

Comparative study of trauma in the elderly and non-elderly patients in a University Hospital in Curitiba

Estudo comparativo entre o trauma em idosos e não idosos atendidos em um Hospital Universitário de Curitiba

CÉSAR AUGUSTO BROSKA JÚNIOR¹; AUGUSTO BERNARDO DE FOLCHINI¹; RICARDO RYDYGIER DE RUEDIGER, ACBC-PR²

A B S T R A C T

Objective: To compare and identify differences in the profile of elderly and non-elderly patients with trauma. **Methods:** We conducted a comparative, cross-sectional, retrospective, quantitative study with 3112 patients between November, 25th 2010 and February, 25th 2011; patients were classified into GI: elderly (60 years or older) and GA: non-elderly (13-59 years). We collected information on the mechanism of trauma, injuries and factors associated with the event, which were compared between groups by using chi-square, Student t and proportions tests. **Results:** Falls were more frequent in GI, mostly from the standing height, while violence and traffic accidents (especially with motorcycles) were the most important in GA. Both groups possessed mild trauma (bruises, sprains) as the most frequent, followed by traumatic brain injury (TBI) and fractures. Femur fractures were more common in the elderly, and hand and wrist fractures in the nonelderly. The elderly were hospitalized fewer days and there was no difference as for complications, need for intensive care unit (ICU), or mortality between groups. **Conclusion:** Falls from the standing height are more frequent in the elderly, and motorcycle accidents and interpersonal violence in the non-elderly. Both groups had superficial injuries, head trauma and fractures as major injuries. The elderly were hospitalized for less time. There was no difference in the need for ICU, complications and mortality.

Key words: Aged. Wounds and injuries. Hospital care. Accidents. Health profile.

INTRODUCTION

Approximately 90% of traumatic injuries can be identified by the mechanism of injury and can be caused by intentional causes (interpersonal violence) or unintentional ones, such as falls and traffic accidents¹.

Traumatic diseases are prominent in our society. In Brazil, they occupy the third position on the causes of deaths. Between January 2008 and April 2010 there was approximately two million hospitalizations due to trauma².

Young people tend to get involved in trauma by external violence and traffic accidents, influenced largely by the use of alcohol and drugs³. In the elderly there is a greater incidence of nonviolent traumas, generally predisposed by use of drugs or age-related diseases, such as gait disturbances, decreased visual acuity or hearing and osteoporosis⁴. Among those younger than 60 years, the population aged between 15 and 44 years has a higher risk of death from unintentional causes in relation to other groups, this risk being highest in the group 15-29 years.

From 45 on, mortality decreases and unintentional causes tend to increase in proportion.

When it comes to the elderly population, the number of hospitalizations was lower, around 190,000 in the period from 2008 to January 2010, the mortality rate was 5.45 and the average hospital stay, approximately six days^{2,5,6}.

In the elderly the most common cause of injury is falls, followed by traffic accidents and violence (especially domestic), with men being the main risk group⁷⁻⁹.

In 2007, Siqueira et al. found that the falls may be responsible for up to 34.8% of trauma in the elderly, with approximately 12% presenting with at least one fracture, mainly in the upper limb¹⁰. Muniz *et al.* observed that approximately 90% of fractures of the proximal femur in elderly were the result of falls from the standing height¹¹.

Due to the differences among the elderly and non-elderly in relation to the mechanism, type, severity and related injuries, it is important to know the profile of trauma in the area where they occur, so that planning of care

Work done at the Surgical Emergency Room of the Evangelical Hospital in Curitiba – HUEC, Curitiba, Paraná State PR, Brazil.

1. Medical School Graduate, 6th year, Evangelical Faculty of Paraná – FEPAR; 2. Head, Surgical Emergency, General Surgery Service, Evangelical University Hospital in Curitiba – HUEC.

and prevention may be more efficient in the different age groups.

The present study aimed to compare and identify differences in the profile of elderly and non-elderly patients sustaining trauma.

METHODS

We conducted a retrospective, cross-sectional, quantitative, comparative study with 3,112 trauma patients treated at HUEC (Evangelical University Hospital in Curitiba) between November 25th, 2010 and February 25th, 2011. We excluded patients under 13 years of age and those who had no traumatic condition.

Patients were divided into two groups. Elderly group (GI) aged over 60 years and non-elderly (GA), aged between 13 and 59 years.

The survey was conducted on the electronic database of HUEC, collecting information on demographics, mechanism of injury, time of accident, injuries, body regions affected, treatment administered, clinical evidence of alcohol or drugs, diagnostics and destination (admittance, discharge, death or outpatient follow-up). We also evaluated the time of hospitalization, need for intensive care unit (ICU) and complications.

