

INTOXICATION BY HAND SANITIZER



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CE Earn Up to 8.0 Hours. See page 225.

A 28-year-old man, a well-known ED recidivist, was found in the ED waiting room bathroom, consuming hand sanitizer from a 500-mL bottle that appeared to have been taken from the department. He had been discharged earlier that morning, and when confronted by staff in the restroom, he refused additional treatment and chose to leave.

The patient was a chronic alcoholic and had been admitted on psychiatric holds and voluntarily numerous times, sometimes twice in one day over the course of a summer, and always with an elevated blood alcohol level. At the time, EMS personnel reported that the patient was known to take hand sanitizer from other area emergency departments. The patient died several months after the incident due to complications of alcoholism.

Pharmacology

The hand sanitizer consumed by our patient was Advanced Gel Hand Sanitizer (Ecolab, Saint Paul, MN), which is 62% ethyl alcohol. Also known as ethanol or grain alcohol, this is the same intoxicating form of alcohol found in distilled spirits, beer, and wine. By comparison, vodka is usually about 40% ethanol, or 80 proof. Other hand sanitizer products, including those by Avagard (3M, Maplewood, MN), Aterra (B4 Brands, Lisbon, IA), Steris (Steris, Mentor, OH), and others, all have high ethanol content.

Some brands of hand sanitizer, including Purell (GOJO Industries, Akron, OH), are predominantly isopropyl alcohol (isopropanol). Like ethyl alcohol, isopropyl alcohol is intoxicating but is oxidized in the liver to form acetone and causes greater central nervous system depression than does ethanol.¹

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Pharmacokinetics and Usual Treatment

Peak serum levels of ethanol are typically reached within 1 hour, although a full stomach can slow absorption of alcohol. In persons tolerant to alcohol, such as the chronic drinker in our case study, ethanol can be eliminated from the body at a rate as fast as 30 mg/dL/h.^{2,3} Ethanol is a central nervous system depressant and is dose-dependent (the larger the dose, the greater the effect). In pediatric patients or very malnourished adults, ethanol can cause severe hypoglycemia.⁴

For the inebriated patient, ED treatment typically involves supportive care, including fluid hydration, either orally or intravenously. The “banana bag,” composed of 100 mg thiamine, 1 mg folic acid, one ampule of multivitamin for infusion, and 3 g of magnesium sulfate, is often ordered but not required.⁵ At a minimum, a fingerstick glucose level may be checked, as well as a blood alcohol level, although the latter correlates poorly with the patient’s level of intoxication, especially in persons with chronic alcoholism.⁶ Typically, intoxicated ED patients are allowed to “metabolize to freedom,” when they are deemed safe to be discharged and walk out on their own or be driven home.

Discussion and Epidemiology

A review of Google Scholar and PubMed reveals 5 cases of adult alcohol intoxication from hand sanitizer in care settings since 2013. Most of these cases describe men who were profoundly alcoholic and were being treated via inpatient treatment or in emergency settings where hand sanitizer was the only available alcohol source. In a case similar to our own, but with a more immediately catastrophic outcome, a 36-year-old man was treated in the emergency department for alcohol intoxication, released, and then found in an ED waiting room bathroom apneic and pulseless, having drunk ethanol-based hand sanitizer.⁷

In another case report, a 25-year-old veteran with a history of depression was found to be drinking hand sanitizer while admitted to an inpatient substance abuse treatment program. Not only did he have access to hand sanitizer provided by the treatment program, but family members were bringing it to him.⁸ A similar case was reported of a 38-year-old man admitted to a secured psychiatric facility for

medically managed alcohol withdrawal who ingested hand sanitizer that he obtained from a housekeeper's closet.⁹ A homeless client was able to steal more than a gallon of hand sanitizer a week from a homeless shelter and preferred to drink hand sanitizer with cola and ice.¹⁰

A 40-year-old psychiatric patient was reported to have used a crude extraction method of mixing table salt with hand sanitizer and then straining it through a sock. She was found nonresponsive with a blood alcohol level of 382 mg/dL.¹¹ This method of distillation of ethanol from hand sanitizer is well described in several YouTube videos, both for the purposes of use as camp stove fuel and as the source of an inexpensive high.

Epidemiology

Current data on adults intentionally ingesting hand sanitizer are sparse. Gormley et al¹² found 14 detailed case reports of intentional alcohol-based hand sanitizer ingestion from 2005 to 2009, with one case resulting in death. The National Poison Data System received reports of 68,712 exposures to ethanol hand sanitizer from 2005 to 2009. Of these, 288 cases were classified as moderate, with treatment required, and 12 patients had major medical complications.

Data on adolescent ingestion of hand sanitizer indicate that some teens drink hand sanitizer, usually experimentally at school or at home. A review of 385 cases of hand sanitizer alcohol abuse by 13- to 19-year-olds treated in Texas emergency departments¹³ revealed that only 18% of these cases were intentional ingestions. From 2011 to 2014, 65,293 cases of exposure to hand sanitizer that contained alcohol were reported to the National Poison Data System for children 12 years and younger (about 95% of these cases were ingestions). A report from the Centers for Disease Control and Prevention⁷ stated that older children who ingest hand sanitizer are more likely to do so intentionally and have worse outcomes than do younger children, suggesting deliberate abuse of hand sanitizer by the older children. Only 158 of these cases required treatment, and 5 cases were life threatening.

Conclusion

Hand sanitizers have become ubiquitous in emergency departments and in other patient care settings frequented by high-risk patients. This case illustrates the potential for significant alcohol intoxication toxicity from this common product. It appears that young men are more likely to ingest hand sanitizer and that hand sanitizer ingestion among older children and teens is a real concern and consideration.

In emergency departments and other settings where care is provided for a high-risk population, hand sanitizer is a necessity to reduce disease transmission; however, its potential for abuse raises concern and a need for staff vigilance. Mounting hand sanitizer on walls may deter some patients, although these units can be dismantled easily. Bottles of hand sanitizer should not be left on countertops or in other areas that are within easy reach of patients and visitors, and extra care must be taken when known high-risk patients are present.

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