



K55 The Increased Prevalence of Illicit Synthetic Opioids in Postmortem Casework at the New York City Office of Chief Medical Examiner (NYC OCME) From January to June, 2016

Gail Audrey Ann Cooper, PhD, OCMENYC, 520 First Avenue, New York, NY 10016*

After attending this presentation, attendees will better understand the prevalence of illicit synthetic opioids in postmortem casework at the NYC OCME through the first six months of 2016.

This presentation will impact the forensic science community by providing a detailed overview of the cases submitted to the NYC OCME Forensic Toxicology Laboratory where synthetic opioids were identified. This presentation will also help attendees inform their laboratories of the scope of testing and highlight the limitations of current testing protocols. This will be achieved with the use of specific case examples typifying the cases where historical or scene information provides critical information for the toxicological investigation, to cases where key information was not readily available.

The Forensic Toxicology Laboratory at NYC OCME receives between 5,000 and 6,000 postmortem cases each year from the five city boroughs (The Bronx, Brooklyn, Manhattan, Queens, and Staten Island) with an estimated combined population of 8.5 million. Forensic toxicology and drug-testing laboratories across North America and Europe have reported an increased prevalence of illicit synthetic opioids resulting in accidental overdose, predominantly involving fentanyl. A number of structurally related “fentanyls” have also been reported, including furanyl fentanyl, butyryl fentanyl, acetyl fentanyl, and other structurally unrelated synthetic opioids, including U-47700 (3,4-dichloro-N-[(1R,2R)-2-(dimethylamino)cyclohexyl]-N-methylbenzamide), MT-45 (1-Cyclohexyl-4-(1,2-diphenylethyl)piperazine), and W-18 (4-chloro-N-[1-[2-(4-nitrophenyl)ethyl]-2-piperidinylidene]-benzenesulfonamide).

A total of 306 cases were identified as containing an illicit synthetic opioid equating to approximately 11% of all cases submitted for toxicological investigation. Fentanyl was most commonly identified (90.8%), followed by norfentanyl (54.2%), acetyl fentanyl (8.8%), furanyl fentanyl (6.5%), 4-ANPP (4-anilino-N-phenethylpiperidine or despropionyl fentanyl) (5.2%), and U-47700 (2.6%).

Multi-drug intoxication was prevalent throughout the 306 cases and the most common drugs found in combination with the above synthetic opioids were heroin metabolites (46.7%), cocaine and metabolites (37.6%), other opioids (35.3%), benzodiazepines (31.4%), alcohol (26.1%), and cannabinoids (19.9%). Amphetamines (including synthetic cathinones) were detected in 4.9% of cases, while etizolam and PCP were identified in 2.6% and 2.3% of the cases, respectively. Numerous other prescription medications were identified but not collated for this study.

Twenty-four cases were identified with either furanyl fentanyl, 4-ANPP or U-47700, or a combination. Eleven of these cases were identified in the month of June alone, raising concerns that the prevalence of the newer illicit synthetic opioids would continue to increase through the remainder of 2016.

The synthetic opioids in this study were identified through a combination of Enzyme-Linked Immuno-Sorbent Assay (ELISA) as an initial screening tool only, Gas Chromatography/Mass Spectrometry (GC/MS), Liquid Chromatography/Time-Of-Flight/Mass Spectrometry (LC/TOF/MS), and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS), using commercially available reference standards.

Copyright 2017 by the AAFS. Unless stated otherwise, noncommercial *photocopying* of editorial published in this periodical is permitted by AAFS. Permission to reprint, publish, or otherwise reproduce such material in any form other than photocopying must be obtained by AAFS.



Toxicology - 2017

Synthetic Opioids, Fentanyl, Postmortem Forensic Toxicology

Copyright 2017 by the AAFS. Unless stated otherwise, noncommercial *photocopying* of editorial published in this periodical is permitted by AAFS. Permission to reprint, publish, or otherwise reproduce such material in any form other than photocopying must be obtained by AAFS.