Sexual dysfunctions in drug-naive male patients with first-episode schizophrenia: a case–control study

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Introduction
Sexual dysfunction is highly prevalent in patients with schizophrenia and other psychotic disorders, which may be because of their symptoms, hospitalization, or psychotropic medications. This could have a negative impact on patients' quality of life. However, data on this topic are scarce among Egyptian patients.

Aim
We aimed to evaluate and compare types of sexual dysfunctions in a sample of nonmedicated male patients with first-episode schizophrenia and healthy individuals, and to determine the possible relationships between the sexual dysfunction domains and symptom profile among patients.

Patients and methods
The study included 50 male patients aged younger than 50 years, admitted to the Inpatient Unit of Psychiatric Department, Cairo University, over a 1-year interval. They were subjected to the following scales: the Mini International Neuropsychiatric Interview, the Positive and Negative Syndrome Scale, the Montgomery–Asberg and a designed questionnaire was also used to collect the patients' sociodemographic data.

Results
Male patients with schizophrenia have significantly more sexual dysfunction than healthy controls (56 vs. 6%). There was a statistically significant relationship ($P \leq 0.001$) between long duration of untreated psychosis, severity of negative symptoms and depressive symptoms with the severity of sexual dysfunction among patients with schizophrenia.

Conclusion
The prevalence of sexual dysfunction in psychotropic drug-naive male patients with first-episode schizophrenia was generally high and would suggest that sexual dysfunction is an integral part of the development of illness and unlikely to be related to the prolactin-increasing properties of the antipsychotic medication. The study also concludes that greater symptom severity in the patient group was associated with greater impairment in sexual function. Therefore, sexual assessment should be a part of every psychiatric examination.

Keywords:
first episode, male patients, schizophrenia, sexual dysfunctions

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Introduction

Sexual dysfunction is highly prevalent in patients with schizophrenia and other psychotic disorders, with reported prevalence rates up to 80% in men and women [1–4]. Many factors are implicated in the etiology of sexual dysfunction in psychotic patients including long-term pharmacological treatment [4,5], impairment of personal and sexual relationships as part of negative or depressive symptoms, nicotine, illicit drug use, and comorbid physical disorders [6–9]. In addition, sexual dysfunctions in psychotic patients are not frequently reported by patients; thus, they are usually considered challenging underestimated problems for clinicians and therapists [2,10].

The peak age of onset of schizophrenia is during the reproductive period [11], which could deleteriously affect the quality of life of individuals with schizophrenia and may be related to patients' unwillingness to adhere to their medication regimens. They are even considered significantly more dreadful than sedation, extrapyramidal, or vegetative side effects of antipsychotics [12].

First-episode psychosis is reported to be associated with a higher prevalence of sexual dysfunctions. Unfortunately, the elucidation of causative factors remains a challenging and debatable issue as some researches have pointed to the effects of antipsychotic medications [4,5] on patients' sexual functions, whereas other recent researches reported sexual dysfunctions in schizophrenia as an intrinsic part related to the development of illness or as a sequel of the disease itself and may also be related to symptom severity [13]. Nevertheless, there is still little

information on the relation between different schizophrenia symptoms and sexual dysfunctions in individuals with first-episode psychosis.

Sexual dysfunctions are prevalent in both male and female patients with schizophrenia, but female patients usually show a better social, functional outcome and longer lasting (sexual) relationships than men with schizophrenia. Previous studies reported sex differences in the types of sexual dysfunctions as it has been reported that the most frequent sexual dysfunctions in patients with first-episode psychosis are ejaculatory disorders and erectile dysfunction in men, hypolubrication, and anorgasmia in women, and a decrease in sexual desire or libido in both sexes [4,14,15].

Despite the importance of sexual function to the patients' quality of life and treatment compliance, the prevalence of sexual dysfunction in schizophrenia, particularly in Egypt, has not been studied adequately. The degree to which sexual dysfunction may be underdiagnosed remains uncertain. Thus, clinicians' awareness and recognition of these sexual matters is of utmost importance.

The aim of this study was to compare sexual functions of nonmedicated male patients with first-episode schizophrenia and healthy control participants, and to determine the possible relationships between the sexual dysfunction domains and symptom profile in patients with schizophrenia.

Patients and methods

Study design

The study is a cross-sectional study that was carried out on a sample of Egyptian drug-naive patients with first-episode schizophrenia.

