

# CASE STUDY: SCHIZOPHRENIA WITH ANTIPSYCHOTICS INDUCED PSEUDO PARKINSONISM

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**Abstract-** Schizophrenia is a complex, chronic mental health disorder and serious mental illness that affects how a person thinks, feels, and behaves. such patients lose touch with reality which can affect their family and friends. Also called as altered perception syndrome characterized by positive, negative, and cognitive symptoms, caused by chemical imbalances and other changes in the brain. It is treated with antipsychotic medication and psychotherapeutic approaches. The adverse effects of schizophrenia medication in several organ systems, In the Central Nervous System it induces Dystonia, Akathisia, Pseudo parkinsonism, tardive dyskinesia, akinesia, and all antipsychotics increase the risk of seizures.

In this case, the patient has almost 14 years of anti-psychotic medications are risperidone, chlorpromazine, diazepam, and trihexyphenidyl, he maintained well with the medication with regular follow-up but in 4 months before he left the trihexyphenidyl medication without any knowledge about its benefits and importance of the medication. It will lead to dopamine deficiency with an increased level of acetylcholine leads to extrapyramidal symptoms such as Pseudo parkinsonism.

It could be due to medication adherence and compliance with medication, knowledge, and carefulness of patients regarding their medication, and also physician or health provider's knowledge, skill, and sincerity may effects. The patient's tendency to increase and decrease the medication on one's own is detrimental to the health and lifestyle. Eliminating conditions like these is essential, otherwise it will increase the economic burden on the community and affect the patient's quality of life. avoiding such incidents also required the intensive support of clinical and community pharmacists. Their drug monitoring and counseling help to eliminate medication-related adverse drug reactions.

**Keywords:** Schizophrenia, antipsychotics, FGAs, SGAs, extrapyramidal symptoms(EPS), Pseudo parkinsonism.

## INTRODUCTION

Schizophrenia is a complex, chronic mental health disorder and serious mental illness that affects how a person thinks, feels, and behaves. such patients lose touch with reality which can affect their family and friends. schizophrenia badly affects everyday activities it worsens with improper treatment. Genetic, environmental, brain structure, and functions are risk factors.<sup>[1]</sup> Schizophrenia symptoms can differ from person to person, but they generally fall into three main categories Psychotic symptoms, include changes in the way a person thinks, acts, and experiences the world such as Hallucinations, Delusions, Thought disorder, and Movement disorder.<sup>[1]</sup>

Symptoms like loss of interest, enjoyment in daily activities, loss of motivation, withdrawal from social life, difficulty showing emotions, and difficulty in normal functioning are found in them, these are negative symptoms. Cognitive symptoms include problems with attention, concentration, and memory.<sup>[2]</sup>

A diagnosis of schizophrenia is reached through an assessment of patient-specific signs and symptoms, as described in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5).<sup>[3]</sup>

For schizophrenia patients, the goals in treating include targeting symptoms, preventing relapse, and increasing adaptive functioning so that the patient can be integrated back into the community, the Psychotherapeutic approaches are Cognitive behavioral therapy and compliance therapy, Supportive or counseling, Personal therapy, Social skills therapies, Vocational sheltered employment rehabilitation therapy, and interactive or social therapy.<sup>[3]</sup>

The pharmacological treatment for schizophrenia is antipsychotics are the mainstay for acute and chronic schizophrenic conditions. As per the treatment guideline, it consists of six stages of the therapeutic algorithm while in that path starts with monotherapy of second-generation (atypical) antipsychotics (SGAs), in the second stage with the respective response considered monotherapy with first-generation (typical) antipsychotics (FGAs) or SGAs, in stage 3 clozapine monotherapy with WBC monitoring, in stage 4 combination with clozapine with an FGA or an SGA or electroconvulsive therapy (ECT).up to those stages not showing response start stage 5 therapy in stage 5 calls for

monotherapy with an FGA or an SGA that has not been tried, if the 5<sup>th</sup> stage therapy also unsuccessful in 6<sup>th</sup> stage treatment consist of combination therapy with an SGA, an FGA, ECT, and/or a mood stabilizer<sup>[3]</sup>.

