ASSOCIATION OF SOCIO-DEMOGRAPHIC CHARACTERISTICS WITH METABOLIC SYNDROME AMONG SUBJECTS WITH SCHIZOPHRENIA AND BIPOLAR AFFECTIVE DISORDER: A HOSPITAL-BASED, COMPARATIVE CROSS-SECTIONAL STUDY

Authors: Dr Suhas[1], Dr Kasthuri Pandiyan[2], Dr Veda N Shetageri[3], Dr Akshatha J K[4], Dr Prabhu Jadhav[4], Dr Supriya D'Silva[4], Dr Subhashini Shanmugamurthi[5], Dr Pooja Raikar[5]

[1] Junior Resident, [2] Professor and HOD, [3] Professor, [4] Assistant Professor, [5] Senior Resident.

Place of Institution: Department of Psychiatry. MVJ Medical College and Research Hospital, Bengaluru.

ABSTRACT:

Aim and objective: To assess the socio-demographic characteristics with metabolic syndrome among subjects with Schizophrenia and Bipolar Affective disorder.

Materials and methods: A cross-sectional study was done using convenience sampling. Fifty subjects each, diagnosed with Schizophrenia and Bipolar Affective disorder(BPAD) as per ICD-10, belonging to the age group 18-30 years were included in the study after obtaining the consent. The study was done over a period of 18 months. Statistical analysis was done using SPSS version 22.

Results: The mean age and duration of illness of the subjects with metabolic syndrome were more than the ones without metabolic syndrome in both Schizophrenia and BPAD group subjects. BPAD group had statistically significant values for both the mean age and duration of illness. The two groups containing subjects with Schizophrenia and BPAD differed when socio-demographic variables were compared with the ones with and without metabolic syndrome. But statistically significant values could not be obtained for other variables.

Conclusion: Although there were differences in socio-demographic variables between the two groups, only the mean age and duration of illness showed statistical significance in the BPAD group of subjects.

Keywords: Schizophrenia, BPAD, Bipolar Affective disorder, mean age, duration of illness, socio demographic characteristics.

INTRODUCTION:

Over the last fifty years, there has been changes in the human environment, behaviors and way of lifestyle[1]. Lifestyle modifications have resulted in increased rates of medical morbidities not only in the general population but also among people with mental illnesses[2]. The prevalence of Metabolic syndrome among subjects with psychiatric illnesses ranges from 25-50%, with a relative risk of up to 2.0 when compared to the general population[3]. The higher rates of undiagnosed and untreated medical illnesses are seen in various psychiatric conditions like Major depressive disorder, Bipolar Affective disorder, Schizophrenia, Anxiety disorders, Attention-deficit/hyperactivity disorder, and Posttraumatic stress disorder[4]. The etiology of the Metabolic syndrome is multifactorial among psychiatric subjects[5]. They include the usage of psychotropic drugs like antipsychotics most commonly second-generation ones, immuno-metabolic dysregulations, and risk factors due to lifestyles like low physical inactivity, poor sleep, and patterns of unhealthy nutrition[6]. We conducted this study to know the socio demographic profile of the individuals with and without metabolic syndrome in the psychiatric illnesses, Schizophrenia and Bipolar Affective disorder presenting to our tertiary care hospital, which is a rural setup.

MATERIALS AND METHODS:

Convenience sampling was used for selecting the subjects for the study. The subjects of both gender, who belonged to the age group 18-40 years, diagnosed with Schizophrenia or Bipolar Affective disorder as per ICD-10 were evaluated for the presence of the metabolic syndrome. They were recruited by convenient sampling from the psychiatry outpatient and inpatient services from February 2021 to July 2022. The basic socio-demographic information about the study sample was collected using the Semi-structured proforma. A modified National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) criterion for the diagnosis of metabolic syndrome was used. General physical examinations including waist circumference, blood pressure, and blood investigations including fasting blood sugar levels and fasting lipid profile levels were done. Data was entered using MS Excel and analyzed using IBM SPSS 22 software. Qualitative data were analyzed using frequency and proportion, and the association between qualitative data

was measured using the chi-square test. Fischer exact test was used whenever necessary. A p-value of less than 0.05 was taken as statistically significant.

RESULTS:

In subjects with Schizophrenia, the mean age of the subjects with metabolic syndrome was more (33.3+4.8 years) than the ones without metabolic syndrome. But in subjects with BPAD, the mean age of the subjects was significantly higher (**p=0.044**) in subjects with metabolic syndrome (33.3+5.3 years) when compared to subjects without metabolic syndrome (29.8+5.7 years) (*Table No.1*).

Duration of illness was more in subjects with metabolic syndrome (5.44+3.35 years vs 4.41+3.34 years) compared to the subjects who were without metabolic syndrome in the Schizophrenia group. But the statistically significant value **(p=0.017)** was seen for the duration of illness in subjects with metabolic syndrome (4.87+2.44 years) when compared to the subjects without metabolic syndrome (3.17+2.10 years) (*Table No.2*).

