

Alcohol Use and Interpersonal Violence: Alcohol Detected in Homicide Victims

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Abstract: To characterize the relationship between alcohol use and homicide victimization, we used data from the Los Angeles City Police Department and the Los Angeles Medical Examiner's Office to study 4,950 victims of criminal homicides in Los Angeles in the period 1970-79. Alcohol was detected in the blood of 1,883 (46 per cent) of the 4,092 victims who were tested. In 30 per cent of those tested, the blood alcohol level was ≥ 100 mg/100 ml, the level of legal intoxication in most states. Blood alcohol was present most commonly in victims who were male, young, and Latino,* categories where rates have been increasing at an alarming pace. Alcohol was

also detected most commonly in victims killed during weekends, when homicides occurred in bars or restaurants, when homicides resulted from physical fights or verbal arguments, when victims were friends or acquaintances of offenders, and when homicides resulted from stabbings. The evidence for alcohol use by homicide victims focuses attention on the need for controlled epidemiologic studies of the role played by alcohol as a risk factor in homicide and on the importance of considering situational variables in developing approaches to homicide prevention. (*Am J Public Health* 1986; 76:144-149.)

Introduction

The use of alcohol and other drugs has long been suspected as a possible risk factor for homicide victimization.¹ Because homicide is now recognized as a major cause of premature mortality in the United States, recent public health initiatives have emphasized the need to define better the role of alcohol and other risk factors for homicide victimization and perpetration.²

Alcohol use could relate to an increased risk of homicide victimization in several ways.³⁻¹⁰ Alcohol could increase the likelihood of risk-taking and provocative behavior by some potential victims; this might, in turn, lead to violent interactions and homicide. Wolfgang originally advanced the concept that such homicides are victim-precipitated.³ This hypothesis is consistent with the known physiological action of alcohol which, acting as a central nervous system depressant, may release inhibitory control mechanisms and thereby permit expression of aggressive or violent behavior.⁸ Alternatively, individuals who are intoxicated may be easier targets for robberies and other predatory crimes that often end in homicide. Clinical and experimental research has addressed the questions of whether alcohol use increases risk-taking behavior, whether behavioral effects of alcohol are modulated by the presence of congeners, and whether alcohol use and instigator intent are important in shaping aggressive behavior.^{7,9,10} However, experimental data concerning the hypothetical role played by alcohol are still inconclusive.

Most studies of the relationship between alcohol use and homicide reported in the literature have been subject to a variety of methodologic constraints.¹¹⁻¹⁸ Many studies have been limited by their reliance on a history of alcohol use by victims and/or offenders prior to the homicide. Such historical accounts of alcohol use given by a variety of informants represent, at best, only a crude proxy for level of blood

alcohol at the time of the homicide¹⁹; this limits the interpretation of findings as they relate to biologic and behavioral effects of alcohol on homicide occurrence. A second limitation has been the limited field of demographic and situational variables available for examination (situational variables have been defined as factors which describe a person's engagement with an array of other persons, objects, and/or actions over a period of time).²⁰ Recent evidence suggests that alcohol consumption and subsequent behavior of people who are drinking can be profoundly influenced by the situation or environment within which the drinking takes place.^{21,22} Third, many of the previous reports about alcohol and homicide are based on studies of restricted, unrepresentative samples of victims rather than on large population-based samples.¹⁸

This paper reports results of a study of blood alcohol levels detected in homicide victims who were killed in Los Angeles between 1970 and 1979. Specifically, the study examines how blood alcohol levels in homicide victims are related to demographic characteristics of these victims and to situational characteristics of the homicide event.

Methods

Information about alcohol levels in homicide victims was collected as part of a study, initiated in 1980, of all homicides that occurred in the city of Los Angeles from 1970 to 1979.²³ The city of Los Angeles comprises 464 square miles within Los Angeles County, and in 1980 had an estimated population of approximately 3 million. For the 10-year period studied, a total of 4,950 criminal homicides (i.e., death due to injuries illegally inflicted by another person with intent to injure or kill, by any means) occurred in the city. The average crude annual rate of homicide for Los Angeles for this period was 17.1 per 100,000 population, but rates increased 84 per cent over the decade from 12.5 per 100,000 in 1970 to 23.0 per 100,000 population in 1979. Homicide rates also varied dramatically among different sex, age, and race-ethnic groups; rates were higher among males (27.0 per 100,000), persons who were 25 to 34 years old (26.9 per 100,000), and Blacks (45.6 per 100,000).

