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KEY WORDS:

SEXUAL DYSFUNCTION IN PATIENTS WITH SCHIZOPHRENIA AND BIPOLAR MOOD DISORDER ON ANTIPSYCHOTIC MEDICATIONS: A SOUTH INDIAN INSTITUTIONAL COMPARATIVE STUDY

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ABSTRACT

AIMS and Objectives: This study intends to study sexual dysfunction in schizophrenics [SZ] and bipolar mood disorder [BMD] patients under active treatment as compared with controls in this part of India.

Material and Methods: In a secondary data, SZ, BMD and normal controls(n=30each) formed the study-group. Detailed histories were collected. Scales used to measure the predictors were PANSS scale for SZ, YMRS/HAM-D for BMD. The outcome variables were - sexual experience of SZ, BMD and normal subjects using Arizona Sexual Experience Scale[ASEX,1997]. Descriptive statistics, chi-square and Kruskal-Wallis test were used. P≤0.05 was considered significant.

Result: ASEX score was significantly different between 3 groups.(P=0.049) Between ASEX domains, ability to reach orgasm was only significantly different.(P=0.024)

Discussion: The study discusses the sexual dysfunction in SZ and BMD under active treatment. With the limited sample size of this secondary data study, the trend of results indicates that in spite of adequate treatment, sexual dysfunction exists in SZ/BMD. More research, with large sample size, follow up and consideration of more confounding factors need to be performed to ensure complete and wholesome recovery in SZ/BMD. This study gives a robust estimate for determining proper sample size and determining power. Also, the individual benefit of using ASEX questionnaire is being highlighted.

Introduction

Sexuality is one of the basic human behaviors that extends beyond procreation, perceived as an act of pursuit of pleasure and is an essential component of normal social life and relationships. [1] Sexual function reflects human's individual physiologic capacity for desire, arousal and ability to attain orgasm. [2] Sexual dysfunction (SD) causes a decrease or other disturbances of sexual desire, which can actively disrupt a person's ability to form or sustain intimate inter-personal relationships. It is reported in relatively common, in varying frequency, among general population and has been reported to be associated with a reduction of the quality of life (QoL).[3]

Sexual dysfunction is reported to be common among patients under treatment for schizophrenia and bipolar mood disorder (BMD)[1-3]. The prevalence of SD in such schizophrenic patients is reported to vary between 16–96% and is often cited as the single most important cause of noncompliance to medications.[3] Among BMD patients, about 66% of them are reported to suffer from SD.[2] Literature reports that there is a tendency among psychiatrists to underestimate the presence of SD in such schizophrenics and BMD. Schizophrenics suffer with SD more commonly than those with affective disorders, whereas it is reported that untreated patients had less SD as compared to those on antipsychotic medication. [4] There are contradicting reports of atypical antipsychotics causing less SD than conventional one while an equal amount of literary evidence found no such pattern of occurrence. It has been reported that Risperidone is associated with SD more frequently than olanzapine, quetiapine and clozapine. [3]

Antipsychoctics is reported to cause SD by either (i) dopaminergic antagonist action,(ii) increased prolactin (secondary to dopaminergic antagonistaction), (iii) blockage of alpha-adrenergic receptor (antiadrenergic action), (iv) blockage of acetylcholine receptors (anticholinergic action), (v) serotonin antagonist action, (vi) histamine antagonist action. It is reported that antipsychotics by binding to dopaminergic, cholinergic, histaminergic and -adrenergic receptors may directly affect sexual function by inhibiting motivation and reward, increasing sedation and reducing peripheral vasodilation. Several neurotransmitters have been involved in three stages of human sexual response cycle. In the desire stage, dopamine exerts a positive influence, while serotonin has negative effects. In sexual arousal stage, norepinephrine, acetylcholine, and dopamine (DA) are positively involved while serotonin has a negative effect. Orgasm or the final stage is inhibited by serotonin and facilitated norepinephrine with dopamine exhibiting weak positive influences. [5] The schizophrenia and BMD illness variables include negative symptoms mediated by low libido, direct effects of psychosis and abnormalities in the limbic system contributing directly to SD. [6]

