



Pathology Biology Section – 2006

G45 Antemortem and Postmortem Toxicological Findings in Motor Vehicle Accidents, Maryland (2003-2004): Does Impairment Equal Death?

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After attending this presentation, attendees will understand the potential utility of adding toxicological screening for drugs to the routine testing of alcohol levels in individuals involved in motor vehicle accidents. Furthermore, attendees will better understand the individual, situational and regional factors associated with motor vehicle related fatalities.

This presentation will impact the forensic community and/or humanity by demonstrating a method to assist state officials in setting policy for the testing of substances of impairment involved in serious motor vehicle accidents. In addition, the presentation will impact the design of public alcohol and drug prevention programs by identifying at risk populations and consumption trends, assist law enforcement in the development of improved interdiction programs, and serve as a guide for future research among the forensics community.

In the state of Maryland, law enforcement personnel perform alcohol testing of individuals involved in motor vehicle accidents. The purpose of this research is to determine whether alcohol testing alone is a reasonable marker of impairment in motor vehicle accidents or whether full toxicological screening should also be required. In addition, this research identifies factors associated with use of alcohol and/or drugs in the driving fatality population with the goal of improving public policies and decreasing driving fatalities.

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The research methodology is based on a retrospective study of the motor vehicle accident fatalities that presented to the State of Maryland Office of the Chief Medical Examiner (OCME) and the motor vehicle accident injured population that presented to the University of Maryland Shock Trauma Center (UMSTC) between July 2003 and June 2004. The study sample included motor vehicle operators, passengers, pedestrians, motorcyclists and bicyclists. Outcome variables include the presence of alcohol alone, drugs alone, and both alcohol and drugs. In the fatalities, drugs included are those routinely tested for at autopsy at the OCME and include illicit drugs, prescription medications and over the counter medications. In the injured sample, drugs included the 18 drugs tested for at UMSTC.

Predictor variables include individual factors (e.g., decedent age, race, and gender), situations factors (e.g., vehicle type, single vs. multiple vehicles, driver vs. passenger, at fault vs. not at fault, safety equipment, and road conditions), and regional/geographic factors (e.g., access to trauma care). This approach is similar to that used in public health research, focusing on primary (before event), secondary (during event) and tertiary (after event) factors, as they pertain to injury-causing events.

Using various descriptive and inferential statistical techniques, the following results were derived (for fatalities n=251; for injured n=2,880). The fatality sample was predominately male (n=186), constituting 74%. Caucasians (n=147) and African-Americans (n=78) comprised approximately 90%. Decedent ages in both populations ranged from 13 to 65 years. Of the fatality sample, 50.6% tested positive for alcohol and/or drugs, 39.4% tested positive for alcohol alone, 12.4% tested positive for alcohol and drugs, and 11.2% tested positive for drugs alone. Of the injured sample, 22.3% tested positive for alcohol and/or drugs, 16.5% tested positive for alcohol alone, 2.6% were positive for both alcohol and drugs, and 5.8% were positive for drugs alone.

The results suggest that alcohol is a good indicator of driving impairment, as approximately 40% of the fatality sample and 16.5% of the injured sample tested positive for its presence. However, nearly half of the fatality sample and 69% of the injured sample that tested positive for drugs would have been missed by alcohol screening only. Therefore, the ability to determine impairment following motor vehicle accidents may be improved by expanded toxicological studies.

Toxicology, Alcohol, Motor Vehicle Accidents