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Injuries and Alcohol Involvement

The Connecticut Injury and Alcohol Project recently completed a 3-year collaborative effort between the Injury Prevention Program of the Department of Public Health (DPH); the Department of Surgery, Yale University School of Medicine; and the Department of Emergency Services, Yale-New Haven Hospital (YNHH). The project was funded through a cooperative agreement with the Centers for Disease Control and Prevention (CDC). The purpose of the project was to determine whether a brief intervention concerning alcohol use would reduce repeat Emergency Department (ED) visits among injured alcohol-using patients (1). This report describes the study population. Of those enrolled in the study, 17% of crash injuries and 22% of fall injuries may have involved alcohol.

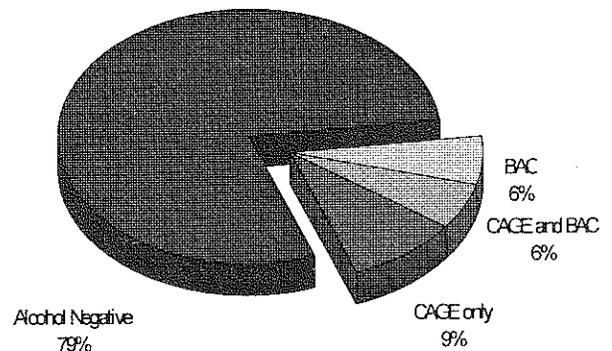
Recruitment of project participants, screening for alcohol use, and data collection were performed in the YNHH ED. Project participants were enrolled from June 1, 1995 through June 30, 1996. Patients aged ≥ 18 years who presented with injuries not resulting in a hospital admission were eligible for inclusion in the project. Patients were screened for the presence of alcohol and indicators of alcohol use.

Blood alcohol concentrations (BAC's) were determined either from a blood sample or, as in most cases, from a saliva test strip. Alcohol detecting saliva strips are easy to use and are highly reliable (2). A BAC above 0.02% was considered positive for alcohol use.

Because a negative BAC does not eliminate the possibility of an alcohol problem (3,4), screening for indicators of alcohol problems and/or a history of alcohol use was determined by responses to the CAGE questionnaire (5). CAGE is an acronym/mnemonic for: Have you ever felt the need to Cut down on your drinking? Do you feel Annoyed by people complaining about your drinking? Do you ever feel Guilty about your drinking? Do you ever drink an Eye opener in the morning to relieve the shakes? Persons responding yes to one or more of these questions were considered to have a problem with alcohol.

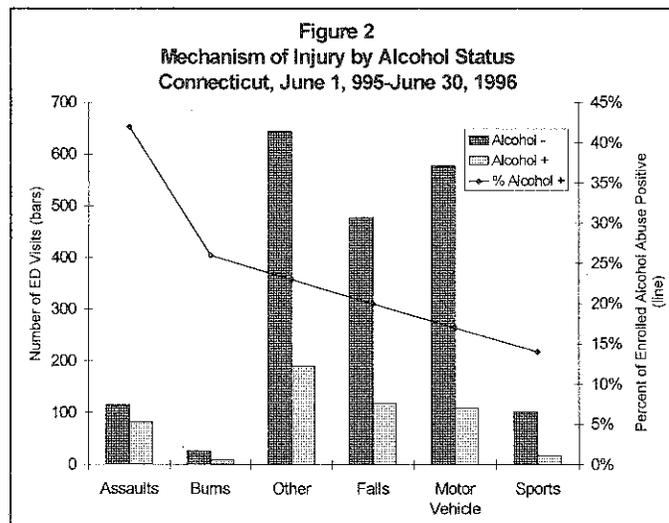
During the 13-month course of the project, the ED treated 9,372 injured patients eligible for inclusion in the project (Table 1). Of the 2,439 (26%) cases enrolled in the project, 525 (22%) tested positive for a possible problem with alcohol use by either the CAGE questionnaire (9%), BAC (6%), or both (6%) (Figure 1).

Figure 1
Alcohol Abuse Screening Results
Connecticut, June 1, 1995-June 30, 1996



Overall, injured persons seen in the ED were most likely to be single (555/9348, 59%), white (5297/9341, 57%), younger than 35 years of age (5379/9367, 57%), or male (5268/9369, 56%). In the alcohol-using group, the majority of patients were single (395/523, 75%), male (393/525, 75%), under 35 years of age (317/525, 60%), or white (266/522, 51%); proportions that differ from those in the overall group. Eleven percent of alcohol-users were under the legal drinking age.

