



Acute Dystonic Reaction Following a Single 4 mg Dose of Chlorpheniramine in an Adolescent: A Case Report

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Abstract

Drug induced dystonia is a bizarre type of adverse drug reaction commonly seen with anti-dopaminergic drugs. It is characterized by involuntary muscle spasm resulting in abnormal movement or posture. We hereby present a case report of acute dystonic reaction in a 14-year-old female after ingestion of 4 mg of chlorpheniramine for common cold. She was brought to the emergency room with complaints of restlessness, spasm of the facial muscles and tongue protrusion five hours after taking the chlorpheniramine tablet. The patient was given 10 mg of intramuscular diazepam and monitored for 24 hours. All the symptoms disappeared 20 minutes after administration of diazepam with no relapse of symptoms. She was counseled and discharged for follow-up. Chlorpheniramine can trigger acute dystonic reaction even at therapeutic doses. Clinicians should maintain a high index of suspicion when evaluating acute movement disorders and consider antihistamines among potential causes. A PubMed and Google Scholar search found no previous reports on acute dystonia induced by chlorpheniramine alone. This is, to our knowledge, the first reported case of acute dystonia induced by a therapeutic dose of chlorpheniramine alone, highlighting the need for close monitoring of drugs including common over-the-counter medications.

Keywords: Chlorpheniramine, Dystonia, Adverse drug reaction, Extrapyrimal symptoms

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Introduction

Acute dystonic reaction is a syndrome characterized by intermittent or sustained involuntary skeletal muscle contraction or abnormal posture. It is commonly caused by drugs that block dopamine receptors (D2) in the nigrostriatal pathway of the brain. Acute dystonic reaction is thought to occur as a result of imbalance in dopaminergic-cholinergic signaling resulting in acetylcholine excess over dopamine in the basal ganglia [Frez et al., 2018](#); [Incekik et al., 2008](#); [Karagoz et al., 2013](#). Antiemetic and antipsychotic drugs are the common causes of drug-induced dystonia (DID). Other drugs implicated in DID include alben-dazole, chloroquine, antidepressants, cough and

cold preparations containing dextromethorphan, codeine or antihistamines [Lewis & O'Day, 2023](#). Manifestation of symptoms of DID can be early or late. Although dystonic reactions are rarely life threatening, they cause significant distress to the patient and patient's relatives. Here we report a case of drug-induced dystonia following ingestion of 4 mg of chlorpheniramine.

Patient Information

A 14-year-old female student residing at Kofar Doka, Zaria, Kaduna State, Nigeria was admitted into the emergency unit with complaints of sudden onset of twitching of the face, protrusion of the tongue and restlessness of one-hour duration.

There was a prior history of ingestion of 4 mg of chlorpheniramine tablet she bought from a community pharmacy due to common cold about five hours prior to onset of her symptoms (Table 1). There was no history of loss of consciousness, fever, head trauma, loss of sphincteric tone, upward rolling of eyeballs or confusion. No recent or past history of antipsychotic or antiemetic medication use. She had a positive history of using common cold medications in the past without any adverse events. Notably, her younger sister had similar symptoms following ingestion of chlorpheniramine in the past. There was no history of chronic medical conditions, psychiatric illness, substance use, drug or food allergy. Her developmental and academic performance were reported to be normal.

Clinical Findings

On arrival, the patient was acutely ill-looking, restless, anxious, afebrile, with intermittent facial muscle spasms and lingual protrusion. She was conscious and oriented in time, place and person. No signs of focal neurological deficit, meningeal irritation, oculogyric crisis, limb dystonia or autonomic instability were present.

Her pulse rate was 82 beats/minute, blood pressure was 120/80 mmHg, respiratory rate was 18 cycles/minute while oxygen saturation (SpO₂) was 99% on room air.

The requested laboratory investigations included rapid diagnostic test (RDT) for malaria parasite, complete blood count, random blood glucose, serum urea, electrolytes, creatinine, ionized calcium, total calcium and albumin. All the results of the requested investigations were normal Table 2.

Timeline

The chronological sequence of key events in the patient were summarized in Table 1.

Diagnostic Assessment

A clinical diagnosis of chlorpheniramine-induced acute dystonic reaction was made. The differential diagnoses considered included seizure disorder, hypocalcaemic tetany, tetanus, serotonin syndrome and conversion disorder. These differentials were excluded based on history, physical examina-

tion findings and available laboratory results.

Table 1: Timeline of events for clinical presentation and management of acute dystonic reaction following a single 4 mg dose of chlorpheniramine in an adolescent

Time point	Event
0 hours	Ingestion of 4 mg chlorpheniramine tablet
5 hours	Onset of facial spasms, tongue protrusion, restlessness
6 hours	Presentation to emergency unit
+20 minutes post-treatment	Complete resolution of dystonia
24 hours post-admission	Uneventful observation and discharge

Table 2: Lab results for acute dystonic reaction management

Investigation	Result
Malaria parasite (RDT)	Negative
Total calcium	2.2 mmol/L
Ionized calcium	1.2 mmol/L
Serum albumin	4.3 g/dL
Serum potassium	4.1 mmol/L
Serum sodium	138 mmol/L
Serum urea	3.6 mmol/L
Serum creatinine	0.8 mg/dL
Random blood glucose	5.6 mmol/L
White blood cell count	$5.4 \times 10^9 \text{ L}^{-1}$
Red blood cell count	$4.5 \times 10^{12} \text{ L}^{-1}$
Platelets	$180 \times 10^9 \text{ L}^{-1}$

RDT = Rapid Diagnostic Test

Therapeutic Intervention

She was administered 10 mg of diazepam via intramuscular route to control the spasms. All the symptoms disappeared after 20 minutes. The patient was monitored for 24 hours, during which no recurrence of symptoms occurred. She was counseled to avoid taking chlorpheniramine in the future.

