Original Article

Sexual Dysfunction in Drug-Naïve or Drug-Free Male Patients with Psychosis: Prevalence and Risk Factors

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ABSTRACT

Background: There is a growing body of literature on the high prevalence of sexual dysfunction in patients with psychotic disorders. However, most studies have focused on medication-related sexual side effects. **Material and Methods:** Consecutive males with a diagnosis of acute psychosis or schizophrenia who were either drug-naïve or drug-free for six months were recruited to the study after obtaining informed consent. Sociodemographic and clinical data, psychopathology (using Positive and Negative Syndrome Scale), and sexual functioning (using The International Index of Erectile Functioning and DSM-IV TR criteria) were assessed. Bivariate and multivariate statistics were obtained. **Results:** One hundred males were recruited. The overall prevalence of sexual dysfunction by DSM IV-TR criteria in this population was 17%. The factors that were associated with sexual dysfunction were older age and later age of onset of illness. The rate was higher on excluding those who said that they were not sexually active (25%). **Conclusions:** Sexual dysfunction may be found in patients with psychotic disorders even prior to commencing antipsychotic medications. It is possible that this is contributed to by several factors including the disease process. Assessment of sexual function in these patients will help in early identification and appropriate management.

Key words: *Schizophrenia, sexual dysfunction—prevalence and nature, sexual dysfunction—risk factors*

Key messages: *Impaired sexual functioning may be present prior to initiation of treatment in patients with psychotic disorders. Sexual dysfunction in these patients may be contributed to by the disease process and should be differentiated from sexual side effects due to prolactin-increasing properties of the antipsychotic medication. A detailed assessment of sexual functioning at the onset of treatment may be beneficial.*

The prevalence of sexual dysfunction in men with schizophrenia and other psychotic disorders has been reported to be as high as 80%.[1-3] Despite this being higher than that seen in the general population, which is about 20%,[4] this area has not been adequately researched. As the onset of schizophrenia most often coincides with the reproductive period of a person, sexual dysfunction can significantly affect the quality of life in

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these patients.[5-7] It has also been reported to contribute to medication non-adherence.[8] As the majority of patients with psychosis do not spontaneously report their sexual difficulties, the magnitude of the problem is often underestimated. However, it is a challenging problem for the clinicians.

Sexual difficulties among patients with schizophrenia are commonly attributed to the side effects of antipsychotic medications.[9] Other etiological factors that have been implicated include impairment in social and personal relationships, negative symptoms of the illness, and comorbid substance use.[5,10,11] There is also increasing evidence to suggest that sexual dysfunction in schizophrenia may be an intrinsic part of the illness, either during its development or as sequelae.[6,12]

Studies on the prevalence of sexual difficulties among drug-naïve patients with psychosis are scarce with a reported prevalence of 30–60%.[2,3,12] This study aimed to assess the prevalence, nature, and risk factors of sexual dysfunction in drug-naïve or drug-free male patients with psychosis using standardized diagnostic criteria and assessment tools in contrast to previous reports. To the best of our knowledge, there have been no published studies from India which have looked at this topic.

MATERIAL AND METHODS

Study design

This study employed a cross-sectional design.

Study setting and site

The study was carried out in a tertiary care psychiatric hospital which provides short-term care for patients with a range of psychiatric diagnoses. Patients were recruited over a period of 12 months from December 2012 to November 2013. Participants were interviewed at the initial presentation to the hospital when in a drug-naïve state or when off antipsychotic medications for at least six months. All patients received treatment as usual.

Subjects

Consecutive male outpatients and inpatients who were Tamil speakers aged between 18 and 60 years, who satisfied International Classification of Diseases - 10 (ICD-10) research diagnostic criteria for acute and transient psychotic disorder or schizophrenia were invited to take part in the study. Those with a history of antipsychotic exposure within the previous 6 months; with severe language, hearing or cognitive impairment; with a diagnosis of primary mood disorder, substance use disorder or organic disorders; with comorbid medical or surgical disorders or concomitant use of other medications which affect sexual functioning; and those who were unable to participate in the interview due to the severity of psychosis were excluded. The details of the study were explained and written informed consent was obtained from the patient and his caregiver. The Institutional Review Board and Ethics Committee approved the study protocol (IRB Min. No. 7940 dated 02.08.2012).

Variables assessed

Sexual functioning of all subjects who consented to take part in the study was assessed using the Tamil version of the International Index of Erectile Function scale (IIEF)[13] and diagnoses were made in accordance to DSM IV-TR criteria for male sexual dysfunctions. The severity of illness was assessed using the Positive and Negative Syndrome Scale (PANSS).[14] Sociodemographic data and clinical variables were recorded in a specially designed proforma. Serum testosterone (early morning fasting sample) and serum sex hormone binding globulin levels were tested, and free testosterone indices were calculated. All assessments were carried out by the first author (DR).

