



Isopropyl alcohol poisoning

● Quick action puts a patient on the path to recovery.

By Jennifer Schieferle Uhlenbrock, DNP, MBA, RN, TCRN

MICHAEL JANSEN*, age 20, arrives in the emergency department and says he's been drinking hand sanitizer. He's mildly intoxicated, with a slight hand tremor. Michael has a history of polysubstance abuse (alcohol and cocaine). His vital signs are heart rate (HR) 124 beats per minute (bpm), blood pressure (BP) 123/74 mmHg, respiratory rate (RR) 14 breaths/minute, and temperature 97.9°F (36.6°C).

Initial laboratory results reveal elevated ethanol 300 mg/dL (normal < 5) and anion gap 20 mmol/L (normal 3-12), and low potassium 3.0 mmol/L (normal 3.5-5.0). Michael's provider suspects toxic ingestion. She orders a bolus of normal saline to help clear the toxins through the kidneys, oral potassium replacement to restore Michael's electrolyte balance, and supportive care, including lorazepam as needed to minimize alcohol withdrawal symptoms and thiamine to prevent Wernicke's encephalopathy. Differential diagnosis includes ethanol, ethylene glycol, and methanol toxicity, as well as alcoholic ketoacidosis.

Michael is transferred to an in-hospital unit.

On the scene

Kim, Michael's nurse, assesses his neurologic status and monitors his vital signs. Four hours after admission, his neurologic status precipitously deteriorates; he's drowsy and hypoxic, and his vital signs are HR 65 bpm, BP 94/59 mmHg, and RR 7 breaths/min. Kim puts Michael in high Fowler's position to facilitate chest expansion, places a 100% oxygen nonrebreather mask, and calls for the rapid response team. The team brings a crash cart, has suction ready, prepares medication for rapid sequence intubation, and sets up end-tidal capnography. Michael requires intubation to maintain his airway and is admitted to the intensive care unit (ICU).

In the ICU

As ordered by the provider, the ICU nurse administers a loading dose of I.V. fomepizole 15 mg/kg to treat possible methanol and ethylene glycol poisoning. Although the results of the volatiles panel blood test won't be available for 24 hours, the provider feels that the benefit of fomepizole outweighs the risk of delaying treatment; its administration is straightforward and adverse effects are rare.

The next day, the volatiles panel comes back positive for isopropyl alcohol poisoning; no additional treatment is required. After 3 days in the ICU, Michael is extubated and transferred to a stepdown unit for 5 days, after which he's discharged.

Education and follow-up

Isopropyl alcohol poisoning is uncommon and resembles ethanol intoxication because both toxins affect the central nervous system. People ingest isopropyl alcohol to become intoxicated (when traditional alcohols aren't available) or to harm themselves. When ingested, isopropyl alcohol is quickly absorbed with peak concentration a couple of hours after ingestion. Use the acronym MUDPILES—methanol, uremia, diabetic ketoacidosis, paraldehyde, iron, lactic acid, ethylene glycol, and salicylate—to rule out other causes of toxicity.

The presence of an anion gap metabolic acidosis is used to differentiate etiology, assess severity, and determine treatment, but it's not a definitive diagnosis. For that reason, additional testing, such as the volatiles panel, is needed. Typically, isopropyl alcohol doesn't cause elevated anion gap acidosis.

Isopropyl poisoning can cause altered mental status, intoxication, nausea, vomiting, abdominal pain, acid-base imbalance, hematemesis, pulmonary edema, shock, and death. Your nursing assessment should focus on close monitoring of vital signs and neurologic and pulmonary status.

Anticipate intubation to protect the patient's airway. Treatment includes I.V. access for medication administration and infusions; I.V. crystalloids to correct dehydration, hyperglycemia, and hypotension; and vasopressors for hypotension. With treatment, most patients will recover within several hours.

The nurse in the stepdown unit discusses the dangers of isopropyl alcohol with Michael and connects him with a treatment center in the community. ★

*Names are fictitious.

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