

Million dollar ride

Crime committed during involuntary scopolamine intoxication

Sonja Reichert MD MSc CCFP Cassandra Lin MD CCFP William Ong Claudia Chon Him MD Saadia Hameed MD MCISc CCFP

Scopolamine, also known as *burundanga*, is a tropical alkaloid produced by species of plants such as *Hyoscyamus albus* and *Datura stramonium*.¹ Uses of these

plants around the world range from food to ornaments to medicinal preparations that take advantage of their strong anticholinergic, antiemetic, and hallucinogenic properties.²⁻⁴ Criminal administration of extracts of *Datura* has been reported in South America since the 1950s.² The most intriguing phenomenon seen in burundanga intoxication is not the anticholinergic side effects (ie, mydriasis, confusion, and palpitations), but the submissive and obedient behaviour of the victim.² This phenomenon is caused by a reduction in declarative memory.⁵ Criminals typically use burundanga to take their victims on the “million dollar ride,” during which victims submissively withdraw money from a bank machine. The drug is commonly blown in the faces of the victims or placed in their beverages. Victims often surrender their valuables to the criminals without resistance. Neither the victim nor the surrounding people are aware that a crime is being committed and, as a result, there are usually no witnesses. Although it is well known in South America, criminal use of scopolamine has rarely been described in the Canadian primary care literature. This report serves to educate FPs regarding the importance of considering scopolamine intoxication in the setting of amnesia and anticholinergic toxidrome.

EDITOR'S KEY POINTS

- Scopolamine intoxication should be considered as part of the differential diagnosis for patients who present with anticholinergic toxidrome and who have recently traveled to South America. The 2 most notorious clinical signs of scopolamine intoxication are severe anterograde amnesia and submissiveness.
- Scopolamine does not have a very long half-life; even high doses leave the body in 3 to 4 days. Scopolamine is excreted unchanged in the urine within the first 12 hours after oral ingestion, which makes obtaining a positive urine toxicologic test result challenging.
- Patients should be educated on safety precautions when traveling to countries that commonly use scopolamine as a predatory drug. Patients taking commercial preparations of scopolamine should be warned of the possibility of accidental intoxication.

POINTS DE REPÈRE DU RÉDACTEUR

- On devrait envisager une intoxication à la scopolamine parmi les diagnostics différentiels chez les patients qui présentent un toxidrome anticholinergique et qui ont récemment voyagé en Amérique du Sud. Les 2 signes cliniques les plus remarquables d'une intoxication à la scopolamine sont une amnésie antérograde sévère et la docilité.
- La scopolamine n'a pas une très longue demi-vie; même à fortes doses, elle disparaît du corps en 3 ou 4 jours. La scopolamine est excrétée sans changement dans l'urine durant les 12 premières heures après une ingestion par la bouche, ce qui complique l'obtention de résultats de tests toxicologiques positifs dans l'urine.
- Il faudrait informer les patients des précautions à prendre pour leur sécurité lorsqu'ils voyagent dans des pays où la scopolamine est couramment utilisée comme drogue par des escrocs. Il faut avertir les patients qui prennent des préparations commerciales de scopolamine de la possibilité d'une intoxication accidentelle.

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Case

A healthy 47-year-old man presented to his Canadian FP worried that he had been robbed at a bus terminal after vacationing in Bogotá, Colombia, 6 days previously. The patient was amnesic for approximately 12 hours during and after the event. He was able to successfully board a bus despite his state and after returning home and becoming aware of his surroundings, he noted he was missing an estimated \$250 in cash and his cell phone. He had no signs of physical or sexual assault; however, he felt disoriented and confused, was unable to concentrate, and suffered from marked xerostomia.

Upon his return to Canada he discussed the event with his family, who believed he might have been exposed to burundanga (scopolamine). As he still felt unwell he presented to his physician with questions about scopolamine toxicity and long-term effects. Urine toxicology screening and drug screening for scopolamine and flunitrazepam were performed. Test results were negative, and the patient returned for follow-up 2 days later to monitor his symptoms, according to advice from poison control. Poison control indicated that there would be no benefit from dialysis but that there might be a role for activated charcoal and lavage within hours

of scopolamine ingestion.⁶ Given that he presented days after exposure, no additional intervention was offered.

