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Neck Trauma Deaths in Brazil: Review of 541 Cases

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Abstract. Neck trauma is associated with high morbidity and mortality. To establish the profile of death by neck trauma in the metropolitan area of Belo Horizonte (BH), Brazil, fatal cases subjected to necropsy at the Forensic Medicine Institute of BH 2006 to 2012 were evaluated. A total of 541 necropsy reports were analyzed; most victims were male (82%), single (70%) and non-white (72%). Almost half of the victims were under 30 years old (47%). Penetrating neck trauma was the most prevalent injury (74%), mainly caused by firearm projectiles (54%), and most cases were of homicide victims (67%). Alcohol consumption before death and positive drug tests were found in almost half of the cases (42% and 45%, respectively). Establishing the sociodemographic and behavioral profile of victims as well the intrinsic characteristics of this type of trauma are potentially relevant for identifying the high-risk population and for elaborating intervention strategies.

Keywords: Neck injuries; Forensic medicine; Autopsy; Homicide; Wounds gunshot; Wound; Penetrating.

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1. Introduction

Neck injuries are an important cause of trauma-related hospital admission and death[1], and these injuries include several mechanisms that account for death, such as respiratory failure, bleeding, and spinal cord injury[1,2].

Neck trauma injuries are classified as penetrating and non-penetrating. Penetrating (open) trauma involves injuries that penetrate beyond the platysma muscle, while non-penetrating (blunt) trauma does not reach this anatomical structure[3-4].

Open and blunt neck injuries are usually caused by different mechanisms. Gunshot wounds and stab wounds are the main causes of penetrating neck trauma in the United States and Brazil[4,5,6]. In turn, the main mechanism of non-penetrating neck trauma is blunt force, such as that in motor vehicle crashes, falls, and diving into shallow water[5,6].

Despite the relevance of neck trauma, few studies have sought to elucidate the epidemiological profile of fatal victims. This study was undertaken to address this gap, with an additional aim to establish comparisons between deaths due to gunshot wounds and sharp force injury. To the best of our knowledge, no study has been performed in Brazil regarding the specific characteristics of the victims of fatal neck trauma.

2. Methods

The present retrospective study analyzed deaths due to neck trauma for cases subjected to necropsy at the Forensic Medicine Institute of Belo Horizonte (Instituto Médico-Legal de Belo Horizonte - IML/BH) from January 2006 through December 2012. Located in the capital of the state of Minas Gerais, the IML/BH is a government agency affiliated with the Civil Police and is in charge of the medical investigation of violent deaths in the state capital and most counties in the metropolitan area of Belo Horizonte. In Brazil, a federal law requires a forensic necropsy in all cases of violent death. Belo Horizonte has the sixth largest population in Brazil and includes 2,502,557 inhabitants according to 2015 estimates[7]. The metropolitan area of Belo Horizonte has the third largest population in the country, estimated at 5,829,921 inhabitants in 2015; its total area is 14.979.1 km^2, and the gross domestic product was estimated at BRL 188,541.7 million[7] in 2013.

The deaths analyzed in the present study were directly related to neck trauma. Cases with technical errors in the corresponding reports or a non-definable trauma type were excluded from the study, as were cases in which death was due to trauma to body areas other than the neck or to asphyxia by neck compression (hanging, strangulation).

The information in the necropsy reports was exported to Microsoft Excel®, and the fields were re-encoded to represent the following variables: year, month, day of the week, gender, age, age range, skin color, civil status, city of residence, employment status, educational level required for occupation, manner of death, provenance of the victim, medical care received before death, medical procedures performed, blood alcohol content testing (and results) and drug testing (and results)[8].

Victims were considered as having received medical care when they had been referred from healthcare services and/or had a medical report.

Statistical analysis was performed using IBM SPSS version 20.0. Frequencies and measures of central tendency were calculated. Chi-square and Fisher's exact tests or mean rank tests (such as the Kruskal-Wallis test) were performed to investigate possible associations. The significance level was set to $\alpha=0.05$, and the confidence interval was set to 95%.

IML-BH authorized the present study, which was approved by the Research Ethics Committee of the Hospital Foundation of the State of Minas Gerais, protocol no. 31115314.5.0000.5119.

