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Difference in prevalence of metabolic syndrome between Japanese outpatients and inpatients with schizophrenia: A nationwide survey

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ABSTRACT

Patients with schizophrenia have a higher risk of metabolic syndrome (MetS). MetS prevalence varies with ethnicity. Although environmental factors, such as lack of physical activity and unbalanced diet, can lead to MetS, these may differ between outpatients and inpatients with schizophrenia. The Japanese mental health care system differs from that in other countries. However, few studies have investigated the prevalence of MetS in Japanese patients with schizophrenia. Therefore, we conducted a nationwide survey to clarify the prevalence of MetS in Japanese outpatients and inpatients with schizophrenia.

We investigated the risk of MetS by questionnaire in 520 facilities for outpatients and 247 facilities for inpatients. There were 7655 outpatients and 15,461 inpatients with schizophrenia. MetS prevalence was based on the National Cholesterol Education Program Adult Treatment Panel III (ATP III-A) and the Japan Society for the Study of Obesity (JASSO).

The overall MetS prevalence in outpatients using the ATP III-A definition was 34.2%, with 37.8% in men and 29.4% in women, compared with 13.0% in inpatients, with 12.3% in men and 13.9% in women. MetS prevalence in outpatients was approximately 2- to 3-fold higher than in inpatients.

In conclusion, MetS prevalence in Japanese outpatients was approximately 3-fold higher than in inpatients. Therefore, we should pay more attention to the risk of physical disease in Japanese patients with schizophrenia, considering the difference in health characteristics between outpatients and inpatients.

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1. Introduction

Patients with schizophrenia have a reduced life expectancy compared with the general population (Druss et al., 2011; Laursen et al., 2007). One reason is that patients with schizophrenia have nearly twice the normal risk of dying from cardiovascular disease (Saha et al., 2007; Capasso et al., 2008). Many studies in Europe and North America have found a higher prevalence of metabolic syndrome (MetS) in patients with schizophrenia compared with the general population (Casey, 2005; Gurpegui et al., 2012). According to a meta-analysis of 25,692 subjects, the MetS prevalence rate was 32.5%

overall, and there were no significant differences due to the inpatient-outpatient status or country (Mitchell et al., 2013). In contrast, in a study in Japan, the MetS prevalence rates in outpatients and inpatients with schizophrenia were 48.1% and 15.8%, respectively (Sugawara et al., 2011). Our previous study revealed that the prevalence of underweight in Japanese inpatients with schizophrenia may be higher than that in the general population (Suzuki et al., 2014). Another study showed that obesity in Japanese inpatients with schizophrenia was associated with <3 months hospitalisation, whereas underweight was associated with ≥3 months hospitalisation (Inamura et al., 2012). The mental health care system in Japan remains hospital based, and has the largest number of psychiatric beds per person in the world. In Japan, the average length of stay is 8.5 years, and 71% of psychiatric inpatients remain in hospital for ≥1 year (Ministry of Health and Welfare, 1999). In addition, there has been a gradual ageing of inpatients, with 29.5% of patients aged >65 years and 64.6% aged >50 years (Zenkaren

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Health and Welfare Research Institute, ZHWRI, 2000). This aspect of the mental health system in Japan may be related to the difference in physical health between outpatients and inpatients with schizophrenia. There have been no large investigations of the prevalence of MetS in Japanese patients with schizophrenia, and such data are required to establish the risk of MetS.

The most common definitions for MetS are the adapted Adult Treatment Panel III (ATP III-A) criteria proposed by the American Heart Association and the National Cholesterol Education Program. These definitions include waist circumference (WC), blood pressure (BP), triglyceride (TG), high-density lipoprotein cholesterol (HDL) and fasting plasma glucose (FPG) (Alberti et al., 2010). WC has been proposed as the most useful predictor of MetS in various populations with or without schizophrenia (Jin et al., 2010; Wang et al., 2009). However, it is difficult to use the same WC criterion as with European patients because of the smaller physique of Japanese people. In the present investigation, we also used the definition established by Japanese Society for the Study of Obesity (JASSO) (Examination Committee of the Criteria for Metabolic Syndrome in Japan, 2005). In the JASSO definition, the cut-off value for WC is 85 cm for men and 90 cm for women (Examination Committee of Criteria for 'Obesity Disease' in Japan; Japan Society for the study of Obesity, 2002). However, the prognostic utility of MetS remains controversial because the different criteria and definitions provide differing results according to cohorts and settings (Zimmet et al., 2005; Alberti et al., 2005).

