

ANTICHOLINERGIC INTOXICATION DUE TO DATURA STRAMONIUM: THREE PEDIATRIC CASES

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Application date: 10.05.2007

Approval date: 03.09.3007

Running Title: Anticholinergic intoxication

Summary

Anticholinergic plants contain a variety of alkaloids and have been used for herbal medicine and abused by adolescents. We present three children (two of them were 5 and 7-years-old sister and brother and other was 5-years-old girl), who had applied to emergency room by parents, suspected due to self poisoning by *Datura stramonium*. Goal of this report is remembering the importance of evaluation and treatment of patients who suspected intoxication, and applied to emergency room with altered mental status and/or unconsciousness, also toxicities and potential risks of different kinds of plants. We also pointed to importance of protecting and educating of children, adolescents, and their parents against to abuse or accidentally use of these kinds of plants.

Key words: *Datura stramonium*, Pediatrics, Anticholinergic, Intoxication.

Datura stramoniuma bağlı antikolinerjik intoksikasyon: Üç çocuk vaka

Özet

Antikolinerjik bitkiler farklı alkaloidler içerirler ve şifalı bitkiler olarak kullanıldığı gibi gençler tarafından suiistimal de edilirler. Bu çalışmada ebeveynleri tarafından acil servise getirilen ve kendilerini *Datura stramonium* ile zehirledikleri düşünülen 3 çocuk hasta (ikisi 5 ve 7 yaşlarında iki kız ve erkek kardeş ve diğeri 5 yaşında kız çocuğu) sunulmuştur. Bu sunumun amacı, acil servise bilinci kapalı ve/veya şuuru bulanık olarak acil servise getirilen ve intoksikasyon düşünülen hastaların değerlendirilmesi ve tedavisinin önemi ile farklı bitkilerin toksisiteleri ve potansiyel risklerini hatırlatmaktır. Ayrıca çocukları, gençleri ve ebeveynlerini bu tip bitkilerin kazara alınması veya bilinçli olarak suiistimaline karşı korumak ve eğitmenin önemine dikkat çektik.

Anahtar Kelimeler: *Datura stramonium*, Pediatrik, Antikolinerjik, Zehirlenme

Introduction

Datura stramonium (DS) is a wild growing plant, which can cause serious illness or death, due to mild to severe toxicity. DS plant also known as Jimson weed, thorn apple, angel's trumpet, and Jamestown. It contains a variety of alkaloids including atropine, hyoscamine and scopolamine that can all cause anticholinergic poisoning^(1,2,3,4,5). All parts of the DS plant are poisonous and highest concentrations of anticholinergic occurs in the seed (equivalent to 0.1mg of atropine per seed)⁽¹⁾. The estimated lethal doses of atropine and scopolamine in adults are greater than or equal to 10mg and greater than 2-4mg, respectively^(1,2).

We present unusual case of DS intoxication in three pediatric patients who initially presented with altered

mental status, abnormal/incoherent speech, and sleepy when applied to emergency room (ER) by parents. Goal of this report is remembering the importance of taking history in physical examination, toxicities and potential risks of different kinds of plants. Also protecting and educating of children and adolescents against to use of these plants.

Case Report

Case 1 and 2

Five and 7-years-old sister and brother were admitted to ER because of acute loss of consciousness. Their parents reported that they had found them at home in the saloon. Both of them were incoherent, difficult speech and sleepy. They have lost their consciousness then awoke for a few

seconds but shortly afterward lost their consciousness again.

Physical and neurological examination was performed for case 1 and 2 in 10 minutes after arriving to ER. Symptoms occurring time was unknown. There was no history and evidence of trauma.

The patients were monitored and oxygenized from 4-6 lit/min with face masks and accessed vessel way with 22G branules antecubitally for each one. Vital signs, such as heart rate, arterial pressure, respiratory rate, body temperature, and oxygen saturation measured with pulse oxymeter (from finger probe) were normal. Glasgow coma scores were 13 (E3M6V4) and pupils were bilaterally mydriatic and light reactions were normal for both. Their skins, oral mucosa and faces were dry and flushed. Electrocardiograms showed no abnormalities. There is no lateralizing neurological deficit and Babinski signs were negative for each patient, but there was a decrease in bowel sounds which were quite soft sounds, moreover non-distended abdomen was revealed for two children.

As measured by emergency unit, serum glucose level: 179 mg/dl, white blood cells: 18300/mm³ (%94 neu), blood urine nitrogen: 72 mg/dl, creatinin: 0.8 mg/dl and urine density were 1033 for case 1 and serum glucose level: 209 mg/dl, white blood cells: 23600/mm³ (%92 neu), blood urine nitrogen: 82 mg/dl, creatinin: 0.9 mg/dl and urine density were 1030 for case 2. Other initially laboratory tests for electrolyte disorders or hepatic failure and arterial blood gases were normal for case 1 and 2. We suspected; these signs and symptoms could be due to anticholinergic intoxication. But, what was the cause of these? Furthermore, resuscitation was carried out with crystalloid for prerenal failure and replaced nasogastric tube, for gastric decompression, lavage, and active charcoal administration (1g/kg via nasogastric tube) to each case. The physical examination was otherwise normal for both. Nearly 36 hours after admission, their conscious cleared and they told what happened to them. Both of them had eaten a plant while playing in the garden of their house. We asked to parents if they could bring an example from that plant. It was DS (Fig. 1).