Demographic characteristics of victims and perpetrators, and details about the homicides were obtained from

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Editor's Note: See also related article p 139 this issue.

TABLE 1—Blood Alcohol Levels in Homicide Victims by Sex of Victim, Los Angeles, 1970–79*

Blood Alcohol Level (mg%)	Sex of Victim					
	Male		Female		Total	
	No.	%	No.	%	No.	%
0	1,538	48.7	633	74.2	2,171	54.1
1–99	545	17.3	93	10.9	638	15.9
100–199	594	18.8	69	8.1	663	16.5
200–299	377	11.9	43	5.0	420	10.5
300–399	94	3.0	13	1.5	107	2.7
400+	11	0.4	2	0.2	13	0.3
TOTAL	3,159	100.0	853	100.0	4,012	100.0

*Excludes 80 homicides for which there were no data on sex of victim.

confidential police files.²³ In this study, Latinos* are defined as persons of Latin American origin (in Los Angeles, this group includes not only Mexican-Americans, but also substantial representation by immigrants from Central America and other Latin American locations); White refers to persons who are not of "Hispanic" origin but who are White; Black refers to persons who are not of "Hispanic" origin but who are Black. Situational characteristics include the day of week on which the homicide occurred, the specific location where the homicide occurred, the nature of the circumstances which culminated in the homicide, the relationship(s) between persons involved in the homicidal encounter, and the actual method or weapon responsible for the homicide.

Results of toxicologic analyses performed during autopsies of homicide victims were abstracted from files of the Los Angeles Medical Examiner-Coroner and linked to the data obtained from the police files. During the period 1970–79, autopsies were routinely performed on all homicide victims in Los Angeles. As part of the autopsy, blood samples usually were first screened with permanganate and then analyzed by gas chromatography to assay and quantify alcohol levels²⁴ (also personal communication, J. Choi, MD, June 5, 1984).

Results

Testing of blood samples for alcohol levels was completed in 4,092 (82.7 per cent) of the 4,950 victims. Assays were not performed for 858 (17.3 per cent) of the victims for several reasons: testing of blood samples may have been precluded because too much time had elapsed between the homicidal injury and death (e.g., following prolonged hospitalization or because of advanced decomposition of the corpse); the medical examiner may have deemed testing of blood samples for alcohol as unnecessary, for example if victims were children; testing was not done at the time of autopsy because the case had not yet been classified as a homicide. Except for 1970, when the proportion of victims tested for alcohol presence was 76.4 per cent, the proportions tested varied little by year (1971 to 1979, range: 83.6 to 87.4 per cent). When examined by sex or by race-ethnicity, the proportions of victims not tested were similar among subgroups. However, test status varied markedly by age group-

ing: 49.8 per cent of those less than age 15 years and 25.2 per cent of those over age 65 years were not tested compared to only 11.9 per cent of victims in the 15- to 64-year age group.

Alcohol was detected in 1,883 (46 per cent) of the victims who were tested; levels ranged from 1 mg per 100 ml (1 mg per cent) to 870 mg per cent. In 15.9 per cent of the victims, levels were \leq 99 mg per cent; however, in 30 per cent of the victims, blood levels were \geq 100 mg per cent, the level of legal intoxication in most states. Male homicide victims were almost twice as likely to have detectable alcohol levels in their blood as were females: detectable levels were found in 51.3 per cent of males and 25.8 per cent of females (Table 1). Levels of \geq 100 mg per cent were detected in 34.1 per cent of males and in 14.8 per cent of females.

Blood alcohol levels varied markedly by race-ethnicity. Latino victims, as a group, were observed to have the highest proportions of detectable alcohol (57 per cent), in contrast to 47.7 per cent of Blacks and 34.6 per cent of Whites (Table 2). Levels were \geq 100 mg per cent in 38.2 per cent of Latinos, 31.8 per cent of Blacks, and 20.5 per cent of Whites. Approximately one-half of all victims in the 25- to 64-year age group showed evidence of alcohol use prior to their homicide, and more than one-third of all persons in this group had alcohol concentrations \geq 100 mg per cent (Table 2).

