K49 Prevalence of Carisoprodol, Methadone, Oxycodone and Zolpidem in Subjects Suspected of Driving Under the Influence of Drugs (DUID) by Enzyme Linked Immunosorbent Assay

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After attending this presentation, attendees will be aware of the prevalence of carisoprodol, methadone, oxycodone and zolpidem in the blood specimens from drivers in the state of Arizona.

This presentation will impact the forensic community and/or the public by demonstrating how the toxicological analysis for carisoprodol, methadone, oxycodone and zolpidem will significantly improve the safety of the population, particularly road-users in the state of Arizona.

Methods: Driving under the influence of drugs and/or alcohol is a major problem in public safety. Enzyme linked immunosorbent assays (ELISA) are currently used to screen for the presence of barbiturates, benzodiazepines, opiates, cocaine, methamphetamine and THC in whole blood. This study was designed to determine whether the prevalence of carisoprodol, methadone, oxycodone and zolpidem warranted their inclusion in the initial immunoassay screen performed in the subject population. The study evaluated 1109 consecutive cases submitted over a 5 month time period. Cut-offs were established which appeared to reflect a potentially impairing concentration, as well as a concentration which could be confirmed using gas chromatography-mass spectrometry (GC/MS). The established cut-off levels were carisoprodol 1000 ng/mL; methadone 100 ng/mL; oxycodone 25 ng/mL and zolpidem 25 ng/mL. The screening prevalence was compared with the documentation supplied by the drug recognition experts or arresting officer, when available.

Results: Of the 1109 cases evaluated, 55 (4.9%) contained carisoprodol; 16 (1.4%) methadone; 51 (4.6%) oxycodone; and 9 of 946 cases (1%) were positive for zolpidem. Zolpidem was added to the panel at a later date; hence the number of specimens tested is lower. Not surprisingly, the most prevalent drug detected was marijuana, which was found in 47% of the cases. Methamphetamine was found in 30%. Benzoylecgonine and benzodiazepines each were detected in approximately 13% of the samples. The current opiate assay, the Immunalysis Opiates Direct ELISA Kit, is approximately 21% cross-reactive to oxycodone and in this study had 89 (8%) cases. The lowest class prevalence of drugs found was barbiturates at 2%. The GC/MS confirmation rates for these prevalence study assays are as follows:

Assay	Confirmation	Analytes found
Zolpidem	89 %	Zolpidem
Carisoprodol	96 %	Carisoprodol & meprobamate
	2 %	Meprobamate only
Methadone	100 %	Methadone
Oxycodone	25 %	Oxycodone
	18 %	Hydrocodone
	12 %	Codeine
	8 %	Morphine
	2 %	Codeine & morphine

15 (29%) of the presumptive positive oxycodone cases were not confirmed by the current GC/MS procedure and one case each for both carisoprodol and zolpidem. In many cases, multiple drugs were detected.

Summary: The additional ELISA screening has proven to be an effective approach to identify specimens for confirmation of prescription medications that have demonstrated impairing effects in the driving population. It has given this laboratory a preliminary screening test that is less labor intensive than and complementary to GC/MS. These results demonstrated that carisoprodol has a higher occurrence than the barbiturate class in the current screening set-up. The prevalence of methadone and zolpidem are not as high as expected. Zolpidem may be expected to rise based on the interest growing for this generation of drug type. Methadone has not increased as much as expected based on trends in other regions of the country. Oxycodone was not as prevalent as other parts of the country. It has not been decided to implement the use of the oxycodone assay because the majority of the positives were also identified by the current opiate assay. The differences between the two screening assays could be explained by the higher cutoff currently used for the opiate assay of 50 ng/mL. Several of the oxycodone positive samples were positive for opiates

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other than oxycodone.

Carisoprodol, Methadone, Zolpidem

