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Original article

# Sexual dysfunction and central obesity in patients with first episode psychosis

C. Theleritis [a,1], S. Bonaccorso [a,1,*], N. Habib [a], D. Stahl [b], F. Gaughran [a], S. Vitoratou [b], Z. Atakan [a], A. Kolliakou [a], P. Gardner Sood [a], P. Dazzan [a], T.R. Marques [a], P. McGuire [a], K. Greenwood [d], J. Eberhard [a], J. Breedvelt [a], S. Ferracuti [c], M. Di Forti [a], R.M. Murray [a], S. Smith [a]

[a] Department of Psychosis Studies, Institute of Psychiatry, Psychology and Neuroscience, King's College, London, UK
[b] Department of Biostatistics, Institute of Psychiatry, Psychology and Neuroscience, De Crespigny Park, King's College, London, UK
[c] University of Rome « La Sapienza », Sant'Andrea Hospital, Rome, Italy
[d] School of Psychology, University of Sussex, Brighton, UK

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ABSTRACT

*Background:* In recent years the association between sexual dysfunction (SD) and obesity in the general population has drawn major attention. Although sexual dysfunction is common in psychosis, its relationship with weight gain and obesity remains unclear.
*Aims:* To investigate the association between sexual dysfunction and obesity in a cohort of patients with first episode psychosis.
*Method:* Sexual function was assessed in a cohort of patients with first episode psychosis using the Sexual Function Questionnaire (SFQ). Anthropometric measures, including weight, BMI, waist, waist–hip ratio were investigated. Additionally, leptin and testosterone were investigated in male patients.
*Results:* A total of 116 patients (61 males and 55 females) were included. Of these 59% of males and 67.3% of females showed sexual dysfunction (SD) according to the SFQ. In males, higher SFQ scores were significantly correlated with higher BMI (Std. $\beta = 0.36$, $P = 0.01$), higher leptin levels (Std. $\beta = 0.34$, $P = 0.02$), higher waist–hip ratio (Std. $\beta = 0.32$, $P = 0.04$) and lower testosterone levels (Std. $\beta = -0.44$, $P = 0.002$). In contrast, in females, SFQ scores were not associated with any of these factors.
*Conclusions:* While sexual dysfunction is present in both female and male patients with their first episode of psychosis, only in males is sexual dysfunction associated with increased BMI and waist–hip ratio. The association between SD, BMI, low levels of testosterone and high levels of leptin suggest that policies that lead to healthier diets and more active lifestyles can be beneficial at least, to male patients.


## 1. Introduction

The association between sexual dysfunction (SD) and heavier weight and obesity in the general population has recently drawn considerable attention [1–3]. More specifically, erectile dysfunction in healthy males has been observed in association with obesity and other abnormal metabolic parameters [1], as well as with high levels of leptin and low levels of testosterone [2,4].

It is of interest that some of these factors, such as abnormal testosterone [5] and increased leptin levels [6] have also been reported as altered in patients with first episode psychosis, who also exhibit high rates of SD [7]. For example, prevalence rates of up to 37–65% of SD have been reported in patients with FEP [7,8]. Furthermore, patients with FEP often present weight gain and metabolic abnormalities, mainly attributed to the use of antipsychotics [9–12].

A relationship between being overweight and central obesity on one side, and higher levels of leptin [13] and lower levels of testosterone on the other has been proposed to explain the presence of hypogonadism and sexual dysfunction in the general population. According to this, the excessive circulating levels of leptin seen in the overweight might disrupt the steroidogenic function of the Leydig cells, with a subsequent reduction in

* Corresponding author. Department of Psychosis Studies, Institute of Psychiatry, Psychology and Neuroscience, King's College London, PO 63, De Crespigny Park, SE5 8AF London, UK.
*E-mail address:* stefania.bonaccorso@kcl.ac.uk (S. Bonaccorso).
[1] The first two authors have contributed equally to the manuscript and share the first position.

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hCG-driven testosterone production and testosterone deficiency as a final result [4,14,15]. This testosterone deficiency has then been found to be associated with both hypogonadism and SD [2,3,16–18].

However, so far, few studies have investigated the potential causes of SD in FEP patients [8,19]. To our knowledge, none has explored the relationship between SD, weight, testosterone, leptin and central obesity in patients with FEP. More specifically, no previous study has investigated whether hyperleptinaemia and testosterone deficiency may explain, at least in part, the sexual dysfunction often seen in patients with first episode psychosis; and how weight gain is associated with increased levels of leptin and decreased values of testosterone and ultimately with sexual dysfunction. Studying these factors in patients at their first psychotic episode has several advantages: individuals have been exposed to medication for a relatively short period of time, and are less likely to suffer from residual and negative symptoms.

