

# Datura stramonium poisoning in children

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## Abstract

Although substance abuse is fairly common among adolescents, poisoning from *Datura stramonium* (a broadleaf annual erect herb with spine-covered seed capsule) is uncommon in children and has not been reported in our locality. We present the case of two children admitted at the Children Emergency Room of a teaching hospital following ingestion of extract of *Datura stramonium*. They developed neurotoxicity (confusion, agitation, mydriasis, and hallucination) and were managed symptomatically with good outcome. A high index of suspicion and early management of poison in children is imperative if a favorable outcome is expected. Early presentation and the presence of an eyewitness contributed to the very good outcome in these index cases. In this report, we discussed the symptomatology and management of *Datura* toxicity in children.

**Key words:** Children, *Datura*, poisoning, stramonium

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## Introduction

In Nigeria, substance abuse is common among adolescents, with rates ranging from 3.8 to 40.1% in local studies.<sup>[1-3]</sup> Globally, adolescents do not only consume traditional drugs, other substances such as extracts or brew of plants are also taken. One of such plants is *Datura stramonium* which contains a mixture of anticholinergic agents (alkaloids such as atropine, scopolamine, and hyoscamine) that are responsible for its pharmacological actions.<sup>[4]</sup> The plant is commonly called thornapple, angel's trumpet, jimson weeds, or moon flower and belong to Solanaceae family.<sup>[5]</sup> In Nigeria, *Datura stramonium* grows abundantly in wasteland, usually near habitations and serves as sources of poison, dyes, intoxicants, and medicine.<sup>[6]</sup>

Consumption of any part of the shrub causes atropine intoxication with a resultant anticholinergic delirium, as well as a wide range of hallucination, making the plant a popular hallucinogenic agent in many parts of the world.<sup>[7-9]</sup> Children are particularly susceptible to atropine toxicity, even with small amounts producing marked central nervous system features.<sup>[8]</sup> Unfortunately, the diagnosis is usually delayed, except with an eye witness account.

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## Case Reports

On December 16, 2010, two adolescents were rushed into the Children Emergency Room of the University Teaching Hospital, Ado-Ekiti, south-western Nigeria, from a public secondary school located about 5 km away from the hospital by two of their teachers and a classmate, approximately 1 hour after ingestion of an extract of thornapple (*Datura stramonium*). The seeds had been previously soaked in water for about 24 hours and kept in an uncompleted building close to the secondary school. The boys ingested the extract in the presence of the accompanied classmate within the school compound, who believed that the extract was taken primarily for its hallucinogenic effects.

### Case 1

AU, a 14-year-old boy presented with history of restlessness, excessive and incoherent talks, visual hallucination, inability to recognize familiar people, and irrational behavior (fighting other students and staff). On examination, he was confused, febrile with axillary temperature of 38.7°C, and

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had dry mouth and dilated reactive pupils bilaterally. He had tachycardia with pulse rate of 132 beats per minute and systolic hypertension with blood pressure of 150/55 mmHg. There were no focal neurological signs and other systemic examination findings were normal. The diagnosis of *Datura stramonium* poisoning was made based on the eye witness account and the clinical manifestations.

Investigations revealed mild anemia (hematocrit=28%), serum aspartate aminotransferase of 39 IU/l, and hyperglycemia (random blood sugar=14.2 mmol/l). Serum sodium (134 mmol/l), potassium (3.6 mmol/l), bicarbonate (22 mmol/l), creatinine (73 µmol/l), and urea (3.1 mmol/l) were normal. Electrocardiogram could not be done because it was not available. He was restrained in bed and was given intravenous fluid of 4.3% dextrose in 0.18% saline infused at maintenance rate, intravenous diazepam 20 mg, and intramuscular haloperidol 5 mg stat. In addition, gastric lavage was done. About 19 hours after admission, he became fully conscious, cooperative, and communicating intelligently. He was also able to recognize familiar people.