The times of the accidents were grouped into periods: morning, between six and noon; afternoon, between noon and 18 hours; night, between 18 and midnight; and dawn, between zero and six hours.

Traumas were categorized as intentional: assault, FAP (Firearm Projectile) and SW (stab wound), and unintentional: traffic accidents, subdivided in car or motorcycle accidents and pedestrian accidents; and falls, subdivided into falls from the standing height and from higher levels. Superficial lesions comprised abrasions and lacerations.

The data from GI and GA groups were compared using Student's *t*, proportions and chi-square statistical tests. We deemed statistically significant the difference greater than 95% ($p < 0.05$).

The project was approved by the Ethics Committee of the Evangelical Beneficent Society on July 26th, 2010, under protocol number 6833/10.

RESULTS

We analyzed 3112 patients, 11.7% of GI and 88.3% of GA, between November 25th, 2010 and February 25th, 2011, with a predominance of men (62.8%) over women (37.2 %) ($p < 0.001$).

In the afternoon there was a greater demand for care in both groups (47.3% GI, 35.6% GA, $p < 0.001$). During dawn, the non-elderly sought more care than the elderly (2.47% GI, 13.33% GA, $p < 0.001$). Morning (26.92% GI, 23.63% GA, $p = 0.16$) and night (23.35% GI, 27.46% GA, $p = 0.09$) were not significant. The mostly observed types of accidents in the elderly were falls, and in the nonelderly, traffic accidents (Table 1).

The elderly were more victimized by runs over (15.6% GA, 46.3% GI, $p < 0.001$) with predominance of motorcycle accidents in the adults (57.8% GA, 19.5% GI, $p < 0.001$). Both groups had the same frequency of accidents with cars (26.6% GA, 34.1% GI, $p = 0.28$).

The fall from the standing height was more frequent in the elderly (GI 85.5%, 66.2% GA, $p < 0.001$). Falls from another level (24.4% GA, 12.9% GI, $p < 0.001$) and other types of falls (9.37% GA, 1.66% GI, $p < 0.001$) were more frequent in the non-elderly.

As for interpersonal violence, assaults (85.7% GI, 67.14% GA, $p = 0.83$), wounds by firearms (0% GI, 21.14% GA) and stab wounds (GI 14.3%, GA 11.7%, $p = 0.29$) did not show statistical significance.

There were signs of alcohol intoxication in 7.75% of cases, more frequent in non-elderly (8.4% GA, 2.75% GI, $p < 0.001$). Drunkenness in the elderly was associated with falls from the standing height (80% GI, 16.89% GA, $p < 0.001$), and in the non-elderly, interpersonal violence (GI 0%, GA 55.8%).

Superficial injuries were the most frequent in both groups and were more common in non-elderly patients. Fractures, both of upper and lower limbs, were the most common among the elderly, as well as traumatic brain injury

Table 1 - Mechanisms of trauma in the elderly and non-elderly seen at the emergency room of the HUEC.

Mechanism	Frequency (GI)	Percentage (GI)	Frequency (GA)	Percentage (GA)	Proportions Test
Traffic accidents	41	11.26	790	28.7	$p < 0.001$
Interpersonal violence	7	1.92	350	12.7	$p < 0.001$
Falls	241	66.2	630	22.9	$p < 0.001$
Burns	5	1.1	109	4	$p < 0.001$
Others	71	19.5	869	31.6	$p < 0.001$
Total	364	100	2748	100	

(TBI). Femur fractures were more common in the elderly (23.2% GA, 47.8% GI, $p < 0.001$) and hand and wrist fractures in the non-elderly (GA 32.9%, 18.9% GI, $p < 0.05$). Other types of fractures showed no statistically significant difference. The other lesions are listed in table 2.

Most trauma victims were discharged after initial treatment, hospitalization being required in approximately 19% of patients. Destination after admission can be seen in table 3.

Traffic accidents (40.2% GA, 21% GI, $p < 0.001$) and interpersonal violence (23.3% GA, 1.23% GI, $p < 0.001$) were the leading causes of hospitalization of patients in GA; in the elderly they were falls (69.1% GI, 18.1% GA, $p < 0.001$). In the group of traffic accidents, motorcycle accidents were the leading cause of hospitalization in GA (65.1% GA, 29.4% GI, $p < 0.01$), as opposed to run over on GI (70.6% GI, 17.2% GA, $p < 0.01$).

