'Devil's Breath' Intoxication Presenting with Acute-Onset Psychosis and Self-Injurious Behavior: A Case Report and Review of Literature

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BACKGROUND

Non-pharmaceutical Scopolamine, widely known outside the scientific community as ***'Devil's Breath'*** or ***'Burundanga'*** is a tropane alkaloid and muscarinic antagonist that is among the metabolites of plants from the ***Solanaceae*** family, which grow freely throughout much of South America (2). These plants historically have been used as psychoactive drugs due to their Antimuscarinic-induced hallucinogenic effects.

The anticholinergic intoxication that results is built on a synergistic but even more toxic mixture of the additional alkaloids in the plants, which include atropine and Hyoscyamine (1).

Devil's Breath is gaining a reputation in the media as the **"world's most dangerous drug."** Recently, its use has become a well-known practice across Latin American countries to incapacitate people for criminal gain due to its cognitive inhibition properties (3).

The Cocktail: 'Devil's Breath'

Peripheral inhibition: tachycardia, hypertension, flushing, dry skin and mucous membranes, intense thirst, mydriasis, decreased bowel sounds and urinary retention

Central inhibition: confusion, disorientation, restlessness, amnesia, cognitive inhibition, frightening hallucinations, paranoia

CASE

Identifying Information: A 52 year-old Spanish-Speaking male from the Dominican Republic with **no known past psychiatric or substance use history** and unremarkable past medical history, presented as a category 2 trauma due to self-inflicted lacerations to the left forearm and neck and altered mental status.

Reason for CL Psychiatry Consultation: **Suicide Attempt**

Initial Presentation: On admission to the hospital 4 days after arriving home from a trip to the Dominican Republic, the patient was exhibiting amnesia to recent events, confusion, disorientation, restlessness, paranoid delusions, as well as visual, auditory, and tactile hallucinations. Physical exam was notable for dry skin and mucous membranes and mild tachycardia. He complained of dry mouth and dizziness. initial workup, including CT brain, labwork, and toxicology screen was unremarkable.

Background/Collateral: Patient was described as a loving and kind husband and father of three and business owner, with no history of psychiatric symptoms, self-injurious behaviors, or substance use. There was no known family history of psychiatric illness or substance use disorders. The patient appeared to be suffering from a psychotic episode of acute onset that started the morning after visiting a nightclub during a trip to the Dominican Republic. Both patient and his family were insistent that he unknowingly ingested some atypical substance of abuse while at the nightclub on the night before his trip home.

Intervention: The patient was initiated on Risperidone 0.5 mg BID for presumed psychosis without substantial improvement in psychotic symptoms. Given the high clinical suspicion for scopolamine intoxication, and in consultation with regional poison control, risperidone was discontinued and the patient was administered Rivastigmine 4.6mg patch with successful resolution of psychosis.

CONCLUSIONS

While voluntary or involuntary intoxication with 'Devil's Breath' is becoming a relatively frequent situation that is no longer confined to South America, little is known about the course of symptom development, identification, or treatment of this often medically unrecognized intoxication that presents with severe psychiatric symptoms.

Additionally, research has shown that the psychotic symptoms that occur with scopolamine intoxication are due to scopolamine's anti-muscarinic effects. Therefore, treatment with antipsychotics alone will not produce the expected effect unless a cholinesterase inhibitor is added (10). Furthermore, the muscarinic antagonistic properties of the antipsychotic have the potential to accentuate the anti-cholinergic symptoms produced by scopolamine intoxication.

The presented case supports the findings of Sandia et al.'s 2018 case series, which was the first to suggest that the use of Rivastigmine alone could be effective in treating the psychiatric symptoms of non-pharmacological scopolamine intoxication.

Consultation-liaison Psychiatrists are well poised to identify and treat this medically unrecognized intoxication that presents with psychiatric symptoms.

DISCUSSION and REVIEW OF LITERATURE

Devil's Breath intoxication is difficult to prove scientifically, as there is minimal data on methods of toxicological analysis, and therefore diagnosis relies heavily on the patients' stories to reach any conclusion. Furthermore, there is limited literature available on the clinical effectiveness of possible cholinesterase inhibitors as antidotes.

