

Profile of fracture victim patients interned in a university hospital: a cross-sectional study

Perfil de pacientes vítimas de fraturas internados em um hospital universitário: estudo transversal

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ABSTRACT | OBJECTIVE: To describe the clinical epidemiological profile of patients who suffered fractures hospitalized at a university hospital in Maranhão. **METHODS:** This is a cross-sectional, retrospective and quantitative study based on the analysis of the medical records of these patients at the Federal University Hospital of Maranhão (HU-UFMA) in the orthopedic-trauma sector. **RESULTS:** A total of 251 medical records were analyzed, with a predominance of males (52.59%), brown (64.1%), residents in São Luís (57%), unmarried individuals (51%), low education, incomplete elementary school index (35.3%) and the mean age was 45,49 years. The type of trauma that caused the most fractures were falls, with 127 victims (50.6%), followed by traffic accidents with motorcycle accidents 3.98%, 3.88% motor vehicle crashes, 3.98% of run over. As for the most affected body regions, lesions in the lower limbs (LL) were observed, 33.47% with fractures of the femur, 23.11% of the tibia and 11.95% of the ankle. The most frequent type of surgery was osteosynthesis, for stabilization of follow-up, with 82.87%. Of these patients, 98.8% were discharged after a surgical procedure with a median of 3 days of hospitalization and 1.2% died. **CONCLUSION:** There was a higher prevalence among males, single, comprised between 13 and 38 years old, the mechanism of trauma with the highest numbers of cases were falls and traffic accidents, with a higher prevalence of LL involvement.

KEYWORDS: Health profile. Bone fractures. Orthopedics. Accidents.

RESUMO | OBJETIVO: Descrever o perfil clínico epidemiológico dos pacientes vítimas de fraturas internados em um hospital universitário do Maranhão. **MÉTODOS:** Trata-se de um estudo descritivo transversal, retrospectivo e de abordagem quantitativa, realizado a partir da análise de prontuários destes pacientes no Hospital Universitário da Universidade Federal do Maranhão (HU-UFMA) no setor de traumatologia-ortopedia. **RESULTADOS:** Foram analisados 251 prontuários, no qual houve predomínio do sexo masculino (52,59%), cor parda (64,1%), residentes em São Luís (57%), solteiros (51%), baixa escolaridade, apresentando maior índice de ensino fundamental incompleto (35,3%) e a média de idade foi de 45,4 anos. O tipo de trauma que mais causou fraturas foram as quedas, com 127 vítimas (50,6%), seguido dos acidentes de trânsito com 27,8% de acidentes motociclísticos, 3,98% de acidentes automobilísticos, 3,98% de atropelamentos. Quanto às regiões corporais mais acometidas, observou-se com maior frequência as lesões nos membros inferiores (MMII), sendo 33,47% fraturas de fêmur, 23,11% de tibia e 11,95% de tornozelo. O tipo de cirurgia mais realizado foi a osteossíntese, para a estabilização do seguimento, com 82,87% de prevalência. Desses pacientes 98,8% obtiveram alta hospitalar após procedimento cirúrgico com mediana de 3 dias de internação e 1,2% evoluíram para óbito. **CONCLUSÃO:** Houve maior prevalência de fraturas entre os indivíduos do sexo masculino, solteiros, compreendidos na faixa etária de 13 a 38 anos, o mecanismo de trauma com maiores números de casos foram quedas e acidentes de trânsito, com maior acometimento dos membros inferiores.

PALAVRAS-CHAVE: Perfil. Fraturas ósseas. Ortopedia. Acidentes.

Introduction

Currently, traumas stand out in high numbers in the statistics of diagnoses and hospital admissions, in view of the increase in the number of motor vehicles in circulation, being among the most notable injuries that affect the younger and economically productive population¹. They become a major public health problem since they are one of the main reasons for mortality, in addition to producing sequelae and functional disabilities, which reduces the social productivity of these individuals, thus resulting in high economic and social costs².

According to the World Health Organization (WHO), traffic accidents are the eighth leading cause of death in the world, and the first among young people aged 15 to 29 years. Every year 1.24 million people die on the roads, which represents a total of 3,400 deaths per day. Worldwide, there are about 20 to 50 million injuries each year and it is estimated that in 2030 they will be the fifth leading cause of death, if preventive measures are not taken to alter this growing trend³.