Follow-up and Outcomes

At 24-hour follow-up, the patient remained asymptomatic with normal neurological function. Her parents were informed about possible hypersensitivity to chlorpheniramine and advised to

avoid over-the-counter cold preparations containing chlorpheniramine. A telephone follow-up one week later confirmed no recurrence or new symptoms

Discussion

Drug-induced dystonia is commonly caused by dopamine receptor-blocking medications [Frez et al., 2018](#). Although antiemetic and antipsychotic drugs are the commonly known causes of drug-induced dystonia, dystonia can also occur rarely following ingestion of other classes of drugs or combinations of drugs. DID was previously reported after ingestion of cough syrup containing a combination of chlorpheniramine and dextromethorphan [Bikashita & Sriparna, 2023](#).

This case is notable because the reaction followed a therapeutic dose of chlorpheniramine alone, with no concomitant drug use. Some first-generation antihistamines such as promethazine and diphenhydramine have been reported to cause dystonia [Khater et al., 2022](#); [Southard & Al Khalili, 2024](#). Promethazine has previously been reported to have dopamine-blocking activity [Southard & Al Khalili, 2024](#). Diphenhydramine is a potent anticholinergic agent and has been reported to paradoxically precipitate acute dystonia [De Leon & Nikoloff, 2008](#), possibly by unmasking compensatory dopaminergic overactivity in the striatum [Khater et al., 2022](#).

Chlorpheniramine is also a first-generation histamine antagonist with mild-to-moderate anticholinergic activity and does not primarily affect dopaminergic pathways, making dystonia an uncommon reaction. However, being a first-generation antihistamine with anticholinergic effects, chlorpheniramine can also precipitate paradoxical extrapyramidal effects in the nigrostriatal pathway of the brain [De Leon & Nikoloff, 2008](#); [Stephen, 2022](#).

Acute dystonic reactions have previously been reported to be of rapid onset after administration of antihistamines, and the clinical presentation includes facial spasms and involuntary skeletal muscle movement [Kumar et al., 2025](#). These symptoms are consistent with the clinical presentation of our patient.

Genetic predisposition may play a role, sug-

gested by a similar reaction reported in the patient's sibling. The observed dystonic reaction could also be idiosyncratic in a susceptible individual. This case underscores the need for greater awareness of extrapyramidal reactions associated with commonly used medications. Chlorpheniramine-induced acute dystonia warrants further investigation to explore the exact mechanism for the extrapyramidal symptoms. Early detection and rapid implementation of appropriate care for DID can lead to better patient outcomes.

Anticholinergic agents such as diphenhydramine are the first-line treatment for dystonia from typical dopamine receptor antagonists when diphenhydramine is not the culprit, while benzodiazepines are the first-line treatment for acute antihistamine-induced dystonia [Claud & Jinnah, 2010](#); [Duma & Fung, 2019](#); [Khater et al., 2022](#). In this case, our patient was successfully managed with 10 mg of intramuscular diazepam without relapse. The rapid resolution of symptoms with diazepam also supports the diagnosis of an acute dystonic reaction precipitated by an antihistamine.

Patient Perspective

The patient described the experience as frightening because she could not control her tongue movements and felt embarrassed. Her parents initially thought the episode was a seizure. They were reassured after rapid resolution of symptoms with treatment.

Informed Consent

Written informed consent for publication was obtained from the patient's legal guardian.

Conclusions

Acute dystonic reactions can occur with chlorpheniramine even at therapeutic doses. A high index of suspicion is required to make the diagnosis. Antihistamines should be considered as possible culprits in the evaluation of unexplained movement disorders.

Lesson Learned

Antihistamines such as chlorpheniramine possess anticholinergic activity and should be considered as possible culprits in the evaluation of unexplained movement disorders. The appropriate choice of medication used for treating drug-induced dystonia depends on the mechanism of action of the causative drug. Anticholinergic agents such as diphenhydramine are the first-line treatment for dystonia from typical dopamine receptor antagonists when diphenhydramine is not the culprit. Benzodiazepines such as diazepam are the first-line treatment for acute antihistamine-induced dystonia.

What is Known About the Topic

- Acute dystonic reaction is a syndrome characterized by intermittent or sustained involuntary skeletal muscle contraction or abnormal posture.
- Drug-induced dystonia is commonly caused by drugs that block dopamine (D2) receptors in the nigrostriatal pathway of the brain.
- Antiemetic and antipsychotic drugs are the

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most common causes of drug-induced dystonia.

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- Abu Ali – Reviewing
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Conflicts of Interest

All authors declare no conflict of interest.

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