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Assessment of Adverse Effects Associated with Antipsychotics in Patients with Schizophrenia

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Abstract
Schizophrenia causes major disruptions in a person's life, making it challenging to go to work or school, maintain a routine, interact with others, finish daily duties, or take care of oneself. This study aimed to assess adverse effects of antipsychotics in patients with schizophrenia. This study is relevant in identifying the side effects and improving the treatment options which HELPs reducing side effects and improved quality of life of patients. Antipsychotic drugs can lessen or alleviate psychotic symptoms like delusions and hallucinations. Antipsychotic medications can have side effects that range from being mildly unpleasant to extremely unpleasant. A total of 42 patients complying the inclusion criteria were included in the study among which The majority were in the age group of 35-44 and with male gender dominanc. The study observed no significant relationship between the occurrence of the side effects and age but found to have a significant relation between weight gain and male gender. The drug which was most prescribed was Risperidone, followed by Olanzapine. From this study it was evident that, side effects such as akathisia, tremors, insomnia, weight gain, dizziness, weight gain etc was due to second generation antipsychotics from usage over a longer period of time. This study observed that male age groups were more prone to get weight gain as side effect while taking second generation side effects. While no significant comparison with age was found. The study concluded that adverse effect can be attenuated by alternating the drugs instead of long term usage.

Keywords: Schizophrenia, adverse effects, Delusions, Hallucinations, Weight gain.

1. Introduction

Schizophrenia is a severe mental condition that has an impact on a person's thoughts, feelings, and actions. Schizophrenia sufferers may appear to have lost all sense of reality, which can be upsetting to both them and their loved ones [1]. Schizophrenia can cause major disruptions in a person's life, making it challenging to go to work or school, maintain a routine, interact with others, finish daily duties, or take care of oneself. People with schizophrenia can control their condition and enjoy happy lives, nevertheless, with regular treatment—a mix of medication, therapy, and social support [2]. Schizophrenia patients may experience:

- False beliefs that remain unchanged in the face of evidence.
- The experience of seeing or hearing things that are not real, such as commands being given by a voice.

- The conviction that one's thoughts is being read or controlled by another.
- Thinking and speaking in a dis organised manner, such as jumping from one idea to another without a logical relationship or speaking in phrases that are unclear to other people.
- Speech and emotional expression difficulties, as well as issues with organisation, memory, and focus.
- A diminished capacity for basic functioning, such as disregarding personal cleanliness or suppressing emotion [3].

