Section: Psychiatry

Original Research Article

METABOLIC EFFECTS IN PATIENTS ON SECOND GENERATION ORAL ANTI-PSYCHOTICS IN A TERTIARY CARE HOSPITAL IN CENTRAL GUJARAT: A CROSS-SECTIONAL STUDY

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Corresponding Author:
Dr. Yukti Vaishal Chokshi,,
Email: chokshiyukti@gmail.com

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Vaishal D Chokshi[1], Vinodkumar M Darji[2], Divyank A Jajoo[3], Riddhi R Donda[3], Simra I Saiyed[3]

[1]Assistant Professor, Department of Psychiatry, Narendra Modi Medical College and Sheth LG General Hospital, India.
[2]Associate Professor, Department of Psychiatry, Narendra Modi Medical College and Sheth LG General Hospital, India.
[3]Resident, Department of Psychiatry, Narendra Modi Medical College and Sheth LG General Hospital, India.

Abstract

Background: The aim and objective are to assess the overall incidence of metabolic disorders among patients on second-generation oral antipsychotics. 2. To evaluate the incidence of metabolic abnormalities specific to individual SGAs. 3. To examine the correlation between socio-demographic factors and metabolic abnormalities. **Materials and Methods:** This prospective cohort study was conducted after Institutional Review Board (IRB) approval. Patients on risperidone, aripiprazole, olanzapine, and clozapine were enrolled through purposive sampling after informed consent. Participants were monitored for metabolic parameters, including complete blood count, total cholesterol levels, and fasting blood sugar, after three months of treatment. Data on antipsychotic type, dosage, and socio-demographic variables (age, sex, marital status, education, and residence) were collected and analyzed. **Result:** The overall incidence of metabolic abnormalities among study participants was 8.547% (n=10). Olanzapine exhibited the highest prevalence of metabolic disturbances, followed by clozapine, risperidone, and aripiprazole. **Conclusion:** Metabolic abnormalities associated with SGAs pose a significant health risk. Regular metabolic screening and early intervention can help improve patient quality of life.

INTRODUCTION

Antipsychotic drugs used in the treatment of schizophrenia and other psychotic illnesses can induce weight gain, with some medications-second generation anti-psychotics having a greater propensity to do so than others.[1] These adverse effects associated with second-generation antipsychotics are also part of the metabolic syndrome, which includes obesity, dyslipidemia, derangements in blood glucose levels, hypertension and abnormal renal functions.[1]

Predictors of metabolic dysregulation are poorly understood. The association between metabolic changes, socio-demographic profile and duration of anti-psychotic treatment needs further research and assessment to detect at risk individuals.[2]

Among different classes of anti-psychotics second generation anti- psychotics have highest propensity for developing metabolic side effects. This is a serious concern for physicians - The development of metabolic syndrome, also known as syndrome X, in patients suffering from schizophrenia.

It is thought that a patient's genetic makeup and environment may directly contribute to the risk of developing of metabolic syndrome.[3] It is unknown why some patients have higher chances of developing metabolic syndrome then others.[3]

Insulin resistance and obesity are considered to be core elements in the development of metabolic syndrome, but accumulating evidence suggests that varying degrees of insulin resistance may be the common etiological factor responsible for metabolic syndrome.[4]

Aims And Objectives

- To study various socio-demographic markers of patients with metabolic abnormalities.
- To assess the over-all incidence of metabolic disorders among patients on 2nd generation oral anti-psychotics.
- To assess the incidence of metabolic abnormalities among patients on respective second generation oral anti-psychotics.

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MATERIALS AND METHODS

After AMCMET Institutional review board (dissertation and scientific committee) held on 4th March 2022, study was approved. A total of 117 patients who had initiated treatment with second-generation antipsychotics were included in the study after obtaining informed consent. The study population comprised 40 patients on risperidone, 28 patients on aripiprazole, 34 patients on olanzapine, and 15 patients on clozapine. This prospective cohort study employed a purposive sampling method to ensure the selection of participants meeting the specified criteria.

The inclusion criteria required patients to be on a stable regimen of second-generation oral antipsychotics—risperidone, aripiprazole, olanzapine, or clozapine—for a minimum duration of three months. Additionally, all participants were required to be above 18 years of age to be eligible for the study.

Exclusion criteria were also established to maintain the study's validity and reliability. Patients who were unwilling or lacked the capacity to provide informed consent were excluded. Furthermore, individuals with other co-morbid psychiatric illnesses or pre-existing metabolic abnormalities were not included in the study to minimize confounding factors and ensure a more focused assessment of the effects of second-generation antipsychotics.

Patients on above mentioned second generation oral anti-psychotics were screened for the following metabolic parameters after a period of 3 months on second generation anti-psychotics: Complete Blood Count, Total Cholesterol levels, Fasting Blood Sugar levels

Socio-demographic profile such as age, sex, marital status and residence were taken.

Details about the anti-psychotic and its dosage were taken.

Ethical Considerations: approval for study obtained from AMCMET Institutional review board (dissertation and scientific committee) on 4th March 2022

After consent of patient, study was initiated. Strict confidentiality was maintained.