Among enrolled patients, falls and motor vehicle crashes accounted for 51% (1251/2437) of ED injury visits at YNHH, while assaults, burns and sports injuries accounted for 14% (351/2437) of injuries. The percentage of alcohol-related injuries varied by the mechanism of injury (Figure 2). Although assaults accounted for only 8% (197/2437) of injuries, 42% (82/197) of all assault patients tested positive for the presence or use of alcohol. The percentage of alcohol involvement among enrolled patients by mechanism of injury ranged from 14 to 42% (Table 1).



Editorial note: Motor vehicle crashes are the single leading cause of injuries seen in hospital EDs and trauma centers in the United States (US) (6). Alcohol involvement in fatal motor vehicle crashes is 41% nationally and 43% in Connecticut (7,8). Nonfatal motor vehicle crashes are less vigorously investigated; therefore, the degree of alcohol involvement is unknown though estimates of 25% to 35% are common (9).

One third of all subcritical injuries seen in the YNHH's ED during the enrollment period were due to motor vehicle crashes. Seventeen percent of these crash injuries involved alcohol use by the

injured person. The lower than expected proportion of alcohol-involved crash injuries most likely occurred as a result of limited screening and enrollment seen in the trauma unit, a section of the ED that treats a majority of motor vehicle crashes.

The second leading cause of unintentional injury deaths in both the US and Connecticut is injury from falls (10). The elderly and persons drinking alcohol are at highest risk(6). The risk of dying from a fall is 16 times greater for alcoholics than for the general public (11). One study found that 40% of fatal fall injuries involved alcohol (9). The extent of alcohol involvement in nonfatal falls is unknown. A Finnish study found that alcohol involvement occurred among 53% of admitted fall patients (12). Among patients enrolled in the YNHH ED study, fall related injuries accounted for 24% of all ED visits. Of these, 20% screened positive for alcohol use or potential alcohol problem.

The highest percentage of injury patients who tested alcohol positive (BAC and/or CAGE) in the YNHH ED were among assault (42%) and burn (26%) patients. Other studies on violence-related injuries found alcohol involvement to range from 45% to 70% (13). Limited data exist on the prevalence of alcohol use among burn patients. Findings from one study indicate that the largest predisposing factor for burns was alcohol (14). A Finnish reviewer estimated that alcohol was involved in 50% of house fire deaths (15).

A relationship between injury and alcohol consumption has been demonstrated in various studies conducted in trauma centers and hospital emergency departments (2,3,13,16,17). In most cases, injured patients who present for treatment in these facilities are more likely than noninjured patients to have alcohol involvement (16,18,19). For motor vehicle crashes, a dose response relationship has been demonstrated (20). There is an increased risk of motor vehicle crashes beginning with BAC's as low as 0.05%. The risk increases exponentially as alcohol levels increase. Based on self-reported alcohol use, injury rates increase as alcohol intake increases (21).

While this study did not address the causal relationship between alcohol and injury, it does suggest a high prevalence of possible underlying alcohol problems among the population seeking treatment for injuries at the YNHH ED. The association between alcohol and motor vehicle

crashes is well known and has been extensively documented. Although less is known about the association between alcohol and other mechanisms of injuries, it is apparent from this and other studies that a significant proportion of all types of injury may involve alcohol.

For additional information contact the Injury Prevention Program DPH at (860) 509-7793.

Acknowledgment

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References

1. Rivara F, Koepsell T, Jurkovich G, Gurney J, Soderberg R. The effects of alcohol abuse on readmission for trauma. *JAMA*. 1993;270:1962-1964.
2. Clifford P, Sparadeo F, Minugh A, Nirenberg T, Woolard R, Longbeach R, Becker B. Identification of hazardous/harmful drinking among subcritically injured patients. *Acad. Emerg. Med.* 1996;3:239-245.
3. Cherpitel C. Alcohol and injuries: a review of international emergency room studies. *Addiction*. 1993;88:923-937.
4. Rivara F, Jurkovich G, Gurney J, Seguin D, Fligner C, Ries R, Raisys W, Copass M. The magnitude of acute and chronic alcohol abuse in trauma patients. *Arch Surgery*. 1993;128:907-913.
5. Ewing J. Detecting alcoholism, The CAGE questionnaire. *JAMA*. 1984;252:1905-1907.
6. Hingson R, Howland J. Alcohol and non-traffic unintended injuries. *Addiction*. 1993;88:877-833.
7. National Highway Traffic Safety Administration, Traffic safety facts 1995. A compilation of motor vehicle crash data from the fatal accident reporting system and the general estimates system.
8. Connecticut Department of Transportation, State of Connecticut fiscal year 1997 highway safety strategic plan. Department of Transportation.
9. Lowenfels A, Miller T. Alcohol and trauma. *Ann of Emerg Med.* 1984;13:1056-1060.
10. United States Department of Health Services, NCHS vital statistics, injury mortality, national summary of injury mortality data 1987-1993
11. Smith G. Alcohol and residential, recreational, and occupational injuries: A review of the epidemiological evidence. *Ann Rev Public Health*. 1988;9:99-121.
12. Honkanen R, Ertama L, Kuosmanen P, Linnoila M, Alha A, Visuri T. The role of alcohol in accidental falls. *J Studies on Alcohol*. 1983;44:231-245.
13. Cherpitel C. Alcohol and violence-related injuries: an emergency room studies. *Addiction*. 1993;88:79-88.
14. MacArthur J, Moore J. Epidemiology of burns: the burn-prone patient. *JAMA*. 1975;231:259-263.
15. Honkanen, R. Alcohol in home and leisure injuries. *Addiction*. 1993;88:939-944.
16. Becker B, Wollard R, Nirenberg T, Minugh A, Longabaugh R, Clifford R. Alcohol use among subcritically injured

