PREVALENCE AND QUALITY OF LIFE IN TERMS OF SEXUAL DYSFUNCTION IN DIABETIC PATIENTS

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ABSTRACT
The aim of this review is to discuss the topic about sexual dysfunction impact on the diabetic patients and also to discuss the quality of life in diabetic patients. Diabetes mellitus is a chronic and progressive metabolic disorder characterized by hyperglycaemia resulting from inadequate production of insulin and insulin action, or both. DM can potentially affect in various areas of life, ranging from physical complications to psychological imbalance, among which the well-known and most common difficulty is sexual dysfunction in both male and female. In men, the diabetic person has three times more chance for affecting with sexual dysfunction as compared to a non-diabetic person. In women, the association between diabetes and sexual dysfunction are less complicated as compared to diabetic men. The female sexual functions are more linearly related to social and psychological components than the physiological changes of diabetes. Thus, the prevalence rate was reported higher in diabetic women as compared to non-diabetic women. The diabetic patients also have been present with different clinical conditions, micro and macro vascular complications, including hypertension, overweight, metabolic syndrome, CVD, atherogenic dyslipidaemia, retinopathy, nephropathy, and neuropathy. This can cause damage to the nerves and blood vessels, as per which it can cause a potential increase in the risk chance for sexual dysfunction in both men and women.

KEYWORDS: Diabetes mellitus, Prevalence, Male sexual dysfunction, Female sexual dysfunction.
INTRODUCTION

Diabetes mellitus is a chronic disease that occurs when the pancreas does not produce adequate insulin, or when the body is unable to utilize the insulin produced by the pancreas. Hyperglycaemia is raised blood sugar level which found in the diabetic state. DM is a known risk factor for different medical, psychological and sexual complications. The sexual dysfunction is one of the most important complication of DM. Sexual dysfunction is referred to as a difficulty experienced by an individual or a couple during any stage of a normal sexual activity. Sexual function is an important aspect of life; thus the sexual dysfunction can cause a huge negative impact on the wellbeing of the person. As per the patient who is affected by the clinical condition of diabetes and the sexual dysfunction hence caused, the quality of their life is adversely affected.

The World Health Organization estimates that more than 180 million people worldwide have diabetes, which has been doubled in 2030. Diabetes mellitus is associated with both macro vascular and micro vascular complications which include CVD, retinopathy, neuropathy and nephropathy. These complications can directly cause damage to the nerves and blood vessels. Diabetes Mellitus patients also have a suffering from different type of clinical conditions, such as hypertension, obesity, elevated low-density lipoprotein, overweight, cigarette smoking and metabolic syndrome. Although most of the studies reported these themselves are risk factors for sexual dysfunction in both sexes. The prevalence of sexual dysfunction in diabetic men is estimated to about 50%. But in diabetic women, they are less prone to sexual dysfunction as compared with diabetic men.

In men, erectile dysfunction is more important issue and other forms of problems are discussed very narrowly. Erectile dysfunction is defined as the inability of a male to attain and maintain an erection of the penis sufficient to permit satisfactory sexual intercourse. Erectile dysfunction is an important factor, which will degrade the quality of life in men with diabetes. Erectile dysfunction increases proportionately with the age of the patient. The FSD is a complex condition that affects women in all age groups. In women, diabetes mainly inducing neuropathy, vascular impairment and psychological complaints which contributes to decrease libido, orgasmic dysfunction, decreased vaginal lubrication and dyspareunia. The diabetic condition mainly affects the sexual response cycle in women, such as decreased sexual desire, arousal, orgasm and pain. Thus this decreases the quality of life and interpersonal relationship.
This review is aimed at looking onto the patient as a whole, including problems coming out of diabetes which affects their life and also discussed behavioral changes, disease management, treatment outcomes. The purpose of the review is to discuss diabetes, sexual dysfunction in men and women with diabetes, prevalence condition and quality of life.

**DISCUSSION**

Diabetes is a chronic disease which has now been a common major global health problem. The International Diabetes Federation (IDF) estimated that 288 million people worldwide are suffering from diabetes disease, which contains 6.4% of adults and they also predicted that there will be an increase the rate up to 435 million by 2030. Indian Diabetes Association (IDA) estimated that there are approximately 31.1 million diabetes patients in India. IDA predicates it will increase up to 100 million in 2030.[11]

**PREVALENCE**

The complication of erectile dysfunction is increased by the age of patients.[12] The prevalence rate in the male with age of 20-24 years is found to be 5.7% which rise up to 52.4% in person aged between 55-59 years.[13] The International consultation committee for sexual medicine on definition/ epidemiology/ Risk factors for sexual dysfunction found the prevalence of ED was 1%-10% in men younger than 40 years. 2-9% chance in 40-49 years patients and 20-40% increase in people between 60-69, which reaching in high out rate in men with more than 70 years (50%-100%).[14] In the Massachusetts Male Aging study, discussed the ED have three folded probability chance in diabetic men compared with non-diabetic patient[15] and also showed the ED was doubled chance in diabetic men with age-adjusted relationship compared with non-diabetes. It has been estimated that the worldwide prevalence of ED will rise up to 322 million rates in the year of 2025.[16] Johannes et.al was estimated that the rate of ED was greater than or equal to 50% of a man with DM in worldwide. In this study, Johannes et.al reported that man with DM may develop ED within 5-10 years.[17] The 6% chance in the age group of 20-24 years and 52% prevalence in 55-95 years of the patient.[18]

