TO STUDY CARDIOMETABOLIC RISK FACTORS IN PATIENTS WITH PSYCHIATRIC DISORDERS

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ABSTRACT
Aim: The aim of the present study was to assess the cardiometabolic risk factors 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. There were 54(42.9%) cases who were having no history of substance use, 41(32.5%) cases who were both drinking alcohol and also used to smoke,20(15.9%) cases were only drinking alcohol and 11(8.7%) cases only used to smoke. 71(56.35%) cases were having elevated triglycerides and 55(43.65%) cases were having triglyceride level under normal range. 83(65.9%) patients showed reduced HDL and 43(34.1%) cases were having HDL under normal range. 86(68.25%) were having their LDL under normal range and 40(31.75%) were having elevated LDL. 91(72.22%) cases were having their cholesterol under normal range and 35(27.78%) had increased cholesterol levels. 100(79.37%) cases were normotensive and 26(20.63%) were hypertensive.
Conclusion: The present study suggests that about one-third of patients diagnosed with schizophrenia have metabolic syndrome. Among the various subcomponents of metabolic syndrome, increased waist circumference is the most common abnormality. These findings suggest that patients of schizophrenia should be closely monitored for the CVR factors, especially the waist circumference and BP, which can be done easily without any extra cost.

Keywords: cardiometabolic risk factors, patients, psychiatric disorders

1. INTRODUCTION

Several studies suggest that patients with serious mental illness die about 20 years earlier than the general population[1-3] with cardiovascular disease being the leading cause of mortality in

patients with schizophrenia.[2-6] A population-based study in a nationally representative sample from United States reported two-fold increase in the risk of mortality in persons with mental disorders, with an average life span of 8.2 years less than the rest of the population, with the majority of deaths (95.4%) attributed to medical causes rather than unnatural causes.[7] Relative risk of all-cause mortality for patients with schizophrenia has been reported to be 2.6.[8] Poor health status, socioeconomic deprivation, adverse health behaviors, and poor quality of medical care are important factors associated with high mortality in subjects with severe mental illness.[1] Despite this these patients usually receive inconsistent and insufficient physical monitoring and management.[8]

Recently, some studies have assessed the prevalence of cardiovascular risk (CVR) factors in patients with schizophrenia and have calculated the 10-year risk of having a cardiovascular event using various parameters such as Framingham risk equation score[9,10] and systematic coronary risk evaluation (SCORE) function indicating 10-year cardiovascular mortality risk (CMR).[11] The Framingham risk equation score, provides a validated calculation of 10-year risk of development of coronary heart disease (CHD)[9,10] and the SCORE function indicates the 10-year CMR.[11] Recognition of these factors is emphasized as these are modifiable risk factors, which if identified and managed properly in time can contribute to a reduction in cardiovascular mortality.

Metabolic syndrome is an array of metabolic conditions, which when present in an individual increases the risk of cardiovascular events. National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATP III) guidelines, 2018, define metabolic syndrome as the presence of three or more of the factors such as fasting blood glucose of more than 110 mg/dL, high-density lipoprotein (HDL) cholesterol <40 mg/dL in men or 50 mg/dL in women, blood triglycerides more than 150 mg/dL, a waist circumference of more than 102 cm for men or 88 cm for women, or blood pressure of 130/85 mmHg.[12]

The prevalence of metabolic syndrome in the general population ranges from 8% to 24% in different parts of the world.[13] Studies have shown that there is variability in prevalence rates based on gender, age, and ethnicity.[14] Metabolic syndrome is associated with the risk of developing diabetes mellitus, coronary heart disease, stroke, and premature mortality. Studies have shown that the prevalence of metabolic syndrome in people with schizophrenia treated with antipsychotics ranges from 15% to 69%. The high prevalence of metabolic syndrome in patients with schizophrenia can be attributed to various factors such as unhealthy lifestyle, poor diet, substance use, sedentary behavior, and antipsychotics. Low prevalence of the metabolic syndrome is reported in untreated chronic schizophrenic patients when compared to patients who had received antipsychotics.[15-17]

The aim of the present study was to assess the cardiometabolic risk factors 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.

