



Epidemiology of traffic accidents involving cyclists in the city of São Paulo

Raphael M. Besborodco¹, Caio F. Silva¹, Georgia S. C. Teixeira¹, Carlos Górios², Cintia L. Rodrigues^{1*}, Jane E. Armond¹ -

¹Universidade Santo Amaro. ²Centro Universitário São Camilo

ABSTRACT

OBJECTIVE

To to describe the accidents involving cyclists notified in the city of São Paulo during the year 2018, and to analyze the associated factors.

METHODS

This is a descriptive, quantitative approach, based on the Violence and Accidents Surveillance Information System of the city of São Paulo (SIVVA), in the selection of reports, including those related to accidents of traffic involving cyclists, from January to December 2018, in the city of São Paulo, in the southeastern region of Brazil.

RESULTS

Between January and December 2018, 701 cases of traffic accidents involving cyclists living in the city of São Paulo were reported. The profile of the victim was 82.5%, predominantly male (83.0%) and adolescents (10 to 19 years of age). Regarding the diagnosis of injury, the traumas were more prevalent, mainly superficial head trauma.

CONCLUSIONS

In this study, the prevalence of bicycle, adolescent and male drivers was observed. The main diagnosis of injury was trauma, injuries and fractures affecting the upper limbs.

DESCRIPTORS

Accident Prevention. Epidemiology. Wounds and Injuries.

Corresponding author:

Cintia Leci Rodrigues -
Rua Professor Candido Nogueira da Mota,409
Interlagos São Paulo/SP.35
E-mail: kikarodrigues@hotmail.com
ORCID iD: 0000-0001-8064-2203

Copyright: This is an open-access article distributed under the terms of the Creative Commons

Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided that the original author and source are credited.

DOI: <https://doi.org/10.56242/globalhealth;2020;1;1;12-15>

INTRODUCTION

Traffic accidents remain an important public health problem and demand different approaches to action and prevention¹. These accidents have been referred to as one of the main causes of hospitalizations for external causes in Brazil and have a direct impact on the organization of the health system, mainly due to the high costs of medical assistance for trauma².

According to Galvão², the bicycle is considered a viable solution to the traffic problems arising from the largest number of motor vehicles in large and medium-sized cities worldwide².

Some authors cite, bicycles are, therefore, the most used individual vehicles in Brazil, constituting the only alternative available to all people, regardless of income, and can be used by those who are in good health, from childhood to older age^{2,3}. Therefore, the bicycle is considered a practical, cheap and environment-friendly vehicle; some of the reasons for this popularity are the price of gasoline, an increasingly mobile population and the vision of the bicycle as a type of high-tech sports equipment and a healthy means of transport. However, its use, whether for transportation, recreational or sports activities, is not exempt from accidents, with few studies in the Brazilian scenario on its profile of accidents involving cyclists^{3,4}.

In 2016, 784 accidents involving bicycles were reported in the city of São Paulo⁵. Deaths involving cyclists account for 3.3% of traffic and land transport accidents in the city⁶.

Within this context, the present study aimed to describe accidents involving cyclists notified in the city of São Paulo during 2018, and to analyze the associated factors.

METHODS

This is a descriptive study, with a quantitative approach, whose data source was the Information System for the Monitoring of Violence and Accidents in the city of São Paulo (SIVVA), which is fed by notifications and investigations of cases of violence and accidents listed in the list of diseases, according to Ordinance No. 1328/078 of the Municipal Health Secretariat of the city of São Paulo⁷.

Data collection took place through consultations to the SIVVA website (<http://tabnet.saude.prefeitura.sp.gov>)⁵. Through SIVVA, the information contained in traffic accidents was collected, and accidents involving cyclists, residing in the city of São Paulo, were selected.

In the selection of notifications, those related to traffic accidents involving cyclists, from January to December 2018, in the city of São Paulo, belonging to the southeastern region of Brazil, were included.

Searches on the SIVVA website generated condensed files of the information, which were imported into Excel spreadsheets for later analysis. For the variables considered in the present study, a consolidation of the entire period studied was carried out, adding manually the amount obtained by the period studied.

