ORIGINAL RESEARCH

Assessment of drug-emergent metabolic syndrome in psychiatric patients receiving second-generation antipsychotics

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ABSTRACT
Background: Individuals with serious mental disease, especially schizophrenia, have higher rates of morbidity and mortality when compared to the overall population. The present study was conducted to assess drug-emergent metabolic syndrome in psychiatric patients receiving second-generation antipsychotics. **Materials & Methods:**100 patients suffering from schizophrenia were divided into three subgroups, i.e. subgroup I, subgroup II, and subgroup II, who were prescribed risperidone, olanzapine, and clozapine respectively. Group IV was a control group who were prescribed haloperidol. Measurements of blood pressure, fasting blood glucose, fasting HDL levels, fasting triglycerides level, and waist circumference were performed after 1 month and 4 months, respectively. **Results:** Out of 100 patients, males were 56 and females were 44. Metabolic syndrome was seen in 4 in group I, 8 in group II, 5 in group III and 0 in group IV. The difference was significant (P< 0.05). The meanFBG (mg/dl) was 80.2, 82.5, 79.2 and 78.4 in group I, II, III and IV respectively. The mean fasting TG was 82.3, 90.4, 83.2, and 77.4 in group I, II, III and IV respectively. The mean fasting HDL was 50.4, 48.2, 47.6, and 48.1 in group I, II, III and IV respectively. The mean WC was 77.6, 78.2, 79.4, and 78.0 in group I, II, III and IV respectively. The mean HC was 82.5, 84.2, 85.1, and 84.2 in group I, II, III and IV respectively. The difference was significant (P< 0.05). **Conclusion:** The metabolic parameters are markedly altered by second-generation antipsychotics, raising the risk of metabolic syndrome and related conditions such as type II diabetes and cerebrovascular accidents. The antipsychotic medication with the highest propensity to induce metabolic syndrome is olanzapine.
Keywords:schizophrenia, metabolic syndrome, risperidone

INTRODUCTION

Individuals with serious mental disease, especially schizophrenia, have higher rates of morbidity and mortality when compared to the overall population.[1] They also have a 20% lower life expectancy. According to some, schizophrenia is a "life-shortening disease," and the evidence for this assertion is mounting.[2] Without taking into account suicide, which makes up less than one-third of all preventable deaths, individuals with schizophrenia should anticipate living 9–12 years shorter lives on average than persons in the general population.[3]A group of risk factors known as metabolic syndrome are linked to higher rates of morbidity and death from cardiovascular disease and type 2 diabetes mellitus. The metabolic syndrome is a transitional state that leads to type II diabetes and cardiovascular disease in the general adult population.[4]

Second-generation antipsychotics are prescribed extensively for both psychotic and nonpsychotic diseases due to their greater and possibly wider efficacy over classic neuroleptics, along with lower rates of extrapyramidal side effects and tardive dyskinesia. On the other hand, reports of hyperglycemia, dyslipidemia, and excessive weight gain have raised serious concerns.The metabolic syndrome also includes several side effects linked to second-generation antipsychotics.[5]The present study was conducted to assess drug-emergent metabolic syndrome in psychiatric patients receiving second-generation antipsychotics.

MATERIALS & METHODS

The present study consisted of 100 patients suffering from schizophrenia diagnosed using the ICD-10 criteriaof both genders. All gave their written consent to participate in the study.

Data such as name, age, gender, etc. was recorded. The group was further divided into three subgroups, i.e. subgroup I, subgroup II, and subgroup II, who were prescribed risperidone, olanzapine, and clozapine respectively. Group IV was a control group who were prescribed haloperidol. Measurements of blood pressure, fasting blood glucose, fasting HDL levels, fasting triglycerides level, and waist circumference were performed after 1 month and 4 months, respectively.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 100		
Gender	Male	Female
Number	56	44

Table I shows that out of 100 patients, males were 56 and females were 44.

Table II Assessment of metabolic syndrome

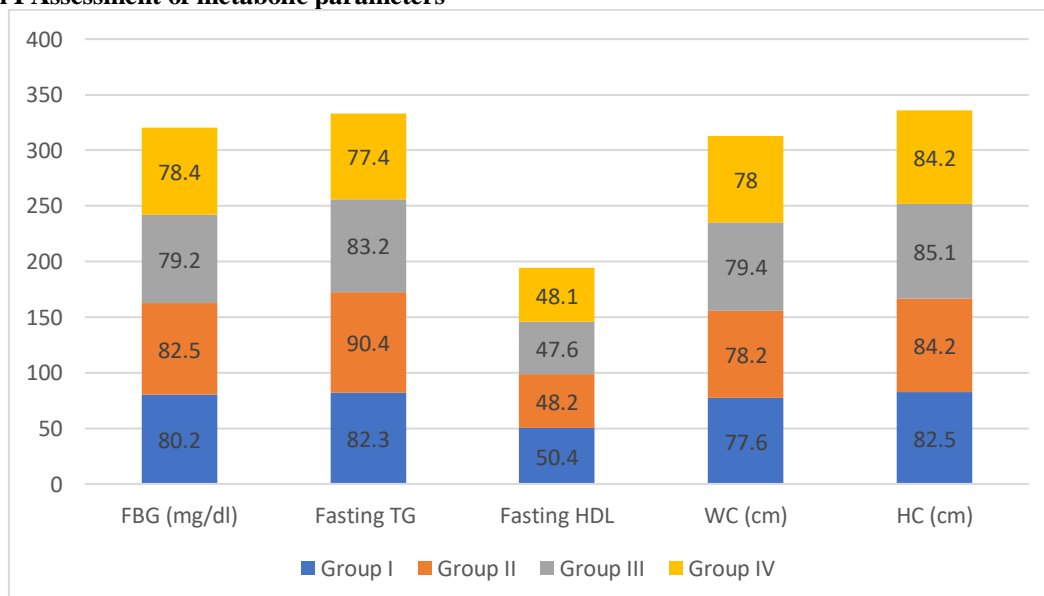| Groups	Metabolic syndrome	No metabolic syndrome	P value
Group I	4	21	0.01
Group II	8	17	0.02
Group III	5	20	0.04
Group IV	0	25	0.01