The patients were hospitalized for an average of 7.66 days (5.48 days GI, 8.03 days GA, $p < 0.001$).

There was no significant difference between the groups regarding the presence of complications (19.8% GA, GI 13.6%, $p = 0.18$), need for ICU (19.75% GI, GA 19.82%, $p = 0.98$) or death (7.5% GI, 7.86% GA, $p = 0.17$) among inpatients.

Overall mortality was similar in both groups (2.8% GI, 1.6% GA, $p = 0.1$).

DISCUSSION

Trauma is the third leading cause of death in Brazil, second only to cardiovascular diseases and malignancies. It is also the leading cause of death among young people.

The majority of attended individuals under 60 years are male, especially the younger ones, the opposite occurring in people over 60, in which women predominate^{6,12}. Such data can be explained by a

Table 2 - Injuries in the elderly and non-elderly seen at the emergency room of the HUEC.

	Frequency (GA)	Percentage (GA)	Frequency (GI)	Percentage (GI)	Proportions Test
Superficial injuries	1582	50	175	42.5	$p < 0.01$
Sprains. strains. ligament injuries	194	6.13	13	3.1	$p < 0.05$
TBI	395	12.5	74	18	$p < 0.05$
Face fractures	44	1.4	5	1.2	0.08
Upper limb fractures	234	7.4	53	12.9	$p < 0.001$
Upper limb luxation	35	1.1	8	1.7	0.14
Hemopneumotorax	34	1.08	2	0.5	0.26
Rib fracture	6	0.19	2	0.5	0.23
Traumatic acute Abdomen	28	0.9	1	0.25	0.17
Vertebrae fractures	16	0.5	5	1.2	0.08
Pelvis fracture	15	0.47	5	1.2	0.06
Lower limb fracture	194	6.1	46	11.2	$p < 0.001$
Lower limb luxation	12	0.4	1	0.24	0.67
FAP not specified	26	0.8	0	0	-
SW not specified	10	0.3	0	0	-
Others	338	10.7	22	5.3	$p < 0.001$
Total	3163	100	412	100	

Table 3 - Destination of the patient after attendance at the emergency room of the HUEC.

Destination of the patient	Frequency (GI)	Percentage (GI)	Frequency (GA)	Percentage (GA)	Test of Ratio
Discharge	235	64.56	1993	72.5	$p < 0.01$
Outpatient Clinic	47	12.9	255	9.3	$p < 0.05$
Admission	81	22.25	464	16.9	$p < 0.05$
Evasion	1	0.27	29	1.05	0.15
Death	0	0	7	0.25	-
Total	364	100	2748	100	

higher risk behavior among men, usually young people, while trauma in the elderly may predominate in women since their ratio to men increases as the population ages.

Most assistances occurred during the day, the afternoon being the most common period, as also observed by Mascarenhas¹³, which may be due more activity in this period. The incidence of evidence of alcohol intoxication in the study, between 7 and 8%, was similar to that observed in other series^{13,14}.

Approximately 90% of injuries treated in hospitals are unintentional both among adults and in the elderly¹⁵, but among non-elderly adults intentional traumas are more common, outweighing the unintended in some reports^{5,7,16}. This variation may be due to socioeconomic factors and to the region studied. In general intentional traumas are more common in the non-elderly population due to increased risk behavior.

Falls, especially from the standing height, were the main mechanisms of injury among the elderly in many studies, followed by traffic accidents and interpersonal violence^{7,12,13,16,17}.

The frequency of traffic accidents ranged between 9 and 28% according to our study, but even so they are a major cause of injury among elderly, being the second most frequent cause in this age group^{3,7,13,18}. Pedestrian collisions are the leading cause of traffic accidents in the elderly, reaching a 90% prevalence in some regions¹⁹. Interpersonal violence was not a common cause of care in our emergency room, being more frequent in other services^{5,7,17,18}.

The aging process leads to a motor deficit, represented by lower speed, reflexes, agility, strength and instability, which itself is an important risk factor for falls and pedestrian accidents amongst the elderly. It is also important to mention the higher incidence of chronic diseases and the use of polypharmacy to treat them, which brings a higher risk. The highest proportion of unintentional injuries can also be explained by a lower exposure to risk factors for intentional ones. The main intentional trauma found would be interpersonal assaults, generally committed by a family member, but it is a feature that varies greatly with region and socioeconomic status. The complaint about mistreatment or lack thereof are factors that can lead to divergence of data on intentional injuries among the elderly, making prevention strategies difficult.

