

Hallucinations and toxicologic findings after ingestion of an infusion made from an anticholinergic plant

Alucinaciones tras ingerir una infusión de una planta anticolinérgica con confirmación toxicológica

To the editor:

The diagnosis of poisoning by plants containing anticholinergic alkaloids is usually determined in the emergency department (ED) by clinical and anamnestic examination of the patient. Botanical identification or toxicological identification in biological samples of these alkaloids (atropine, scopolamine or hyoscyamine)¹ is very rarely possible. Patients themselves report what they believe they have consumed. The genera *Atropa* (belladonna), *Hyoscyamus* (henbane), *Brugmansia* (angel's trumpet) and *Datura* (stramonium) are of toxicological importance^{2,3}. In addition, a differential diagnosis should be made with other intoxications (drugs, drugs of abuse, mushrooms) and other diseases⁴. In Spain, accidental acute intoxications have also been described in pediatric patients, adolescents and young adults associated with recreational use⁴⁻⁶. These

plants can be consumed as an infusion, ingested or smoked and are sometimes combined with alcohol or cannabis to enhance their hallucinogenic effects⁷. We present the case of an adolescent who reported consuming an infusion of floripondium flowers.

A 17-year-old male brought from home to the ED by EMS for visual hallucinations, disorientation, nervousness and vomiting. The mother found him at home with a friend. On examination he had a blood pressure of 117/71 mmHg, heart rate of 66 bpm, respiratory rate of 14 brpm, temperature of 36.5°C and oxygen saturation of 98%. He was in good general condition, uncooperative and disoriented in time. Pulmonary auscultation, cardiocirculatory examination and electrocardiogram were normal. On neurological examination he presented a normal level of consciousness (Glasgow 15), with reactive mydriatic pupils. During the observation period, he claimed to have smoked cannabis the previous day and drank an infusion of a plant he called "floripondio", which was responsible for the hallucinations. In addition, he acknowledged daily consumption of cannabis and occasional use of other intoxicants. Four hours after admission, his speech was already coherent, although mydriasis and blurred vision persisted. He continued under observation for symptomatic control, with abundant hydration. In the psychiatric evaluation, he reiterated consumption, shared with a friend, of an infusion with 6 floripondio flowers and then began to see non-existent objects that he was trying to reach. After 10 hours in the ED, he was discharged and referred to the psychiatry department. The hemogram and blood biochemistry showed no alterations. Urine toxicology analysis was positive for cannabis (DRI immunoassay, Diagnostic Reagents Inc.). Expanded urine toxicology screening by gas chromatography-mass spectrometry detected scopolamine (2,407 ng/ml; 3,327 ng/mg creatinine), THCCOOH (tetrahydrocannabinol, 307 ng/ml; 424 ng/mg creatinine) and cotinine. Serum ethanol was undetectable.

El diagnóstico del cuadro clínico de The diagnosis of the clinical picture of this patient was clinical and toxicological. However, botanical identification of the flowers was not possible, although the patient reported that they were floripond flowers (*Brugmansia sp.*).

Different plant species containing anticholinergic alkaloids have varying concentrations of these substances, which vary between different parts of the plant and even between plants of the same species^{2,7}.

However, the clinical manifestations are generally similar. Symptom onset occurs within 5-10 minutes as a result of blockade of peripheral muscarinic receptors in the heart, salivary and sweat glands, gastrointestinal and genitourinary tract leading to tachycardia, hyperthermia, dry mucous membranes and skin, mydriasis, decreased bowel sounds and urinary retention. The blockade of central nervous system receptors justifies hallucinations, psychosis, convulsions and coma, which generally occur later in life⁷. Fatal cases have been described, in which the identification of the toxicants has allowed the establishment of the cause of death⁸.

Our patient was attended more than 12 hours after ingestion. This fact may explain why he did not present tachycardia. After 5 hours after ingestion of hallucinogenic plants, only 31% of patients present tachycardia². The management of intoxicated patients consists of supportive treatment, gastrointestinal decontamination with activated charcoal and physostigmine in severe cases (convulsions or delirium with agitation)^{2,4}.

The estimated lethal doses of atropine and scopolamine in adults are greater than or equal to 10 mg and 24 mg, respectively⁴. In the case of floripond flowers, they are estimated to contain ~ 0.65 mg of scopolamine and 0.3 mg of atropine⁷. The availability of detection methods for scopolamine and other alkaloids in biological fluids is scarce in hospitals. In addition, their detection is complicated by the short window of detection of scopolamine, 45 hours in blood and about 12 hours in urine⁹. Scopolamine is also included in chemical submission protocols¹⁰. Considering the easy availability of plants containing anticholinergic alkaloids, this case highlights the importance of a good anamnesis and clinical history for early recognition of hallucinogenic plant intoxication. Analytical confirmation allows diagnostic confirmation without the need for botanical identification.

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References

- Marc B, Martis A, Moreau C, Arlie G, Kintz P, Leclerc J. Acute Datura stramonium poisoning in an emergency department. *Presse Med.* 2007;36:1399-403.
- Isbister GK, Oakley P, Dawson AH, Whyte IM. Presumed Angel's trumpet (*Brugmansia*) poisoning: clinical effects and epidemiology. *Emerg Med (Fremantle).* 2003;15:376-82.
- Doan UV, Wu ML, Phua DH, Mendez Rojas B, Yang CC. Datura and Brugmansia plants related antimuscarinic toxicity: an analysis of poisoning cases reported to the Taiwan poison control center. *Clin Toxicol (Phila).* 2019;57:246-53.
- Reyes Balaguer J, Almero Ves R. Intoxicación por *Datura stramonium*. *Emergencias.* 2006;18:382-9.
- Castañón López L, Martínez Badás JP, Lapeña López De Armentia S, Gómez Mora J, García Arias ML. Intoxicación por *Datura stramonium*. *An Esp Pediatr.* 2000;53:53-5.
- Gri E, Beltrán B, Durán Y, Riera A. Midriasis unilateral después de contacto ocular accidental directo con semillas de *Datura stramonium*. *Emergencias.* 2001;13:145-50.
- Greene GS, Patterson SG, Warner E. Ingestion of angel's trumpet: an increasingly common source of toxicity. *South Med J.* 1996;89:365-9.
- Urich RW, Bowerman DL, Levisky JA, Pflug JL. *Datura stramonium*: a fatal poisoning. *J Forensic Sci.* 1982;27:948-54.
- Renner UD, Oertel R, Kirch W. Pharmacokinetics and pharmacodynamics in clinical use of scopolamine. *Ther Drug Monit.* 2005;27:655-65.
- Gomila Muñoz I, Puiguirguer Ferrando J, Quesada Redondo L. Primera confirmación en España del uso de la burundanga en una sumisión química atendida en urgencias. *Med Clin (Barc).* 2016;147:421.