Globally, though there is much ongoing research on SD in patients with schizophrenia and BMD. However most of the studies are jeopardized by inclusion of culturally, racially, mixed and cross-diagnostic groups, smaller sample-sizes, issues with retrospective quality of the analysis, predominant inclusion of men and use of conventional, multidrug antipsychotics. These variables pose difficulty in interpreting the results. [2]

Though there are several studies to high light the existence of SD in schizophrenic and BMD among several populations, there are very few reports of the existence of SD in these populations from Southern part of India. The present study intends to assess and compare the prevalence of SD in schizophrenic and BMD as compared to normal controls. The secondary aim was to describe the select socio-demographic and clinical characters of the disease process associated with SD. Our null hypothesis was that there would be no difference in SD characteristics between schizophrenics, BMD and normal controls in this part of India.

Materials and Methods

Sample Size Calculation

The sample size was calculated using values for schizophrenia and controls and the same numbers extended to BMD. Using open epi-info (http://www.openepi.com/v37/Menu/OE_Menu.htm) software, using the sample size calculator for a cohort study, a two sided confidence level (1- α) of 95%, a 5% significance level and for a power (1- β) of 90 and a ratio of 1 case for every control was given. An assumption that 5% of unexposed (Controls) had SD and 50% of schizophrenic patients had SD (outcome), a minimum sample of 23 in each of control and schizophrenia was calculated. This was rounded to 30 in each of schizophrenia, BMD and control group with equal gender distribution.

Study design and population

This was a secondary data analysis. The primary data was collected for a study presented in the Zonal level meeting of the National Psychaitric Association. The aim was to compare the quality of life, particularly in the sexual domain among schizophrenia, BMD and apparently normal controls. The data were collected from subjects attending a single-center. The design was non-interventional,

cross-sectional observational study. At the start of the study, the interviewing author (AMA) was educated and calibrated by senior authors by providing education and training for using the standardized profoma, the scales used in evaluating sexual function, monitored and ensured its continuous standardized use. The primary data used standard, recommended protocols and did not deviate from any recommended health care delivery process. Verbal, informed consent from all participants was taken. After collection of the data, the personal identifiers were masked during the data entry and this masked data formed the data for this study.

Thirty consecutive outpatients with schizophrenia and BMD attending the hospital between 1st August to 30th September 2013 fulfilling the inclusion and exclusion criteria were recruited for the primary study. Inclusion criteria for the study are the following: (1) diagnosed with condition (schizophrenia/BMD) according to the diagnostic criteria of ICD10; (2) between 18 and 60 years of age; (3) having received the adequate doses of the same antipsychotic drugs for at least 3 months; (4) no history of hospitalization, exacerbation or electroconvulsive therapy application in the last 3 months; (5) enough intellectual capacity to answer the scale questions. Exclusion criteria are the following: (1) use of drugs that are known to cause SD (antidepressants, antiepileptics, antihypertensives, antidiabetic drugs, etc.); (2) presence of a systemic medical disease that might cause SD; (3) pregnant or lactating women; and (4) history of alcohol and/or drug addiction or abuse. (5) unwilling patients and those were not in a position to give voluntary consent (6) those with irregular treatment seeking behavior and (7) newly diagnosed patients. Gender, Age (±1 year) and educational status were matched as near possible. Apparently normal and healthy controls, drawn from normal public visiting the hospital as other department patient's attendees were recruited as controls in the primary data. Care was ensured to recruit these controls among willing persons fulfilling inclusion and exclusion criteria except for inclusion criteria 1 and 3. Those control population who had their first or second degree relative suffering from any psychiatrical disorders were excluded from this study.

From potential participants, using a preformatted, semi-structured data collection form for each patient was filled out by a single author (AMA). Details of the sociodemographic information, patients' interest in and attitude towards sexuality, presence of partner/marriage relations were all questioned in this form.

The following were the predictor variable used. Age was categorized in to below 3rd decade of life, 4th, 5th and 6th decade of life. Education, income and occupational was classified as per updated Kuppuswamy's socioeconomic scale. [7] Familial setup (joint/nuclear) and marital status (single/ married/ separated/divorced) were the other parameters used. Clinical severity of the disease was evaluated using the following forms. For this current study, the following forms were translated to regional language using the standard, prescribed World Health organization methodology. [8] Positive and Negative Syndrome Scale (PANSS +ve/ PANSS –ve)[9] and General Psychopathology scale [10] was used for schizophrenic patients, Young Mania Rating Scale (YMRS)[11] or Hamilton Depression Scale (HAMDS) [12]for BMD appropriately.

