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Homicide Victims and Alcohol Related Consumption in Brazil

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Abstract

Introduction: Deaths due to external causes, mainly homicides, are a serious public health problem in Brazil. There is evidence that the tendency to impulsive and / or violent behavior is exacerbated after alcohol consumption. Otherwise, the relationship between alcohol and violent deaths is described in the medical literature without much precision.
Objective: Analyze the relationship between victims' blood alcohol levels and homicides, in the micro-region formed by some municipalities in Greater São Paulo.
Methods: Retrospectively, we reviewed the data from the medical records of 805 necropsies performed at the Medical Legal Institute of Sao Paulo (IML-SP) in Franco da Rocha, Brazil, from 2001 to 2017. Descriptive statistics were calculated to assess BAC testing status among decedents overall. The variables studied were sex, age, manner of death and blood alcohol level (BAC).
Results: Of the 230 individuals analyzed, 200 (86.9%) were male and 30 (13.04%) female. The most prevalent age range for males was between 18 and 23 years (19.5%). For the women group it was between 12 and 23 years (33.2%). The vast majority of homicides (n = 162, 70.4%) was due to firearms, followed by sharp force and blunt force trauma (13% each one). Of the 230 cases of homicide victims analyzed, 205 (89,1%) presented a positive blood alcohol level (BAC), e.g, over 0,3 mg/dl. In the group of homicide victims by firearm, 57 (24,7%) of them presented a median value of BAC of 1.3 mg/ml.
Discussion and Conclusions: The results of this study indicate that alcohol intoxication was common in homicide victims in Franco da Rocha from 2001-2017. It also confirms some findings from other researchers linking blood alcohol and deaths from unnatural causes. Our study showed that majority of victims are young adults, and most of them were under alcohol effect when they were murdered. So, the fact that the victims were drunk can contribute to the fatal outcome, in cases of homicide. This approach alone cannot establish that alcohol consumption is a risk factor for become a victim of homicide and further studies are necessary to a better comprehension of the effect of alcohol in homicide victims.

Keywords: Homicide; Mortality; Precision

Abbreviations: BAC: Blood Alcohol Concentration; IML-SP: Medical Legal Institute of Sao Paulo

Introduction

Deaths due to external causes are a serious public health problem in Brazil - being the third leading cause of mortality in the country [1]. In the other hand, homicide is the most serious crime committed against a person and embraces every mode of violent death [2]. Furthermore, there is evidence that the tendency to impulsive and / or violent behavior is exacerbated after alcohol consumption. As stated by Greene N. et al. [3] "scientific evidence has shown that effective population-level alcohol policies are not only

associated with reductions in excessive alcohol use, but also decreases in alcohol-related harms, such as violence".

Besides, countries with policies that reduce alcohol's affordability or days/hours of sales tend to have fewer alcohol-attributable homicides, regardless of their income level. Alcohol-attributable homicide rates are highest in low- and middle-income countries [3], as in Brazil.

Otherwise, the relationship between alcohol and violent deaths is described in the medical literature without much precision. For this reason, some authors believe that the role of "alcohol as a relevant factor in cases of sudden or unexpected or unnatural death seems to be underestimated" [4].

For example, Branas, et al. [5] state that the misuse of a firearm it is a necessary factor in the genesis of violence, but "alcohol is one such key modifiable factor" and "one large group of studies showed that over one-third of firearm violence decedents had acutely consumed alcohol and over one fourth had heavily consumed alcohol before their deaths."

However, there are not many studies in the medical literature that make this correlation with other types of violent death, highlighting (or excluding) alcohol consumption as a factor that increases the risk of the victim suffering a violent death mainly homicides[6]. On the other hand, despite this, the relationship between alcohol and both violent offending and victimization is firmly established. Previous studies have identified and documented the presence of alcohol among homicide victims in varied settings.

According to Shaw, et al. [7], in England and Wales, in a period of 1996-9, "Of the 1594 homicide perpetrators, more than one-third (42%) occurred in people with a history of alcohol misuse or dependence and 40% in people with a history of drug misuse or dependence. Alcohol or drug misuse played a contributory role in two-fifths of homicides. Alcohol played a major role in 52 (6%) and a minor role in 364 (39%) homicides."

