

Body injury in the elderly victims of fall in public transportation.

Lesões corporais em idosos vítimas de queda no transporte coletivo.

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Abstract

Introduction: Body injury due fall can happen in all subjects, but this risk increases in the elderly due to the inherent changes of aging itself. Moreover, the public mass transit system is not adapted to the needs of this population on the rise. **Objective:** The objective of this research was to describe and analyze injuries by body segment in the elderly victims of fall in the public transport of Maringá. **Method:** Cross-sectional, descriptive, retrospective and quantitatively through analysis of patient records of the occurrence of falls in the elderly aged over 60 years in the collective transport of Maringá between the period 2005 to 2012, where we analyzed the following variables: gender, age and injured segment. Data were analyzed using descriptive statistics and the Kruskal - Wallis test. **Results:** The results showed an increase in the number of falls in transport in the city and in 2012 (60%) of these events were elderly, most cases of falls is in females (69% of cases) and body segments more injured were members. **Conclusion:** We conclude that in Maringá women are the most frequent victims of falling in public transport and the most significantly injured segment are the upper and lower limbs.

Keywords: falls; transport; bodily; body segments.

Resumo

Introdução: As lesões corporais decorrentes de queda podem acontecer em todos os indivíduos, porém este risco aumenta nos idosos devido as alterações inerentes do próprio envelhecimento, além disso, o sistema público de transporte coletivo não se encontra adaptados às necessidades desta população em ascensão. **Objetivo:** O objetivo desta pesquisa foi descrever e analisar as lesões por segmento corporal em idosos vítimas de queda no transporte coletivo de Maringá. **Método:** Esta pesquisa é transversal, descritiva, retrospectiva e quantitativa realizada através da análise dos prontuários de atendimento de ocorrência de queda de idosos com idade igual ou superior a 60 anos no transporte coletivo de Maringá entre o período de 2005 a 2012, onde foram analisadas as seguintes variáveis: sexo, idade e segmento lesionado. Os dados foram analisados através da estatística descritiva e o teste de Kruskal-Wallis. **Resultados:** Os resultados demonstraram houve um aumento no número de quedas no transporte na cidade, sendo que em 2012 (60 %) destas ocorrências eram de idosos; a maioria dos casos de quedas se encontra no sexo feminino (69% dos casos) e os segmentos corporais mais lesionados foram os membros. **Conclusão:** Conclui-se com esta pesquisa que em Maringá, as mulheres são as vítimas mais frequentes de queda no transporte coletivo da cidade e que o segmento mais lesionados significativamente são os membros superiores e inferiores.

Palavras chaves: Queda; transporte; lesões; segmento corporal.

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INTRODUCTION

Aging is a dynamic and continuous physiological process that subjects the human body to different dynamics and functional changes culminating in substantial effects on individual health.⁽¹⁾ The changes caused by aging, plus the coexistence of chronic diseases, continuous medication and structural changes and function of all body systems predispose the elderly to several accidents, making them more vulnerable. Even though the elderly suffer the same injuries that young individuals, they have some differences regarding the appearance of the lesion; sexual dominance; the degree of established injury; the duration and result of injury.⁽²⁾

Some authors reports that the elderly are more vulnerable to trauma structurally, because of the changes of aging and have reduced resilience remained hospitalized for over time and gradually lost functional capacity. Thus traumatized elderly people die from the same causes that young, but due to pre-existing conditions, die from less severe injuries.⁽³⁾

Authors also describe that, among countless challenges faced by the elderly in Brazil, including the lack of planning of cities. Thus, due to the growth of the elderly population discussions around disabling events become increasingly important and inevitable, and the fall event is the most common and the leading cause of morbidity and mortality in this age group.⁽⁴⁻⁷⁾

Fall is defined as an unintentional event due to loss of body posture and balance, causing the displacement of the individual to the ground, may be related to endogenous changes of the elderly, such as neuromuscular disorders; skeletal abnormalities involved in the maintenance of postural balance shaft, or can be caused due to exogenous factors such as stairs, curbs and sudden events which cause the loss of balance, being the etiology multifactorial. The physical and psychological consequences to the elderly affected by the fall are considered serious, especially for the injuries that they cause, as time of hospitalization, loss of mobility; functional decline and the development of fear of falling again, this way may represent the leading cause of death in the elderly.^(4-6,8-10,12)

Faced the large public health problem that the fall event and its consequences, this study aimed to describe and analyse injuries per body segment of elderly victims of fall in the public transport of Maringa between the period 2005 to 2012.

