Evaluation of the mortality due to external causes

Avaliação da mortalidade por causas externas

Ricardo Alessandro Teixeira Gonsaga[1]; Caroline Fernandes Rimoli[2]; Eduardo Araújo Pires[2]; Fernando Scaramucci Zogheib[2]; Marcos Vinicius Tadao Fujino[2]; Milena Bolini Cunha[2]

A B S T R A C T

Objective: To analyze the characteristics of fatal victims of trauma in a microregion from São Paulo State. **Methods:** This was a retrospective, transverse, exploratory and descriptive study. The Coroner's Office of Catanduva – SP – provided 511 medical records of the victims of external reasons from 2008-2011. It was performed a survey and a review of those records and the data retrieved regarded gender, age, intentionality and mechanism of external cause. **Results:** The mortality predominance was on male individuals (77.9% of the cases - p<0.001). Deaths classified as non intentional represented 66.9%, whereas the intentional ones represented 33.1% (p<0.0001). Accidents caused by land transports were responsible for 45.6% of cases, being the main cause for the deaths analyzed. On second place there were suicides (16%), followed by the homicides (13.9%). **Conclusion:** The results of the present study were different from the profiles found in some other Brazilian studies, approaching to the reality of the developed countries, considering non-intentionality as preponderant and the main causes were accidents by land transports, suicides and homicides, respectively. Improvements should be done to assure the quality of information in the documentation of Forensic Physicians, since the lack of information in the Death Certificate was one of the difficulties found by the authors.

Key words: Public health. Wounds and injuries. External causes. Mortality. Epidemiology.

INTRODUCTION

External causes are traumas, injuries or other health problems – whether intentional or not – of sudden onset and immediate consequences of violence or other exogenous causes. This group includes lesions caused by events in transports, homicides, assaults, falls, drowning, poisoning, suicides, burns, injuries mudslides or floods, or other occurrences caused by environmental conditions (mechanical, chemical, thermal, electrical power and/or radiation). External causes were responsible for 10.7% of preventable deaths according to a systematic review of publications on preventable deaths in trauma victims between 2000 and 2009 [1].

The industrial age, high technology, increased speed of vehicles, socioeconomic conditions, poverty and human nature itself are factors that contributed to the progressive growth of the different types of trauma[2]. These are characterized as public health problems due to their high mortality, morbidity, costs, years of potential life lost and impact to the individuals, their families and society [3-5].

From the 1980s on, external causes became the second cause of death in Brazil and the first for those who are between five and 39 years of age [6].

The data analysis shows the great impact that they determine in population's life and health. According to the World Health Organisation (WHO), in 2003 traffic accidents led the global statistics of deaths from external causes, followed by homicides[7]. In Brazil, according to DATASUS[8], from January 2008 to June 2010 there were 52,379 deaths from such causes, 48.9% of them (25,640) in the Southeast. In Catanduva – SP – microregion 948 deaths were recorded between 2004 and 2008; in 2007 and 2008, there were 191 deaths from external causes [1,9].

Due to the frequency with which they occur and the prevalence in adolescents and young adults, external causes are the most responsible for years of potential life lost (YPLL). Males account for approximately 45% of YPLL, which corresponds to almost three times the YPLL for cardiovascular diseases [10].

Thus, prevention of external causes should be on the agenda of priorities in the health field. Most of the available scientific knowledge on the subject comes from information about deaths[7,11]. Therefore, given the importance of the topic and the lack of data in the literature, this article aims to make an assessment of all external cause deaths in the microregion of Catanduva, São Paulo State, Brazil.

Work conducted by the League of Trauma and Emergency Surgery "Luis Fernando Almeida Maia" of the Father Albino Integrated Colleges – Faculty of Medicine (FIPA - MEDICINE), Catanduva, São Paulo State – SP, Brazil.
1. Master's Degree, Assistant Professor, Faculty of Medicine; Coordinator, Knowledge in Surgery and Emergency Medicine, Father Albino Integrated Colleges – Catanduva; 2. Medical School Graduates, Faculty of Medicine, Father Albino Integrated Colleges – Catanduva.