The exact mechanism of action of antipsychotic drugs is unknown, although it has been suggested that these drugs comprise three main categories: 1) typical, or traditional, antipsychotics, which are associated with high dopamine (D2) antagonism and low serotonin (5-HT<sub>2A</sub>) antagonism; 2) atypical antipsychotics that have moderate-to-high D2 antagonism and high 5-HT<sub>2A</sub> antagonism; and 3) atypical antipsychotics that demonstrate low D2 antagonism and high 5-HT<sub>2A</sub> antagonism.<sup>[3]</sup>

The adverse effects of schizophrenia medication in several organ systems, In the endocrine system Hyperprolactinemia, sexual dysfunction, decreased libido, menstrual irregularities, gynecomastia, and weight gain. hyperprolactinemia and weight gain due to antipsychotics can increase the risk of diabetes mellitus and cardiovascular mortality.

In the cardiovascular system Orthostatic hypotension can occur, if the patient has pre-existing cardiovascular disease, diabetes, and advanced age will increase the risk.

Studies have shown that Patients treated with SGAs or phenothiazine have the risk of rising serum triglycerides and cholesterol levels.

In the Central Nervous System, it induces Dystonia, Akathisia, pseudo-parkinsonism, tardive dyskinesia, akinesia, and all antipsychotics increase the risk of seizures. Poikilothermia and Neuroleptic malignant syndrome (NMS) are rare and serious side effects due to antipsychotics, Psychiatric side effects, such as delirium and psychosis, can occur with higher doses of FGAs or with combination treatments involving anticholinergics.<sup>[4]</sup>

## CASE REPORT

A 42-year-old male was presented to the Psychiatry department in the tertiary care teaching hospital with complaints of tremors with rigidity and disturbed sleep. patient had a known case of schizophrenia In the past 14 years on medication. Treated with tablet Risperidone (1mg-0-2mg).tablet chlorpromazine 100mg (0-0-1), tablet Diazepam 5mg (0-0-1), and Trihexyphenidyl (THP) 2mg (1-1-0). The patient has avoided taking the THP medication for the last 4 weeks. 4 weeks before he experienced mouth ulcers and so the patient and his family misunderstood it was because of the THP therapy, As a part of it he left the THP medication without consulting the physician. After 4 weeks he developed rigidity, showed the ability to walk was significantly reduced, excessive salivation reduced sleep, and difficulty in speaking.

After taking all the history we examined the patient properly, and then we understood tremors, Cogwheel rigidity, muscle stiffens, hypersalivation, dysarthria, and bradykinesia. a conclusion has been reached by taking into account all the previous history and the relevant symptoms it is a case of antipsychotics-induced extrapyramidal symptoms(EPS), After ruling out other possible causes of EPS, a probable diagnosis of risperidone and chlorpromazine-induced EPS was thought of and the drug was withdrawn. we treated with stat dose of injection promethazine (1amp-25mg/ml), tablet promethazine 25mg (1-1-1) for three days, tablet chlorpromazine 100mg (0-0-1) should continue and central anticholinergic tablet trihexyphenidyl (4mg-2mg-0) for 3 days, counseled the patient caretakers about side-effect, risk factors, importance of treatment, lifestyle and fixed the next appointment after 3 days.



After three days patient came with his wife we examined the patient and improvement was noted, then decided to taper the dose of promethazine 25mg (1-0-0) and tablet trihexyphenidyl (2mg-2mg-0). Continue the therapy of tablet chlorpromazine 100mg (0-0-1) and Risperidone 2mg (0-0-1). later on, we explained everything about what are the changes made in medication and again gave proper counseling about the importance of treatment and lifestyle, and the next appointment fixed after 7 days.

## DISCUSSION

Schizophrenia is a complex, chronic psychiatric disorder, that often presents with several symptoms involving thoughts, perception, emotions, movements, and behavior. It is treated with antipsychotic medication and psychotherapeutic approaches. the most common adverse drug effects of anti-psychotics are Extrapyramidal side effects.

