



K81 Designer Stimulants and Hallucinogens in Routine Casework

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After attending this presentation, attendees will be able to discuss the type and frequency of synthetic stimulants and hallucinogens seen in routine casework at a large reference laboratory.

This presentation will impact the forensic science community by providing a comprehensive review of designer drugs being seen in routine postmortem and human performance casework.

Over the past several years, the forensic toxicology community has been challenged with the emergence of large numbers of designer stimulants and hallucinogens in products commonly referred to as "Bath Salts." The speed at which the drug-using community is able to adjust to new legislation and find compounds that are not specifically scheduled has mandated a mechanism to quickly add new compounds to the scope of routine testing. A protocol was developed to rapidly expand the Deconvolution Reporting Software (DRS) library for the Gas Chromatography/Mass Spectrometric (GC/MS) screen used in the laboratory.

Data was extracted from the laboratory information management system for all GC/MS screening analyses from January 1, 2012, to July 26, 2012. All cases in which the presence of at least one designer drug was indicated were included in the data analysis. A total of 178 such cases were identified. Pentedrone was the most prevalent compound identified (42 cases), followed by alpha-pyrrolidinopentiophenone (Alpha-PVP, 41 cases), dimethylamylamine (DMAA, 36 cases), and methylenedioxypropylvalerone (MDPV, 26 cases). Other drugs identified were methylone (16), 4-methylethcathinone (10), methylbenzylpiperazine (7), pentylone (5), butylone (5), ethylone (4), dimethylamphetamine (4), 3,4-dimethylmethcathinone (3), 1,4-dibenzylpiperazine (3), buphedrone (3), methoxetamine (2), 2C-I (2), and 1 case each of paramethoxymethamphetamine, 2C-H, 5-MeO-DALT, and paramethoxyamphetamine. Twenty-eight cases included multiple compounds. Nine of these contained didesmethylsibutramine, a metabolite of the diet drug sibutramine, but no sibutramine.

The compounds commonly found in "Bath Salts" generally fall into one of several classes of compounds, substituted phenethylamines, beta-keto cathinones, tryptamines, or piperazines. They are abused for their stimulant and/or hallucinogenic properties. The mechanism of action has not been elucidated for each compound. They generally elicit their effects by acting on serotonergic and dopaminergic receptors or by stimulating the production of related neurotransmitters. DMAA has been detected in "Bath Salts" products, specifically "Pumplt Powders," but is not structurally similar to other common bath salt compounds. It is widely available as a supplement and used by body builders and is believed to stimulate the release of catecholamine. It does not work directly at adrenergic receptors. While 92% of cases which had a positive screen for DMAA did not appear to contain any other "Bath Salt," three cases contained DMAA in combination with other compounds. One also contained Alpha-PVP and didesmethylsibutramine, one contained only Alpha-PVP, and one contained methylone.

The review of seven month's worth of routine GC/MS screening data confirms the necessity of establishing a method able to detect designer stimulants and hallucinogens. These compounds are relevant to both postmortem investigations and as substances which can potentially impair driving.

Designer Drugs, Bath Salts, Postmortem