The outcome variables used were the Arizona Sexual Experience Scale (ASEX) [13]. They were filled in as described for the entire study group. ASEX quantifies sexual desire, arousal, vaginal lubrication/penile erection, ability to reach orgasm and satisfaction with orgasm in both genders. ASEX was applied to the patient by the interviewing author, by reading out the items and choices. ASEX total score is obtained from the sum of the scores of five questions each scored between 1 and 6. Possible scores range from 5 to 30, where higher scores represent greater sexual dysfunction. The criterion for sexual dysfunction was total ASEX ≥ 19 or any one SEX item with an individual score ≥ 5 or any three ASEX items with individual scores ≥4 [13]. Depending on this clinical outcome, the entire study population was dichotomized in to non-SD and SD. The ASEX have been reported to posses' favorable psychometric properties. [14]

Statistical Analysis

Data were entered and analyzed using Statistical Package for Social Service 17.0. (SPSS-IBM, IL, USA) Descriptive statistics were provided for the numeric and categorical variables using mean, standard deviation (with prefix ±) and percent distribution (%), as necessary. Group differences were determined using Chi-square (2) test for categorical variables and student t-test for continuous variables. Cross tabulation were performed and nominal variable by a chi square test to give a P-value. Kruskal-Wallis test was used to determine the overall significant differences among groups for the ASEX score. Overall significant differences were analyzed for presence of pair wise difference using the Mann-Whitney U-test. Wilcoxon Signed Rank test was used to assess the distribution of two paired variables in two related samples. A p-value of less than 0.05 was used for statistical significance.

Results:

The demographic characters of schizophrenic (n=30), BMD patients (n=30) and controls (n =30) are depicted in Table 1. Each group had equal gender distribution. The mean age of schizophrenic, BMD and control group were 38.53±8.33, 38.47±7.85 and 35.83±7.22 years respectively and this was not statistically significant different. (P =0.534) The age, age group, religion, education, occupation, income, familial setup or marital status did not significantly between the study groups. The mean duration of illness was 87.53 months for schizophrenics and 86.73 months for BMD while the duration of treatment was 69.97 months in schizophrenics and 60.47 months among BMD study group.

Among schizophrenics, risperidone (12 patients, 40%), haloperidol (10 patients, 33.33%), chlorpromazine (5 patients, 16.67%) and triflurperazine (3 patients, 10%) were the predominant drugs while in entire BMD study population were on sodium valporate.

In all, 27 (30%) of the 90 people had SD in the study group. Of this, 16.67% (n=5) of controls, 40% (n=12) of schizophrenics and 33.33% (n =10) of BMD had SD. The distribution of SD between schizophrenics and controls was significantly different. (P = 0.043) while the same in between BMD and controls was not significant (P = 0.117) [Table 2] On comparing the SD with non-SD, age group (P=0.157), gender (P=1), religion (P=0.677), education (P=0.291), occupation (P=0.619), income (P= 0.788), familial set-up (P=0.858) and marital status (P=0.569) were not significantly different.

The ASEX score for males was 15.38±5.17 and females were 15.31±5.05 and the difference was not statistically significant. (P =0.661). Similarly ASEX scores was not significantly different between age group (P=0.683), religion (P=0.553), educational status (P=0.14), income (P=0.407), familial (P=0.938) and marital status (P=0.235) and occupation (P=0.298) in the study group. (Table 2)

On comparing the schizophrenic disease severity, with clinical SD with non-clinical SD, it was observed that PANSS +ve score was 8 ±1.78 in non-SD group while in SD group it was 11.33±5.43 with a significant difference. (p = 0.022). The PANSS-ve and general psychopathology was not significantly related (P =0.122 and 0.222 respectively) between SD and non-SD group. The severity of the disease and ASEX score was directly correlated with PANSS+ve and PANSS-ve (P=0.000) and moderately with general psychopathology scale. (P =0.024).

