Functional capacity and severity of trauma in the elderly

Capacidade funcional e a gravidade do trauma em idosos

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Abstract

Objective: Correlate functional capacity in elderly people with the severity of the trauma and compare it before and after the trauma.

Methods: Prospective observational study conducted in an emergency department, comprised of 55 elderly people, age 60 and over, of both sexes, who suffered trauma. The incapacity of patients with functional limitations of various origins was assessed. The research instruments applied at three different times were: the Functional Independence Measure and the Injury Severity Score to assess the severity of the trauma.

Results: Functional capacity within 48 hours of the trauma was significantly higher than functional capacity at discharge and after one month. The lower the severity of the trauma was the greater the functional capacity of the aged.

Conclusion: The functional capacity of the elderly deteriorated during the time of hospital stay and one month after discharge.

Resumo

Objetivo: Correlacionar a capacidade funcional do idoso com a gravidade do trauma e compará-la nos momentos antes e após a ocorrência do trauma.

Métodos: Estudo prospectivo e observacional realizado no Serviço de Emergência. Foram incluídos 55 idosos com idade a partir de 60 anos, ambos os sexos, vítimas de trauma. Foram avaliados a incapacidade de pacientes com restrições funcionais de origem variada. Os instrumentos de pesquisa aplicados em três momentos foram: a Medida de Independência Funcional e o *Injury Severity Score* para avaliar a gravidade do trauma.

Resultados: A capacidade funcional em até 48 horas foi significativamente maior que a capacidade funcional na alta e após um mês. Quanto menor a gravidade do trauma maior a capacidade funcional do idoso.

Conclusão: Os idosos apresentaram piora da capacidade funcional durante o período de internação e após um mês de na alta hospitalar.

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Introduction

Brazil is in the midst of a demographic transition process known as population aging, which results from a decline in the fertility rate combined with increased life expectancy. Better social and sanitation conditions, added to the use of antibiotics and vaccines, have enhanced overall life expectancy.[1]

The World Health Organization defines elderly as those 65 years of age and over in developed countries and 60 and over in developing countries.[1]

Population aging has certain consequences for the Brazilian society, since this country has still not managed to subsidize social and economic changes which would improve the quality of life of seniors.[2]

The aging process is characterized by the loss of functional capacity which leads to greater vulnerability and dependence during this stage of life.[3] Impaired functional capacity has major consequences for the family, the community, the health system and the life of the elderly. Functional capacity appears as a new component in the health model of the elderly, because aging, while at the same time maintaining full functionality, means greater autonomy and less risk of institutionalization.[4,5]

The increased incidence of traumas in the elderly may be related to advances in health care that provide more individuals with the opportunity to live longer and enjoy more productive years. The elderly share certain characteristics with adults under age 60 years, in that they maintain their independence and autonomy, thereby being exposed to traumatic events of a varied nature.[2]

Studies show that falls are the most common type of trauma among the elderly, followed by transportation-related accidents, assaults and violence. In the case of falls and transportation-related accidents, the legs are the most affected members, leading to functional impairment, with approximately 32% of these elderly patients needing caregivers.[6,7]

Functional capacity is influenced by external, environmental, physical and even cultural factors, which have an effect on the independence of the individual. Functional independence may change during the hospitalization process of an elderly person, since it is a complex and unusual event that occurs during a time of fragility and imbalance.[8]

The objective of this study was to make a correlation between functional capacity in the elderly and severity of the trauma and then compare it in the periods before and after the trauma.

Methods

A prospective observational study conducted at the Emergency Department of the teaching hospital of Universidade Federal de São Paulo, during the period between May and October 2012, comprised of 55 elderly people, aged 60 and over, of both sexes, who suffered a trauma.

