Maria Gabriella Pacheco da Silva[1]
Vanessa de Lima Silva[1]
Mirella Rodrigues Bezerra Vilela[1]
Adriana de Oliveira Camargo Gomes[1]
Ilka Veras Falcão[1]
Ana Karina Pessoa da Silva Cabral[1]
Maria Luiza Lopes Timóteo de Lima[1]

Factors associated with speech-language disorders in motorcycle accident victims

Fatores associados às alterações fonoaudiológicas em vítimas de acidentes de motocicletas

ABSTRACT

Purpose: To investigate factors associated with speech-language disorders in victims of motorcycle accidents. **Methods:** This is a cross-sectional study. Victims of motorcycle accidents studied were treated at Hospital da Restauração between June and July 2014. The data were collected by consulting the records and direct interviews with these, at admission and after discharge. For analysis were raised single frequencies, average and chi-square test or Fisher's exact test. The margin of error used in the statistical tests was 5%, and the intervals were obtained with 95% reliability. **Results:** 99 individuals were studied, 90.9% male, the mean age of 32.7 years. It found a high percentage of 42.3% of drunk drivers and 51.5% were not enabled. The Head Injuries were present in 30.3% of cases. The most affected body area were the lower limbs (71.7%), followed by the head and face region (56.6%). It was also found that 30.3% had complaints of speech pathology after hospital discharge and a statistically significant association between speech therapy complaint and not enabled (p=0.012) and collisions between bikes (p=0.004). **Conclusion:** There was a high percentage of lesions in the head and face resulting from accidents, associated mainly not eligible to drive bike and collisions between motorcycles, suggesting that these factors can aggravate injuries speech therapy.

RESUMO

Objetivo: Verificar fatores associados às alterações fonoaudiológicas em vítimas de acidentes motociclísticos. **Método:** Trata-se de um estudo de corte transversal. Foram estudadas vítimas de acidentes motociclísticos assistidas no Hospital da Restauração entre junho e julho de 2014. Os dados foram coletados através da consulta dos prontuários e entrevistas direta com esses acidentados, no momento da internação e após a alta hospitalar. Para análise, foram estudadas as frequências simples, média e teste Quiquadrado de Pearson ou o teste Exato de Fisher. A margem de erro utilizada nas decisões dos testes estatísticos foi de 5% e os intervalos de confiança foram obtidos com confiabilidade de 95%. **Resultados:** Foram estudados 99 indivíduos, sendo 90,9% do gênero masculino, com idade média de 32,7 anos. Constatou-se um alto percentual de condutores alcoolizados (42,3%) e não habilitados (51,5%). Os traumatismos cranianos estavam presentes em 30,3% dos casos. As áreas corporais mais afetadas foram os membros inferiores (71,7%), seguidos da região da cabeça e face (56,6%). Depois da alta hospitalar, 30,3% referiram queixa de alterações fonoaudiológicas e essas mostraram uma associação estatisticamente significativa com não habilitados (p=0,012) e colisões entre motos (p=0,004). **Conclusão:** Verificou-se alto percentual de lesões em região de cabeça e face decorrentes dos acidentes, associadas principalmente à não habilitação para conduzir moto e colisões entre motocicletas, sugerindo que tais fatores podem agravar as lesões fonoaudiológicas.

Correspondence address:
Maria Gabriella Pacheco da Silva
Rua dos Navegantes, 1717, Apt. 602,
Boa Viagem, Recife (PE), Brazil,
CEP: 51020-010.
E-mail: gabriellafono@gmail.com

INTRODUCTION

Currently, traffic accidents (ATs) are becoming an epidemy in several countries, and they are entering in the public health agenda as morbidities and mortalities due to external causes, affecting the younger age groups of productive age, and generating enormous economic, social and emotional repercussions[1].

When observing the rates of ATs by motorcycles, the data are more expressive. Motorcyclists are highlighted among the victims of traffic in Brazil. This can be due to the use of this vehicle as a means of rapid transportation and as a working tool, corresponding to an increase of almost 51% in deaths between 2006 and 2010, while other types of accidents, such as pedestrians and cars have reduced or maintained the rates[1,2].