In addition to accidents, falls are considered external causes of health problems, both remain in evidence for decades in the epidemiological field of Brazil and the world, being largely responsible for a high proportion of hospital admissions, although they have shorter hospital stays, have a more significant representation in public health expenditures than natural causes. In Brazil in 2015, more than 1 million hospital admissions for external causes, paid by SUS, were registered. the majority of which were among men (70%) and among people aged 20 to 39 years (36.2%). Of this number, 35% were due to falls, 53% of whom were adults and 26.1% were elderly⁴.

Regarding falls, the Ministry of Health defines them as unintentional displacement of the body to a level below the initial position, with no correction of the body position in a timely manner due to a disturbance

of the balance and momentary weakness of the postural control system⁵. They affect female and male individuals, at any age, socioeconomic condition or any other attributes⁶.

Among the main consequences of trauma are fractures, which are defined as loss of total or partial bone continuity of one or more segments and are due to a direct or indirect action of a force by traction, torsion or compression of the bone^{7,8}. Although there are several studies in the literature on the epidemiology of fractures in specific anatomical regions or age groups, few studies address the epidemiological profile of fractures in general⁹, in addition to the scarcity of regional studies¹⁰.

In view of the magnitude of the numbers of victims of fractures resulting from trauma, it is emphasized that the study of clinical and epidemiological data is of paramount importance for public health, since it will enable better planning and organization regarding their prevention, in order to reduce health problems and decrease the demand for hospitals and expenses^{9,9,10}. Most studies address the cause of the trauma and do not observe its demand or outcome, as well as which body regions are most affected by the trauma. Therefore, this study aims to describe the clinical epidemiological profile of patients who are victims of fractures admitted to a university hospital in Maranhão.

Methods

This is a descriptive cross-sectional study with a quantitative approach, carried out based on the analysis of medical records of patients suffering from fractures admitted to the University Hospital of the Federal University of Maranhão (HU-UFMA) in the trauma-orthopedics sector.

Data collection was carried out from August to December 2018 at the Medical and Statistical Archiving Service (SAME), in which the medical records were listed, located and examined. For the data collection, a form was prepared with fields to fill in the sociodemographic and clinical data with the following categorical variables: sex, skin color, residence, marital status, education, medical diagnosis, cause of trauma, comorbidities, level of dependence, type of surgery, outcome; and numerical: age and length of stay.

The medical records of patients who were hospitalized with fractures from January to December 2017 were adopted as inclusion criteria, and data were collected only from the first hospitalization at HU-UFMA, where the research was conducted, in order to avoid duplication of data. The exclusion criteria refer to the medical records of patients who were hospitalized and did not undergo a surgical procedure and who did not contain the requested or incomplete information, who were not in research conditions or who were not found in the data collection.

The sampling is probabilistic of the simple random intentional type, in which the study population consisted of the medical records of patients admitted in 2017, totaling 998. We used a sample calculation with an estimated prevalence of 50%, 95% confidence level, and 3% accuracy. After analyzing the inclusion and exclusion criteria, there were 251 patients in the final sample.

After collection, the data were tabulated in a Microsoft Excel spreadsheet to form the database. Subsequently, they were exported and analyzed using the STATA 14.0 program. Categorical variables were exposed in the form of absolute and relative frequency. The numerical ones, after analysis of normality of distribution, in mean and standard deviation in case of normal distribution and median and interquartile range in case of non-normal distribution, considering a 95% confidence level.

The research complies with CNS resolution 466/2012, with the opinion of the Research Ethics Committee (CEP) No. 2,708,691 (CAAE 88673418.4.0000.5086). All procedures related to data collection and analysis took place after CEP approval.

Results

A total of 251 medical records of fracture patients were included in the study, in which there was a predominance of males (52.59%), the mean age was 45.4 (\pm 21.6) years. The brown skin color stood out (64.1%), followed by white (24.3%) and black (11.6%). Regarding the residence, 57% lived in São Luís, while 43% in the interior of Maranhão. Regarding marital status, there was a predominance of singles (51%), followed by married people (28.3%). As for education, most had low education, 35.3% with incomplete elementary education, followed by 32.7% with complete high school and 10% were illiterate. The data regarding the sociodemographic characterization of the sample are shown in Table 1.

