K35 Recent Trends of Designer Drugs in Harris County, Texas

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The goal of this presentation is to provide attendees with relevant information about the trends and prevalence of newly emerging designer drugs such as synthetic cathinones (bath salts), cannabinoids (Spice), and designer psychedelics such as 25I-NBOMe (25I, or N-Bomb). This presentation will also provide a forum to discuss the associated challenges that the forensic community is facing every day in discovery, analysis, and interpretation.

This presentation will impact the forensic science community by raising awareness on rapidly changing trends in the availability and use of different classes of designer drugs and the need for the development of cutting-edge analytical strategies to keep up with them. Liquid Chromatography Time-Of-Flight Mass Spectrometry (LC/TOF/MS) has proven to be a successful screening tool, whereas Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS) is vital in confirming these newly emerging designer drugs and their metabolites. Examining the trends in new drug use and market availability will also help facilitate the scheduling of illicit drugs by local and federal government officials.

This study's laboratory has identified and confirmed designer drugs in 61 (3%) of cases out of a total of 1,992 cases screened involving Driving While Intoxicated (DWI) suspects, victims of sexual assaults, and death investigations since 2011. The screening and confirmation analysis was done on blood (62%) and urine (38%). The drugs currently included in the screening and confirmation panel are 11 cathinones (mephedrone, methedrone, methylone, butylone, ethylone, methylenedioxypyrovalerone (MDPV), naphyrone, alpha-pyrrolidinopropiophenone (α-PPP), alpha-pyrrolidinopentiophenone (α-PVP), pentedrone, and 4'-methyl-α-pyrrolidinopropiophenone), 19 cannabinoids and metabolites (JWH-015, JWH-018, JWH-018 N-5-(hydroxypentyl) metabolite, JWH-018 N-pentanoic acid metabolite, JWH-019, JWH-019 N-(6-hydroxyhexyl) metabolite, JWH-073, JWH-073 N-(4-hydroxybutyl) metabolite, JWH-073 N-butanoic acid metabolite, JWH-081, JWH-122, JWH-200, JWH-210, JWH-250, WIN 55212-2, AM-2201, UR-144, UR-144 N-pentanoic acid metabolite, and XLR11), and 7 designer psychedelics (25I-NBOMe, 25B-NBOMe, 25C-NBOMe, 2C-E, 2C-I, TMA-2, and TFMPP).

Out of 61 total cases, 33 cases were deceased individuals and 28 cases were DWI suspects. Bath salts were detected in 38 (62%) of the cases, synthetic cannabinoids were detected in 18 (29%) of the cases, and designer psychedelics were detected in 5 (8%) of the cases. Among the bath salts, the most frequently detected drug was α-PVP, followed by pentedrone, MDPV, ethylone, methylone, and naphyrone. Since 2011, the appearance of synthetic cannabinoids began with JWH-018 and associated hydroxyl/carboxyl metabolites, followed by AM-2201, then giving way more recently to XLR11 and UR-144. In the class of designer psychedelics, the most frequently detected drugs are in the NBOMe series such as 25I-NBOMe and 25B-NBOMe, followed by TFMPP.

This research has found that bath salts are the major designer drugs detected in deceased individuals. In two of these cases, acute toxicity of MDPV was implicated as the cause of death. The toxic effects of α-PVP have been implicated as a cause of death in ten cases. The toxic effect of pentedrone, either alone or with α-PVP, has also been implicated as a cause of death in several cases. The newly emerging designer psychedelics 25I-NBOMe and 25B-NBOMe have been implicated as a cause of death in four cases. Although synthetic cannabinoids are a frequent finding in DWI and death investigations, there are no deaths classified under synthetic cannabinoid toxicity. Three cases representative of each class of the designer drugs will be discussed, including investigational scene information about the subject, behavioral and pathological findings, and the comprehensive toxicology results.

Bath Salts, Designer Psychedelics, Synthetic Cannabinoids

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