3. Results

3.1 Global profile of neck trauma

Of a total of 42,196 reports of necropsies performed at IML/BH from January 2006 to December 2012, 541 corresponded to fatal neck trauma victims. Most were male (81.9%), brown-skinned (62.3%), single (70%), and aged 18 to 39 years old (57.1%). The largest proportion were of residents of Belo Horizonte (40.3%) (Table 1).

The mean age of the victims was 34 years old, with a standard deviation of 16 years (varying from 4 to 82 years old). Most victims were employed (73%) and had a requirement of complete secondary education for their occupation (68.2%). Penetrating trauma was the most frequent type (74.7%), followed by blunt injury (14.7%) and burns (physical trauma - 10%) (Table 1).

Table 1. Sociodemographic characteristics of fatal neck trauma victims per type of trauma (IML/BH, 2006 a 2012).

Variables	Blunt injury		Penetrating trauma		Burns		Total	
	N	%	N	%	N	%	N	%
Sex								
Male	65	91,3	344	85,1	34	59,6	443	81,9
Female	15	8,7	60	14,9	23	40,4	98	18,1
Age range								
Less than 18 years old	5	6,3	44	10,9	8	14,0	57	10,5
18 to 29 years old	13	16,3	171	42,3	15	26,3	199	36,8
30 to 39 years old	20	25,0	82	20,3	8	14,0	110	20,3
40 to 49 years old	11	13,8	61	15,1	5	8,8	77	14,2
50 to 59 years old	13	16,3	32	7,9	8	14,0	53	9,8
60 to 69 years old	9	11,3	6	1,5	8	14,0	23	4,3
70 years and older	9	11,3	6	1,5	5	8,8	20	3,7
Data not recorded	0	0,0	2	0,5	0	0,0	2	0,4
Skin color								
White	25	31,3	106	26,2	15	26,3	146	27,0
Brown-skinned	50	62,5	249	61,6	38	66,7	337	62,3
Black	5	6,3	47	11,6	4	7,0	56	10,3
Data not recorded	0	0,0	2	0,5	0	0,0	2	0,4
Civil status								
Single	41	51,3	304	75,2	34	59,6	379	70,0
Married / in stable unions	24	30,0	54	13,4	15	26,3	93	17,2
Widow	4	5,0	7	1,7	4	7,0	15	2,8
Divorced	8	10,0	17	4,2	4	7,0	29	5,4
Data not recorded	3	3,8	22	5,4	0	0,0	25	4,6
City of residence								
Belo Horizonte	30	37,5	172	42,6	16	28,1	218	40,3
Other cities	47	58,8	211	52,2	41	71,9	299	55,3
Data not recorded	3	3,8	21	5,2	0	0,0	24	4,4
Employment status								
Economically active	61	76,3	295	73,5	37	64,9	393	73,0
Not economically active	16	20,0	84	20,3	20	35,1	120	21,8

Data not recorded	3	3,7	25	6,2	0	0,0	28	5,2
Educational level required for occupation								
Complete secondary education	55	68,8	277	68,5	37	64,9	369	68,2
Undergraduate degree	4	5,0	6	1,5	0	0	10	1,8
Undefined	6	7,5	17	4,2	2	3,5	25	4,6
Housewifes / students / unemployed	11	13,7	79	19,6	18	31,6	108	20,0
Data not recorded	5	5,0	25	6,2	0	0	29	5,4
Total	**80**	**100**	**404**	**100**	**57**	**100**	**541**	**100**

The largest proportions of necropsies were performed on Sundays (10.7%) and Saturdays (15.7%). The greatest occurrence rates were in March (11.6%) and July (10.2%). In the series assessed, 2006 was the year with the largest number of cases (92 cases, 17%) (Figure 1).