In BMD group, HAMD score was used in 4 BMD cases. In non-SD group it was 2.5 ±0.71 while in SD group it was 12 ±1.41 (P = 0.333) and YMRS in 26 BMD cases with no difference between SD and non-SD difference. (P = 0.426). The disease severity relation to ASEX score, revealed that HAMD had no statistical correlation (P = 0.068) while YMRS showed significant relation. (P=0.000)

Mean ASEX score was 13.15 ± 2.72 for non-SD group while for SD group it was 20.21 ±5.72 with a high statistical significance. (P = 0.000) and a similar observation was made among the schizophrenic, BMD and controls.

Table 3 depicts the self rated perception of SD among various

domains of ASEX in each of schizophrenia, BMD and controls. Sexual drive was reported as varying degrees of strong by 50% of schizophrenics and BMD and 60% of controls. (P = 0.152). Ability of arousal and maintain the same was reported to be varyingly strong in 17 (56.67%) schizophrenics, 23 (76.67%) BMD and 27 (90%) controls with high statistical significance (P = 0.04). The ability to sustain erection/achieve lubrication, reach orgasm and overall satisfaction was not statistically different (P = 0.698, 0.068 and 0.064 respectively). Number of patients/controls having scores of ≥5, expressing SD and ≤4 in each domain were compared in each group. Of this, the ability of getting aroused, with 26.67% (n=8) schizophrenics and 20% (n=6) BMD as compared with no controls had statistical significance. (P=0.012) In the overall satisfaction domain, SD was seen in 16.67% of schizophrenics and 20% of BMD as against 0 controls with high statistical significance (P=0.04). For sexual drive (p=0.11), erection/lubrication (P = 0.232) and ability to reach orgasm (P =0.133) was not significant.

The self perception of SD compared within the study group (Table 4) revealed that the ability to reach orgasm was single most important criteria, as reflected by the difference of mean, as it was significantly different among the groups. (P =0.024).

On comparing the mean ASEX domain score separately with controls, the schizophrenic subgroup had no statistically significant domain while the BMD sub group had statistically significant difference with ability of arousal (P = 0.036), ability to reach orgasm (P = 0.008) and overall satisfaction (P = 0.031). (Table 5)

Discussion:

A normal sexual function is complex, mediated, influenced and orchestrated by chemicals of endocrine, neurotransmitters and neuropeptides in origin. Endogenous chemicals such as androgens, estrogens, progesterone, prolactin, oxytocin, cortisol and pheromones and neurotransmitters such as dopamine, serotonin and epinephrine, are also implicated in the pathophysiology of the major psychiatric disorders widely employed in their pharmacological management. Schizophrenic patients by virtue of their disease process are susceptible to SD. The pre-morbid personality of these patients has been often described schizoid or schizotypal with a history of limited interpersonal relationships and even lack of sexual experience. In course of disease, negative symptoms of the disorder, such as anhedonia, avolition and blunted affect are correlated to hypodopaminergic activity in the frontal cortex which limits the ability to enjoy a healthy and satisfactory sexual life. Adding to these, is the fact that these patients face issues with establishing relationships due to recurrent psychotic episodes, obesity and often low self esteem. Moreover, schizophrenia patients are on antipsychotics that often lead to blockade of postsynaptic D_2 dopaminergic receptors in brain leading to SD. [15] It is reported that the SD in bipolar disorder, is attributed to antipsychotics and antidepressants used as a part of treatment.[2] Though large number of studies attribute SD to antidepressants, very few study have studied the prolonged use of antipsychotic's effect on SD in BMD and much less in Indian population. [2,16] Binding to dopaminergic, histaminergic, chlorinergic and alpha-adrenergic receptors may affect sexual function directly by inhibiting motivation and reward, increasing sedation and reducing peripheral vasodilation leading to poor sexual outcome. Blockade of dopamine D_2 receptors in the tubero-infundibular pathway by antipsychotic drugs can modify sexual function causing elevated prolactin levels. Symptoms of such hyperprolactinemia include decreased libido, impaired arousal and orgasm. Hyperprolactaemia is an important mechanism through which antipsychotics cause SD. The drugs prescribed to this study population have been known to cause hyperprolactinaemia including risperidone and haloperidol. [17]

