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## Delirium Due to *Datura stramonium* Ingestion: A Case Report

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### Authors' contributions

This whole work was carried out by the authors MSY, BI, MO and CK. Authors AGS and GK wrote the first draft of the manuscript. Author OS make proof reading and managed the literature searches. All authors read and approved the final manuscript.

Case Study

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### ABSTRACT

**Introduction:** *Datura stramonium*, known as devils apple or tatula by Turkish people. It is a plant known as a member of belladonna alkaloid family contains atropine, hyoscyamine and scopolamine that are having hallucinogenic and anticholinergic effects. In our study we described a case presented by delirium to our emergency department with later diagnosed as *Datura stramonium* poisoning.

**Presentation of Case:** 19 years old male patient admitted to our emergency department by his relatives with the complaints of altered mental status, yelling, and meaningless speech. He was conscious at the time of admission but place, time and person orientation was altered with no cooperation. Ten mg midazolam was administrated intravenously to the patient because he was further harm caused by him to himself and environment. After further monitorisation for 8 hours patient were discharged safely.

**Discussion and Conclusion:** Herbal wealth of Turkey is widespread. Turkish people are traditionally more prone to usage of herbal medicine. Also drug abuse is a growing problem in the country.

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## 1. INTRODUCTION

*Datura stramoniumun* (DS) is a common plant found in all regions of Turkey especially in Central Anatolia. DS is commonly known as pipe flower, garden clove, magic herb, jinn herb, stinking herb, devil's apple, tatula. This plant is about 20-100 cm height, stiff stemmed, 7-14 branched, and has green fruits around 3-4 cm containing black seeds. this plant is about 20-100 cm height, stiff stemmed, 7-14 branched, and has green fruits around 3-4 cm containing black seeds. DS flowers have a shape of cone usually white colored (Fig. 1). All parts of plant contains variable amounts of belladonna alkaloids namely atropine, hyoscyamine and scopolamine. Mainly seeds of the plant contain high concentrations of atropine. DS is commonly used as an herbal medicine traditionally to treat asthma, bronchitis, hemorrhoids, eczema; moreover has an important part in drug industry [1,2].



**Fig. 1.** *Datura stramonium*

## 2. CASE

19 years old male patient was admitted to emergency department (ED) by his relatives with the complaints of altered mental status, yelling, and meaningless speech. He was conscious at the time of admission. But time, person orientation was altered with no cooperation. He had no chronic illness in the history. Deeply agitated; patients vitals were recorded as tension arterial; 142/75 mmHg, heart rate; 122/min, fever; 37,5°C breath rate; 20/dk. ECG shows sinus tachycardia without any abnormal morphology. His pupils were isochoric with bilateral mydriasis. Skin and mucous membranes were dry, Intestinal motility was hypoactive by auscultation. Complete blood count, renal and liver function tests and arterial blood gas analysis and pH in arterial blood gas analyse were normal. Drug could not be determined in toxicological screening. In the light of these signs and symptoms, anticholinergic toxidrome was suspected and supportive therapy was started. Due to patient's general medical condition and consciousness level, gastric lavage was not performed and active coal was not administered because of aspiration risk. For symptomatic treatment of agitation 10 mg midazolam was administered intravenously. Agitations were ceased and reoccurred in a brief period. When we got a detailed history of anamnesis from the parents of the patient, we have learned that the patient ingested "Datura stramonium" with the expectation of euphoric effects, about 4 hours ago the development of symptoms. National Referral Centre for Poisoning was called for further information and treatment options. To prevent from the further harmful effects from DS, 2 mg physostigmine were administered. Due to known arrhythmogenic and epileptogenic effects of physostigmine patient were monitored before administration. 2 minutes after administration of physostigmine patient responded the drug and immediately regained consciousness, also disorientation and incooperation ended rapidly. After further monitoring for 8 hours patient were discharged safely.

## 3. DISCUSSION

DS is commonly known as pipe flower, garden clove, magic herb, jinn herb, stinking herb, devil's apple, tatula [2]. This plant contains atropine, scopolamine, and hyoscyamine responsible for anticholinergic effects. Each of the seed contains 0, 1 mg atropine. 100 seed contains potentially fatal 6-10 mg atropine [3-6]. Ingestion of a capsule containing 50 to 100 seeds can lead to severe anticholinergic toxicity [4]. Due to potential Psychedelic and euphoric effects on central nervous system, although rare, abuse can be observed in young population as in our case report. Symptoms usually start in 30-60 minutes after oral use. First symptoms are usually hallucinations, dryness in mucosal membranes, dehydration, pupil dilatation, accommodation and speech disorders accompanying tachycardia, urinary retention and ileus. In the literature, some authors have reported cases of delirium due to DS [2,4,5]. Rarely hyperthermia, respiratory arrest and convulsions can be encountered. Due to decreased gastrointestinal motility toxin elimination is delayed and symptoms may last in 24-48 hours.

Urich et al reported a 20 year old male patient who died because of the side effects of DS [7]. Bouzuri et al presented a case with complaint of excitation, delirium, and hallucinations due to oral intake of DS [8]. Our patient was admitted to the our ED with complaints of change in the level of consciousness and speech impairment.

Treatment of anticholinergic toxidromes is conservative and supportive and specific antidote is physostigmine. Kurzbaum et al suggested that Physostigmine can be used in DS toxicity [5]. Physostigmine can easily pass over the blood-brain barrier and inhibits anti-

cholinesterase enzyme reversibly [9]. Hori et al. [10] commented that upregulations of cholinergic system compensates the anticholinergic burdens, however, cholinergic system is deteriorated in some situations such as Alzheimer's disease patients. Our patient was 19 year- old. Therefore, his cholinergic system was now fully developing and was not fully upregulated. Hori et al reported that exogenous anticholinergic burden was not ameliorated by the upregulation of cholinergic system in such case, which causes anticholinergic toxicity. Peripheral anticholinergic intake causes anticholinergic toxicity not only in peripheral system but also in central nervous system. Downregulation of cholinergic system causes the hyperactivations of inflammatory events both in peripheral and central nervous system. There was no infection detected by the patient. Onset of the anticholinergic cascade was reported by Hori et al. [11]. Hori K, et al reported that the prescription of cholinesterase inhibitor might stop the anticholinergic activity by upregulation of cholinergic system. By soon after the injection of physostigmine our patient's symptoms was dramatically recovered and continuous injection of physostigmine was not needed. Most of the patient's mental and hemodynamic status can be managed safely with supportive and benzodiazepine therapy but administration of physostigmine must be considered when patient is hemodynamically unstable due to arrhythmias, respiratory arrest and convulsions resistant to standard therapy. Also physostigmine can be applied if the patient is severely agitated and causes harm to him and environment. Adult dose is 2 mg and must be applied in no shorter than 5 minutes [9,12].

#### 4. CONCLUSION

Turkish people are traditionally more prone to usage of herbal medicine. When a young patient with delirium is encountered in ED specifying story and physical examination can lead to rare toxidromes as in our case.

#### COMPETING INTEREST

Authors have declared that no competing interests exist.

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