



IJCRR
Section: Healthcare
ISI Impact Factor
(2019-20): 1.628
IC Value (2019): 90.81
SJIF (2020) = 7.893

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Antipsychotic Drugs Induced Movement Disorders: A Pharmacist Led Study

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ABSTRACT

Introduction: Drug-induced movement disorder is one of the major complications among patients undergoing antipsychotic drug therapy.

Objective: The study aims to assess the antipsychotic drugs induced movement disorders in hospitalized patients with psychiatric disorders.

Methods: A prospective observational study was carried out in a tertiary care teaching hospital for eight months. A total of 110 patients diagnosed with various psychiatric disorders and prescribed antipsychotic drugs were enrolled in the study. The movement disorders identified were documented and evaluated for causality assessment by using Naranjo's Algorithm and WHO Probability Scale. Severity was assessed by Modified Hartwig and Siegel scale and preventability was assessed by using Modified Schumock and Thornton's criteria. Data were analyzed by applying descriptive statistics.

Results: Out of 110 patients followed, 25 patients developed 25 incidents of movement disorders. It was found more among male patients. The incidence of Parkinsonism (40%) was higher and was then followed by akathisia (32%), dystonia (24%) and tardive dyskinesia (4%). Causality assessment reported the majority of adverse drug reactions (ADRs) as 'possible'. The severity assessment showed that 76% of the ADRs were moderately severe and 24% were mild reactions. The majority of the reactions were found probably preventable.

Conclusion: Antipsychotics are one of the major choices of drugs among psychiatric patients and they, in turn, can cause several adverse outcomes that can lead to a need for a modified therapeutic approach. Proper monitoring can prevent some possible and predictable adverse reactions.

Key Words: Psychiatry, Antipsychotics, Movement disorders, Causality assessment, Severity assessment.

INTRODUCTION

The drug-induced disorder is one of the major causes of hospitalization and poor therapeutic outcomes.^{1,2} Drug-induced disorders are adverse drug reactions.³ Antipsychotic drugs are meant for treating schizophrenia and other psychiatric disorders and their therapeutic efficacy is well established. Yet, many of these drugs have different side effect profiles. It is evidenced that second-generation antipsychotics have lesser effects when compared to first-generation antipsychotics.^{4,5} Ever since the antipsychotic effect of chlorpromazine was discovered there was an intense use of the drug. Within a short period, the parkinsonian side effects were identified.^{5,6} Akathisia is a type of disorder that involves motor restlessness

with discomfort especially in the limbs of the patient. These symptoms that appear in the initial stages of the therapy are more stressful and can lead to poor medication adherence.⁷ Similarly, it can happen with dystonia which is an involuntary movement disorder characterized by a recurrent spasm that subsequently leads to unusual movements or changing postures.⁸ Drug-induced parkinsonism is more common and causes considerable disability during maintenance treatment, most commonly in elderly patients. The patients may experience slow movements, flexed postures and soft speech.⁹ Tardive dyskinesia is also characterized by unusual involuntary movements but it reflects especially on the face and can vary in severity.¹⁰ The pharmacist-led study can identify the incidence of ADRs and other drug-related

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ISSN: 2231-2196 (Print)

ISSN: 0975-5241 (Online)

Received: 31.08.2020

Revised: 07.11.2020

Accepted: 04.01.2021

Published: 19.05.2021

problems.^{11,12} With this background the current study is focused on identifying the incidence of antipsychotic-induced movement disorders in a sample of patients with psychiatric disorders.

MATERIALS AND METHODS

A pharmacist-led prospective observational study was conducted for eight months. Institutional ethics committee approval was obtained before the initiation of the study. Informed consent was obtained from the patient/patient's party for taking a role in the study. All the inpatients of either gender aged above 18 years diagnosed with psychiatric disorders and prescribed with antipsychotics were included in the study. A suitable data collection form was designed to document the patient's age, gender, diagnosis, drug therapy details including drug, dose, duration of therapy and route of administration. These details were obtained from the patient's medical records. The enrolled patients were monitored daily. Any movement related disorders observed during the study was documented with the help of treating psychiatrists. The identified events were subjected to causality assessment using the WHO probability scale and Naranjo's scale. Severity was assessed by Modified Hartwig and Siegel scale and preventability by using Modified Schumock and Thornton's criteria. Descriptive statistical analysis was carried out using Statistical Package for Social Sciences.

RESULTS

Patient characteristics

Out of the total 110 patients enrolled in the study, 87 (79.1%) were males and 23 (20.9%) were females. The categorization according to the gender and various age groups of the patients is presented in Table 1.

