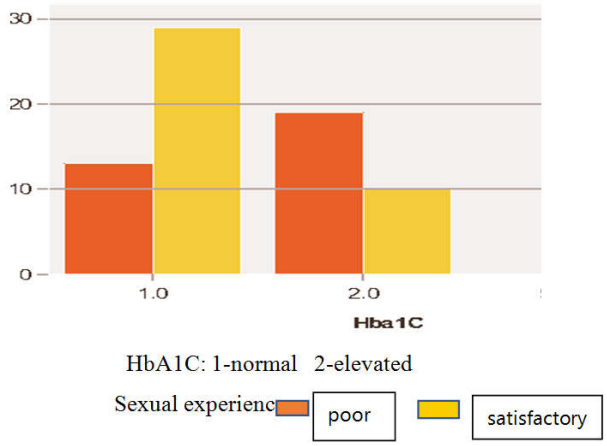

Table 3 Quality of glycaemic control vs Quality of Sexual Experience

The quality of sexual life was found to be deteriorating with the poor control of glycemic status. Association of autonomic neuropathy, nephropathy and retinopathy were not found to have any association of statistical significance with quality of sexual experience.

DISCUSSION

We found 67.2 % of the diabetic patients in the study population to have impaired sexual function. The association of diabetes with impaired quality of sexual experience was significant. Amaral et al[10],in his study on diabetic men and women found prevalence of sexual dysfunction to approach around 50% in diabetic men and slightly lower in women.An Iranian study[11] found sexual dysfunction to be 82.5% in a population of 100 diabetic males and 100 females.In diabetic men worldwide,erectile dysfunction is known to have a prevalence of >_50%.It usually presents within 10 years of diagnosis of DM[12]. The incidence of ED was reported to be higher in men with DM than for men without DM and up to 12% of men who present with ED were found to have previously undiagnosed DM [12].ED occurs at ayounger age in men with Type 1 DM than in the general population and the incidence of insulin resistance is three times higher in men with ED [13].Presence of DM at baseline was significantly associated with all aspects of sexual dysfunction, including sexual drive, ejaculatory function and sexual satisfaction[14]. Esposito[15] studied female sexual dysfunction (FSD) in diabetics and found its overall prevalence to be 53.4%. Specifically, the prevalence of FSD was significantly higher (63.9%) in menopausal women as compared with nonmenopausal women (41.0%); for most sexual domains, there was no significant difference between groups, except for lubrication which was significantly lower in menopausal women[15].The Iranian study[11] found no statistical associations were found between clinical characteristics of patients including diabetes status, duration of diabetes and hypertension with sexual dysfunction. Similarly a study from Turkey[16] indicated that no risk factor predicted SD in diabetic women. A study from Belgium[17] has reported also that SD in type 1 diabetic women did not correlate with age, BMI, duration of diabetes, glycemic control, using medication, menopausal status or complications. Nonetheless, it has been suggested hat a normal glycemic control in type 2 diabetic women would be fundamental to restoring normal sexual activity in diabetic women. On the contrary, in men with diabetes there have been significant associations between control of diabetes mellitus and serum testosterone levels, a probable factor governing impairment of sexual function[18].Also,longer duration of diabetes, and chronic diabetic complications such as hypertension are related to elevated incidence of SD in female and male diabetic cases.

The underlying mechanism of erectile dysfunction in diabetes mellitus is diverse. Normal penile erection is a hemodynamic process dependent upon corporal smooth muscle relaxation mediated by parasympathetic neurotransmission, nitric oxide (NO), electrophysiologic events and possibly other regulatory factors[19].Hyperglycemia in diabetes will lead to the formation of advanced glycation end-products (AGE). AGEs are the products of non-enzymatic reactions between glucose and lipids, proteins or nucleic acids[20]. AGE formation leads to vascular thickening, decreased elasticity, endothelial dysfunction and atherosclerosis[21].Generation of free radical associated with impaired nitric oxide synthesis leads to damage to potassium channels in the smooth muscle wall of corpus cavernosum leading to erectile dysfunction[20,22].ED in diabetics is linked to an imbalance toward increased penile vasoconstriction as the result of endothelin-1 and its receptors and ultrastructural changes in the endothelium[23] .Mechanisms involved in testosterone deficiency in diabetes include low levels of the sex hormone-binding globulin due to insulin resistance, increased aromatase activity in visceral adipose tissue leading to an augmented conversion of testosterone in estradiol, leptin resistance causing reduced secretion of LH and testosterone, and increased levels of inflammatory mediators, which may suppress the secretion of gonadotropin-releasing hormone and LH[24,25]. Bellastella et al[26] suggested a possible autoimmune pathogenesis of hypogonadotropic hypogonadism in type 2 diabetic patients, as indicated by the presence of antipituitary antibodies at high titers, as compared with age-matched controls. Recent research has shown that the transduction pathway for the endothelins and its receptor might play a role in diabetic ED. The pathway is composed of a GTP-binding protein, Rho-A, and its effector agent, Rho-kinase.ET-1 induced vasoconstriction has been shown to belinked to the RhoA/Rho-kinase pathway[27-29]. The activation of the pathway suppresses endothelial nitric oxide secretion.

Neurologic testing has also shown that diabetics with ED have abnormal nerve conduction, sphincter electromyography and vibratory testing more commonly than diabetics without ED[30,31]. Further, patients with diabetic and neuropathic ED have been noted to have similar frequencies of somatic and autonomic neuropathies, suggesting that neuropathy contributes significantly to diabetic ED. Although rates of sexual dysfunction in women are not dissimilar to those in men, the pattern of specific effects of diabetes on men and women is markedly different. While predominantly ED affects men both with type 1 and with type 2 diabetes, the most prevalent sexual dysfunction, lubrication and sexual arousal difficulties, are not the sole or the most prevalent problem in women. Sexual dysfunction is more strongly related to psychosocial aspects rather than the typical pattern of cardiovascular- and metabolic-related risk factors observed in studies of men with diabetes[32-34]. This study had a small sample size and a hospital based, findings are unlikely to be generalized to the rest of the population. Female participants are also less in this study and there exists a likelihood of their being more hesitant to share their quality of sexual experiences exists.

CONCLUSIONS

Diabetes mellitus has a significant effect on the quality of sexual life. The quality of sexual life deteriorates with the duration diabetes and the extent of glycemic control. Future strategies in the evolution of the treatment of ED are aimed at correcting or treating the underlying mechanisms involved in diabetic ED. Various targets of investigation include gene therapy with neurotrophic factors like endothelial and neuronal nitric oxide synthetases and superoxide dismutase. Currently no definite guidelines are available and treatment has mixed results. Other conclusions that can be drawn from the study are the need to maintain good glycaemic control and need for detailed evaluation of sexual history in all patients presenting with diabetes mellitus so that treatement can be initiated early to ensure optimum results.

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