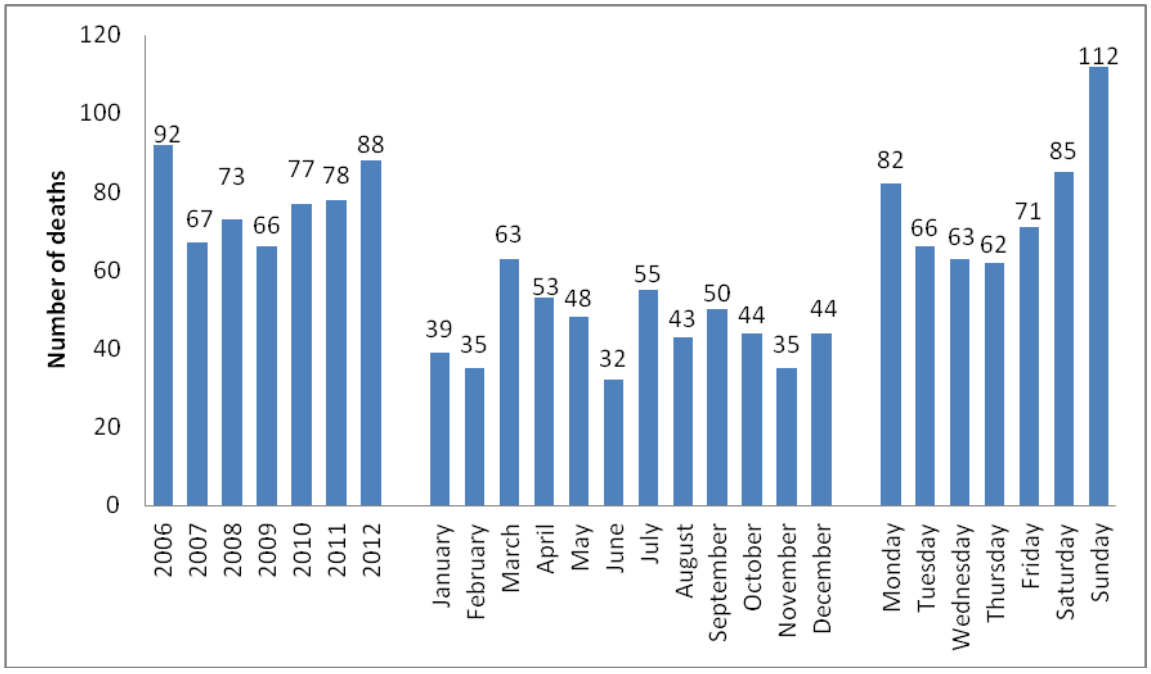

Figure 1. Seasonality of deaths due to neck trauma: year, month, and day of the week (IML/BH, 2006 a 2012).

Relative to the manner of death, most were cases due to homicide (67.1%), followed by accidents (21.5%) and suicide (6.8%). Traffic-related events represented most accidents (47 cases, 40.1%), followed by burns (36 cases, 30.8%) and falls (18 cases, 15.4%). Approximately half of the blunt trauma cases (39, 48.8%) were related to traffic accidents. Most victims had not received medical care before death (61.8%) (Table 2).

Table 2. Data related to death circumstances, provenance of the victim, medical care, medical procedures, blood alcohol content and drug testing of fatal neck trauma victims according to trauma type (IML/BH, 2006 a 2012).

Variables	Blunt injury		Penetrating trauma		Burns		Total	
	N	%	N	%	N	%	N	%
Manner of death								
Homicide	6	7,5	355	87,9	3	5,3	365	67,1
Suicide	1	1,3	21	5,2	13	22,8	37	6,8
Accident	60	75,0	19	4,7	38	66,7	117	21,5
Data not recorded	13	16,3	9	2,2	3	5,3	25	4,6
Provenance of the victim								
Residence	12	15,0	123	30,4	1	1,8	137	25,2
Healthcare unit	42	52,5	108	26,7	56	98,2	208	38,2
Street	25	31,3	152	37,6	0	0,0	177	32,5
Comercial address	0	0,0	16	4,0	0	0,0	16	2,9
Data not recorded	1	1,3	5	1,2	0	0,0	6	1,1
Medical care received before death								
Yes	42	52,5	108	26,7	56	98,2	208	38,2
No	38	47,5	296	73,3	1	1,8	336	61,8
Medical procedures performed								
Yes	28	35,0	39	9,7	36	63,2	105	19,3
No	62	65,0	365	90,3	21	36,8	439	80,7
Blood alcohol content testing								
Performed	39	48,8	328	81,2	2	3,5	372	68,4

