CRANIOFACIAL TRAUMA IN OLDER ADULTS VICTIMS OF ROAD TRAFFIC ACCIDENTS: A CROSS-SECTIONAL STUDY

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Palavras-chave: Idoso. Acidentes de Trânsito. Traumatismos Maxilofaciais.

RESUMO

Objetivo: Caracterizar e avaliar a ocorrência de trauma craniofacial causado por acidentes de transporte em idosos atendidos em um centro de referência. **Métodos:** Estudo transversal e retrospectivo, sendo a amostra composta por 117 prontuários médicos de indivíduos com idade igual ou superior a 60 anos hospitalizados por acidentes de transporte. Foram coletados dados referentes ao sexo, faixa etária, dia da semana e horário, tipo de acidente de transporte, lesão em tecido mole, existência de lesões múltiplas, lesão na cabeça e face, ocorrência de fratura e tipo de osso acometido, ocorrência de traumatismo crânio-encefálico e óbito durante os meses de janeiro a dezembro de 2011. Os dados foram analisados por meio da estatística descritiva e inferencial (teste Qui-quadrado), sendo adotado um nível de significância de 5%. **Resultados:** As vítimas eram homens (74,4%), entre 60 a 69 anos (61,5%). A maioria dos acidentes ocorreram durante dias úteis (68,4%), a noite (38,5%) e envolviam pedestres (45,3%). Verificou-se associação estatisticamente significante entre o gênero e o tipo de acidente de transporte (p=0,004). Lesões em tecidos moles acometeram 76,9% das vítimas e 39,3% apresentavam lesões múltiplas. A ocorrência de injúrias na cabeça e na face foi de 17,9% para cada região. As fraturas no crânio acometeram 6% das vítimas, enquanto as fraturas na maxila representaram 4,3% dos casos. A ocorrência de óbito foi de 9,4%. A análise bivariada mostrou associação estatisticamente significante entre a presença de trauma na face e a ocorrrência de traumatismo crânio-encefálico (p=0,034). **Conclusão:** Os acidentes de transporte acometem pedestres do sexo masculino, na faixa etária de 60 a 69 anos, no período noturno e acarretam lesões múltiplas. As vítimas apresentam injúrias nas regiões da cabeça e da face, com elevada ocorrência de fratura óssea. Verificou-se associação estatisticamente significante entre a presença de trauma na face e a ocorrrência de traumatismo cranioencefálico.

Keywords: Aged. Accidents. Traffic. Maxillofacial Injuries.

ABSTRACT

Aim: To characterize and evaluate the occurrence of craniofacial trauma caused by road traffic accidents in older adults attended at a reference center. **Methods:** This is a cross-sectional and retrospective study comprising 117 medical records of individuals aged 60 years or more hospitalized due to road traffic accidents. Data regarding gender, age group, day of week and time of occurrence, type of road traffic accident, soft tissue injury, multiple lesions, head and face injury, occurrence of fracture and type of bone involved, occurrence of cranial-encephalic trauma and death were collected during the period January-December 2011. Data were analyzed through descriptive and inferential statistics (Chi-square test), with a significance level set at 5%. **Results:** Victims were mostly males (74.4%), aged 60-69 years (61.5%). The majority of accidents occurred during weekdays (68.4%), at night (38.5%) and involved pedestrians (45.3%). There was a statistically significant association between gender and road traffic accident (p = 0.004). Soft tissue lesions accounted for 76.9% of victims and 39.3% had multiple lesions. The incidence of head and face injuries was 17.9% for each region. Fractures in the skull affected 6% of victims, while fractures in the maxilla represented 4.3% of cases. The occurrence of death was 9.4%. The bivariate analysis showed a statistically significant association between presence of trauma in the face and the occurrence of cranial-encephalic trauma (p = 0.034). **Conclusion:** Road traffic accidents affect male pedestrians in the age range of 60-69 years, at night and cause multiple lesions. Victims present injuries in the regions of head and face, with high occurrence of bone fracture. Statistically significant association was observed between presence of trauma in the face and occurrence of traumatic brain injury.

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INTRODUCTION

According to the Statute of the Elderly, a person is considered elderly when he / she is 60 years or older.[1] Between 2005 and 2015, this population group increased by about 45% compared to the previous period in total of the Brazilian population[2], revealing an increase in the life expectancy in this population group, resulting from greater number of basic care services in the country, as well as the improvement in the quality of these services.[3]

It is well known that several natural functions such as motor, cognitive and sensory decline with time in this population[4], causing hospital admissions due to external causes, such as falls and road traffic accidents[5], since they are associated with greater vulnerability due to advanced age.[6]

Among external causes responsible for hospital admissions of older adults, road traffic accidents stand out and are characterized by involving pedestrians, motorcyclists, drivers and passengers in vehicles.[7] Responsible for about 1.24 million deaths worldwide each year[6], road traffic accidents are among the main causes of death in the young and adult population, contributing even to increase the mortality rates of the elderly population.[8]

In Brazil, the elderly population is not usually a priority in the approach related to accidents with external causes due to the predominance of young people involved in higher number of accidents.[9] However, road traffic accidents can lead older adults to death even by injuries considered mild, due to their lower capacity for recovery, characteristic of advanced age caused by preexisting diseases.[10] In addition, being the fifth cause of death in the elderly population, aging directly influences mortality and morbidity rates of trauma in the country,[9] being about 25% higher in this age group compared to the age group of 20-59 years.[5]

Road traffic accidents represent an important public health problem, which has a major impact on the profile of illness and death in the population.[11] Thus, knowing the profile of older adults hospitalized due to road traffic accidents and the characteristics of these accidents is a way of making possible the adoption of preventive and assistance strategies by managers directed to this population.