Table 1. Sociodemographic data of fracture patients admitted to the HU-UFMA from January to December 2017

CHARACTERISTICS		M (SD)	Min / Máx	F	%
		45.4 ± 21.6	13-98	251	100
Age (years)	13 to 33			92	36.6
	34 to 54			77	30.7
	55 to 75			51	20.3
	76 or more			31	12.3
Gender	Male			132	52.9
	Female			119	47.1
Skin color	Brown			161	64.1
	White			161	24.3
	Black			29	11.6
Residence	São Luís			143	57.0
	Other municipalities			108	43.0
Marital Status	Single			128	21.0
	Married			71	28.3
	Stable union			29	11.6
	Widower			16	6.3
	Divorced			7	2.6
Schooling	Illiterate			25	10.0
	Incomplete primary education			89	35.4
	Complete elementary school			16	6.3
	Incomplete high school			24	9.6
	Complete high school			82	32.7
	Higher education			15	6.0

Source: Data taken from medical records at SAME. Legend: M - mean; SD - Standard Deviation; Min - minimum; Max - maximum; f- Frequency; % - Percentage

Table 2 shows the data referring to the type of trauma that most caused fractures, especially falls, with 127 victims (50.6%), followed by traffic accidents, with 27.8% of motorcycle accidents, 3.98% of automobile accidents and 3.98% of pedestrians being run over.

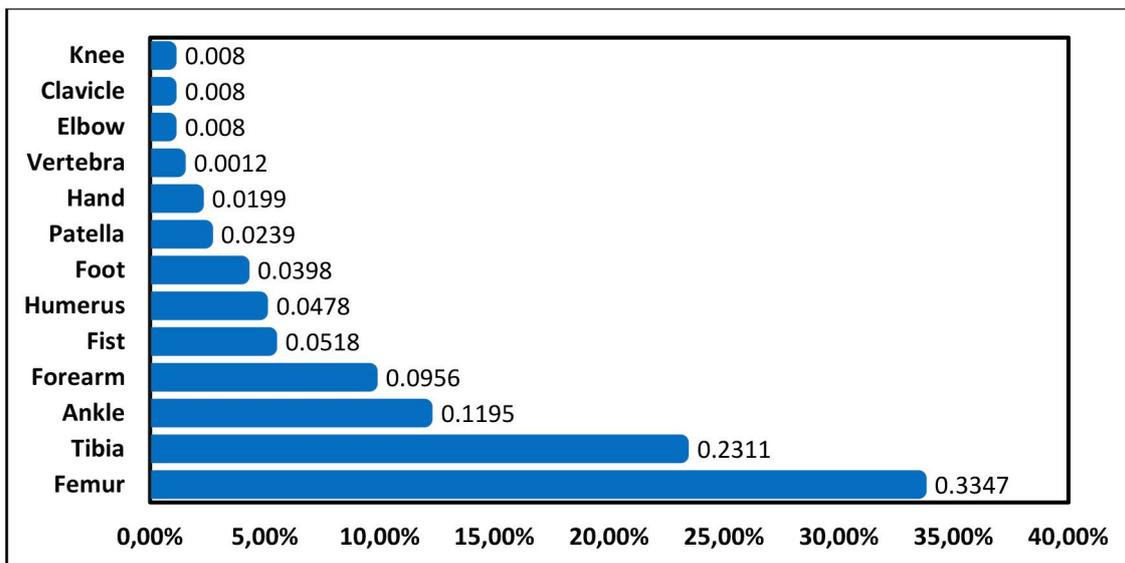
Table 2. Distribution of patients regarding the fracture etiology admitted to the HU-UFMA from January to December 2017

Cause	N	%
Fall	127	50.60
Motorcycle accident	70	27.89
Direct trauma	17	6.77
Run over	10	3.98
Car Accidents	10	3.98
Osteomyelitis	9	3.59
Pseudoarthrosis	6	2.39
Spontaneous fracture	1	0.40
Others	1	0.40

Source: Data collected from medical records at SAME.