Schizophrenia symptoms differ from person to person and might evolve over time. While some people only ever have one psychotic episode, others have numerous over their lifetimes. Schizophrenia symptoms can be generally classified as: Psychotic Symptoms: Changes in a person's thinking, behaviour, and perception of the world are among the signs of psychosis. People who are experiencing psychotic symptoms may lose their sense of reality with others and have distorted perceptions of the outside world. These symptoms fluctuate for some people. Hallucinations, Delusions, Thought Disorder are common examples of Psychotic symptoms. Negative Symptoms: lack of motivation, lack of interest in or enjoyment from daily tasks, withdrawal from social life, difficulty expressing feelings, and difficulties functioning regularly are examples of negative symptoms. For example, spending a lot of time on inactive tasks and having very little energy. Cognitive Symptoms: Attention, focus, and memory issues are examples of cognitive symptoms. To follow a discussion, pick up new information, or remember appointments may be challenging under these conditions. One of the best indicators of a person's daily functioning is their degree of cognitive functioning. For example, unable to concentrate or pay attention, having problems using knowledge right away after learning it [4]. There are several factors that can lead to schizophrenia symptoms: Genetic: Evidence suggest that, schizophrenia may be caused by a number of different genes, such as Neuregulin (NRG-1,8p12-21), Dysbindin [DTNBP1(Dystrobrevin-binding protein 1 gene) ,6p22.3] but no one gene is responsible for the condition on its own. Environmental factors: Evidence suggest that, the onset of schizophrenia may be influenced by a person's surroundings, experiences, and a combination of hereditary and environmental variables. Environmental variables may include living in poverty, being in a dangerous or stressful environment, being exposed to viruses, or having nutritional issues before birth[[5]. Brain size & Structure: Previous studies suggest that, people who have schizophrenia may be more prone to have variations in the size of specific brain regions and in the connections between those regions. Some of these changes in the brain maybe formed before birth. The relationship between brain shape and function and schizophrenia is still a topic of research [6]. Around 24 million people, or 1 in 300 persons (0.32%), globally suffer with schizophrenia. Adults make up 1 in 222 of this rate, or 0.45%. It does not occur as frequently as many other mental illnesses. The most common times for onset are in late adolescence and the early twenties, and onset often occurs earlier in men than in women [7]. Schizophrenia prevalence studies in India show rates of 1.5 per 1000 to 2.5 per 1000. There doesn't seem to be a persistent variation in the incidence of the sickness between rural and urban locations, and there are no obvious hotspots of high or low prevalence. There aren't many incidence studies, but those that do suggest a yearly incidence of 0.44 per 1000 in rural areas and 0.35 to 0.38 per 1000 in urban areas [8]. Antipsychotic drugs can lessen or alleviate psychotic symptoms like delusions and hallucinations (the perception of unreal sights or sounds). Antipsychotic pharmaceuticals, formerly known as major tranquilizers and neuroleptics, are the primary class of treatments used to treat schizophrenia. In a person with acute psychosis, antipsychotic drugs can assist to calm and resolve confusion within hours or days, but it may take them up to four or six weeks to fully take action. These

drugs do not treat the underlying illness; nevertheless, they can aid with symptom control. Antipsychotics can aid in the prevention of additional psychotic episodes when administered for a longer period of time [9]. The more established class of drugs is referred to by doctors as "first-generation," and the most recent ones are referred to as "atypical" or "second-generation" antipsychotics. The first generation drugs are Haloperidol, Thiothixene, Trifluoperazine, Chlorpromazine and second generation drugs are Olanzapine, Clozapine, Aripiprazole, Risperidone, Paliperidone. Antipsychotic medications can have side effects that range from being mildly unpleasant (such as mild sedation or dry mouth) to being extremely unpleasant (such as constipation, akathisia, and sexual dysfunction), painful (such as acute dystonias), disfiguring (such as weight gain, tardive dyskinesia), and even life-threatening (such as myocarditis, agranulocytosis). Some adverse effects, such as elevated prolactin or serum cholesterol levels, have minimal short-term clinical relevance but may increase the risk of long-term medical issues. Each antipsychotic drug has a distinct side effect profile that has a different impact on various people. Due to the fact that the incidence of side effects varies greatly between the several antipsychotic drugs [10]. Antipsychotic drugs frequently significantly reduce hallucinations and delusions in schizophrenia patients and improve disordered thinking and behavior. However, conversations concerning these drugs are frequently dominated by their side effects rather than their advantages because they are linked to a variety of adverse effects, some of which are medically serious and many of which alter patient attitudes about therapy [11]. Assessment to counter those side effects:Usage of low dose: When the antipsychotic has been beneficial and the adverse effect is dose-related and not an emergency medical situation, this is pertinent. It is generally advised to use the lowest dose necessary to achieve therapeutic objectives as this lessens dose-related side effects include parkinsonism, drowsiness, hyperprolactinemia, orthostatic hypotension, and anticholinergic effects [12]. Switching to different antipsychotic treatment: A popular tactic that has been shown to be successful for at least some side effects is switching to a medicine that is unlikely to trigger the problematic effect. To prevent symptom aggravation and other rebound symptoms, switching should ideally be done gradually rather than suddenly. Non-Pharmacological interventions: Although attractive, non-pharmacologic methods to lessen side effects are typically not available. Exercise and diet plans have a limited impact on weight increase and associated lipid problems [13].