In a sample of patients at their first psychotic episode we investigated the following hypotheses:

- that the presence of SD would be associated with being overweight, as indicated by higher weight and BMI, larger waist, waist–hip ratio;
- that in male patients sexual dysfunction would be associated with overweight, lower testosterone and higher leptin plasma levels.

## 2. Methods

### 2.1. Design

This was a cross-sectional study of patients with first episode psychosis, conducted in the South London and Maudsley (SLAM) and Oxleas and Sussex Partnership NHS Trusts. The study was approved by the Ethics Committees of these Trusts (ref. # 1275/SUPA/2009).

### 2.2. Participants

Patients presenting for the first time to psychiatric services with a functional psychotic illness (ICD10: F = 20–29 excluding coding F1x.0 for acute intoxication), psychotic symptoms lasting for at least 7 days and with an age between 18–65 years were approached from August 2008 to July 2011. Researchers screened for potential participants at the beginning of each week through a variety of means to ensure the maximum level of recruitment and minimise selection bias. They took a list of all new admissions and screened clinical notes to assess for eligibility. Researchers attended weekly team meetings where the cases were discussed with doctors, nurses and healthcare assistants. Once a patient was deemed suitable, researchers would approach the potential participant and invited to participate in the study. The specifics of the project would be fully described and patients would be given the information and consent sheets. If patients were willing to participate and able to give informed consent, they were requested to read through the information sheet, invited to ask any questions and confirm that they fully understood the study and eventually sign the consent form.

Exclusion criteria were: presence of an organic psychosis, a moderate or severe learning disability (as defined by ICD-10 F = 70–73, WHO, 1992), pregnancy, history of a medical or physiological cause of gonadal or sexual dysfunction (including hypothyroidism or other endocrine or metabolic disorder, vascular disorders and neurological disorders) [7,20,21], lack of English fluency (requiring a translator), history of contact with health services (GP or mental health services) for psychosis beyond the previous 6 months.

A total of 286 patients consented to the study. Of the 286 potential patients at baseline, 27 were subsequently excluded for not satisfying the criteria for a first episode of psychosis or needing a translator, leaving a sample of 259 eligible participants. A further 40 patients dropped out leaving a final sample of 219 patients available for baseline assessments. At baseline, information on sexual dysfunction were available on 116 subjects.

### 2.3. Study procedure

Sociodemographic data (age, gender, self-reported ethnicity, level of education attainment, and employment status) on subjects were collected using the Medical Research Council Social Scale [22]. Medication histories were completed using information directly from patients and double checked with both inpatients and outpatients' electronic records. Total days of exposure to antipsychotic medication was intended to be a lifetime exposure. This was calculated by converting the antipsychotic daily dose into chlorpromazine equivalent and multiplied for the total number of days the subject was exposed to antipsychotic – this was taken as a cumulative dose of antipsychotics. The date when the first prescription was issued was as start date and the date of completion of assessments and point of entry to our study was used as end date.

Antipsychotic doses were converted into chlorpromazine equivalents using established criteria [23]. Daily and cumulative dose of antipsychotics was used as an indicator of impact of antipsychotics on sexual function and to determine whether there was a relationship between dose and outcome.

Sexual dysfunction was evaluated with the short Sexual Function Questionnaire (SFQ) [20]. The SFQ is a self-report structured instrument that has been previously validated in patients with psychotic disorders [20,21]. Higher scores indicate greater impairment, and a total SFQ score equal or higher than 8 is considered a cut off indicating the presence of sexual dysfunction. The Positive and Negative Syndrome Scale (PANSS) [24] was used to evaluate psychotic and negative symptoms in patients with psychosis, as there is evidence of an association between sexual dysfunction and negative symptoms in patients with chronic psychosis [25,26]. Depressive symptoms were assessed with Calgary Depression Score (CDS [27]) as previous studies have shown that low mood can impact sexual function in the general population [28–30]. Researchers with extensive training rated PANSS and CDS. Inter-rater variability for PANSS and CDS was 0.95 and 0.96 respectively. A detailed history of illicit drug use (cannabis, stimulants, and any other recreational drug) was taken using the Cannabis Experience Questionnaire modified version [31]. Anthropometric measures such as weight, waist, hip, waist–hip ratio, BMI were recorded on the day of assessment together with serum levels of prolactin, leptin and testosterone.

### 2.4. Laboratory procedures

Patients were asked to fast and abstain from eating or drinking (except plain water) from midnight until 8am of the day on which a blood sample was collected by an experienced phlebotomist. Samples were analysed by the King's Pathology Laboratory at King's College Hospital, London.

Testosterone was analysed using a radio-immuno-enzymatic procedure that uses testosterone labelled with acridinium ester and an anti-testosterone antibody bound to paramagnetic particles to produce a light emission reaction. Intra-assay precision was calculated as mean 3.31 (nmol/L) for Level 1 with CV of 6.2%.