



K45 AB-CHMINACA, AB-PINACA, XLR-11, and UR-144 and Driver Behavior in Suspected Impaired Driving Cases in Which a Drug Recognition Expert (DRE) Exam Was Performed

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After attending this presentation, attendees will better understand the driving behaviors of individuals under the influence of the synthetic cannabinoids AB-CHMINACA, AB-PINACA, XLR-11, and UR-144. Additionally, attendees will better understand the various physiological indicators observed by DREs in their exams of individuals under the influence of these synthetic cannabinoids and be able to compare these indicators to those observed with marijuana use.

This presentation will impact the forensic science community by helping law enforcement and toxicologists become familiar with the effects of these synthetic cannabinoids on driving performance, their physiological indicators, how these indicators differ from one compound to another, and how they differ from those observed with marijuana use.

Synthetic cannabinoids are chemically synthesized compounds that are prepared and used to mimic the effects of marijuana.¹ Synthetic cannabinoids are often marketed as legal drugs and are commonly known as “Spice” products. Although attempts have been made to regulate synthetic cannabinoids, modifications to their molecular design provide ways to circumvent scheduling restrictions.² In the meantime, people continue to use these drugs and drive.

This presentation reviews case reports for 31 suspected impaired driving cases that were positive for the synthetic cannabinoids AB-CHMINACA, AB-PINACA, XLR-11, and UR-144 and in which DRE exams were performed. All cases were submitted to the Washington State Patrol Toxicology Laboratory from 2012 to 2014, from either Washington State or State of Alaska law enforcement agencies. The population of drivers in this study was predominantly male (95% in AB-CHMINACA and AB-PINACA; 100% in XLR-11 and UR-144), with a mean age of 28 years and 25 years, respectively (range 18-61 years).

Testing for synthetic cannabinoids was performed at either NMS Labs or the American Institute of Toxicology (AIT) laboratory. Horizontal Gaze Nystagmus (HGN) was observed in 50% and 60% of the AB-CHMINACA ($N=10$) and AB-PINACA ($N=10$) cases, respectively. In cases in which XLR-11 ($N=4$), UR-144 ($N=2$), or both ($N=5$) of these compounds were present, HGN was observed in 50%, 0%, and 20% of the cases, respectively. Blood pressure levels were low in the majority of the AB-PINACA, AB-CHMINACA, and UR-144 cases (70%, 60%, and 50%, respectively) and were normal in 100% of the XLR-11 cases. Blood pressure levels were also normal in 80% of the cases in which both XLR-11 and UR-144 were present. Lack of convergence was present in only 30% of the AB-CHMINACA cases and in 0% of the UR-144 cases, but was present in 60%-75% of all the other cases.

Overall, several physiological indicators varied between the four compounds and varied from those typically observed with marijuana use. The majority of these cases had very poor driving skills; subjects were either involved in an accident, found passed out in a vehicle, drove in the wrong direction, or were called in as a suspected impaired driver. Slurred speech, confusion, lack of coordination/dexterity, and lethargy were commonly observed.

Consumption of synthetic cannabinoids can lead to significant impairment, including sedating effects and deficits in fine motor skills which are necessary for safe driving.³

Reference(s):

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2. Brents L.K., Prather P.L. (2014) The K2/Spice Phenomenon: emergence, identification, legislation and metabolic characterization of synthetic cannabinoids in herbal incense products. *Drug Metabolism Review*, 46(1): 72-85.
3. Musshoff F., Madea B., Kernbach-Wighton G., Hutter M., Auwärter V. (2014) Driving under the influence of synthetic cannabinoids (“Spice”): a case series. *Int J Legal Med* 128:59-64. DOI 10.1007/s00414-013-0864-1.

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