ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

A Study to Assess Sociodemographic Profile and Prevalence of Metabolic Syndrome in Patients with Psychiatric Disorders

Dr. Vivek Pratap Singh[1], Dr. Archana Javadekar[2*], Dr. Ekram Goyal[3]

[1]Assistant Professor, Department of Psychiatry, Netaji Subhash Medical College & Hospital, Patna, Bihar, India
[2]Professor, Department of Psychiatry, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune, Maharashtra, India
[3]Assistant Professor, Department of Psychiatry, B.R. Ambedkar State Institute of Medical Sciences, Punjab, India

***Corresponding author**
Dr. Archana Javadekar, Professor, Department of Psychiatry, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune, Maharashtra, India

ABSTRACT

Aim: The aim of the present study to assess sociodemographic profile and prevalence of metabolic syndrome in patients with psychiatric disorders.

Methods: The cross-sectional study was conducted at Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune from July 2015 to September 2017 and 126 patients were included in the study.

Results: The majority of patients 78 (61.9%) were in the age group of less than 40 years and there were 48(38.1%) cases who were aged more than 40 years. Majority of cases were females 67 (53.2%) and 59 (46.8%) cases were males. 47 (37.3%) patients were having metabolic syndrome as compared to 79 (62.7%) who were not having metabolic syndrome. 56 (44.4%) cases were having Schizophrenia, 3 (2.38%) were having Delusional disorder, 25 (19.8%) cases were from others group, 22 (17.5%) cases were from Bipolar Affective Disorder and Manic episode group. There was significant difference of age according to metabolic syndrome was found in the study group as p value was <0.0001. A significant association was found between sex and metabolic syndrome and the data showed that females were more prone to metabolic syndrome as compared to males. There was no statistical significant relation was found between disease type and metabolic syndrome. A significant relation was found between family history of psychiatric illness and metabolic syndrome as p value was found to be <0.05.

Conclusion: The factors which were found to be responsible for high risk of metabolic syndrome in psychiatric disorders were older age, female gender, schizophrenia and family history of psychiatric illness.

Keywords: metabolic syndrome, sociodemographic, treatment related details, psychiatric disorders

1. INTRODUCTION

Metabolic Syndrome (Mets) is a worldwide health problem that can be defined as a constellation of risk factors including glucose intolerance, raised blood pressure, obesity, and dyslipidemia, which increases cardiovascular morbidity and mortality rate.[1] During the last two decades, the frequency of obesity and diabetes mellitus has increased in the United States, which is directly associated with cardiovascular disease (CVD).[2] When compared to people

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

without MetS, the chance of heart attack or stroke is three times more and the chance of death because of cardiovascular complication is twice higher in MetS patients.[3]
In contrast to the general population, patients with schizophrenia have a higher rate of Mets.[4] As a result of this, these patients are at increased risk of premature CVD and subsequent shorter life expectancy.[5-7] A previous study showed that 31–34% of the population with severe and persistent psychiatric disorders complicated by Metsdied from CVD, which indicates how much Mets directly increases the risk of developing CVD.[8]
Severe mental illness (SMI) describes the presence of chronic psychiatric disorders that result in substantial functional impairment and typically includes the diagnosis of psychotic disorders, bipolar disorder, and recurrent major depressive disorder.[9,10] People with SMI have worse physical health and life expectancy compared to the general population.[10] Interestingly, the increased mortality risk in people with SMI is mainly associated with cardiovascular diseases.[11] People with SMI are more likely to exhibit risk factors for cardiovascular diseases (CVD) such as obesity, dyslipidaemia, hypertension, and smoking relative to people without SMI.[12] Furthermore, second generation antipsychotics are widely used for acute and maintenance treatment of schizophrenia, acute mania, maintenance treatment in bipolar disorder and adjunctive therapy for major depressive disorder.[13] Although second generation antipsychotics have a clear therapeutic advantage over typical antipsychotics such as having a lower risk of extrapyramidal symptoms, they have been associated with metabolic abnormalities including an increased prevalence of metabolic syndrome.[14] MetS prevalence is 2–3 times greater in people with schizophrenia or bipolar disorder compared to the general population.[15]
The aim of the present study to assess the prevalence of metabolic syndrome in sociodemographic, illness details in patients with psychiatric disorders.