For the characterization of traffic accidents involving cyclists, the variables that make up the notification form were considered: age (years), region of residence (center, east, north, southeast, south and west), sex (female and male), situation of the victim during the accident (pedestrian or occupant), collision object involved in the accident with cyclists (other vehicle, pedestrian / animal, fixed object - pole, wall), diagnosis of injury, use of alcohol and drugs, evolution of case.

The study was undertaken exclusively with publicly available data, so that it was not necessary to be assessed by an ethics committee in research with human beings, according to the Resolution of the National Health Council (CNS 510/16).

RESULTS

In the period from January to December 2019, 701 cases of traffic accidents involving cyclists residing in the city of São Paulo were reported. Among accidents involving bicycles: 82.5% were bicycle drivers and 15.7% were pedestrians.

Table 1. Accidents involving bicycles (pedestrian / occupant), according to the victim's age group, São Paulo, 2018.

| Age range | Pedestrian | f(%) | Occupant | f(%) | Ignored | f(%) |
|-------------------|------------|--------------|------------|--------------|-----------|--------------|
| 0 to 9 years | 27 | 24,5 | 82 | 14,2 | 2 | 15,4 |
| 10 to 19 years | 25 | 22,7 | 204 | 35,3 | 6 | 46,2 |
| 20 to 59 years | 42 | 38,2 | 278 | 48,1 | 5 | 38,5 |
| 60 years and over | 16 | 14,5 | 14 | 2,4 | 0 | 0,0 |
| Total | 110 | 100,0 | 578 | 100,0 | 13 | 100,0 |

As shown in table 1, in the elderly population (60 years and over) they are the biggest victims of being run over by cyclists. The data referring to traffic accidents involving cyclists, according to the victim's sex: 83.0% male and 17.0% female.

The data related to schooling, 19.4% had 8 to 11 years of study; 39.5% were black; 1.7% had abused alcohol. Accidents involving cyclists, according to the collision object: 46.0% motor vehicles; 4.1% fixed object (wall, pole); 1.0% pedestrian and street animals and the remaining data were ignored. According to the injury diagnosis (Figure 1), they were divided into: Trauma (45.6%), Wounds (25.0%), Contusion (16.3%), Fractures (10.0%), Dislocation (1.4%) and Sprain (1.3%).

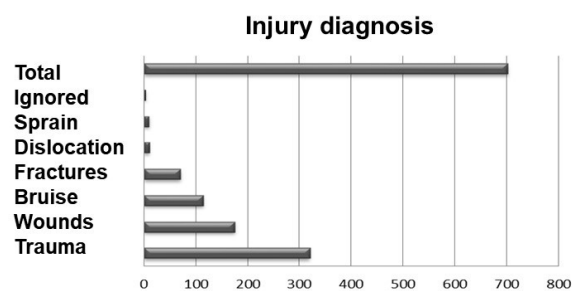


Figure 1. Accidents involving cyclists, according to injury diagnosis, São Paulo, 2018.

Among trauma diagnoses, the most prevalent were: 44.4% superficial head trauma, 15.6% shoulder and arm trauma, 5.9% superficial ankle and foot trauma. The main diagnoses of contusions were knee contusion (25.4%), shoulder and arm contusion (18.4%) and wrist and hand contusion (17.5%). The most relevant fractures: 23.0% fracture of the wrist and hand, 8.6% fractures of the skull or bones of the face of an unspecified part, 7.1% fracture of the clavicle. Regarding the diagnosis of dislocation; dislocation of the shoulder joint (20.0%), dislocation of the elbow (20.0%) and dislocation of the patella (10.0%).

Regarding the diagnosis of sprain: 40.0% sprained and sprained ankle. Among diagnostic reports of injuries: head and knee injuries. Data referring to the evolution of cases: 87.4% immediate hospital discharge, 4.0% hospitalization, 5.1% transfer to referral hospitals in orthopedics and traumatology and 0.2% death during care.

DISCUSSION

During 2018, 701 cases of traffic accidents involving cyclists were reported. Being the victim's profile, 82.5% are drivers, predominantly male (83.0%) and adolescents (10 to 19 years old).

The main victims of traffic violence are young men⁸, who deserve to be highlighted regarding the implementation of actions to promote and prevent urban traffic accidents, since these groups are the most affected by this condition⁹.

Currently, the use of bicycles can be for leisure or as a mode of transportation in the city of São Paulo, as already mentioned by Bacchieri¹⁰, in the Brazilian literature there are few studies on traffic accidents involving cyclists, thus making comparison with Brazilian cities difficult.