According to the World Health Organization, men are the most common victims of motorcycle accidents. The data are worrying when it is considered that ATs are the 9th cause of sequels in the general population and become the largest cause of death in the population aged 5 to 44 years old[1]. There were 45,700 fatal victims in 2012, which represents a death every 12 minutes, and 177,400 injured people after the accident with sequels, mutilations, and psychological damage[3].

A study[4] reports that traumatic injuries in the head and face area are considered serious since they can lead to death or lead the injured person to a physical deficiency condition. The authors verified that 44.8% of 194 traumas in this body region had as etiology the accidents involving motorcycles.

Such sequels installed by the injuries in this region can impact the communication in the speech, voice, reading, writing, memory, comprehension and in eating, such as dysphagia, reducing the quality of life of the victims[5]. In this way, the diagnosis and multi-professional care are essential, whenever necessary, to minimize these damages to the health. Depending on the location of the injury and its degree, the victim will require speech-language rehabilitation[5,6].

In a study[7] evaluating patients with multiple causes, such as motorcycle accidents, it was found that there were changes in stomatognathic functions due to facial region trauma in 100% of the cases. The most common changes were: deviations and/or changes in mandibular movements, facial edema, pain on palpation, muscular alterations resulting from fracture, articular noise, scarring changes (keloid or restrictive scar).

Fractures in this region of the head and face have been common in victims of motorcycle accidents, representing an area of speech-language problems, because they frequently interfere with the performance of the functions of this system and, consequently, the quality of life of the victims. Therefore, the main objective of this study was to analyze the association of speech-language disorders in motorcycle accident victims.

METHODS

This is an observational and cross-sectional study occurring in two moments: for the first moment, there was a characterization of the victims of traffic accidents by motorcycles, hospitalized in a large hospital and referred in Traumas; for the second moment, the individuals were contacted by telephone after being discharged to investigate the speech-language disorders resulting from the accident.

Motorcycle accident victims hospitalized in Bucomaxillofacial, Neurosurgery and Traumatology wards were studied between June and July 2014.

Data were collected through consultation of two sources: the medical records of inpatients and direct interviews with them. In the medical records, there was information collected regarding the type of accident and the clinical conditions due to the accident (body parts with injuries, traumas, sequels).

After the selection of the individuals, totaling 99, they were invited to respond to the protocol that evaluates the access and satisfaction of motorcycle accident victims to rehabilitation services. The recommendations of this study were given to the participants, who after being aware, authorized the data for research purposes, signing the Consent and Free Consent Form (TCLE).

This protocol has 7 parts. In 2 of them, they can characterize the victims (age, gender, income, education, number of residents); and accident (alcohol/drug use before the accident, motorcycle position, driving license, type of collision, helmet use, rescue, used health services and waiting time for rescue, type of injury, body parts hit).

After hospital discharge and a period ranging from 1 to 3 months, patients were contacted by telephone to be submitted to a brief anamnesis to obtain information regarding possible changes in speech-language pathology. The interview was carried out by one of the researchers and by telephone, using the first two parts of the protocol of Speech Therapy for Face Trauma[7], and it was answered by the individual of the sample or by a caregiver when necessary.

The Protocol of Speech Therapy for Face Trauma[7] is an instrument directed to the possible aspects of human communication changed by the head and neck trauma. It has two parts: an anamnesis that it was used for this study, in which data could be collected on the main myofunctional disorders in this body region, such as loss or diminution of facial mobility, change in occlusion, limitation of opening the mandible, difficulty in chewing, changes in food consistency, changes in speech, difficulty in swallowing and choking. The second part was the evaluation of the morphological and functional aspects of the stomatognathic system.

The research was approved by the Research Ethics Committee under the protocol nº 504.301/12.

