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Metabolic syndrome among schizophrenia patients: Study from a rural community of south India

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ABSTRACT

Though metabolic syndrome (MS) is a major concern in schizophrenia, there is no data among rural community dwelling patients in India. This study describes prevalence and correlates of MS in a cohort of schizophrenia patients from a rural community of south India. 171 patients with schizophrenia were screened for the presence of MS using the International Diabetes Federation (IDF) criteria. 94.8% were receiving atypical antipsychotics for a mean (SD) duration of 13.04 (9.51) months. Fifty-four of the 171 (31.6%) patients screened met criterion for central obesity. Of these, laboratory results (fasting blood sugar, triglycerides and HDL cholesterol) were available for 47 patients. The rest 7 were deemed to have met the criteria for MS in order to avoid under-estimation of the syndrome. Only 22 (12.86%) patients met the criteria for MS thus defined. Females were significantly likely to have both central obesity and MS than males. No other predictors of metabolic adverse effects could be identified. Biological and the prevailing socio-cultural factors may contribute to such considerably low prevalence of metabolic abnormalities. Lack of data from a control group forms the most important limitation of this study.

1. Introduction

Physical health of patients with schizophrenia is increasingly becoming an issue of public health significance. These individuals have higher mortality (Saha et al., 2007) and reduced life expectancy (Jacob and Chowdhury, 2008) than general population. Only about 40% of this excess mortality is because of unnatural causes like suicide/accidents; about 60% of it is because of physical illnesses (Brown, 1997). This excess mortality risk is due to circulatory, respiratory, digestive, genitourinary and endocrine diseases including diabetes (Brown et al., 2000).

With regard to the cardio metabolic risk factors among patients with schizophrenia, there is extensive literature (Newcomer, 2007; Jacob and Chowdhury, 2008). Obesity is known to occur in a frequency that is three times higher than that of the general population (Coodin, 2001); almost half the population of schizophrenia is reported to have obesity (McElroy et al., 2006). Prevalence of diabetes and impaired glucose tolerance is higher among patients with schizophrenia (Bushe and Holt, 2004). Cardiac morbidity is significantly more in patients with mental illnesses (including those with schizophrenia) when compared to the general population (Sowden and Huffman, 2009). Both hypertension and smoking are seen two to three times more commonly in patients with schizophrenia than that are seen in general population (De Hert et al., 2011). Though the mortality from heart diseases is decreasing over the past two decades in the general population (Jemal et al., 2005), this is not so in the case of individuals with schizophrenia. In fact, the 'mortality gap' has widened between general population and persons with schizophrenia (Saha et al., 2007). It is in this background that metabolic syndrome (MS) among schizophrenia patients has assumed great significance in recent decades.

There is evidence of impaired insulin sensitivity even among un-medicated schizophrenia patients (Ryan et al., 2003; Venkatasubramanian et al., 2007; Grover et al., 2012b). However, with the advent of second-generation antipsychotics (SGA), issues related to diabetes, obesity and metabolic syndrome have raised considerable concern among clinicians and researchers alike (American Diabetes Association, 2004).

Reported prevalence of MS ranges between 22% and 60% percent among antipsychotic-treated patients in the western countries (McEvoy et al., 2005). It is important to study the occurrence of this association in the Indian context, as ethnicity, diet and lifestyle differences are likely to influence insulin sensitivity (King et al., 1998).

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Reports from India also show the prevalence rates varying from 3.9% to 45% (Saddichha et al., 2007; Padmavati et al., 2010; Subashini et al., 2011; Grover et al., 2012a; Kagal et al., 2012). Incidence rates have varied from 10.1% (Saddichha et al., 2007) after six weeks of antipsychotic treatment to 11.6% (Gautam and Meena, 2011) after 4 months of treatment. Biological as well as psychosocial factors have been implicated in its causation. However, these reports are based on patients that were freshly treated in the hospital setting. The relevance of these studies to the rural community setting, where more than 70% of the population of India is residing is unexplored. This is particularly important because under the National Mental Health Program, all patients with severe mental disorders are likely to be brought under the umbrella of treatment, mostly with SGAs. Thus, studying the prevalence and determinants of metabolic syndrome in rural areas provides more useful information from the public health perspective. In this study, we have examined the issue of MS among schizophrenia patients living in a rural south Indian community.

2. Methods

2.1. Sample

Patients for this study came from a community intervention program that is running Thirthahalli taluk (a local administrative unit) of south India. Our team has been running this program for the past seven and a half years. Case identification and treatment issues have been detailed elsewhere (Thirthalli et al., 2009). At the time of conducting this study, a total of 256 persons were identified as having schizophrenia. Out of this 256, there was a change of diagnosis in two, four had died and 25 did not consent. Out of the remaining 227, 171 had been screened for MS. We provide findings from this sample.