The non-elderly, especially younger ones, are more likely to be involved in traffic accidents and interpersonal violence. Traffic accidents are the leading cause for seeking treatment and hospitalization, represented by accidents involving motorcycles and cars, and motorcycle

accidents, the latter being the leading cause of hospitalization^{3,20}. Data from our study confirm these findings. The events with motorcyclists tend to be more frequent and the lesions more serious, because there is no barrier of protection, such as in cars, protecting the rider. This is a problem to be faced in trauma, especially in large cities, where there is increased use of motorcycles as a means of transportation and labor.

Interpersonal violence comes as the second leading cause of care and admission in the non-elderly, with an increasing trend over the last years²⁰. The factors that lead to this increase are worth a more accurate investigation, since such violence often affects part of economically active, resulting in harm to the society.

Superficial injuries, such as bruises and abrasions, are usually the most found in both age groups¹⁶, which is expected, since the majority of treatments are due to mild trauma. Often they are located in the head, neck and limbs, but there is still some disagreement about what would be the most common location of these lesions. The elderly, by changes of the age, such as osteoporosis, have higher risk of certain fractures such as femoral neck^{6,7,12,15,17,21,22} and are also predisposed to specific types of injuries, such as dislocations, sprains and strains, particularly in women⁷. Injuries are usually due to falls and running over and the higher incidence found among women can be explained by the fact that they represent a larger population as aging takes place.

The elderly stay, on average, six days in hospital^{6,22}, and for high-energy trauma, up to ten¹⁹. In the present study, the average hospital stay was 5.48 days in the elderly and 8.03 days in non-elderly. This difference may be due to more serious lesions in the latter group^{14,20}.

The mortality rate in hospitalized individuals varies between 7.4% and 9.1%, being 12.5% at the Evangelical Hospital in Curitiba, which is a reference in treatment of polytrauma victims, receives patients with greater complexity and severity of injuries, which may explain the higher mortality in relation to other studies^{6,7,17}.

In conclusion, in the elderly falls were the leading cause of trauma, especially falls from the standing height, followed by traffic accidents, especially pedestrians. In the non-elderly traffic accidents were the leading cause of injury, especially motorcycle accidents and interpersonal violence. Elderly patients are more susceptible to fractures and to TBI, with increased risk for fractures of the femur and spine. The elderly had greater need for outpatient treatment and hospitalization, but their average length of stay was less than the non-elderly, with no difference as for complications or mortality.

R E S U M O

Objetivo: comparar e identificar diferenças no perfil de pacientes idosos e não idosos atendidos por trauma. **Métodos:** estudo transversal comparativo quantitativo retrospectivo realizado com 3112 pacientes entre 25/11/2010 e 25/02/2011 que foram classificados em GI idosos (60 anos ou mais) e GA não idosos (13 a 59 anos). Foram coletadas informações sobre mecanismo, lesões e fatores associados ao acidente que foram comparados entre os grupos através da utilização dos testes χ^2 , t de Student e proporções. **Resultados:** as quedas foram mais frequentes em GI em destaque as de própria altura enquanto que violência, quedas e acidentes de trânsito (em especial os com moto) foram os mais importantes em GA. Ambos os grupos possuíram traumas leves (contusões, entorses) como os mais frequentes, seguido por traumatismo crânio-encefálico (TCE) e fraturas. Nos membros inferiores as fraturas de fêmur foram mais comuns em idosos enquanto que fraturas de mão e punho nos não idosos. Os idosos ficaram menos dias internados e não houve diferença quanto a presença de complicações, necessidade de UTI ou mortalidade entre os grupos. **Conclusão:** Quedas de mesmo nível são mais frequentes em idosos e acidentes de moto, violência interpessoal em não idosos. Ambos os grupos apresentaram traumas superficiais, TCE e fraturas como principais lesões decorrentes do trauma. Os idosos ficaram menos dias internados. Não houve diferença quanto a necessidade de UTI, presença de complicações e mortalidade.

Descritores: Idoso. Ferimentos e lesões. Assistência hospitalar. Acidentes. Perfil de saúde.