METHODS

This was an exploratory, descriptive, cross-sectional, retrospective study. Were carried out a survey and review of 511 medical records provided by the Coroner's Office (IML) of Catanduva – SP, which serves the counties of Ariranha, Cajobi, Catanduva, Catiguá, Elisiário, Ibirá, Novais, Novo Horizonte, Palmares Paulista, Paraíso, Pindorama, Santa Adelia and Tabapuã, from January 2008 to December 2011, from patients who died due to some external cause and had their death certificates issued by the institution.

The study was approved by the Ethics in Research Committee - CEP/FIPA – under Opinion No 06/2011 and CAAE 0001.0.218.000 11. Because it is a retrospective research with medical records, researchers dismissed the use of an Informed Consent (IC) Statement.

The data were classified by gender, age, intentionality and mechanism of injury. We applied the statistical test of Kolmogorov-Smirnov to analyze the normality of the variables. For normal variables we performed "Student t" tests, while for non-parametric variables we used the Fisher exact test (categorical variables) and Mann-Whitney test (common variables).

RESULTS

Among the 511 medical records provided by the Coroner's Office (IML) of Catanduva that were analyzed, the predominant gender was male, with 77.9% of cases ($p < 0.001$), and in all mechanisms of injury there was a greater proportion of males (Table 1).

Regarding ethnicity, 76.3% were white, 7.4% brown, 2.5% black and 13.7% unknown. Regarding occupation, 152 (29.7%) had jobs that required up to the first degree of education, 23 (4.5%), technical courses, 10 (1.9%) higher education courses, and in 326 (63.8%) this variable was not informed.

There were nine (1.8%) work-related injuries. As for the location of the occurrence of deaths, 57.1% occurred in the main county of the microregion (Catanduva). The urban area had 38% of deaths, followed by the periurban area, with 14.5%, and the countryside, with 6.5%. Location of death was not reported in 41% of records. The average age of victims was 40.5 ± 18.4 years, minimum zero and maximum 88 years, mode 30 years.

The deaths classified as unintentional accounted for 66.9%, while intentional, 33.1% ($p < 0.001$). The road traffic accident (RTA) accounted for 45.6% of cases, being the leading cause of deaths analyzed. Suicides accounted for the major intentional cause, with 16%, followed by homicides, with 13.9%. Burns accounted for 5.5% of deaths. Two RTAs (0.4%) were classified as intentional (Table 2).

DISCUSSION

The results of this study differ from the profiles found by other authors in some aspects[12]. While in the State of São Paulo, in 2003, there was a predominance of intentionality in deaths (49.7% versus 39.7% of non-intentionality), 44.6% being due to homicides and 22.3% due to RTAs, in the microregion of Catanduva the intentionality was not predominant, with 66.9% of total deaths, 45.6% due to RTAs, 16% suicides, and less than 14% homicides. This feature of non-intentionality exceeding intentionality is consistent with the reality of developed countries, like the United States of America, in 2001 (64.6%), where 27% of deaths were caused by RTAs, 19.5% by suicides and 12.9% by homicides[13]. Intent and mechanism of injury varied according to gender and age.

As can be seen, suicide is an important public health issue worldwide. the World Health Organization (WHO) estimates that, by the year 2020, more than 1.5 million people will commit suicide. With regard to gender, this study is consistent with the findings of national and international studies, ie, the suicide rate is higher among men [14], as well as other mechanisms of trauma. The study found increased mortality rates in younger age groups (up to 44 years old), which was not observed in another study

Table 1 - Types of occurrence of deaths according to the gender of the victims.

