Prevalence of Metabolic Syndrome in Psychiatric Outpatients in a Tertiary Care Hospital, Kerala.

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ABSTRACT

Psychiatric disorders are among the leading causes of global morbidity. These are often chronic and need treatment with psychopharmacological agents for prolonged periods often extending up to a lifetime. The bulk of the research on metabolic syndrome (MS) shows that the use of the psychopharmacological agents. The present study was carried out at a tertiary care hospital, Perinthalmanna for eight months (Aug 2011-Mar 2012) with the aim of assessing the rate of Metabolic Syndrome in a group of psychiatric outpatients and also to determine the link between Second Generation Antipsychotics and Metabolic Syndrome. Out of the 65 patients included, 25 were found to have metabolic syndrome. The overall prevalence of MS was 38.5%. 16 patients at the first assessment and 9 at the second assessment had metabolic syndrome. However, the metabolic syndrome is not associated with the anti-psychotic therapy. This study shows that metabolic syndrome was higher in patients taking resperidone 17 (68%) followed by quietiapine 10 (40%). It was concluded that the occurrence of metabolic syndrome is not only related to the second generation antipsychotics but also it is due to various other factors such as genetic risk factors, increased cortisol levels, unhealthy diet (carbohydrate and fat rich diet), lack of exercise, propensity for the development of abdominal obesity. Therefore, psychiatrists should consider measuring BP and waist circumference, two components of the metabolic syndrome, which can be easily monitored in the office setting itself. Abnormalities in either BP or waist circumference warrant screening for the other components of the syndrome, more frequent monitoring of fasting glucose and lipids. If possible early interventions can be done such as diet control and exercise counseling to reverse the changes.

Keywords: Metabolic Syndrome, psychiatric disorders,

INTRODUCTION

Psychiatric disorders are among the leading causes of global morbidity. These are often chronic and need treatment with psychopharmacological agents for prolonged periods often extending up to a lifetime. The bulk of the research on metabolic syndrome (MS) shows that the use of the psychopharmacological agents, especially the newer ones, is associated with metabolic side effects such as weight gain, deranged glucose tolerance and lipid profile.[1]

The magnitude of public health impact of the metabolic syndrome is reflected by an estimated prevalence of approximately 47 per cent in adults in the United States to 11.2 per cent in a study from Chennai, India.[2] Studying the MS is important heuristically to understand its pathophysiology and practically to determine the appropriate use of the psychopharmacological agents. The metabolic syndrome is a constellation of interrelated abnormalities namely (obesity, dyslipidaemia, hyperglycaemia, and hypertension) that increase the risk for cardiovascular disease and type-2 diabetes.[3] It is also known as syndrome X, insulin resistance syndrome and dysmetabolic syndrome.[4] This is a common metabolic disorder which increases in prevalence as the population becomes more obese. Distribution as well as amount of fat is important. The syndrome develops more often in people whose fat accumulates around the abdomen (called apple shape) and who have a high waist-to-hip ratio. The syndrome is less common among people whose fat accumulates around the hip (called pear shape) and who have a low waist-to-hip ratio.[5] The number of people with metabolic syndrome increases with age, affecting up to 25% of the population.

So, the main aim of our study was to assess the rate of Metabolic Syndrome using International Diabetic Federation (IDF) criteria in a group of psychiatric out patients in a tertiary care hospital at Malabar region of Kerala. As the use of pharmacological agents causes metabolic syndrome study

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also tried to determine link between use of second generation antipsychotics and metabolic syndrome along with determination of minimizing strategies.

METHODOLOGY

This study on "Prevalence of Metabolic Syndrome in Psychiatric Out-patients" was carried out at a tertiary care referral hospital at Perinthalmanna. It is one of the largest tertiary care teaching hospitals in south Malabar region of Kerala. The study population included patients attending the psychiatric outpatient department. This study was carried out over eight months (Aug 2011-Mar 2012). Ethical approval for this study was obtained from the Ethical committee of the Hospital. Data were collected from treatment chart, personal interview with patients, personal interview with doctors and from laboratory values.

Out of the patients attending psychiatric outpatient department, who were on second generation antipsychotics were included in the study. Patient's demographic profile, psychiatric and medical histories were obtained from case notes. Medication history was based on information documented in the medical record as well as reports from the patient. As a part of the routine admission procedure height, weight and blood pressure were recorded. The body mass index was calculated from the weight and height (kg/m^2). Biochemical parameters which include fasting blood sugar, serum triglycerides, HDL were obtained and additionally waist circumference was recorded. All these details were documented in the patient data collection form.

