K39 Characteristics of Drug Use Among Drivers in Houston, Texas

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After attending this presentation, attendees will better understand the prevalence and concentrations of drugs found in blood samples of Houston drivers involved in traffic accidents or suspected of impaired driving.

This presentation will impact the forensic science community by providing important regional information so attendees can better understand the demographic profile of drug-impaired or suspected impaired drivers in Houston, TX. The long-term objective is to help design and implement regulations and prevention methods that will lead to a reduction in drug-impaired driving, an urgent traffic safety concern.

Commonly abused drugs, including amphetamines, benzodiazepines, cannabis, hypnotics, and opioids, have been associated with increased road traffic crash risks due to their psychoactive properties that can impact driving-related functions.[1] According to the 2014 National Survey on Drug Use and Health (NSDUH), ten million people, aged 12 years or older, reported driving under the influence of illicit drugs during the past year. That is an increase from the 9.9 million people who reported similar activity in the 2013 NSDUH survey. The survey additionally found the rate of driving under the influence of illicit drugs to be highest among young adults 18 to 25 years of age. Houston is the most populous city in Texas and the fourth most populous in the United States. Hence, evaluation of the Houston dataset can also provide insight into drug use patterns among drivers in other major metropolitan areas.

This research includes cases of driving while intoxicated or driving under influence of drugs, both fatal and non-fatal, occurring in 2014 or 2015 that were analyzed by the Houston Forensic Science Center in 2015 for common drugs of abuse in blood samples. These samples were collected from drivers and submitted by the Houston Police Department. The data evaluated includes drug concentrations and detection rates in addition to demographics, including age, sex, and race/ethnicity. These samples are routinely analyzed for blood alcohol first. All fatality cases and those with a blood alcohol concentration of <0.010g/100mL proceeded to further toxicological analysis. The blood samples were screened by immunoassay for benzodiazepines, benzoylecgonine, cannabinoids, methamphetamine, opiates, and phencyclidine. After October 19, 2015, an additional six immunoassay kits (amphetamine, barbiturates, carisoprodol/meprobamate, methadone, oxycodone/oxymorphone, and zolpidem) were added to the testing panel. Gas Chromatography/Mass Spectrometry (GC/MS) or Liquid Chromatography/Mass Spectrometry (LC/MS) systems are used as a secondary analysis to confirm a positive screening. An external laboratory completed the majority of the confirmatory analyses.

In 2015, the laboratory tested 425 impaired driving or traffic accident cases for common drugs of abuse in blood. Of those cases, 34% tested positive for cannabinoids, 27% for alprazolam, 12% for cocaine/metabolites, 12% for hydrocodone, 10% for phencyclidine, and 6% for carisoprodol/meprobamate. The mean blood concentrations of Δ^9-tetrahydrocannabinol, alprazolam, cocaine, hydrocodone, phencyclidine, and carisoprodol/meprobamate were 3.8ng/mL (median 2.9; range 0.5-17), 67 ng/mL (49; 5.6-450), 56ng/mL (38; 15-120), 65ng/mL (45; 6.4-311), 44 ng/mL (39; 7.3-92), and 4.5/21 µg/mL (4.6/17; 0.5/3-17/55), respectively. Males accounted for 79% of the cases and Whites for 60%. Blacks accounted for 30%, Asians for 4%, and Hispanics for 3%. The mean age was 33 years (median 31; range 17-83).

The list of prevalent drugs found among suspected impaired drivers in Houston or involved in a traffic accident was similar to those observed in other laboratories.[2] Since cannabis is the most widely abused illicit substance, it is not surprising that it is also the most frequently detected drug (other than alcohol) in this study and others.[3,4] The number of illicit drug users has been steadily rising nationally since 2002, making risk assessment and prevention of drug-impaired driving increasingly important.

Reference(s):

1. Gjerde et al. Driving under the influence of non-alcohol drugs – an update. Part I: e pidemiological studies. *Forensic Sci Rev.* 2015;27:89-113.
2. Logan et al. Recommendations for toxicological investigation of drug-impaired driving and motor vehicle fatalities. *J Anal Toxicol.* 2013;37:552-558.
3. Wilson et al. Fatal crashes from drivers testing positive for drugs in the U.S., 1993-2010. *Public Health Rep.* 2014;129:342-50.
4. Legrand et al. Alcohol and drugs in seriously injured drivers in six European Countries. *Drug Test Anal.* 2013;5:156-165.

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