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Original article

Factors associated with mortality among elderly people hospitalized due to femoral fractures☆

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ABSTRACT

Objective: To analyze factors associated with mortality among elderly people hospitalized in a single-center regional hospital due to femoral fractures.
Methods: This was a retrospective cohort study. Patients aged 60 years or over who were hospitalized with a diagnosis of femoral fracture (ICD S72) between 2008 and 2013 were selected through the electronic medical records.
Results: The study evaluated 195 individuals of mean age 78.5 ± 9.6 years; females predominated (68.2%). The main mechanism for falls was low-energy (87.2%). Surgery was performed on 93.3% of the patients; the mean length of hospital stay was 13.6 ± 7.5 days and the mean waiting time for the surgery was 7.7 ± 4.2 days. The prevalence of mortality was 14.4%, and this occurred mostly among older individuals ($p = 0.029$); patients with leukocytosis ($p < 0.001$); those who needed intensive care ($p < 0.001$); and those who did not undergo surgery ($p < 0.001$). The mean survival was significantly longer among patients who underwent surgery and shorter among those who needed intensive care.
Conclusion: Women predominated among the hospitalizations, and the degree of leukocytosis associated with advanced age presented a relationship with mortality, independent of the type of lesion or surgical procedure. More studies still need to be conducted in order to assess other factors associated with mortality.

Fatores associados à mortalidade em idosos hospitalizados por fraturas de fêmur

Palavras-chave:
Fraturas do fêmur
Idoso
Mortalidade hospitalar
Análise de sobrevida

RESUMO

Objetivo: Analisar os fatores associados à mortalidade em idosos hospitalizados por fratura de fêmur em um hospital unicêntrico regional.
Métodos: Estudo de coorte retrospectiva. Foram selecionados, por meio do prontuário eletrônico, pacientes internados com diagnóstico de fratura de fêmur (CID S72) com 60 anos ou mais de 2008 a 2013.

☆ Study conducted at the Hospital Nossa Senhora da Conceição, Tubarão, SC, Brazil.

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Resultados: Foram avaliados 195 indivíduos com idade média de 78,5 ± 9,6 e o gênero feminino foi mais prevalente (68,2%). O principal mecanismo de queda foi o de baixa energia (87,2%), a feitura de cirurgia foi de 93,3%, o tempo de internação médio foi de 13,6 ± 7,5 dias, o tempo de espera para a cirurgia médio foi de 7,7 ± 4,2 dias. A prevalência de mortalidade foi de 14,4%, ocorreu principalmente nos indivíduos mais idosos (p = 0,029), com leucocitose (p < 0,001), com necessidade de cuidados intensivos (p < 0,001) e que não foram submetidos a cirurgia (p < 0,001). A sobrevida média foi significativamente maior nos pacientes submetidos a cirurgia e inversamente nos pacientes que necessitaram da unidade de terapia intensiva.

Conclusão: As mulheres predominaram nas internações e o grau de leucocitose associado a idade avançada apresentou relação com a mortalidade, independentemente do tipo de lesão e procedimento cirúrgico. Ainda devem ser feitos mais estudos para avaliar outros fatores associados à mortalidade.

Introduction

The World Health Organization (WHO) classifies as elderly every individual aged 60 years or more.[1] This population sample presents an accelerated increasing percentage rate, generating an increase in the prevalence of chronic degenerative diseases.[2]

According to Monteiro, falls of the elderly – in addition to the injury itself – are also damaging the family, as they create a dependency due to the loss of autonomy after the trauma event, representing an important social, economic, and public health issue.[3] It is estimated that the number of hip fractures worldwide will reach 4.5 million cases in 2050.[4]

The main factors associated with mortality after fracture are age, comorbidities, cognitive status, time between fracture and surgery, and type of anesthesia used.[5–8] However, the association of time until surgery and risk of death is controversial. The literature indicates that there is a relationship between time until surgery and mortality.[9] Altered laboratory blood exams such as leukocyte levels, which may present as a associated factor with death, have also been widely addressed.[10]

From this perspective, the data presented herein is expected to lead to a better understanding of this problem and contribute to a better care of elderly patients with femoral fracture. Therefore, this study aimed to evaluate the associated factors with mortality in elderly patients with hip fracture during hospitalization.

Material and methods

The present study was a retrospective cohort of 275 elderly patients who had femoral fractures from January 2008 to December 2013 and were admitted to a single-center, regional reference hospital.

For sample selection, the medical patient record of the institution was contacted in order to stratify individuals hospitalized with a diagnosis of femoral fracture (ICD-10 S72), who were older than or equal to 60 years in the proposed period.

The exclusion criteria comprised incomplete data on the medical charts, misdiagnosis at hospitalization, transfer to other hospitals, and re-admissions. The study was approved by the Research Ethics Committee under No. 34735814.2.0000.5369.

The following variables were collected: gender, age, comorbidities, type and side of fracture, type of fall, surgical treatment, type of surgery and time until surgery, hospital length of stay, need for intensive care treatment, hematocrit and leukocytes in the first week of hospitalization, and outcome, described as discharge or death.

An anatomical subdivision was used to classify femoral fracture regions. The proximal part of the femur comprises the intracapsular and extracapsular fractures; the joint capsule is used as a reference. In turn, the intermediate portion corresponds to the femoral shaft; the final subdivision consists of fractures of the distal part of the femur.[11]

Data were stored in an Excel spreadsheet and then transferred to the SPSS 20.0 software for analysis. Numerical variables were presented as central tendency and dispersion, and categorical variables as absolute frequencies and percentages.

Numerical variables were analyzed using the Kolmogorov–Smirnov normality test. To compare these variables with the outcome, Student's *t*-test ($p < 0.05$) was used for data with normal distribution; for nonparametric variables, the Mann–Whitney test was used ($p < 0.05$). For results with significant difference, accuracy was assessed through the area under the ROC curve.

For comparison among gender, ICU hospitalization, and performance of surgery, the chi-squared test was used ($p < 0.05$). The relative risks of death, with their respective 95% confidence intervals, were calculated.

The survival rate of patients who required intensive care and underwent surgery was analyzed using Cox regression ($p < 0.05$) and presented through Kaplan–Meier curves.

Results

Initially, 275 individuals were selected. Of these, 80 were discarded due to incomplete or missing data in the medical

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