Not performed	41	51,3	76	18,8	55	96,5	172	31,6
Blood alcohol content testing - results								
Positive	19	48,7	134	40,9	0	0,0	155	41,7
Negative	20	51,3	180	54,9	2	100	203	54,6
Data not recorded	0	0,0	14	4,3	0	0,0	14	3,8
Drug testing								
Performed	34	42,5	337	83,4	2	3,5	376	69,1
Not performed	46	57,5	67	16,6	55	96,5	168	30,9
Drug testing - results								
Positive	8	23,5	161	47,8	1	50,0	170	45,2
Negative	25	73,5	157	46,6	1	50,0	186	49,5
Data not recorded	1	2,9	19	5,6	0	0,0	20	5,3
Total	**80**	**100**	**404**	**100**	**57**	**100**	**541**	**100**

Most victims were subjected to blood alcohol content (68.4%) and drug (69.1%) testing. Approximately 41.7% of the cases tested positive for blood alcohol, and 45.2% were positive for drugs. The mean blood alcohol content was 16.85 dg/L, with a standard deviation of 10.3 dg/L. Among the cases that tested positive for drugs, the most frequent substances or combinations were cocaine (45.9%), marijuana (16.5%), and cocaine-marijuana combinations (32.9%) (Table 2).

3.2 Penetrating neck trauma profile: gunshot wounds vs. sharp force injuries

Of the 541 cases of neck trauma, 404 were of the penetrating type (74.3%), with most caused by gunshot wounds (219 cases, 54.12%) (Table 3). For gunshot wounds, the mean number of entrance wounds was 1.4, and in the case of sharp force trauma, the mean number of wounds to the neck was 2.1.

Most cases were male (85.1%); this proportion was higher in the case of gunshot wounds (91.3%, $p<0.001$) than in the case of sharp force trauma (77.8%). Consequently, the proportion of women was significantly higher among the cases of sharp force trauma (22.2%, $p<0.001$) (Table 3).

Table 3. Comparison of sociodemographic characteristics of fatal victims of penetrating neck trauma according to death-causing action (IML/BH, 2006 a 2012).

Variables	Gunshot wounds		Sharp wounds		P value	Total	
	N	%	N	%		N	%
Sex					p=0,000		
Male	200	91,3	144	77,8		344	85,1
Female	19	8,7	41	22,2		60	14,9
Age range					p=0,022		
Less than 18 years old	29	13,2	15	8,1		44	10,9
18 to 29 years old	102	46,6	69	37,3		171	42,3
30 to 39 years old	44	20,1	38	20,5		82	20,3
40 to 49 years old	27	12,3	34	18,4		61	15,1
50 to 59 years old	10	4,6	22	11,9		32	7,9
60 to 69 years old	3	1,4	3	1,6		6	1,5
70 years and older	2	0,9	4	2,2		6	1,5
Data not recorded	2	0,9	0	0,0		2	0,5
Skin color					p=0,011		
White	65	29,7	41	22,2		106	26,2
Brown-skinned	121	55,3	128	69,2		249	61,6
Black	32	14,6	15	8,1		47	11,6
Data not recorded	1	0,5	1	0,5		2	0,5
Civil status					p=0,045		
Single	177	80,8	127	68,6		304	75,2
Married / in stable unions	25	11,4	29	15,7		54	13,4
Widow	1	0,5	6	3,2		7	1,7
Divorced	8	3,7	9	4,9		17	4,2
Data not recorded	8	3,7	14	7,6		22	5,4
City of residence					p=0,216		
Belo Horizonte	101	46,1	71	37,3		172	42,6
Other cities	110	50,2	101	55,7		211	52,2
Data not recorded	8	3,7	13	7,0		21	5,2
Employment status					p=0,210		
Economically active	168	76,7	127	69,7		295	73,5
Not economically active	40	18,3	44	22,7		84	20,3
Data not recorded	11	5,0	14	7,6		25	6,2
Educational level required for occupation					p=0,668		
Complete secondary	156	71,3	121	65,4		277	68,5

education						
Undergraduate degree	4	1,8	2	1,1	6	1,5
Undefined	9	4,1	8	4,3	17	4,2
Housewifes / students / unemployed	39	17,8	40	21,6	79	19,6
Data not recorded	11	5,0	14	7,6	25	6,2
Total	**219**	**100**	**185**	**100**	**404**	**100**

