A case of pediatric age anticholinergic intoxication due to accidental *Datura stramonium* ingestion admitting with visual hallucination

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***Datura stramonium* (DS) is a hallucinogenic plant that can produce anticholinergic toxicity because of its significant concentrations of toxic alkaloids, such as atropine, hyoscyamine, and scopolamine. DS grows in both rural and urban areas in Turkey. Clinical findings of toxicity are similar to those of atropine toxicity. DS abuse is common among adolescents because of its hallucinatory effects. However, accidental DS poisoning from contaminated food is very rare. Accidental poisonings are commonly seen among children. Children are more prone to the toxic effects of atropine; ingestion of even a small amount can cause serious central nervous system symptoms. Treatment is supportive; antidote treatment is given rarely. An eight-year-old male with accidental DS poisoning who presented to the Pediatric Emergency Department with aggression, agitation, delirium, and visual hallucinations is reported.**

Key words: atropine, anticholinergic, children, Datura stramonium, poisoning.

Datura stramonium (DS) is a hallucinogenic plant that grows in both urban and rural areas in Turkey. It inhibits both peripheral and central muscarinic neuronal transmission due to its contents of atropine, scopolamine and hyoscyamine and causes anticholinergic syndrome[1]. Conscious consumption of any part of the plant because of its hallucinogenic and euphoria effect causes DS-related anticholinergic toxicity and is mostly seen among adolescents[2].

Hallucinations can be auditory and/or visual. Psychiatric diseases such as schizophrenia should be considered in auditory hallucinations, while toxic causes should be considered if visual hallucinations are present[3,4]. Because of the diversity of the differential diagnosis, a systemic approach is necessary for the definitive diagnosis and treatment planning.

The goal of the case presented herein is to emphasize that, in children presenting to the Pediatric Emergency Department (PED) with the symptom of visual hallucination, toxic causes must be considered and investigated for early diagnosis and early treatment. An eight-year-old male, who was accidentally poisoned with DS and presented to the PED with visual hallucination, disorientation, slurred speech, and agitation, is reported.

Case Report

A previously healthy eight-year-old boy presented to the PED with visual hallucination, disorientation, slurred speech, and agitation. His complaints started three hours before presentation. He was conscious and had no prior history of convulsions, infection or trauma.

No familial psychiatric and/or epileptic disease history was known. His body temperature taken at home was 39°C.

In the first evaluation, Glasgow coma score was 15, and vital signs were normal. He was confused and agitated, and demonstrated aggression and visual hallucinations. No findings relative to anticholinergic toxicity except bilateral mydriatic pupils were detected in the systemic examination.

Serum glucose level, blood count, biochemical parameters, and blood gas analyses were within reference ranges. No intracranial

pathologic findings were detected on computed cranial tomography. Electrocardiography and electroencephalography were normal. Toxicity was suspected as clinical symptoms were acute onset, no presence of previous psychiatric/epileptic diseases, and absence of any other detected organic cause. He was admitted to the Pediatric Observation Unit for follow-up. Cholinesterase, salicylate, barbiturate, and alkaloid levels were checked, and all of them were normal.

It was learned from his parents that no drug usage was present. Three hours before the complaints started, a salad containing purslane was consumed. Two more members within the same family who ate the salad experienced vertigo. The parents were requested to bring the remaining purslane to the hospital. A foreign plant of different leaf size and shape was detected within the purslane and sent to the Faculty of Agriculture for analysis. This plant was reported as DS, and these clinical findings were determined as "anticholinergic intoxication". When the parents were informed about the DS, they stated that they had purchased the purslane from a market and had weeded it out before consumption.

Since the definitive diagnosis was made 15 hours after the consumption, gastric lavage was not performed and no activated charcoal or antidote (i.e. physostigmine) was given. His clinical signs resolved in the follow-up and his vital signs were normal. He was discharged on the second day of hospitalization.

Discussion

Visual hallucination is a rare symptom in the PED. In the presence of visual hallucinations, toxic causes must be considered, and hallucinogenic drug and/or plant ingestion must be queried. In this case report, as clinical symptoms were acute onset, there was no previous psychiatric disease, and no organic reason could be detected, toxicity was suspected and laboratory tests were done. With the help of information obtained from the parents, the remainder of the purslane consumed at dinner was obtained and sent for analysis, which provided data for the definitive diagnosis. The diagnosis was anticholinergic toxicity due to DS ingestion.