2. MATERIALS AND METHODS

The cross sectional study was conducted at Dr. D. Y. Patil Medical College, Hospital and Research centre, Pimpri, Pune from July 2015 to September 2017 and 126 patients were included in the study.
Inclusion criteria

- Patients presenting with psychiatric disorders at a tertiary care centre for the first time
- Patients taking some psychotropic medications
- Adults >20yrs Old

Exclusion criteria

- Patients who refused to give consent
- Pregnant women with psychiatric illness
- All those who have delivered a child in past 1 year

ETHICS
IEC (Institute ethics committee) clearance was obtained before starting the study.
Written and informed consent was obtained, from all patients.
METHODOLOGY:
Informed consent was taken from all the patients who were the part of this study. At any point any patient who was found to be incompetent on the basis of severity of any illness to provide informed consent the caregiver who were staying with the patient were approached for the same. After explaining the purpose and design of the study all the patients who were diagnosed with psychiatric disorders according to ICD-10 by two senior psychiatrists of tertiary health care system were recruited.

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

Patient's age, demographic features; family history, level of education, duration of disease, use of alcohol and or nicotine, use of concomitant medications or psychotropic drug history, history of diagnosis and treatment of diabetes, dyslipidaemia, hypertension or any other medical conditions was also evaluated and mentioned. Calibrated Scales was used to measure body weight and height in kilograms and centimeters respectively. Waist circumference was measured at a point taken midway between inferior costal margin and superior iliac crest at the end of normal expiration while standing. Blood pressure in supine position was noted by using standard mercury manometer and at least two readings at five minutes intervals were taken. If blood pressure was >140/90 mm of Hg then a third reading after 30 minutes was recorded and the lowest of these readings was taken. Fasting blood sugar, triglyceride, high density lipoprotein values were also estimated by taking fasting venous samples under aseptic measures. Metabolic Syndrome was diagnosed in the enlisted study group from the data obtained after obtaining all the biochemical values and comparing the values with the base values which were mentioned in the International Diabetes Federation Criteria and then 10 years cardiovascular risk was assessed in the same patient by using the Framingham risk scoring. The data obtained according to the study requirement was analyzed using the proper statistical methods.

TOOLS

INTERNATIONAL DIABETES FEDERATION CRITERIA (IDF):

Metabolic syndrome was first defined by International Diabetes Federation in 2006 and of all the criterion which were used this was the only criteria which was epidemiologically and clinically relevant. This was well adapted as these provided a differential profile for Asian populations.

These definitions gave priority to abdominal obesity (Abdominal circumference of ≥ 90cms and ≥ 80cms for men and women of Asian origin respectively and 102cms and 88cms for Non-Asians male and females respectively. The other criteria used was Triglyceride levels of > 150 mg/dl, a systolic blood pressure ≥130 mm of Hg or a diastolic blood pressure ≥85 mm of Hg, A fasting plasma glucose level of ≥100 mg/dl, high density lipoproteins of <40 mg/dl and 50 mg/dl for men and women respectively. The IDF criteria needs central obesity plus any other two or more out of five criteria.[16]

FRAMINGHAM CARDIOVASCULAR RISK SCORE (FRS) :

The Framingham Risk Score is a sex specific algorithm that was used to estimate the 10 years cardiovascular risk of an individual. The score was estimated on the basis of age, sex, total cholesterol, high density lipoprotein (HDL) cholesterol, diabetes mellitus, smoking habits and systolic arterial pressure. The Framingham Risk Score first originated based on the data that was obtained from Framingham Heart Study to estimate the 10 years risk of developing coronary heart disease. In addition to coronary heart disease prediction 10 years cardiovascular disease risk, periphery artery disease, heart failure, cerebrovascular events were subsequently added in 2008 Framingham Risk Score.[17]

STATISTICAL ANALYSIS:

The scales were scored as per the test manual. Data was collected, compiled and tabulated.The statistical analysis was done using parametric test and the final interpretation was based on Z test (standard normal variate) with 95% level of significance. Results were statistically analyzed using the software: - Statistical package for the social science (SPSS) Version 21. Parametric data was analyzed by paired and unpaired T test. Frequency data was analyzed by chi square test.

3. RESULTS

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

Table 1: Baseline characteristics

Age (Yrs)	**No of cases**	Percentage
21 – 30	40	31.7
31 – 40	38	30.2
41 – 50	32	25.4
>50	16	12.7
Sex		
Male	59	46.8
Female	67	53.2
Metabolic syndrome		
Present	47	37.3
Absent	79	62.7

The majority of patients 78(61.9%) were in the age group of less than 40 years and there were 48(38.1%) cases who were aged more than 40 years. Majority of cases were females 67(53.2%) and 59(46.8%) cases were males. 47(37.3%) patients were having metabolic syndrome as compared to 79(62.7%) who were not having metabolic syndrome.