Most victims were 18 to 39 years old (62.6%); the proportion of cases within this age range was higher among the group with gunshot wounds (66.7%) than in the group with sharp force trauma (57.8%). The largest difference between groups as a function of age range corresponded to victims over 50 years old (6.9% of gunshot wound cases and 15.7% of sharp force trauma victims) (Table 3). The difference between the mean age of these groups was significant ($p<0.001$, 29 years old [standard deviation 12 years] among the gunshot wound victims and 34 years old [standard deviation 14 years] among sharp force injury victims).

Brown-skinned individuals (61.6%) predominated among the penetrating neck trauma victims. Among the victims who died due to sharp force trauma, the proportion of brown-skinned individuals (69.2%) was higher than that of black individuals (8.2%). The same pattern was found among the gunshot wound cases (Table 3). More than 75% of the victims were single; this proportion was higher among the victims with gunshot wounds (80.8%). Most individuals (52.2%) resided in the counties composing the metropolitan area of Belo Horizonte, but not in the state capital (Table 3). Most victims were economically active (73.5%) and had a complete secondary education as an educational requirement for their occupation (68.5%).

Relative to the manner of death, homicide prevailed (87.9%), and the largest proportion of corpses was found on the street (38.1%) (Table 4). Most victims (73.3%) had not received medical care before death, and only 9.7% exhibited signs of having been subjected to medical procedures, such as venous access, drains, tracheal intubation, surgery, or suturing. Signs of medical care were significantly ($p<0.001$) more prevalent among the individuals with sharp force trauma (34.2%) (Table 4).

Table 4. Comparison of death circumstances, provenance of the victim, medical approach, alcohol level and toxicology testing of fatal victims of penetrating neck trauma according to death-causing action (IML/BH, 2006 a 2012)**.**

Variables	Gunshot wounds		Sharp wounds		P value	Total	
	N	%	N	%		N	%
Manner of death					p=0,000		
Homicide	211	96,3	144	77,8		355	87,9
Suicide	5	2,3	16	8,6		21	5,2
Accident	3	1,4	19	10,3		19	4,7
Data not recorded	0	0,0	6	3,2		9	2,2
Provenance of the victim					p=0,000		
Residence	55	25,1	68	36,8		123	30,4
Healthcare unit	75	34,2	33	17,8		108	26,7
Street	80	36,5	72	38,9		152	37,6
Comercial address	5	2,3	11	5,9		16	4,0
Data not recorded	4	1,8	1	0,5		5	1,2
Medical care received before death					p=0,000		
Manner of death	75	34,2	33	17,8		108	26,7
Homicide	144	65,8	152	82,2		296	73,3
Medical procedures performed					p=0,237		
Yes	25	11,4	14	7,6		39	9,7
No	194	88,6	171	92,4		365	90,3
Blood alcohol content testing					p=0,251		
Performed	173	79,0	155	83,8		328	81,2
Not performed	46	21,0	30	16,2		76	18,8
Blood alcohol content testing - results					p=0,216		
Positive	65	37,6	69	44,5		13	40,9

						4	
Negative	100	57,8	80	51,6		180	54,9
Data not recorded	8	4,6	6	3,9		14	4,3
Drug testing					p=0,044		
Performed	175	79,9	162	87,6		337	83,4
Not performed	44	20,1	23	12,4		67	16,6
Drug testing - results					p=0,022		
Positive	98	56,0	63	38,9		161	47,8
Negative	67	38,3	90	55,6		157	46,6
Data not recorded	10	5,7	9	5,6		19	5,6
Total	**219**	**100**	**185**	**100**		**404**	**100**

Blood alcohol content and drug testing were performed in most cases of penetrating neck trauma (81.2% and 83.4%, respectively); 40.9% of individuals tested positive for blood alcohol, and 47.8% were positive for drugs (Table 4). The mean blood alcohol content was 16.41 dg/L (standard deviation 10.4 dg/L). The mean blood alcohol content differed significantly ($p<0.001$) between the groups (12.17 dg/L [standard deviation 8.3 dg/L] among gunshot wound victims and 20.4 dg/L [standard deviation 10.7 dg/L] among the sharp force victims). The results of drug testing also differed significantly ($p<0.05$) between the groups; the results were more often positive among the gunshot wound victims (56%) than among the sharp force trauma victims (38.9%) (Table 4). Among the cases that tested positive for drugs, cocaine was the most frequently found drug (44.1%), followed by marijuana-cocaine combinations (34.6%) and marijuana alone (16.8%).

