H106 Hand Sanitizer Ingestion Leads to Lethal Methanol Toxicity

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Learning Overview: The goal of this presentation is to present a case study regarding an individual who died of unintentional methanol toxicity due to hand sanitizer ingestion and to make the forensic community aware of the possibility of methanol as an unlisted ingredient in hand sanitizers.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by presenting a case of a chronic alcoholic known to consume alcohol-based hand sanitizer who died of unintentional methanol toxicity.

Alcohol-based hand sanitizers are commonly used as a quick alternative to hand washing for the purpose of hand sanitation. According to the United States Food and Drug Administration (FDA), 97% of hand sanitizers contain one of three active ingredients: ethanol, isopropyl alcohol, and benzalkonium chloride. The Centers for Disease Control and Prevention (CDC) recommend using alcohol-based hand sanitizers containing greater than 60% ethanol and 70% isopropanol as active ingredients.

Recently, multiple brands of alcohol-based hand sanitizer have been found to contain methanol as an unlisted ingredient. Methanol, also known as wood alcohol, is a toxic alcohol that is widely used as a solvent. Methanol is typically found in industrial products, antifreeze, de-icing solutions, windshield wiper fluid, cleaners, and fuels. Methanol can appear in hand sanitizer as an unlisted ingredient due to contamination or manufacturing. Methanol is an unacceptable ingredient in hand sanitizers as it can be absorbed through the skin and lungs, or potentially ingested, causing methanol toxicity.

Methanol toxicity can lead to a decreased level of consciousness in a manner similar to ethanol (alcohol). In addition, if treatment is not sought early in the course of toxicity, the liver will convert methanol into formic acid. Formic acid accumulation can lead to metabolic acidosis, vision disturbances, seizures, end-organ toxicity, coma, and death. Treatment options for methanol toxicity include supportive care, fomepizole, dialysis, and folate.

This case report describes the death of a 34-year-old man with a history of heavy alcohol use. Due to an inability to obtain alcohol, he began consuming hand sanitizer with an active ingredient of ethyl alcohol (70%) for an unknown period of time. The night prior to his death, he complained of visual difficulties and was found unresponsive several hours later. Following his death, his spouse found numerous empty containers of the same brand of hand sanitizer hidden around the house. There were no other sources of methanol within the residence.

Postmortem examination revealed a well-developed man with a bicuspid aortic valve and nephrolithiasis. There were no other significant gross or microscopic abnormalities. Toxicology analysis of postmortem femoral blood detected only a significantly elevated level of methanol (370mg/dL). No other substances were present on postmortem toxicology analysis, including a screen for ethylene glycol.

The cause of death in this case was attributed to the toxic effects of methanol and the manner of death was accidental. Because the decedent was known to consume alcohol-based hand sanitizer and numerous empty bottles of the same hand sanitizer were found hidden in his house following his death, the source of the methanol was believed to be hand sanitizer. The purpose of this case report is to make the forensic community aware of the possibility of methanol as an unlisted ingredient in hand sanitizers, leading to lethal, unintentional methanol toxicity.

Methanol, Hand Sanitizer, Chronic Alcohol Abuse

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