Richardson and Vinik et al conducted the similar studies in type 1 DM patients since 10 years. To estimate for ED were 1.1%, 55% and 75% of man in the age group of 21-30 years, 50-60 years and more than the age of 60 years respectively.[19] The epidemiological studies on sexual attitudes and sexual difficulties are common in a middle-aged female worldwide and it should be ranged between 40-60%.[20] In Type 1 DM about 71% prevalence exists and
Type 2 DM in women is 42% respectively.\textsuperscript{[21]} This epidemiological study to estimates, the data about lack of subjective arousal, insufficient vaginal lubrication, orgasmic disorder and dyspareunia observed in 17%, 5-25%, 5-12% respectively in diabetic patients.\textsuperscript{[22]}

Enslin et al studied the sexual function in both males and female diabetic patients and estimates 27% prevalence condition in women and 25% in men.\textsuperscript{[23]} Copeland et.al investigated the sexual dysfunction in diabetic women compared with non-diabetic women. To reported a higher risk of prevalence present in insulin treating women such as lubrication and orgasm.\textsuperscript{[14]}

**MALE SEXUAL DYSFUNCTION**

The male sexual dysfunctions in diabetic patients include libido, ejaculatory problems and erectile dysfunction. All these three forms of sexual dysfunction can affect their quality of life. While among the 3 forms of male sexual dysfunction in diabetic patients, the common form is ED. Erectile dysfunction is defined as the inability to maintain and achieve an erection of the penis sufficient for satisfactory sexual performance.\textsuperscript{[18]} The reasons for ED in diabetic man is multi-factorial, it contains hypogonadism, autonomic neuropathy, insulin resistance, arterial insufficiency and psychological factors.\textsuperscript{[24]} Both micro vascular and macro vascular diabetic complications also increase the risk of ED in diabetic patients.\textsuperscript{[25]} The use of several medications frequently in diabetic patients, such as antihypertensive drugs (beta blockers, thiazide diuretics and spironolactone), psychotropic drugs and fibrates are all associated with the underlying reason for this.\textsuperscript{[26]}

The hyperglycaemia on the endothelium results in endothelial dysfunction, which connects across a link between ED and CVD. Endothelial dysfunction in diabetes was as a result of decreased amount of nitric oxide, resulting from insufficient relaxation of vascular smooth muscle of the corpora cavernous. It was favoring to increased vasoconstriction.\textsuperscript{[27]} Esposito et.al estimated in these studies, an increase in circulating endothelial micro particle are an important marker for endothelial dysfunction in the diabetic patient with ED as compared to non- diabetic patient.\textsuperscript{[28]}

Insulin resistance and visceral adiposity are distinctive clinical traits of Type 2 diabetes associated with decreased availability and activity of NO, which leads to ED in obese and overweight patients.\textsuperscript{[29]} The testosterone deficiency in diabetes to decrease the luteinizing hormone (LH) and follicle-stimulating hormone (FSH), which has the emergent component
of ED in a diabetic patient.\textsuperscript{30} Bella Stalla et.al suggested that possible autoimmune pathogenesis of hypogonadotropic hypogonadism in Type 2 diabetic patients.\textsuperscript{31}

**FEMALE SEXUAL DYSFUNCTION**

FSD has been closely associated with both Type 1 and Type 2 diabetes.\textsuperscript{32} Sexual disorder reported in women with diabetes include decreasing or loss of sexual desire, arousal or lubrication difficulties, dyspareunia and loss of the ability to reach orgasm.\textsuperscript{33} Recent meta-analysis studies, which contain 26 studies, include 168 women and 2823 controls showed FSD is more common. The increased risk of FSD was found in premenopausal women with any type of diabetes but not found out in postmenopausal women.\textsuperscript{34}

In a study conducted by Esposito et.al, it was found that metabolic syndrome and atherogenic dyslipidaemia is an independent marker of FSD in 595 Type 2 diabetic women and also the depression and marital status were the strongest predictors of FSD.\textsuperscript{14}

The main pathogenesis behind FSD in the diabetic patient is hyperglycaemia-induced vascular dysfunction may lead to decreasing the blood flow, which can cause inhibition of the puffiness of the clitoris and lubrication of the vagina during arousal resulting in dyspareunia and difficulty in vaginal lubrication. In animal studies showed that DM may affect arousal and orgasmic sexual response.\textsuperscript{35}

**CONCLUSION**

Diabetes mellitus is a growing public health issue, which causes cardiovascular, psychological, and sexual dysfunction. Diabetes is a well-known cause of sexual dysfunction in both male and female patients. The prevalence rates are approaching 50% in both type 1 and type 2. The commonly related risk factor which is recognized to develop sexual dysfunction in diabetic patients includes hyperglycaemia, hypertension, obesity, secondary lifestyle, smoking, metabolic syndrome and autonomic neuropathy. Some diabetic complications such as microvascular and macrovascular also play an important role in increasing the sexual dysfunction in patients. Generally, patients are receiving a large number of drugs to control DM which further may cause sexual dysfunction. Some other risk factors which are associated with DM that reduce sexual desire are depression, hypogonadism, coronary artery disease, renal failure and use of certain drugs such as anti-depressant or antihypertensive.
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