Extrapyramidal side effects of EPS include acute dystonia, akathisia, Parkinsonism, and tardive dyskinesia sometimes these symptoms produce stigmatized debilitating effects on patients. EPS is in 2 phases. EPS developed at the beginning of treatment with antipsychotics or when the dose is increased, such types of EPS are more prevalent they are Early acute EPS. The later-onset EPS usually because of prolonged treatment and it is mostly presents with tardive dyskinesia. Acute EPS usually responds to dose reduction of the antipsychotic agent or requires additional pharmacological treatment. Development of EPS is not a uniform phenomenon to all psychotic patients, it depends on the host of risk factors that include exposure and duration of antipsychotic drugs, elderly patients, female gender, non-Caucasian race, organic brain damage, the presence of affective disorders, genetic vulnerability, disease-related vulnerability, history of diabetes mellitus, habits like alcoholism, and decreased functional reserve. <sup>[5]</sup>

Dystonia is a state of abnormal tonicidity, sometimes described simplistically as a severe “muscle spasm.” Akathisia is defined as the inability to sit still and as being functionally motor restless. The most accurate diagnosis is made by combining subjective complaints with objective symptoms (pacing, shifting, shuffling, or tapping feet). Tardive dyskinesia is a syndrome characterized by abnormal involuntary movements occurring late in onset concerning the initiation of antipsychotic therapy. and Pseudo parkinsonism, produced by D 2 blockade in the nigrostriatum, resembles idiopathic Parkinson's disease. A patient with pseudo parkinsonism can present with any of four cardinal symptoms: (1) akinesia, bradykinesia, or decreased motor activity including difficulty initiating movement, as well as extreme slowness, mask-like facial expression, micrographia, slowed speech, and decreased arm swing; (2) tremor, known as pill-rolling type, that is predominant at rest and decreases with movement, usually involving the fingers and hands, although tremors can also be seen in the arms, legs, neck, head, and chin; (3) cogwheel rigidity, seen as the patient's limbs yielding in jerky, ratchet-like fashion when passively moved by the examiner; and (4) postural abnormalities and instability manifested as stooped posture, difficulty in maintaining stability when changing body position, and a gait that ranges from slow and shuffling to festinating.

The pseudo-Parkinsonism due to antipsychotic therapy may occur between a few days and up to several months after the initiation of the treatment. Age (elderly population), gender (females), cognitive deficit, and early-onset EPS are considered the risk factors of pseudo-parkinsonism. it is considered a reversible condition although its duration is variable. The specific treatment of choice for pseudo Parkinsonism is not well documented but dose reduction and anticholinergic drugs may help to reduce and reverse the symptoms.

As per clinical studies, SGAs like aripiprazole, quetiapine, and clozapine are associated with a lesser risk of EPS compared to FGAs like chlorpromazine, fluphenazine, mesoridazine, and SGAs are associated with a greater risk of weight gain contrast with FGAs

Some analysts suggested that more than one-fifth of patients had a diagnosed EPS due to atypical anti-psychotic medication within a period of a year. EPS due to SGA medication increases the patient–disease burden due to higher health costs and frequent hospitalization.

The mechanisms by which neuroleptic medications exert antipsychotic effects are not precisely known. It is generally believed that antagonistic binding of dopaminergic D2 receptors in the mesolimbic and neocortical regions of the brain plays a major role. Unfortunately, neuroleptics can't show selective binding with dopaminergic neurons in these brain regions; they bind to other regions of the brain that also have high dopaminergic activity. It is this antidopaminergic effect in the caudate nucleus and other basal Gan-glia nuclei that are thought to produce most of the neurological side effects of neuroleptic medications. The basal ganglia are subcortical structures that mediate involuntary and voluntary muscular movements. The basal ganglia belong to the extrapyramidal system of the brain, so named because they are located separately from the axons of the pyramidal cells, large motor cortical neurons that send motor signals directly to the spinal cord.<sup>[6]</sup>

In this case, the patient has almost 14 years of anti-psychotic medications of risperidone 3mg per day, chlorpromazine 100mg per day, diazepam 5 mg per day, and trihexyphenidyl 4mg per day, he maintained well with the medication with regular follow-up but in 4 months before he left the THP medication without any knowledge about its benefits and importance of the medication. Most of the understanding of the EPS with the usage of anti-psychotics is primarily because of dopamine-2 (D2) receptor blockade. It will lead to dopamine deficiency with an increased level of acetylcholine, why THP is taken with antipsychotic medication, the THP can modify acetylcholine receptor neurotransmission, by it will enhance the release of in the striatum. Although the anticholinergics help to treat symptoms of EPS like pseudo-parkinsonism and other movement disorders. Hear the avoidance of THP leads to higher cholinergic activity, it produces EPS of pseudo-parkinsonism.