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.[18]

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.[19]

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

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
Education		
Illiterate	56	44.4
Primary	36	28.6
Secondary	8	6.3
Higher secondary	14	11.1
Graduate	12	9.5
Marital status		
Married	79	62.7
Unmarried	41	32.5
Separated	2	1.6
Divorced	4	3.2
Residence		
Rural	68	54
Urban	58	46
Occupation		
Unskilled	71	56.3
Skilled	23	18.3
Housewife	17	13.5
Student	4	3.2
Unemployed	11	8.7

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. 56(44.4%) cases were illiterates, 36 patients (28.6%) were educated upto primary level,14(11.1%) were from higher secondary level,12(9.5%) were graduates and 8(6.3%) were educated upto secondary level. 79(62.7%) cases were married ,41 cases(32.5%) were unmarried,4(3.2%) were divorced and 2(1.6%) cases were separated. 68(54%) patients were belonging to rural areas and 58(46%) cases were from urban India. 71(56.3%) cases were unskilled,23(18.3%) were skilled,17(13.5%) were housewife,11(8.7%) cases were unemployed and 4(3.2%) cases were students.

Table 2: Risk factors

Substance abuse	No of cases	Percentage
Alcohol	20	15.9
Nicotine	11	8.7
Alcohol + Nicotine	41	32.5
No	54	42.9

There were 54(42.9%) cases who were having no history of substance use, 41(32.5%) cases who were both drinking alcohol and also used to smoke,20(15.9%) cases were only drinking alcohol and 11(8.7%) cases only used to smoke.

4. DISCUSSION

Schizophrenia is a chronic mental illness characterized by a cluster of positive, negative, and cognitive symptoms. It affects activities of daily living, social life, and occupational functioning.[20] Studies have shown that people with schizophrenia die a decade or two earlier when compared to the general population.[21] The most frequent causes of mortality apart from suicides include coronary artery disease, cerebrovascular disease, and chronic obstructive pulmonary disease. There is an increasing trend of mortality due to cardiovascular events in recent times, which poses a major challenge in the management of people with schizophrenia.[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. 56(44.4%) cases were illiterates, 36 patients (28.6%) were educated upto primary level,14(11.1%) were from higher secondary level,12(9.5%) were graduates and 8(6.3%) were educated upto secondary level. This was consistent with a study done by Gomes et al[25] where maximum number of individual suffering from mental disorders had completed their studies only till their secondary education and another possible explanation would be that poor education can decrease people skills and could lead to faulty coping mechanism making them prone to mental health illnesses.[26]

79(62.7%) cases were married ,41 cases(32.5%) were unmarried,4(3.2%) were divorced and 2(1.6%) cases were separated. Even in comparison with other developing countries, India has one of the lowest ages at marriage.[27] 68(54%) patients were belonging to rural areas and 58(46%) cases were from urban India. This was in accordance to a study done at India where prevalence of mental illness was found to be higher in rural settings, considering the fact that larger population of rural population lives in poverty, it can be a significant determinant of mental health illnesses.[23] 71(56.3%) cases were unskilled,23(18.3%) were skilled,17(13.5%)

were housewife,11(8.7%) cases were unemployed and 4(3.2%) cases were students. In general, persons suffering from mental illness also have neurocognitive impairment and maladaptive social functioning which hinders them to continue their higher education, which tends to affect entry into the skilled job market.[28,29] There were 54(42.9%) cases who were having no history of substance use, 41(32.5%) cases who were both drinking alcohol and also used to smoke,20(15.9%) cases were only drinking alcohol and 11(8.7%) cases only used to smoke. This was in accordance to a study where Poirer et al[30] found that prevalence of smoking was higher in psychiatric patients. In an another study by Huang et al[31] it was found that alcohol use disorder comorbidity was common in patients suffering from mental health illnesses and it was found that alcohol and nicotine were used as a self medication by psychiatric patients.[32] 47(37.3%) patients were having metabolic syndrome as compared to 79(62.7%) who were not having metabolic syndrome. This was in accordance to a study done in India which shows that 37.8% patients attending psychiatric units were having metabolic syndrome.[33] 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[34] in the patients of schizophrenia and similar findings was also noted by Eimslie et al[35] in patients suffering from bipolar disorder and also by Skilton et al[36] 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.

5. CONCLUSION

The present study suggests that about one-third of patients diagnosed with schizophrenia have metabolic syndrome. Among the various subcomponents of metabolic syndrome, increased waist circumference is the most common abnormality. These findings suggest that patients of schizophrenia should be closely monitored for the CVR factors, especially the waist circumference and BP, which can be done easily without any extra cost. Further, the CVR factors must be taken into account, while choosing various antipsychotics medications which are known to be associated with higher weight gain and metabolic abnormalities. There is a need to increase the awareness among mental health professional about the various cardio-metabolic risk factors in patients with schizophrenia and how to manage the same.

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