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Original Research Article

Role of depression, anxiety, testosterone and luteinizing hormone levels in disorders of sexual function

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ABSTRACT

Background: Hypogonadism as well as deficiency of testosterone can lead to disorder of sexual function in males. The initial clinical manifestations of this are mostly erectile dysfunction (ED) and hypoactive sexual desire disorder (HSSD). This not only causes the sexual dysfunction but can also lead to many health problems. To study the role of depression, anxiety, testosterone and luteinizing hormone levels in disorders of sexual function
Methods: A hospital based cross sectional study was conducted at department of General Medicine, Kamineni Academy of Medical Sciences, Hyderabad for a period of one year among 60 eligible study subjects to study the role of depression, anxiety, testosterone and luteinizing hormone levels in disorders of sexual function. All male patients aged between 21-60 years, who had stable heterosexual relationship, were included. Patients with severe diseases, users of alcohol and smoking, having marital disharmony were excluded. Informed consent was obtained from all the patients.
Results: Testosterone and LH levels are significantly lower in subjects with SD, suggesting that a state of hypogonadotropic hypogonadism prevails in male diabetics with SD. Depression and anxiety are significant factors associated with SD. Premature Ejaculation is significantly associated with Anxiety.
Conclusions: Testosterone and LH levels are significantly lower in subjects with SD. Depression and anxiety is significant factors associated with SD. Premature Ejaculation is significantly associated with anxiety.

Keywords: Luteinizing hormone, Metabolic disorder, Testosterone

INTRODUCTION

Hypogonadism as well as deficiency of testosterone can lead to disorder of sexual function in males. The initial clinical manifestations of this are mostly erectile dysfunction (ED) and hypoactive sexual desire disorder (HSSD). This not only causes the sexual dysfunction but can also lead to many health problems.[1] Many studies may be required to prove the fact that therapy with testosterone can improve the sexual function, and quality of life of males.[2] It was found by one author that psychological factors were responsible for 50% of cases of ED and were found to be as an independent risk factor of ED.[3]

Depression is characterized by loss of interest, reduction in energy, lowered self-esteem and inability to experience pleasure: irritability and social withdrawal may impair the ability to form and maintain intimate relationships. Depressive symptoms produce difficulty in sexual relationship. In some patients, low sexual desire may land them into depression.[4]

Anxiety can be defined as a feeling of apprehension and fear characterized by physical, psychological, and cognitive symptoms. In the context of stress or danger, these reactions are normal. However, some people feel extremely anxious with everyday activities, which may result in distress and significant impairment of normal activity. Various aspects of anxiety are historically considered in arousal disorders, particularly the vicious circle of anxiety-SD-performance anxiety.[5]

Diabetic men show decreased libido. But to prove the fact, very few studies are available. In two studies, the existence of an inverse relationship between age and sexual interest was found.[6]

HSDD is probably the most difficult to evaluate SD. Several reliable and valid questionnaires are available for assessing sexual desire problems. Once HSDD has been established, mood disorders like depression, anxiety and psychotic disorders, drugs' side effect and relationship problems should be ruled out. In men with acquired HSDD, once all of these potential etiologies have been discarded, blood test, including testosterone, should be performed.[7]

There are no studies focusing on DE in patients of diabetes as a risk factor. AE can be due to lack of peristalsis of the vas. AE is caused by diabetic autonomic neuropathy. If there is a problem in the internal sphincter of bladder, then it can lead to retrograde ejaculation (RE).[8]

Hence present study was carried out to study the role of depression, anxiety, testosterone and luteinizing hormone levels in disorders of sexual function.

METHODS

A hospital based cross sectional study was conducted at Department of General Medicine, Kamineni Academy of Medical Sciences, Hyderabad for a period of one year among 60 eligible study subjects to study the role of depression, anxiety, testosterone and luteinizing hormone levels in the disorders of sexual function. All male patients aged between 21-60 years, who had stable heterosexual relationship, were included. Patients with severe diseases, users of alcohol and smoking, having marital disharmony were excluded. Informed consent was obtained from all the patients. Institutional Ethics Committee permission was taken.

Detailed History and clinical examination was carried out for each and every individual. Body mass index (BMI) was calculated by dividing weight (kg) by the height squared (m^2). Waist circumference (to the nearest centimeter) was measured with measuring tape at midway between the iliac crest and the costal margin (lower rib). Blood pressure was recorded in standing and supine positions.