The collected data were analyzed by Epinfo software, using descriptive statistical tests: mean, standard deviation and median; and inferential statistics analysis using Pearson's Qui-square test or Fisher's exact test, when the conditions for using the Qui-square test were not achieved. The prevalence ratio was used to evaluate the strength of the association between the categorical variables, with the margin of error for statistical test decisions of 5% and confidence intervals with 95% confidence.

RESULTS

Regarding the socioeconomic characteristics, it was observed that the patients´ ages ranged from 19 to 65 years old, with a mean of 32.4 years old, concentrating in the young age group, between 19 and 29 years old ($p < 0.02$) (Table 1).

The male population concentrated 90.1% of the cases (p<0.001). As for education, it was verified that individuals with low school level were 51.5%, distributed among illiterates and those who did not complete elementary school. As for the number of people living in the same residence, 53.5% reported between 3 and 4 residents in the same house. It was also verified that 78.8% had a low income, from 1 to 3 minimum wages. There were 39.4% of alcoholic individuals at the time of the accident and 51.5% of unqualified drivers, with the significance of p=0.044 and p<0.001, respectively. The use of the helmet was used in 68.7% of the accidents. The SAMU was the rescue service used in 55.6% of the cases, followed by 17.2% of private vehicles and the study hospital as a neurological trauma reference received 28.3% of the victims directly. Other 26.3% and 21.2% of respondents were seen in other health services, such as reference and municipal hospitals, respectively, before being referred to the study hospital (Table 1).

The most frequent types of injuries were fractures in 88.9%, followed by cuts and lacerations in 34.3% and TCE in 30.3%. The lower limbs were the parts of the body affected in 71.7%, followed by the head, face and neck region in 56.6% and upper limbs in 29.3% of individuals (Table 2).

About 30.3% of the 99 individuals recruited for the first stage of the research reported having speech-language disorders due to the accident. The disorders were related to trauma in the head and face region, limiting mandibular movements to 23.2%, reducing facial mobility in 24.2%, changing occlusion to 24.2% and making chewing difficult in 23.2%. The speech was changed in 20.2% of the interviewees after the accident (Table 3).

Speech-language disorders showed a significant association with victims without driver's license (p=0.012) and motorcycle collisions (p=0.004) (Table 4).

DISCUSSION

The characteristics of gender, young age group, low education level and income of the studied population confirm the findings of other studies[8,9], verifying that the male population is the most affected by this type of traffic accident, with a mean age of 32.7 years old. Another study[10] found that 46% of the injured motorcyclists had a maximum education of 7 years, similarly to this study. Thus, low level of education can be understood as a major risk factor for traffic accidents by motorcycles.

Marín-Leon et al.[11] state that the population with the lowest purchasing power uses motorcycles, because they have the low cost of acquisition and it is stimulated by the media that associates them with the idea of an agile vehicle: an important attraction for young people, especially with few financial resources, who can replace inefficient and time-consuming public transportation, and even use it as a working tool.

The consumption of alcohol before the accident can be considered high (39.4%), as well as the non-driving license for motorcycles (51.3%). The alcohol consumption by motorcyclists was pointed out in research[12], whose percentage of alcoholic drivers was 39%. These data associated with low education and young age only reaffirm the high vulnerability of this

Table 1. Distribution of AT victims by motorcycles assisted in HR/PE, according to socioeconomic and accident characteristics, Recife, 2014

