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Original Article

THE FREQUENCY, SEVERITY AND RISK FACTORS OF ERECTILE DYSFUNCTION IN PATIENTS WITH DIABETES MELLITUS.

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ABSTRACT

Objectives: To determine the frequency, severity and risk factors of erectile dysfunction in patients with diabetes mellitus.
Material & Method: This study is descriptive analytical cross-sectional study that was carried out in medical wards, medical out patients department and Diabetic clinic of civil hospital Karachi on patients with established diagnosis of diabetes mellitus from 16-06-2007 to 15-12-2007.
Three hundred ninety (n=390) adult male sexually active diabetic patients, fulfilling the selection criteria were enrolled for this study. The patients were interviewed and screened for erectile dysfunction by using the international index of Erectile Functoin-5(IIEF-5) questionnaire.
Results: Mean age of the study population was 48.28 years (range 18-75 years). Out of three hundred ninety (390) patients interviewed, three hundred ten (n=310, 79.5%) reported having various degrees of erectile dysfunction. Mild (n=76, 24.5%), moderate in (n=80, 25.8 %) and severe (n= 154, 49.7. %). There was significant association between frequency & severity of erectile dysfunction with age, duration of diabetes, body mass index, hypertension, and use of anti hypertensive drugs, treatment modalities for diabetes control, smoking and number of cigarettes but not with duration of smoking.
Conclusion: Erectile dysfunction is a very common condition in diabetic men and therefore should be routinely sought for by the clinicians. This study provides a quantitative estimate of the frequency of erectile dysfunction and its main risk factors in diabetic patients.

Keywords: Diabetes mellitus, Erectile dysfunction, Frequency, smoking, IIEF

INTRODUCTION

Sexual health is an important determinant of an individual's over all physical and emotional well being. The Erectile Dysfunction (ED), a common disorder, is defined as the persistent inability to attain or to maintain penile erection sufficient for sexual intercourse [1]. It does not directly affect life expectancy but can have a strong negative effect on the well being and quality of his and his partner's life, as it often leads to various psychiatric and social problems. [1]

The prevalence rate of ED in USA, Europe and South East Asia has been reported to vary from 31.6% to 52% among men over the age of forty [2]. However the prevalence and severity of this problem increases with age and is influenced by the presence of other risk factors. It has been well recognized that erectile dysfunction and coronary artery disease share many of the risk factors including smoking, dyslipidemia, diabetes hypertension, lack of physical activity & obesity. Erectile dysfunction is an important early marker of the presence of coronary artery disease and may be an independent risk factor and predictor of future major cardiovascular events. [3]

Diabetic men are two to three times as likely to develop erectile dysfunction as non-diabetic men.[4] Hyperlipidemia, hypertension and cardio-vascular disease, which frequently

complicate diabetes and the use of drugs, that are commonly given to diabetic patients for such disorders are associated with higher frequency of erectile dysfunction.[5]

Various epidemiological studies been shown that 86 to 90% patients with diabetes mellitus have erectile dysfunction.[6-7] Furthermore erectile dysfunction usually starts at an earlier age and it is often related to duration and severity of diabetes.[7] In Pakistan studies done on this subject have also shown high prevalence (40 to 60%) of erectile dysfunction in diabetic patients. [8-9]

The International Index of Erectile Function (IIEF) has been used as a diagnostic tool in various epidemiological and clinical studies [10 -11]. This 15 item questionnaire evaluates 5 domains including erectile and orgasmic function, sexual desire, intercourse satisfaction, and global satisfaction. A simplified version "International Index of Erectile Function-5 (IIEF-5)" based on 5-question tool has been used [2, 6-7, 9] as a sexual health inventory for men to screen the patients for erectile dysfunction. The erectile function domain consists of questions 1 to 5 and 15 for assessing global erectile function. The IIEF-5 scores the answers on a scale of 0-5.

As diabetes and erectile dysfunction both are common and the growing global epidemic of diabetes forecasts the prevalence of erectile dysfunction to double by the year 2025 so that there is a need to study on this problem in local diabetic population, where only two studies [5,8- 9] have been conducted on this important problem. In Pakistan because of the social and cultural reasons the problem of erectile dysfunction in general population and more so in diabetics is perhaps underestimated and therefore neglected. As such not much work has been done on this subject locally.