This study is unique, as it is probably first in this population as there are no studies that report of SD among schizophrenics and BMD under active medical treatment as compared to general population, especially those using ASEX. The assessment procedure used to measure SD differs widely. There are self-reported, semi-structured direct and indirect questionnaire, or direct questioning method and the measures include the objective versus subjective measures. Many studies that deal with SD rely on self-report or subjective clinician impression, rather than structured assessment, except for the ones that measures prolactin levels. Designing structured interviews and using it efficiently to elicit accurate information from schizophrenic regarding their sexuality is often considered challenging. Some of the structured assessments are widely believed to be over projecting SD incidence in this group, there is also wide variability among types of structured interviews utilized. The most commonly used instruments are the ASEX and Udvalg for Kliniske Undersřgelser (UKU) Side Effect Rating Scale. [18] The other scales include Psychotrophic Related Sexual Dysfunction Questionnaire[19] International Index of Erectile Function (IIEF) questionnaire [20] Sexual Functioning Questionnaire [21] and Sexual Behavior Questionnaire.[22] A recent study has compared the efficacy of predicting SD among schizophrenics and found that ASEX, UKU Side Effect Rating Scale, Psychotrophic Related Sexual Dysfunction Questionnaire and found that there is rate of SD differed with instrument. However there was a significant relationship between the instruments with greater agreeability. [19] Several other studies have identified ASEX as a reliable instrument for assessing SD. [3,23] Given the taboo associated with discussions related to sexual behavior in Indian communities[19], a reliable instrument with minimum questions (five) - the ASEX was used for this study. Furthermore the ASEX design of being a self- or clinician-administered instrument, applicable to heterosexual and homosexual populations, as well as for those without sexual partners, renders this instrument more suitable for a rapid, mass screening tool with high reliability. [23] Hence this instrument is also valid, as it is a self perception of the study population with regards to SD. The high degree of correlation of WHO-BREF QoL with ASEX score validates that the interviewer bias is minimal in this study.

As observed in table 1, the schizophrenic, BMD and controls had no significant difference in terms of age group, religion, education, occupation, income, familial set up and marital status. There was no significant difference between SD and non-SD as well as ASEX score between these parameters as described in result section. However, significant difference existed between the schizophrenia and controls in terms of SD and non-SD as seen in table 2. Similarly, significant difference existed between ASEX score between BMD and controls.

From table 3, it is observed that the domains that differed with statistical significance were the ability to get sexually aroused and sustain the same. For this domain, 10% of controls, 43.33% of schizophrenics and 23.33% of BMD had expressed that they were "weak" in this domain. Of these, 16.67% of schizophrenics and 13.33% of BMD had "never" arousal at all. The difference in the answers was statistically significant with P = 0.04. The prevalence of SD, measured as an ASEX score of ≥5 in each domain as compared with ≤4 was highly significant for arousal, indicating that about 1 in 4 schizophrenics had SD in this domain. The arousal domain is a significant aspect of SD, especially in schizophrenics and bears a direct relationship with disease process though the mean ASEX scores (Table 4 and 5) fail to find statistical association, which could be related to the closer range.

Sense of sexual gratification is a complex neuro-endrocrine process, mediated by hormones and neurotransmitters that could be compromised by self-perceived or organically mediated decreased libido, arousal, ability to initiate and sustain an erection/vaginal lubrication, achieve orgasm and overall satisfaction. [18] There are many circuitries involved from several higher centers of the brain that control these domains. [22-27]