2.2. Treatment

All subjects were encouraged to continue or commence APs from either our team or any other physicians of their preference. Their treatment details were noted. Table 1 shows the socio-demographic and clinical details of these patients. Of these, 5.2% refused APs and they continued to remain untreated; 94.8% received APs (Table 2). The treated patients were on APs for a mean (SD) period of 13.04 (9.51) months at the time of screening for MS.

2.3. Assessments

Height, weight, waist circumference, and blood pressure were recorded in all subjects. Subjects were weighed with minimal necessary clothing; their height was measured to the millimeter accuracy after taking off the footwear; waist circumference was measured at the level of the highest point on bilateral iliac crest at the point of gentle exhalation in standing position. Blood pressure was recorded once using the manual sphygmomanometer to the millimeter accuracy in the supine position after making the patient lie down for 10 min.

International Diabetes Federation (IDF) criteria were used to define metabolic syndrome in this population. Waist circumference greater than 90 cm for males and 80 cm for females is an essential criterion to define MS for South Asian population (International Diabetes Federation, 2006; see Box 1). All subjects who met this criterion were advised laboratory tests, which included fasting blood sugar, triglycerides and high-density lipoprotein cholesterol (HDL cholesterol). Psychopathology was assessed using Positive and Negative Syndrome Scale (Kay et al., 1987). Disability was assessed using the Indian Disability Assessment and Evaluation Scale (IDEAS; Rehabilitation Committee of Indian Psychiatric Society, 2002).

This study was cleared by the Institutional ethics committee. Written informed consent was obtained from the participants. Statistics were computed for the demographic and clinical variables as well as for the variables relevant for the evaluation of metabolic abnormalities.

Table 1
Socio-demographic and clinical details of patients who were screened for metabolic syndrome ($n = 171$).

Variable	Mean (SD)/*N* (%)	Range
Age in years	41.38 (11.00)	17–80
Education in years	5.75 (4.59)	0–15
Sex		
Males	81 (47.4%)	–
Females	90 (52.6%)	
Socioeconomic status		
Low	85 (49.7%)	
Middle	64 (37.4%)	–
High	22 (12.9%)	
Duration of illness in years	11.44 (8.81)	0.2–46
PANSS scores[a]	49.80 (19.85)	29–135
IDEAS score[a]	4.34 (6.67)	0–53

[a] At the time of screening for metabolic syndrome.

Table 2
Treatment details.

Antipsychotic	*N* (%)	Mean (SD) dose[a]	Dose range
Risperidone	118 (68.2)	3.5 (1.67)	1.5–8.0
Olanzapine	31 (17.9)	10.0 (5.83)	2.5–30.0
Clozapine	1 (0.6)	145.0 (146.20)	25–400
Chlorpromazine	8 (4.6)	127.28 (60.68)	50–250
Trifluperazine	4 (2.3)	10.0 (5.0)	5–15
No treatment	9 (5.2)	–	–

[a] mg/day in the past 2 months prior to assessment.

Box 1. International Diabetic Federation criteria for the metabolic syndrome (2006).

Central obesity (defined as waist circumference >90 cm for South Asian men and >80 cm for South Asian women)
Plus any two of the following four factors:
Raised TG level: ≥150 mg/dL (1.7 mmol/L), or specific treatment for this lipid abnormality
Reduced HDL cholesterol: <40 mg/dL (1.03 mmol/L[a]) in males and <50 mg/dL (1.29 mmol/L[a]) in females, or specific treatment for this lipid abnormality
Raised blood pressure: systolic BP ≥130 or diastolic BP ≥85 mm Hg, or treatment of previously diagnosed hypertension
Raised fasting plasma glucose (FPG) ≥100 mg/dL (5.6 mmol/L), or previously diagnosed type 2 diabetes
If above 5.6 mmol/L or 100 mg/dL, OGTT is strongly recommended but is not necessary to define presence of the syndrome.

[a] These values have been updated from those originally presented to ensure consistency with ATP III cut-points.

3. Results

Table 3 shows the results of the screening and laboratory findings. A total of 54 patients (5 males and 49 females) had waist circumference above the cut-off. Laboratory tests could be conducted in 47 (87.0%) of these. Two (3.7%) refused consent for laboratory tests and 5 (9.3%) missed the appointments. For the purposes of further analysis, patients whose waist circumference were in the risk range but had no laboratory data were deemed to have met the full criteria for MS. This was done in order to avoid