2. Materials and Methods

This is an observational study and was carried out for a period of 6 months. The study was carried out in the Out-patient Department of Psychiatry, ESIC MC - PGIMSR, Rajajinagar, Bengaluru for 6 months. Using the formula, sample size was found to be 42 samples.

Study tools:

The following tools were employed to obtain information pertaining to the study:

- **AIMS: abnormal involuntary movement scale**

The AIMS is a 12-item scale that is evaluated by a clinician and used to determine the severity of dyskinesias in patients receiving neuroleptic medicines (more specifically, orofacial movements, extremities movements, and truncal movements). Additional questions evaluate the overall seriousness, level of incapacity, the patient's knowledge of the movements, and the discomfort they cause.

- **BARS: barnes akathisia rating scale**

The Barnes Akathisia Scale (BAS or BARS) is a rating scale that is administered by healthcare providers like physicians, and nurse practitioners to assess the severity of drug-induced akathisia (It follows diagnostic criteria for pseudo-akathisia, and mild, moderate, and severe akathisia).

- **Structured Data collection form**

Inclusion criteria:

1. Patients diagnosed with Schizophrenia
2. years of history and >18 years of age

Exclusion criteria:

1. Any other major medical condition like Congestive heart failure, Chronic Kidney Disease, Hypothyroidism etc.
2. Psychiatric co-morbidities

Statistical Analysis:

All recorded data were entered and analyzed using MS Excel for determining for the statistically significant. Descriptive statistical analysis of data was done using Chi-square test and also calculated percentage. Column charts, bar graphs were made to find the nature of data distribution.

3. Results

Out of 42 patients included in the study, majority percentage (%) of patients were from the age group of 35-44 years and least were from the age group of 55-64 years.

Age (years)	Number of patients (n)	Percentage (%)
18-24	0	00.0
25-34	6	14.28
35-44	22	52.38
45-54	10	23.80
55-64	4	9.52
>65	0	0.00

Table 1: Age distribution of patients

Out of 42 patients included in the study, the majority of the subjects 25 (59%) were males & 17(41%) females included in the study. Male subjects were more than the females.

Gender	Number of Patients (n)	Percentage (%)
Male	25	59.52
Female	17	40.48
Total	42	100

Table 2: Distribution of patients according to genderAll the 42 patients were prescribed with antipsychotics including Olanzapine, Risperidone, Aripiprazole, haloperidol. Among those 42 patients, majority 33 patients were given Risperidone and least number of 2 patients were given with aripiprazole.

Antipsychotic Drugs	Number of patients (n)	Percentage (%)
Olanzapine	30	71.42
Risperidone	33	78.57
Aripiprazole	2	4.76
Haloperidol	5	11.90

Table 3: Distribution of patients based on antipsychotic drug prescribed

Among those 42 patient 26 (61.90%) patients showed side effect and 16 (38.10%) patients were not showed side effects.

Side Effect	Number of Patients (n)	Percentage (%)
Not showed	16	38.10
Showed	26	61.90

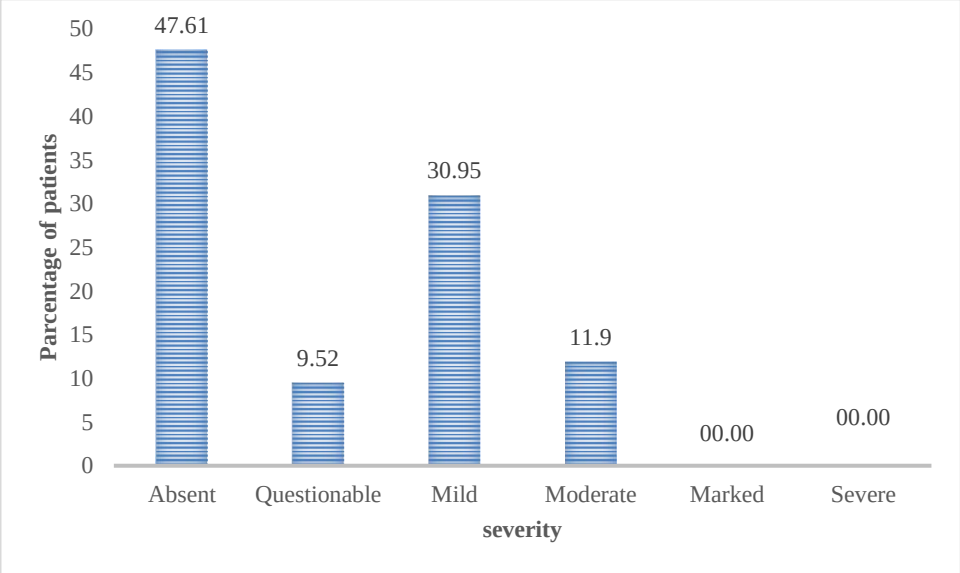
Table 4: Distribution of patients according to occurrence of side effects

