ANALYSIS OF THE EPIDEMIOLOGICAL PANORAMA OF HOSPITALIZATIONS FOR FEMUR FRACTURE IN BRAZIL FROM 2018 TO 2020

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Abstract: The femur is one of the bones most exposed to trauma in the human body, so it represents the main cause of fracture care, mainly due to falls among the elderly and high-energy trauma among young people and adults. Based on the above situation, the objective of this study was to describe the epidemiological profile of hospitalizations for femur fractures throughout Brazil, from 2016 to 2019. For this purpose, a longitudinal observational analysis was used, based on the data obtained in the SUS hospital admissions information system (SIH-SUS: www2.datasus.gov.br). The results indicate that there were 411,865 hospitalizations over the four years described. Individuals between 20 and 29 years of age and over 70 years of age were more affected, with a prevalence of males. Thus, it was concluded that hospitalizations in young and elderly predominate, in males and in the Southeast region. Car accidents and diseases acquired in senility probably contribute to this profile. Keywords: Femur fractures, hospitalization, epidemiology.

INTRODUCTION

In the daily routine of urgent and emergency care, the femur is one of the bones most exposed to trauma. It is the largest, strongest and heaviest tubular bone in the human body, located in the thigh and responsible for one third of the size of the individual 1.

One of the bones most exposed to trauma in everyday life, the femur is the largest, strongest and heaviest tubular bone in the human body, located in the thigh and responsible for one third of the individual’s size (1). Like most long bones, it is formed from endochondral ossification, and its head ossifies in the first year of life and fuses at age 18 (2).
In terms of anatomy, the proximal femur is composed of a metaphyseal region that encompasses the head, neck, and greater and lesser trochanters. In its distal portion, it comprises the metaphyseal enlargement, which continues with the lateral and medial femoral condyles, interspersed by the intercondylar notch. The lower segment is called the diaphysis, it starts at the lesser trochanter and ends at the metaphyseal flair and condyles. It is worth mentioning that the 5 cm distal to the lesser trochanter are classically called the subtrochanteric region, being considered a fracture pattern (1 and 3).

It is one of the main load-bearing bones (1). Thus, the most common mechanism of femur fractures is high-energy trauma in young and adult individuals and low-energy trauma in the elderly, characterized, respectively, by car accidents and falls (3 and 4). In childhood, traumas also come from high impact, the most common coming from falls, traffic accidents, in addition to frequent associations with various bodily injuries implying abuse and neglect (4).

Furthermore, femur fracture may be related to comorbidities such as osteoporosis, decreased muscle strength, hip geometry, calcium and vitamin-D intake and genetic predisposition (2).

Studies have identified femoral fractures as the main fractures in causes of care, accounting for about 9.69% of these visits, followed by trauma to the head region (7.22%). This fact makes it necessary for the health professional to know how to evaluate, identify, prevent and treat complications in these patients (2).

The advanced trauma life support protocol is necessary to clinically evaluate any injury arising from some high-energy mechanism. The patient’s clinic, in general, is characterized by intense pain located in the hip, thigh or knee. In addition, the complaint is accompanied by an inability to bear weight on the affected extremity, and there may or may not be some noticeable deformity. Thus, a complete evaluation of the pelvis is mandatory in order to rule out open fractures. If an open fracture is identified, intravenous tetanus and antibiotic prophylaxis must be administered immediately, in addition to debridement and irrigation of the wound to prevent infection. As for neurovascular assessment, the affected extremity must be assessed before and after reduction. In case of suspicion of vascular compromise, the orthopedist must consult vascular surgery (5).

The treatment of femoral fractures in adults is surgical, while in pediatrics, the most conservative treatment varies from the use of immediate plaster, preceded by closed reduction, being a conservative treatment, or even surgical correction with the use of fixators, external, plates and screws or intramedullary nails (2). Therefore, the social and economic cost of a femoral fracture is high, and among other factors, it results from the morbidity and mortality of the fracture itself, associated diseases, a variable period of hospitalization, often even in an intensive care unit, clinical care and surgical procedures, in addition to prolonged periods of rehabilitation (2 and 6). In the elderly, only 40.5% of patients are totally independent in activities of daily living within a year (6).

Due to its high incidence and relevance in emergency care, this article aimed to analyze the epidemiological profile of femur fractures in Brazil.

**METHODOLOGY**

This is a longitudinal observational epidemiological analysis based on data obtained from the SUS (unified health system) hospital admissions information system (SIH-SUS: www2.datasus.gov.br).
After accessing the site, the option “Health Information (TABNET)” was chosen, within which the topic of “Epidemiological and Morbidity” was selected with the group of “Hospital Morbidity of the SUS (SIH/SUS)”. Then, we chose to search in “General, by place of hospitalization – from 2008 onwards” with the geographic scope of “Brazil by Region and Federation Unit”. From then on, in the column, the parameters of year of processing, sex and age group 1 were selected, with a line corresponding to the ICD-10 Morbidity List and the content of the searches based on the values of hospitalizations, within the period of January 2016 to December 2019. The hospitalizations analyzed correspond to Femur Fracture (ICD-10 Morbidity List), as shown in figure 1.

RESULTS

Table 1 shows the data on the total number of hospitalizations for femur fractures recorded in the period from 2016 to 2019 in Brazil, which totaled 321,288 new cases, of which 98,509 occurred in 2016, 100,956 in 2017, 103,211 in 2018 and 109,189 in 2019.

It can be seen in Table 2 that, in relation to the gender category, males have the highest percentage of cases, 51.72% (213,037), while females represent the share of 48.28% (198,828).