Alcohol levels were also examined in relation to age and race-ethnic groupings in males. The proportions of victims with any detectable level of alcohol were generally lowest among Whites (Figure 1). Alcohol was present in more than half of the Black males in the 25 to 64 year age groups, and in 70.4 per cent of Latino victims in the 25–34 year age group. Among female victims, the proportion with any detectable level of alcohol also varied by race-ethnic group: 19.4 per cent in Latinos, 23.2 per cent in Whites, and 29.1 per cent in Blacks.

When blood alcohol levels were examined by day of the week, alcohol was detected in markedly greater proportions of persons killed on weekend days than on midweek days: Monday, 41.7 per cent; Tuesday, 38.1 per cent; Wednesday, 36.1 per cent; Thursday, 37.2 per cent; Friday, 50.7 per cent; Saturday, 55.5 per cent; Sunday, 53.4 per cent). When examined by year and in the aggregate by month of occurrence, no temporal trends were observed and alcohol presence generally showed minimal variation. Proportions of victims with any detectable level ranged from 40.1 per cent of victims in July to 51.6 per cent in September, while those who were legally intoxicated ranged from 26.1 per cent of victims in July to 35.3 per cent in September.

Evidence for alcohol use was greatest among persons

*Editor's Note: The authors would have preferred the term "Hispanic," used in official statistics and commonly used by many scientists. The Journal prefers the term "Latino" to the term "Hispanic" when exact national origin cannot be specified. Most Latin Americans in the United States have come from Central America and the Caribbean, and have little or no Spanish ancestry, although they may have Spanish surnames.

TABLE 2—Blood Alcohol Levels in Homicide Victims by Age and by Race/Ethnicity of Victim, Los Angeles, 1970–79*

Demographics	Number of Victims	Per Cent of Victims with Blood Alcohol Level			Total Percent
		0 mg%	1–99 mg%	≥100 mg%	
Race/Ethnicity					
White	1,027	65.4	14.1	20.5	100.0
Black	1,914	52.3	15.9	31.8	100.0
Latino	911	43.0	18.8	38.2	100.0
Other	98	66.3	9.2	24.5	100.0
Age Group (years)					
<15	125	86.4	4.0	9.6	100.0
15–24	1,141	57.4	19.4	23.2	100.0
25–34	1,097	48.7	17.7	33.6	100.0
35–44	615	46.8	12.2	41.0	100.0
45–54	448	47.8	12.7	39.5	100.0
55–64	250	50.8	16.4	32.8	100.0
65+	261	77.8	10.0	12.3	100.0

*Excludes 142 homicides for which there were no data on race/ethnicity of victim and 155 homicides for which there were no data on age of victim.

killed in bars or restaurants. Alcohol was detected in 75.1 per cent of those killed in bars or restaurants in contrast to 38.6 per cent to 50.0 per cent of those killed at other types of sites (Table 3). Alcohol was detected in 67.9 per cent of victims when a physical fight was the crime circumstance leading to homicide, in 55.0 per cent of victims involved in verbal arguments, in 48.3 per cent of victims in gang-related homicides, and in approximately one-third of victims in other crime circumstance categories (Table 3).

In general, presence of alcohol appeared to be associated with the nature of the relationship between victim and suspect. In relationships for which the suspect was known to the victim, alcohol was detected in 38 per cent to 53.1 per cent of victims (Table 3). However, when the suspect was a stranger, alcohol was present in only 37.1 per cent of victims. The likelihood of the victim being intoxicated was greatest when the suspect was a friend or acquaintance of the victim, or was the victim's spouse; in those relationships, alcohol was ≥ 100 mg per cent in 38.1 per cent and 30.6 per cent of victims, respectively. Evidence of alcohol use was greatest among persons who were killed with cutting instruments

(58.6 per cent) in contrast to only 28.7 per cent of victims who were strangled (Table 3).