Sample size calculation

The sample size was determined using EpiInfo (Version 6.0; 1993). The calculations were based on the following assumptions: Estimated prevalence of sexual dysfunction in drug naïve men with psychosis 50%, confidence interval 95%, margin of error of estimate 10%, power 80%.[12] The sample size thus obtained was 100.

Data analysis

Mean, standard deviation, and range were employed to describe continuous variables, while frequency distributions were obtained for polychotomous variables. The Chi-square test and Student's t-test were used to assess the significance of the associations for categorical and continuous variables respectively. Spearman's correlation coefficient was employed to study the correlation between continuous variables. Multivariate logistic regression analysis was carried out using factors found significant on univariate analysis. SPSS for Windows (version 16.0.1) was employed for the analysis of data.

RESULTS

One hundred and eight patients who fulfilled the inclusion criteria were invited to take part in the study. Eight patients refused consent, and hence the sample consisted of 100 patients.

Sociodemographic and clinical characteristics are summarized in Table 1. The majority of the patients

Table 1: Socio-demographic and clinical characteristics of the patients

Sociodemographic and clinical characteristics (*n*=100)	Mean (SD)	Frequency (percentage)
Age in years	31.09 (8.43)	-
Religion - Hindu	-	88 (88)
Occupation of the patient - Employed	-	75 (75)
Occupation of the spouse - Employed (*n*=39)	-	21 (54)
Residence - Rural	-	92 (92)
Literacy - Read and write	-	22 (22)
Marital status - Single	-	58 (58)
Duration of marriage in years (*n*=40)	11.61 (7.95)	-
Age of the spouse in years (*n*=39)	31.56 (6.49)	-
Years of schooling	9.51 (4.49)	-
Family's monthly income (INR)	6113 (8303.69)	-
Patient's monthly income (INR)	1785 (4370.47)	-
Debt - Yes	-	69 (69)
No. of sexual partners (*n*=45) - Single sexual partner	-	41 (91)
Separate bedroom - Yes	-	49 (49)
Diagnosis - schizophrenia	-	87 (87)
Age of onset of illness in years	28.27 (7.59)	-
The total duration of illness in months	33.19 (49.41)	-
Weight (kg)	55.29 (9.48)	-
BMI	19.90 (3.32)	-
PANSS		
Positive scale score	24.78 (6.69)	-
Negative scale score	28.51 (7.17)	
General psychopathology score	53.93 (10.15)	
Depression/anxiety factor score	9.37 (4.17)	
Total score	107.22 (19.36)	
Sexual activity in the last one month - present	-	48 (48)
IIEF		
Erectile function	14.44 (12.14)	-
Orgasmic function	4.62 (4.87)	-
Sexual desire	5.67 (2.09)	-
Intercourse satisfaction	4.56 (5.18)	-
Overall satisfaction	6 (2.20)	-
Testosterone level (ng/dL)	431.68 (210.16)	-
Serum sex hormone binding globulin (nmol/L)	38.94 (18.09)	
Free testosterone index (%)	43.78 (24.34)	

Reliable information regarding age of the spouse and occupation of the spouse were not provided by three patients and hence these patients were excluded, resulting in an 'n' of 39. Similarly, two patients did not provide information on duration of marriage, resulting in an 'n' of 40. INR – Indian Rupees; BMI - Body Mass Index; PANSS - Positive and Negative Syndrome Scale; IIEF - International Index of Erectile Function

were single, employed, and with financial debt. Of those who were married, the majority had been married prior to the onset of the illness. Most patients were diagnosed to have schizophrenia, with a mean age of onset of illness of 28.27 years (sd – 7.59 years) and mean duration of illness of 33.19 months (sd – 49.41 months). A minority of patients reported the use of tobacco or alcohol. Nineteen percent of the study subjects had low testosterone levels (less than 290 ng/Dl in males below 50 years, less than 212 ng/Dl in those above 50 years), and 42% had a baseline low free testosterone index (normal range: 33.8%–106%).

Sexual activity

Totally, 52% of the participants said that they had not been sexually active in the past month. Such lack of sexual activity was significantly associated with higher negative symptom ($t = 3.72$, $df = 98$, $P < 0.001$), general psychopathology ($t = 3.72$, $df = 98$, $P < 0.001$), total PANSS scores ($t = 3.94$, $df = 98$, $P < 0.001$), and single marital status ($\chi^2 = 10.11$, $P = 0.001$). Testosterone levels in the normal range ($\chi^2 = 4.42$, $df = 1$, $P = 0{,}036$, higher body mass index ($t = -3.08$, $df = 98$, $P = 0.003$) and older age ($t = -2.24$, $df = 98$, $P = 0.027$) were associated with being sexually active in the past month.