In 2009, Andreucceti, et al. [8] in a preliminary cross-sectional study analyzed 2042 victims of homicides in 2005, in the city of Sao Paulo (Brazil) and found that alcohol was detected in blood samples of 43% of the victims. In their cohort, the prevalence of positive BAC levels was higher among men (44.1%) than women (26.6%). Firearms caused most of the deads (78.6%).

In a another study published in 2018, in the city of São Paulo, alcohol was the main substance consumed before the fatal event [9]. Welte, et al. [10], investigating 792 homicides that occurred in New York from 1972 to 1984, concluded that in some cases alcohol may be the causal factor in this type of death.

However, there are not many recent studies relating alcohol consumption and homicide victims. Kuhns, et al. [11] meta-analyzed 61 independent studies from 57 published manuscripts that report alcohol toxicology test results for homicide victims, in 2010. The authors found that "on average, 48% of homicide victims tested positive for alcohol, and 33% (using the 0.08 threshold) or 35% (using the 0.10 threshold) were determined to be intoxicated." The authors also show that "studies from populations in New York City report that between 30% and 40% of homicide victims tested positive for the presence of alcohol".

Naimi, et al. [12], in an extensive study carried out in the United States, reported that "Among all homicide victims, 39.9% had a positive blood alcohol concentration (BAC) including 13.7% with a BAC between 0.01%–0.79% and 26.2% of victims with a BAC ≥0.08%. Males were twice as likely as females to have a BAC ≥0.08% (29.1% vs. 15.2%; $p < 0.001$)."

Goodman, et al. [13] analyzed the relationship between alcohol use and 4590 homicide victims in Los Angeles (USA) in the period 1970-1979, reaching the following results: Alcohol was detected in the blood of 1.883 (46%) of the 4.092 victims who were tested. In 30% of those tested, the blood alcohol level was 2.100 mg/100 ml, the level of legal intoxication in most states.

Some studies have proposed and explored causal explanations beyond the correlation between alcohol consumption and the situational and demographic characteristics of homicide offenders and victims. Goldstein´s tripartite framework suggests that drug-related violence occurs because of the psychopharmacological effects of alcohol or because of other secondary factors, such as the violent nature of illegal drug users and markets. Probably proximal factors, including alcohol-related cognitive impairments, "dysfunctions such as disrupted decision-making, inability to process perceptual cues accurately, and increased reactive aggression" should be most important in the genesis of homicide victimization [11].

It is important to mention that routine activities theory argues that alcohol consumption reduces the ability to protect oneself and increases the likelihood of been viewed as a suitable target [14]. As Kuhns et al. [11] stated, "considered collectively, these perspectives emphasize the importance of studying why and how alcohol consumption

increases the risk for homicide victimization and exploring variations in alcohol-homicide victimization relationships across different populations, settings, times and homicide event circunstances".

Anyway, as we have already said, the correlation between alcohol use and abuse and violent deaths in general is poorly studied in Brazil, when it comes to fatal victims. Thus, the objective of this study is to analyze the relationship between victims' blood alcohol levels and homicides, in the micro-region formed by some municipalities in Greater São Paulo (Franco da Rocha, Caieiras, Mairiporã and Francisco Morato), which are served by the Medical Expertise Team Franco da Rocha of the Legal Medical Institute of the State of São Paulo.

Methods

The present study was approved by the Ethics Committee for Analysis of Research Projects - CAPPesq - of the Faculty of Medicine of the University of São Paulo, under number 0090/09, on 03/11/2009 and by the Scientific Committee of the Medical Legal Institute of the State of São Paulo.

Retrospectively, we reviewed the data from the medical records of 805 necropsies performed at the Medical Legal Institute of Sao Paulo (IML-SP) in Franco da Rocha, Brazil, from 2001 to 2017. We excluded 575 cases from the analysis whose autopsy showed death from natural causes or other forms of violent deaths. Only 230 cases of homicide were included in the study.

