Epidemiology of Fractures in Patients from Small Towns in Ceará Treated by the SUS

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ABSTRACT

Objective: To scientifically prove the high number of patients with fractures coming from the small towns of the State of Ceará treated with surgery by the SUS (the Brazilian State healthcare system) in Fortaleza. Methods: A transversal, prospective, descriptive study was carried out involving 1694 patients treated by the SUS in Fortaleza, from August 2006 to March 2007, in four public hospitals and three private hospitals. Results: 38.78% of the patients came from small towns, and their ages ranged from 1 to 97 years old. The majority were single, male adults. The most common mechanism of injury was traffic accidents, accounting for 30.4% of all the cases. The forearm was the body segment most operated on, corresponding to 19%. Conclusions: These results suggest there is a need for preventive measures, such as public traffic safety awareness campaigns, in order to reduce accidents. We have also verified the importance of investments aimed at developing the Traumatology Emergency services in the small towns of Ceará. Level of evidence II, Transversal, Prospective Study (Lower quality prospective study).

Keywords: Epidemiology, Fractures, Bone. Orthopedics. Trauma centers.

INTRODUCTION

Trauma currently constitutes a serious public health issue, as it is responsible for a significant portion of the hospital care provided worldwide. Of the patients victims of closed trauma, 85% suffer injury to the musculoskeletal system, while the vast majority of these patients seek medical care in emergency clinics. In the age bracket from 0 to 39 years, for example, trauma ranked first as etiology of morbimortality. Braga Junior et al. estimated that in terms of deaths among teenagers and children, respectively, 80% and 60% are secondary to traumatism. The annual costs for US society exceed 400 billion dollars, including hospitalization, insurance administration, labor costs and reduction of productivity. Several publications show that fractures occur frequently in traumatized patients. De Laat and Pols reported that, in elderly patients, osteoporosis and osteoporotic fractures are the main source both of morbidity and of cost, while the most common fractures are those of the hip, distal forearm and vertebrae. Rennie et al. reported in their study that 25% of children are injured every year, while 10-25% of these suffer fractures.

Although there are several studies in literature on the epidemiology of fractures in specific anatomical regions or age brackets, few studies address the epidemiological profile of fractures in general. Moreover, the results are controversial, with fracture incidence ranging from 9.0 to 22.8/1000/year, mainly affecting the age bracket of young adults. Another fact to be considered is that patients with musculoskeletal trauma coming from small towns in the state of Ceará currently represent a large portion of the hospital care recipients at the traumatology clinics of the capital. Braga Junior et al. 2005 verified that of 500 patients treated in the traumatology emergency service of IJF, in Fortaleza, 24% came from small towns in Ceará. This situation leads to the overcrowding of hospitals in the capital city, contributing to the quality impairment of the hospital service. Such a situation can be severely detrimental to the patient, as their prognosis is directly related to the quality of the medical care made available and to the speed at which such care is provided, besides the physician-patient relationship. These markers are also important in the medium and long-term follow-up of these patients.

Given that the knowledge of fracture incidence is important not only for the therapeutic aspects, but also for preventive measures, and that the Northeast Region lacks studies conducted with patients from the small towns of states, the importance of this study, whose objective is to scientifically prove the high number of patients with fractures coming from small towns in...
the state of Ceará treated surgically by SUS in Fortaleza, is noteworthy, drawing attention to the possibility of treatment of these patients in their place of origin, with the performance of public preventive policies.

MATERIAL AND METHOD

It is a prospective transversal study, carried out at seven hospitals from the capital of Ceará, Brazil affiliated to SUS, four of which are public, and three private, in the period from August 2006 to March 2007.

All the patients with fractures who were treated surgically by SUS at these hospitals in the abovementioned period were included in the study, totaling a sample of 1694 patients. These were interviewed through a questionnaire prepared according to the survey objectives, as well as an analysis of their medical records. Only patients who agreed to take part and signed the informed consent form after receiving an explanation about the study were included in the survey.

This study was previously authorized by the Institutional Review Board of Instituto Dr. José Frota, with protocol number 2342/06, aiming to safeguard the precepts established in CNS Resolution 196/96.

The following data were gathered: origin of the patients, sex, age, marital status and occupation; mechanism of injury, as well as the bone exposure of the fracture; the bone segment treated surgically.

After the data were gathered, these were analyzed through the Epi Info program, version 3.5.1 (CDC/WHO).

RESULTS

During the period in which the survey was concluded, from August 2006 to March 2007, 1694 patients were treated surgically by SUS at the seven hospitals of Fortaleza affiliated to this health system. Of these, 61.22% came from the capital, while the other 38.78% were from small towns in the state. (Figure 1) Among the patients from small towns, 33.79% suffered the injury in the Metropolitan Region of Fortaleza, with the city of Caucaia (9.7%) ranking first, followed by Maracanaú (4.39%) and Horizonte (3.18%). The remaining 66.21% suffered the accident in the other small cities of Ceará.

