



## Pathology/Biology Section - 2014

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### **G129 Sudden Death Following Mono-Intoxication With 3,4-Methylenedioxypropylamphetamine (MDPV)**

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The goals of this presentation are to understand the mechanisms of death following 3,4-Methylenedioxypropylamphetamine (MDPV) use, the toxicology of MDPV use, and the pathology associated with MDPV use.

This presentation will impact the forensic science community by detailing the pathology and toxicology associated with an emerging drug.

“Bath salts” are the name given to a group of drugs that have been growing in popularity as recreational drugs in a number of regions in the world in the last few years. “Bath Salts” are synthetic cathinones and commonly encountered drugs include mephedrone, methylone, and 3,4-methylenedioxypropylamphetamine (MDPV). Most reports have involved the drug mephedrone. Synthetic cathinones have been associated with multiple effects including panic attacks, anxiety, paranoia, psychotic behavior, hallucinations, aggressive behavior and excited delirium, insomnia, depression, and suicide. Reported physical effects include tachycardia, hypertension, sweating, hyperthermia, myocardial infarction, sweating, rhabdomyolysis, and seizures. Deaths have occurred.

A 42-year-old man had a history of a psychotic mood disorder and was prescribed olanzapine, citalopram, and clonazepam, but was thought to have run out four days before his death. He was found in the afternoon lying on the floor and talking incoherently. He was brought to the ambulance walking with assistance, but suffered a cardiac arrest in the ambulance. He was recorded in the ambulance as having a core temperature of 41°C (105.8°F). The autopsy revealed no significant injuries. On internal examination, there was non-specific congestion of the organs but no significant natural disease. Microscopic examination of the lungs revealed intra-alveolar and perivascular macrophages with foreign birefringent material present. In the liver, there were increased neutrophils in the sinusoids, microvesicular fatty change, and pigment granules seen in macrophages. Toxicologic analysis revealed traces of MDPV along with traces of citalopram. Acetone was present in the urine. Subsequent quantitation revealed an MDPV concentration of 5.8mg/L.

The features in this case are that of hyperpyrexia following use of MDPV. No other drugs were present in significant amounts. The synthetic cathinones have been associated with the development of hyperpyrexia with core temperatures over 41°C (105.8°F). The administration of drugs via snorting (insufflation) is recognized, but pathological evidence of past use is rarely evident at autopsy. “Bath Salts” are reported to often be snorted.

Recreational drugs are often used in combination with other drugs. Reports of deaths with synthetic cathinones often involve multiple drugs with pharmacological activity. MDPV concentrations have been reported to be up to 8.0mg/L in drivers, illustrating again that recreational drug concentrations typically overlap with concentrations seen in fatal cases.

In conclusion, this case involves a mono-intoxication with MDPV causing fatal hyperpyrexia with evidence of past use of drugs by insufflation.

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#### **MDPV, Toxicology, Pathology**