FREQUENCY OF METABOLIC SYNDROME IN SCHIZOPHRENIC PATIENTS IN A TERTIARY CARE HOSPITAL, PESHAWAR, PAKISTAN

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ABSTRACT

OBJECTIVES

This study aimed to determine the prevalence of metabolic syndrome in schizophrenic patients in a tertiary care hospital.

METHODOLOGY

This descriptive cross-sectional study was conducted at the Department of Psychiatry, PGMI Lady Reading Hospital Peshawar, Pakistan, from March 2023 to February 2024. A total of 196 schizophrenic patients were studied. After obtaining permission from the hospital's ethical committee and consent from patients included in the study, metabolic syndrome was diagnosed based on the American Association of Clinical Endocrinology criteria (2003). All the data, like age, gender, height, weight, BMI, smoking status, and metabolic syndrome, were recorded in a pre-designed proforma. All the data were analyzed in SPSS version 20. Mean and standard deviation were calculated for numerical variables, and frequencies and percentages for qualitative variables. The Chi-square test for categorical variables was applied with a p-value of < 0.05 as significant. Results were presented in the form of tables and charts.

RESULTS

The mean and standard deviation of age, height, weight, and BMI were 35.72±13.28, 164.80±11.50, 71.87±13.60 and 27.00±6.96, respectively. Out of 196 schizophrenic patients, 59 patients had metabolic syndrome, making up 31.1%, while 69.9% of patients had no metabolic syndrome. Of 196 schizophrenic patients, 106 were female, and 90 were male, making 54.1% and 45.9%, respectively, of all schizophrenic patients. Among 196 patients, 28 were from the BMI group < 18kg/m2, 71 from the BMI group 18-24kg/m2, 51 from the BMI group 25-30kg/m2, and 46 from the BMI group> 30kg/m2 making 14.3%, 36.2%, 26.0% and 23.5% respectively. Metabolic syndrome was statistically significant in age and BMI groups using the chi-square test with a p-value < 0.05 as significant.

CONCLUSION

The metabolic syndrome affects individuals with schizophrenia, particularly among older patients and those with a high BMI. Significant associations were observed with age and BMI, but gender and smoking status did not show significant differences.

KEYWORDS: *Metabolic syndrome, schizophrenia, Anti-Psychotics, BMI, Smoking*

INTRODUCTION

Schizophrenia is one of the psychiatric illnesses affecting about 1% of the population of the world.[1] It is a severe mental illness causing morbidity and mortality globally. The lifetime risk of schizophrenia in developing countries is about 4.0 per 1000 population.[2] It is more common in males than females, forming a ratio of 1.4:1.[3] The age of onset of schizophrenia is usually early adulthood. For males, the peak age of onset of schizophrenia is <25 years, and for females, the peak age for onset of schizophrenia is <35 years.[4] The prevalence of schizophrenia in Pakistan is 1.5%, causing premature mortality due to the disease and drug's side effects and associated other risk factors.[5] Schizophrenic patients are at risk of cardiovascular events due to the prevalence of cardio-metabolic disorders related to schizophrenia.[6] Metabolic syndrome is a collection of clinical and metabolic disorders, including insulin resistance, impaired glucose tolerance, hypertension, obesity, and dyslipidemia.[7] Different criteria are used for diagnosing metabolic syndrome, i.e., WHO criteria.[8] European Group for the Study of Insulin Resistance criteria, National Cholesterol Education Program Adult Treatment Panel 111(NCEP/ATP111) criteria, American Association of

Clinical Endocrinology criteria, and International Diabetes Federation (IDF) criteria.[9] The American Association of Clinical Endocrinology criterion for metabolic syndrome is based on impaired glucose tolerance, BMI, dyslipidemia, and hypertension.[10] The metabolic syndrome causes morbidity and mortality due to cardiovascular diseases. Metabolic syndrome includes a disease of old age affecting 42% of the population above 70 years old and affects both males and females equally. The overall prevalence of metabolic syndrome ranges from 8% to 63%, depending on age, race, and geographical location.[11] Schizophrenic patients have an increased risk of developing metabolic syndrome due to unhealthy lifestyles, poor diet, sedentary behavior, and side effects of drugs. The prevalence of metabolic syndrome in schizophrenic patients varies, as shown in different studies. The prevalence of metabolic syndrome in a study was 37%.[12] Another study showed the prevalence of metabolic syndrome as 50%, while another study showed a 44.6% prevalence of metabolic syndrome in schizophrenic patients.[13,14] This study aimed to determine the prevalence of metabolic syndrome in schizophrenic patients in a tertiary care hospital. This study will help us to know the association of age, gender, BMI, and smoking with metabolic syndrome in schizophrenic patients.