The main collision object was automotive vehicles (46.0%). The relationship between the object of the collision and the severity of the trauma, that is, when we try to formulate the hypothesis that the collision of the cyclist with a car, for example, would lead to a diagnosis of more serious injury than that caused by the fall of the bicycle itself, was a limitation of this research¹¹.

The profile of the cyclist victim of a traffic accident, 19.4% had 8 to 11 years of study; 39.5% were black; 1.7% had abused alcohol. Less education was considered a risk factor for accidents involving motorcyclists and cyclists, corroborating the result found in our study¹².

The present research revealed a higher prevalence of accidents involving cyclists among black people, who represent lower income and education. These results are in line with other studies found in the literature, which emphasize the predominance of injured young men. Thus, it can be inferred through these epidemiological studies that traffic accidents have different distribution characteristics for sex, age, social groups, and education, which reveals specific situations of vulnerability^{12, 13, 14}.

Damacena et al¹⁵ found in their study that they refer to the abusive and frequent consumption of alcohol, according to sociodemographic characteristics, the highest prevalence was found among young, single men who declared to have black skin color¹⁵. In this study, 1.7% of accidents involving cyclists had abused alcohol.

Regarding injury diagnoses, trauma was more prevalent, especially superficial head trauma. Some authors mention in accidents involving motorcyclists and cyclists, the use of safety devices, such as a helmet, contributes to minimize the severity of the accident and consequently the occurrence of sequelae^{14, 16, 17}.

The higher proportion of accidents with injuries, bruises, and sprains / dislocations as the nature of the injury suggests that most of them are mild, with only those in serious situations arriving at the hospital. This fact agrees with the findings of the present study, in which most consultations for accidents involving cyclists were discharged after treatment (87.4%)¹⁷.

Regarding the severity of injuries, the vulnerability of cyclists in relation to the others is evident. Because the cyclist is more exposed to the body, they are more prone to more serious injuries and, consequently, require hospitalization, follow-up in specialized services¹⁸.

Regarding fractures, the most frequent were wrist and hand and facial bones. To the etiological factors of facial fractures in the national and international literature, it is possible to show that the accidents of cyclists in collisions by motor vehicles have as the main causal factors of facial trauma¹⁹.

An integrative review carried out by Tavares²⁰ stands out regarding the thematic category of the epidemiological profile of injuries, it is noteworthy that, in its entirety, studies were carried out by dentists, whose main objective was to inves-

tigate traumatic injuries. oral and maxillofacials of patients seen in buccomaxillofacial surgery centers²⁰.

Tavares²⁰ also states that there is a great urgency to develop studies capable of clarifying the various other types of injuries that affect victims of bicycle accidents, since it is possible to assume that other body segments, in addition to the facial regions, can also be achieved if we consider the body exposure of cyclists in the use of bicycles, representing a great gap and a great field of investigation for doctors who work in trauma emergencies²⁰.

CONCLUSIONS

In this study, the prevalence of bicycle, adolescent and male drivers was found, with trauma, wounds and fractures being the main diagnosis of injury, affecting the upper limbs. It is noteworthy whose aspects the low scientific production on the theme, the adequate filling of the notification forms, elucidating the need for studies in order to know the wide spectrum of factors related to the accident -, under what conditions occur and what are their impacts on the current morbidity and mortality profile of the population.

