Acute ethanol poisoning in a 6-year-old girl following ingestion of alcohol-based hand sanitizer at school

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INTRODUCTION

ABHSs have been widely used in recent years in hospitals, households and schools for its ability to reduce transmission of gastrointestinal and respiratory illnesses, making it an essential part of the infection control programs at schools.\(^1\,^2\) Common ABHSs use ethyl alcohol and/or isopropanol with their concentrations ranging from 60% to 65%. Intentional ingestion of hand sanitizers for its alcohol content leading to intoxication in adults has been reported.\(^3\,^4\) Most recently, an unintentional ingestion of ABHSs in a 4-year-old child at home leading to significant intoxication has also been reported.\(^5\) We present another case of unintentional ingestion of ABHSs in a 6-year-old girl.

Case report

An unresponsive 6-year-old girl was brought to the pediatric ED via emergency medical services (EMS). Her father picked up the girl from school who appeared drowsy for a "long day at school". By the time they arrived at home, the girl deteriorated rapidly from being lethargic with slurred speech to becoming unresponsive to any stimuli. Her medical history was unremarkable. In the ED, her vital signs were as follows: blood pressure.
children to ingest enough of them to cause significant intoxication. Our case suggests that young children at school may be at risk for significant intoxication from lime verbena, and others that come in very attractive interest, there are increasingly ABHSs with such flavors of the hand sanitizer, which causes no intoxication. Of due primarily to ingestion of a less significant amount spinal trauma at school. Laboratory values included and cervical spine computerized tomography (CT) were revealed no acute cardiopulmonary abnormalities. Head and cervical spine computerized tomography (CT) were performed to exclude the possibility of any head and spinal trauma at school. Laboratory values included potassium 2.8 mEq/L, bicarbonate 20 mEq/L, anion gap 16 mmol/L, and glucose 126 mg/dL. Serum acetone was within normal limits. Calculated osmolality was 281 mOsm/kg, whereas actual osmolality was 340 mOsm/kg. The results of toxicological studies were negative for salicylates and acetaminophen, and urine screening was normal. However, her serum alcohol level was 205 mg/dL on admission. An investigation found that the teacher of the girl had noticed that she had gone frequently to the restroom by another student. The girl was admitted to the restroom during the school day, where there was an ABHS pump removed from the classroom to the restroom by another student. The girl was admitted to the hospital for intravenous fluid hydration, re-warming and close observation of her altered mental status. Later on, she ingested a small amount of hand sanitizer in the restroom that day because she "liked the taste". The girl was discharged from the hospital the next day without any complications.

DISCUSSION

The wide use of ABHSs for hand hygiene in schools, hospitals, offices, and public buildings leads to an increase in the pediatric exposure of such products, but there are no complications in most cases.[6,7] This is due primarily to ingestion of a less significant amount of the hand sanitizer, which causes no intoxication. Of interest, there are increasingly ABHSs with such flavors as warm vanilla sugar, Japanese cherry blossom, coconut lime verbena, and others that come in very attractive bottles. These products could be enticing to young children to ingest enough of them to cause significant intoxication. Our case suggests that young children at school may be at risk for significant intoxication from these products. The patient, weighing 24 kg, would have to ingest 55 mL of a 60% ethanol product to demonstrate a blood ethanol of 205 mg/dL. This is calculated by the Estimated Blood Level Calculator in Micromedex for ethanol (amount ingested X% alcohol ingested X specific gravity)/ Volume distribution X weight kg = 55 mL × 60% × 0.79 g/mL / 0.53 L/kg × 24 kg = Potential blood level of 205 mg/dL (44.5 mmol/L).[8] Measures taken to decrease potential toxicity of ABHSs in children include installation of hand sanitizer stations in schools, which can be appropriately supervised by the teachers and avoidance of food like labeling of hand sanitizers enticing young children to ingest these products.

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