Table II shows that Metabolic syndrome was seen in 4 in group I, 8 in group II, 5 in group III and 0 in group IV. The difference was significant (P< 0.05).

Table III Assessment of metabolic parameters

Parameters	Group I	Group II	Group III	Group IV	P value
FBG (mg/dl)	80.2	82.5	79.2	78.4	0.05
Fasting TG	82.3	90.4	83.2	77.4	0.04
Fasting HDL	50.4	48.2	47.6	48.1	0.05
WC (cm)	77.6	78.2	79.4	78.0	0.81
HC (cm)	82.5	84.2	85.1	84.2	0.92

Table III, graph I show that meanFBG(mg/dl) was 80.2, 82.5, 79.2 and 78.4 in group I, II, III and IV respectively. The mean fasting TG was 82.3, 90.4, 83.2, and 77.4in group I, II, III and IV respectively. The mean fasting HDL was 50.4, 48.2, 47.6, and 48.1in group I, II, III and IV respectively. The mean WC was 77.6, 78.2, 79.4, and 78.0in group I, II, III and IV respectively. The mean HC was 82.5, 84.2, 85.1, and 84.2in group I, II, III and IV respectively.The difference was significant (P< 0.05).

Graph I Assessment of metabolic parameters

DISCUSSION

Olanzapine is the antipsychotic drug that has the maximum potential to cause metabolic syndrome.[6,7] Haloperidol has the least potential to cause metabolic syndrome. Clozapine and risperidone also have the potential to cause metabolic syndrome but have a lower potential to do so as compared with olanzapine.[8] Olanzapine causes maximum weight gain while haloperidol causes least weight gain among the four antipsychotics studied.[9]The present study was conducted to assess drug-emergent metabolic syndrome in psychiatric patients receiving second-generation antipsychotics.

We found that out of 100 patients, males were 56 and females were 44. Metabolic syndrome was seen in 4 in group I, 8 in group II, 5 in group III and 0 in group IV. Gautam et al[10]evaluated the emergence of metabolic syndrome due to second-generation antipsychotics as compared with conventional (typical) antipsychotics.Thirty patients were given conventional antipsychotics and 90 were given second-generation antipsychotics, including risperidone, olanzapine and clozapine. Metabolic parameters were taken before onset of drug treatment therapy and after 4 months. 11.66% of the patients developed metabolic syndrome after 4 months of antipsychotic medication.

We found that the meanFBG (mg/dl) was 80.2, 82.5, 79.2 and 78.4 in group I, II, III and IV respectively. The mean fasting TG was 82.3, 90.4, 83.2, and 77.4 in group I, II, III and IV respectively. The mean fasting HDL was 50.4, 48.2, 47.6, and 48.1 in group I, II, III and IV respectively. The mean WC was 77.6, 78.2, 79.4, and 78.0 in group I, II, III and IV respectively. The mean HC was 82.5, 84.2, 85.1, and 84.2 in group I, II, III and IV respectively.De Hert, Van Eyck et al[11] found that metabolic abnormalities were already present in first-episode patients, and considerably increased with increasing duration of illness. When compared to the general population much higher rates of the metabolic syndrome and diabetes were observed in patients with schizophrenia. In contrast, the difference in the prevalence of diabetes in patients with schizophrenia and the general population dramatically and linearly increased from 1.6% in the 15-25 age group, to 19.2% in the 55-65 age-band.

Suvisaari JM, Saarni SI et al[12] in their study the prevalence estimates of metabolic syndrome were 36.2%, 41.4% and 25.0%, among subjects with schizophrenia, other non- effective psychosis, and affective psychosis, respectively, compared with 30.1%, in subjects without psychotic disorders. Subjects with schizophrenia had significantly lower high-density lipoprotein cholesterol and higher triglyceride and glucose levels and larger waist circumference. The prevalence of metabolic syndrome was significantly elevated among users of high-potency (52.1%, p < .001) but not low- potency (39.0%) and atypical (23.4%) antipsychotic medication.

The limitation of the study is the small sample size.

CONCLUSION

Authors found that the metabolic parameters are markedly altered by second-generation antipsychotics, raising the risk of metabolic syndrome and related conditions such as type II diabetes and cerebrovascular accidents. The antipsychotic medication with the highest propensity to induce metabolic syndrome is olanzapine.

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