http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v9i3.31

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Prevalence of metabolic syndrome in patients admitted in State Mental Health Hospital: A cross sectional study

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Abstract
Aim: *To evaluate the prevalence of metabolic syndrome and analyse its corelation with metabolic and clinical parameters in patients admitted in HHMH & R, Shimla.*
Material and Methods: *Cross-sectional analysis was conducted at the HHMH & R, Shimla. 46 patients in total with a primary psychiatric diagnosis as per ICD 10 were included and assessed for metabolic syndrome. For diagnosing MetSNCEP criterion was applied. Chi-square was used for all the comparisons.*
Results: *In our observation prevalence of MetS came out to be 39.1% and was higher in males (28.2%) in comparison with females (10.8%). Prevalence was higher innon-psychotic patients (21.7%), whereas it was lesser in psychotic patients (17.4%). In patients who were on second generation antipsychotics the prevalence of metabolic syndrome was significantly higher (66%).*
Conclusion: *39% of the participated hospitalized patients met the criteria for MetS and they tend to have significantly higher adiposity measures, cardiovascular markers, more likely to have comorbid conditions and history of substance use.*
Keywords: *Himachal Hospital of Mental Health and Rehabilitation (HHMH & R), Metabolic syndrome (MetS), Hospital for Mental Health (HMH), Second Generation Antipsychotics (SGA), Modified National Cholesterol Education Program Adult Treatment Panel III(NCEP ATP III).*

Introduction

Metabolic syndrome comprises of several parameters mainly truncal obesity, deranged blood sugar, lipids and high blood pressure, all of them are possibly linked to state of high cardio-metabolic risk.[1]MetS is also known as 'syndrome X' and 'insulin resistance syndrome'.[2] Three major predisposing factors contributing towards metabolic syndrome are insulin resistance, truncal obesity and adipose tissue disorders. Aging along with hormonal factors and any pro-inflammatory state are other contributing factors.[3]

In general population MetS is vastly prevalent. On analysing the existing literature, the prevalence of MetS varied from 8 to 24% in men and 7 to 46% in women across the world; in our country in males it was around 7% and in females it was around 46%.[4] In psychiatric patients the prevalence was reported even higher. In literature it is seen that in patients of schizophrenia it was

around 28.4% and was 62.4% in patients of schizoaffective disorder.[5-8] This higher prevalence in this group can be due to stress, sedentary life style, poor nutrition, substance use, lack of awareness leading to delay in medical care.[9]

One of the main aetiological factor for predisposition in psychiatric patients for MetS is use of psychotropic medication. Antipsychotics mainly second generation are mainstay of treatment of patients in our set up which cause weight gain of which Clozapine and Olanzapine are most notorious. Other medications like mood stabilizers and antidepressants mainly Mirtazapine also cause weight gain.[10,11] Moreover, antipsychotics mainly olanzapine also disturb glucose and lipid metabolism adversely.[12] Henceforth, we planned this study to assess MetS prevalence in patients admitted in our facility, and analyse any correlation with the clinical and metabolic profile of patients.

Material and Methods

A cross-sectional study was conducted at Himachal Hospital for Mental Health and Rehabilitation, Shimla. All patients admitted in general psychiatry ward both male and female during month of January and February 2021 were recruited in study. Informed consent was taken. Patients who didn't give consent or were below 18 years with no caretaker were excluded from study. Total of 46 patients were recruited in study.

Diagnosis was established as per ICD 10. For analysis, patients were divided in two broad groups: psychotic illness (F20-F29), non-psychotic illness which included mood disorders, anxiety disorders along with other groups.

Modified NCEP criterion for Asian population was applied Metabolic Syndrome[13]as per which out of following criteria three or more should be met: -

I. Abnormal waist circumference > 90 cm for males and > 80 cm for females
II. High Triglycerides ≥ 150 mg/dl
III. Low HDL levels < 40 mg/dl for males and < 50 mg/dl for females
IV. Blood pressure systolic≥ 130 mmHg or Diastolic ≥ 85 mmHg or both
V. Abnormal Fasting blood sugar ≥ 100 mg/dl

Waist Circumference was taken half way from inferior most border of ribs and superior most border of iliac crest. All blood investigations were done after 8-12 hours of fasting. Blood pressure (SBP and DBP) was measured two times at an interval of three minutes after which the mean was calculated.

Statistical Analysis

Data was analysed using descriptive statistics in which mean, standard deviation was used for continuous variables and frequencies were used for categorical variables. Comparisons were analysed using Chi-square test.