Table No.1: Association between age and duration of illness with metabolic syndrome in Schizophrenia subjects

Characteristics	Schizophrenia subjects		p-value
	Metabolic syndrome	No metabolic syndrome	
Age	33.3+4.8 years	32.3+5.4 years	0.498
Duration of illness	5.44+3.35 years	4.41+3.34 years	0.297

Table No.2: Association between age and duration of illness with metabolic syndrome in BPAD subjects

Characteristics	BPAD subjects		p-value
	Metabolic syndrome	No metabolic syndrome	
Age	33.3+5.3 years	29.8+5.7 years	**0.044**
Duration of illness	4.87+2.44 years	3.17+2.10 years	**0.017**

Among the Schizophrenia subjects with metabolic syndrome, the majority were males(55.5%), living in a nuclear family(55.5%), educated up to secondary education, married(61.1%), unemployed(27.7%), and belonged to upper lower socio-economic strata(38.8%). However, no significant statistical values were found for the socio-demographic parameters when the subjects with and without metabolic syndrome were compared (*Table No.3*).

Similarly, among the BPAD subjects with metabolic syndrome, the majority were males (53.8%), living in a nuclear family (66.6%), educated up to secondary education, married(53.3%), semi-skilled laborers (53.8%) and belonged to upper lower socio-economic strata(60%). Like the subjects with Schizophrenia, no significant statistical values were found for the socio-demographic parameters when the subjects with and without metabolic syndrome were compared (*Table No.4*).

DISCUSSION:

Prevalence of metabolic syndrome and its components, which are risk factors for cardiovascular disease and type 2 diabetes are found at higher rates in subjects with mental illnesses like Bipolar Affective disorder and Schizophrenia[7]. We used the modified National Cholesterol Education Program/Adult Treatment Panel III (NCEP/ATP III)criteria for diagnosing metabolic syndrome which included[8] :

1. Waist circumference > 90 cm for males and > 80 cm for females;

2. Triglycerides ≥ 150 mg/dl;

3. HDL levels < 40 mg/dl for males and < 50 mg/dl for females;

4. Blood pressure ≥ 130/ 85 mmHg;

5. Fasting glucose ≥ 100 mg/dl.

Table No.3: Association between sociodemographic characteristics with metabolic syndrome in subjects with Schizophrenia

Socio-demographic characteristics	Metabolic syndrome		P value
	Present (18)	Absent (32)	
Gender			
Female	44.4% (8)	46.8% (15)	0.869
Male	55.5% (10)	53.1% (17)	
Type of family			
Nuclear	55.5% (10)	53.1% (17)	0.869
Joint	44.4% (8)	46.8% (15)	
Religion			
Hindu	83.3% (15)	75% (24)	
Muslim	11.1% (2)	12.5% (4)	0.713
Christian	5.5% (1)	12.5% (4)	
Marital status			
Unmarried	38.8% (7)	40.6% (13)	
Married	61.1% (11)	43.7% (14)	0.319
Widowed	0	6.2% (2)	
Separated/Divorce	0	9.3% (3)	
Education	22.2% (4)	25% (8)	
1^{st} to 4^{th} standard	27.7% (5)	21.8% (7)	
5^{th} to 7^{th} standard	16.6% (3)	25% (8)	0.919
8^{th} to 10^{th} standard	22.2% (4)	15.6% (5)	
1^{st} and 2^{nd} PUC	11.1% (2)	9.3% (3)	
Graduate	0	3.1% (1)	
Professional			
Occupation			
Unemployed	27.7% (5)	37.5% (12)	
Unskilled	16.6% (3)	15.6% (5)	
Semiskilled	22.2% (4)	34.3% (11)	0.383
Skilled	22.2% (4)	3.1% (1)	
Clerical/farmer/shop	5.5% (1)	6.2% (2)	
Semi-professional	5.5% (1)	3.1% (1)	
Socio-economic status			
Upper middle	16.6% (3)	3.1% (1)	
Lower middle	16.6% (3)	21.8% (7)	0.288
Upper lower	38.8% (7)	31.2% (10)	
Lower	27.7% (5)	43.7% (14)	

Table No.4: Association between sociodemographic characteristics with metabolic syndrome in subjects with BPAD