Datura stramonium (DS) can produce anticholinergic toxicity because of its significant concentrations of toxic alkaloids, such as atropine, hyoscyamine, and scopolamine. Anticholinergic toxicity due to DS occurs by improper preparation of edible vegetables, accidental poisoning from ingestion of contaminated DS, and deliberate abuse as a hallucinogen consumption for its hallucinatory effects, commonly seen among adolescents[5,6]. However, accidental DS poisoning from contaminated food is very rare. Consumption of any part of the plant can cause serious anticholinergic intoxication[7]. Published cases of DS intoxications are usually due to consumption of seeds or dried leaves[6], but even consumption of raw leaves, as in this case, can cause toxicity. A case of intoxication due to accidental ingestion of DS by a 3.5-year-old child with pica due to iron deficiency anemia is found in the literature[5]. In our country, DS can grow in any region, so it can be picked with vegetables in agricultural areas. If the purchased vegetables are not cleaned well, accidental ingestion can cause toxicity.

Clinical findings caused by DS are similar to those of atropine poisoning and include tachycardia, hyperthermia, flushing, dry skin, dilated pupils and blurred vision, disorientation, delirium, visual hallucinations, and in severe cases, seizures, decreased bowel sounds and urinary retention[5]. In a study from Turkey, 49 pediatric age DS intoxication cases were evaluated and grouped into two according to the presence or absence of encephalopathy. The severity of clinical signs was evaluated. The presence of two items among consciousness, cognitive disability, personality changes, and coma was accepted as encephalopathy and severe toxicity. Even though the study included the largest number of cases within the childhood age group, none of the cases within the two groups had a symptom of hallucination. Among 43 cases of mild intoxication, 41.8% had speech disturbance, 37.2% agitation, and 6.9% convulsion. Among six cases of severe toxicity, all had speech disturbance, and coma was present in three, convulsion in two, and agitation in one. No information was given in that study about the route or amount of ingestion[8]. Schneider et al.[9] reported eight cases intoxicated with *Atropa belladonna* seeds. Three of four adult patients had delirium associated with visual hallucination. In our case, even

though he was in the childhood age group and the amount of ingestion was unknown, he admitted to the PED with the symptom of visual hallucination. In anticholinergic toxicity in childhood, hallucinations are thought to be a rare symptom. Although it is a rare symptom, toxic causes must be questioned after evaluating organic pathologies in patients admitting to the PED with visual hallucination. Symptoms of DS toxicity begin 60 minutes after ingestion, and as the anticholinergic effect prolongs gastric emptying; signs and symptoms of toxicity can be seen up to 24-48 hours[1]. Children are more prone to the toxic effects of atropine, and even small amounts can cause central nervous system signs[10]. In this case, the amount of ingestion could not be detected as the ingestion was accidental.

For treatment planning, detection of the cause of toxicity is important. The content of tropane alkaloids of the plant can be detected by gas chromatography-mass spectroscopy, but serum levels of anticholinergic agents are neither helpful nor readily available in the PED, so the diagnosis of anticholinergic toxicity is based on clinical findings[1,7]. Even though the clinical signs of anticholinergic intoxication were present, for a definitive diagnosis, the rest of the purslane was brought to the hospital. The foreign plant was sent to the Faculty of Agriculture for analysis, and was subsequently reported as DS. If gas chromatography cannot be done, other means for the definitive diagnosis can be pursued. Detection of the cause helps in the definitive diagnosis and proper treatment.

Treatment is supportive, but antidotal therapy can be used rarely[1,6]. Physostigmine is an antidote for anticholinergic poisonings. However, physostigmine should not be used in all poisoning cases because of its side effects. Physostigmine is indicated in cases of delirium, hypotension, seizure, malignant hypertension, malignant hyperthermia, uncontrolled agitation, coma caused by respiratory depression, and dysrhythmia[11]. In this case, the time between ingestion of the plant and symptoms was prolonged, so no gastric lavage was applied and no activated charcoal was given. Physostigmine was not given because the patient's clinical findings had regressed in the follow-up.

In conclusion, in cases admitting to the PED with the symptom of visual hallucination, signs of anticholinergic toxicity should be evaluated, and hallucinogenic drugs and plants must be questioned. DS grows in every region of our country. It must be remembered that not only consumption of seeds or dried leaves but also consumption of small amounts of raw elements can cause toxicity. If intoxication is suspected, for the definitive diagnosis and proper treatment, each material (plant and drug) to which the patient was exposed must be queried, and if necessary, must be sent to proper centers for analyses.

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