Discussion

The results of this study indicate that alcohol consumption was common in persons who were homicide victims in Los Angeles from 1970 to 1979. Moreover, because rigorous criteria specifying duration between time of injury and death were not used to exclude victims, the results probably underestimate the proportion of cases in which alcohol was present at the time of the homicidal encounter. Although previous investigations in other settings have demonstrated that alcohol use is common among homicide victims, the present study is unique. It examined all of the homicides that occurred in a defined, culturally heterogeneous community over an extended time period. Second, results of laboratory testing for alcohol presence were linked to the data file of each homicide victim; this file included information about victims and suspects, as well as details about the homicide event. Finally, this study setting provided the opportunity to examine alcohol use in Latino homicide victims and to compare these findings directly with patterns of alcohol use among Whites and Blacks.

In general, our findings reflected patterns of alcohol consumption that have been previously reported for different population subgroups.^{25–30} Most striking, however, was the evidence of use among male Latino victims, suggesting that this association may be a problem that warrants special attention.³⁰

Wolfgang found that alcohol use prior to the homicide had been reported for 53 per cent of the victims in Philadelphia^{3,4} and that for nearly 44 per cent of all homicides, alcohol use had been reported for both the victim and offender. Wolfgang also found that alcohol use was reported in 56 per cent of male victims but in only 42 per cent of female victims, and alcohol use (by victim and/or offender) was reported in 70 per cent of homicides with Black male victims versus 50 per cent for homicides with White male victims. Similarly, Voss and Hepburn¹¹ reported a history of alcohol use was associated with 54 per cent of all homicides in Chicago, and, in 54 per cent of homicides with non-White male victims versus 46 per cent for White male victims; and for females, 61 per cent non-White versus 47 per cent White victims.

The limited data on biochemical testing for alcohol

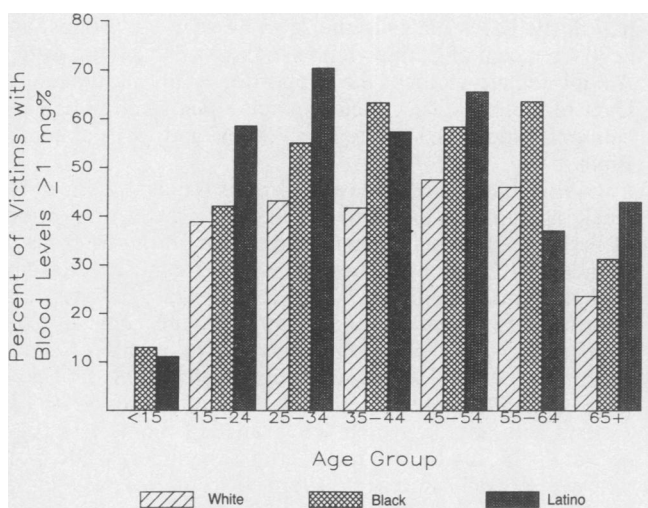


FIGURE 1—Blood Alcohol Detected at Any Level in Male Homicide Victims by Race/Ethnicity and Age Group, Los Angeles, California, 1970–79.

TABLE 3—Blood Alcohol Levels in Homicide Victims by Situational Characteristics, Los Angeles, 1970–79*

Situational Characteristics	Number of Victims	Per Cent of Victims with Blood Alcohol Level			Total Percent
		0 mg%	1–99 mg%	≥100 mg%	
Site of Occurrence					
Bar/Restaurant	161	24.8	15.5	59.6	100.0
Unknown	497	48.1	15.7	36.2	100.0
Street	868	50.0	16.9	33.1	100.0
Home	1,772	57.1	15.9	27.1	100.0
Business	199	60.3	12.1	27.6	100.0
Other	595	61.3	15.6	23.0	100.0
Crime Circumstance					
Physical Fight	434	32.0	15.4	52.5	100.0
Verbal Argument	1,385	45.1	16.9	38.1	100.0
Gang-related	209	51.7	26.8	21.5	100.0
Other	262	64.1	15.7	20.2	100.0
Crime-related	1,032	65.8	14.3	19.9	100.0
Sex-related	211	65.9	12.8	21.3	100.0
Child Abuse/Neglect	24	92.3	3.9	3.9	100.0
Victim/Suspect Relationship					
Friend/Acquaintance	1,277	46.8	15.0	38.1	100.0
Unknown	444	48.4	19.4	32.2	100.0
Spouse	386	52.8	16.6	30.6	100.0
Intimate Acquaintance	158	53.2	20.2	26.6	100.0
No Suspect	504	56.7	16.3	27.0	100.0
Other Non-family	233	59.2	17.2	23.6	100.0
Other Family	192	62.0	15.6	22.4	100.0
Stranger	898	62.9	13.6	23.5	100.0
Method of Homicide					
Cutting	1,014	41.4	15.1	43.5	100.0
Long Gun	507	51.9	16.8	31.4	100.0
Hand Gun	1,896	57.1	17.8	25.1	100.0
Bludgeon	310	59.7	11.6	28.7	100.0
Strangulation	181	71.3	12.7	16.0	100.0
Other	171	73.1	7.6	19.3	100.0