Socio-demographic characteristics	Metabolic syndrome		P value
	Present (15)	Absent (35)	
Gender			
Female	46.6% (7)	48.5% (17)	0.902
Male	53.3% (8)	51.4% (18)	
Type of family			
Nuclear	66.6% (10)	62.8% (22)	0.797
Joint	33.3% (5)	37.1% (13)	
Religion			
Hindu	93.3% (14)	80% (28)	
Muslim	6.6% (1)	2.8% (1)	0.204
Christian	0	17.1% (6)	
Marital status			
Unmarried	33.3% (5)	42.8% (15)	
Married	53.3% (8)	48.5% (17)	0.877
Widowed	6.6% (1)	2.8% (1)	
Separated/Divorce	6.6% (1)	5.7% (2)	
Education			
Illiterate	0	5.7% (2)	
1st to 4th standard	6.6% (1)	20% (7)	
5th to 7th standard	20% (3)	22.8% (8)	0.616
8th to 10th standard	40% (6)	22.8% (8)	
1st and 2nd PUC	26.6% (4)	25.7% (9)	
Graduate	6.6% (1)	2.8% (1)	
Occupation			
Unemployed	6.6% (1)	28.5% (10)	
Unskilled	26.6% (4)	37.1% (13)	
Semiskilled	53.3% (8)	28.5% (10)	0.057
Skilled	0	2.8% (1)	
Clerical/farmer/shop	13.3% (2)	0	
Semi-professional	0	5.7% (2)	
Socio-economic status			
Upper middle	0	2.8% (1)	
Lower middle	13.3% (2)	14.2% (5)	0.917
Upper lower	60% (9)	54.2% (19)	
Lower	26.6% (4)	25.7% (9)	

Higher rates of metabolic syndrome were seen above 50 years in studies by Vancampfort D et al[9] and Mitchell AJ et al[10]. Indian population too had similar results, where Hussain T et al found the prevalence of metabolic syndrome in psychiatric illnesses increased with age[1]. In our study also, in the subjects with Schizophrenia, the mean age was higher for the ones with metabolic syndrome (33.3+4.8 years) compared to the ones without metabolic syndrome (32.3+5.4 years). For subjects with BPAD, the mean age was higher for the ones with metabolic syndrome (33.3+5.3 years) compared to subjects without metabolic syndrome (29.8+5.7 years). The difference in the BPAD group was statistically significant with a p-value = **0.044**. Hence it was inferred from our findings that prevalence increases over age which was told in the literature. The higher propensity of an individual developing medical illnesses like type 2 diabetes and hypertension which could be due to environmental risk factors, genetic causes could be contributing to the development of metabolic syndrome along with effects of the illness per se like the course of the illness, lifestyle changes and the prolonged usage of psychotropics.

Longer duration of illness on treatment predicted the occurrence of metabolic syndrome in several studies[9][10]. In our study, in subjects with Schizophrenia, the duration of illness was higher in subjects with metabolic syndrome (5.44+3.35 years) compared to subjects without metabolic syndrome (4.41+3.34 years). Similarly, in subjects with BPAD, the duration of illness was significantly higher **(p=0.017)** in subjects with metabolic syndrome (4.87+2.44 years) compared to subjects without metabolic syndrome (3.17+2.10 years). So, the findings of the study support the existing data that a longer duration of illness attributes to the occurrence of metabolic syndrome.

In subjects with psychiatric illness, studies by Challa F et al said higher rates in females for metabolic syndrome(29.6% vs 17.1%)[5]. Studies by Mitchell AJ et al and Kornetova EG et al did not show such a difference between males and females[10] [12]. In our study, there was not much gender difference. No difference observed in our study may be due to the predominance of the rural population where both genders are involved in manual work which is comparable. It can also be due to the sample size, which was relatively less to find any significant association between the gender.

When compared with other socio demographic parameters, both the groups of Schizophrenia and BPAD did not differ considerably in the parameters. The parameters like marital status, type of family, socioeconomic strata, educational status, and occupation were almost comparable. Among the subjects with and without metabolic syndrome too, the study subjects were comparable. Hence the significant values were not obtained. The data suggests that the predominant population in our study had similar socio-demographic variables. The predominance of males with metabolic syndrome here can be because of the predominance in the male population. The reason for the majority belonging to the nuclear family may be because they belonged to a treatment-seeking population rather than the ones who sought alternate modes of management for psychiatric illness. The educational status and occupation did not prove to be of much significance, even though the findings were different in both the groups and their subgroups. Since the study was conducted here in a setup where predominantly people from a rural community belonging to lower and upper lower socio-economic strata were predominant, the study also showed similar findings.

CONCLUSION:

The study shows that there were minimal differences in the various socio-demographic parameters among the subjects with Schizophrenia and Bipolar Affective disorder. When they were subclassified with the presence of metabolic syndrome, the differences were seen. In the BPAD group, the mean age and duration of illness showed to be of statistical significance, which was higher for the subjects with metabolic syndrome.

Limitations: Our study had various limitations, beginning with a small sample size. The study was a tertiary care psychiatric unit study with a predominantly rural population; hence generalization of the study results might not yield similar results. A family history of metabolic syndromes was not taken into consideration, which could be a factor in the development of metabolic syndrome in the individual. Substance use and its role in the occurrence of metabolic syndrome were not assessed in our study.

Clinical Implications: The study was done by comparing metabolic syndrome with subjects of Schizophrenia and bipolar Affective disorder; similarly, studies comparing other psychiatric illnesses and metabolic syndrome can be done. Comparative studies among neurotic and psychotic spectrum diseases can be done. Studies in the general population can be done to assess the socio-demographic parameters and their association

with the causation of metabolic syndrome as its occurrence is rapidly increasing in various populations.

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