
Toxic Delirium due to *Datura Stramonium*

Alberto Kurzbaum MD¹, Claudia Simsolo MD¹, Ludmilla Kvasha MD³ and Arnon Blum MD²

Departments of ¹Emergency Medicine and ²Internal Medicine, and ³Psychiatric Unit, Poriya Government Hospital, Tiberias, Israel

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Altered mental status and delirium are common and challenging problems in emergency medicine. Since the differential diagnosis is wide a systematic approach is necessary to reach the correct diagnosis and prescribe the appropriate treatment. Toxic delirium is one of the common causes, and poisoning from anticholinergic tropane alkaloids (or belladonna alkaloids: scopolamine, hyoscyamine and atropin) one of its possible etiologies. Many plants contain these alkaloids.

We present two patients with tropane alkaloid poisoning due to *Datura stra-*

monium taken as a recreational hallucinogen, and describe the clinical manifestations. Physicians should be alert to the variable clinical picture in order to avoid pitfalls in diagnosis and treatment.

Patient Descriptions

Two brothers, 17 and 16 years old, were brought to the emergency department by ambulance. On arrival they were uncooperative and in agitated delirium. Physical examination revealed tachycardia (140 and 120 per minute), blood pressure 140/70 and 120/55 mmHg, respirations

18/min, and rectal temperature 37 and 37.7°C respectively. Both of them had mydriasis and their skin was warm and dry. One of them had flushed skin and dry mucosa. Their veins were not scarred and no signs of venous injections were noted. Their chests were clear, and apart from the tachycardia their hearts seemed normal. There was no obvious evidence of trauma. They were not communicating and were in a state of agitated delirium with purposeless movements. No focal or meningeal irritation signs were found. Blood glucose, oxymetry, and blood chemistry were normal.

They were given crystalloids infusion and benzodiazepines. After voiding spontaneously and following a diazepam injection, toxicological screening was performed, which was positive only for benzodiazepines. The patients' condition improved gradually, and after they started to communicate they denied at first any recreational drug abuse. Later, one of them admitted to sniffing glue. An anticholinergic toxidrome was diagnosed and *Datura stramonium* (Jimson weed) poisoning was suspected. They were admitted to the Intensive Care Unit; fluids and gastric decontamination with activated charcoal by mouth were initiated. They remained tachycardic and with mydriasis. During psychiatric evaluation in the Intensive Care Unit they admitted to having ingested *Datura* seeds. About 18 hours after arrival their mother took them home against medical advice.

Comment

The anticholinergic toxidrome may be due to many different causes: medical non-compliance and polypharmacy, intentional overdose, or inadvertent ingestion. The syndrome usually follows the ingestion of a variety of over-the-counter and prescription medicines. Intentional abuse with some hallucinogenic plants can evoke the anticholinergic syndrome due to the presence of tropane alkaloids. Toxicity from plants containing these alkaloids manifest as a classic anticholinergic poisoning. Symptoms usually occur within 30–60 minutes after ingestion and may last more than 24 hours because of delayed gastric emptying. Scopolamine acting at peripheral and central muscarinic receptors is considered the primary cause of these plants' toxicity.

Datura stramonium is a wild-growing herb. Known as Jimson weed, it also has several slang names: thorn apple, angel's trumpet, loco weed, etc. The whole plant is toxic, particularly the foliage and seeds. The incidence of *Datura* poisoning is sporadic with a cluster of poisoning

cases occurring mostly among adolescents. The wide availability of information about hallucinogenic plants will likely lead to an increase in incidence. While an uneventful recovery is reported in most cases, mortality may occur from the poisoning itself or from related causes such as drowning and trauma.

The anticholinergic syndrome results from the inhibition of central and peripheral muscarinic neurotransmission. The patient presents with dry skin and mucosa, flushing, mydriasis with loss of accommodation that causes blurred vision and photophobia, altered mental status, hyperpyrexia, sinus tachycardia, decreased bowel sounds, urinary retention, tremulousness and myoclonic jerking. Other symptoms may include ataxia, impaired short-term memory, disorientation, confusion, hallucinations (visual and auditory), psychosis, agitated delirium, seizures, coma, respiratory failure and cardiovascular collapse. The differential diagnosis may be difficult because the symptoms are not always concomitantly present. Some manifestations are similar to those seen with other more common hallucinogens such as LSD (lysergic acid diethylamide) or Ecstasy, and routine drug screening does not detect these agents. Tropane alkaloids may be detected by gas chromatography-mass spectrometry [1] but the diagnosis is essentially clinical. Recognizing the correct toxidrome [2] is the key to avoiding pitfalls in diagnosis.

The treatment is essentially supportive [3]: gastric decontamination with activated charcoal by mouth or tube, control of agitation with benzodiazepines, and hyperpyrexia control (fluids and other cooling measures). Tachycardia usually responds to crystalloids. Although physostigmine is the antidote for anticholinergic toxicity, its use is controversial despite recent reports of it being a safe treatment [4]. Physostigmine is recommended when the patient has severe agitation or psychosis not controlled with benzodiazepines and is considered a threat to him/herself or to

others, or if the patient has intractable seizures or tachydysrhythmias with hemodynamic compromise. It can be used only if the electrocardiogram demonstrates normal PR and QRS intervals, since the anticholinergic syndrome may be secondary to overdose with tricyclic antidepressants where it is contraindicated. Phenothiazines for agitated delirium should be avoided due to their anticholinergic properties, and barbiturates can be administered in the case of refractory seizures to benzodiazepines. Phenytoin has not been proven to have a role in toxin-induced seizures. Acute toluene intoxication from sniffing glue, which our patients admitted to, may affect the central nervous system. Although it does not explain the full anticholinergic syndrome recognized in the two boys, it may have contributed to their altered mental status.

Educational efforts targeted at teenagers to avoid the use of *Datura* plants, as well as an increased awareness of the clinical picture among medical personnel may reduce the deleterious effects of these poisonings.

References

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Correspondence: Dr. A. Kurzbaum, Dept. of Emergency Medicine, Poriya Government Hospital, Tiberias 15208, Israel. Phone: (972-4) 673-8397, Fax: (972-4) 673-8478, email: akurzbaum@poria.health.gov.il