Regarding the age range of hospitalizations for femoral fractures, in Table 3, it is noticeable that the rates are directly proportional to age, since the older the patient, the greater the incidence of the injury. However, it is also possible to notice that the age group corresponding to the period from 20 to 29 years is different from the increases between the other ages, representing an incidence greater than 50% of the previous group and about a third in relation to the following decade.

Figure 1: Step by step of how the methodology of the present study was made.

### ICD-10 Morb List: Femur Fracture

**Period: 2016-2019**

Table 1: Hospitalizations by Year of Processing According to the ICD-10 Morb List.

Source: Ministry of Health - Hospital Information System of the SUS (SIH/SUS).

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospitalizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>98,509</td>
</tr>
<tr>
<td>2017</td>
<td>100,956</td>
</tr>
<tr>
<td>2018</td>
<td>103,211</td>
</tr>
<tr>
<td>2019</td>
<td>109,189</td>
</tr>
</tbody>
</table>

**TOTAL: 411,865**

### ICD-10 Morb List: Femur Fracture

**Period: 2016-2019**

Table 2: Hospitalizations by Sex According to ICD-10 Morb List.

Source: Ministry of Health - Hospital Information System of the SUS (SIH/SUS).

<table>
<thead>
<tr>
<th>Sex</th>
<th>Hospitalizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>213,037</td>
</tr>
<tr>
<td>Female</td>
<td>198,828</td>
</tr>
</tbody>
</table>

**TOTAL: 411,865**

### ICD-10 Morb List: Femur Fracture

**Period: 2016-2019**

Table 3: Hospitalizations by Age Group 1 According to ICD-10 Morb List.

Source: Ministry of Health - Hospital Information System of the SUS (SIH/SUS).

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Hospitalizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>under 1 year</td>
<td>987</td>
</tr>
<tr>
<td>1 to 4 years</td>
<td>7,082</td>
</tr>
<tr>
<td>5 to 9 years</td>
<td>6,219</td>
</tr>
<tr>
<td>10 to 14 years</td>
<td>8,880</td>
</tr>
<tr>
<td>15 to 19 years</td>
<td>20,468</td>
</tr>
<tr>
<td>20 to 29 years</td>
<td>46,664</td>
</tr>
<tr>
<td>30 to 39 years</td>
<td>32,011</td>
</tr>
<tr>
<td>40 to 49 years</td>
<td>27,647</td>
</tr>
<tr>
<td>50 to 59 years</td>
<td>33,343</td>
</tr>
<tr>
<td>60 to 69 years</td>
<td>46,319</td>
</tr>
<tr>
<td>70 to 79 years</td>
<td>72,241</td>
</tr>
<tr>
<td>80 years and over</td>
<td>110,004</td>
</tr>
</tbody>
</table>

**TOTAL: 411,865**
DISCUSSION

This study demonstrates that the rate of hospitalizations for femur fractures increases significantly over the years determined throughout the national territory. The profile of these patients was composed mainly of male individuals, aged 70 years or older. However, the number of individuals aged between 20 and 29 years was quite expressive.

The prevalence of males, as well as the most affected age groups, is already expected. Men and 20-29 year olds are more involved in high-energy accidents such as traffic, firearm injuries and falls from great heights, while the elderly are more susceptible to low-energy accidents such as falls, own height or twists (7 and 8).

In this context, osteoporosis stands out, assuming special attention. In 1948, osteoporosis was defined as “a disease in which there is very little bone but what exists is normal”, and remains valid today, being considered the most common bone disease of all, especially in the elderly (9). This way, the symptomatology is only present when there is a fracture, even if it is microscopic, which makes it necessary for senile individuals to investigate, through imaging and blood tests, the possible presence of this pathology, considering that the primary objective of the treatment is the prevention of fractures (7).

With regard to the prevalent gender, male, it is known that young adults are the most involved in traffic accidents, with motorcycles being the most cited vehicle. Among the most related causes are the use of alcohol, speeding and inexperience (10). However, in contrast to the total values, according to studies, the female sex prevails after the age of 70, in contrast to the other age groups, since osteoporosis is more prevalent, due to the loss of bone mass due to the decrease in estrogen after menopause (4, 7 and 10).

As for the values of annual hospitalizations, the numbers showed an increasing rate, of about 2% per year, disagreeing with the population growth rate, which corresponds to about 0.7% per year, as shown in table 4. However, this value can be justified based on the frank aging process in Brazil, which has already reached its final stage in the so-called “epidemiological transition” (11).

Thus, several dimensions of the problem, which goes beyond an isolated pathology. It becomes clear, then, the need to continue with the studies, paying attention to new investigations of factors that make femur fractures not only a problem in itself, but one of the consequences.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>206,081,432</td>
</tr>
<tr>
<td>2017</td>
<td>207,660,929</td>
</tr>
<tr>
<td>2018</td>
<td>209,182,802</td>
</tr>
<tr>
<td>2019</td>
<td>210,659,013</td>
</tr>
</tbody>
</table>

Period: 2016-2019

Table 4: Resident population by Year by Year.


Projection of the population of Brazil and Federation Units by sex and age for the period 2000-2030.
CONCLUSION

Through this study, it was possible to conclude that femur fractures go beyond an isolated problem, and affect older age groups, such as young people and adults aged between 20 and 29 years, mainly among males. In addition, the number of cases grows every year, disproportionately to population growth, which makes it essential for authorities and health professionals to act in public safety and awareness measures so that the population can be involved in preventive actions.

REFERENCES