Among 42 patients, the most shown side effect was found to be Akathisia (24) and least showed side effect was found to be Dizziness (10).

Side Effect	Number of Patients (n)	Percentage (%)
Hypotension	14	33.33
Insomnia	16	38.09
Tremors	17	40.47
Weight Gain	19	45.23
Constipation	15	35.71
Dizziness	10	23.80
Akathisia	24	57.14
Dry mouth	14	33.33
Nausea	11	26.19

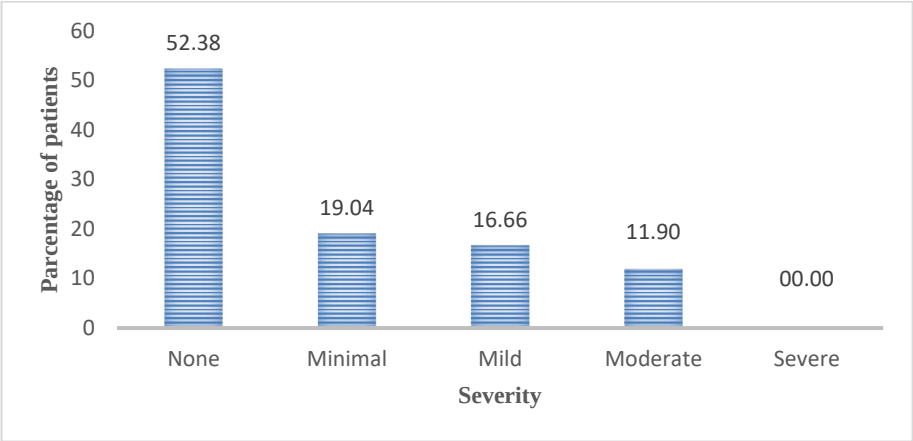
Table 5: Distribution of patients according to side effects

Figure 1: Distribution of patients according to severity of Akathisia



Severity of Akathisia was assessed using BARS scale consisting of 6 questions. The scale was administered only to 42 patients who were prescribed with antipsychotics. Among 42 patients, 20 patients were found to be in Absent group and least number was 5, who all are in moderate group.

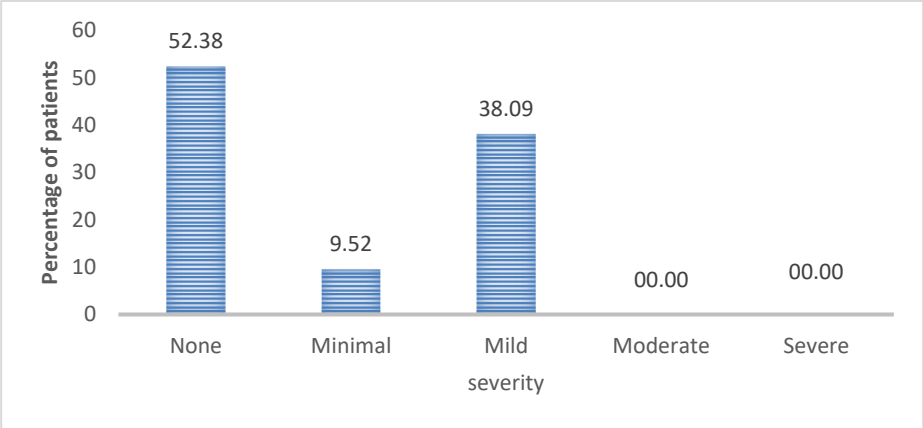
Figure 2: Distribution of patients based on abnormalities in muscle and facial expression



Among 42 patients, 22 patients were found to be in None (0) group and least number was 5, who all are in moderate (3) group.

