K50 The Effects of Synthetic Cannabinoids and Poly-Drug Use on Drug Recognition Expert Evaluations

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Learning Overview: After attending this presentation, attendees will be able to describe the effects of synthetic cannabinoids, both unaccompanied and in combination with other drugs of abuse, such as fentanyl, cocaine, or methamphetamine, on evaluations performed by Drug Recognition Experts (DREs).

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing data related to the physiological signs and symptoms associated with the ingestion of synthetic cannabinoids, both on their own and in combination with other commonly encountered drugs in oral fluid collected concurrently with evaluations performed by DRE officers.

The DRE program was developed to establish a systematic procedure for identifying and documenting signs of impairment in subjects suspected of being under the influence of drugs. The DRE program is currently the best tool for evaluating a subject's drug-related impairment at the roadside. Several studies have demonstrated the reliability of the DRE program for traditional drugs of abuse; however, there are limited reports related to the constellation of symptoms associated with use of synthetic cannabinoids alone or in combination with traditional drugs of abuse. The purpose of this evaluation was to compile DRE evaluation data and relate it to the analytical findings obtained from comprehensive oral fluid testing.

Participation in the evaluation was strictly voluntary and performed as part of the DRE certification process. A total of 25 subjects were assessed using the standardized evaluation protocol for drug influence. Parameters of evaluation included presence or absence of nystagmus, pulse rate, Lack Of Convergence (LOC), One Leg Stand (OLS), Walk And Turn (WAT), modified Romberg balance, pupil size in three different lighting conditions, blood pressure, and body temperature, among others. At the conclusion of the evaluation, an oral fluid sample was collected using the Immunalysis™ Quantisal® device for laboratory-based analysis. Samples were analyzed using a SCIEX™ TripleTOF® 5600+ quadrupole time-of-flight mass spectrometer coupled to a Shimadzu® Nexera® ultra high-performance liquid chromatograph.

Five subjects tested positive for 5F-MDMB-PICA, a popular synthetic cannabinoid, in the absence of any other drugs. In all five cases, no nystagmus was noted, and only one had slight indications of LOC. All subjects had difficulty with the WAT test (e.g., missing all heel-to-toe steps, inability to keep balance, and stepping off the line) and OLS test (e.g., swaying while balancing, using their arms, hoping, and putting their foot down). Only one of five of the DRE opinions included cannabis.

Fifteen subjects tested positive for fentanyl in combination with 5F-MDMB-PICA, with 4 of the 15 also testing positive for 4F-MDMB-BINACA. Horizontal Gaze Nystagmus (HGN) and a lack of smooth pursuit were noted in only one individual. LOC was present in ten of the subjects (66%) and most exhibited flaccid muscle tone. All 15 DRE opinions correctly noted a narcotic analgesic, but only 2 also indicated cannabis.

Three subjects tested positive for cocaine and 5F-MDMB-PICA, and two subjects tested positive for methamphetamine and 5F-MDMB-PICA. One individual displayed HGN and a lack of smooth pursuit. All five subjects demonstrated difficulty on the WAT and OLS tests; four subjects had LOC. Only one subject had dilated pupils. The DRE opinion in all five cases was a Central Nervous System (CNS) stimulant.

The opinion of a DRE is based on physiological and behavioral indicators consistent with specific drug categories. The ever-changing drug market, which now includes combinations of Novel Psychoactive Substances (NPS) -like synthetic cannabinoids as well as an increase in the frequency of poly-drug use encompassing NPS and traditional drugs of abuse, adds to the complexity of the DRE evaluation. In cases in which fentanyl is present, physiological signs and symptoms of other drugs used could be masked. Therefore, comprehensive toxicology testing, including NPS, is imperative to ensure all substances contributing to the impairment are identified.

Synthetic Cannabinoids, Fentanyl, DRE