K52 Methamphetamine and Amphetamine in Suspected Driving Under the Influence (DUI) Cases in the City and County of San Francisco: A Six-Year Review

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After attending this presentation, attendees will possess the necessary knowledge to assess methamphetamine/amphetamine blood concentrations in DUI cases based on a six-year review of such cases in San Francisco.

This presentation will impact the forensic science community by demonstrating the need for and usefulness of comprehensive drug testing in DUI cases irrespective of the driver's alcohol concentration and will provide reference concentrations for others to use in their own case work.

In the City and County of San Francisco, the American Board of Forensic Toxicologists (ABFT) -accredited Forensic Laboratory Division (FLD) of the Office of the Chief Medical Examiner (OCME) performs all forensic toxicology testing, including postmortem as well as human performance forensic toxicology cases. A retrospective review of all suspected DUI cases submitted to the FLD between April 1, 2009, and April 30, 2015, was undertaken in order to better understand and characterize the incidence of methamphetamine/amphetamine (mAmp/Amp) in DUI cases in San Francisco.

Prior to August 1, 2014, DUI specimens were only screened for drugs by immunoassay and/or gas chromatography/mass spectrometry if drug testing was specifically requested by the police or if the ethanol was ≤0.12%(w/v). Since August 1, 2014, all DUI specimens have been screened for drugs, regardless of the driver's blood alcohol concentration.

The yearly distribution of mAmp/Amp DUI cases in San Francisco are shown below:

Period	No. of mAmp/Amp Cases
Apr. 1 to Dec. 31, 2009	7
Jan. 1 to Dec. 31, 2010	17
Jan. 1 to Dec. 31, 2011	37
Jan. 1 to Dec. 31, 2012	37
Jan. 1 to Dec. 31, 2013	36
Jan. 1 to Dec. 31, 2014	40
Jan. 1 to Apr. 30, 2015	21

It is noteworthy that in 2014 and the first part of 2015, the number of mAmp/Amp DUI cases have increased as the FLD's testing protocol was adjusted in compliance with the "Recommendations for Toxicological Investigation of Drug-Impaired Driving and Motor Vehicle Fatalities."[1]

Examination of digital and physical records revealed that in the six-year period of interest, the FLD has performed analyses in 5,023 DUI cases (494 felonies; 4,529 misdemeanors). Of these, 179 cases (3.6%) had mAmp/Amp in blood and of those, there were 66 cases in which mAmp/Amp were the only drugs found in blood.

Whites, Hispanics, and Blacks comprised the three most common race groups among the 179 drivers with mAmp/Amp in their blood and among the 66 drivers with only mAmp/Amp in their blood.

One hundred thirty-seven of the 179 drivers with mAmp/Amp were male (76.5%). The mean and median age of the 179 drivers with blood mAmp/Amp was 37 years and 35 years, respectively. In the 179 cases with blood mAmp/Amp, the mean and median mAmp concentrations were 355ng/mL and 250ng/mL, respectively, while the mean and median Amp concentrations were 54ng/mL and 50ng/mL, respectively.

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Fifty-two of the 66 drivers with only mAmp/Amp in their blood were male (78.8%). The mean and median age of these 66 cases were 39 years and 40 years, respectively. In the 66 cases with only mAmp/Amp in their blood, the mean and median mAmp concentrations were 454ng/mL and 320ng/mL, respectively, while the Amp concentrations were 56ng/mL and 50ng/mL, respectively.

In the 113 cases with other substances detected, the most common ones were cannabinoids (n=59; 52.2%), ethanol (n=25; 22.1%), and benzodiazepines (n=24; 21.2%). Other compounds detected included GHB, MDMA, PCP, cocaine, methadone, carisoprodol/meprobamate, morphine/codeine/6-MAM, hydrocodone, oxycodone, zolpidem, and mirtazapine.

Analysis of variance revealed statically significant differences (p<0.05) when the mAmp/Amp-only drivers' sex was examined for age: males' mean age was 39.97 years, but females' mean age was 33.92 years. Differences were also noted in the time of day the blood collections took place. Most specimen collections from female drivers occurred from 9:00 p.m. to 2:59 a.m., peaking between 1:00 a.m. and 2:59 a.m. (11 of 40 cases, 27.5%), but most collections for male drivers occurred between 7:00 p.m. and 4:59 a.m., peaking between 3:00 a.m. and 4:59 a.m. (21 of 137 cases, 15.3%).

This retrospective review of mAmp/Amp DUI cases in San Francisco clearly demonstrates that methamphetamine DUIs remain an issue in our driver population and comprehensive drug screening beyond alcohol in these cases is justified in the interest of public safety, despite the perceived short-term financial burden and time delays associated with drug testing.

Reference(s):

1. Logan B.K., Lowrie K.J., Turri J.L., Yeakel J.K., Limoges J.F., Miles A.K., et al, Recommendations for Toxicological Investigation of Drug-Impaired Driving and Motor Vehicle Fatalities. *Journal of Analytical Toxicology* 2013;37:552–558.

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