The aim of this study was to determine the frequency and severity of erectile dysfunction in diabetic patients by using "International Index of Erectile Function-5" and to determine the risk factors that are associated with erectile dysfunction. Not only this would enable us to identify the diabetic patients with potentially treatable complication of erectile dysfunction but the results would highlight the extent of this problem in this population so that further studies and measures could be taken up for prevention and management of this problem.

MATERIAL & METHOD

A descriptive analytical cross-sectional study was carried out at Civil Hospital Karachi from June 2007 to December 2007. The three hundred ninety (n=390) adult male diabetic and sexually active patients visiting medical OPD, medical wards or diabetic clinic of Civil Hospital and fulfilling the selection criteria (Details are given in table No.1) were selected for this study. The sample size of 390 was calculated, using 5% level of significance, margin of error as 5% and an expected prevalence of 60%. Patients were explained the purpose, the procedure and the risk/benefit of the study and written consent were taken about study. In complete privacy, patients were interviewed and screened for erectile dysfunction by using the International Index of Erectile Function-5 (IIEF-5) questionnaire. The questions were translated in the local languages. The socio-demographic data including age occupation, marital status as well as history of smoking were also recorded. Medical history including type, duration and treatment for diabetes, history of hypertension history of medication and other associated illness was also noted. General physical examination like pulse, blood pressure, weight and height measurement for calculation of body mass index (BMI) was also done. Body Mass Index of less than 25 was taken as normal, 25.1 to 27 was taken as overweight and greater than 27 was considered as obesity.[7]

Patients were categorized according to scoring of International Index of Erectile Function domain of erectile function as no (26 to30), mild (17to25), moderate (11to16) or severe (0to10) erectile dysfunction.[2, 6-7, 9.]

STATISTICAL ANALYSIS:

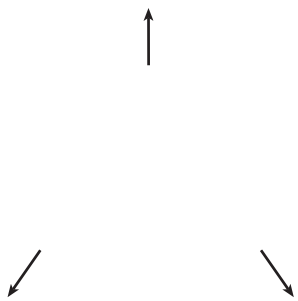
The data was entered by two people to control the bias and was analyzed with help of SPSS program version 13.0. Means and standard deviations of continuous variables like age and duration of erectile dysfunction had been calculated. Frequency and percentage was computed for categorized variable like age group, marital status, sexual desire, erectile dysfunction and severity according to IIEF-5, risk factor of erectile dysfunction (like smoking, duration of diabetes, hypertension, anti HTN drug, body mass index) and type treatment of diabetes. Chi-square test was used for observing the relationship between erectile dysfunction with age, body mass index, duration & type of treatment of diabetes, smoking, hypertension and use of anti hypertensive drugs like beta-blockers and diuretics on erectile dysfunction was noted.. The Correlation coefficient test was used for observing the relationship between erectile dysfunction score (grade of severity) with age, body mass index, duration & type of treatment of diabetes, smoking, hypertension and use of anti hypertensive drugs like beta-blocker and diuretic on erectile dysfunction. P- Value <0.05 was taken as level of significance.

RESULTS:-

A total of three hundred ninety (n=390) male patients with diabetes were the subject of this study. Mean age was 48.28 ± 11.82 (range 18 to75) years. Three hundred two patients (n=302, 77.4%) had age more than 40 years. Of these patients 98.5% were married. One hundred sixty six (n=166, 42.6%) patients had normal BMI, ninety four (n=94, 24.1%) were over weight and one hundred thirty (n=130. 33.3%) patients were obese. Hypertension was present in two hundred twenty four (n=224, 57.4%) patients, eighty (n= 80, 35.7%) were taking beta blockers and fifty four (n=54, 24.1%) were taking diuretic therapy. One hundred four (n=104, 26.7%)

FIG NO 1

Severity Of Erectile Dysfunction According To International Index of Erectile Function-5



patients were current smokers, most of them (94%) were smoking for more than five years, ninety eight (n= 98, 25.1%) patients were ex smokers. The duration of diabetes was more than ten years in one hundred forty nine (n=149 38.2%) patients and most of the patients (n= 254, 65.1 %,) were on oral hypoglycemic agents alone.

Three hundred seventy two (n=372, 95.4%) patients had sexual desire while three hundred ten (n= 310, 79.5%) patients with a mean age of 49.84 ±11.49 years had various degrees of erectile dysfunction (figure 1). The group without erectile dysfunction representing 20.5% of the study population was younger with a mean age of 42.24 ±11.11Years**.** The mean duration of erectile dysfunction was 3.25± 3.49 years (0- 20 years).