Sexual dysfunction

17% of the participants reported sexual dysfunction based on the DSM-IV TR criteria. The most common sexual dysfunction was hypoactive sexual desire disorder. Premature ejaculation, male erectile disorder, and orgasmic dysfunction were also reported [Table 2]. IIEF was administered to all participants. Two patients qualified for erectile dysfunction based on the IIEF score and four satisfied DSM-IV-TR criteria.

DSM-IV TR[15] stipulates that in order to make a diagnosis of sexual dysfunction, sexual difficulties should cause significant distress to the individual. On excluding the distress criterion, the overall prevalence of sexual dysfunction increased to 70%, the majority of which were hypoactive sexual desire disorders.

Risk factors associated with sexual dysfunction

Sexual dysfunction of any type was associated with increasing age, later age of onset of illness, married status, presence of financial debt, and higher PANSS depression/anxiety factor [Table 3]. There was no association between sexual dysfunction and the severity of illness or serum testosterone levels. Similarly, there was no correlation between serum testosterone levels and IIEF erectile function scores among those patients who reported to be sexually active.

PANSS negative score had a weak correlation with IIEF subscales of erectile function ($\rho = -0.428, P < 0.001$), orgasmic function ($\rho = -0.373$, $P < 0.001$), sexual desire ($\rho = -0.333$, $P = 0.001$) and intercourse satisfaction ($\rho = -0.353, P < 0.001$). Similarly, PANSS general psychopathology score correlated with erectile function ($\rho = -0.373$, $P < 0.001$), orgasmic function ($\rho = -0.297$, $P = 0.003$), sexual desire ($\rho = -0.301$, $P = 0.002$) and intercourse satisfaction ($\rho = -0.340$, $P = 0.001$). PANSS total score correlated with erectile function ($\rho = -0.401$, $P < 0.001$), orgasmic function ($\rho = -0.343$, $P < 0.001$), sexual desire ($\rho = -0.311$, $P = 0.001$) and intercourse satisfaction ($\rho = -0.346$, $P < 0.001$).

Presence of financial debt (OR = 0.16, CI = 0.03-0.81, $P = 0.027$) and PANSS depression/anxiety factor (OR = 1.17, CI = 1.02-1.34, $P = 0.022$) remained statistically significant on logistic regression when adjusted for age.

Table 2: Prevalence of sexual dysfunction

Type of sexual dysfunction	Prevalence	
	DSM-IV TR criteria (*n*=100)	DSM-IV TR criteria and sexually active (*n*=48)
Hypoactive Sexual Desire Disorder		
Overall	14 (14%)	18.8%
Single	4 (6.9%)	
Married	10 (23.8%)	
Premature Ejaculation		
Overall	5 (5%)	10.4%
Single	-	
Married	5 (11.9%)	
Male Erectile Disorder		
Overall	4 (4%)	
Single	2 (3.4%)	8.3%
Married	2 (4.8%)	
Orgasmic Dysfunction		
Overall	1 (1%)	
Single	1 (1.7%)	2.1%
Married	-	
Prevalence		
Overall	17 (17%)	25%
Single	5 (8.6%)	
Married	12 (28.6%)	

None of the patients fulfilled criteria for sexual aversion or sexual pain disorder. Marital status: Single n=58, Married n=42

DISCUSSION

This study attempted to document the prevalence and characteristics of sexual dysfunction in drug-naïve patients with psychosis, in contrast to most other

Table 3: Factors associated with sexual dysfunction in drug-naïve patients with psychosis - bivariate and multivariate statistics

Socio-demographic and clinical characteristics	Sexual dysfunction		Bi-variate statistics			Multivariate statistics[$] (Adjusted for age)	
	Present (*n*=17)	Absent (*n*=83)	df	t/χ^2	*P*	Odds ratio (CI)	*P*
Age in years (sd)	35.18 (8.23)	30.25 (8.27)	98	-2.24	0.028*	-	-
Marital status							
Single	5	53	1	6.87	0.009*#	0.31 (0.07-1.31)	0.112
Ever married	12	30					
Financial debt							
Yes	15	54	1	3.54	0.084*#	0.16* (0.03-0.81)	0.027*
No	2	29					
Number of sexual partners	0.94 (0.9)	0.45 (0.67)	98	-2.62	0.01*	-	-
Age of onset in years (sd)	33.47 (8.38)	27.2 (7.01)	98	-3.25	0.002*	1.20 (0.99-1.46)	0.062
PANSS - positive score (sd)	24.29 (6.05)	24.88 (6.84)	98	0.33	0.744	-	-
PANSS - negative score (sd)	27.06 (7.4)	28.81 (7.14)	98	0.92	0.363	-	-
PANSS - general psychopathology score (sd)	55.59 (10.33)	53.59 (10.14)	98	0.74	0.462	-	-
PANSS - depression/anxiety factor (sd)	11.24 (4.48)	8.99 (4.02)	98	-2.06	0.042*	1.17 (1.02-1.34)	0.022*
PANSS - total score (sd)	106.94 (20.03)	107.28 (19.34)	98	-0.07	0.948	-	-

