Original Article

Metabolic syndrome and associated factors among psychiatric patients in Jimma University Specialized Hospital, South West Ethiopia

Sintayehu Asaye, Shiferaw Bekele*, Daniel Tolessa, Waqtola Cheneke

School of Medical Laboratory Sciences, Institute of Health Sciences, Jimma University, P.O.Box: 378, Jimma, Ethiopia

ARTICLE INFO

ABSTRACT

Background: Metabolic syndrome is a multisystem disorder which coined to describe the recognized clustering of metabolic and cardiovascular abnormalities including obesity, hypertension, dyslipidemia, and abnormalities of glucose homeostasis.

Objective: To assess the prevalence and associated factors of metabolic syndrome among psychiatric patients in Jimma University Specialized Hospital.

Methods: This study was conducted at Jimma University Specialized hospital psychiatric ward from May 15 to July 16, 2015. A cross-sectional study design and consecutive sampling technique were used. A single population proportion formula was used to include a total of 360 psychiatric patients. An interview administered structured questionnaire was used to collect socio-demographic and some clinical data. Anthropometric data were collected based on standard guild line for anthropometric measurement. Five milliliter of venous blood was collected from ante-cubital fossa after overnight fasting for 8 h. Semi-automated clinical chemistry analyzer (Temis Linear) was used for biochemical laboratory analysis. Data analysis was performed by using SPSS version-20 software. Binary and multiple logistic regressions were used to identify the association between dependent and independent variables. P value less than 0.05 was taken as statistically significant association.

Results: The prevalence of metabolic syndrome among psychiatric patients was 28.9%. Age greater than 30 years old (AOR: 5.2, CI: 2.3, 11.8, P. value < 0.05); being female (AOR: 7.1, CI: 3.3, 15.2, P. value < 0.05); regularly eating high protein and fat (AOR: 3.3, CI: 1.3, 8.2, P. value < 0.056) were independent determinant variables for high prevalence of metabolic syndrome among diabetic patients in the study area. The other independent variables such as family history of hypertension, chewing chat, Psychotropic drugs, duration of treatment, regularly eating fruits and vegetables had no statistically significant association with metabolic syndrome (P. value > 0.05).

Conclusion and recommendation: There was high prevalence of metabolic syndrome among the psychiatric patients. Therefore; close assessment, management and treatment of metabolic syndrome among patients with psychiatry problem is essential.

© 2018 Diabetes India. Published by Elsevier Ltd. All rights reserved.

1. Background

Metabolic syndrome is a multisystem disorder and coined to describe the recognized clustering of metabolic and cardiovascular abnormalities including obesity, hypertension, dyslipidemia, and abnormalities of glucose homeostasis [1].

In 2001, National Cholesterol Education Program-the third Adult Treatment Panel(NCEP-ATP III) developed criteria for metabolic syndrome which include waist circumference(cm) male ≥ 102,female ≥88;blood pressure(mmHg) ≥130/85, High density lipoprotein(HDL)(mg/dl) male <40,female <50;triglyceride(mg/dl) ≥150 and fasting plasma glucose(mg/dl) ≥110 [2].

In 2004, a workshop convened by International Diabetes Federation(IDF) in London including 21 expert groups have attempted to develop a unifying definition for metabolic syndrome, World Health Organization (WHO), the European Group for Study of Insulin Resistance (EGIR) and the NCEP-ATP III [3]. In the same year, 2004, American Heart Association (AHA) modified NCEP

ATP III criteria of fasting plasma glucose to be the cut off value $\geq$ 100mg/dl. Moreover, in 2005 the International Diabetes Federation(IDF) made additional modification of AHA criteria on waist circumference(cm) to be male $\geq$ 94,female$\geq$80 and the rest criteria is the same with AHA [4,14–24].

The most accepted hypothesis to describe the pathophysiology of the metabolic syndrome is insulin resistance due to overabundance of circulating fatty acids, released from an expanded adipose tissue mass. Free fatty acid (FFA) reduces insulin sensitivity in muscle by inhibiting insulin-mediated glucose uptake. Increased level of circulating glucose increases pancreatic insulin secretion resulting in hyperinsulinemia [5,25–29]. In the liver, FFA increases the production of glucose, triglycerides and secretion of Very Low Density Lipoprotein (VLDL). As a result, glycogenesis decreased and increased lipid accumulation in triglyceride. The increased amount of lipolysis of stored triacylglycerol molecules in adipose tissue produces more fatty acids, which could further inhibit the antilipolytic effect of insulin, creating additional lipolysis [6, 36,37,39].

However, the etiological basis for the syndrome and its pathophysiological mechanism are not completely known, and there is no unifying pathophysiological explanation for the metabolic syndrome [7,40,49].

The fundamental cause of metabolic syndrome remains to contest the experts. Nevertheless, insulin resistance and abdominal obesity are hypothesized to be the vital components. Genetic predisposition, physical inactivity, smoking, an unhealthy dietary pattern, ageing, pro-inflammatory state and hormonal changes may also have a causal effect [8,43,45].