Types of Occurrence	Female		Male		Total	
	N	%	N	%	N	%
RTA *	58	24.7	177	75.3	235	46
Suicides	22	26.8	60	73.2	82	16
Homicides	17	23.9	54	76.1	71	13.9
Falls	5	15.2	28	84.8	33	6.5
Burns	5	17.9	23	82.1	28	5.5
Other occurrences	2	6.7	28	93.3	30	5.9
Not reported	4	12.5	28	87.5	32	6.3
Total	113	22.1	398	77.9	511	100

** RTA = Road Transport Accidents. $X^2 = 9.19$; $p = 0.163$.*

Table 2 - Mortality by age groups, mechanisms and intentionality.

Mechanism	0 a 14		15 a 29		30 a 44		45 a 59		> 60		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Intentional												
RTA	0	0	2	3.4	0	0	0	0	0	0	2	0.4
Homicides	1	1.4	30	42.3	25	35.2	9	12.7	6	8.5	71	13.9
Suicides	1	1.2	25	30.5	24	29.3	21	25.6	11	13.4	82	16.0
Falls	0	0	1	100.0	0	0	0	0	0	0	1	0.2
Burns	0	0	1	33.3	2	66.7	0	0	0	0	3	0.6
Other	0	0	1	50.0	0	0	1	50.0	0	0	2	0.4
Not reported	0	0	0	0	4	50.0	3	37.5	1	12.5	8	1.6
Subtotal	2	1.2	60	35.5	55	32.5	34	20.1	18	10.6	169	33.1
Unintentional												
RTA	10	4.3	71	30.2	66	28.1	45	19.1	41	17.4	233	45.6
Falls	0	0	2	6.2	5	16.6	8	25.0	17	53.1	32	6.3
Burns	3	12.0	9	36	5	20.0	4	16.0	4	16.0	25	4.9
Other	0	0	7	25.0	7	25.0	10	35.7	4	14.3	28	5.5
Not reported	0	0	7	29.2	7	29.2	8	33.3	2	8.3	24	4.7
Subtotal	13	3.8	96	28.1	90	26.3	75	21.0	68	19.9	342	66.9
Total	15	2.9	156	30.5	145	28.4	109	21.3	86	16.8	511	100.0

$X^2 = 52.46$; $p < 0.001$.

[15], although it has been found that the rates in the population of young adults is rising [15].

With regard to violence in Brazil, some explanations should be considered: high and increasing rates over the past 25 years, differences between the municipalities – some with high rates and others with zero rates –, spatial dispersion of traffic and transport accidents, low but increasing rates of suicides in the elderly, concentration by gender, age and place of residence and, finally, the concentration of deaths by firearms [16]. A study conducted in Jundiai – SP – showed homicides as the second form of external cause of death, after RTA [17]. Similar data were found in the Federal District, Uberaba – Minas Gerais State – and Campinas – SP [2,18,19]. In the present study, the main cause coincides with previous studies, but the second one differs, with suicide being more important than other forms (especially homicide), as previously described.

When analyzing only unintentional causes, injuries resulting from RTAs represent 68.2% of the mechanisms. Taking into account the total deaths, 45.6% are assigned to RTAs. These data are corroborated by the literature, especially Brazilian [20]. The male predominance and the young age of traffic victims in this study is noteworthy. Studies in Goiânia (GO) showed that the increase in the number of deaths of young men, especially motorcyclists, is becoming a public health problem. These authors also found similar numbers in Londrina and Ponta Grossa – PR [3]. This fact was also observed in one Northeast region's capital [6] and in Mexico [21]. The data relating specifically to the deaths of motorcyclists cannot be evaluated in this study due to failure to complete the statements, as will be explained below, but it is becoming a trend nowadays.

Another relevant fact is the number of deaths secondary to burns (5.5% of total cases). This is due in part to the presence in the city of Catanduva a hospital specialized in the care of patients sustaining this type of injury, which is a reference to a macroregion of the São Paulo State. As the death certificate is issued in the place of death, the incidence of this type becomes important.