The research instrument was a questionnaire containing sociodemographic variables (age, gender, education, marital status and occupation). The instruments used to assess functional capacity and severity of trauma were the Functional Independence Measure (FIM) and the Injury Severity Score (ISS), respectively.[9,10]

The Functional Independence Measure was translated and certified in Brazil, and was used in this study because its measure meets the criteria of reliability, validity, accuracy, convenience and ease. The FIM, which assesses the incapacity of patients with functional limitations of various origins, was applied in this study at three different times. The first time was within 48 hours of the patient's admission to the hospital, in order to assess the functional capacity of the aged person before the trauma. The second assessment took place at the time of hospital discharge, due to the effect that this environment can have on functional capacity. The third time was one month after discharge to assess whether the functional capacity of the elderly person had changed in relation to the other assessments within 48 hours of admission and at discharge.[11]

The activities this instrument assessed include: self-care; mobility/displacement; locomotion; sphincter control; communication; and social cognition, which includes memory, social interaction

and problem solving. Each of these activities is evaluated and assigned an individual score ranging from one (total dependence) to seven (complete independence), and a total score ranging from 18 to 126. A low score indicates greater dependence on the part of the patient.

The Injury Severity Score assesses the overall trauma severity of the patient, adding up the three worst injuries, which must be from different body regions. It is calculated based on the severity of each injury contained in the Abbreviated Injury Scale 2005. The ISS ranges from one to 75. Higher scores indicate greater trauma severity and a higher probability of death.[10]

The questionnaire with sociodemographic information and the FIM were administered by the researcher, within 48 hours of admission of the elderly patient in the emergency department, and in the presence of an accompanying person only when the senior was unable to answer the questions. The FIM was used during hospitalization, at discharge and one month after discharge in a telephone interview lasting an average of 20 minutes. No data was gathered from medical records.

The data collected was analyzed using descriptive statistics. Mean, standard deviation, median, minimum and maximum values were calculated for the continuous variables, and frequency and percentage for the categorical variables. The Friedman test was used to compare the FIM (at 48 hours, at discharge and one month after discharge) and ANOVA to compare the FIM (at discharge and one month after) with the ISS. The significance level was 95% (p-value <0.05) and the data was computed using the software SPSS, version 19.

The development of the study complied with national and international ethical standards in research involving human beings.

Results

Seventy-one percent of the elderly patients said they had suffered a previous trauma in the past year, of which 87% corresponded to falls from a standing position and the other 13% were falls from sitting down or standing up from a chair, falls on stairs or car accidents (Table 1).

Table 1. Sociodemographic variables, comorbidities and medication used by the elderly trauma victims

Sociodemographic variables	n(%)
Age range (years)	
60-80	29(52)
81-100	26(48)
Gender	
Female	39(71)
Male	16(29)
Skin color	
White	40 (73)
Brown	9(16)
Other*	6(11)
Household structure	
Lives alone	9(16)
Lives with spouse	10(18)
Lives with children	34(62)
Institutionalized	2(4)
Education	
None	3(5)
Incomplete primary school	33(60)
Complete primary school	8(15)
Complete high school	4(7)
Complete higher education	7(13)
Comorbities	
Hypertension	32(59)
Diabetes mellitus	13(25)
Heart disease	9(16)
Class of drugs**	
Antihypertensive	39(71)
Diuretics	12(22)
Anti-glucose	12(22)
Physical activity	
Yes	41(25)
No	14(75)

Legend: *Skin color (other): black and yellow; **The sum of the sample and percentage of the class of drugs totals over 55 and 100%, respectively, due to the large number of elderly who used more than one medication

With respect to the causes of the trauma incurred by the elderly patients treated in the Emergency Department, 69% fell from a stand-

ing position, 24% were from other causes (31% from a 1-2 meter fall, 31% from falling out of bed, 22% from falling on the stairs, 8% from being hit on the head with a heavy object and 8% were unable to attribute the cause) and 7% were run over.

Table 2 shows a significant difference in the total score of the Functional Independence Measure in relation to the assessment periods. The FIM within 48 hours of admission was significantly higher than the assessments at discharge and one month after discharge.

Table 2. Comparison of the Functional Independence Measure scores

Total FIM	Within 48 hours	Discharge	After a month	p-value
Mean (SD)	120(14)	113(19)	114(18)	<0.0001*
Median	126	125	125	
Minimum/Maximum	69-126	68-126	70-126	

Legend: *Friedman Test. The Bonferroni adjustment was used; FIM: Functional Independence Measure

Table 3 indicates a correlation between the Functional Independence Measure scores at discharge and one month after discharge, on the one hand, and the Injury Severity Scores, on the other. As observed, the lower the severity of the trauma, the greater the functional capacity of the elderly person.