The present observation of a statistical significance exhibited by the altered arousal pattern in ASEX scale among schizophrenics could be explained by the pathological process in brain. In schizophrenics, the relationship of brain activity deficits in the arousal circuitry with schizophrenic symptomatology has been varyingly reported in literature. Some school of thoughts have identified a unique subset of patients referred as "deficit schizophrenia" who exhibited greater reductions in emotion expression and recognition than their "non-deficit counterparts" while some of have refuted the existence of such subtypes. Some distinct studies have identified that the psychotic symptomatology

has lead to change in brain activity deficits in arousal circuitry. Though the admission, selection and gender bias have been cited for this phenomenon, the gender mediated existence of differential reaction of human brain to affective disturbances cannot be largely ignored. It is reported that several studies have documented the difference in functional imaging studies of emotion discrimination and mood induction deficits in activations of frontal cortex, insula, and amygdale unaccounted for by medication effects or visual perception deficits. These brain activity deficits bore correlation with autonomic arousal and modulated by valence. The basic fact these areas in human brain exhibit greatest sexual dimorphism and have high density of sex steroid and glucocorticoid receptors, indicating a potential role for gonadal and adrenal hormones in understanding affective disturbances in schizophrenia and their association with gender. Research findings have documented that there is a dysregulation of feedback between the autonomic nervous system, amygdala and prefrontal cortex that regulate arousal in schizophrenics. While attributing SD to such abnormalities, caution should be exercised as hormonal abnormalities among schizophrenics under treatment, at least in part, could explain the gender based differential dysregulation between the autonomic and central nervous system. [29] Our findings of statistically significant altered arousal domain in schizophrenic could be attributed to this phenomenon. Our results are in agreement with previous studies from other parts of the world. [15,17,19,23]

From Tables 5, it could be visualized that the domains of arousal, reach orgasm and overall satisfaction was significantly related to BMD. The individual scores too exhibited this trend. These domain relationships too, underline the direct relational ship with the BMD disease progression. In BMD, episodes of depression occur alternately with manic or hypomanic episodes. At such periods, patient's mood turns euphoric and labile, with his/her capacity for deriving pleasure increases, which in turn leads to increased tendency for pleasure seeking behavior, and causing increased energy psychomotor activity, libido. Owing to these patients experience elevated self esteem. The same emotional domains variations are implicated in depression and maniac episodes. The clinical manifestations of BMD have involvement of cognitive, emotional and visceral functions subserved by the orbital and medial prefrontal networks. The neuroimaging abnormalities found in BMD are in agreement with above hypotheses regarding the neural circuitry underlying depression. This were initially based on observations from the behavioral effects of lesions experimentally placed in experimental animals via the Cortico-Striatal-Thalamic Circuits and the related Orbito-Medial Pre-Frontal Circuitry (OMPFC) as well as from the clinical manifestations of lesions or atrophy arising in the context of neurological disorders associated with major depressive episodes. It also has been reported that degenerative basal ganglia diseases, and lesions of the striatum and OMPFC, increased the risk of developing such major depressive episodes in BMD. Data emanating from these animal studies implicated the limbic-cortico-striato-pallido-thalamic circuits and the related to the medial and orbital prefrontal networks in BMD. Because these neurological disorders affect synaptic transmission through the cortico-striato-pallidothalamic circuitry in diverse ways it appears that dysfunctions that alters transmission through these circuits in a variety of ways can produce the pathological emotional symptoms in BMD. Patients with BMD manifest abnormalities of morphology or morphometry in several medial prefrontal network and limbic structures. The most prominent volumetric abnormality reported in BMD has been a reduction in gray matter in the left anterior cingulate cortex ventral to the carpos callosum. Many of the regions in which structural abnormalities are evident in BMD also contain abnormalities of blood flow and glucose metabolism. [29] These circuitry have been reported to be involved in the domains of perceiving and mediating pleasure seeking behavior compromised by dopamine antagonism and disrupted circuitries in brain that is concerned with neural correlates of orgasm and sexual satisfaction. [24-27]

Our results with regards to SD in BMD patients are in agreement with previous reports.[24-26] All the current BMD patients were on sodium valporate for varying lengths of time. This drug is known to significantly lower the intratesticular testosterone levels in rats. It has been demonstrated that sodium valproate acts directly on the rat testis, to inhibit testosterone synthesis by the Leydig cells. Such alterations were documented even with short span of use and levels return to normalcy with cessation of drug. The inhibition of intratesticular testosterone could result be a cause of SD at least in male rats. Similar effects have been observed among humans too. [30]

Based on the above discussion, we reject our null hypothesis in favor of alternate hypothesis. Sexual dysfunction is more among schizophrenics, BMD than controls and could cause decreased quality of life in these patients. The age, gender, religion, education, occupation, marital status, income and familial set-up does not influence SD in this cohort. The disease process, besides the drugs given, intrinsically could lead to SD. This could be further modified by the strong, deep rooted, socio-cultural, semblance imbibed in the South Indian population leading to perceived poorer SD in these patients. It is worthwhile to observe that the clinical outcome of SD is more significant for schizophrenia while the entire ASEX score gives better meaning in BMD population.