Increasing age showed significant relationship with frequency & severity of erectile dysfunction. In the study population, 63.6% of the younger patients (<40 years old) and 84.1% of the older patients (>40 years old) had erectile dysfunction (P value <0 .001 & Spearman's rho = 0.281). (Table.2, 3 and4).

Body mass index (BMI) was also significantly correlated with erectile dysfunction frequency and severity. The erectile dysfunction was present in 66.3% of patients with normal BMI, 80.9% of overweight patients and 95.4% of obese patients (P value of <0 .0001 & Spearman's rho = 0.287.) (Table 3and 4).

Increasing duration of diabetes also showed significant association with frequency & severity of erectile dysfunction. Erectile dysfunction was present in 52.9% of patients having diabetes of less than 5 years duration, in 83.3% of patients having diabetes of less than 10 years duration and in 90.6% of patients having diabetes for more than 10 years

(P value <0 .0001& Spearman's rho = 0.361) (Table 3 and 4).

Hypertension was present in 224 (57.4%) diabetic patients, 88.8% of them reported having erectile dysfunction with varying degree of severity (P value < 0.0001 & Spearman's rho = 0.304).The use of diuretics and beta blockers also revealed significant association with frequency (P value < 0.001 for both drugs) and severity (Spearman's rho - 0.192 and -0.212 respectively).

History of smoking and its relationship with frequency and severity of erectile dysfunction was also analyzed. ED was present in 86.5% of current smokers, 81.6% of ex smokers and in 75.5% of nonsmokers (p value of <0.010 & Spearman's rho = 0.196). We noticed that patients who smoked less than ten cigarettes per day the frequency of erectile dysfunction was 79.6% as compared to non smokers (75.5%) and those who smoked more than twenty cigarettes per day the frequency of erectile dysfunction was 88.9%

TABLE NO. 1 SAMPLE SELECTION CRITERIA

Inclusion Criteria:

- ❖ All adult male diabetic and sexually active patients who have continuous erectile dysfunction for at least one month.

Exclusion Criteria:

- ❖ Patients with systemic illness like chronic decompensated liver disease, chronic renal failure, chronic obstructive pulmonary disease, Severe Neuropsychiatric disorders and Systolic blood pressure <100mmHg.
- ❖ Patients with Severe cardiac decomposition that is myocardial infarction in last three months, unstable angina pectoris in the last 3 week, Congestive heart failure.
- ❖ Daily alcohol user.
- ❖ Patients with neurological disease like epilepsy, stroke, spinal cord injury and multiple sclerosis.
- ❖ Patients with any known urological pathology potentially responsible for erectile dysfunction that is hypospadiasis, epispadiasis, phimosis, balanitis, Lesion of the corpus cavernosum with induration or deviation as in the Peyronie's disease or fibrosis sequelae or Priapism.
- ❖ Patients who are taking drugs that can cause erectile dysfunction like, Psychiatric medications Anxiolytic agents, H_2 receptor blockers. Anti fungal agent, Digoxin, sympatholytics.
- ❖ Patients with history of Abdominal or prostate surgery

TABLE NO 2

AGE DISTRIBUTION OF THE STUDY POPULATION

ACCORDING TO ERECTILE DYSFUNCTION

AGE	ERECTILE DYSFUNCTION (NO OF PATIENTS WITH %)	NOERECTILE DYSFUNCTION (NO OF PATIENTS WITH %)	TOTAL (NO OF PATIENTS WITH %)	
<30	12 (50%)	12 (50%)	24 (100%)	P=0.001 & correlation coefficient Sig (2-tailed)= 0.281**
31-45 YEARS	108 (72%)	42 (28%)	150 (100%)	
46-60 YEARS	144 (87%)	20 (13%)	164 (100%)	
61-70 YEARS	40 (88.4%)	6 (11.6%)	46 (100%)	
>71 YEARS	6 (100%)	0 (000%)	6 (100%)	
TOTAL	310(79.5%)	80(20.5%)	390 (100%)	

with statically significant association (P value < 0.017 and Spearman's rho = 0.200). However there was no significant correlation of duration of smoking with erectile dysfunction (P value <0.246 and Spearman's rho = 0.016) Details are given in tables 2 and 3.There was also significant association of erectile dysfunction with treatment modalities for diabetes control. Details are also given in table 3 and 4.