*Excludes 535 homicides for which there were no data on crime circumstance and 13 homicides for which there were no data on method of homicide.

presence have been generally consistent with the findings reported by Wolfgang for history of alcohol use. Haberman and Baden in New York City found that alcohol was detected in 41.9 per cent of victims who were tested over a 12-month period in 1974–75, with 26.7 per cent having blood alcohol concentrations ≥ 100 mg per cent.¹² In Allegheny County, Pennsylvania, from 1966 to 1974 alcohol was detected in the blood of 42.4 per cent of the victims, while 31.8 per cent were legally intoxicated.¹³ In a study of homicides occurring in South Africa's Cape Peninsula in 1962, alcohol was detected in 64 per cent of adult victims; levels were ≥ 150 mg per cent in the majority of victims.¹⁴ More recently, in Erie County, New York, 32 per cent of homicide victims were found to be intoxicated at time of death.¹⁵

Compared with known information about homicide victims, data about homicide suspects are even more limited. Shupe reported on alcohol detected in the urine of homicide suspects who were arrested "during or immediately after" the commission of the crime in Columbus, Ohio, during 1951–53.¹⁶ Urine alcohol concentrations of ≥ 100 mg per cent were detected in 67 per cent, 88 per cent, 79 per cent, and 78 per cent of suspects arrested for murder, stabbing, shooting, and other assaults, respectively.

Considerations pertinent to the evaluation of the weekly time patterns illustrate some of the complexities associated with interpretation of variations associated with situational characteristics. For example, Wolfgang also noted that a history of alcohol use by victims and/or suspects was greater for homicides occurring on weekends (e.g., Saturdays, 73 per cent, versus Mondays, 41 per cent).³ In the Cape Peninsula

study, alcohol was detected in 72.2 per cent of persons killed on the three weekend days, but in only 16.1 per cent of weekday victims.¹⁴ Thus, despite major differences in the populations studied in these reports, the remarkably consistent patterns might suggest an hypothesis that increased use of alcohol causes more homicides. Alternatively, however, the increased presence of alcohol in victims killed on weekends may merely reflect daily patterns of alcohol use: patterns of alcohol consumption are cyclical and are characterized by a trough on Mondays and a crest on weekends.^{31,32} After noting this pattern in Boston, Argeriou proposed that the low frequency of homicides which occur on Tuesday reflects the low quantity of alcohol consumed the preceding day and night.³¹ Although different patterns of social interaction and increased patterns of alcohol consumption may account for part of the increased occurrence of homicides on weekends, analytical epidemiologic studies will be required to establish the proportion of the increase attributable to alcohol.

The detection of alcohol in large proportions of victims in certain settings is consistent with patterns of alcohol consumption that might be expected in those settings. For example, in the present study, more than 75 per cent of persons killed in bars or restaurants had used alcohol. Consuming alcohol while at bars or while attending parties or other celebrations may increase the risk of becoming a homicide victim, regardless of the intoxicating effects of alcohol, because individuals are more likely to be in a high-risk place or situation. A related hypothesis suggests that interpersonal aggression that occurs in a setting such as

a bar is a function of aversive stimuli present in the environment.³³ The evaluation of these hypotheses, however, requires estimates of blood alcohol concentrations in victims, offenders, and controls in different settings; attempts to obtain such data have been limited by various constraints.³⁴