REFERENCES

- World Health Organization. Injury surveillance guidelines. Geneva: WHO; 2001.
- Brasil. Ministério da Saúde. Departamento de Informática. Morbidade hospitalar do SUS por causas externas – por local de internação – Brasil [Internet]. Brasília, DF: Ministério da Saúde, 2013. [acessado em 19 de julho de 2013]. Disponível em: <http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sih/cnv/fiuf.def>
- 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.
- Marin MJS, Castilho NC, Myazato JM, Ribeiro PC, Candido DV. Características dos riscos para quedas entre idosos de uma unidade de saúde da família. REME rev min enferm. 2007;11(4):369-74.
- Gawryszewski VP. Injury mortality report for São Paulo State, 2003. Sao Paulo Med J. 2007;125(3):139-43.
- Campos JFS, Poletti NAA, Rodrigues CDS, Garcia TPR, Angelini JF, Von Dollinger APA, et al. Trauma em idosos atendidos no pronto atendimento da emergência do Hospital de Base. Arq Ciênc Saúde. 2007;14(4):193-7.
- Biazin DT, Rodrigues RAP. Perfil dos idosos que sofreram trauma em Londrina – Paraná. Rev esc enferm USP. 2009;43(3):602-8.
- Mathias TAF, Jorge MHPM, Andrade OG. Morbimortalidade por causas externas na população idosa residente em município da região sul do Brasil. Rev Latino-Am Enfermagem. 2006;14(1):17-24.
- Gaioli CCLO, Rodrigues RRP. Ocorrência de maus-tratos em idosos no domicílio. Rev Latino-Am Enfermagem. 2008;16(3):465-70.
- Siqueira FV, Facchini LA, Piccini RX, Tomasi E, Thumé E, Silveira DS, et al. Prevalência de quedas em idosos e fatores associados. Rev saúde pública. 2007;41(5):749-56.
- Muniz CF, Arnaut AC, Yoshida M, Trelha CS. Caracterização dos idosos com fratura de fêmur proximal atendidos em hospital escola público. Espaço saúde. 2007;8(2):33-8.
- Gawryszewski VP, Scarpelini S, Dib JA, Jorge MHPM, Pereira Júnior GA, Morita M. Atendimentos de emergência por lesões decorrentes de causas externas: características das vítimas e local de ocorrência, Estado de São Paulo, Brasil, 2005. Cad Saúde Pública. 2008;24(5):1121-9.
- Mascarenhas MDM, Silva MMA, Malta DC, Moura L, Gawryszewski VP, Costa VC, et al. Atendimentos de emergência por acidentes na Rede de Vigilância de Violências e Acidentes: Brasil, 2006. Ciênc saúde coletiva. 2009;14(5):1657-68.
- Oliveira LR, Mello Jorge MHP. Análise epidemiológica das causas externas em unidades de urgência e emergência em Cuiabá/Mato Grosso. Rev bras epidemiol. 2008;11(3):420-30.
- 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.
- Lima RS, Campos MLP. Perfil do idoso vítima de trauma atendido em uma Unidade de Urgência e Emergência. Rev Esc Enferm USP. 2011;45(3):659-64.
- Mesquita GV, Lima MALTA, Santos AMR, Alves ELM, Brito JNPO, Martins MCC. Morbimortalidade em idosos por fratura proximal do fêmur. Texto & contexto enferm. 2009;18(1):67-73.
- Parreira JG, Soldá SC, Perlingelro JAG, Padovese CC, Karakhanian WZ, Asséf JC. Análise comparativa das características do trauma entre pacientes idosos e não idosos. Rev Assoc Med Bras. 2010;56(5):541-6.
- Katz M, Okuma MAA, Santos ALG, Guglielmetti CLB, Sakaki MH, Zumiotti AV. Epidemiologia das lesões traumáticas de alta energia em idosos. Acta ortop bras. 2008;16(5):279-83.
- Lozada EMK, Mathias TAF, Andrade SM, Aidar T. Informações sobre mortalidade por causas externas e eventos de intenção indeterminada, Paraná, Brasil, 1979 a 2005. Cad Saúde Pública. 2009;25(1):223-8.
- Barbosa MLJ, Nascimento EFA. Incidência de internações de idosos por motivo de quedas em um hospital geral de Taubaté. Rev Biociências. 2001;7(1):35-42.
- Gawryszewski VP. A importância das quedas no mesmo nível entre idosos no estado de São Paulo. Rev Assoc Med Bras. 2010;56(2):162-7.

Received on 25/07/2012

Accepted for publication 03/09/2012

Conflict of interest: none

Source of funding: none

How to cite this article:

Broska Júnior CA, De Folchini AB, Ruediger RR. Comparative study of trauma in the elderly and non-elderly patients in a university hospital of Curitiba. Rev Col Bras Cir. [periódico na Internet] 2013;40(4). Disponível em URL: <http://www.scielo.br/rcbc>

Address correspondence to:

César Augusto Junior Broska
E-mail: cesar_broska41@hotmail.com