METHODOLOGY

This descriptive cross-sectional study was conducted at the Department of Psychiatry, Lady Reading Hospital Peshawar, Pakistan, from March 2023 to February 2024. The sample size was calculated using the WHO sample size calculator, keeping a 50% proportion of metabolic syndrome in schizophrenic patients, a 95% confidence interval, and a 7 % margin error. The sample size was 196. Sampling was done using a consecutive non-probability sampling technique. All the patients presenting with schizophrenia were diagnosed based on the Diagnostic and Statistical Manual of Mental Disorders-IV-Text Revision (DSM-IV-TR) diagnostic criteria with ages 20 or less to 50 or more years included in the study. Patients having a history of other psychiatric illnesses, hypothyroidism, pregnancy, malignancies, and secondary hypertension due to endocrine causes were excluded. Exclusion criteria were strictly followed to control the confounders and to exclude bias in the study results. After obtaining permission from the hospital's ethical committee and consent from patients included in the study, metabolic syndrome was diagnosed based on the American Association of Clinical Endocrinology criteria (2003). A patient was labeled as having metabolic syndrome if they had impaired fasting glucose plus any of the following, i.e., BMI ≥ 25kg/m2 or serum triglycerides ≥ 150mg/dl and HDL-cholesterol <40mg/dl in men and <40mg/dl in women or Blood pressure 130/85mmHg or greater. The body mass index of all the patients was calculated. 10 ml of blood was taken from all the patients and sent to the hospital laboratory to detect impaired fasting glucose and dyslipidemia. A patient was labeled as having impaired fasting glucose if the fasting blood sugar was > 100mg/dl. A patient was labeled dyslipidemia if the serum triglycerides were≥ 150mg/dl and HDL-cholesterol <40mg/dl in men and <40mg/dl in women. All the investigations were done in the same laboratory by a technician with more than five years of experience. Blood pressure was calculated manually. Certeza Aneroid Sphygmomanometer (CR 1006). All the data, such as age, gender, height, weight, BMI, smoking status, and metabolic syndrome, were recorded in a pre-designed proforma. All the data were analyzed in SPSS version 20. Mean and standard deviation were calculated for numerical variables, and frequencies and percentages were calculated for qualitative variables. The Chi-square test for categorical variables was applied with a p-value of < 0.05 as significant.

RESULTS

The mean and standard deviation of age, height, weight, and BMI were 35.72 ± 13.28, 164.80 ± 11.50, 71.87 ± 13.60 and 27.00 ± 6.96 respectively. (Table1).

Table 1: Demographic variables of schizophrenic patients

		f (%)
Age	< 20 years	62(31.6)
	21-30 years	32(16.3)
	31-40 years	33(16.8)
	41-50 years	51 (26.0)
	> 50 years	18(9.2)
Gender	Female	106 (54.1)
	Male	90 (45.9)
BMI	< 18kg/m2	28 (14.3)
	18-24kg/m2	71 (36.2)
	25-30kg/m2	51 (26.0)
	> 30kg/m2	46 (23.5)
Metabolic Syndrome in Schizophrenic Patients	Present	59 (30.1)
	Absent	137 (69.9)

Table 2: Prevalence of Metabolic Syndrome among Age groups

Age	Metabolic syndrome in schizophrenic patients		P-value
	Present	Absent	
< 20 years	04 (6.8)	58 (42.3)	<0.001
21-30 years	06 (10.2)	26 (19.0)	
31-40 years	14 (23.7)	19 (13.9)	
41-50 years	22 (37.3)	29 (21.2)	
> 50 years	13 (22.0)	05 (3.6)	

Table 3: Gender-wise metabolic syndrome distribution in schizophrenic patients

Gender	Metabolic syndrome in schizophrenic patients		P-value
	Present	Absent	
Female	30 (50.8)	76 (55.5)	0.551
Male	29 (49.2)	61 (44.5)	

Table 4: Prevalence of Metabolic Syndrome among BMI groups

BMI	Metabolic syndrome in schizophrenic patients		P-value
	Present	Absent	
< 18kg/m2	03 (5.1%)	25 (18.2%)	0.004
18-24kg/m2	16 (27.1%)	55 (40.1%)	
25-30kg/m2	19 (32.2%)	32 (23.4%)	
> 30kg/m2	21 (35.6%)	25 (18.2%)	