In addition, it is a way of making possible the recovery of accident victims and the reduction of deaths due to road traffic accidents. Therefore, the present study aims to characterize and evaluate the occurrence of craniofacial trauma caused by road traffic accidents in older adults attended at a reference center.

MATERIALS AND METHODS

This cross-sectional and retrospective study was carried out based on medical records of individuals aged 60 years or more hospitalized for external causes at the "Senador Humberto Lucena" Emergency and Trauma Hospital, a public reference institution for the emergency care of trauma victims, located in the city of João Pessoa, Paraíba. The sample consisted of 117 medical records of patients aged 60 years and older hospitalized due to road traffic accidents from January to December 2011.

The collection instrument consisted of a form developed from the information contained in medical records, in which demographic data (gender and age group) and those related to the accident (day of week, time of occurrence [moorning, afternoon, evening and night] and type of road traffic accident [pedestrian, cyclist, motorcyclist and vehicle occupant]), injuries (lesion in soft tissue [yes/no], presence of multiple lesions [yes/no], presence of head and face injury [yes/no], occurrence of bone fracture [yes/no] and type of bone involved, presence of cranial-encephalic trauma (CET) [yes/no] and death [yes/no] were recorded. Multiple lesions were defined as lesions that affected more than one region of the body. Two duly trained researchers performed data collection in the Medical and Statistical Archive Sector (SAME) of the aforementioned hospital.

In the data analysis, descriptive and inferential statistics techniques were used. Statistical techniques involved obtaining absolute and percentage distributions. Bivariate analyzes were performed between gender and the type of accident, between the presence of multiple lesions and cranial-encephalic trauma and between facial trauma and cranial-encephalic trauma. For the bivariate analyses, the chi-square test was used, with significance level of 5%. Data were analyzed through the Statistical Package for the Social Sciences software, version 18.0.

This study followed all the ethical guidelines recommended by the international scientific community and by the Brazilian legislation. The ethics committee of human research from the State University of Paraiba has previously approved the study (CAAE nº 05480133000-11).

RESULTS

During the evaluation period, 426 hospital admissions were registered in patients aged 60 and over, of whom 117 (27.5%) were hospitalized due to road traffic accidents. There was a predominance of male individuals (74.4%) aged 60-69 years (61.5%). Male to female ratio in road traffic accident was 2.9:1; a higher ratio was seen in motorcycle (8.7:1) and bike (5:0) accidents and a lower ratio in vehicle occupant (1:1). A percentage of 68.4% of accidents occurred during the week, 38.5% during the night and 45.3% involving pedestrians (Table 1). The bivariate analysis revealed

statistically significant association between gender and type of road traffic accident (p = 0.004).

The presence of soft tissue lesions was identified in 76.9% of victims and 39.3% had multiple lesions. The incidence of head and face injuries was 17.9% for each region (Table 2).

The occurrence of bone fractures was verified in 67.5% of victims. Fractures in the skull affected 6% of victims, while fractures in the maxilla represented 4.3%. CET affected 24.8% of victims and the occurrence of death was 9.4% (Table 3).

The presence of fracture was associated with the occurrence of multiple lesions (p = 0.005) and the presence of cranial-encephalic trauma (p = 0.036). The bivariate analysis also revealed a statistically significant difference between presence of trauma in the face and the occurrence of CET (p = 0.034).

Table 1: *Distribution of victims according to demographic variables and related to road traffic accidents*

Variables	N	%
Gender		
Male	87	74.4
Female	30	25.6
Age (Years)		
60-69	72	61.5
70-79	27	23.1
> 80	18	15.4
Weekend		
Yes	37	31.6
No	80	68.4
Time of Occurrence		
Moorning	32	27.4
Afternoon	35	29.9
Evening	45	38.5
Night	5	4.3
Type of Road Traffic Accident		
Pedestrian	53	45.3
Cyclist	5	4.3
Motorcyclist	39	33.3
Vehicle occupant	20	17.1

Table 2: *Distribution of victims according to the type of injury and the region involved.*

Variables	N	%
Soft Tissue Injuries		
Yes	90	76.9
No	27	23,1
Multiple Injury		
Yes	46	39.3
No	71	60.7
Head Injury		
Yes	21	17.9
No	96	82.1
Face Injury		
Yes	21	17.9
No	96	82.1

Table 3: *Distribution of victims according to the presence of bone fracture, regions affected, occurrence of CET and death.*