Clinical Manifestations of the Central Anticholinergic Syndrome

- The central anticholinergic syndrome is dose-dependent and the range of toxicity for scopolamine is variable and unpredictable (6). Scopolamine administered in pharmacologically effective doses produces CNS depressive effects (i.e., drowsiness, amnesia). High doses can lead to CNS stimulation (i.e., restlessness, hallucinations, delirium) (5). Scopolamine-induced cholinergic hypofunction causes a loss of the augmenting effect of emotional excitation on memory (4).
- Idiosyncratic reactions have been documented with even therapeutic doses of pharmaceutical scopolamine, including acute psychosis described as confusion, agitation, rambling speech, hallucinations, erratic behavior, and delusions (6). There is typically amnesia from the appearance of the hallucinations until return of normal consciousness (8).
- Van Sassenbrocck and colleagues describe three patients who received 10 mg of scopolamine hydrobromide as an accidental overdose and in some cases, symptoms persisted for months (7).

Detection

- Scopolamine has a short plasma half-life, between 2 – 4 hours after oral administration. Therefore, blood concentrations of scopolamine when used as an incapacitating drug are largely unknown (9).
- However, urine concentrations of scopolamine collected within 24 h may range from 32.4 to 186.4 ng/mL in cases of intoxication due to the ingestion of plants from the *Solanaceae* family (1).

Potential Treatment

One 2018 case series described successful use of transdermal patches of Rivastigmine in the treatment of 'Devil's Breath' intoxication (2).
In all six patients, psychotic symptoms were the main concern at presentation and laboratory values of the substance were not determined. Four of the patients received treatment with atypical antipsychotics for at least four days, without any improvement in psychotic symptoms. The antipsychotic was then suspended and all six subjects received a transdermal patch of Rivastigmine (equivalent to 9.5 mg) with a significant decrease in psychotic symptoms within 3 – 5 days.

REFERENCES

1. Papoutis et al. Mass intoxication with Datura innoxia—case series and confirmation by analytical toxicology. ClinToxicol. 2010; 48: 143-145.
2. Sandia et al. Treating 'Devil's Breath' intoxication: use of Rivastigmine in six patients with toxic psychoses due to non-pharmaceutical scopolamine. J. Toxicol. Clin. Toxicol., 2018; 6:4-7.
3. Stebner B. The most dangerous drug in the world: 'Devil's Breath' chemical from Columbia can block free will, wipe memory and even kill. The Daily Mail. 2012.
4. Kamboj SK, Curran HV. Neutral and emotional episodic memory: global impairment after lorazepam or scopolamine. Psychopharmacol (Berl). 2006; 188: 482-488.
5. Apfel C, Zhang K, George E, Shi S, Jalota L, Hornuss C, et al. Transdermal scopolamine for the prevention of postoperative nausea and vomiting: a systematic review and meta-analysis. ClinTher. 2010; 32: 2502.
6. Corallo CE, Whitfield A, Wu A. Anticholinergic syndrome following an unintentional overdose of scopolamine.Ther Clin Risk Manag. 2009; 5: 719-723.
7. Van Sassenbrocck D, Hemelsoet D, Vanwalleghem P, et al. Three cases of substitution errors leading to hyoscine hydrobromide overdose. ClinToxicol (Phila). 2005;43:861–865.
8. Lauwers LF, Daelemans R, Baute L, Verbraeken H. Scopolamine intoxications. Intens Care Med. 1983;9:283–285.
9. Lusthof K, Bosman I, Kubat B, Vincenten-van Maanen M. Toxicological results in a fatal and two non-fatal cases of scopolamine-facilitated robberies. Forensic Sci Int. 2017; 274: 79-82.
10. Barak S, Weiner I. Scopolamine Induces Disruption of Latent Inhibition which is prevented by Antipsychotic Drugs and an Acetylcholinesterase Inhibitor. Neuropsychopharmacology. 2007; 32: 989-999.