Table 2: Psychiatric illness wise, Past H/O psychiatric illness, Past H/O medical illness, Family H/O illness distribution of cases in study group

Psychiatric illness	**No of cases**	Percentage
Schizophrenia(F20)	56	44.44
Delusional disorder(F22)	3	2.38
Bipolar Affective Disorder & Manic episode(F30-31)	22	17.5
Unipolar depression(F 32-33)	20	15.9
Others(F00,42,41,44,45,10,60,70)	25	19.8
Family H/O illness		
Yes	19	15.08
No	107	84.92

56(44.4%) cases were having Schizophrenia,3(2.38%) were having Delusional disorder, 25(19.8%) cases were from Others group, 22(17.5%) cases were from Bipolar Affective Disorder and Manic episode group and 20(15.9%) cases were of Unipolar depression. There were 107(84.92%) cases who were having no family history of psychiatric illness and 19(15.08%) cases who were having family history of psychiatric illness.

Table 3: Association between sociodemographic and metabolic syndrome

Age (Yrs)	**Metabolic syndrome**		Total (%)
	Present (%)	Absent (%)	
21 – 30	5 (10.64)	35 (44.30)	40 (31.75)
31 – 40	12 (25.53)	26 (32.91)	38 (30.16)
41 – 50	26 (55.32)	6 (7.60)	32 (25.39)
>50	4 (8.51)	12 (15.19)	16 (12.70)
P value	< 0.0001		

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

Gender			
Male	16 (34.04)	43 (54.43)	59 (46.83)
Female	31 (65.96)	36 (45.57)	67 (53.17)
P value	<0.027		
Diseases			
Schizophrenia(F20)	24 (51.06)	32 (40.51)	56 (44.44)
Delusional disorder(F22)	2 (4.26)	1 (1.26)	3 (2.38)
Bipolar Affective disorder & Manic episode(F30-31)	10 (21.28)	12 (15.19)	22 (17.46)
Unipolar depression(F32-33)	6 (12.77)	14 (17.72)	20 (15.87)
Others(F00,42,41,44,45,10,60,70)	5 (10.64)	20 (25.32)	25 (19.84)
P Value	0.001		
Family H/O illness			
Yes	11 (23.40)	8 (10.13)	19 (15.08)
No	36 (76.60)	71 (89.87)	107 (84.92)
P Value	<0.05		

There was significant difference of age according to metabolic syndrome was found in the study group as p value was <.0001. A significant association was found between sex and metabolic syndrome and the data showed that females were more prone to metabolic syndrome as compared to males. There was no statistical significant relation was found between disease type and metabolic syndrome. A significant relation was found between family history of psychiatric illness and metabolic syndrome as p value was found to be <.05.

4. DISCUSSION

The metabolic syndrome (MetS) describes a cluster of risk factors for cardiovascular diseases and type 2 diabetes mellitus which include well recognized metabolic risk factors such as central obesity, dyslipidaemia, hypertension, glucose intolerance/diabetes and a prothromotic inflammatory state.[18] The prevalence of MetS is reportedly high among individuals with obesity and sedentary lifestyle.[19] Studies have shown that individual metabolic abnormalities of the MetS predict both type 2 diabetes and cardiovascular disease.[20] Therefore, the co-occurrence of these metabolic risk factors in an individual patient imposes additional risk. Furthermore, deaths from coronary heart diseases, cardiovascular diseases and all-cause mortality have been shown to be higher among patients with MetS compared to those without MetS.[21,22]

The majority of patients 78(61.9%) were in the age group of less than 40 years and there were 48(38.1%) cases who were aged more than 40 years. This finding was consistent with a study done by Lakhan et al[23] which showed that age is an important predictor of mental illness in the population irrespective of the residential settings. Majority of cases were females 67(53.2%) and 59(46.8%) cases were males. This was in accordance to a study done by Malhotra et al[24] where they found that gender differences occurs in mental disorder but women predominates. According to several studies it was noted that the prevalence of MS and its various components are notably higher in populations with mental illness when compared with the general populations. This came out to be correct according to a study which was conducted by Heiskanen et al[25] in the patients of schizophrenia and similar findings was also noted by Eimslie