emergency department patients. *Academic Emergency Medicine*. 1995;2:784-790.

17. Cherpitel, C. Injury and the role of alcohol: County-wide emergency room data. *Alcoholism: Clinical and Experimental Research*. 1994;18:679-684.
18. Gentilello L, Duggan P, Drummond D, Tonnesen A, Degner E, Fischer R, Reed R. Major injury as a unique opportunity to initiate treatment in the alcoholic. *American Journal of Surgery*. 1988;156:558-561.
19. Longabaugh R, Minugh A, Nirenberg T, Clifford P, Becker B. Injury as a motivator to reduce drinking. *Acad. Emerg. Med.* 1995;2:817-825.
20. Council on Scientific Affairs. Alcohol and the driver. *JAMA*. 1986;255:522-527.
21. Anda R, Williamson D, Remington P. Alcohol and fatal injuries among US adults. Findings from the NHANES I Epidemiological follow-up study. *JAMA*. 1988;260:2529-2532.

Alcohol-Impaired Driving



Motor vehicle crashes are a leading cause of death in the United States for persons from 1 to 34 years of age.



41.3% of the 41,693 traffic fatalities in 1995 were alcohol-related (i.e., either the driver or nonoccupant (e.g., pedestrian) had a BAC equal to or greater than 0.01 g/dL in a police-reported crash).



A driver with an alcohol concentration of 0.10 (the legal limit in many states) or greater is 7 times more likely to be involved in a fatal motor vehicle crash than is a driver who has not consumed alcoholic beverages, and a driver with an alcohol concentration of 0.15 or greater is about 25 times more likely.



From 1982 through 1995, the number of alcohol-related traffic fatalities decreased 31%, from 25,165 to 17,217.



Approximately 40% of persons will be involved in an alcohol-related crash during their lifetime.



In 1990, alcohol-related crashes cost \$46.1 billion, including \$5.1 billion in medical expenses.



By the Year 2000, the U.S. Public Health Service wants to reduce alcohol-related motor vehicle crash deaths to no more than 5.5 per 100,000 population. (In 1994, the rate of deaths from these crashes was 6.4 per 100,000 population.)



By 2005, the U.S. Department of Transportation wants to reduce alcohol-related traffic fatalities to 11,000.

Table 1

Emergency Department Subcritical Injury Patients
Connecticut, June 1995-June 1996

Categories	Total Injured	Enrolled	Enrolled Alcohol +
All Patients	9372	2439 (26%)*	525 (22%)**
Gender			
Males	5268	1378 (26%)	393 (29%)
Female	4101	1061 (26%)	132 (12%)
Race/Ethnicity			
Black	2864	803 (28%)	199 (25%)
White	5297	1346 (25%)	266 (20%)
Hispanic	1001	245 (24%)	51 (21%)
Asian	179	40 (22%)	6 (15%)
Age			
18-20	1041	241 (23%)	56 (23%)
21-24	1301	318 (24%)	86 (27%)
25-34	3037	801 (26%)	175 (22%)
35-44	1842	535 (29%)	118 (22%)
45-54	879	239 (27%)	54 (23%)
55-64	483	130 (27%)	15 (12%)
65-74	337	86 (26%)	17 (20%)
75-84	300	61 (20%)	4 (7%)
85+	147	28 (19%)	0 (---)
Marital Status			
Single	5555	1464 (26%)	395 (27%)
Married	2714	677 (25%)	78 (12%)
Other	1079	294 (27%)	50 (17%)
Injury Mechanism			
Assaults	852	197 (23%)	82 (42%)
Burns	152	35 (23%)	9 (26%)
Falls	2097	595 (28%)	118 (20%)
Motor Vehicle	3156	656 (21%)	109 (17%)
Sports	504	119 (24%)	17 (14%)
Miscellaneous	2600	835 (32%)	190 (23%)

* percent of total patients ** percent of enrolled patients

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