DISCUSSION

Metabolic syndrome is one of the metabolic disorders causing mortality and morbidity worldwide. It is more prevalent in schizophrenic patients as compared to non-schizophrenic patients. The metabolic syndrome was more prevalent in schizophrenic patients as compared to normal people of the same population.[15] The prevalence of metabolic syndrome was 46% in people with schizophrenia and 18.3% in normal individuals in that population. The prevalence of metabolic syndrome was 19.4%, while in another survey, the prevalence of metabolic syndrome in schizophrenic patients was 53.3%.[16,17] In our present study, the prevalence of metabolic syndrome in schizophrenic patients was 31.1% presenting in tertiary care hospitals. The prevalence of metabolic syndrome in schizophrenic patients increases with the increase of age. It was shown in many studies that metabolic syndrome had a significant association with age. The studies showed that the prevalence of metabolic syndrome in schizophrenic patients increased with the increase of age, significantly affecting the patients in the 3rd, 4th, and 5th decades more as compared to the young patients.[11,18] Our present study showed that metabolic syndrome was more prevalent in the 4th decade and affected patients of old age. Schizophrenia is present in both genders equally. Studies have shown that metabolic syndrome in schizophrenic patients is present more in women as compared to women.[15,19] The present study showed that metabolic syndrome was more common in women but was not statistically significant. Smoking is one of the risk factors for cardiovascular diseases. It is more prevalent in males.[20,21,22] in our study, the prevalence of smoking was higher in male patients, and no female in our research used to smoke. BMI is one of the predictors of metabolic syndrome in patients with schizophrenia.[23] A literature search showed that patients having high BMI had more chances of developing metabolic syndrome than schizophrenic patients.[24,25] Our present study showed that BMI is associated with metabolic syndrome in patients with schizophrenic patients and was statistically significant.

LIMITATIONS

This study has an ethnicity, diet, and the drug effects on metabolic syndrome in schizophrenic patients were not determined.

CONCLUSIONS

It was concluded that the prevalence of metabolic syndrome in schizophrenia was 31.1%, and metabolic syndrome was more prevalent in patients having high BMI and old age. According to age and BMI, the metabolic syndrome in patients with schizophrenia was statistically significant, while gender distribution and smoking status in schizophrenic patients with metabolic syndrome were not statistically significant.

CONFLICT OF INTEREST: None

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REFERENCES

1. Prabhakaran S, Nagarajan P, Varadharajan N, Menon V. Relationship Between Quality of Life and Social Support Among Patients with Schizophrenia and Bipolar Disorder: A Cross-Sectional Study. J Psychosoc Rehabil Ment Health 2021;8(2):137-45.doi:10.1007/s40737-020-00211-7.
2. Baranne ML, Falissard B. Global burden of mental disorders among children aged 5-14 years. Child Adolesc Psychiatry Ment Health . 2018 Apr 12;12:19.
3. Velligan DI, Rao S. The Epidemiology and Global Burden of Schizophrenia. J Clin Psychiatry.2023;84(1).doi:10.4088 /jcp.ms21078com5.
4. Häfner H. From Onset and Prodromal Stage to a Life-Long Course of Schizophrenia and Its Symptom Dimensions: How Sex, Age, and Other Risk Factors Influence Incidence and Course of Illness. Psychiatry J . 2019 Apr 16;2019 :9804836.
5. Ayub M, Arsalan A, Khan S ud DA, Bajwa S, Hussain F, Umar M, et al. Self-reported health and smoking status, and body mass index: a case-control comparison based on GEN SCRIP (GENetics of SChizophRenia In Pakistan) data. BMJ Open 2021;11(4):e042331.doi:10.1136/bmjopen-2020-042331.
6. Balõtšev R, Koido K, Vasar V, Janno S, Kriisa K, Mahlapuu R, et al. Inflammatory, cardio-metabolic and diabetic profiling of chronic schizophrenia. European Psychiatry.2017;39:1-10. doi.10.1016/j.eurpsy.2016.05.010.
7. Gluvic Z, Zaric B, Resanovic I, Obradovic M, Mitrovic A, Radak D, et al. Link between Metabolic Syndrome and Insulin Resistance. Curr Vasc Pharmacol [Internet]. 2016;15(1):30–9. doi:10.2174/1570161114666161007164510.
8. Nilsson PM, Tuomilehto J, Rydén L. The metabolic syndrome – What is it and how should it be managed? Eur J Prev Cardiol 2019;26(2_suppl):33-46.doi:10.1177/2047487319886404.