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

et al[26] in patients suffering from bipolar disorder and also by Skilton et al[27] in patients with major depression. The reason found for this close attribution is either due to psychotropic drug use, lifestyle factors and the psychiatric disorders itself.
There was significant difference of age according to metabolic syndrome was found in the study group as p value was <.0001. This was in accordance to a study done by Chuki et al[28] which showed that patients who were aged more than 40 yrs. were having more chances of having metabolic syndrome as compared to other group and significant relation between age and metabolic syndrome was found in the study. A significant association was found between sex and metabolic syndrome and the data showed that females were more prone to metabolic syndrome as compared to males. This was in accordance to a study done by Shakeri et al[29] which showed that there is a significant relation between metabolic syndrome and sex. It was depicted in the study that females were more prone to metabolic syndrome as compared to males. In our study population more patients were females who were suffering from psychosis and were on antipsychotics and it is hypothesized that women may be more likely to develop metabolic syndrome in response to antipsychotic agents.[30] There was no statistical significant relation was found between disease type and metabolic syndrome. This was in accordance to a study done by Suvisaari et al[31] where he found that prevalence of metabolic syndrome were more in schizophrenia, Non affective and affective psychosis as compared to subjects without psychotic disorders. A significant relation was found between family history of psychiatric illness and metabolic syndrome as p value was found to be <.05. This was in accordance to a study done by Solia et al[32] where he found that patient having family history of illness were more prone to have metabolic syndrome but no significant relation was found between the two in the study done.

5. CONCLUSION

The factors which were found to be responsible for high risk of metabolic syndrome in psychiatric disorders were older age, female gender, schizophrenia and family history of psychiatric illness. Asian population is already at higher risk to develop metabolic syndrome, routine screening of patients suffering from psychiatric disorder and those who are receiving psychotropics for metabolic disturbances becomes essential. We can give simple lifestyle advices like exercises and balanced diet which can reduce the morbidity and mortality rates in patients suffering from mental disorders leading to improvement in their quality of life.

6. REFERENCES

1. Yates K.F., Sweat V., Yau P.L., Turchiano M.M., and Convit A., 2012. Impact of metabolic syndrome on cognition and brain: A selected review of the literature. Arterioscler. ThrombosisVasc. Biol., 32: 2060–2067.
2. Mokdad AH, Ford ES, Bowman BA, Dietz WH, Vinicor F, Bales VS, et al. Prevalence of obesity, diabetes, and obesity-related health risk factors, 2001. Jama. 2003;289(1):76–9.
3. Isomaa B, Almgren P, Tuomi T, Forsen B, Lahti K, Nissen M, et al. Cardiovascular morbidity and mortality associated with the metabolic syndrome. Diabetes Care. 2001;24(4):683–9.
4. Arango C, Bobes J, Aranda P, Carmena R, Garcia-Garcia M, Rejas J. A comparison of schizophrenia outpatients treated with antipsychotics with and without metabolic

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

syndrome: findings from the CLAMORS study. Schizophrenia research. 2008;104(1–3):1–12.
5. Bobes J, Arango C, Garcia-Garcia M, Rejas J. Healthy lifestyle habits and 10-year cardiovascular risk in schizophrenia spectrum disorders: an analysis of the impact of smoking tobacco in the CLAMORS schizophrenia cohort. Schizophrenia research. 2010;119(1–3):101–9.
6. Laursen TM. Life expectancy among persons with schizophrenia or bipolar affective disorder. Schizophrenia research. 2011;131(1–3):101–4.
7. Wahlbeck K, Westman J, Nordentoft M, Gissler M, Laursen TM. Outcomes of Nordic mental health systems: the life expectancy of patients with mental disorders. The British journal of psychiatry: the journal of mental science. 2011;199(6):453–8.
8. Cohn TA, Sernyak MJ. Metabolic monitoring for patients treated with antipsychotic medications. Canadian Journal of psychiatry Revue Canadienne de Psychiatrie. 2006;51(8):492–501.
9. Bhugra D. The global prevalence of schizophrenia. PLoS Med. 2005;9(5):e151.
10. Miller BJ, Paschall CB, Svendsen DP. Mortality and medical comorbidity among patients with serious mental illness. Psychiatr Serv Wash DC. 2006;57(10):1482–7.
11. Wilson PWF, D'Agostino RB, Parise H, Sullivan L, Meigs JB. Metabolic syndrome as a precursor of cardiovascular disease and type 2 diabetes mellitus. Circulation. 2005;112(20):3066–72.
12. Mitchell AJ, Vancampfort D, De Herdt A, Yu W, De Hert M. Is the prevalence of metabolic syndrome and metabolic abnormalities increased in early schizophrenia? A comparative meta-analysis of first episode, untreated and treated patients. Schizophr Bull. 2013;39(2):295–305.
13. Meyer JM. Antipsychotics and metabolics in the post-CATIE era. Curr Top Behav Neurosci. 2010;4:23–42.
14. Meyer JM, Stahl SM. The metabolic syndrome and schizophrenia. Acta Psychiatr Scand. 2009;119(1):4–14.
15. McEvoy JP, Meyer JM, Goff DC, Nasrallah HA, Davis SM, Sullivan L, et al. Prevalence of the metabolic syndrome in patients with schizophrenia: baseline results from the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) schizophrenia trial and comparison with national estimates from NHANES III. Schizophr Res. 2005;80(1):19–32.
16. Alberti KG, Zimmet P, Shaw J. Metabolic syndrome—a new world-wide definition. A consensus statement from the international diabetes federation. Diabetic medicine. 2006 May;23(5):469-80.
17. Mahmood, Levy, Vasan, Wang . The Framingham Heart Study and the epidemiology of cardiovascular disease: a historical perspective. Lancet.2013; 383 (9921): 999–1008.
18. Girman CJ, Dekker JM, Rhodes T, Nijpels G, Stehouwer CDA, Bouter LM, et al. An exploratory analysis of criteria for the metabolic syndrome and its prediction of long-term cardiovascular outcomes: the Hoorn study. Am J Epidemiol. 2005;162(5):438–47.
19. Kivimäki M, Kuosma E, Ferrie JE, Luukkonen R, Nyberg ST, Alfredsson L, et al. Overweight, obesity, and risk of cardiometabolic multimorbidity: pooled analysis of individual-level data for 120 813 adults from 16 cohort studies from the USA and Europe. Lancet Public Health. 2017;2(6):e277–85.
20. Kassi E, Pervanidou P, Kaltsas G, Chrousos G. Metabolic syndrome: definitions and controversies. BMC Med. 2011;5:48.