We analyzed statistically the data obtained using the SPS program. Descriptive statistics were calculated to assess BAC testing status among decedents overall. The variables studied were sex, age, manner of death and blood alcohol concentration (BAC). We considered BAC positive above 0.3 mg / dl (the limit that Brazilian law imposes on drivers when driving a vehicle).

We collected 10 ml blood samples during autopsies, preferably taken from the right femoral vein to perform the blood alcohol concentration (BAC) measurement. Nucleus of Forensic Toxicology of the IML performed the alcoholic dosages by gas chromatography using the technique of separation by "head space" and double column.

Results

Table 1 presents the distribution of age groups, according to sex. Table 2 presents the mechanisms of injury in homicides. The prevalence and median blood alcohol concentration (BAC), according the mechanism of injury, are shown in (Table 3).

	Sex			
	Male (n= 200 86,9%)	Female (n= 30 13,04%)	P	Total (n= 320)
Age range (years)				
0 a 4	10 (5 %)	2 (6,6 %)		12 (5,2 %)
5 a 11	3 (1,5 %)	2 (6,6 %)	0,02	5 (2,1 %)
12 a 17	28 (14 %)	5 (16,6 %)		33 (14,3 %)
18 a 23	39 (19,5 %)	5 (16,6 %)		44 (19,1 %)
24 a 29	24 (12 %)	4 (13,3 %)		28 (12,1 %)
30 a 39	25 (12,5 %)	6 (20 %)		31 (13,4 %)
40 a 49	22 (11 %)	2 (6,6 %)		24 (10,4 %)
50 a 59	27 (13,5 %)	3 (10 %)		30 (13 %)
60 ou mais	22 (11 %)	1 (3,3 %)		23 (10 %)

Data presented as median (p25-p75) e n(%).

Table 1: Age of 230 individuals whose autopsy showed death due to homicide according to sex (2001-2017).

Of the 230 individuals analyzed, 200 (86.9%) were male and 30 (13.04%) female. We divided the individuals into groups of different age, to facilitate the analysis.

The most prevalent age range for males was between 18 and 23 years (19.5%). For the women group it was between 12 and 23 years (33.2%).

Table 2 shows the prevalence of different cause of death according to the mechanism of injury. The vast majority of homicides (n = 162, 70.4%) was due to firearms, followed by sharp force and blunt force trauma (13% each one).

Mechanism of injury	N	% group	% Total
Homicide			
Firearm	162	70,4 %	26,3 %
Sharp force trauma	30	13,0 %	4,9 %
Blunt force trauma	30	13,0 %	4,9 %
Strangulation	5	2,2 %	0,8 %
Incised wounds on neck	2	0,9 %	0,3 %
Drowning	1	0,4 %	0,2 %
Total	230	100,0 %	37,3 %

Table 2: Mechanism of injury in homicides (2001-2017).

Of the 230 cases of homicide victims analyzed, 205 (89,1%) presented a positive blood alcohol concentration (BAC), e.g, over 0,3 mg/dl. In the group of homicide victims by firearm, 57 (24,7%) of them presented a median value of BAC of 1.3 mg/ml as shown in (Table 3).

Cause	N (%) Number of Cases	Positive BAC (>0,3 mg/ml) in%	Positive BAC (mg/ml)†
Homicide			
Firearm	149 (92,0 %)	57 (38,3 %)	1,3 (0,8 – 1,8)
Sharp Force Trauma	24 (80,0 %)	8 (33,3 %)	1,6 (1,4 – 2,4)
Blunt Force Trauma	25 (83,3 %)	14 (56,0 %)	1,8 (0,6 – 3,4)
Strangulation	5 (100,0 %)	2 (40,0 %)	0,5 – 0,5
Incised wounds on neck	1 (50,0 %)	1 (100,0 %)	2,3
Drowning	1 (100,0 %)	1 (100,0 %)	3,4
Total	205 (89,1 %)	83 (40,5 %)	1,4 (0,8 – 2,2)

Table 3: Median values of Blood Alcohol Concentration - BAC (2001-2017).