Selection of participants

Case group

Fifty patients were recruited from the inpatient department of psychiatry and addiction hospital, Cairo University, over a 1-year interval (from July 2014 to June 2015). They were diagnosed according to the International Classification of Diseases, 10th ed., criteria [16] using the Arabic version of Mini International Neuropsychiatric Interview (MINI) [17]. Inclusion criteria for the study participants were: male patients with first-episode schizophrenia, being married at least 2 years before the onset of seeking mental health service advise, age younger than 50 years (to avoid the effect of aging on sexual function), and a negative previous history of psychiatric illness. We excluded patients who had other organic conditions such as metabolic, cardiovascular, and endocrine disorders, substance abuse, and current use of psychoactive medications (e.g. antipsychotics, antidepressants, anticonvulsants, lithium, or β-blockers) that could affect their sexual functions.

Control group

For the purpose of comparison, we recruited 50 Egyptian male healthy participants. They were recruited from among visitors to the Medical Department of Cairo University Hospitals. They were matched with the case group for age, sex, educational level, and other demographic variables as much as possible. Exclusion criteria for the control group were as follows: (i) any current or previous history of psychiatric, medical, or neurological disorder that could affect their sexual functions and (ii) current treatment with any psychotropic medications. They were examined using the MINI to confirm the absence of a current or a previous psychiatric disorder.

Ethical consideration

All procedures were reviewed and approved by The Ethical Committee of Faculty of Medicine, Cairo University. The patients were informed of the nature of the study and the confidentiality of the information obtained. It was stated that participation in the study was voluntary and that the participants has the freedom to withdraw at any time; a printed consent was signed by each participant.

Clinical assessment

All assessments for the case group were performed before the start of any psychotropic medications; this was done within the first 2–3 days of patients' admission to the hospital. We used the following tools for the clinical evaluation of both cases and controls:

(1) A designed questionnaire that was used to gather data on the patients' sex, age, years of education, marital status, occupation, duration of illness (in years), age of onset, and duration of untreated psychosis (DUP), which was defined as the time from the appearance of the first prodromal symptoms to the initiation of antipsychotic treatment.
(2) MINI [17] was used to confirm the presence or absence of a current or a previous mental disorder.
(3) Arizona Sexual Experience Scale (ASEX) [18]: This is a five-item questionnaire designed to measure different aspects of sexual functioning over the previous week: sexual drive, arousal, penile erection/vaginal lubrication, ability to reach orgasm, and satisfaction with orgasm. Items are rated on a six-point Likert scale from 1 (hyperfunction) to 6 (hypofunction). This results in a total score that ranges between 5 and 30. A total score of greater than 18, a score of greater than or equal to 5 (very difficult) on any single item, or scores of greater than or equal to 4 on any three of the five items are considered indicative of clinically significant sexual dysfunction.
(4) The Positive and Negative Syndrome Scale (PANSS) [19]: This scale is a semistructured clinical scale, which is well defined and standardized for typological and dimensional assessments of schizophrenia. The scale is composed of 30 items: a positive scale (first seven items) and a negative scale (other seven items). On the basis of the differential between

these scales, a bipolar composite scale specifies the degree of preponderance of one syndrome over the other. Finally, a fourth index, the General Psychopathology Scale, gauges the overall severity of schizophrenic disorder by summation of the remaining 16 items. This was used to measure symptom severity of patients with schizophrenia. The original English version was used because it is a structured clinician-rated scale. This was applied only for the cases.

(5) The Montgomery–Asberg Depression Rating Scale (MADRS) [20]: was used to evaluate depressive symptoms in patients with schizophrenia.

Statistical analysis

Statistical analysis of data was carried out using SPSS, version 11, SPSS Inc., Chicago, USA. Quantitative data were presented as means ± SD for parametric data and we used Student's *t*-test for the comparison. Number/frequency and percentage were used for nonparametric data. The difference between dichotomous variables was tested using the χ^2-test or Fisher's exact test when appropriate. We used nonparametric statistics with Spearman's correlation coefficient with bivariate analysis to determine the relation between sexual functioning and psychotic symptoms. The level of significance was set to 0.05.

Results

Sample sociodemographic characteristics

The total sample presented here included 50 patients with first-episode schizophrenia and 50 healthy participants. The mean age of the case group was 26.8 ± 10.8 years and that of the controls was 27.1 ± 8.5 years. Cases and controls were well matched with respect to age and education level as much as possible.

Clinical characteristics

The mean DUP was 18.4 ± 9.7 weeks. The mean scores of PANSS and MADRS are presented in detail in Table 1.

Comparison between sexual function of patients with first-episode schizophrenia and healthy participants

Sexual dysfunction was encountered in 32 (64%) patients and six (12%) healthy participants ($\chi^2 = 19.56$, $P < 0.001$) (Fig. 1 and Table 2).

Results also showed that the five components of ASEX (sexual arousal, sex drive, penile erection, achieving orgasm, and satisfaction with orgasm) were significantly worse in patients than in controls. The overall ASEX score also indicated greater sexual dysfunction in patients than in controls (Table 3).