METHODS

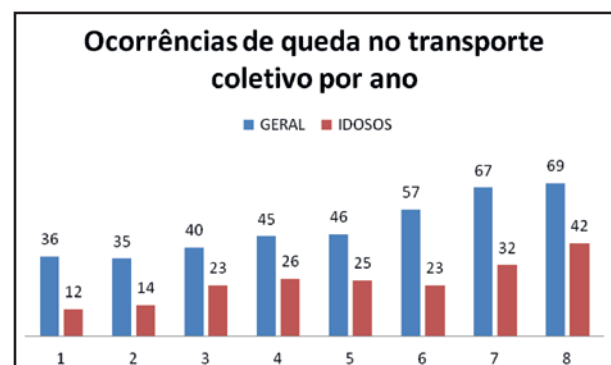
This research is characterized as retrospective, quantitative and descriptive study approved by the Ethics Committee (CEP - UNICESUMAR) by opinion number 174 046 on 14/12/2012. Secondary data from records of care of elderly aged over 60 years, victims of fall in the urban transportation of Maringa were analysed during the years 2005-2012 available in the data-

base of general events of the fire department Maringa - Paraná. The variables analyzed were age, gender and body part injured in the fall event, these data were analyzed using the Statistical Analysis Software application - SAS. The prevalence of injuries due to the fall in transport for the elderly affected body part, were raised by frequency tables simple and cross. The relationship between the amount of damage and the affected body segments was tested using the Kruskal-Wallis test. We adopted a confidence level of 95% ($\alpha = 0.05$).

RESULTS

During the years 2005 - 2012 were attended by the fire department, 395 instances of fall in public transport, being the same in the loading, unloading or inside the vehicle. It was registered by the fire department, that the declines in public transport occurred in 198 (50%) of them in elderly individuals. When analyzing the falls of elderly people in relation to the annual survey period is seen an increased number of falls, because in 2005 the occurrence of falls in the elderly accounted for 33% (12 cases) and in 2012 the number of occurrences in the elderly was 60 % (42 cases), according to Graph 1.

About the gender of individuals was observed that among the occurrence of falls of elderly in the in public transport in the city of Maringa, women appear as the main victims of these falls (Figure 2), representing 69%



Graph 1. Demonstrative of the number of occurrences of fall in public transport among the general population and the elderly population during the years 2005-2012.



Graph 2. Gender of the elderly victims of falling in public transport Maringa in the period 2005-2012.

of the records of falls in the city, and elderly men represent only 31% of these records.

Regarding injured segments due to fall in public transport in Maringa during the period 2005 to 2012 was observed injuries in various body segments such as the skull, face, upper limbs, spine, pelvis and the lower limbs, as shown in Table 1.

It can be observed that the most frequent injury due to fall in Maringa is the injury in the upper limbs, followed by an injury to the skull and lower limbs. This can be explained by the physiological changes of aging itself, because the upper limbs are more frequently present in all years studied. Among the segments injured less frequently, there is the pelvis and face emphasizing that these are important segments for maintenance of postural in elderly.

The data found in the study emphasize some important discussions to be made regarding susceptible and vulnerable body segments to injury in the elderly. According to Table 1, the lesions of the skull ranged from 11% to 25% between 2005-2012, as the face injuries decreased between 2007 and 2008 reaching a null frequency, but reappeared to reach levels of 18.3 % in 2012. However upper limbs injuries grew until 2008, with a slight decrease, but remained the highest incidence of injury during the survey period; spine injuries in 2006 and 2009 showed a reduction in its incidence, and pelvic injuries segment of greatest concern by the medical profession due to cases of femur fractures, presented this research as a lower incidence of injury and injuries lower limbs showed an increase during the years 2008 and 2009, reducing its occurrence in 2012.

Regarding the significance of the data found on body segments affected in the fall, there was a significant difference in relation to the injured segment, since most of the lesions observed in this study occurred in the upper limbs and lower limbs in the elderly of Maringa (Table 2).