Statistical Analysis: Collected data of 117 study subjects were checked for consistency and completeness and entered in Microsoft Excel data sheet for analysis. Data were analysed by IBM Statistical Package for the Social Sciences version 22 (SPSS v22, 2013). They were organized and presented applying the principles of descriptive statistics in the form of percentage and also in tables and diagrams. Chi-square test was applied as test of significance for categorical variables and significance level was set at $p < 0.05$.

RESULTS

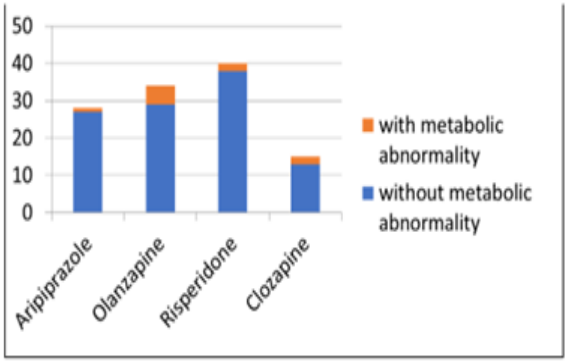

Figure 1

Distribution of participants according to presence of metabolic abnormalities with respective anti-psychotic medications.

Table 1: Distribution of participants according to presence of metabolic abnormalities with various socio-demographic variables.

Residence	**With metabolic abnormalities**	**Without metabolic abnormalities**	P-value = .349639 Chi-square statistic = 0.8748
Urban	8	70	
Rural	2	37	
Age			
<35 years	7	51	P value = 0.176692 Chi-square statistic with Yates correction = 1.0411
>35 years	3	56	
Marital Status			
Married	8	92	P-value = .607754 Chi-square statistic = 0.2635
Unmarried	2	15	
Educational Status			P-value = .181062 Chi-square statistic = 1.7889
Educated	4	66	
Uneducated	6	41	

P Value is significant at $p < .05$

For correlation of metabolic abnormalities with age, the median age, i.e. 35 years was taken and two groups, more than 35 years and less than 35 years were formed . The chi-square statistic with Yates correction is 1.0411. The p-value is .307575. Thus, the correlation is statistically not significant at $p < .05$.

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N=78 patients were residing in urban areas, out which n=8 patients developed metabolic abnormalities. N=39 patients were residing in rural areas, out of which n=2 developed metabolic abnormalities. The chi-square statistic is 0.8748. The p-value is .349639. Not significant at $p < .05$.

No statistically significant correlation was obtained for marital status or educational status.

Table 2: Distribution of participants according to their sex.

Variable	Details
Total Sample Size	117 patients (n=117)
Mean Age	33.63 years
Gender Distribution	
- Male	58 participants (N=58)
- Female	59 participants (N=59)
Patients on Each Drug	
- Olanzapine	34 patients
- Aripiprazole	28 patients
- Risperidone	40 patients
- Clozapine	15 patients

Table 3: Distribution of participants according to presence of metabolic abnormalities with their sex.

Sex	With metabolic abnormalities	Without metabolic abnormalities	P-value =.044179 Chi-square statistic = 4.0497
Male	8	50	
Female	2	57	
	10	107	

P value is significant at $p < .05$

N= 58 patients were male, out of which n= 8 patients developed metabolic abnormalities. N= 59 patients were female out of which, n= 2 patients developed metabolic abnormalities. The chi-square statistic is 4.0497. The p-value is .044179. The correlation is statistically significant at $p < .05$.

Table 4: Prevalence of Metabolic Abnormalities

Drug	Prevalence of Metabolic Abnormalities (%)	Details
Olanzapine	14.76% (n=5)	- 3 patients had hypercholesterolemia - 2 patients had both elevated fasting glucose levels and abnormal lipid profile
Clozapine	13.3% (n=2)	- 1 patient had hypercholesterolemia - 1 patient had elevated glucose levels
Risperidone	Not specified	- 1 patient had elevated sugar levels - 1 patient had elevated lipid levels
Aripiprazole	Not specified	- 1 patient had abnormal fasting sugar levels - No patients had elevated lipid levels

DISCUSSION

It is clearly evidenced here that metabolic adverse effects were more pronounced with olanzapine and clozapine, which should encourage us to go for baseline investigations before starting treatment so that these changes can be regularly monitored. Also, if the patient already suffers from some metabolic derangements, it is best to avoid olanzapine and clozapine; instead risperidone and aripiprazole can be used. The prevalence of Metabolic Syndrome among Indians is 30 %.[5] Studies suggest that low birth weight is a common risk factor for both – schizophrenia and metabolic syndrome. Hence this may partky explain the high risk of metabolic syndrome among patients of schizophrenia.[6,7]

CONCLUSION

The management and prevention of metabolic side effects are important for the overall health and well-being of patients with psychiatric disorders. Key strategies include lifestyle changes (diet, exercise), regular monitoring of weight, glucose, lipid levels and using medications when necessary. Newer antipsychotics with lower metabolic risk should be preferred for who have developed or at risk of metabolic side effects. (Newcomer, 2005). Antipsychotic medications area double edged sword – though they are highly effective, however serial monitoring of patients is a must to counter-act their side effects.

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