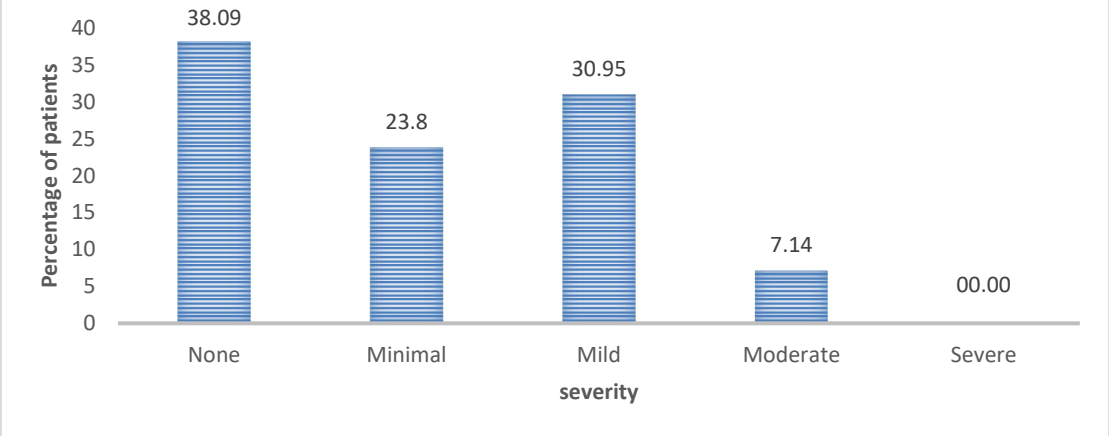
Abnormality in muscle of Facial Expression

Figure 3: Distribution of patients based on abnormalities in severity of abnormal movements overall (AIMS)



Among 42 patients, 22 patients were found in None (0) group who were showed no abnormal movements and 4 patients showed abnormal movements who were found to be in minimal (1) group.

Figure 4: Distribution of patients based on abnormalities in awareness of abnormal movements (AIMS)



Among 42 patients, 16 was the highest number of patients who were in None (0) group, they all are not aware of abnormal movements and 3 patients were moderately known about abnormalities (3).