Variables	N	%
Bone Fracture		
Yes	79	67.5
No	38	32.5
Skull Fracture		
Yes	7	6.0
No	110	94.0
Maxila Fracture		
Yes	5	4.3
No	112	95.7
Mandible Fracture		
Yes	1	0.9
No	116	99.1
Occurrence of Cranial-Encephalic Trauma		
Yes	29	24.8
No	88	75.2
Death		
Yes	11	9.4
No	106	90.6

DISCUSSION

Road traffic accidents have a number of consequences, such as individual and family suffering and increased social and economic costs, and are related to high mortality rates [13]. Regarding the distribution according to gender, male individuals were the most affected by road traffic accidents, confirming previous findings.[6,14] This high prevalence of cases may be related to the fact that men are more exposed to traffic, assuming greater risks that compromise well-being.[15]

In the present study, individuals at the age group of 60-69 years were the most involved in road traffic accidents, similar to another study.[16] This population segment newly admitted in the "elderly" category is more susceptible to risks of accidents due to the characteristics of an adult population, such as autonomy and independence. [8]This fact may also explain the progressive reduction in the frequency of involvement in road traffic accidents with advancing age, since old adults are often accompanied by caregivers, thus receiving more attention.[17]

Weekdays recorded the highest number of cases, differing from the findings described by Cavalcanti et al.,[18] in which most accidents occurred on weekends. The divergence of results can be justified by the fact that the study by Cavalcanti et al.[18] was carried out with young individuals, who relate the use of alcohol in their leisure moments, which occur predominantly on weekends,[19] a condition that is not frequently observed in older adults, since 95% of road traffic accidents in this population occur without the effect of alcohol.[20]

Most road traffic accidents occurred at night, similar to other studies.[7,21] The low visibility typical of the nocturnal period probably explains the higher frequency of accidents during this day shift.

Observing the type of road traffic accident, the majority involved pedestrians (45.3%), as reported by Papa et al.,[13] in which about 35% of road traffic accidents registered in Maringá / PR during 5 years involved pedestrians. The fact that older people take longer time to cross highways makes them more susceptible to traffic[22] and, consequently, to the risk of accidents, which possibly justifies the result found. In addition, the frequent need of pedestrians to divide their circulation spaces with cars, as a result of the presence of obstacles or poor conservation of sidewalks increases the risk of this group to road traffic accidents.[21]

The presence of soft tissue lesions affected most victims, as observed by Miguens Jr et al.,[23] These data may be related to the fact that soft tissues, such as skin, lose elasticity and distension over time,[24] thus suffering greater damage when exposed to trauma.

More than one third of victims had multiple lesions, corroborating previous findings.[25] This fact may be related to the greater bone fragility of this population, even when subjected to low magnitude traumas, and less tolerance to lesions, leading to greater number of injuries.[25] It has been reported that it is not uncommon for older adults to suffer multiple lesions when they are involved in accidents, since as described by Pinto et al.,[21]lesions in this population cause greater consequences than in young people.

Lesions in the head and face regions were present in 17.9% of victims, confirming previous findings.[26] Lesions in these regions deserve special attention because they can have

negative consequences for victims in the physical, emotional and functional aspects,[27] and are considered a serious public health problem in developed and developing countries.[28]

In most road traffic accidents, the presence of bone fractures was verified, including bones of the skull and maxilla, corroborating findings obtained in India.[29] These injuries may be related to osteoporosis, common in the elderly, since this disease is a risk factor for fractures.

Cranial-encephalic trauma was present in one quarter of victims, a result similar to that described by Broska Júnior et al..[30] It could be considered that older adults have lower recovery capacity, require longer hospitalization stay and have higher mortality rate when compared to younger victims.[9]

People over 60 years of age have a double chance of dying from road traffic accidents when compared to individuals less than 60 years of age due to the age-related physiological processes.[6] In this study, 9.4% of road traffic accidents were fatal; therefore, knowing that older people are more susceptible to deaths that could be easily tolerated by younger victims,[9] the need for care in preventing this type of accident is reinforced.

The results should be interpreted with caution, considering the retrospective and cross-sectional nature of the study, the fact data come from a single reference center and incomplete or missing data, which may be considered limitations of the study.

Therefore, the characteristics of hospital admissions due to road accidents allows to infer that public health measures should be adopted to the elderly because they represent a specific population that is commonly affected by transitory and permanent dysfunctions after involved in traffic accidents,[20] It is important to ensure preventive actions to reduce the prevalence of traffic accidents among this age group; this includes applying resources to maintain road safety and adequate structure.[6] Some measures to achieve this are using speed reducers6, warning signs, road stabilizers[26] and improving lighting and road structure. In addition, there is a shortage of studies in literature on road traffic accidents involving this population, and it is important to develop new studies related to this subject, as a way of providing greater knowledge of related risk factors.

CONCLUSION

Thus, road traffic accidents affect male pedestrians in the age range of 60-69 years, at night and cause multiple lesions. Victims present injuries in the regions of head and face, with high occurrence of bone fracture. There was a statistically significant association between presence of trauma on the face and occurrence of traumatic brain injury.

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