Case 3

Five-years-old girl was admitted to ER because of acute loss of consciousness. Her mother reported that she might have eaten some strange plants nearly 10 hours before. The patient was monitored and oxygenized from 4-6 lit/min with face masks and accessed vessel way with 22G branules antecubitally. Vital signs, such as heart rate, arterial pressure, respiratory rate, body temperature, and oxygen saturation measured with pulse oxymeter (from finger probe) were normal.

In physical and neurological examination there was no history and evidence of trauma. Glasgow coma score was 12 (E3M5V4) and pupils were bilaterally mydriatic and light reactions were normal. Her oral mucosa and faces were dry and flushed. There is no lateralizing neurological



deficit and Babinski reflexes were negative. As measured initially laboratory tests for electrolyte disorders, hepatic or renal failure and arterial blood gases were normal. These signs and symptoms were indicating anticholinergic intoxication.

Furthermore, resuscitation was carried out with crystalloid and replaced nasogastric tube, for gastric decompression, lavage, and active charcoal administration (two times between 12 hours, 1g/kg via nasogastric tube). The physical examination was otherwise normal.

Patient admitted to pediatric intensive care unite and discharged 2 days later to be healthy.

Discussion

Datura stramonium is a plant distributed throughout most parts of temperate regions of the world. According to the resent classifications, it has four varieties, which had been considered for years by many botanists to be different species [*D. stramonium* var. *stramonium* L., *D. stramonium* var. *tatula* L. (by Torr.), *D. stramonium* var. *inermis* (by Jacq. Timmerman) and *D. stramonium* var. *godronii* (by Danert)]⁽⁵⁾.

Typical clinical symptoms of DS intoxication are as classic atropine intoxication, which are dry mucous membranes, thirsty, difficult swallowing and speaking, blurred vision, and photophobia in initially, may be followed by hyperthermia, ataxia, impaired short-term memory, disorientation, confusion, hallucinations (visual and auditory), psychosis, agitated delirium, coma, seizure, respiratory failure, and cardiovascular collaps^(1,3,6,7,8). Symptoms of DS toxicity usually occur within 30-60 minutes after ingestion and may continue for 24-48 hours because the alkaloids delay gastrointestinal motility⁽¹⁾. In our cases, signs and symptoms onset and progress periods and differences were similar with the literature. Coma or altered mental status from exogenous poisons or drugs is a common diagnostic problem, not only because of the variety of clinical symptoms but also because of incomplete medical histories and misguided efforts by families and friends to conceal facts. Even if particular toxic agent is suspected, results of a chemical analysis may arrive too late. Therefore, an accurate and immediate

diagnosis depends mostly on the clinical findings as in our patients.

Treatment consist of conservative, supportive care [protecting ABC's, cardiac monitoring, i.v. line, gastrointestinal decontamination (i.e., gastric lavage, emesis and/or activated charcoal)], and physostigmine in severe cases ^(1,7,9,10). We were intervened the same treatment protocols without physostigmine for these cases to. Gastric lavage and activated charcoal administration were important and recommended up to 12 to 24 hour after ingestion, because of anticholinergic agents may remain in the stomach for prolong periods ⁽¹⁰⁾, also delayed gastrointestinal motility and may reabsorption of toxic agent via enterohepatic circulation ^(1,10). We must point that when decided to administration gastric lavage and/or activated charcoal to unconscious patient, airway must be protected, because of aspiration risk contrary to our cases. We did not find any indication for using physostigmine in our cases. Physostigmine is a tertiary ammonium compound that is a reversible acetyl-cholinesterase inhibitor that crosses the blood-brain barrier and reverses both central and periferral anticholinergic effects ⁽¹⁰⁾. The indications for its use include the presence of peripheral anticholinergic signs, seizures and hemodinamically unstable dysrhythmias unresponsive to conventional therapy, uncontrollable agitation, and coma with respiratory depression, malign hypertension, or hypotension. The initial dose is 0.5 to 2.0 mg i.v. over 5 minutes. The

minimal effective dose should be used. Repeated doses may be necessary ⁽¹⁰⁾. It's contraindicated in patients with cardiovascular disease, bronchospasm, intestinal obstruction, heart block, peripheral vascular disease, and bladder obstruction ⁽¹⁰⁾.

Unlike other countries, hallucinogenic, euphoric and other anticholinergic effects of DS ⁽¹⁻¹³⁾ are not well known in Turkey. It has been reported only two times in our country before ^(6,11).

Poisoning associated with DS or other plants can be prevented trough educational programs by press and/or visual media, postgraduate education of health care providers and broadcast reports to the public that emphasize the health hazards of DS ingestion. Also a poison control and information center must be on duty 24 hours-365 days in any country.

Conclusion

These unusual case presentations should remind the importance of toxicities and potential risks of different kinds of plants, also protection and education of children and adolescents and their parents against to abuse or accidentally use of these. We emphasize the importance of accurate history taking, evaluating, and treating the patients which come to ER with suspicious of intoxication, presenting with altered mental status, agitation, hallucinations and other anticholinergic signs and symptoms

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