Figure 1 contains information about the regions most affected by injuries, especially injuries in the lower limbs (LL), and 33.47% femur fractures, 23.11% from 11.95% tibia and ankle. Of the upper limbs (upper limbs), the most affected parts were the forearm (9.56%), wrist (5.18%) and humerus (4.78%).

Figure 1. Fractured body regions of patients admitted to the HU-UFMA between January and December 2017



Source: Data collected from medical records at SAME.

Table 3 shows the clinical data, in which it is observed that the type of surgery most performed, as well as the presence of comorbidities, in addition to information on the level of independence at the time of hospitalization. Of these patients, 98.8% were discharged after the surgical procedure and 1.2% died.

Table 3. Clinical characteristics of fracture patients hospitalized at HU-UFMA from January to December 2017

	CHARACTERISTICS	Med (IQR)	f	%
Type of surgery	Osteosynthesis		208	82.87
	Total hip arthroplasty		17	6.77
	Withdrawal of material		11	4.38
	Partial hip arthroplasty		10	3.98
	Surgical cleaning		2	0.80
	Arthrodesis		2	0.80
	Surgical review		1	0.40
Comorbidities	SAH		52	20.72
	Diabetes Mellitus		20	7.97
PMB	Alcoholic		53	21.12
	Smoker		31	12.35
Dependency level	Getting around with assistance		124	49.4
	Restricted to bed		65	25.9
	Independent		62	24.7
Outcome	Hospital discharge		248	98.8
	Death		3	1.2
Length of hospital stay	Days	3 (2)		

Source: Data taken from medical records at SAME. Caption: PMB: Personal Morbid Background. Med - median; IQR- Interquartile Range; f- Frequency; % - Percentage.

Discussion

The present study aimed to describe the epidemiological clinical profile of patients suffering from fractures, the results showed that for the analyzed sample, there is a predominance of males in the age group corresponding to the economically active population, with low level of education, where the falls were the kind of trauma that most caused fractures, followed by traffic accidents, with emphasis on motorcycle accidents.

Fractures suffer variations in several countries according to the age group of the population, levels or types of violence, traumatic risks, among other causes¹¹. The present study allowed the knowledge of important data about these victims, generating results that are mostly compatible with other studies in the area. The identification of this profile makes it possible to design appropriate preventive measures for the population of the region, in order to reduce trauma cases¹⁰.

A predominance of male victims was identified in the study. When analyzing the age group, it was observed that there is greater involvement in the groups of 13 to 33 years old and 34 to 54 years old, showing to be similar to other studies in the literature, in which the main victims are young adults of working age and the male gender¹²⁻¹⁴. This reality may be related to the greater exposure of men and young people in traffic and for performing acceptable socio-cultural behaviors, where they assume greater risks, such as impulsiveness, immaturity, search for intense sensations, in addition to greater vulnerability to urban violence¹⁵⁻¹⁷.

Regarding marital status, there was a prevalence of singles (50.6%), followed by married people (28.29%), data that are supported by the results found by Zago et al.¹⁸ and Motoki et al.¹⁹ where single individuals prevailed and that had incomplete elementary education as their schooling. It was observed that 21.12% of the analyzed patients declared themselves alcoholics, however there is no information if they were under the effect of this agent during accidents and/or falls.

As for the causes of fractures, falls were the main triggers of injuries, in agreement with some studies in the literature^{18,20,21}. Of the 127 patients who had a fracture due to falls, 67% were young, while 43% of them were elderly. However, there was underreporting regarding the etiology of falls in young patients. The observed literature proposes that this accentuated number of falls in young people and adults occurs because it is an economically active population and exposed to some types of accidents, such as work, because they perform tasks of greater danger and that demand greater physical strength²². Falls in the elderly, which are well explained in the literature, are recurrent and pointed out as an effect of senescence itself²³, which leads to changes in balance, strength, vision or reflex²⁴.