REFERENCES

- Rodrigues CL, Armond JE, Górios C, Pereira RGV. Acidentes de trânsito por atropelamentos na cidade de São Paulo: Série histórica. *Arq. Catarin Med.* 2018; 47 (2): 147-155.
- Galvão PVM, Oliveira TC, Marques OF, Pestana VM, Vidal HG, Souza EHA. Acidentes fatais de bicicletas no Brasil - 2001 a 2010. *Rev. baiana saúde pública* 2017; 41(4): 965-980.
- Galvão PVM, Pestana LP, Pestana VM, Spíndola MOP, Campello RIC, Souza EHA. Mortalidade devido a acidentes de bicicletas em Pernambuco, Brasil. *Ciência & Saúde Coletiva* 2013; 18(5): 1255-1262.
- Secretaria Nacional de Transporte e da Mobilidade Urbana. Caderno de referência para elaboração de Plano de Mobilidade por Bicicleta nas Cidades. Brasília; 2007.
- SIVVA - Sistema de Informação e Vigilância de Violências e Acidentes. [base de dados na internet]. São Paulo: Acidentes de Trânsito. [acesso em 02 de fevereiro de 2019]. Disponível em: <http://www.prefeitura.sp.gov.br/secretarias/saude>.
- SIM - Sistema de Informação Mortalidade. [base de dados na internet]. São Paulo: Mortalidade por Acidentes de trânsito e transporte. [acesso em 20 de novembro de 2018]. Disponível em: <http://www.prefeitura.sp.gov.br/secretarias/saude>.
- Prefeitura da Cidade de São Paulo. Secretaria Municipal da Saúde. Sistema de Informação para a Vigilância de Violência e Acidentes: manual de preenchimento da ficha de notificação de casos suspeitos ou confirmados. 2007. Disponível em: http://www.prefeitura.sp.gov.br/cidade/secretarias/upload/7_08_09_10_manual_sivva_1254424639.pdf.
- Corgozinho MM, Montagner MA, Rodrigues MAC. Vulnerabilidade sobre duas rodas: tendência e perfil demográfico da mortalidade decorrente da violência no trânsito motociclístico no Brasil, 2004-2014. *Cad. Saúde Colet* 2018; 26 (1): 92-99.
- Mendonça MFS, Silva APSC, Castro CCL. Análise espacial dos acidentes de trânsito urbano atendidos pelo Serviço de Atendimento Móvel de Urgência: um recorte no espaço e no tempo. *Rev. bras. epidemiol* 2017; 20 (4): 727-741.

11. Bacchieri G, Gigante DP, Assunção MC. Determinantes e padrões de utilização da bicicleta e acidentes de trânsito sofridos por ciclistas trabalhadores da cidade de Pelotas, Rio Grande do Sul, Brasil. *Cad. Saúde Pública* 2005; 21(5): 1499-1508.
12. Pereira CU, Abud LN, Abud FN, Leite RT. Traumatismo cranecefálico por acidente com bicicleta. *Arq Bras Neurocir* 2000; 19 (2): 83-87.
13. Brasileiro BF, Vieira JM, Silveira CES. Avaliação de traumatismos faciais por acidentes motociclísticos em Aracaju/SE. *Rev. Cir. Traumatol. Buco-Maxilo-fac* 2010; 10 (2): 97-104.
14. Medeiros WMC, Galvão CH, Guedes ISC, Carício MR, Macedo EMF, Ribeiro LM. Perfil epidemiológico das vítimas de acidentes de trânsito atendidas num serviço público de emergência da região metropolitana de Natal/RN. *HOLOS* 2017; 33 (7): 213-224.
15. Rodrigues CL, Armond JE, Górios C, Colombo Souza P. Acidentes que envolvem motociclistas e ciclistas no município de São Paulo: caracterização e tendências. *rev bras ortop.* 2014; 49 (6): 602-606.
16. Damacena GN, et al. Consumo abusivo de álcool e envolvimento em acidentes de trânsito na população brasileira, 2013. *Ciência & Saúde Coletiva* 2016; 21 (12): 3777-3786.
17. Andrade SSCA, Mello Jorge MHP. Estimate of physical sequelae in victims of road traffic accidents hospitalized in the Public Health System. *Rev bras epidemiol* 2016; 19(1): 100-111.
18. Sousa CAM, Bahia CA, Constantino P. Análise dos fatores associados aos acidentes de trânsito envolvendo ciclistas atendidos nas capitais brasileiras. *Ciência & Saúde Coletiva* 2016; 21(12): 3683-3690.
19. Rodrigues APB, Santos AMR, Machado DG, Moura MEB. Caracterização dos acidentes motociclísticos atendidos pelo serviço de atendimento móvel de urgência. *Rev Enferm UFPI* 2014; 3(3): 73-79.
20. Deus DP, Pinho K, Teixeira ALS. Levantamento Epidemiológico das fraturas faciais no hospital regional de urgência e emergência de Presidente Dutra - MA. *Rev. cir. traumatol. buco-maxilo-fac* 2015; 15 (3): 15-20.
21. Tavares FL. The bicycle accident in Brazil: an integrative review. *J. res. fundam. care. online* 2019; 11(1): 263-269.