One of the limitations of the study was the lack of lots of information important from epidemiological point of view. Data such as pre-hospital and hospital care, handicapped, pregnant women and education level are not recorded or, most often, are ignored in the medical records. In fact, other authors found discrepancies between the results of autopsies and reports cadaveric and death certificates officially registered in Brazil. They also concluded that there is a need to improve the coding and selection of underlying cause, improvements in completing death certificates by coroners and in medical and police information in the documents referring bodies for autopsy, especially for RTAs and falls [21,22].

There was also difficulty in obtaining the information, since the Coroner's Office records are not electronic, but printed, without standardization of information.

The results differ from the profiles found in other Brazilian studies, getting closer to the reality of developed

countries, since the intention was not predominant and the main causes were road accidents, suicides and homicides, respectively. This study demonstrated the need for improvements in filing death certificates by the coroner, as this has been a difficulty encountered by the authors in conducting the study.

R E S U M O

Objetivo: *Avaliar os óbitos por causas externas em uma microrregião do Estado de São Paulo.* ***Métodos:*** *Estudo descritivo exploratório transversal retrospectivo. Foi feito um levantamento e revisão de 511 prontuários das vítimas de causas externas fornecidos pelo Instituto Médico Legal de Catanduva – SP de 2008 a 2011. Os dados foram classificados por sexo, idade, intencionalidade e mecanismo de causa externa.* ***Resultados:*** *A mortalidade foi predominante no sexo masculino, com 77,9% dos casos (p<0,001). As mortes classificadas como não intencionais representaram 66,9%, enquanto as intencionais, 33,1% (p<0,001). Os acidentes de transporte terrestre foram responsáveis por 45,6% dos casos, sendo a principal causa dos óbitos analisados. O segundo lugar foi atribuído aos suicídios, com 16%, seguido pelos homicídios (13,9%).* ***Conclusão:*** *Os resultados encontrados diferem dos perfis encontrados em outros estudos brasileiros, aproximando-se mais da realidade de países desenvolvidos, já que a não intencionalidade foi preponderante e as principais causas foram os acidentes de transporte terrestre, suicídios e homicídios, respectivamente. Foi constatada a necessidade de melhorias no preenchimento da declaração de óbito pelos legistas, visto que isto foi uma dificuldade encontrada pelos autores na realização do estudo.*

Descritores: *Saúde pública. Ferimentos e lesões. Causas externas. Mortalidade. Epidemiologia.*