DISCUSSION

Diabetes mellitus induced erectile dysfunction (DMED) is multifactorial in etiology including vascular, neurological, endocrinological and psychological components.[12]

A wide range of prevalence rates of erectile dysfunction among diabetic men has been reported in various studies. In this study, the frequency of erectile dysfunction in diabetic patients is 79.5% which correlates well with other international studies which had reported prevalence rates of 86-90%. [5-7] However, it is higher than the rate reported by previous local studies (48-60%). [8, 9] This difference might be due to the high frequency of risk factors (obesity, hypertension, anti hypertensive drugs and smoking) in our study , different settings, periods and patient population and the different diagnostics tool used for the study.

Erectile dysfunction in diabetes usually starts at an earlier age (10-15 years earlier) and is often related to duration and severity of diabetes.[7] Like others we found age to be the most important risk factor associated with ED in diabetics and the increase in frequency and severity of ED with age was greater than that reported in other studies in diabetic[5-9, 13-15] and non diabetic patients.[16]

The longer duration of diabetes is strongly associated with poor glycemic control [7-9, 14, 17-18] hence higher rates of complication. The risk and severity of erectile dysfunction increases with a longer duration of diabetes and this was also confirmed in our results.

We noted a significant association of erectile dysfunction and its severity in diabetic patients who are on treatment of any form as compared to those who are on diet alone. These results are consistent with those of previous studies.[19] This finding may reflect a poor metabolic control and long lasting diabetic pathology in patients who were not responding to diet alone to control disease and had to be put on treatment with oral drugs and or insulin. The risk was greater in men on combination therapy with oral agent plus insulin. This therapy is usually started after oral agents have failed and often after many years of diabetes in men with poor metabolic control.

In our study hypertension was the most frequent co-morbid condition associated with erectile dysfunction in patients with diabetes. The relationship between hypertension and erectile dysfunction is complex because the increased prevalence of sexual dysfunction in hypertension is well established in many studies.[2, 7, 20]. Enhanced atherosclerosis in hypertension leading to arterial narrowing & loss of elasticity significantly interferes with blood flow to the corpora cavernosa and can result in the partial or complete loss of erection. Moreover, many anti hypertensive drugs (more so beta blockers and thiazides diuretics) are associated with erectile dysfunction as found in our study as well.

Increased BMI was also significantly associated with higher frequency of erectile dysfunction in this study. The patients with normal BMI had the frequency of ED in 66.3% that rose up to 95.4% in obese group. These figures are higher than the corresponding figures of 16% and 77% respectively noted in Saudi diabetic population a by El-Sakka et al [7]. Possible explanation might be confounding effects of relatively poor health education and facility in our public set up.

Cigarette smoking per se is a well known risk factor for ED as found out in epidemiological as well clinical studies [21-22] .more so in diabetics patients [23]. Enhanced atherosclerosis, Nicotine mediated alteration in vascular smooth muscle function, hypercoagulability, increased platelet aggregation, and release of fatty acids and catecholamines are considered to be possible mechanisms [24]. A dose response relationship between number of cigarettes smoked and ED has been well established [25] and also confirmed in our study. However no significant association with duration of smoking was noted which was inconsistent with the results of same study[25]

LIMITATIONS OF THE STUDY:

The study population consisted of male diabetics visiting civil hospital which mainly caters to people from very low socioeconomic status. Thus they cannot be considered representative of all Pakistani population. The results were based on patient self reporting and confessing on hospital visit without any attempt to confirm clinically the diagnosis. Nevertheless, self reporting techniques have been widely used to estimate the prevalence of erectile dysfunction and our findings are highly consistent with previous data.The other risk factors for ED in diabetics like the level of glycemic control as well as the presence of other micro and macro- vascular complications were not evaluated in this study.

CONCLUSION AND RECOMMENDATIONS:

Sexual problems are not commonly discussed in our country because of cultural and social barriers. Both patients as well as doctors consider it as an embarrassing discussion. Erectile dysfunction is a very common condition in diabetic men and therefore should be routinely sought for by the clinicians. This study provides a quantitative estimate of the frequency of erectile dysfunction and its main risk factors in diabetic patients. All male diabetic patients should be asked/ evaluated about this complication like other complication on visits because ED is an independent risk factor & predictor of future major cardiovascular events. If and when detected earlier, further evaluation and management options can be considered and offered to the patients in order to improve their quality of life.

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