

Metabolic syndrome and cardiovascular risk among institutionalized patients with schizophrenia receiving long term tertiary care

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Abstract

Background: Metabolic syndrome (MetS) and cardiovascular risk are highly prevalent among individuals with schizophrenia. This study aimed to determine the cardiometabolic profile and the associated risk factors in a group of institutionalized patients with schizophrenia or schizoaffective disorder receiving prolonged hospital care in the only tertiary psychiatric institution in Singapore.

Methods: Patients residing in long stay wards who were hospitalized for a minimum period of 1 year were recruited. Fasting blood sample was collected to obtain levels of blood glucose, total cholesterol, high-density lipoprotein (HDL) and triglycerides. Waist circumference, blood pressure, height and weight were also measured. The prevalence of MetS and the 10-year cardiovascular risk were determined.

Results: This inpatient group had a mean age of 56.1 years and an average length of hospitalization of 8.8 years. The prevalence of MetS in this group was 51.9% and 26.9% based on the AHA/NHLBI and modified NCEP ATP III criteria respectively. Those in the high risk BMI category and those who had pre-existing diabetes had higher odds of MetS. Their 10-year cardiovascular risk was estimated at 12.8%, indicating intermediate risk based on the Framingham risk function.

Conclusion: Despite the low smoking rate in this group of inpatients, their cardiovascular risk appeared to be relatively high possibly due to old age and age-related conditions such as hypertension and low HDL. While literature has found the use of atypical antipsychotic medications to increase the risk of MetS, we did not find any significant association. Additionally, the duration of hospitalization did not affect the rate of MetS in our sample.

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1. Introduction

Metabolic syndrome (MetS) comprises a constellation of different medical conditions, including central obesity, glucose intolerance, dyslipidemia and hypertension, which are associated with an increased risk for cardiovascular diseases (CVD) [1]. The study of MetS in patients with

schizophrenia in particular has received significant attention in the literature [2,3]. Elevated medical morbidity and mortality rates have been observed in patients with schizophrenia, along with shortened life expectancy compared to the general population [4–6]. This has been largely due to CVD as well as from other causes such as suicide and accidents [4–7]. Koponen et al. [8] reported that individuals with schizophrenia were three times more likely than those from the general population to suffer from sudden cardiac death. Besides the presence of metabolic syndrome, other risk factors such as age, gender and cigarette smoking were also widely recognized for developing CVD [9]. Together, these factors may combine and interact multiplicatively to promote vascular risk and complicate treatment [10].

While the pathophysiology of MetS has not yet been fully understood, insulin resistance and central role of visceral adiposity remain as the two most important underlying causes [11,12]. The presence of Type 2 diabetes mellitus

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(T2DM) was found to be higher among those with schizophrenia than matched controls, as well as those who were prescribed antipsychotics [13]. Hansen et al. [14] found the comorbidity of schizophrenia and T2DM to be associated with an at-risk allele located in the TCF7L2 gene, thus suggesting common genetic predisposition. In recent decades, the differential mortality gap between schizophrenia individuals and the general community is believed to have worsened despite improvements in mental health services [6,15]. Some reports have suggested that the use of second-generation antipsychotic medications (i.e., atypical antipsychotics) can potentially further influence mortality rates among patients with schizophrenia [6,16]. It has been shown that atypical antipsychotics use was associated with higher risk of hyperglycemia and impaired glucose levels, hence leading to increased rates of metabolic syndrome [17]. The incidence of metabolic syndrome was estimated at 20% following a 1-year treatment with an atypical antipsychotic drug [18]. Other studies have also found increasing age-adjusted deaths and standardized mortality ratios for all causes of death including cardiovascular deaths to be possibly a result of deinstitutionalization [15,19]. For example, studies in Japan revealed MetS prevalence to be two-three folds higher in the outpatient compared to the inpatient population [20,21]. It has been suggested that less monitoring and more freedom for the patients accompanied by change in hospitalization environment to shorter inpatient stay and outpatient care have led them to adopt an unhealthy lifestyle and become less inclined to seek health care [22,23]. These adverse lifestyle factors affecting vascular risk may include poor dietary habits, obesity, physical inactivity, and increased cigarette or alcohol intake. In particular, studies have shown that individuals with schizophrenia or psychosis engaged in less moderate and vigorous physical activity [24,25], higher levels of sedentary behavior during waking days [26], and poorer diet characterized by high saturated fat intake and low fiber consumption [27] compared to controls.

Physical health problems have been associated with increased burden among mental health patients which may in turn result in poorer outcomes for their psychiatric conditions, greater symptom severity [28], and eventually leading to decreased compliance with treatment. In this respect, it is therefore essential to identify comorbid medical conditions for psychiatric patients as this plays a significant role in aiding the improvement of subsequent outcomes, both medical and psychiatric.

The Institute of Mental Health (IMH) is the only tertiary psychiatric hospital in Singapore that offers a comprehensive range of psychiatric, rehabilitative and counseling services to those with mental illnesses. The Institute has about 2000 beds in its inpatient setting and approximately 60% of which are housed in long-stay wards for patients requiring long-term care. A large majority of those staying in the long-stay wards suffer from severe and chronic mental illness, and are not manageable at home, homeless or

abandoned by their family members [29]. These individuals tend to require highly structured nursing care and to a large extent, hospital care has replaced home care for them. The current study thus seeks to look into the cardiovascular health status and to examine the abovementioned factors associated with metabolic syndrome among this group of psychiatric inpatients receiving long term hospital care, particularly those with schizophrenia.

2. Methods

2.1. Recruitment

Data were collected in the period of July 2014 to April 2015 from fourteen long-stay wards that house inpatients who had resided in the hospital for more than one year. Inclusion criteria included those aged 21 and above and those who have been diagnosed with schizophrenia or schizoaffective disorder by trained consulting psychiatrists based on Fourth Edition of the Diagnostic and Statistical Manual of Mental Disorders, or DSM-IV criteria. Only inpatients with a minimum hospitalization stay of one year were included and these were classified as “long-stay” patients. Exclusion criteria included those with a history of intellectual disability or dementia, and those who are unable to provide consent. Neither outpatients nor acute ward patients who generally have shorter hospitalization stay were recruited. The study was administered in one of these three languages—English, Chinese and Malay, and thus only participants who spoke and understood these languages were recruited. The response rate for the study was 73.2% and the main reason for not providing consent despite approach was patients’ unwillingness to subject themselves to venepuncture. Ethics approval was obtained from the Domain Specific Review Board of National Healthcare Group, Singapore. Written informed consent was obtained from the patients.

2.2. Data collection

Sociodemographic and clinical information was obtained through a structured interview and further verified with the patients’ medical records. Medical histories such as the duration of illness, length of hospitalization stay, current psychiatric and non-psychiatric medications use, and daily drug dosage were collected. Smoking histories were self-reported. Subjects were defined as having a history of smoking if they had smoked prior to the current admission or as current smokers if they continued to smoke during those times when they were out of the wards or on home leave.

All anthropometric measurements were standardized and collected by trained research assistants. Waist circumference was measured at the narrowest part of the body below the costal margins [30]. For resting blood pressure, the mean of two readings measured at a 1-min interval was taken using a digital sphygmomanometer (Omron HEM-7211) in a seated position on the left arm. Other measurements collected

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