Table 3. Correlation between total FIM at discharge and one month after the trauma and ISS

	Total FIM x ISS	
	Discharge	One month after discharge
R*	-0.555	-0.542
p-value	0.001	0.001
n	33	33

Legend: *R = Spearman correlation coefficient; FIM: Functional Independence Measure; ISS: Injury Severity Score

Discussion

The main limitation of this study is the fact that it was conducted in one single teaching hospital, which provides care to patients from the public and private system, and is not able to represent other realities.

The lack of studies mentioning the severity of trauma in relation to the functional capacity in the elderly made it difficult to compare and discuss the results of this study.

The assessment of functional capacity in elderly patients provides nurses with a more accurate perspective regarding the ability of the elderly to care for themselves and meet their daily basic needs. In other words, the task of the nurse is focused on the educational process of the elderly and their families, for the purpose of achieving functional independence, the prevention of secondary complications and the adaptation of the elderly and their family to the new situation of impaired functional capacity.

In this study, there was a prevalence of trauma in elderly women (71%) and white individuals (73%), similar to the results of another study with elderly trauma victims, treated at an Emergency Ward.[12]

In this survey, 16% of the elderly lived alone. The structural changes noted in families nowadays, as well as significant changes in the roles of its members, make the participation of the family in the care of the elderly more difficult, which may contribute to a lack of care of the elderly who are most incapacitated.[6]

In relation to education, a low level of education was observed, with 60% of the elderly not having completed their elementary education. This result agrees with another study in which low educational level was associated with greater functional incapacity.[4]

With respect to comorbidities, hypertension was the most prevalent (58%) in this study, with similar results found in the literature.[5] Hemodynamic response is limited among the elderly, which can cause losses in functional capacity and, in cases of trauma, lead to a delay in diagnosing shock, thus masking the severity of the trauma and precipitating states of hypoperfusion and hypoxia.[5]

Antihypertensives were the most common continuous prescription drugs among the elderly in this study, followed by diuretics. These medications may cause side effects such as postural hypotension, dizziness and the need to urinate more often, among other effects that can cause falls.[6]

One factor that is typical among the elderly is the recurrence of the same injury, and the presence of comorbidities is associated with this recurrence.[1] In this study, most patients (71%) reported having suffered a previous trauma in the last year.

In this study, 75% of the elderly did not engage in any physical activity, which is a cause of concern, since literature points out that physical exercise is significantly linked to balance. Studies show that seniors who exercise are at significantly less risk of falling within five years compared to those who do not exercise.[13]

Regarding the nature of the trauma, in this study, falls from a standing position were the leading cause (69%), corroborating other findings in literature.[2,14] Falls can be considered a sentinel event in the life of elderly people, as a potential loss of functional capacity.[2] More than two-thirds of those who experience a fall will fall again within six months, and this event can assume the meaning of loss of autonomy generated by the perceived loss of capacity.[2]

In this study, the elderly displayed greater independence during the first 48 hours after trauma than at the time of discharge and one month later. Another study also came up with similar results, indicating a deterioration in functional capacity of the elderly after the trauma.[6]

The correlation between the total Functional Independence Measure at the time of discharge and one month later, on the one hand, and the Injury Severity Score, on the other, showed that the lower the severity of the trauma the greater the independence of the elderly person. Another study found that the severity of the injury is directly related to the extent of injuries, the risk they cause to life, the degree of dependence and the proportion of permanent disabilities.[15] This is very relevant information, since the severity of a trauma negatively influences functional capacity.

Conclusion

The functional capacity of elderly patients deteriorated at the time of hospital discharge and after one month of follow-up, and the lower the severity of the trauma, the greater the functional independence of the elderly person.

Collaborations

Maeshiro FL and Lopes MCBT collaborated with the concept of the project, collection, analysis, interpretation of data and the writing of the article. Okuno MFP and Camapanharo CRV assisted with the writing of the article and relevant critical review of the intellectual content. Batista REA participated in the concept of the project, analysis, interpretation of data and approval of the final version for publication.

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