The proportions of victims with detectable blood alcohol differed notably by crime circumstance. For example, victims killed during physical fights and in crime-related situations differed dramatically by likelihood of being intoxicated: 52.5 per cent of those in fights versus 19.8 per cent of crime-related victims. Similarly, in a study of homicides among White males murdered in Baltimore during a five-year period, blood alcohol was detected in 79 per cent of those killed in arguments, altercations, while committing crimes, or while resisting arrest in contrast to only 14 per cent of men who were robbery victims, "innocent bystanders," or otherwise not actively involved in events leading to the homicide.³⁵ The increased presence of alcohol in those killed during physical fights is compatible with hypotheses which posit that alcohol promotes aggressive behavior and aversive interaction. In contrast, a comparatively diminished overall presence of alcohol might be expected in persons killed during a perpetrator's commission of another crime; in this type of scenario, the victimization might be considered to have been only incidental.

Alcohol presence was most common in persons who were killed by knives and other cutting instruments (58.6 per cent), but was also detected in approximately 45 per cent of those killed by firearms. In comparison, 72 per cent of homicides resulting from stabbing in Philadelphia between 1948 and 1952 were associated with histories of alcohol use by victims and/or suspects, while 55 per cent of the homicides resulting from shootings had histories of associated alcohol use.³ In the Erie County report, blood alcohol concentrations of ≥ 100 mg per cent were present in 44 per cent of those killed by guns, 36 per cent by knives, and 17 per cent by personal weapons (i.e., hands or feet).¹⁵ Explanations for these patterns are unclear, but may be clarified by examining crime circumstance and victim characteristics.

Methodologic constraints in this and other descriptive studies must be addressed in future studies of the association between alcohol use and homicide victimization. First, and perhaps most important, is the need for measurements of blood alcohol levels in referent or "control" populations or in persons who are not homicide victims. In the absence of such specific measurements, estimates of relative or attributable risk are not possible. Second, in this study, it was not possible to determine whether homicide victims were chronic or only short-term alcohol users; most other studies employing biochemical measurement of alcohol have also faced this constraint. Information about alcohol use habits is not routinely collected during police investigations and can be only indirectly inferred through autopsy findings. Other methodologic complexities include variations in the pharmacologic effects of different types of alcoholic beverages, variations in physiologic and behavioral responses to alcohol among different persons, and the greater likelihood that alcohol use patterns may be similar in victim and perpetrator when they are acquaintances rather than when they are strangers.¹⁷

In this study, we took a descriptive approach to examine the relationship between alcohol use and homicide victimization. This approach alone cannot establish that alcohol is a risk factor for homicide. However, because alcohol consumption patterns are related to certain demographic char-

acteristics, and because of alcohol's known physiologic and behavioral effects, the role of alcohol must be further studied and considered when developing approaches to the prevention of homicide and other forms of interpersonal violence.

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Reproductive Health '86 Scheduled April 2-4 in Seattle

Health care practitioners may earn continuing education credits while increasing their knowledge of reproductive health issues during the 13th Annual Nurse Practitioner and Physician Assistants Continuing Education Conference, "Reproductive Health '86," April 2-4 in Seattle, Washington.

Dr. Pepper Swartz, co-author of *American Couples*, will keynote the conference with an address on the American family and how its changing nature affects our lives. Other general sessions will include a look at the United States role in international family planning, the future role of nurse practitioners in the provision of health care, and ethical issues facing health care professionals.

Twenty workshop sessions, scheduled April 3 and 4, address various subjects, ranging from protection against malpractice claims to sexually transmitted diseases. For nurse practitioners seeking prescriptive authority, a full day of pharmacology workshops will be held April 2.

All sessions will earn continuing education credits for registered nurses, nurse practitioners and physician assistants. The conference is open to anyone wishing to attend. Sponsors of the conference are the Center for Health Training and the Harbor General-University of California at Los Angeles Women's Health Care Nurse Practitioner Training Program under a grant from the United States Public Health Service, Family Planning Program, Region X.

To obtain a conference catalog and registration information, write or call the Center for Health Training, 157 Yesler Way, Suite 305, Seattle, WA 98104, (206) 447-9538. Registration *deadline* is March 2, 1986.