### Case 2

OT, a 12-year-old boy was admitted with history of impaired consciousness of about 40 minutes, an episode of generalized tonic-clonic convulsions and restlessness. The convulsion occurred about 20 minutes after ingestion of *Datura stramonium* extracts and lasted for about 10 minutes before abating spontaneously. On examination, he was unconscious with Glasgow Coma Score of 9/15, restless, had dilated reactive pupils bilaterally, dry mouth, and tachycardic with pulse rate of 160 beats per minute. His blood pressure (100/50 mmHg), respiratory and abdominal examination findings were normal. No focal neurological signs. Hematocrit (32%) and serum chemistry such as serum sodium (138 mmol/l), potassium (4.2 mmol/l), bicarbonate (26 mmol/l), creatinine (83 µmol/l), urea (3.3 mmol/l), glucose (5.1 mmol/l), and aspartate aminotransferase (28 IU/l) were essentially normal. He was managed conservatively with intravenous fluid of 4.3% dextrose in 0.18% saline infused at maintenance rate. About 12 hours after admission, he became conscious, was well oriented, and did not require any further active management.

### Counseling and follow-up

Following recovery, the children reported that another classmate gave them the plant, taught them how to prepare it, and described the “pleasant feeling” associated with its consumption. They eventually consumed the extract because of the said “pleasant feeling.” Based on this information, they were subsequently counseled on substance use and abuse by the hospital medical social workers, adolescent psychiatry team, and pediatricians before discharge to the school guidance and counseling staff who also doubled as the school welfare coordinator. The two

subsequent visits at the adolescent psychiatric clinic after discharge revealed no abnormality.

## Discussion

*Datura stramonium* is known as “gegemu” among the Yorubas in the south-western Nigeria. The seeds and leaves of this plant contain a higher concentration of toxic chemicals, hence are more poisonous than other parts of the plant. Tropane alkaloids, the predominant chemicals found in all species of *Datura* plants, are anticholinergic and central nervous system stimulants. They act by competitively and irreversibly inhibiting acetylcholine on muscarinic receptors, thereby causing both central and peripheral nervous system manifestations.<sup>[10]</sup> The central nervous system features include restlessness, delirium, altered sensorium, and hallucinations, as seen in one of our patients. Also, convulsions and deep coma may occur in severe intoxication. The second patient exhibited these features. The peripheral nervous system manifestations include hyperpyrexia, pupillary dilatation, dryness of mouth and skin, urinary retention, and reduced gastric movement.<sup>[9,10]</sup> Most of these features were seen in our patients. It is however possible for patients with *Datura stramonium* poisoning to exhibit either central or peripheral nervous system features independently.

*Datura* has been used extensively in alternative medicine to manage common illnesses such as asthma, chronic bronchitis, flu symptoms, and pain, particularly pain of child birth. In many cultures worldwide, a common use is to add extract from the plant to alcoholic beverages to increase intoxication. The two children in this report developed toxicity following a voluntary ingestion of the extract primarily for its hallucinogenic effects. Accidental ingestion of tropane alkaloids had been reported previously and in many cases resulted in deaths.<sup>[11-13]</sup> In eastern United States, alkaloid poisoning followed inclusion of *Datura* extract in homemade toothpaste and misuse of the plant as an edible vegetable.<sup>[12,13]</sup> In some European countries, it had been found to follow food contamination such as commercially purchased honey, Paraguay tea, hamburger, and stiff porridge.<sup>[11]</sup>

Management of alkaloid poisoning involves a general supportive care, removal of the chemicals either by gastric lavage or with the use of activated charcoal, symptomatic treatment of features such as convulsions and cardiac manifestations, and the use of anticholinesterase agents (physostigmine and tacrine hydrochloride). In most studies, majority of patients with *Datura* poisoning had general supportive care and symptomatic treatment only.<sup>[4-6]</sup> None of our patient required physostigmine or tacrine hydrochloride as they responded well to the initial conservative management given.

Adolescents must have access to correct and detailed information on poisoning prevention since this remains one of the effective interventions in solving health and social challenges facing them. Correct and detailed information is essential to prevent misinformation from peers. Parents and children should be counseled about potential poisons and poison risks, including dangers associated with substance abuse.

One of the most important challenges in *Datura* poisoning is the delay in making diagnosis; hence, it should be suspected in adolescents presenting with altered mental state, hallucination, and anticholinergic features. A high index of suspicion and early management of poison in children is imperative if a favorable outcome is expected. Early presentation and the presence of an eyewitness contributed to the very good outcome in these index cases.

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