Patients with mental disorders are more likely to suffer from metabolic syndrome [9]. Patient with schizophrenia, schizoaffective or bipolar disorder have higher prevalence of metabolic syndrome due to many factors like sedentary lifestyle, unhealthy eating habits, life stressor, and psychotropic medication [10,44,46].

Obesity, primarily central, and metabolic syndrome are greatly prevalent in psychiatric patients. Furthermore, they are frequently attributed to the use of antipsychotic medication and to the lifestyle [11,47].

Atypical or second-generation antipsychotics (SGAs) are allied with obesity [12]. However, the mechanism responsible for weight gain associated with SGA therapy is unknown. Due to the binding affinities of SGA to serotonin, nor-epinephrine, dopamine and particularly histamine H1 receptors, hunger and satiety condition of patients taking these drug may be altered [13,57–61].

As to the knowledge of the principal investigator, there was no any clear data available about prevalence of metabolic syndrome among patients with psychiatry problem in the study area. Therefore; this study was aimed at assessing metabolic syndrome and associated factors in patients with psychiatry problem.

2. Materials and methods

The aim of the study was to assess the prevalence of metabolic syndrome and associated factors among patients with psychiatry problem. A cross-sectional study design was used. The study was conducted at Jimma University Specialized Hospital (JUSH) psychiatry clinic from May 15 to July 16, 2015.

JUSH is found in Jimma town which is located 352 km to the Southwest from Addis Ababa, The capital city of Ethiopia.

JUSH is one of the oldest public hospitals in the country. It was established in 1937(1930 E.C) by Italian conquerors for the service of their soldiers [56]. It is the teaching and referral hospital in the South Western part of the country with total beds of 523. It has inpatients and outpatients service and there are 13 units in each service. Currently there are 590 professional, and 498 supportive staff giving services to the community.

The hospital has an outpatient psychiatry clinic as well as inpatient ward which was established in 1988.Now the inpatient ward has 47 beds for the inpatients services. Currently the clinic is giving service for population of Jimma zone and surrounding areas of other zones of Oromia Regional state as well as Southern Nations, Nationalities, and Peoples' Region (SNNPR).

The clinic is run by 52 staff members and there are four doctors who specialized in psychiatry, three with master in psychiatry, seven Bachelors in psychiatry, two diplomas in psychiatry, sixteen clinical nurses, three psychologists, one occupational therapist, nine porters and seven cleaners.

2.1. Source and study population

All psychiatric patients who were attending psychiatric clinic during the study period were source population and those who had outpatient service follow up at the psychiatry clinic during the study period were the study population.

2.2. Sample size determination and data collection techniques

A single population proportion formula was used to calculate the sample size. A consecutive sampling technique was utilized to include 360 study subjects. Psychiatric patients with age greater or equal to 18 years old those who had taken psychotropic drugs for at least three months during the study period were included. Psychiatric patients who were pregnant and admitted were excluded from the study.

An interview based administered questionnaire was used to collect socio-demographic and some clinical data. The medical records of the study subjects were reviewed to collect some other clinical data.

Anthropometric measurements were administered by trained professional nurses working at psychiatry clinic in the morning after overnight fasting by using a standardized protocol.

The height and weight of each study subject were measured by using analog digital scale without shoes. The height was measured by instructing each subject to point feet outward; legs straight and knee together; arms at sides; head, shoulder blades, buttocks, and heels touching measurement surface; looking straight ahead; and shoulder relaxed. The body mass index (BMI) was calculated by using the formula, weight over height square in kilogram per meter square (BMI = Weight/height^2 in Kg/m$^{2)}$), and the results were recorded.

Circumferences were evaluated by using a stretch-resistant 1-centimeter (cm)-wide measuring tape that provides a constant measurement. The measurement was taken while the subject was in the standing position and breathing normally. Hip circumference was measured around the widest portion of the buttocks, with the tape parallel to the floor. For tape was snug around the body, but not pulled so tight that it is constricting. Each measurement was repeated twice; the average of measurements within 1 cm of one another was calculated. If the difference between the two measurements exceeds 1 cm, the two measurements were repeated.

Waist-to-hip ratio (WHR) was calculated as indicated by World Health Organization as waist circumference (WC) divided by hip circumference. The normal range for WC is $\leq$ 120 cm for men and $\leq$ 88 cm for women, and the normal range for WHR is 0.9 for men and 0.85 for women. To measure blood pressure the study subjects were instructed to sit comfortably, with back supported, legs uncrossed and upper bared and the arm supported at heart level. After that, blood pressure (BP) was measured by clinical nurse using a mercury sphygmomanometer for two consecutive times after the study subjects had taken rest for 10 min and the average values for both diastolic and systolic blood pressures were considered for this study.