



K46 XLR-11 and Impaired Driving — Case Reports

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After attending this presentation, attendees will understand impairments which may be observed in drivers under the influence of the synthetic cannabinoid commonly known as XLR-11.

This presentation will impact the forensic science community by providing new information on the effects of the synthetic cannabinoid XLR-11 on driving, including observations made during the evaluation of drivers by a Drug Recognition Expert (DRE).

The Drug Evaluation and Classification Program was developed to provide a structured series of tests to be performed by DREs to help identify the types of substances, including cannabis, which may be responsible for impairment observed in drivers. While the program is designed to detect the use of marijuana, due to the increasing prevalence of Synthetic Cannabinoids (SCs) in drivers, it must be considered that SCs could be responsible for impairment that is similar to that seen from cannabis use. This presentation includes six cases in which XLR-11, an SC, was identified in blood specimens of drivers who underwent a DRE examination in which only cannabis was identified as being the cause of impairment.

All six drivers indicated they had used SCs. Pulse rate ranged from 50 to 130 beats per minute; two drivers had pulse rates >100 at all three time-points. Horizontal gaze nystagmus, vertical gaze nystagmus, or lack of convergence was not observed in any individual; one had dilated pupils under all light conditions. Two drivers had two clues on the one-leg stand test; the remaining drivers had no clues. Internal clock estimates from the modified Romberg test ranged from 20 to 35 seconds. During the walk-and-turn test, three individuals started too soon, stopped during the exercise, missed heel to toe, stepped off the line, and raised an arm, while two subjects had no observed impairment. Leg, body, and eye tremors were reported for all patients during one or more test. Five of the six individuals had elevated blood pressure and all patients had normal body temperature.

Toxicology tests revealed two individuals to be positive for delta-9 THC and its inactive metabolite, in addition to XLR-11. The delta-9 THC concentrations were low (1.8ng/mL and <1ng/mL). Two drivers tested positive for UR-144 in addition to XLR-11. UR-144 has been identified in herbal incense products and is a predicted metabolite of XLR-11.

In a previous study of 18 drivers, all of whom tested positive for XLR-11 and/or UR-144 and 11 of whom had DRE exams performed, the most common symptoms reported were lack of convergence, slurred speech, and body/eyelid tremors, while blood pressure and pulse rates were noted to be normal.¹ Signs and symptoms indicated on the DRE cover sheets for these six cases were consistent with those typically seen following cannabis use. According to the DRE matrix, elevated blood pressure and pulse rate are consistent with symptoms of cannabis use, which also indicates that after high doses individuals might have dilated pupils. It is important to note that in all six cases, the driver admitted to using a synthetic cannabinoid product, making it difficult to determine if the DRE indicated cannabis use based on the results of the exam or because they were aware these compounds have effects similar to those seen after someone smokes marijuana. These data suggest that XLR-11 may produce impairment that is consistent with impairment generally seen from cannabis and, in cases of low or absent levels of THC, it may be necessary to consider SCs as a potential source of impairment.

Reference(s):

1. Louis A., Peterson B.L., Couper F. XLR-11 and UR-144 in Washington State and state of Alaska driving cases. *Journal of Analytical Toxicology*, 2014 38(8): 563-8.

XLR-11, Driving, DRE