At follow-up, the patient's neurologic examination findings were normal. He was alert and oriented, with a blood pressure of 110/68 mm Hg. He experienced palpitations and lethargy for 3 days and shakiness that lasted for a week after exposure, and he continued to have permanent anterograde amnesia for the 12-hour period around the exposure, but fully recovered to his previous level of functioning.

Discussion

Scopolamine and other plant derivatives are potential drugs of abuse for both recreational and criminal purposes. In our case, the patient suspected scopolamine was the causative agent, as it is commonly used in Colombia and his symptoms matched what would be expected from such intoxication. We cannot discern whether he was given a mixture of psychoactive drugs and their specific doses; however, his symptoms were mostly anticholinergic and were not severe enough to require intervention.

Extensive review of the MEDLINE and EMBASE databases, with search terms *criminal*, *poisoning*, *intoxication*, and *scopolamine*, revealed 40 documented cases of intentional and unintentional poisoning with scopolamine, although accurate information on this intoxication is difficult to ascertain.² In one case, a 28-year-old woman was poisoned by an elegantly dressed man. She subsequently cashed her pay cheque and gave the money to him.² In a meditation session, 30 people were intentionally poisoned and many required supportive therapy.⁷ In another case, a 19-year-old man intentionally ingested an unknown quantity of *D stramonium* seeds to experience their hallucinogenic effects and was found dead.⁸ Increasing misuse has led to prohibition by law in certain regions of planting certain species of plants that produce potentially lethal toxins.⁹

Scopolamine is tasteless and odourless and can be administered through oral, dermal, intravenous, or inhalation routes.¹⁰ Intoxication presents clinically as tachycardia, palpitations, dry mouth, flushed skin, blurred vision, urinary retention, disorientation, confusion, insomnia, and severe anterograde amnesia.^{2,11,12} After scopolamine is orally ingested, most of it is excreted unchanged in the urine within 12 hours, which explains the challenge in obtaining a positive urine toxicologic result, as laboratory tests are usually done more than 12 hours after ingestion.² Toxic doses vary greatly among individuals and children are very susceptible, with less than 10 mg leading to death.⁷ In addition, a combination of tropane alkaloids can have a synergistic action and might lead to death.

In Canada, scopolamine can be purchased without a prescription and comes in 2 commercial preparations: the Transderm-V patch and Buscopan. One case report revealed a substitution error by a pharmacist that led to hyoscine hydrobromide overdose. The patient involved

experienced long-lasting effects including decreased ability to concentrate and memory disturbances.¹³ Further, there has been an increase in poisoning caused by scopolamine disguised and sold as flunitrazepam tablets.¹⁴ This increase has been explained by the lower availability and higher production costs of flunitrazepam.¹⁴

We recognized that our patient described the anticholinergic toxidrome expected in scopolamine intoxication; he was reassured that scopolamine does not have a long half-life and that even high doses leave the body in 3 to 4 days. This patient fully recovered from his symptoms and was educated on safety precautions when traveling to countries that commonly use scopolamine as a predatory drug.

Conclusion

As clinicians, we encourage that when patients present to their FPs with unknown drug intoxication, the common standard of care be applied. However, if screening results are negative and there is no identifiable cause of the symptoms, the patient should be educated on possible scopolamine intoxication, particularly if that patient presents with an anticholinergic toxidrome and traveled to a country that uses scopolamine for recreational and predatory purposes. This case describes suspected toxic alkaloid poisoning managed in primary care. It is important to become educated about the toxicities and potential risks associated with criminal and recreational use of scopolamine. 🌿

Dr Reichert is Assistant Professor in the Department of Family Medicine at Western University in London, Ont. **Dr Lin** is a third-year enhanced skills resident in academic family medicine in the Department of Family Medicine at Western University. **Mr Ong** is a clinical pharmacist at the St Joseph's Family Medical and Dental Centre in London. **Dr Chon Him** is an internationally trained physician with a special interest in internal medicine. **Dr Hameed** is Assistant Professor in the Department of Family Medicine at Western University.

Competing interests

None declared

Correspondence

Dr Cassandra Lin, e-mail clin55@uwo.ca

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