- For the prospective assessment of metabolic syndrome, the International Diabetes Federation (IDF) criterion was used. According to IDF a person is having metabolic syndrome when he/she has a central obesity with waist circumference of ⩾ 94 cm in men or of ⩾ 80 cm in women; and any of the two of four other risk factors: 1) elevated serum triglycerides ⩾ 150mg/dL (1.7 mmol/L); 2) low serum HDL cholesterol <40 mg/dL (1.03 mmol/L) in men or <50 mg/dL (1.29 mmol/L) in women; 3) high systolic blood pressure (⩾ 130 mm Hg) or high diastolic blood pressure (⩾ 85 mm Hg); 4) high fasting plasma glucose level ⩾ 110mg/dL (5.6 mmol/L).
- On review i.e, after 3 months again weight, blood pressure, biochemical parameters and waist circumference were recorded. B.M.I was again calculated.

RESULTS

Out of the 90 patients agreed to participate in the study, 35 were excluded from the analysis, due to missing data or missing follow up, and stoppage of medicines.

Out of the 65 patients included, 25 were found to have metabolic syndrome. Therefore the overall prevalence of MS was 38.5%. 16 patients at the first assessment and 9 at the second had MS.

Age wise distribution of the study population shows a total of 4 patients (16.0%) below 30 yrs and among the middle aged (30-50yrs) it was 13 (52.0%) and above 50 yrs 8 patients (32.0%). Metabolic syndrome was found to be higher among middle aged people.

The gender wise distribution among the study population shows male (n=8, 32.0%) and female (n=17, 68.0%). Subjects with the MS were found to be higher among females.

Study shows that family history of individual risk factors such as diabetes and hypertension do not affect the risk of developing metabolic syndrome.

The number of patients with social habits such as smoking 2 (8%) and alcoholism 3 (12.0%) were very less and also these was not contributing to the development of MS

The diagnostic profile of the study is shown in the above table.MS was higher in the patients diagnosed with bipolar affective disorder 11 (44.0%) and it was nil in the patients with schizoaffective disorder.

As per the study atypical antipsychotics showed that MS is not associated with the therapy. Metabolic syndrome was seen more in patients taking resperidone 17 (44.0%) followed by quietiapine 10 (40.0%).Further analysis of the data on antipsychotics prescription, 13 (52.0%) out of 25 with MS were prescribed with a combination of atypical antipsychotics and valproate. But this was not significant statistically.

The study reveals that the % difference of BMI obtained for baseline and review is 3.14% and mean difference is -8.2616 with p-value 0.001 which is less than 0.05 and thus considered as significant. Therefore BMI was significantly positively correlated with presence of metabolic syndrome. An increased waist circumference (WC) was found in the study population. The % difference for waist circumference is 3.88% and mean difference is -3.600 with p-value 0.001. Abdominal obesity is significantly a contributing factor for MS.

In systolic BP there was an increase of 2.84% on comparison of baseline and review values and the mean difference was -3.600 with p-value 0.071. Therefore systoilc BP is significantly not contributing to metabolic syndrome. Regarding the diastolic BP, on comparison there was a tremendous increase of 6.92% with the p-value 0.001. This indicates that diastolic BP is correlated with the development of metabolic syndrome.

HDL-c levels decreased by a value of -8.08% and the mean difference obtained are 4.920 with a p-value of 0.001. Therefore HDL-c is significantly causing MS. Triglyceride level was found increased by a value of 3.18% .The mean difference is -4.320 and p-value is 0.001. Hyperlipidemia is one of the main features of metabolic syndrome

DISCUSSION

Recently there has been increased concern over the side effects of the atypical antipsychotic drugs, including diabetes, hyperlipidemia and obesity. The relationship between these factors and antipsychotic drugs requires a careful analysis. Metabolic syndrome (MS) is comprised of numerous factors which predict the risk of CVD and diabetes, which may occur due to number of etiological factors but particularly with antipsychotic usage.

In this study among seriously mentally ill patients, 38.5% met criteria for the metabolic syndrome as defined by IDF. This rate is elevated, compared with the rate of 21.4% found in studies in United States' general population.[6] However it is compatible with 38% prevalence rate in a study on in patients with severe psychotic and mood disorders. A general population study from south India using IDF criteria put the prevalence of MS at 25.8 percent.[7]

Metabolic syndrome in this study is higher in females and more common in middle aged (30-50 yrs) group. This is in accordance with general knowledge that females are more prone to metabolic disorder as compared to males. Higher age in general make people more predisposed to metabolic syndrome. The results were similar to those of others showing preponderance of females among those with the MS.[8]

Interestingly, there were no associations between metabolic syndrome and various lifestyle risk factors, such as smoking, alcohol consumption etc. Family history of diabetes and hypertension is not associated with risk of developing metabolic syndrome; this indicates that other environmental or acquired factors relating to the mood or psychotic illness have more influence in the development of metabolic syndrome than genetic factors.