Testosterone

Serum total testosterone was estimated by CLIA method. For patients aged 20-49 years, the median lab reference range for testosterone was 6.2 ng/ml and the absolute reading was 2.7-17.3 ng/ml. For patients aged more than 50 years, the median lab reference range for testosterone was 4.3 ng/ml and the absolute reading was 2.1-7.5 ng/ml.

Luteinizing hormone levels

Serum luteinizing hormone levels were estimated by CLIA method. Lab reference range was 3.9-22.6 mIU/ml.

Generalized Anxiety Disorder Screener was used for evaluation of Anxiety Disorder. Patients were evaluated for depression by administering the nine item Patient Health Questionnaire translated version questionnaire. The score of 5-9 was mild depression, score of 10-14 was moderate depression, score of 15-19 was moderately severe depression and score of 20 or more was severe depression.

Premature ejaculation (PE) diagnostic tool: It was interpreted as follows

Table 1: Premature ejaculation.

Score	Interpretation
≥ 11	Diagnosis of PE confirmed
9-10	Borderline PE
8 or less	Not having PE

Specimen collection

Samples were taken between 8:00 and 9:00 AM in fasting state for hormonal estimation and lipid profile. 8 ml of venous blood sample was collected. Two serum tubes were used for 4 ml blood sample. Of this, 2 ml was taken into EDTA tube to investigate HbA1c, remaining 2 ml was collected for measuring fasting plasma glucose into sodium fluoride tubes. First centrifuged and then immediately frozen at -20° C pending further analysis. PPG was estimated in the sample collected 2 hours after the beginning of food intake. Lipid profile was estimated in fresh sera. The remaining serum was used to estimate the hormones and creatinine. All assays were performed within 2 days of collecting the sample. Grossly hemolysed and lipemic were excluded.

Statistical analysis

Data was entered in Microsoft Excel worksheet and analyzed using proportions. Statistical tests like chi square test was used and a p value of less than 0.05 was taken as statistically significant.

RESULTS

Table 2 shows association of depression with sexual dysfunction. It was found that the prevalence of sexual dysfunction was 88.8% among patients with depression compared to 54.5% among those with no depression. This difference was found to be statistically significant.

Table 2: Association of depression with sexual dysfunction.

Depression	Sexual dysfunction		Total	Chi square	P value
	Yes	No			
Yes	24	03	27	6.785	0.004 Significant
No	18	15	33		
Total	42	18	60		

Table 3 shows association of anxiety with sexual dysfunction. It was found that the prevalence of sexual dysfunction was 100% among patients with anxiety compared to 64% among those with no anxiety. This difference was found to be statistically significant.

Table 3: Association of anxiety with sexual dysfunction.

Anxiety	Sexual dysfunction		Total	Chi square	P value
	Yes	No			
Yes	10	00	10	5.143	0.023 Significant
No	32	18	50		
Total	42	18	60		

Figure 1 shows association between LH level and sexual dysfunction. LH level (p = 0.001) was significantly higher in SD group.

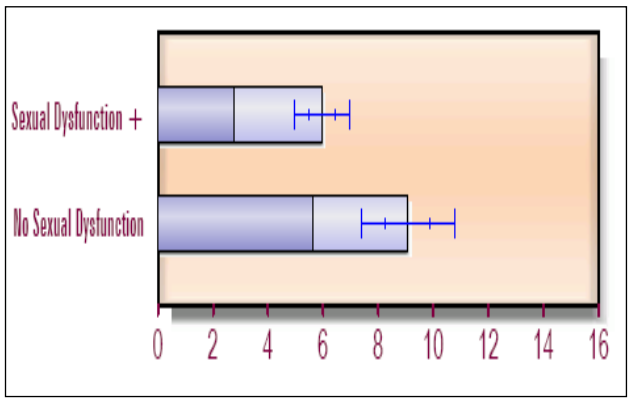

Figure 1: Association between LH level and sexual dysfunction.

Figure 2 shows association between testosterone level and sexual dysfunction. Testosterone level (347.891±147.899 versus 455.522±168.177; p=0.016) was significantly higher in SD group.

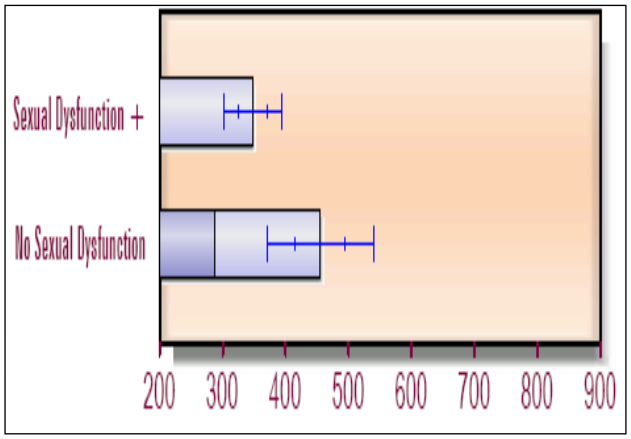

Figure 2: Association between testosterone level and sexual dysfunction.