DISCUSSION

The growth of the elderly population leads us to im-

portant discussions involving the future of society and quality of life of seniors, including modifications or adaptations to vehicles for urban transportation which favors the elderly displacements efficient and safe way within the city.^(4,10,11,14)

Currently, aging is occurring in a healthier way, because the actions of health promotion developed for this population on the rise, and the increase of the quality of life which generates an increased life prospect of these individuals, so we currently have more elderly circulating in the city than before, due to this factor the increase in the number of occurrences of falling in public transportation in the city of Maringa with elderly is important to be investigated and preventive measures are necessary and should be suggested, because the falls since 2004, ranks third in mortality of the elderly in the country and that these events deserve to be highlighted integrating health practices to prevent falls.^(15-19,23)

The falls are classified as a type of external trauma, which in the elderly is presented in a particular way, because due to all the physiological changes brought about by aging, they have difficulty responding to physiological demands caused by trauma and its consequences biopsicosociais.⁽¹⁾ The authors⁽²⁾ emphasize that health care and quality of life of elderly people is becoming a priority in view of the increase of individuals in old age and the elderly predisposed to several accidents, especially the fall. This mechanism, the most common injury in the elderly and can be observed by increasing the number of occurrences of decline in public transport that occurred in 2012.

Table 2. Result of Variance test for injuries occurring by fall organized by body part.

Body segment	N	%
Skull/face	80	24.92
Limbs	182	56.70
Spine	59	18.38
Total	321	100.00

*Mean scores: Skull/face =10.75; Limbs=19.25 and spine=7.5. Qui-square (Kruskal-Wallis test) = 11.90; p-value = 0.0026.

Table 1. Injured body segments in fall per year and frequency

Year	Fall	Skull	Face	Upper Limbs	Spine	Pelvis	Lower Limbs	Total Freq
2005	12	15.4%	7.7%	46.2%	11.5%	7.7%	11.5%	100.0%
2006	14	23.5%	17.6%	23.5%	5.9%	5.9%	23.5%	100.0%
2007	23	15.4%	0.0%	41.0%	17.9%	2.6%	23.1%	100.0%
2008	26	15.0%	0.0%	35.0%	15.0%	0.0%	35.0%	100.0%
2009	25	11.4%	9.1%	36.4%	9.1%	0.0%	34.1%	100.0%
2010	23	18.2%	6.1%	33.3%	15.2%	3.0%	24.2%	100.0%
2011	32	25.5%	5.9%	25.5%	17.6%	3.9%	21.6%	100.0%
2012	43	12.7%	18.3%	29.6%	16.9%	7.0%	15.5%	100.0%

Regarding genders was observed that the elderly woman are the most affected by falls in the public transport in Maringa and this finding corroborates with various research which also found a higher incidence of falls in women, showing the fragility of gender, and this frequency can reach nearly five times higher than in men. According to research, women suffer higher index of falling towards men and according to the incidence of falls increases with advancing age in both gender but is more evident in women, as found this study.⁽¹⁵⁻²⁰⁾

Can be observed after injuries that occurred due to the fall in elderly, that the dynamic changes generated by the aging process and are responsible for a series of morphological and functional changes that predispose these individuals to fall, but on the other hand we cannot say that the fall cannot be prevented this age group.⁽¹⁶⁾

Some of the physiological changes of aging involve the deterioration mechanisms of body balance of the individual, the reduction of proprioceptive function and reduced muscle strength, impaired vestibular function, changes in hearing and vision, frame body hypotension, slow responses and mechanisms motor which added to extrinsic environmental factors may facilitate the occurrence of the fall, especially in a moving vehicle.⁽¹⁶⁾

The physiological changes of aging may predispose some bodily injury segments because, in this study we found the upper limbs injuring more often these fall

events, and this reaction may be related to protection of the individual against bodily movements, where the individual tends to seek balance body and face shield during the fall,⁽²¹⁾ since the lower limb injuries may occur due to loss of flexibility, range of motion and muscle strength that significantly reduce the overall movements of the elderly, resulting in a slow and unsteady gait.⁽²²⁾ In the study of falls injured more frequently the skull and the members being on secondly, when analyzing the decline of household in elderly kinds of shape fracture injury, injury skin, stretching, dislocation, injury of the skull and sprains.^(10,22-24)

CONCLUSION

It can be observed through this research that throughout the period studied increased occurrences of falls in the elderly in public transportation regarding general occurrences falling on transport, furthermore, we observed that in Maringa elderly women are the biggest victims and the injuries of upper limb segment is the most common and significant injuries, possibly because of the protective reactions against an offset unexpected or sudden brake.

Safety measures in transport should be adopted; as safety education programs; communication strategies and physical activity directed toward the elderly are important as they can be tools to prevent falls and their consequences that are the body injuries.

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