In this study, prevalence of metabolic syndrome is higher in bipolar patients (44%) followed by OCD (20%).As the prevalence of metabolic problems is significantly higher in bipolar patients than others, pharmacologic treatment should be implemented only after consideration of metabolic risk factors. In particular, bipolar patients beginning pharmacological treatment for acute mood episodes may be more vulnerable to metabolic derangements, because significant weight gain has been shown to occur during acute treatment with atypical antipsychotics in combination with mood stabilizers.

The other important finding in this study is that the utilization of atypical antipsychotics (eg. resperidone, clozapine, olanzapine, quietiapine) was not significantly associated with the occurrence of metabolic syndrome. Abdul Hamid Abdul Rahman et al conducted a study and found that the metabolic syndrome is not associated with the anti psychotic therapy (p=0.41).[9] Some atypical agents cause substantial metabolic adverse effects. This is of concern because of the well established excess of cardiovascular morbidity and mortality in patients with schizophrenia that predates the widespread introduction of atypical agents. Individual drugs have differing propensities to cause metabolic adverse effects. Results of this study shows that metabolic syndrome was higher in patients taking resperidone 17 (68%) followed by quietiapine 10 (40%).

There are several reasons why severe mood and psychotic disorders might be associated with higher rates of the metabolic syndrome. Certain lifestyles, such as sedentary habits and high fat and carbohydrate diets, are common in people with severe mental illness and are associated with the metabolic syndrome.[6,9] Finally, severe mood disorders and psychotic disorders may predispose individuals to physiological changes that increase the rate of the metabolic syndrome.

Abnormalities of glucose regulation, with a pattern of insulin resistance, have been described in schizophrenic patients even before the development of illness and the use of antipsychotic agents.[10] Genetic risk factors, increased cortisol levels, unhealthy diet, lack of exercise, propensity for the development of abdominal obesity, and antipsychotic treatment might all be common factors in the etiology of metabolic syndrome in people with schizophrenia and affective disorders.[11] In two recent studies, Thakore et al. found increased central obesity in untreated first-episode patients diagnosed with schizophrenia or major depression.[12] Both depression and schizophrenia have been associated with dysregulation of the hypothalamic–pituitary–adrenal (HPA) axis, which has been implicated in the development of the metabolic syndrome.[13]

Table 1: MS -baseline And Review Comparison.

Metabolic syndrome (baseline)	Metabolic Syndrome (review) Yes	No	Total	df	p-value
Yes	16 (100.0%)	0 0%	16 (100.0%)	1	0.001
No	9 1 8.4%	40 81.6%	49 00.0%		
Total	**25 38.5%**	**40 61.5%**	**65 100.0%**		

Table 2: Family History of Risk Factors

Family History	Metabolic Syndrome	Total	df	p-value
Hypertension	9(36.0%)	25(100.0%)	1	0.362
Diabetes	8(32.0%)	25(100.0%)	1	0 .865

Table 3: Social Habits

Social Habits	Metabolic Syndrome	Total	df	p-value
Smoking	2(8%)	25(100.0%)	1	0.403
Alcoholic	3 (12.0%)	25(100.0%)	1	0.800

Table 4: Medications

Medications	Metabolic Syndrome	df	p-value
Resperidone	17 (68.0%)	1	0.217
Olanzapine	6 (24.0%)	1	0.755
Clozapine	0	1	0.066
Quietiapine	10 (40.0%)	1	0.684
Atypical + valproate	13 (52.0%)	1	0.176
Total	**25**		

Fig.1: Gender Wise distribution of the Study Population.

