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Pitfalls of drugs of abuse testing: World of designer drugs

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The first drugs of abuse testing guidelines were published by NIDA proposing testing for five drugs (amphetamine, cocaine as benzoylecgonine, opiates, phencyclidine, and marijuana as THC-COOH). Then SAMHSA replaced NIDA as the Federal agency in charge of implementing guidelines for Federal Workplace Drug testings. In 2015, SAMHSA added testings for oxycodone, oxymorphone, hydrocodone, and hydromorphone in the list. Despite robust drug testing protocol implemented by toxicology laboratories, clinicians often question negative toxicology results when patients clinically appear to have overdosed on a drug or had a toxic response to a pharmaceutical agent. Certain benzodiazepines, date rape drugs such as a gamma-hydroxybutyric acid (GHB), and ketamine, as well as novel psychoactive substances, including bath salts and synthetic cannabinoids, may not be detected by routine toxicology analysis in a clinical laboratory. Bath salts are synthetic derivatives of natural product cathinone which is present in Khat plants. Chewing Khat leaves is common in some Middle Eastern and North African countries, for example, Yemen. Cathinone is structurally similar to amphetamine and has sympathomimetic effects. However, synthetic cathinones are pharmacologically more active than cathinone and abuse may even cause a fatality. Synthetic cannabinoids (spices, K2 blonde etc) such as JWH-018, JWH-073, JWH-250, AM-2201, RCS-8, CP-47,947, UR-144, XLR-11 etc (over 100 such compounds have been identified by WHO experts) have no structural similarity with naturally occurring tetrahydro cannabinoid (marijuana) hence cannot be detected by immunoassays designed to detect the presence of THC-COOH in urine. These compounds are called synthetic cannabinoids because they interact with cannabinoid receptors (CB1 and CB2) in the brain. People who abuse marijuana have a higher risk of abusing synthetic cannabinoids. Similar to bath salts abuse of synthetic cannabinoids may be fatal. This session will address the common scenario where drug testing may be negative in suspected overdose patients and will address how to communicate with ordering clinicians for further testing in order to identify the abused drug that may escape routine toxicology analysis.

Biography

Amitava Dasgupta received his PhD in chemistry from Stanford University and completed his fellowship training in Clinical Chemistry from the Department of Laboratory Medicine at the University of Washington School of Medicine at Seattle. He is board certified in both Toxicology and Clinical Chemistry by the American Board of Clinical Chemistry. Currently, he is a tenured Full Professor of Pathology and Laboratory Medicine at the University of Texas Health Sciences Center at Houston and the Director of Clinical Chemistry and Toxicology Laboratory of Memorial-Hermann Laboratory Services. His major focus of research is in the field of toxicology and therapeutic drug monitoring. He has published 225 scientific papers, wrote many invited review articles and abstracts edited, co-edited, co-authored and wrote a total of 20 books. He is on the Editorial Board of six journals including Therapeutic Drug Monitoring, American Journal of Clinical Pathology, Archives of Pathology and Laboratory Medicine, Clinica Chimica Acta, Annals of Clinical and Laboratory Science and Journal of Clinical Laboratory Analysis. He is the recipient of 2009 Irvine Sunshine Award from the International Association for Therapeutic Drug Monitoring and Clinical Toxicology (IATDMCT) for outstanding contribution in clinical toxicology and in 2010 he received AACC Outstanding contribution to Education Award.

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