Male patients predominated in the sample group originating from small towns of the state, with 65.4% of cases. The age ranged from 1 to 97 years, averaging 40.7 years. We verified that the average age was higher in the female sex, 50.9 years, and the age bracket with the highest incidence was that from 61 to 80 years. In the male sex, the average age was 35.2 years, mainly involving the age bracket from 21 to 40 years. (Figure 2)

As regards marital status, 52% of the patients were single, 37% were married, 9.79% were widows or widowers, and 1.21% divorced. In the distribution by occupations, we verified that the highest levels of incidence were among students (20%), followed by pensioners (19.4%), farmers (12.6%) and housewives (5.5%). (Figure 3)

In relation to the mechanism of injury, the most common was traffic accident, involving 30.4% of the patients, followed by fall from own height (28.4%), fall from height (16.4%), and other injuries. (Figure 4)
As regards the exposure of fractures, 9.5% were open. The anatomical region fractured with the highest number of surgical treatments was the forearm (19%), followed by the proximal femur (17.1%), the leg bones (9.6%) and the elbow (9.3%). (Figure 5)

Figure 5. Distribution of the patients according to the anatomical region.

DISCUSSION

According to the results presented, 38.76% of the patients included in the study came from small towns in Ceará. This value is alarming, as it reflects the lack of support to accident victims in small towns, who are deprived of adequate and immediate care, and may have their prognosis compromised. Another factor to be considered is that the transportation of these patients to the capital is not always appropriate, causing discomfort and pain to the patient, particularly when we consider the time it takes for this individual to effectively receive medical care.

We also observed that of the patients coming from small towns, 66.21% suffered the accident in towns not belonging to the Metropolitan Region of Fortaleza, covering a longer distance to the capital. The high number of patients coming from small towns contributes considerably to the overcrowding of hospitals from the capital, consequently leading to the impairment of the quality of service offered to all the patients.

In our survey, the average age, of 40.7 years, was only slightly different from the average age of the study by Court-Brown et al., 49.1 years. In relation to sex, we obtained concordance with the incidence of fractures in the various age brackets, high energy trauma is the most frequent cause of death in patients under 44 years of age. This curve in the female sex is the association of fractures with the appearance of osteoporosis. 

As regards the mechanism of injury, the most common was traffic accidents, in 30.4% of the patients, followed by fall from own height (28.4%) and fall from height (16.4%). These data are in concordance with the incidence of fractures in the various age brackets. high energy trauma is the most frequent cause of death in patients under 44 years of age. 

This curve, however, was not encountered due to the extremely high percentage of youths in the survey, possibly due to the high rates of mortality in the over-80s age bracket, still persistent in Brazil. Another hypothesis would be the inconsistencies in the methodology, since our study exclusively encompasses fractures treated with surgical procedures and patients from small towns, while the other trials encompass all fractures.

In the female sex, which corresponded to 34.6% of the cases, we noted an increased incidence in patients aged approximately 60 years, while the percentage of fractures from this age is even higher than in the men. According to the literature, the epidemiological curve of women is unimodal, with the peak related approximately to the menopause period, growing up to the last decades of life.

An important explanation for this curve in the female sex is the association of fractures with the appearance of osteoporosis. This was not the curve found in our study for the same reasons already cited previously in relation to the male sex.

In the distribution by marital status, single patients appeared with the highest incidence (52%), followed by married patients (37%). A probable justification for this result is the significant participation of youths in our study. The distribution by occupations, in turn, showed the predominance of students (20%), also due to the extremely high percentage of youths in the survey, followed by pensioners (19.4%), possibly reflecting the greater propensity to fractures in individuals of a more advanced age. As regards the mechanism of injury, the most common was traffic accidents, in 30.4% of the patients, followed by fall from own height (28.4%) and fall from height (16.4%). These data are in concordance with the incidence of fractures in the various age brackets. high energy trauma is the most frequent cause of death in patients under 44 years of age.

Another category of fractures that we should also take into account are those resulting from osteopenia, which are directly related to age. Due to the rise in life expectancy, osteoporotic fractures have occupied more and more space. Moreover, the types of fractures in elderly patients have changed, generating...
controversy regarding the true definition of osteoporotic fractures. Hip fractures, a classic example, and very common in the elderly female population, are those that present the strongest impact on morbidity and the highest mortality rate. We know that the mortality rate increases from 20 to 30% in patients who have already suffered a hip fracture, in the first year after the accident. This fact is due both to the actual fracture, and to the comorbidities, since these are more present in these patients than in the rest of the population. Estimates indicate that approximately 6.5 million hip fractures will occur worldwide in the year 2050. In our study, hip bone fractures were the second most common type, with 17.1% of the cases, of which 80.5% occurred in the over-60s age bracket, probably as a result of osteoporosis.

CONCLUSION
Analyzing the data relating to the 1694 patients treated surgically by the SUS in Fortaleza, we verified that 38.78% of them, a considerable number, came from small towns in the state of Ceará. Moreover, exposed fractures corresponded to 9.5% of the cases, when we consider only the patients from small towns, whereas these patients are even more subject to complications due to the time it takes for them to receive care and to the precarious conditions of transportation to the capital. Hence we concluded that there is a lack of support for the performance of surgeries in small towns, contributing to the overcrowding of hospitals in the capital.

As regards the patients from small towns, most of them were single young male adults who had suffered a closed fracture of the forearm after a traffic accident. The main impact is economic, since besides the medical and hospital expenses, there is loss of salary, destruction of property and labor charges. We can conclude, therefore, that steps should be taken to reduce accidents. An example would be the performance of public campaigns, on topics such as traffic accident prevention, aimed at educating the population and, consequently, reducing accident rates.

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