REFERENCES

1. Settervall CHC, Domingues CA, Sousa RMC, Nogueira LS. Mortes evitáveis em vítimas com traumatismos. Rev Saúde Pública. 2012;46(2):367-75.
2. Cardona D, Peláez E, Aidar T, Ribotta B, Alvarez MF. Mortalidade por causas externas em três cidades latino-americanas: Córdoba (Argentina), Campinas (Brasil) e Medellín (Colômbia), 1980-2005. Rev bras estud popul. 2008;25(2):335-52.
3. Caixeta CR, Minamisava R, Oliveira LMAC, Brasil VV. Morbidade por acidentes de transporte entre jovens de Goiânia, Goiás. Ciênc saúde coletiva. 2010;15(4):2075-84.
4. Costa JSD, Victora CG. O que é "um problema de saúde pública" ? Rev bras epidemiol. 2006;9(1):144-6.
5. Krug EG. Injury surveillance is key to preventing injuries. Lancet. 2004;364(9445):1563-6.
6. Santos AMR, Moura MEB, Nunes BMVT, Leal CFS, Teles JBM. Perfil das vítimas de trauma por acidente de moto atendidas em um serviço público de emergência. Cad saúde pública. 2008;24(8):1927-38.
7. Gawryszewski VP, Morita M, Hidalgo NT, Valencich DMO, Brumini R. A mortalidade por causas externas no Estado de São Paulo em 2005. Bol epidemiol paul. 2006;3(33):2-7.
8. Brasil. Ministério da Saúde (BR). Datasus. Informações de saúde. Estatísticas de mortalidade: óbitos por ocorrência segundo causas externas do Brasil. Brasília (DF); 2010. Acessado em fevereiro 2010. Disponível em: http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sim/cnv/ext1ouf.def.
9. Oliveira MLC, Souza LAC. Causas externas: investigação sobre a causa básica de óbito no Distrito Federal, Brasil. Epidemiol Serv Saúde. 2007;16(4):245-50.
10. Barros MDA, Ximenes R, Lima MLC. Mortalidade por causas externas em crianças e adolescentes: tendências de 1979 a 1995. Rev Saúde Pública. 2001;35(2):142-9.
11. Holder Y, Peden M, Krug E, Lund J, Gururaj G, Kobusingye O, editors. Injury surveillance guidelines. Geneva: World Health Organization; 2001.
12. Gawryszewski VP. Injury mortality report for São Paulo State, 2003. Sao Paulo Med J. 2007;125(3):139-43.
13. Anderson RN, Miniño AM, Fingerhut LA, Warner M, Heinen MA. Deaths: injuries, 2001. Natl Vital Stat Rep. 2004;52(21):1-86.
14. Lovisi GM, Santos SA, Legay L, Abelha L, Valencia E. Análise epidemiológica do suicídio no Brasil entre 1980 e 2006. Rev Bras Psiquiatr. 2009;31(supl II):S86-93.
15. Meneghel SN, Victora CG, Faria NMX, Carvalho LA, Falk JW. Características epidemiológicas do suicídio no Rio Grande do Sul. Rev Saúde Pública. 2004;38(6):804-10.
16. Minayo MCS. Seis características das mortes violentas no Brasil. Rev bras estud popul. 2009;26(1):135-40.
17. Neme C. Diagnóstico municipal de la violencia y la criminalidad en Jundiaí, São Paulo. Salud publica Méx. 2008;50(supl I):S19-28.
18. Chavaglia SRR, Amaral EMS, Barbosa MH, Bittar DB, Ferreira PM. Vítimas de trauma por causas externas na cidade de Uberaba-MG. Mundo saúde. 2008;32(1):100-6.
19. Gawryszewski VP, Koizumi MS, Mello-Jorge MHP. As causas externas no Brasil no ano 2000: comparando a mortalidade e a morbidade. Cad Saúde Pública. 2004;20(4):995-1003.
20. Arreola-Rissa C, Santos-Guzmán J, Esquivel-Guzmán A, Mock CN. Traffic related deaths in Nuevo Leon, Mexico: causes and associated factors. Salud Publica Mex. 2008;50(supl I):S48-54.
21. Matos SG, Proietti FA, Barata RCB. Confiabilidade da informação sobre mortalidade por violência em Belo Horizonte, MG. Rev Saúde Pública. 2007;41(1):76-84.
22. Laurenti R, Jorge MHPM, Gotlieb SLD. Mortalidade segundo causas: considerações sobre a fidedignidade dos dados. Rev Panam Salud Publica. 2008;23(5):349-56.

Received on: 28/01/2012
Accepted for publication: 25/03/2012
Conflict of interest: none
Source of funding: League of Trauma and Emergency Surgery "Luis Fernando de Almeida Maia" of the Medical School of Integrated Schools Father Albino.

How to cite this article:
Gonsaga RAT, Rimoli CF, Pires EA, Zogheib FS, Fujino MVT, Cunha MB. Mortality due to external causes in a microregion of São Paulo State. Rev Col Bras Cir. [periódico na Internet] 2012; 39(4). Disponível em URL: http://www.scielo.br/rcbc

Address correspondence to:
Ricardo Teixeira Gonsaga
E-mail: novo02@uol.com.br