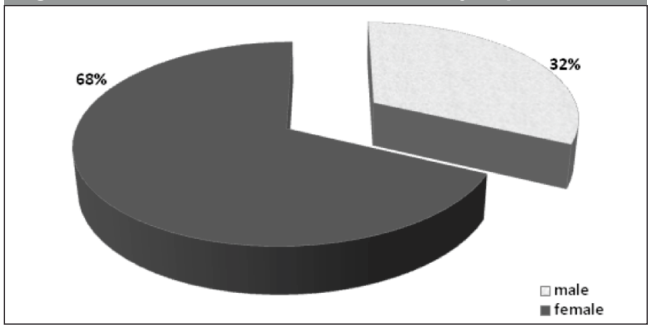


Fig. 2: Age Wise Distribution of the Patients

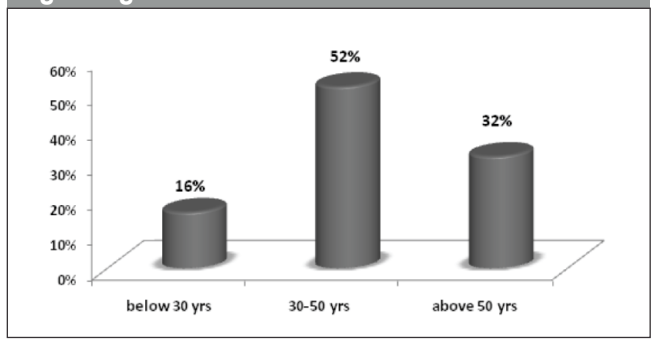
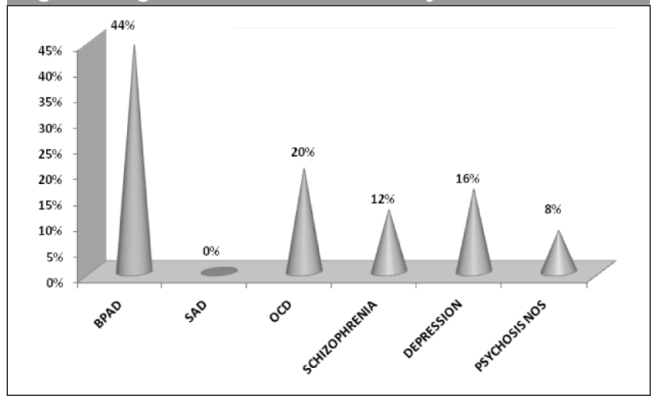


Fig. 3: diagnosis and metabolic syndrome



BPAD –Bipolar affecting disorder, SAD –Seasonal Affective Disorder
OCD –Obsessive Compulsive Disorder

CONCLUSION

In conclusion, this study shows that in routine practice the natural course of metabolic syndrome in patients with psychotic disorders is dynamic. In one year follow-up a considerable number (25) of patients developed metabolic syndrome. The clinical relevance of this study's findings is high–a positive detection of metabolic syndrome provides a baseline from which to monitor and treat any emerging (and potentially life-threatening) cardiovascular problems. It have also been demonstrated that measuring the criteria for metabolic syndrome is quick, simple and inexpensive. Therefore, it is proposed that the measurement of the metabolic syndrome parameters (including the recording of waist circumference) become routine for psychiatric patients.

Abnormalities in either BP or waist circumference warrant screening for the other components of the syndrome, more frequent monitoring of fasting glucose and lipids, and further interventions such as diet and exercise-counseling to reverse the changes. All patients taking atypical antipsychotics require monitoring of weight, fasting glucose, and lipids.[14] Failure to monitor metabolic parameters and intervene early may result in continued high rates of morbidity in severely mentally ill patients secondary to complications of CVD and diabetes. Whether as a part of the illness or its consequence (change in lifestyle) or medication, patients with severe mental illnesses have a high prevalence of metabolic syndrome.[1] With the Indian population already susceptible to develop metabolic syndrome, screening of larger samples of patient with mental disorders and those who are receiving neuroleptic medication becomes essential. With a large proportion of the country still having limited access to primary care and with limited availability of laboratory investigations, it becomes essential to at least perform physical measures in patients on antipsychotic medication. Regular screen for metabolic disturbances where facilities are available should be ensured. A prudent approach to caring for persons with major mental illnesses involves monitoring cardio metabolic risk, including measurement of baseline and

Table V- Comparison of Baseline and Review Values of Various Paramerters with their Statistical Significance.

Variables	Sample (N)	Mean	SD	% difference	Mean difference	SD of mean difference	Paired t-test	df	p-value
BMI-I	25	26.2610	3.88526	3.14%	-8.2616	.60624	-6.814	24	.001
BMI-II	25	27.0872	3.72915						
WAIST -I(in cms)	25	92.72	7.547	3.88%	-3.600	2.179	-8.259	24	.001
WAIST-II (in cms)	25	96.32	7.936						
SBP-I	25	126.40	9.522	2.84%	-3.600	9.522	-1.890	24	.071
SBP-II	25	130.00	2.887						
DBP-I	25	83.80	6.964	6.92%	-5.800	7.455	-3.890	24	.001
DBP-II	25	89.60	3.202						
TG-I	251	35.561	4.480	3.18%	-4.320	5.460	-3.956	24	.001
TG-II	25	139.88	16.435						
HDL-I	25	60.88	10.822	-8.08%	4.920	6.812	3.611	24	.001
HDL-II	25	55.96	13.043						
FBS-I	25	97.80	13.586	10.18%	-9.960	7.202-	6.914	24	.001
FBS-II	25	107.76	16.984						

I-baseline, II-review

serial indicators for risk during antipsychotic treatment.[15] Treatment of the metabolic syndrome focuses on lifestyle modifications which include dietary changes and exercise. The professionals need to be aware of the existence of the metabolic syndrome, be vigilant to its development and take prompt steps to rectify it.

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