K47 The Z Drugs: An Update for Forensic Toxicologists in Light of DUID Cases

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After attending this presentation participants will have a greater understanding of the Z drugs, how they produce the effects commonly seen in DUID cases and metabolism and excretion profiles that affect the forensic toxicologist abilities to detect the drug or metabolites. In addition, recent pharmacological research will be summarized concerning such issues as sleep driving and other aberrant behavior.

This presentation will influence the forensic science community who support suspected DUID and drug facilitated sexual assault cases by enhancing their understanding of the drug mechanisms and current challenges to interpretive issues.

The "Z-drugs" are non-benzodiazepine sedative hypnotic available in standard release and extended release formulations. Zolpidem (Ambien) has consistently finished in the "Top 20" of the 200 most prescribed medications over the last seven years. Zolpidem is commonly prescribed for treatment of insomnia. Lunesta (Eszopiclone) has been approved by the U.S. Food and Drug Administration for long term treatment of insomnia since 2004. Eszopiclone is a nonbenzodiazepine hypnotic that is a pyrrolopyrazine derivative and is a steroisomer of zopiclone (Imovane, Noctitrex, Ximovane, Zimovane), which is not currently available in the U.S. Zaleplon (Sonata) is also a nonbenzodiazepine hypnotic from the pyrazolopyrimidine class. Zaleplon interacts with the GABA receptor complex and shares some of the pharmacological properties of the benzodiazepines. Although not a benzodiazepine, zaleplon can cause similar effects: anterograde amnesia (forgetting the period during the effects) as the most common side effect.

Multiple cases will be presented highlighting some of the analytical and interpretation challenges presented by the "Z-drugs". Zolpidem blood concentrations in a few selected cases ranged from 190 to greater than 4,000 ng/mL. Clearly some of these drivers' blood concentrations dramatically exceed those expected from single oral dosing for night time hypnotic effect. A typical case of Zolpidem impaired driving is presented: A law enforcement officer observed a subject crash into the rear of a parked car. The officer also noted "bizarre driving" with the subject driving in reverse for one block, then stopping in the line of traffic for one minute (one vehicle had to swerve to avoid crash). The officer pulled up behind & activated emergency lights; however the subject didn't notice the officer and started driving forward. Eventually the subject stopped. The subject was wearing a fur lined winter cap over a baseball cap and sunglasses over the top of prescription eyeglasses even though it was night time at the time of the incident. The subject exhibited delayed responses to the officer's questions, slow slurred speech and seemed confused. The subject was unsteady and needed to brace on the car to attempt Standardize Field Sobriety Tests (SFST). The subject exhibited multiple clues on all 4 SFSTs. The subject was arrested and taken in for a blood sample. Throughout the examination the subject was unable to recall any of the recent incidents. The subject stated: "I'm confused, lost and out of it". Toxicological analysis of the blood revealed zolpidem at 500 ng/mL and less than 50 ng/mL of citalopram.

As this case report demonstrates, "Z-drugs" have the potential to significantly impair the driving abilities of an individual. Dissemination of toxicological findings for cases such as these will assist forensic toxicologists in their own case interpretations.

DUID, Zolpidem, Zaleplon and Zopiclone

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