The second major cause of fractures in this study was due to traffic accidents, a result that differs from the position occupied in the number of occurrences in some studies, where traffic accidents appear as the biggest cause^{1,22,25} and whose number has been growing in the last few decades due to the increase in the number of vehicles²⁶. A probable reason for this result stems from the fact that HU-UFMA is not an open-door hospital, where surgeries are performed electively, assuming that significant traumas, such as multiple trauma, resulting from automobile accidents are addressed and notified in other urgent and emergency hospitals in the city of the study.

Among the types of traffic accidents, the most frequent presented was the motorcycle, corroborating other findings that highlight the motorcycle as the main vehicle involved in this type of accident^{14,15,27}. The significant increase in motorcycles partly explains the occurrence of accidents, as it has become an economical, agile and more affordable means of transportation for the population, but there are other factors that influence it, such as the profile of those who drive the vehicle, where there is a predominance of young men with low schooling, a group with characteristics of greater recklessness in traffic, in addition to inadequate road conditions^{28,29}.

As for the most affected body regions, injuries in the lower limbs were found more frequently, with 73.8%. This type of fracture is related to falls and car accidents that impact high energy axial trauma³⁰.

This number is in line with other studies^{18,20}. A study carried out in an emergency hospital in Teresina-PI, with an analysis of 1566 medical records, trauma stood out in the lower limbs as a result of a traffic accident³¹.

Regarding the length of stay of the patients in the study, a median of 3 days of hospital stay was obtained, this median can be justified by the fact that most of the surgeries performed in the trauma-orthopedics sector of the analyzed hospital are of medium complexity, being electives, in which the patient is hospitalized in one day, performs the surgical procedure the next day and is discharged on the third day when he is clinically stable. Generally, this period can be prolonged due to the need for intravenous antibiotic therapy and / or wound dressings. In the study by Zago et al.¹⁸, which aimed to verify the incidence of physiotherapy visits in fracture victims at a university hospital, the average hospital stay was 5 days, varying from 3 to 9 days. In the study by Santos et al.³¹ the average length of stay was 15 days longer, the length of hospital stay reflects the etiology of the injuries and the type of treatment, so it is suggested that more serious injuries require a longer hospital stay.

As for the outcome obtained by hospitalized patients, in this study 98.8% were discharged and three deaths occurred, two of them in elderly patients, similar to the study by Castro et al.¹ that reports that most patients who were hospitalized were discharged and only one death was registered during the research period. The mortality rate analyzed during the study period was small (1.2%), however, victims who died before hospitalization should not be neglected. And the need to report the reasons for deaths in subsequent research is evident. Santos et al.³¹, observed that the majority of deaths resulting from fractures occurred in the elderly who suffered a fracture of the femur after falling from their own height, this data reflects the vulnerability of this age group to low-energy trauma and the need to implement effective measures in order to avoid such consequences^{23,24}.

This research had as a limitation the data collection through medical records, with the risk of information bias, incomplete data, or the impossibility of collecting more information than recorded. Therefore, the relevance of making accurate and adequate records is emphasized, since it is a document handled by different professionals of the health team and reports the assistance provided, being a relevant source for data collection and contribution in conducting research.

Conclusion

There was a higher prevalence of fractures among male individuals, single, between the ages of 13 and 38 years. The trauma mechanism was falls and traffic accidents, with a greater occurrence of lower limb involvement. These findings should encourage the development of preventive actions to the causes, in order to mitigate the incidence of fractures and contribute to the quality of life of the analyzed population, since the study in question corroborates with researches carried out in other institutions in the country, which could contribute for directing public policies, with the objective of educating the population and reducing the rates of falls and accidents that are responsible for a large part of these injuries, which often result in temporary or permanent disabilities and result in public spending.

Author contributions

Nascimento ALS and Cavalcante TB contributed to the planning, design, execution, collection and analysis of data, as well as writing the article. Silva JCA contributed to the critical review of the article. Mendonça ACS contributed to data collection and article writing. Lui LCP and Costa ETN contributed to the research design and data collection.

Competing interests

No financial, legal or political conflicts involving third parties (government, companies and private foundations, etc.) have been declared for any aspect of the submitted work (including, but not limited to, grants and funding, participation in advisory council, study design, preparation of manuscript, statistical analysis, etc.).

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