DISCUSSION

Depression is significantly associated with sexual dysfunction (p = 0.044) in our study. Similar findings were observed Casper et al, Mathew et al, and Angst et al.[9-11] In all these studies, the respective authors have found that among patients with depression, the prevalence of sexual dysfunction was very high. They concluded this observation for all types of depression including recurrent brief depression, dysthymia and major depression. The prevalence of sexual dysfunction was twice among patients with depression than the patients without depression.[12]

Anxiety disorder is significantly associated with sexual dysfunction (p=0.023) in our present study. Kaplan et al also suggest that anxiety disorder is associated with SD in men.[13] It has been an accepted fact that anxiety leads to disorders of sexual arousal. There is a vicious circle of anxiety leading to sexual dysfunction and sexual dysfunction leading to performance anxiety.[14]

Shamloul has observed that honeymoon impotence was a citing example of this condition.[15] Among males suffering from ED, are usually found to have a 2.5% to 37% prevalence of disorders of anxiety.[16] Anxiety (P= 0.0043) is significantly associated with PE in our study. Dunn KM et al, study suggests that anxiety is associated with PE.[17] Surprisingly PE was not correlated with metabolic, hormonal and complication status in type 2 DM in this study.

It is a well-known fact that androgens play an important role as a regulator of sexual behavior especially in males.[18] We found that among males diagnosed as having sexual disorder, the mean levels of testosterone were highly significantly lower than their counterparts who had no sexual dysfunction. (347.892±22.821 versus 455.522±39.640 ng/dl; p = 0.016). These findings are similar to the findings and observations of a study done previously.[19] It was postulated that high levels of testosterone can reduce the erection latency provided that

erection was due to stimulation of sexual material.[20] It was also found that substitution of testosterone especially in males with hypogonadism, arouses the interest in sex, leads to decreased latency and at the same time had positive effect on nocturnal penile tumescence (NPT).[21] Grossmann M et al noted that a very high number of diabetic males had deficiency of testosterone and they were found to have symptoms of hypogonadism.[22] Thus, in males with type 2 diabetes mellitus, as their symptoms are not very specific, it is difficult to diagnose hypogonadism.

In males with type 2 diabetes mellitus, for diagnosis of borderline hypogonadism, it is important to measure the bioavailability of testosterone. In a study, it was found that incidence of free available testosterone concentration was 44% and 33% in diabetic and non-diabetic men respectively.[23]

LH level ($p = 0.001$) was significantly lower in SD group in our study. These findings of significantly low LH and testosterone levels in SD group suggest that a state of functional hypogonadism prevails in this group. The association between type 2 diabetes mellitus and hypogonadotropic hypogonadism was proved in some studies. The incidence of hypogonadotropic hypogonadism was found to be ranging from 25% to 40% in males with type 2 diabetes mellitus.[24] In younger males aged 18 to 35 years with diabetes also, it was observed that the prevalence of hypogonadotropic hypogonadism was at an alarming high rate of 33%.[25]

Males with type 2 diabetes mellitus having low levels of testosterone have high prevalence of hypogonadism. They suffer from erectile dysfunction and easy fatigue.[24] The prevalence of hypogonadotropic hypogonadism is rare in patients with type 1 diabetes mellitus. So, there is confusion over the role of hyperglycemia in hypogonadotropic hypogonadism.[23] Also we know that as the body mass index increases, the testosterone levels decrease. This is applicable for both type 1 and type 2 forms of diabetes mellitus. Hence some consider that hypogonadotropic hypogonadism may be due to insulin resistance.[27] Studies related to hypogonadism speak about insulin resistance, metabolic syndrome and central obesity as the prominent risk factors for hypogonadism.[28] In view of all these observations, the Endocrine Society recommends that men with low testosterone and symptoms of androgen deficiency be considered for therapy with testosterone.[29]

CONCLUSION

Testosterone and LH levels are significantly lower in subjects with SD. Depression and anxiety are significant factors associated with SD. Premature Ejaculation is significantly associated with Anxiety. We conclude that any diabetic patient presented with PE should be focused on management of anxiety.

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