Variable	N	%	p-value
TOTAL	**99**	**100**	
Age group			p [(1)] = 0.002*
19 to 29 years old	44	44.4	
30 to 39 years old	38	38.4	
40 to 65 years old	17	17.2	
Gender			p [(1)] < 0.001*
Male	90	90.9	
Female	9	9.1	
Education			p [(1)] < 0.001*
Illiterate	8	8.1	
Incomplete Elementary School	43	43.4	
Complete Elementary School	11	11.1	
Incomplete High School	13	13.1	
Complete High School	24	24.2	
Number of people they live/reside			p [(1)] < 0.001*
One to two	22	22.2	
3 to 4	53	53.5	
5 to 12	24	24.2	
Family income (minimum wage)			p [(1)] < 0.001*
Less than 1	13	13.1	
From 1 to 3	78	78.8	
More than 3 to 6	8	8.1	
Alcohol/drug use before the accident			p [(1)] = 0.044*
Yes	39	39.4	
No	60	60.6	
Motorcycle position			
Pedestrian	1	1.0	p [(1)] < 0.001*
Driver	84	84.8	
Passenger	14	14.1	
Motorcycle License			
Yes	33	33.3	p [(1)] < 0.001*
No	51	51.5	
Not applicable (Pedestrian or passenger)	15	15.2	
Type of collision			
Car	46	46.5	p [(1)] < 0.001*
Motorcycle	18	18.2	
Public bus	3	3.0	
Fixed object	5	5.1	
Animal	2	2.0	
Fall	22	22.2	
Other	3	3.0	
Using helmet during the collision			p [(1)] < 0.001*
Yes	68	68.7	
No	30	30.3	
Not applicable (Pedestrian)	1	1.0	
Rescue			p [(1)] < 0.001*
SAMU	55	55.6	
Ambulance	7	7.1	
Private care	17	17.2	
Firefighters	13	13.1	
Other	7	7.0	

* Significant difference to 5%; ** Study Hospital; [(1)] Fisher's Exact Test

Table 1. Continued...

Variable	N	%	p-value
Health Service			**p $^{(1)}$ < 0.001***
HR**	28	28.3	
City Hospital + HR	21	21.2	
City Hospital + reference hospital + HR	11	11.1	
UPA+HR	13	13.1	
Reference Hospital + HR	26	26.3	
Waiting time for the rescue			**p $^{(1)}$ < 0.001***
Up to 10 minutes	21	21.2	
More than 10 to 30 minutes	25	25.3	
More than 30 to 60 minutes	14	14.1	
More than 60 minutes	5	5.1	
Not informed	34	34.3	

* Significant difference to 5%; ** Study Hospital; $^{(1)}$ Fisher's Exact Test.

Table 2. Distribution of ATs victims by motorcycles treated in HR/PE, according to types of injuries and parts of the body affected, Recife, 2014

Variable	Occurrence of Injury	
	n*	%
Type of lesion		
Fracture	88	88.9
Cutting/laceration	34	34.3
Cranioencephalic injury	30	30.3
Polytrauma	9	9.1
sprain/dislocation/Contusion	8	8.0
Dental trauma	5	5.1
Contusion	4	4.0
Amputation	4	4.0
Parts of the body affected		
Lower limbs	71	71.7
Other region of the head/face/neck	56	56.6
Upper limbs	29	29.3
Mouth/teeth	16	16.2
Abdomen/hip	15	15.2
Thorax/back	11	11.1
Spine/marrow	6	6.1
Neck	5	5.1
Genitals	1	1.0

* Variables with the sum of more than one option

Table 3. Distribution of ATs victims by motorcycles treated in the HR/PE according to types of speech-language disorders, Recife, 2014

Type of disorder	Disorder Occurrence	
	n*	%
Loss/diminution of facial mobility	24	24.2
Change in occlusion	24	24.2
Limitation of jaw opening	23	23.2
Difficulty in chewing	23	23.2
Change in food consistency	21	21.2
Change in speech	20	20.2
Difficulty swallowing	7	7.1
Choking	6	6.1

* Variables with the sum of more than one option

population. The consumption of alcoholic beverages leads to risky behavior and damages not only for themselves but also for other individuals around them.

Besides they are not qualified and the high percentage of motorized motorcycle drivers, it is necessary more efficient educational/punitive actions, emphasizing that the investigation of social factors contributing to the presented outcomes is essential for the effectiveness of policies aimed at these drivers.

This study observed that the type of collision of the most frequent accident was motorcycle versus cars (46.5%), followed by motorcycle falls (22.2%). These data are like the findings in the city of Londrina (PR)[13]. For the authors, accidents involving motorcycles and cars are common in urban centers and can be explained by the intense flow of automobiles in large cities. This same study also observed that in accidents involving motorcyclists, the highest number of deaths was due to motor-to-car collisions, justified by the impact intensity caused to the motorcyclist at the time of the collision.

