

Delirium due to Datura Stramonium Ingestion: A case report

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.

KEY WORDS: *Datura stramonium*, delirium, physostigmine, Emergency department

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28 INTRODUCTION

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

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41 CASE

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43 19 years old male patient was admitted to emergency department (ED) by his relatives with
44 the complaints of altered mental status, yelling, and meaningless speech. He was conscious at
45 the time of admission. But time, person orientation was altered with no cooperation. He had
46 no chronic illness in the history. Deeply agitated; patients vitals were recorded as tension
47 arterial; 142/75 mmHg, heart rate; 122/min, fever; 37,5°C breath rate; 20/dk.ECG shows sinus
48 tachycardia without any abnormal morphology. His pupils were isochoric with bilateral
49 mydriasis. Skin and mucous membranes were dry, Intestinal motility was hypoactive by
50 auscultation. Complete blood count, renal and liver function tests and arterial blood gas
51 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 charcoal 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 to the drug and immediately regained consciousness, also disorientation and incooperation ended rapidly. After further monitoring for 8 hours patient was discharged safely.

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 complains 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, which is due to the toxicity of anticholinergic agents. 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 injection of physostigmine 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].

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.

REFERENCES

1. Uzun E, Sariyar G, Adsersen A, Karakoc B, Ötük G, Oktayoglu E, et al. Traditional medicine in Sakarya province (Turkey) and antimicrobial activities of selected species. J Ethnopharmacol 2004; 95:287-296.
2. Wiebe TH, Sigurdson ES, Katz LY. Angel's trumpet (*Datura stramonium*) poisoning and delirium in adolescents in Winni-peg, Manitoba: summer 2006. Paediatr Child Health 2008;13(3):193- 196.

- 126 3. Vanderhoff BT, Mosser KH. Jimson weed toxicity: manage-ment of anticholinergic plant
127 ingestion. *Am Fam Physician* 1992; 46: 526-530.
- 128 4. Klein-Schwartz W, Oderda GM. Jimson weed intoxication in adolescents and young adults.
129 *Am J Dis Child* 1984;138:737-739.
- 130 5. Kurzbaum A, Simsolo C, Kvasha L, Blum A. Toxic delirium due to *Datura stramonium*. *Isr*
131 *Med Assoc J* 2001;3:538-9.
- 132 6. Parissis D, Mellidis C, Boutis A, Apostolidis K, Ignatiadis M, Kiosses V, Milonas I.
133 Neurological findings in a case of coma secondary 140 to *Datura stramonium* poisoning. *Eur J*
134 *Neurol* 2003;10(6):745-746
- 135 7.Urich RW, Bowerman DL, Levisky JA, Pflug JL. *Datura stramonium*: a fatal poisoning. *J*
136 *Forensic Sci.* 1982 Oct;27(4):948-54.
- 137 8. Bouziri A, Hamdi A, Borgi A, Hadj SB, Fitouri Z, Menif K, Ben Jaballah N. *Datura*
138 *stramonium* L. poisoning in a geophagous child: a case report. *Int J Emerg Med.* 2011 Jun
139 15;4(1):31. doi: 10.1186/1865-1380-4-31
- 140 9. Wolf LR. Anticholinergic toxicity. In:Tintinalli JE, Kelen GD, Stapczynski JS (eds).
141 *Emergency Medicine: A Comprehensive Study Guide* (seventh ed). New York, McGraw-Hill
142 2010, p 1182–1185.
- 143 10. Hori K, Konishi K, Tani M, Tomioka H, Akita R, Kitajima Y et al. Serum anticholinergic
144 activity: A possible peripheral marker of the anticholinergic burden in the central nervous
145 system in Alzheimer's disease. *Disease Marker*, 2014; Article ID 459013. doi:
146 dx.doi.org/10.1155/2014/459013
- 147 11. Hori K , Konishi K, Tani M, Tomioka H, Akita R, Kitajima Y et al Why does the
148 progression of Alzheimer's disease accelerate? *Ann Psychiatry Ment Health* 2014;1(2): 1006

12. Burns MJ, Linden CH, Graudins A, Brown RM, Fletcher KE. A comparison of physostigmine and benzodiazepines for the treatment of anticholinergic poisoning. Ann Emerg Med 2000; 35:374-381.

Competing Interest

Authors have declared that no competing interests exist.

Authors' Contributions

'Author BI, MB and MSY' designed the study, wrote the first draft of the manuscript. 'author CK, GK' and 'author AGS' managed the literature searches. Author OS was proofreading . All authors read and approved the final manuscript



163 Figure-1. *Datura stramonium*

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