



G19 **Methylenedioxypropylone “Bath Salts” Related Death: Case Report and Review of the Literature**

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After attending this presentation, attendees will be familiar with methylenedioxypropylone (MDPV), a new designer drug more commonly known as “bath salts,” and its significance as a current public health trend.

This presentation will impact the forensic science community by increasing awareness of “bath salt” use, the clinical presentation of a MDPV-related death, and the importance of monitoring its emergence as a possible new epidemic in substance abuse.

“Bath salts” are white, tan, gray, yellow, or brown odorless powders sold in “head shops”, gas stations, and convenience stores and on the Internet where they are marketed under multiple names. They also retail as plant food, pond water cleaner, odorizers, research chemicals, potpourri, and incense. “Bath salts” are recreational designer drugs of abuse that are injected, ingested, or inhaled, which unlike traditional cosmetic bath salts have no legitimate use for bathing. These products contain stimulant compounds such as 3,4-methylenedioxypropylone (MDPV) or 4-methylmethcathinone (mephedrone) whose effects are similar to methamphetamine, amphetamine, and cocaine.

MDPV is part of the phenethylamine class of drugs and is structurally similar to cathinone (khat), found in both schedule I hallucinogenic substances and schedule I stimulants. MDPV is currently not scheduled by the DEA; however, many states have banned the sale of “bath salts.” Clinical effects of MDPV include tachycardia, chest pain, hypertension, increased body temperature, diaphoresis, seizures, agitation, paranoia, hallucinations, delusions, aggression, excited delirium, and suicidal thoughts. The psychogenic effects can be prolonged. Symptoms may also progress to rhabdomyolysis and renal or liver failure. Currently MDPV is not found by routine immunoassay toxicology screens.

In April 2011, a 39-year-old white male with a history of depression, back pain, drug, and alcohol abuse was found outside his residence delusional and wandering around in clothing inappropriate for the weather. He was taken to the emergency department (ED) by law enforcement officers under emergency petition for a drug overdose and psychiatric disorder. In the ED, the staff noted whitish powder around his mouth and he admitted he had used “bath salts.” He subsequently became agitated, tachycardic and hyperthermic (106.8°F), and eventually went into asystole. Resuscitation was unsuccessful and he died approximately 12 hours after presenting to the ED. Hospital urine drug screen was positive for benzodiazepines and phencyclidine (PCP). Upon inquiry with the hospital, it was determined that the PCP was most likely a false positive and diazepam and diphenhydramine were given at the hospital.

Autopsy was basically unremarkable except for toxicology. Comprehensive alcohol and drug testing were performed in this case. Therapeutic and abused drug testing was performed on the bile. This included: (1) acid/neutral drug screen by gas chromatography(GC)-nitrogen-phosphorous detection (NPD); (2) alkaline drug screen by GC-NPD; (3) acetaminophen and salicylate by color test; and, (4) morphine and benzodiazepines by enzyme-linked immunosorbent assay (ELISA). The salicylate color test was positive and the alkaline drug screen was positive for diphenhydramine, MDPV, promethazine, diazepam, and nordiazepam. Salicylate was confirmed by ELISA. The alkaline extractable drugs were confirmed by full scan electron ionization gas chromatography/mass spectrometry. MDPV was quantitated using the alkaline drug screen routinely employed by this laboratory. The heart blood contained 0.1mg/L diphenhydramine, 0.2mg/L promethazine, 0.1mg/L nordiazepam and 0.7mg/L MDPV and the peripheral blood MDPV concentration was 1.0mg/L. Based on the investigative, autopsy, and toxicology findings in this case, the cause of death was methylenedioxypropylone intoxication and the manner of death was accident.

As of July 2011, it is believed that this is the first reported MDPV related death in the United States. Louisiana and states in the Midwest have reported that almost all of their MDPV deaths are traumatic in nature and not due to the drug alone. MDPV is an emerging drug trend in the United States and medical examiner and coroner’s offices need to be aware of the limitations of routine toxicology testing in detecting MDPV. One should consider testing for MDPV in cases with a history of polysubstance abuse with stimulant type and psychogenic symptoms of acute onset and those individuals in a hyperthermic excited delirium type state. Further research on MDPV related deaths is necessary to assist in the determination of emerging drug trends of public health significance.

Methylenedioxypropylone, Bath Salts, Designer Drugs