There were different findings by the Fire Department of Pernambuco, whose records in 2013 reported falls due to collision (47.6% and 46.2%, respectively)[14]. Such a difference can be explained by the fact that the victims of fall accidents do not necessarily need more complex care, such as hospital medical care. This is confirmed in another study[15], in which about 30% of the traffic accidents occurred in the hospital and 20% of cases the victims were "released" at the accident site, not requiring them to be taken to the hospital. Possibly, because they were less traumatic, the falls were never sent to the hospital of this study.

As for the rescue unit for the victims, the performance of SAMU was verified in most cases (55.6%). Created in 2003, as part of the National Emergency Care Policy, the Mobile Emergency Care Service (SAMU) has helped reduce the number of deaths, length of stay in hospitals and the sequels due to accidents[16].

In a survey[17] on the implementation of SAMU in Brazil, it was pointed out that there was a transition from prehospital care models, previously largely performed by the Fire Department. Most of the team did not have a medical professional. With SAMU, there was an expectation of improving the quality of care and standardization of rules and procedures, as well as the adoption of rescue equipment needed to save the victims.

The percentage of victims with speech-language disorders rescued by private vehicles (47.1%) was considered high. This type of rescue is not appropriate since it leads to improper handling of the victim. Victim care should be started as early as possible, with the best integration between on-site care, care during transportation and definitive treatment[18].

Initial treatment often determines the patient´s final prognosis. This phase also begins in the scene of the accident with a fast evaluation and procedures performed from life-threatening injuries, thus establishing priorities. Assistance to motorcycle victims requires involvement in the dynamics of care and a holistic view of everything that surrounds them[19]. Specialized and appropriate support such as SAMU and Firefighters aims to provide quality care and equity above all, providing the victim

Table 4. Factors associated with speech-language disorders in ATs victims by motorcycles assisted in the HR/PE, Recife, 2014

Variable	Speech-language Disorders				RP (CI to 95%)	p-value
	Yes		No			
	n	%	n	%		
Gender						
Male	27	30.0	63	70.0	1.00	p [1] = 1.000
Female	3	33.3	6	66.7	1.11 (0.42-2.95)	
Age group (years old)						
19 to 29	15	34.1	29	65.9	1.16 (0.50-2.69)	p [2] = 0.744
30 to 39	10	26.3	28	73.3	0.89 (0.36-2.22)	
40 to 65	5	29.4	12	70.6	1.00	
Consumption of alcohol/drug before the accident						
Yes	11	28.2	28	71.8	1.00	p [1] = 0.714
No	19	31.7	41	68.3	1.12 (0.60-2.09)	
Motorcycle position [3]						
Driver	26	31.0	58	69.0	1.08 (0.45-2.63)	p [2] = 1.000
Passenger	4	28.6	10	71.4	1.00	
Motorcycle license [4]						
Yes	5	15.2	28	84.8	1.00	p [1] = **0.012** *
No	21	41.2	30	58.8	2.72 (1.14-6.50)	
Type of collision						
Car	8	17.4	38	82.6	1.00	p [1] = **0.004** *
Motorcycle	10	55.6	8	44.4	3.19 (1.50-6.78)	
Fall	5	22.7	17	77.3	1.31 (0.48-3.53)	
Other	7	53.8	6	46.2	3.10 (1.38-6.93)	
Use of helmet during The collision [3]						
Yes	17	25.0	51	75.0	1.00	p [1] = 0.134
No	12	40.0	18	60.0	1.6 (0.88-2.92)	
Rescue [5]						
SAMU	15	27.3	40	72.7	1.00	p [2] = 0.240
Private car	8	47.1	9	52.9	1.72 (0.89-3.35)	
Firefighters	2	15.4	11	84.6	0.56 (0.15-2.17)	
Other	5	38.5	8	61.5	1.41 (0.63-3.18)	
Health Service						
HR	6	21.4	22	76.8	1.00	p [1] = 0.098
City Hospital + HR	7	33.3	14	66.7	1.56 (0.61 - 3.95)	
City Hospital + Reference hospital + HR	3	27.3	8	72.7	1.27 (0.38-4.22)	
UPA+HR	8	61.5	5	38.5	2.87 (1.25-6.58)	
Reference Hospital + HR	6	23.1	20	76.9	1.08 (0.40-2.92)	
Waiting time for the rescue (minutes) [5]						
Up to 30	16	34.8	30	65.2	1.10 (0.51-2.38)	p [1] = 0.804
More than 30	6	31.6	13	68.4	1.00	