PANSS – Positive and Negative Syndrome Scale; *t*=*t* value on Independent *t*-test; χ^2=Pearson Chi-Square value; df – Degree of freedom. The following variables were not significantly related to the presence of sexual dysfunction: years of schooling, place of residence, number of people living in the household, separate bedroom, substance use, duration of illness, serum testosterone level and BMI. [$]Logistic regression adjusted for age. [#]Fisher's exact test *P*. *$P<0.05$

studies that have focused primarily on the prevalence of sexual dysfunction and the effect of medications on sexual functioning.[5,9]

The overall prevalence of sexual dysfunction in this hospital sample was 17%, which increased to 25% on including only those patients who were sexually active. These rates are lower than the prevalence reported in the general population in this region.[4] The EUFEST trial in patients with first-episode schizophrenia reported decreased libido in 30.8%, erectile dysfunction in 17.7% and orgasmic dysfunction in 15%, while Sabry *et al*. reported a prevalence of 64% in their report on 50 drug naïve men with psychosis from Egypt.[2,3] The varying prevalence rates can be explained by the differences in sample selection and assessment criteria.[15-17] In contrast to this study which used the DSM-IV TR diagnostic criteria, previous studies used questionnaires to assess sexual functioning. The mechanical use of assessment instruments may have resulted in higher rates, as these often do not take into account the distress and broader personal and social context that are necessary for a contextual diagnosis of sexual dysfunction.[18] One could also attempt to explain the lower prevalence rates as secondary to the severity of psychopathology;[19] however, there was no statistically significant difference between the two groups based on PANSS positive symptom score in this investigation. Another possible explanation is that partners are more concerned about positive psychotic symptoms and poor occupational and social functioning, and consequently, do not regard sexual dysfunction as a priority, resulting in the under-reporting of it as a problem.

The DSM IV-TR includes distress related to sexual dysfunction as a criterion for diagnosis. Those who did report distress were those who had a lower negative symptom score. This may suggest that patients with significant deficits related to the illness may be less concerned about the sexual difficulties.[5,6] The presence of reduced sexual desire and negative symptoms may explain the lack of distress.

Age was found to be an independent risk factor for sexual dysfunction, and this has been well documented in several other studies as well.[20] Sexual dysfunction and related distress were found to be significantly associated with a later age of onset of illness and married status. While an early onset of the psychotic illness may interfere with the sexual maturation of an individual, later onset of illness following a period of normal sexual functioning may result in greater distress. Many of the single males in the sample were not sexually active. Possible explanations for this could be the fact that the cultural milieu in India does not encourage premarital sex, in addition to which patients with psychosis may not have the social sophistication or resources required for a romantic relationship to progress to a sexual relationship. Such patients may consequently be unaware of their sexual difficulties and therefore report less distress.

There was no association between sexual dysfunction and serum testosterone levels. The lower testosterone levels frequently reported in patients with schizophrenia are most often secondary to antipsychotic medication-related hyperprolactinemia. Negative symptoms are known to be associated with poor functioning in all aspects of life: sexual functioning also appears to be affected, as evidenced by the correlation between negative symptom and IIEF scores in exploratory analysis.

The study adds to the sparse literature on the subject. Its advantages include the use of standard tools for the assessment of sexual dysfunction and psychosis, enrollment of consecutive subjects, the relatively large sample size, and the use of biological parameters and multivariate statistics. Information from the partner provided a useful supplement to patient information; however, it was not possible in patients who were unmarried or living alone. While more objective measurements of sexual functioning to improve reliability would be ideal, these would be time-consuming, resource intensive, and fraught with ethical problems. While the sociodemographic and clinical factors described above were found to be associated with sexual dysfunction, the cross-sectional nature of this study does not allow us to comment on the direction of the relationship. Sexuality is a complex interplay of biological and psychosocial factors, and different kinds of stress are known to have an adverse impact on sexual functioning.

CONCLUSIONS

Impaired sexual functioning is evident prior to initiation of treatment in patients with psychotic disorders. This may suggest that sexual dysfunction in these patients may be contributed to by the disease process and should be differentiated from dysfunction secondary to the prolactin-increasing properties of the antipsychotic medications. A detailed assessment of sexual functioning at the onset of treatment will help in establishing the multidirectional relationships between psychopathology, antipsychotic medication side effects and sexuality, which can improve both psychiatric and sexological treatment.

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Conflicts of interest

There are no conflicts of interest.

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