4. Discussion

The relationship found between neck trauma and male gender, especially in the case of gunshot wounds, might be attributed to the more aggressive behavior of men than women. Men are more frequently either victims or perpetrators of homicides, use

firearms as instruments of aggression more often, and consume more alcohol and drugs, which may increase aggressiveness and high-risk behaviors[9-12]. Concerning the high proportion of female victims of sharp force neck trauma, crimes against women are frequently motivated by passion and usually occur in the home environment, where “cold weapons” are easily accessible to perpetrators[12]. Neck and head injuries are significant markers for intimate partner violence[13,14]. In a 10-year period study of adult femicide victims carried out in Taiwan, the most common site of injuries in the intimate partner group was the neck[14]. And a study conducted in Norway with victims of homicide by sharp force found that 91% of the females had been killed inside their home[15].

Young and single people, who were more prevalent in the present study, are more predisposed to violence because many of them have not yet started a family of their own or do not have a safe socioeconomic status and are therefore more prone to become involved in high-risk situations, particularly in developing countries such as Brazil[16-17]. Concerning penetrating trauma, the proportion of non-single (married, in stable unions, etc.) individuals and the mean age of gunshot wound victims were lower than those of sharp force trauma victims. These findings might be attributed to the involvement of young and single people with crime (mainly drug trafficking and organized crime) and consequently with firearms, especially in the Brazilian urban peripheral areas[16-18]. The most striking characteristic of the epidemiological pattern of homicide in Brazil (the main circumstance of death in the present study) is its occurrence among an increasingly younger population[19-20]. Most of the victims subjected to necropsy at IML-BH resided in the metropolitan area of the state capital. In general, the peripheral areas of the large Brazilian cities exhibit higher levels of crime, which corroborates the high index of homicide found in the present study[21].

Non-white (brown-skinned and black) victims were the most prevalent in the present study. In Brazil, such individuals tend to belong to the less favored social classes and exhibit higher social risk for violent death[11,22]. Young black Brazilians have 2.5 times higher odds of being murdered than white youths[11]. While the absolute number of homicides among the Brazilian young white population is decreasing, that of young blacks is increasing[18]. In the present study, the number of blacks who died from gunshot wounds was higher than that of cases of death by sharp force trauma, which suggests a relationship among a socially vulnerable population, criminality, and the use of firearms.

Most of the deaths assessed in the present study were due to penetrating neck trauma, which is directly related to interpersonal violence. This was also evidenced in other studies and is related to the fact that the rates of homicide in Brazil are high[6,11,18]. Firearm homicides were more prevalent in the present and other studies[16]. However, the main mechanism of penetrating trauma varied among different studies, mainly because they were conducted in different places. For example, in São Paulo, the most populous Brazilian city, the prevalence of deaths by penetrating neck trauma due to gunshot wounds is higher[22], whereas in the United Arab Emirates a higher prevalence of neck trauma by sharp force occurs[21]. In Brazil, since the beginning of the 1990s, the death by homicide rate per 100,000 habitants has surpassed the rate of deaths by traffic accidents, a fact that corroborates the data relative to the population assessed in the present study, as blunt trauma (more closely related to traffic accidents) ranked second in prevalence[6].

Approximately 50% of gunshot wounds in the neck have significant injuries to vital structures, in comparison with only 10% to 20% of the stab wounds in the same region[1]. The damaging power of “cold weapons” is lower than that of firearm projectiles, and thus, a larger number of stab wounds are usually needed to cause death; this fact corroborates the results of the present study, in which the mean number of gunshot wounds was lower than wounds caused by “cold weapons”. In the neck, where major blood vessels and the airways are relatively unprotected, a low number of wounds is needed to cause death, which accounts for the fact that the mean number of wounds found in the present study (only two) was lower than the rate described in other studies (3 to 4 wounds, on average), in which most victims presented more than one affected body region[23-25].