* Significant association to 5,0%; [1] Fisher's Exact Test; [2] Pearson's Chi-Square Test; [3] The pedestrian was not considered; [4] Not applicable: pedestrians and passengers; [5] Not considered those who did not know to inform.

with the maintenance of life and preventing or minimizing possible sequels.

As for the network described by the victims interviewed, a diversity of public health equipment was verified for the maintenance of life. The National Policy of Emergency Care recommends that this network should be organized in regional blocks, with its various components: mobile pre-hospital; hospital and post-hospital[16].

Reference hospitals located at municipal borders, regional hospitals, as well as Emergency Care Units (UPA) had a large participation in the first visits to the victims, having a high percentage. However, the HR was the direct hospital

care sought in 28.3% of the cases. This fact can be explained by the fact that HR is considered as the largest complex in emergency and trauma service in the North/Northeast, being a reference unit to attend to several cases, including those of victims of traffic violence[20].

In this study, it was found that 21.2% of respondents waited less than 10 minutes to be rescued, followed by 25.3% who waited less than 30 minutes, being within the average time stipulated by the National Policy on Emergency Care, recommending up to 20 minutes, considering that a fast care contributes to a shorter hospitalization, improving rehabilitation prognosis, and reducing the mortality rate by accidents[16].

Among the most serious lesions, there were fractures (88.9%), followed by head trauma (TCEs) (30.3%). TCEs can be prevented or attenuated using personal protective equipment, in this case, is the helmet. In this study, it was found that 68.7% of the interviewees used the equipment. The importance of helmets by motorcycle drivers and passengers is emphasized[11] to prevent major injuries and to reduce morbidity and mortality from accidents.

As for the most affected body areas, there are the lower limbs, followed by the region of the head and face and upper limbs. The lower and upper limbs are identified as those most affected by motorcycle accidents[21], although the victims are often characterized as multiple trauma patients or with multiple injuries in the same body segment, a situation that worsens the prognosis, needing the emergency evaluation of the surgical teams[22].

In this study, there was a high percentage (30.3%) of patients with speech-language disorders after hospital discharge. Those disorders involving movements in the mandible highlighted among the disorders mentioned. Considering the contribution of this structure to the speech[23], to the efficient mastication, to the swallowing and to the formation of the lower part of the face[24], the lesions that involved it received a series of speech-language disorders as sequels after the accident. They were: limitation of jaw opening, loss/diminution of facial mobility, change in occlusion, change in food consistency and difficulty in chewing.

The inability of movements with the jaw, swelling, jaw deformity and abnormal mobility are common symptoms in traumas involving structures such as the mandible[7]. In general, the trauma in the face region is usually the most complex, and it is the most difficult to deal with since it often triggers complicated healing wounds and sequels[25]. It is also worth noting that the head and mainly the face traumas have repercussions on the emotional state, orofacial functions, and permanent aesthetic deformities[26].

It should be emphasized that changes in orofacial functions can be attenuated through specific speech-language therapy for face lesions, eliminating the main disorders, minimizing observed clinical signs and sequels inherent to the trauma, promoting myofunctional rehabilitation or functional adaptations. This professional contributes to the viability of the proper functioning of the Stomatognathic System[7].