Table 1 Means of Positive and Negative Syndrome Scale and Montgomery–Asberg Depression Rating Scale

PANSS	Mean ± SD
Positive Scale	22.1 ± 10.4
Negative Scale	28.3 ± 11.8
General Psychopathology	49.3 ± 14.6
MADRS	19.9 ± 7.2

MADRS, Montgomery–Asberg Depression Rating Scale; PANSS, Positive and Negative Syndrome Scale.

Figure 1

Comparison between sexual function of patients with first-episode schizophrenia and healthy participants.

Correlation between sexual functions and clinical characteristics in patients with first-episode schizophrenia

Results showed that patients' sexual dysfunctions were correlated positively with long DUP and more prominent negative symptoms on PANNS and depressive symptoms on MADRS (Table 4).

Discussion

A limited number of studies have evaluated sexual functioning in patients with schizophrenia. Improving clinicians' awareness of the importance of sexual dysfunction in patients may improve tolerability and subsequent treatment outcomes.

The aim of the current study was to compare sexual function between drug-naive male patients with first-episode schizophrenia and healthy control participants, and to determine the possible relationships between the sexual dysfunction domains and symptom profile in schizophrenic patients.

These results showed that more than half (64%) of all our patients with first-episode psychosis had some form of sexual dysfunction. These high rates of dysfunction involved all sexual domains and are not specific to particular domains of sexual function, affecting sexual drive and arousal as well as erectile functioning, orgasm, and satisfaction. The observed impairment was significantly greater than that in healthy individuals ($P \leq 0.001$). Our findings are comparable with those reported in other studies [21–28] and similar to previous studies that demonstrated that sexual dysfunction is already present at illness onset [13,29] and in antipsychotic-naive patients [30].

Table 2 Percentages of patients with first-episode schizophrenia versus healthy participants who reported sexual dysfunction using the Arizona Sexual Experience Scale

ASEX subscales	Patients (*N*=50) [*n* (%)]	Controls (*N*=50) [*n* (%)]	χ^2 (*P*-value)
Sexual drive	10 (20)	2 (4)	18.56 (<0.001)**
Sexual arousal	22 (44%)	3 (6)	17.68 (0.022)*
penile erection	30 (60)	4 (8)	10.09 (0.004)**
Achieve orgasm	28 (56)	5 (10)	19.76 (<0.001)**
Satisfaction with orgasm	28 (56)	5 (10)	16.81 (<0.001)**
Overall sexual dysfunction	32 (64)	6 (12)	19.56 (<0.001)**

ASEX, Arizona Sexual Experience Scale.
Significant differences ($P<0.05$).
*Statistically significant.
**High statistical Significance.

Table 3 Comparison between sexual function of patients with first-episode schizophrenia and healthy participants using the Arizona Sexual Experience Scale

ASEX subscales	Patients (*n*=50) (mean ± SD)	Controls (*n*=50) (mean ± SD)	*t*-Test (*P*-value)
Sexual drive	4.50 ± 1.82	2.16 ± 0.67	3.90 (<0.001)**
Sexual arousal	3.53 ± 1.19	1.02 ± 0.99	1.73 (0.003)**
penile erection	3.51 ± 1.52	1.42 ± 1.02	2.86 (0.003)**
Achieve orgasm	3.46 ± 1.53	2.61 ± 1.01	3.31 (0.001)**
Satisfaction with orgasm	3.64 ± 1.71	1.14 ± 1.03	4.91 (<0.001)**
Total score (range: 5–30)	19.98 ± 6.43	10.78 ± 2.46	4.33 (<0.001)**

ASEX, Arizona Sexual Experience Scale (higher scores represent greater dysfunction).
Significant differences ($P<0.05$)
**High statistical Significance.

Table 4 Correlation between sexual functions and clinical characteristics in patients with first-episode schizophrenia

ASEX item	DUP [*r* (*P*)]	PANSS positive score [*r* (*P*)]	PANSS negative score [*r* (*P*)]	PANSS general psychopathology score [*r* (*P*)]	MADRS score [*r* (*P*)]
Sexual drive score	−0.31 (0.982)	−0.072 (0.531)	−0.31 (0.405)	−0.32 (0.523)	0.34 (0.004)**
Sexual arousal score	−0.56 (0.431)	−0.08 (0.438)	0.31 (0.059)	−0.91 (0.861)	0.89 (0.023)*
Penile erection score	−0.11 (0.04)**	−0.81 (0.329)	−0.418 (0.009)**	−0.27 (0.478)	0.19 (0.435)
Achieve orgasm score	0.17 (0.03)**	−0.10 (0.648)	−0.351 (0.001)**	−0.03 (0.673)	−0.96 (0.013)*
Satisfaction with orgasm score	−0.336 (0.001)**	−0.17 (0.248)	0.402 (0.002)**	−0.33 (0.532)	0.39 (0.041)*
Total ASEX score	0.297 (0.01)*	−0.21 (0.362)	0.501 (0.008)**	−0.18 (0.660)	−0.342 (0.002)**