9. Ulaganathan V, Kandiah M, Mohd Shariff Z. A case-control study of the association between metabolic syndrome and colorectal cancer: a comparison of International Diabetes Federation, National Cholesterol Education Program Adults Treatment Panel III, and World Health Organization definitions. J Gastrointest Oncol. 2018 Aug;9(4):650-63.
10. Al-Hamad D, Raman V. Metabolic syndrome in children and adolescents. Transl Pediatr. 2017 Oct;6(4):397-407.
11. Yoca G, Anıl Yağcıoğlu AE, Eni N, Karahan S, Türkoğlu İ, Akal Yıldız E, et al. A follow-up study of metabolic syndrome in schizophrenia. Eur Arch Psychiatry Clin Neurosci.2019;270 (5):611-8.doi:10.1007/s00406-019-01016-x.
12. Sneller MH, de Boer N, Everaars S, Schuurmans M, Guloksuz S, Cahn W, et al. Clinical, Biochemical and Genetic Variables Associated With Metabolic Syndrome in Patients With Schizophrenia Spectrum Disorders Using Second-Generation Antipsychotics: A Systematic Review. Front Psychiatry. 2021 Mar 29;12:625935.
13. Pillinger T, McCutcheon RA, Vano L, Mizuno Y, Arumuham A, Hindley G, et al. Comparative effects of 18 antipsychotics on metabolic function in patients with schizophrenia, predictors of metabolic dysregulation, and association with psychopathology: a systematic review and network meta-analysis. Lancet Psychiatry. 2019/12/17. 2020 Jan;7(1):64-77.
14. Piras M, Ranjbar S, Laaboub N, Grosu C, Gamma F, Plessen KJ, et al. Evolutions of Metabolic Parameters Following Switches of Psychotropic Drugs: A Longitudinal Cohort Study. Schizophr Bull. 2023 Jan 3;49(1):24-33.
15. Challa F, Getahun T, Sileshi M, Geto Z, Kelkile TS, Gurmessa S, et al. Prevalence of metabolic syndrome among patients with schizophrenia in Ethiopia. BMC Psychiatry. 2021 Dec11;21(1): 620.
16. Nebhinani N, Tripathi S, Suthar N, Pareek V, Purohit P, Sharma P. Correlates of Metabolic Syndrome in Patients with Schizophrenia: An Exploratory Study. Indian J Clin Biochem. 2020/07/06. 2022 Apr;37(2):232-7.
17. Xing M, Sheng J, Cui M, Su Y, Zhang C, Chen X, et al. Differing Prevalence and Correlates of Metabolic Syndromes Between Chlorpromazine and Clozapine: A 10-year Retrospective Study of a Male Chinese Cohort. Curr Neuropharmacol. 2022;20(10):1969-77.
18. Sahpolat M, Ari M. Higher prevalence of metabolic syndrome and related factors in patients with first-episode psychosis and schizophrenia: a cross-sectional study in Turkey. Nord J Psychiatry. 2020;75(1):73-8. doi:10.1080/08039488.2020.1815 080.
19. Bowo-Ngandji A, Kenmoe S, Ebogo-Belobo JT, Kenfack-Momo R, Takuissu GR, Kengne-Ndé C, et al. Prevalence of the metabolic syndrome in African populations: A systematic review and meta-analysis. PLoS One. 2023 Jul 27;18(7): e0289155-e0289155.
20. Rosenthal T, Touyz RM, Oparil S. Migrating Populations and Health: Risk Factors for Cardiovascular Disease and Metabolic Syndrome. Curr Hypertens Rep. 2022/06/15.2022 Sep;24(9): 325-40.
21. Teo KK, Rafiq T. Cardiovascular Risk Factors and Prevention: A Perspective From Developing Countries. Canadian Journal of Cardiology [Internet]. 2021;37(5):733-43.doi:10.1016.j.cjca. 2021.02.009.
22. Farahbakhsh M, Faramarzi E, Fakhari A, Sadeghi M, Barzegar H, Norouzi S, et al. The PERSIAN Cohort: Prevalence of Psychiatric Disorders Among Employees. Arch Iran Med 2024 Feb 1;27(2):72-8.
23. Şahin B, İlgün G. Risk factors of deaths related to cardiovascular diseases in World Health Organization (WHO) member countries. Health & Social Care in the Community 2020;30(1):73-80.doi:10.1111/hsc.13156.
24. Poojari PG, Khan SA, Shenoy S, Acharya LD, Shetty S, Bose S, et al. Identification of risk factors and metabolic monitoring practices in patients on antipsychotic drugs in South India. Asian J Psychiatr. 2020;53:102186.doi:10.1016/j.ajp.2020.1021 86.
25. Saccaro LF, Aimo A, Panichella G, Sentissi O. Shared and unique characteristics of metabolic syndrome in psychotic disorders: a review. Front Psychiatry. 2024 Mar 4;15:134 3427.

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