Limitation of this study

A larger cohort would highlight sharply the standard deviation associated with the various domains of ASEX, which in turn would give better, focused and clearer significant P values. This would help to highlight the true nature of the disease process. The drug prescribed, duration of illness, age of diagnosis and duration of drug use are other important variables, though unconnected (and hence not studied) with the aim of this study has to be considered and studied as they are potential factors that could cause SD. Measure of prolactin levels would have given more insights to the SD. Lack of pre-morbid assessment and its non-consideration in this cohort is a drawback, a possible, inherent defect in such cross-sectional observational study design.

The main clinical lesson from the current study is that:

1. For schizophrenic ASEX outcomes are more important while for BMD, total score is important.
2. Domains of ASEX should be concentrated for both the population.
3. Psychiatrists should look out for possible SD in schizophrenic and BMD patient under drug therapy.

Conclusions

The study has identified that SD exists more common among schizophrenics and BMD patients. It could be a major factor to cause non-adherence of therapy and cause decreased quality of life. Hence sexual and SD history must be sought at all patient interviews and suitable modifications be instituted early for better quality of life. Psychiatrists should include questions pertaining to the details of SD appropriately in their periodic interviews to provide better health care to their patients.

Table 1: Demographics of the cohort classified by schizophrenia, bipolar mood disorder and controls

		Schizophrenia (N = 30) N (%)	BMD (N = 30) N (%)	Controls (N = 30) N (%)	P value
Age Group (in years)	Below 30	3 (10)	3 (10)	6 (20)	0.820
	30-39	14 (46.7)	15 (50)	15 (50)	
	40 to 49	10 (33.3)	9 (30)	8 (26.7)	
	50-59	3 (10)	3 (10)	1 (3.3)	
Mean age		38.53±8.33	38.47±7.85	35.83±7.22	0.534
Religion	Hindu	28 (93.3)	29 (96.7)	27 (90)	0.650
	Christian	2 (6.7)	1 (3.3)	2 (6.7)	
	Islam	0	0	1 (3.3)	

Education	Post Graduation	0	0	1 (3.3)	0.171
	Post high school	1 (3.3)	0	0	
	Diploma	0	0	1 (3.3)	
	High school	13 (43.3)	12 (40)	6 (20)	
	Middle school	9 (30)	3 (10)	10 (33.3)	
	Primary school	5 (16.7)	8 (26.7)	8 (26.7)	
	Illiterate	2 (6.7)	7 (23.3)	4 (13.3)	
Occupation	Semi-profession	0	0	1 (3.3)	0.222
	Farmer	1 (3.3)	0	0	
	Skilled	1 (3.3)	0	2 (6.7)	
	Semiskilled	4 (13.3)	3 (10)	2 (6.7)	
	Unskilled	14 (46.7)	12 (40)	5 (16.7)	
	Unemployed	3 (10)	2 (6.7)	5 (16.7)	
	Home maker	7 (23.3)	13 (43.3)	15 (50)	
Income (In Indian Rupees) Per month	16020- 32049	0	0	1 (11.1)	0.134
	12020 – 16019	1 (5.3)	0	1 (11.1)	
	8010 -12019	5 (26.3)	1 (6.7)	1 (11.1)	
	4810-8009	5 (26.3)	3 (20)	4 (44.4)	
	1601-4809	8 (42.1)	8 (53.3)	1 (11.1)	
	Below 1600	0	3 (20)	1 (11.1)	
Familial Setup	Nuclear	28 (93.3)	23 (76.7)	27 (90)	0.133
	Joint	2 (6.7)	7 (23.3)	3 (10)	
Marital status	Single	2 (6.7)	1 (3.3)	1 (3.3)	0.628
	Married	27 (90)	29 (96.7)	29 (96.7)	
	Divorced/ Separated	1 (3.3)	0	0	
Duration (in Months)	Illness	87.53	86.73		
	Treatment	69.97	60.47		