The low education level required for the job performed by most victims in the present study, together with the high prevalence of homicide found, corroborates the observation made by several studies that the education level may be inversely proportional to the homicide rate in a given population[11,16,22,26]. Low education levels (less than four years of formal schooling) are associated with higher risk of death by homicide in all the Brazilian states[16].

As only the smallest proportion of the victims assessed had received medical care, it is possible that neck trauma is associated with high immediate and precocious mortality. The increased severity of injury is further supported by the fact

that a relevant percentage of the corpses had been transported to IML/BH directly from the street, suggesting that there was no time for the victims to be taken to a healthcare facility. In the case of penetrating trauma, the percentage of victims who received medical care and procedures was even lower, the reason being that this type of injury is associated with greater odds of damage to vital structures, such as large blood vessels and the airways. These data reinforce the fact that the best social approach to neck trauma, especially in the case of penetrating injuries, is its prevention, as once it occurs, the rate of immediate mortality is high.

Blood alcohol content and drug testing were positive in a considerable number of cases. The relationship between alcohol intake and neck trauma has previously been emphasized in several studies[3,10,17,19]. More than half of the homicides in the United States are related to the consumption of alcohol or psychoactive drugs[4]. Almost half of the victims subjected to necropsy at the Forensic Medicine Institute of São Paulo in 2015 tested positive for blood alcohol, and consumption was higher among the victims of sharp force homicide[10]. The data relative to IML/BH are similar to those of São Paulo, as the largest proportion of cases was positive for alcohol and significantly higher blood alcohol concentrations were found among the victims of penetrating neck trauma by sharp force. The drugs most often used by the neck trauma victims were cocaine and marijuana, which are the illegal substances that are more widely consumed in Brazil[26]. Although some data indicate that marijuana is more widely used than cocaine in the country, in the present study, the drug most frequently found among the victims was cocaine, the chemical properties and neurological effects of which are more closely related to violent attitudes and actions and thus might also be more strongly associated with death by external causes[27]. As some studies show, violence associated with use of “cold weapons” or firearms might be related to the use of psychoactive drugs[18,19,27].

The fact that deaths due to neck trauma occurred more often on Saturdays and Sundays might be related to the prevalence of penetrating injuries, especially those caused by firearms, in which case homicide is the main circumstance of death[27,28]. In addition, in Brazil, most jobs do not require full-time work on weekends, and employees might spend their free time consuming large amounts of legal or illegal drugs, a behavior associated with aggressiveness and criminality[10,11,18]. However, from the occupational perspective, most of the victims analyzed in the present study were economically active, which highlights the economic and social

damage associated with neck trauma resulting in disability or death. Brazil is currently undergoing a phase of demographic transition, with increasing population aging, which in combination with the loss of economically active individuals is a problem with serious economic and social impacts that makes measures for primary prevention of neck trauma even more necessary[29]. As neck trauma is associated with increased morbidity and mortality, establishing the sociodemographic and behavioral profile of victims as well of the intrinsic and related characteristics of this type of trauma is highly relevant for identifying the high-risk population and for the elaboration of intervention strategies.

The main limitations of the present study include the fact that data collection was performed in a specific geographical area; therefore, extrapolation of the conclusions requires caution; the operation of Forensic Medicine Institutes involves particular administrative and technical aspects that differ among the various Brazilian states and also among different countries; information was collected from secondary sources; and the data corresponding to the variables assessed were not recorded in all of the analyzed reports.

5. Conclusion

The sociodemographic profile of the victims of neck trauma corresponded to male, young, non-white, and economically active individuals. Penetrating trauma was the most prevalent trauma type, followed by blunt injury. Among the types of penetrating neck trauma, gunshot wounds were most prevalent. Homicide was the circumstance most often associated with neck trauma, and a large number of victims were under the influence of legal (alcohol) or illegal (cocaine and marijuana) drugs.

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