K27 Combined Drug and Alcohol Use in Drivers Suspected of Vehicular Assault and Homicide

Barry K. Logan, PhD, Washington State Toxicology Laboratory, Washington State Patrol Forensic Laboratory Services Bureau, 2203 Airport Way South, Seattle, WA 98134; and Laurie Barnes, BS, JD, Washington State Toxicology Laboratory, Washington State Patrol Forensic Laboratory Services Bureau, 2203 Airport Way South, Seattle, WA 98134*

After attending this presentation, the attendee will understand the limitations of current toxicological practices in identifying drug impairment by drivers involved in serious injury traffic accidents; recognize the major drug classes known to be involved, and the degree of combined alcohol and drug involvement.

This presentation will impact the forensic community and/or humanity by attempting to be the first to document the combined use of drug and alcohol use in drivers suspected of vehicular homicide and assault. This should improve practices of traffic law enforcement, provide a basis for allocation of enforcement assets to detecting symptoms of drug impairment, and encourage comprehensive drug testing in alcohol DUI cases.

Since the relationship between blood drug concentrations and the degree of effects associated with those is not well established for most drugs, investigation of vehicular assault and homicide cases should ideally include an assessment of the suspect's degree of sobriety by a trained officer proximate to the time of the accident. This is often not possible due to injuries sustained by the subject. In those cases when a blood sample is collected it falls to the forensic toxicologist to interpret those findings, and relate them to the suspects known driving behavior. Current practice in most jurisdictions however, driven by limited toxicological resources, is that if a suspect's blood alcohol exceeds the legal limit, no drug testing is performed and the subject is prosecuted based on the alcohol result and its known effects.

In an effort to assess the true rate of drug use and combined alcohol and drug use in the impaired driving population, samples taken from suspects in vehicular assault and homicide cases were subjected to comprehensive drug testing, irrespective of the blood alcohol concentration.

From a review of cases received during 2002 and 2003, 804 cases were identified where the driver was considered a suspect in a vehicular assault or homicide case. Of these, 700 were available in sufficient quantity for comprehensive testing for priority drug classes by immunoassay (EMIT for barbiturates, benzodiazepines, cannabinoids, cocaine metabolite, methadone, opiates, phencyclidine, propoxyphene and tricyclic antidepressants), alcohol, and basic drugs by gas chromatography. Since this was an assessment of incidence of drug use, determinations were qualitative only.

Table 1 shows the relative frequency of alcohol and drug use alone and in combination. Alcohol positive cases were those with blood alcohol concentrations 0.01g/100mL and greater. Drug positive cases were those with one or more drugs capable of causing impairment.

Table 1. Drug and alcohol positivity rates for all cases (n=700)

	Drug Positive	Drug	Totals
Alcohol Positive	235 (33.5%)	223 (31.8%)	458 (65.4%)
Alcohol Negative	115 (16.4%)	126 (18.0%)	242 (34.5%)
Totals	351 (50.1%)	349 (49.9%)	700

Of the 700 cases tested, 126(18.0%) had no detectable alcohol or drugs. There may be a variety of reasons why samples were submitted in these cases. It would include the fact that some agencies have a policy of submitting samples from the driver in any serious injury accident, whether or not there is evidence of fault, or of drug or alcohol use. It would also include individuals who submitted samples to protect themselves in case of civil litigation resulting from the collision. Additionally, drugs such as gabapentin, GHB, lorazepam, and clonazepam, are not detected in the test batteries used in this study. Drugs which are generally not considered to have any significant effect on driving such as caffeine, nicotine, lidocaine, bupivacaine, venlafaxine, citalopram, and other SSRIs were not included in the totals for drug positive cases.

The mean (+SD) blood alcohol concentration (BAC) among the alcohol positive cases was 0.15 (+ 0.07) g/100mL (median 0.15, range 0.01 0.44g/100mL). This is similar to the average blood alcohol concentration seen in DUI arrests in Washington State, where there is either no collision, or no serious injury.

Of the alcohol positive cases, 235 (51.3%) additionally had drugs which could have contributed to impairment. This is a significant finding since in many jurisdictions a positive blood alcohol result would preclude any further testing for drugs, meaning that the subject's drug use would go undetected. This is important for a number of reasons, including the ability

 ** Presenting Author*

to fully prosecute the case, negotiations on a plea agreement, assessment or treatment for drug use, and allocation of law enforcement resources.

The data were also examined to assess relative rates of drug use among drivers with high BAC's compared to lower BAC's, and the data are presented in table 2.

Table 2. Drug positivity with respect to blood alcohol concentration.

	Drug Positive	Drug	Totals
Alcohol >0.08g/100mL	192 (41.9%)	200 (43.7%)	392 (86.0%)
Alcohol 0.01–	43 (9.3%)	23 (5.0%)	66 (14.0%)
Totals	235 (51.3%)	223 (48.7%)	458

Of the alcohol positive cases 392 (86%) had alcohol concentrations of 0.08g/100mL or above. Among these high BAC drivers, 48.9% were positive for drugs. For the low BAC drivers (0.01 – 0.079g/100mL), 65% were positive for drugs. The combination of low levels of alcohol with other drugs having CNS depressant properties such as marijuana, benzodiazepines, opiates and muscle relaxants, can cause impairment in a synergistic manner. When circumstances suggest poor or inattentive driving, and the blood alcohol is less than 0.08g/100mL, further assessment of the drivers sobriety, and collection of a blood sample should be standard procedure.

The data were examined for evidence of any relationship between the drug classes detected as a function of BAC, and the data are shown in Table 3.

Table 3. Relative frequency of major drugs/classes identified as a function of blood alcohol concentration†.

	Alcohol Negative (n=242)	Alcohol 0.01 - 0.079g/	Alcohol >0.08g/100mL (n=392)
Any impairing	47.5%	65.1%	48.9%
Cannabinoids	9.9%	58.0%	26.7%
Amphetamines	14.9%	6.9%	2.0%
Cocaine	2.4%	6.9%	4.8%
Opiates*	8.7%	27.9%	12.8%
Benzodiazepines*	4.1%	20.9%	8.9%

* Note: Opiates and benzodiazepines may be administered during emergency medical treatment prior to the collection of a forensic blood sample, therefore opiate and benzodiazepine rates should be interpreted with caution in this population.

† Columns will not total to 100% since many subjects were positive for more than one class of drugs.

Overall rates of drug positivity were high in all three groups. Therapeutic drug use was highest in the alcohol negative group with muscle relaxants, antiseizure medications, sleep aids and over the counter drugs being more frequently encountered than in the alcohol positive groups. These drugs can nevertheless cause driving impairment even when used according to directions. Rates of combined marijuana and alcohol use were dramatically higher in the alcohol positive groups, with cannabinoids being detected in 58% of low BAC drivers and 26.7% of high BAC drivers. Combined alcohol and marijuana use, particularly in young drivers has been demonstrated to cause synergistic impairment. Amphetamine use (principally methamphetamine) was highest among the alcohol negative drivers. Other studies have demonstrated relatively low rates of concomitant alcohol use among methamphetamine users.

In conclusion, this study documents the high frequency of combined drug and alcohol use among drivers suspected of impaired driving leading to vehicular assault or vehicular homicide. According to current practice, suspicion of drug use increases when a subject's low BAC is not consistent with their observed impairment, and these data validate that practice. In addition however, the data demonstrate that drug use is a factor throughout the range of BAC, and that investigators should be alert for indicia of drug use in any contact with a suspected alcohol impaired driver.

Toxicology, Impaired Driving, Drugs of Abuse

 ** Presenting Author*