ASEX, the Arizona Sexual Experience Scale; DUP, duration of untreated psychosis; MADRS, Montgomery–Asberg Rating Depression Scale; PANSS, Positive and Negative Syndrome Scale.
Significant differences ($P<0.05$).
*Statistically significant.
**High statistical Significance.

Our study confirms and extends the results of previous studies [8,10,31], which showed a positive correlation between the severity of illness profile and the severity of sexual dysfunction in patients with first-episode schizophrenia. This was explained in some other studies by the fact that this observed relationship could be an epiphenomenon of antipsychotic treatment as higher doses of antipsychotic medication may be associated with more severe illness [5,9,12]. However, our results confirmed that the positive linear relationship between symptom severity and the total ASEX score was detectable in patients who were antipsychotic naive, suggesting that the reported finding was not an effect of antipsychotic treatment. Our study findings thus support previous findings and suggest that sexual dysfunction is a feature of vulnerability to or development of a psychotic illness [8].

In the current study, higher PANSS negative symptoms and longer DUP were identified as predictors of decreased orgasm, satisfaction, and overall sexual functions in patients with first-episode schizophrenia. Our results are consistent with other studies that reported that negative symptoms have negative effects on the sexual life of patients with schizophrenia [27]. However, data on the association of sexual dysfunction domains with the schizophrenia psychopathology are inconsistent. Some studies reported that more pronounced PANSS general psychopathology symptoms significantly predicted higher rates of both erectile and ejaculatory dysfunctions, whereas more PANSS negative symptoms and older age were identified as predictors of decreased libido [8]. However, another study by Ciocca *et al.* [32] suggested that female sexuality is more linked to the psychopathological condition compared with that in men, and the strong connection between psychopathology and female sexuality is also present at the beginning of a mental disorder.

Various studies showed that long DUP correlated significantly with poor general symptomatic outcome and more severe negative symptoms [33,34]. Similarly, in agreement with our results, a study by Sibinovic *et al.* [35]

found that longer DUP was associated with sexual dysfunction among male patients with schizophrenia and more severe negative symptoms at baseline.

Incorporation of depressive symptoms into the pathogenesis of sexual dysfunction in psychotic disorders remains controversial; some studies reported a direct effect of depressive symptoms on sexual function [36], whereas others found no association between these variables [14,37].

Our data showed that although depressive symptoms contributed toward sexual dysfunction, they do not fully explain all types of sexual impairment observed in patients with first-episode schizophrenia, and indicated that a component of sexual dysfunction, mainly erectile dysfunction, is integrally linked to the psychotic symptoms. The link between psychotic symptoms and erectile dysfunction suggests that they are mediated by the same underlying neuroanatomical and neurobiological factors. One potential candidate is dopaminergic dysfunction, which is already present at the early stages of psychotic disorders, but appears to progress with the longer duration of psychosis (DUP) and with negative symptoms [38,39], and may disrupt erectile pathways required for sexual function [40,41].

Strengths and limitations

This is one of the few studies to investigate the prevalence and patterns of sexual dysfunction in nonmedicated male patients with first-episode schizophrenia and how the severity of sexual dysfunctions correlated with the illness severity and psychopathology, whereas most other studies have either focused exclusively only on the prevalence of sexual dysfunction or have analyzed the effect of medications on sexual functions.

However, our study was limited by its cross-sectional design; a longitudinal follow-up might provide more information. This study could only determine the association between sexual dysfunction and possible predictors, but not the cause and effect relationship. A larger sample size would have enabled more analyses and could have shown clearer differences between the groups. Another limitation is the lack of information on the levels of hormones such as sex hormones and prolactin and their impact on sexual functioning.

Conclusion

Sexual dysfunction in nonmedicated patients with first-episode schizophrenia was highly prevalent, and more than expected; therefore, the sexual assessment should be a part of routine psychiatric examination. This suggests that sexual dysfunction is intrinsic to the development of illness and unlikely to be related to the prolactin-increasing properties of the antipsychotic medication. In addition, the severity of sexual dysfunction is strongly correlated with the severity of schizophrenia psychopathology and the duration of untreated illness. An understanding of this aspect is necessary to determine both psychiatric and sexological treatment.

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Conflicts of interest

There are no conflicts of interest.

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