Table 2: Comparison of Sexual Dysfunction patient with non-Sexual Dysfunction patient in the cohort

		No Sexual Dysfunction N (%)	Sexual Dysfunction N (%)	P value
Controls		25 (83.3)	5 (16.7)	
Schizophrenia		18 (60)	12 (40)	0.043* (Significant)
BMD		20 (66.67)	10 (33.3)	0.117*
		Mean ± SD	Mean ± SD	
Schizophrenia	PANNS – Positive	8±1.78	11.33±5.43	0.022 (Significant)
	PANNS – Negative	8 ±0.84	10±5.11	0.122
	General Psychopathology	18.06 ±3.02	19.5±3.23	0.222
BMD	HAMD	2.5 ±0.71	12 ±1.41	0.333
	YMRS	7.59±7.46	5.4±6.19	0.426
	Controls	3.76 ±0.52	3.6 ± 0.89	
ASEX score		13.15 ± 2.72	20.21 ±5.72	0.000(Significant)
ASEX	Schizophrenia	13.67±3.74	19.67±713	0.000(Significant)
	BMD	13.69 ±1.83	21.73±5.18	
	Controls	12.36 ±2.31	18.2±1.3	

*As compared with control group;

Table 3: Number of patients in the cohort in various domains of the Arizona Sexual Experience Scale

		Controls	Schizophrenia	BMD	P value
Sexual drive	Extremely strong	0	3	0	0.152
	Very strong	5	2	5	
	Somewhat strong	14	10	11	
	Somewhat weak	9	7	7	
	Very weak	2	2	3	
	Absent	0	6	4	
Arousal	Extremely strong	2	4	2	0.04(Significant)
	Very strong	11	6	4	
	Somewhat strong	14	7	17	
	Somewhat weak	3	5	1	
	Very weak	0	3	2	
	Absent	0	5	4	
Erection/Lubrication	Extremely strong	3	5	3	0.698
	Very strong	15	8	9	
	Somewhat strong	8	10	11	
	Somewhat weak	3	3	2	
	Very weak	0	1	2	
	Absent	1	3	3	
Reach orgasm	Extremely strong	1	5	0	0.068
	Very strong	15	7	7	
	Somewhat strong	11	10	15	
	Somewhat weak	2	2	2	
	Very weak	1	2	3	
	Absent	0	4	3	

Satisfaction	Extremely strong	3	7	0	0.064
	Very strong	10	7	9	
	Somewhat strong	17	10	14	
	Somewhat weak	0	1	1	
	Very weak	0	2	1	
	Absent	0	3	5	

Table 4: Arizona Sexual Experience Scale - Mean Score for each domain in the cohort

	Schizophrenia	BMD	Controls	P value
Sexual Drive	3.7±1.53	3.67±1.27	3.27±0.83	0.432
Arousal	3.4±1.65	3.3±1.37	2.6 ±0.77	0.077
Erection/ Lubrication	2.87±1.46	3 ±1.41	2..5 ±1.04	0.358
Reach orgasm	3.03 ±1.59	2.5 ±1.04	2.57 ±0.82	0.024(Significant)
Satisfaction	2.77±1.55	2.79 ±1.32	2.47 ±0.68	0.094

Table 5: Comparison of mean score of each domain of Arizona Sexual Experience Scale of Controls with Schizophrenia and Bipolar mood disorder

	Controls	Schizophrenia		BMD	
	Mean ± SD	Mean ± SD	P value	Mean ± SD	P value
Sexual Drive	3.27±0.83	3.7±1.53	0.231	3.67±1.27	0.305
Arousal	2.6 ±0.77	3.4±1.65	0.63	3.3±1.37	0.036(Significant)
Erection/ Lubrication	2..5 ±1.04	2.87±1.46	0.34	3 ±1.41	0.15
Reach orgasm	2.57 ±0.82	3.03 ±1.59	0.336	2.5 ±1.04	0.008(Significant)
Satisfaction	2.47 ±0.68	2.77±1.55	0.856	2.79 ±1.32	0.031(Significant)

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