Discussion

The results of this study indicate that alcohol intoxication was common in homicide victims in Franco da Rocha from 2001-2017. It also confirms some findings from other researchers on the topic in question (association between blood alcohol and deaths from unnatural causes) [2,3].

The first topic we confirmed was in relation to the sex of the individuals involved. In our series, in all age groups there was a predominance of male individuals, with statistical significance. In general, these are young adults (18 to 49 years of age). The fact that women are less affected by the influence of alcohol, in our sample, also reveals a cultural characteristic of Brazilian society in which, traditionally, women drink less (and have less resistance to the effects of alcohol) than men.

Our data shows worst numbers than Kuhns and Edwards presented in their cohort, in Trinidad, et al. [15]. While in our cohort we had 89.1% of the victims under the influence of alcohol, in the authors' casuistry "only" 29.4% of the homicide victims were drunk.

On the other hand, a study made by Nazarov, et al. [16], in a 9 US states between 2004-2016, showed that 37,5% tested positive for alcohol and male was the prevalent gender of the victims (10.303 male versus 2335 female).

Many other previous investigations, in other settings or countries have demonstrated that alcohol intoxication is common among homicide victims, but our study has some unique characteristics, in Brazilian setting: it occurred in a defined community, culturally and ethnically heterogenous, over an extent time period (16 years). It is important to note, that the micro-region where our study was made, has a very poor population, and the socioeconomic status of that population implies reduced economic power which means few possibilities for fun. It remains for this population to go to bars, and use alcohol routinely, which implies frequent violence and homicides, becoming aggressors or victims.

But a relevant question arises here in our study: to what extent did the fact that the victim was drunk contribute to the type of violent death that hit her, mainly a homicide?. The action of alcohol in the body has two main phases. In the first, alcohol inhibits the inhibitory synapses in the Central Nervous System and releasing impulses, often violent, which can also give rise to a violent attitude on the part of the aggressor or a provocative behavior by some potential victims advanced the concept that such homicides are victim-precipitated. It can be true, as in our series we found a major proportion of young adult men, and these individuals can be more violent or provocative then women.

In the second phase of its action, alcohol plays a frankly depressing role in the Central Nervous System, causing the individual to have reduced volition and attention, the ability to resist aggression, and consequently they may be easier targets for robberies and other predatory crimes that often end in homicide.

In homicide cases, whether by firearms (38,3%), knives (33,3%) or blunt agents (56%), the victims of our series had blood alcohol levels above those established as we can see in the Table 3. In some types of homicides (i.e., by strangulation, 40%, or drowning, 100%), it is clear that high blood alcohol levels have contributed to decreasing the victim's resistance to the aggression. In others cases, (i.e., by firearm projectile and use of cutting agents), the explanation could not be so simple. In the Erie County report [17], blood alcohol concentrations over 100 mg% were present in 44% of those killed by guns, 36% by knives, and 17% by personal weapons (i.e., hand or feet). These numbers are similar to ours, but, again, explanations for these patterns are unclear, "but may be clarified by examining crime circunstance and victim characteristics" [9].

Perhaps further studies are needed to correlate the crime scene, the genesis of events, in order to find a satisfactory explanation. The most plausible explanation, that is, that the individual under the influence of alcohol is more frequently involved in fights and other forms of interpersonal violence, may not be the only possible explanation.

Conclusions and Final Considerations

The association between alcohol and violence has been known throughout the ages. Our study showed that majority of victims are young adults, and most of them were under alcohol effect when they were murdered. So, the fact that the victims were drunk can contribute to the fatal outcome, in cases of homicide. This approach alone cannot establish that alcohol consumption is a risk factor for become a victim of homicide. However, because of alcohol´s known physiologic and behavior 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 [9].

Our study has some bias, such as the fact that it comes from a retrospective analysis of the data. However, the questions it raises (ie, high blood alcohol levels among homicide victims), despite the socio-cultural differences between the Brazilian population and other culturally distinct countries, may favor future research on alcohol use and violence - and which will undoubtedly be very relevant in social terms.

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