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

21. Isomaa B, Almgren P, Tuomi T, Forsén B, Lahti K, Nissén M, et al. Cardiovascular morbidity and mortality associated with the metabolic syndrome. Diabetes Care. 2001;24(4):683–9.
22. Malik S, Wong ND, Franklin SS, Kamath TV, L'Italien GJ, Pio JR, et al. Impact of the metabolic syndrome on mortality from coronary heart disease, cardiovascular disease, and all causes in United States adults. Circulation. 2004;110(10):1245–50.
23. Lakhan R, Ekúndayò O. National sample survey organization survey report: An estimation of prevalence of mental illness and its association with age in India. Journal of Neurosciences in Rural Practice. 2015;6(1):51.
24. Malhotra S, Shah R. Women and mental health in India: An overview. Indian Journal of Psychiatry. 2015;57(6):205.
25. Heiskanen T, Niskanen L, Lyytikainen R, Saarinen PI, Hintikka J. Metabolic syndrome in patients with schizophrenia. Journal of Clinical Psychiatry. 2003 May 5;64(5):575-9.
26. Elmslie JL, Silverstone JT, Mann JI, Williams SM, Romans SE. Prevalence of overweight and obesity in bipolar patients. Journal of Clinical Psychiatry. 2000 Mar 3;61(3):179-84.
27. Skilton MR, Moulin P, Terra JL, Bonnet F. Associations between anxiety, depression, and the metabolic syndrome. Biological psychiatry. 2007 Dec 1;62(11):1251-7.
28. Chuki P, Gupta A, Sharma AK, Dahiya N. Prevalence of metabolic syndrome in patients on antipsychotic drug therapy. Eur J Pharm Med Res. 2016;3(2):288-93.
29. Shakeri J, Karimi K, Farnia V, Golshani S, Alikhani M. Prevalence of metabolic syndrome in patients with schizophrenia referred to farabi hospital, Kermanshah, Iran. Oman Medical Journal. 2016 Jul;31(4):270.
30. Cornier MA, Dabelea D, Hernandez TL, Lindstrom RC, Steig AJ, Stob NR, Van Pelt RE, Wang H, Eckel RH. The metabolic syndrome. Endocrine reviews. 2008 Dec 1;29(7):777-822.
31. Suvisaari JM, Saarni SI, Perala J, Suvisaari JV, Harkanen T, Lonnqvist J, Reunanen A. Metabolic syndrome among persons with schizophrenia and other psychotic disorders in a general population survey. Journal of Clinical Psychiatry. 2007 Jul 16;68(7):1045-55.
32. Solia F, Rosso G, Maina G. Metabolic syndrome in acute psychiatric inpatients: clinical correlates. Journal of Psychopathology. 2015;21(3):246-53.