Results

Out of all the patients, 46 met the criteria for inclusion in study. Out of these, 73.9% were males and 26.1% were females and mean age was 37.28 years. *[Table -1]*

The psychotic illness group was more common (60.9%) whereas non-psychotic was around (39.1%). Prevalence of MetS in the sample studied was 39.1% (n = 46).Prevalence among males was 28.3% (n =13), while the prevalence among females was 10.9% (n =05) which can be explained by more representation of males.*[Table -1, 2]*

Amongst the subgroups, prevalence was higher in those who were on second generation antipsychotics (SGAs) (66%).In patients with MetS around 66% patients had hospital stay more than 6 months and it was significantly higher in comparison with patients with stay less than 6 months (P= 0.07*). Around 50% patients with metabolic syndrome had on or other co-morbidity and around 72.2% had history of substance use in which tobacco was commonest which was significantly higher in comparison with without substance use (p=0.01*).*[Table – 2]*

Among the individual metabolic abnormalities in patients with MetS, high waist circumference was most common abnormal marker found among patients (88.11%) followed by hypertriglyceridemia (77.8%) while abnormal fasting blood sugar and hypercholesterolemia were least common abnormality (55%). *[Table – 2]*

Table 1: Co-relation among MetS and Clinical variables

	Metabolic syndrome		P value (chi square test)
	Present	**Absent**	
Gender			
Male	13	21	
Female	05	07	
Duration of stay			
<6 months	06	17	0.070*
>6 months	12	11	
Treatment			
FGA	06	08	
SGA	12	10	
Co-morbidity			
Yes	09	06	0.044*
No	09	22	
H/o substance use			
Yes	13	10	0.016*
No	05	18	
BMI			
Normal	02	06	
Higher side	16	22	
Waist circumference			
Abnormal	16	13	0.331
Normal	02	15	
Hypercholesterolemia			
Present	10	11	0.280
Absent	08	17	
Hypertriglyceridemia			
Present	14	05	0.0001***
absent	04	23	
Abnormal FBS			
Present	10	01	0.0001***
Absent	08	27	
Diagnosis			
Psychotic illness	08	20	
Non-Psychotic illness	10	18	

Table 2: Sociodemographic & Clinical variables.

Age in years	37.28 (11)
Gender	
Male	34 (73.9%)
Female	12 (26.1%)
Diagnosis	
Schizophrenia	16 (34.8%)
Psychosis unspecified	12 (26.1%)
Others	18 (39.1%)
Medication	
Olanzapine	17 (37.0%)
Haloperidol	12 (21.7%)
Others	17 (37.0%)
Metabolic syndrome	
Present	18 (39.1%)
Absent	28 (60.9%)

Discussion

In our study overall prevalence of metabolic syndrome came out to be 39.1%. Which is comparable to the studies in past. In a study done on 90 patients in North India; prevalence of MetS was around 37.8%.[14] In another study prevalence of MetS was 35% done in Hong Kong.[15]

In our observation MetS was found to be in 66% of patients who were on SGAs. This is also seen in literature. In a study in which they studied MetS in bipolar patients who were on SGAs. MetS was higher in patients who were on SGAs in comparison with patients who were FGAs or mood stabilizers.[16]Recently In a study which was done on 210 patients with schizophrenia olanzapine was found to be most potent antipsychotic followed by clozapine in causation of metabolic syndrome.[17] In our observation, patients with higher waist circumference had highest prevalence of MetS (88.11%) followed by patients with high triglycerides (77.8%). Therefore, most common predictor of MetS was higher waist circumference among all parameters studied. These results are in agreement with studies in literature with shown similar findings. In a study done in North India, around 70% of the cases with higher waist circumference also met criteria for metabolic syndrome.[14] The means of waist circumference, fasting blood sugar and triglycerides were higher in patients who have Met Swhen equated to patients without MetS. Alike findings were found in existing literature too.[18,19]

Conclusion

In our study it is evident that Mets is significantly prevalent in psychiatric patients admitted in HHMH & R, Shimla. Prevalence in cases with non-psychotic illness and on second generation antipsychotics was on higher side. Males along with higher waist circumference was related with higher risk. So, the individuals with severe psychiatric illness remain at higher chances of developing MetS which will adversely affect course of their illness. Hence, patients with severe mental illness on treatment especially on SGAs should be regularly screened and supervised for cardio-metabolic risk factors during their follow ups and appropriate measures should be taken.

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