An Unusual Case of Misrepresented Cocaine Powder that Resulted in Fatal and Non-Fatal Intoxications Involving the Novel Synthetic Opioid Etodesnitazene

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Learning Overview: After attending this presentation, attendees will be able to assess the negative impacts of novel synthetic opioids (e.g., nitazene analogues) in toxicology samples after people consume recreational drugs.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by expanding knowledge of novel synthetic opioids and cases of misrepresented drug materials.

Keywords: Cocaine, Etodesnitazene, Toxicology

Abstract:

The recreational drug supply in the United States (U.S.) remains volatile and increasingly toxic. The twenty first century has observed increasing drug overdose deaths, paired with the emergence and proliferation of novel psychoactive substances (NPS). Currently, fentanyl is the primary driver of drug related deaths, while increasing trends for cocaine and methamphetamine are being observed. To a lesser yet significant extent, other synthetic opioids (e.g., fentanyl analogues, nitazene analogues) have caused substantial mortality across various parts of the country. As drug trends evolve, there remains a constant – misrepresentation, adulteration, cutting, and/or dilution of drug materials occurring to increase profits and produce better effects or highs along with reducing potential unwanted side effects. These scenarios challenge forensic practices and can place strains on forensic pathologists, forensic toxicologists, forensic chemists, and public health officials.

In October 2021, three individuals were found unresponsive in a park after snorting what they believed to be cocaine powder. All three individuals were transported to the hospital for medical care. Two individuals were successfully revived following naloxone administration and survived. The third individual required advanced life support for persistent comatose state suspected to be precipitated by an opioid overdose. A hospital urine drug screen was positive for amphetamine, cocaine, and benzodiazepines and negative for opiates; testing for fentanyl was not performed. The patient died three days later. The body was transported to the Santa Cruz County Sheriff-Coroner's Office. The pathologist performed an external examination. Hospital admission blood and urine samples were sequestered for toxicological analysis. Toxicology testing performed at NMS Labs for traditional drugs uncovered positive results for fentanyl, methamphetamine, and cocaine in urine; the blood was negative for fentanyl. A review of medical records revealed that fentanyl was administered by medical staff prior to urine collection. Since the toxicology results were insufficient to explain the cause of death, further investigation was pursued revealing three white powders were recovered at the scene.

The three white powders were submitted to the Center for Forensic Science Research and Education (CFSRE) to determine the drug culprit. The powders were prepared via a simple methanol dilution and analyzed by gas chromatography mass spectrometry (GC-MS). Two white powders contained cocaine and one white powder contained etodesnitazene, a novel synthetic opioid. Blood and urine samples were submitted to the CFSRE for quantitation of etodesnitazene. Samples were prepared via liquid-liquid extraction and analyzed by liquid chromatography tandem quadrupole mass spectrometry (LC-QQQ-MS). Quantitation was determined by standard addition (internal standard: fentanyl-D5). The blood sample contained 72 ng/mL of etodesnitazene, and the urine sample contained 68 ng/mL.

Etodesnitazene is a new synthetic opioid that is not medically approved for use. Limited information and data exist regarding its presence and toxicity in humans. At the CFSRE, etodesnitazene has been quantified in eleven

death investigation cases. The average concentration in blood was 33 ng/mL (median 11 ng/mL, range 0.53-120 ng/mL). Given the information regarding deaths involving etodesnitazene paired with case circumstances, autopsy findings, and other toxicology results, the pathologist ruled the manner of death to be an accident and the cause of death related to acute etodesnitazene intoxication.

This unusual case of mistaken cocaine powder consumption stresses the importance of thorough medicolegal death investigation paired with expanded toxicology testing, especially for new synthetic opioids in cases where preliminary toxicology findings do not match circumstances. Forensic pathologists and forensic toxicologists must continue to work together and remain vigilant of emerging drug trends, turning to analysis of drug materials when available. Misrepresentation and adulteration of drug products will likely continue, especially with visually indistinguishable white powders; therefore, processes and protocols to combat these scenarios are vitally important.