The findings also showed that drivers who do not have a motorcycle license are more susceptible to speech-language disorders resulting from the accident (p=0.012). A study carried out in Maringá-PR found that drivers who did not have a license were more motorcyclists among the victims of traffic accidents[27].

These data suggest the lack of training of drivers, who are not qualified in traffic, resulting in more accidents with serious injuries, corroborating another study[28] whose unlicensed or inadequately qualified motorcycle drivers presented a higher risk for serious accidents and death when compared to drivers with the appropriate license.

A study carried out in Spain also observed that driving without qualification and under the effect of alcoholic beverage are factors strongly associated with the occurrence of accidents with serious injuries and, consequently, sequels[29]. Recently, a study carried out with motorcyclists and in Maringá-PR revealed a great proportion of deaths in survivors among those who did not have license or had an expired license[9].

This study has a young age group between 19 and 29 years old concentrating a greater percentage of victims with speech-language disorders (34.1%). In fact, young drivers are more likely to be involved in traffic accidents, especially motorbikes, when compared to other ages, either because of lack of skill or inexperience, and seriously more subject to serious injuries and even death. A survey in New Zealand with motorcyclists found a consistent association between deaths and injuries and young motorcyclists. It was found that drivers under 19 had a higher risk of death and sequels than drivers older than 25 years old[28].

Regarding the use of helmets, 40% of the victims who reported having speech-language disorders were not wearing a helmet at the time of the accident. According to a study[29] that considered the perception of the motorcyclists on the helmet, they concluded that only they were saved or had the corporal damages softened by being using such protective equipment. The helmet is an indispensable equipment for the safety of motorcycle riders because it reduces the risk and severity of head injury, reducing the possibility of death and the costs associated with the collision treatment[29].

Concerning the health services used by the group of individuals who reported speech-language disorders after the accident, there was a higher percentage of victims who were attended in more than one service (61.5% -UPA+HR) when compared to the victims with disorders that were referred directly to the reference hospital in trauma (21.4%-HR). This data suggests that the consultation of the victim in health centers not specialized in need of the patient can reflect in the worsening of the injuries, generating sequels. Thus, referring the patient to the correct health service through the right screening, though apparently simple, may not be an easy decision and surely has a great impact on the prognosis of the victims[18].

In the association of the disorders in the type of collision, statistical significance was verified for motorcycle versus motorcycle collision (p=0.004). As described in other studies[21,30], this mechanism of the accident is not the most

common, ranging from a second or third place in collision types involving motorcycles. The vulnerability of the motorcycle rider is evident, becoming duplicated when the means of transportation involved are of the same nature. Almeida et al.[26] verified that accidents involving only motorcycles were the second highest risk for accidents involving deaths.

In the impact of the motorcycle accident, there is often an occurrence of shock absorption by motorcyclists, considering that motorcycles do not have the ideal structure for protection when they are commonly ejected from a distance. Thus, drivers are constantly subject and prone to acquire injuries that can lead to death or temporarily or permanently limit the development of activities of daily living. Despite all the advances obtained by safety equipment, this inequality in the protection conditions leads to greater exposure to the most serious accidents, a determinant of their high morbidity and mortality rate[30].

CONCLUSION

This study found a predominance of males, young and of productive age, among the most frequent victims of motorcycle accidents. Victims with this profile are prone to acquiring injuries leading to death or even limit the development of their daily activities.

The consumption of alcohol before the accident was found in a high percentage of the study population. There was also a statistically significant association between speech-language disorders with unqualified drivers and collisions between motorcycles, suggesting their presence in cases of irresponsible driving and serious accidents.

It is important to point out that victims with facial injuries and problems with jaw movement after a motorcycle accident constituting a population that potentially demands speech-language assistance for the treatment and minimization of sequels resulting from these accidents. This portion of the population would probably benefit from this care even in the hospitalization phase when the disorders are in the installation phase.

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Author contributions

MGPS participated in the collection and production of the text, writing and final writing of the article; VLS and MLLTL participated in the orientation, review and coordination of the research; IVF, MRBV, AOCG and AKPSC participated in the writing and final review of the article.