In Japan, most psychiatric care is entrusted to private psychiatric hospitals; most of which belong to the Japan Psychiatric Hospital Association. The joint project with the cooperation of the Japan Psychiatric Hospital Association and the Japanese society of clinical neuropsychopharmacology to protect patients with schizophrenia was started in Japan in December 2012. In the present study, we used the large questionnaire survey in the joint project to establish the prevalence of MetS in Japanese patients with schizophrenia. This is believed to be the largest study investigating the prevalence of MetS in Japanese patients with schizophrenia.

2. Methods

2.1. Study participants

The questionnaire survey was conducted between January 2012 and July 2014. We obtained 7655 (outpatients) and 15,461 (inpatients) answers from 520 facilities for outpatients and 247 facilities for inpatients belonging to the Japan Psychiatric Hospital Association. All of the subjects were diagnosed with schizophrenia based on the Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR) or International Statistical Classification of Diseases and Related Health Problems version 10 (ICD-10). We excluded individuals aged <20 years and whose sex data were not assessed in the survey ($n = 738$). We also excluded individuals who could not be assessed for MetS ($n = 13,389$). We analysed a final total of 8989 subjects (2983 outpatients and 6006 inpatients) (Fig. 1). The survey was approved by the Ethics Committee at the Japan Psychiatric Hospitals Association.

2.2. Materials and methods

A brief questionnaire was compiled to cover demographic data (age and sex), height, weight, WC, BP, HDL, TG and FPG after reviewing the relevant literature and guidelines. Body mass index (BMI) was determined as the ratio of weight to height (kg/m^2). Standardised health questionnaires were used to determine behaviour, including current smoking status. BP was measured twice while the individual was in the seated position after at least 5 min rest, using a standard mercury sphygmomanometer. HDL, TG and FPG were also measured using standard analytical techniques.

As detailed in the ATP III-A report, participants with ≥ 3 of the following criteria were defined as having MetS: (1) abdominal obesity: WC ≥ 90 cm in men and ≥ 80 cm in women; (2) high BP: $\geq 130/85$ mm Hg; (3) low HDL cholesterol: HDL < 40 mg/dl in men and < 50 mg/dl in women; (4)

hypertriglyceridemia: TG ≥ 150 mg/dl; and (5) high fasting glucose: FPG ≥ 100 mg/dl.

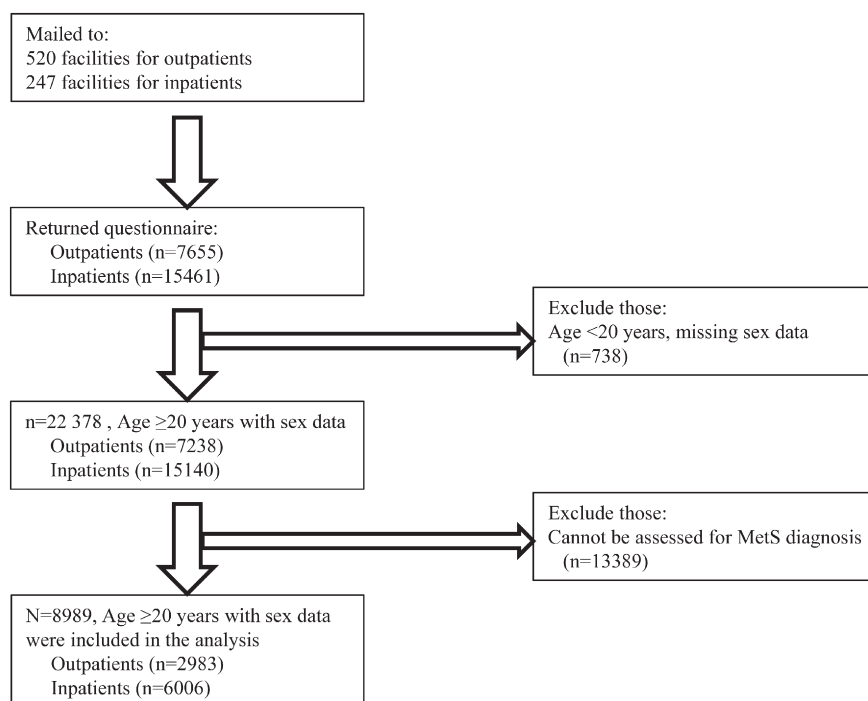


Fig. 1. Flow diagram of participant inclusion and exclusion.

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