Here the condition is managed by promethazine, it is a phenothiazine derivative with antidopaminergic, antihistamine, and anticholinergic properties. Other phenothiazine derivatives include prochlorperazine and chlorpromazine. The phenothiazine drugs like Promethazine work as a direct antagonism at the mesolimbic dopamine receptors and alpha-adrenergic receptors in the brain. Promethazine exhibits its antihistamine effects as an H1-receptor blocker.<sup>[7]</sup> In terms of relative potency in blocking histamine H1 receptors and acetylcholine muscarinic receptors, promethazine is the most potent anticholinergic of the antihistamines. It is very much weaker in blocking dopamine receptors, promethazine remains the antihistamine recommended for sedation in acutely disturbed patients, largely because it is potently

anticholinergic at atropine muscarinic receptors and therefore anti-Parkinsonism. This means it is also useful in combination with older antipsychotics for the treatment for pseudo-parkinsonism.<sup>[8]</sup>

Risperidone is an FDA-approved atypical antipsychotic medication used for the treatment of schizophrenia, bipolar I acute manic or mixed episodes, Autism-associated irritability, etc. It produces agonism at the 5HT1A receptor. Risperidone produces anti-depressive effects by inhibiting the reuptake of Serotonin and norepinephrine. The improvement of positive symptoms is thought to be accomplished through the blockade of D2 receptors, specifically in the mesolimbic pathway. Adverse effects due to risperidone include Weight changes, metabolic changes, and sedation. it produces extrapyramidal symptoms (EPS) including acute dystonia, akathisia, tardive dyskinesia (TD), and Parkinsonian features. EPS is thought to be due to the blockade of D2 receptors in the nigrostriatal pathway. Acute or early EPS can improved with the cessation of the drug, such adverse effects mainly occur due to noncompliance with medication.<sup>[9]</sup>

Chlorpromazine is a typical antipsychotic medication primarily used to treat psychiatric disorders such as schizophrenia, bipolar disorder, acute psychosis, etc. precise mechanism of action is unknown, but it is believed to produce its antipsychotic effect by the post-synaptic blockade at the D2 receptors in the mesolimbic pathway. However, the blocking of D2 receptors in the nigrostriatal pathway is responsible for its extrapyramidal side effects.<sup>[9]</sup>

This is a case of EPS due to anti-antipsychotic medication, non-adherence or noncompliance with medication is the reason for such ADRs, a situation like this is caused by lack of knowledge, carelessness, and self-medication or self-decision to modify the medication plan without proper consultation. Incidents like this are increasing day by day and most of these incidents go unreported. These situations can be prevented as much as possible only through educating the community, and providing proper counseling and guidance by pharmacists.

India like other countries has more incidences of such situations due to a lack of doctors or health care providers as per the patient population. This situation more worsening due to the lack of clinical and community pharmacists in such countries. If a clinical pharmacist is available in the health care team they are experts in the therapeutic use of medicine in the health care team and they will evaluate medication therapy and make appropriate recommendations to patients or health practitioners.

## CONCLUSION

Schizophrenia is an altered perception syndrome and severe mental disorder characterized by positive, negative, and cognitive symptoms, caused by chemical imbalance and other changes in the brain. It is treated with antipsychotic medication and psychotherapeutic approaches. It may cause adverse effects like sexual dysfunction, decreased libido, menstrual irregularities, gynecomastia, and weight gain. hyperprolactinemia, weight gain, and extrapyramidal symptoms like pseudo-parkinsonism are reversible although their duration is variable. The specific treatment of choice for pseudo Parkinsonism is not well documented but dose reduction and anticholinergic drugs may help to reduce and reverse the symptoms.

Some clinical situations illustrate that it could be due to medication adherence and compliance with medication, knowledge, and carefulness of patients regarding their medication, and physician or health provider's knowledge, skill, and sincerity also affects.

The patient's tendency to increase and decrease the medication on one's own is detrimental to the health and lifestyle. Eliminating conditions like these is essential otherwise it will increase the economic burden on the community and affect the patient's quality of life. avoiding such incidents also required the intensive support of clinical and community pharmacists. Their drug monitoring and counseling help to eliminate medication-related adverse drug reactions.

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