Table 1: Distribution of patients according to their gender and age

Age Group	18-29	30-39	40-49	50-59	60-79	Total
Male	26	29	18	10	4	87
Female	5	8	3	4	3	23
Total	31	37	21	14	7	110

Distribution of the patients according to the psychiatric disorders

Among the enrolled patients, the majority were diagnosed with paranoid schizophrenia 39 (35.5%), followed by bipolar affective disorder 26 (23.6%). The details are presented in Table 2

Table 2: Pattern of psychiatric disorders observed among the study population

Types of disorders	Frequency (n)	Percentage (%)
Paranoid Schizophrenia	39	35.5
Bipolar affective disorders	26	23.6
Schizoaffective disorder	17	15.5
Psychosis	14	12.7
Undifferentiated schizophrenia	6	5.5
Post schizophrenic depression	5	4.5
Alcohol dependence syndrome	2	1.8
Nicotine dependence syndrome	1	.9
Total	110	100

Distribution of patients based on antipsychotics prescribed

Overview of the antipsychotic drug prescriptions revealed that 82 (74.5%) patients were prescribed with second-generation antipsychotics and 28 (25.5%) patients received first-generation antipsychotics.

Distribution of patients based on movement disorders identified

In the study, 25 (22.72%) patients reported a total of 25 incidents of movement disorders. The identified antipsychotic drug-related movement disorders were Parkinsonism, akathisia, dystonia and tardive dyskinesia. Details on the identified movement disorders are summarized in Figure 1.

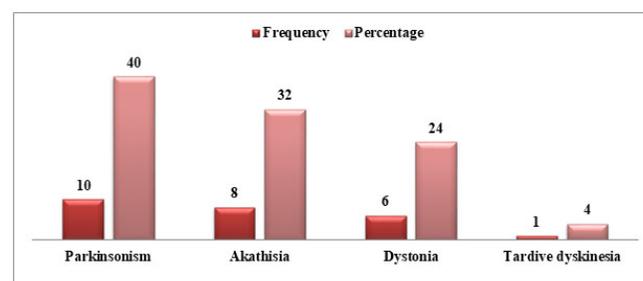


Figure 1: Distribution of different types of movement disorders among the patients.

Categorization of study subjects with movement disorders based on their gender and age.

Out of the total 110 patients, 21 male and 4 female patients developed at least one type of movement disorder. The male patients showed a higher incidence of movement disorders when compared to females (Table 4). Patients belonging to the age group of 30-39 years were found to have the highest incidence of movement disorders (36%). More details are summarized in Table 5.

Table 4: Gender wise categorization of study subjects identified with movement disorders

Gender	Presence	Absence
Male	21 (84%)	66 (77.6%)
Female	4 (16%)	19 (22.4%)
Total	25	85

Table 5: Age wise categorization of study subjects identified with movement disorders

Sl. No	Age group (in years)	Presence	Absence
	18-29	5 (27%)	26 (30%)
	30-39	9 (36%)	28 (32.9%)
	40-49	5 (20%)	16 (18.8%)
	50-59	5 (20%)	9 (10.6%)
	60-79	1 (4%)	6 (7.1%)
Total		25	85

Drugs suspected to cause movement disorders

In the present study, the movement disorders were found to be most commonly associated with the patients who received second-generation antipsychotics. The suspected second-generation antipsychotic drugs were quetiapine, risperidone, amisulpride, olanzapine and aripiprazole. Similarly, the suspected antipsychotic drugs of the first-generation included haloperidol and fluphenazine. Figure 2 summarizes the details of drugs responsible for movement disorders.

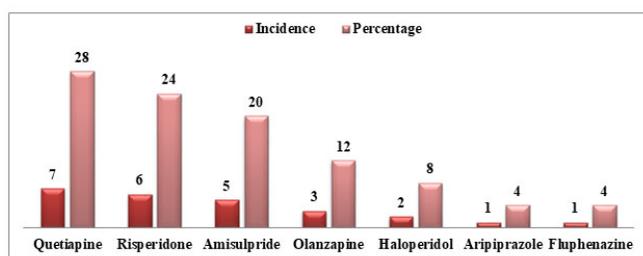


Figure 2: Suspected drugs responsible for movement disorders among the study subjects.

Assessment on various types of movement disorders

On a causality assessment based on the WHO probability scale, the majority of the movement disorders were found to be belonging to the category of possible 13 (52%), followed by probable 10(40%). According to Naranjo’s algorithm, it found that 12 (48%) ADRs were possible and 11 (44%) were probable. The severity assessment based on Modified Hartwig and Siegel scale showed that 19 (76%) of the ADRs were moderately severe and 6 (24%) were mild reactions. The majority of the reactions were found belonging to the

severity Level 3 (10), followed by Level 4b (5), Level 2 and 4a (4 each) and Level 1 (2). As per Modified Schumock and Thornton’s criteria, the majority of the ADRs were found to be probably preventable 20 (80%), followed by definitely preventable, 5 (20%)

Distribution of various movement disorders identified based on the suspected drugs

The study evaluated various types of movement disorders based on the suspected antipsychotic drugs. The details are presented in Table 7.

