COMPARABILITY OF ALCOHOL AND DRUG USE IN INJURED DRIVERS

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Summary. During a recent five month period, 201 injured drivers were admitted to a Level I trauma center. Blood alcohol concentrations (BAC) and drug screens were obtained in 187 and 164 subjects, respectively. BACs were positive in 37% and drugs were confirmed in 40% suggesting that alcohol and drug use among injured drivers is comparable. Over half of drivers using alcohol had detectable drugs on the screening examination. These data indicate that the drug problem on our highways may be greater than previously recognized. The concurrent appearance of drugs and alcohol calls for further study of potentially synergistic effects.

Introduction

Alcohol abuse is recognized by epidemiologists and researchers and increasingly by the lay public as a major contributing factor in motor vehicle crashes and fatalities resulting therefrom. While alcohol is appropriately classified as a drug, other drugs have captured the attention of our political leaders, the media and our citizenry as well. The pervasiveness of drugs in our society is often alluded to, but the role of drugs and their relationship to highway safety remains a matter of some conjecture. Recent reports concerned with hospitalized trauma patients cite the incidence of drug involvement at 35-40% (1,2).

The increasingly frequent presentation of injured patients "under the influence" but who yielded negative BACs led to this prospective survey of drug use among a hospitalized population of injured drivers transported to a regional Level I trauma center. It should be noted that this is not an inner city population but one representing a general mix of medium-sized city, surburban and rural inhabitants.

Method

This study was conducted at the University of Tennessee Medical Center at Knoxville, a 600-bed designated Level I trauma center. Beginning in January, 1985, blood alcohol concentrations (BACs) were routinely obtained from all injured patients admitted to the trauma service. However, in March 1988, the admission trauma protocols were changed to include a urine drug screen. All injured drivers 15 years of age and older admitted to the trauma service between March 1, 1988 and July 31, 1988 were included in this study.

Blood specimens for BACs were collected via peripheral or femoral venipuncture and urine specimens for drug screens were obtained when the urinary catheter was inserted. Both specimens were normally obtained within minutes of the patient's arrival in the Emergency Department. The specimens were labeled and carried to the laboratory for immediate analysis. All urine specimens were tested using the EMIT homogenous enzyme immunoassays on the Dupont ACA IV analyzer. The following drugs were sought:

Opiates (e.g. morphine, codiene)
Cocaine metabolite benzoylecgonine
Amphetamines
Barbiturates
Benzodiazapines (including valium, librium)
Cannabinoides (marijuana)

A cut-off of 50ng/mg was established for the cannibinoid assay. BACs were analyzed on the Bazter Paramaz analyzer using the alcohol dehydrogenase method.

Prehospital records were reviewed to determine if the patient received medication that would effect the drug screen prior to admission. For example, if patients received morphine and valium prior to transport, the positive results were invalidated.

Significance between groups was testing using Chi-Square.

Results

During the study period 201 drivers were admitted to the trauma service. The majority were male (71%), under 30 years of age (61%), unrestrained (73%), and survived (97%). The mean Injury Severity Score (ISS) for all admitted car crash victims was 15, with a range of 1-75.

Urine drug screens were obtained from 164 (82%) of the drivers and BACs were obtained from 187 (93%). BACs were positive in 37% of the drivers and 40% were positive for drugs (Table 1, 2).

Drugs were identified in 50% of the uninsured drivers compared to 32% of the insured drivers ($p=.02$). Results of drug or alcohol testing did not appear to determine the use of restraints ($p=.095$), ISS ($p=.643$), or days in hospital ($p=.568$). One half (53%) of the young males (15-35 years) were positive for drugs compared to 30% of young females. Of the drivers who were positive for alcohol, 57% were also positive for drugs.

DISCUSSION

The underlying role of alcohol in trauma is widely known (3). Although the relationship between drugs and violence is readily apparent, the relationship between drugs and highway crashes is unproven. Unlike alcohol, in which the concentration in the blood is proportionally related to measurable impairment, the relationship for drugs, indeed, whether a relationship exists at all, has been poorly characterized. Variation likely exists between drugs and among similar and dissimilar groups of drugs. In this study no attempt was made to determine the patient's level of impairment at the time of injury. In addition, the relationship between alcohol/drug use and motor vehicle crashes was not sought. Although considered unlikely, this study does not disprove the possibility that alcohol/drug use among drivers not in motor vehicle crashes was just as high as it was among the study group of injured drivers.

In a study of acutely injured patients, 100% compliance with this type of research protocol is unachieveable. Drug and alcohol assays were obtained in 82% and 93% of patients, respectively. Reasons for omission varied. At the beginning of the study, unintentional omissions were noted and corrected.

Throughout the study period, all patients who went directly from the helipad to the operating room (bypassing the Emergency Department), did not have a urine drug screen obtained due to the emergent situation. Patients in shock who were briefly resuscitated prior to transport to the operating room frequently did not have enough urine available for specimen collection.

As the study progressed and the high rate of alcohol and drug detection became apparent, a subgroup of subjects was restudied to determine whether a "legal" BAC or drug screen was requested by law enforcement officials in addition to the laboratory determinations defined herein. (Table 3) Of these 87 patients with BACs>.05 and/or positive drug screens, only 20 were tested further by law enforcement agencies, including just three subjects for drug use. One driver, although negative for alcohol, was positive for cocaine, opiates, amphetamines, THC and benzodiazipines. No legal BAC or drug screen was requested.

Conclusions

1. Alcohol (37%) and drug (40%) use among injured drivers was comparable, suggesting that the drug problem may be greater than previously recognized.

2. Injured drivers with positive drug screens were less likely to have insurance.

3. Over one half of the drivers positive for alcohol were also positive for drugs.

4. The association of drug and alcohol use suggests the need for study of synergistic effects.

References

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2. Rivara, F.P., Mueller, B.A., Fligner, C.L., et. al.: Drug use in trauma victims. J of Trauma, 29:462-470, 1989.

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Table 1

Results of Drug Screens
(N=164)

Marijuana	52 (32%)
Benzodiazapine	20 (12%)
Cocaine	9 (5%)
Opiates	9 (5%)
Amphetamines	4 (2%)
Barbiturates	2 (1%)

Table 2

Number of Drugs Identified
(N=164)

1 drug	=	40 (24%)
2 drugs	=	21 (13%)
3 drugs	=	3 (2%)
5 drugs	=	1 (-)

Table 3

East Tennessee Driver with Positive BACs* and/or Drug Screens

Medical vs Legal Tests

N=87

Medical Test	Legal BAC	Legal Drug Screen	Legal BAC and Drug Screen
Positive BAC only (N=28)	6 (21%)	0	0
Positive Drug Screen only (N=29)	2 (7%)	0	1 (3%)
Positive for BAC and Drug Screen (N=30)	9 (30%)	0	2 (7%)

*BAC>.05 (Six drivers had BACs between .05 and .09)