4. Discussion

This study was conducted in psychiatry department in ESIC MC- PGIMSR& Model Hospital, Rajajinagar, Bangalore among the patients who all are diagnosed with Schizophrenia. Who were eligible as per the inclusion criteria and who were willing to provide informed consent to participate in the study. A total of 42 patients were included in the study which spanned 3 months from April 2023 to July 2023. The subjects were categorized according to their gender identity, age group, experience history of having any kind of side effects after taking antipsychotics in schizophrenia condition. The objective of the study includes investigating the demographic details of which age is a factor. Out of 42 patients included in the study, majority percentage (%) of patients were from the age group of 35-44 years and least were from the age group of 55-64 years, the majority of the subjects 25 (59%) were males & 17(41%) females included in the study. Male subjects were more than the females, male subjects were more affected compare to female which had found in study conducted by Katherine B et al., (2019) [14]. Here using the chi square test that Hypotension (0.578), Insomnia (0.926), Tremors (0.341), Constipation (0.632), Dizziness (1.000), Akathisia (0.930), Dry mouth (0.819), Nausea (0.385), Here all these values are more than anticipated P value which is 0.05. So, these all-side effects are found non-significant while comparing with age but Weight gain (0.043) found to be significant, weight gain is a common side effect of antipsychotics which had found in study counducted by Neil. G. et al., (2018) [15]. As the previous, using the chi square test that Hypotension (0.266), Insomnia (0.735), Tremors (0.939), Weight gain (0.035), Constipation (0.963), Dizziness (0.482), Akathisia (0.414), Dry mouth (0.657), Nausea (0.268). Here all these values are more than anticipated P value which is 0.05 except weight gain which is found significant while comparing with gender. Increased baseline weight, male sex, are predictors of susceptibility to antipsychotic-induced metabolic change, and improvements in psychopathology are associated with metabolic disturbance found in study conducted by Michel. S. et al., (2023) [16]. All the 42 patients were prescribed with antipsychotics including Olanzapine, Risperidone, Aripiprazole, haloperidol. Among those 42 patients, majority 33 (78.57%) patients were given Risperidone and least number of 2(4.76%) patients were given with aripiprazole. Among those 42 patient 26 (61.90%) patients showed side effect and 16 (38.10%) patients were not showed side effects. The most shown side effect was found to be Akathisia (24), weight gain (19) and least showed side effect was found to be Dizziness (10), Olanzapine and risperidone reported the greatest weight gain and olanzapine the largest BMI increase Study conducted by Carla. R. et al., (2021) [17]. 20 patients were found to be in Absent group and least number was 5, who all are in moderate group, 22 patients were found to be in None (0) group and least number was 5, who all are in moderate (3) group, there were no abnormalities in lips and perioral area. No abnormalities in jaw. 34 patients were found in None (0) group where they showed normal tongue movements and minimum 1 patient showed moderate (3) rating, there were no abnormalities in arms, wrists, hands, fingers. no abnormalities in legs, knees, ankles, toes. There were no abnormalities in neck, shoulder and hips. Among 42 patients, 22 patients were found in None (0) group who were showed no abnormal movements and 4 patients showed abnormal movements who were found to be in minimal (1) group, there were no found incapacitation due to abnormal movements. In many cases where the treatment is showing effects and side effects are not life threatening there the reduction of dose can be a better option but if there is a harmful side effect, the drug can be used found in study conducted Scott. T. et al., (2018) [18]. 16 was the highest number of patients

who were in None (0) group, they all are not aware of abnormal movements and 3 patients were moderately known about abnormalities (3), 26 patients claimed that their movements disappear in sleep and 26 patients said No as answer to this question. No patient was found with edentia. In this study, it is found that drug combinations such as Olanzapine and Risperidone are establishing significant relation between side effects such as Hypotension (0.46) & Insomnia (0.44).

5. Conclusion

The study of assessment of side effects of antipsychotics in patients with schizophrenia was conducted in Psychiatric department, ESIC MC- PGIMSR& Model hospital, Rajajinagar, Bengaluru for 3 months. During the study all the schizophrenia patients, who came to outpatient department for following up were asked about their experience after antipsychotic treatment. During the study, it was observed that the second-generation antipsychotics are more prone to prescribed as compared to first generation antipsychotics. In some cases, some side effects of the antipsychotics are shown after 5-6 months of treatment and in some cases after 10-11 months. In the other hand, most of the patients were from 35-44 age group, and the major gender group were the males. Risperidone is the second-generation antipsychotic which is prescribed mostly, followed by Olanzapine. Among all patients, Akathisia was the majorly found side effect, followed by hypotension, tremors, insomnia, constipation. In the past studies, it was founded that akathisia is a frequent side effect while using Risperidone. Here also Risperidone is prescribed more and akathisia is the highest percentage of occurrence among patients. Separately, past studies concluded that Olanzapine are responsible for side effects like insomnia, tremors & hypotension. In this study, it was founded that the patients who all are prescribed with olanzapine, are showed this side effects apparently. Assessment and identifying side effects of frequently prescribed antipsychotics will improve the patient quality of treatment and will help to improve where there is need.

6. Conflict of Interest

The authors declare that no conflict of interest.

7. Acknowledgement

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