Table 7: Distribution of movement disorders based on the suspected drugs

Sl. No	Drugs	Type of disorder	Frequency (n=25)
1.	Haloperidol	Akathisia	2
2.	Fluphenazine	Dystonia	1
3.	Aripiprazole	Parkinsonism	1
4.	Olanzapine	Akathisia	3
5.	Quetiapine	Parkinsonism	4
		Akathisia	1
		Dystonia	2
		Tardive dyskinesia	1
6.	Risperidone	Dystonia	2
		Parkinsonism	3
7.	Amisulpride	Akathisia	2
		Dystonia	1
		Parkinsonism	2

DISCUSSION

Movement disorders are one of the main adverse outcome associated with antipsychotic drug therapy. The current study showed that female patients were less when compared to males. Among these, 4 female and 21 male patients were presented with antipsychotic drug-induced movement disorders. The study conducted by Asif et al, also found that the male patients were more susceptible to drug-induced movement disorders like tardive dyskinesia and akathisia.¹³ Considering age-wise categorization of the study population, the current study found that out of 110 patients, the majority (33%) belonged to the age group of 30-39 years, 28% of patients were found to be in the age group of 18-29 years and 12% belonged to 40-59 years. A previous study conducted by Cascade EF et al. showed that 24% were in the age group of 18-39 years and 45% of patients belonged to 40-59 years.¹⁴ Thus, there is a wide difference in the population when considering the age group.

The most commonly diagnosed psychiatric disorders among the enrolled study subjects were paranoid schizophrenia which accounted for 39%, followed by bipolar disorder. Whereas, in a study conducted by Sengupta et al, it was reported that bipolar disorder (27%) were the most common diagnosis made, followed by schizophrenia (24%).¹⁵ Antipsychotics are the primary drug of choice in the treatment of psychiatric illnesses. In this study, usage of the second generation (74.5%) antipsychotics were found to be higher than the first-generation agents (25.5%). The present study result was found similar to the study carried out by Meltzer et al, as second-generation antipsychotics were found to have a higher usage profile than the first generation.¹⁶ Among the various antipsychotic drugs prescribed, olanzapine accounted for the highest percentage (24.5%). Similar findings were seen in the study conducted by Sengupta et al, in which olanzapine was found to be prescribed among 31.82% of the patients.¹⁵

Out of 25 identified movement disorders, the majority were suspected to be due to Quetiapine and risperidone drug therapy. Similar findings were seen in the study conducted by Piparva et al, which were among a total of 83 ADRs, the majority were caused due to risperidone and olanzapine.¹⁷ The possibility of antipsychotics induced dystonia is common among patients with psychiatric disorders. Antipsychotics induced movement disorders are a common issue associated with the therapy. The antipsychotics show a higher rate of adverse reactions in patients undergoing therapy where the movement disorder is considered to be the major one. In this study, it was observed that 22% of the patients developed movement related disorders. Among these, parkinsonism and akathisia showed a higher rate of incidence with the percentage of 40% and 32% respectively, followed by dystonia 24%, and tardive dyskinesia 4%. The previous study conducted by Janno et al, reported that 61% of the patients were presented with antipsychotic drug-induced movement disorders with a high incidence of akathisia 31.3%, followed by parkinsonism 24% and tardive dyskinesia 32%.¹⁸ The present study results were in association with the previous study suggests that the incidence of akathisia and parkinsonism could be higher than other antipsychotic drug-induced movement disorders. In this study, the occurrence of dystonia was noted to be 24% among all the other identified movement related disorders. A study conducted by Addonizio G et al. reported that 31% of patients developed dystonia during antipsychotic therapy.¹⁹ These reports were found to be comparable with the present study.

CONCLUSION

The study established the incidence of various types of antipsychotics induced movement disorders in this sample population. Antipsychotics are one of the major choices of drugs in the management of psychiatric conditions and they,

in turn, can cause several adverse outcomes that can lead to a need for a modified therapeutic approach. The current study reported Quetiapine and Risperidone as the major suspected drugs that caused movement related disorders. The commonly encountered movement disorders were parkinsonism, akathisia and dystonia. Causality analysis based on Naranjo's scale and WHO scale evidenced that the majority of movement disorders had a possible relationship with the suspected drug. The preventability assessment showed that the majority of the reactions were probably preventable. With these reports, the study suggests that the incidence of movement-related disorders can be controlled by regularly monitoring the patients who are prescribed antipsychotics that are found to have a higher risk of developing such adverse effects.

FUNDING: This work did not receive any financial support from any organization or funding agencies.

ACKNOWLEDGMENT

We Authors are thankful to the Department of Psychiatry, Justice K. S. Hegde, Charitable Hospital, Nitte (Deemed to be University) for their support during the study.

Conflict of Interest: There is no conflict of interest

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