Journal of Trauma & Treatment

Souza, et al., J Trauma Treat 2014, 3:4
DOI: 10.4172/2167-1222.1000209

Case Report Open Access

Analysis of the Epidemiological Profile of Patients Treated in the Orthopedic Ward of a Referral Hospital for Trauma Care in Belém, Pará – Brazil

Vinicius C Souza[1,2], **Luiz FRM Mourão**[1,2], **Paulo HB Araújo**[1,2], **Rafael MS Mendes**[1,2], **André LF Barros**[3,4], **José CFF Junior**[3,4], **Tiago O Leão**[1,2] **and Marcus A Preti**[1]

[1]*Hospital Universitário João de Barros Barreto, Federal University of Pará, Rua dos Mundurucus Brazil*

[2]*Institute of Health Sciences, Federal University of Pará, Av. Generalissimo Diodorus, Brazil*

[3]*University Center of the State of Para CESUPA, Almirante Barroso, 3775 - Souza, Brazil*

[4]*Orthopedist at Metropolitan Hospital, Rod Br-316, Km 1 - Guanabara, Brazil*

[*]**Corresponding author:** Vinicius C Souza, Hospital Universitário João de Barros Barreto, Federal University of Pará, Rua dos Mundurucus, 4487 - Guama, Belém - Pará, 66073-000, Brazil, Tel: 55- (91) 82214896; E-mail: vinicius_costasouza@hotmail.com

Rec date: Jun 25, 2014; **Acc date:** July 25, 2014; **Pub date:** July 28, 2014

Abstract

Introduction: Trauma is a very important social and economic problem. It has become a worldwide public health problem, due to its high rates of morbidity and mortality and it is frequently associated to functional impairment. The main purpose of this study is to analyze the epidemiological profile of patients treated in the orthopedic ward of the Metropolitano Hospital situated in Ananindeua.

Materials and Methods: Descriptive and analytical study. A standardized data collection form was used for epidemiological data abstraction from the medical record of all injured patients in the orthopedic ward of the Metropolitano Hospital from August to December of 2012.

Results: The majority of injured patients were male adults. Road traffic injuries, involving motorcycles were the most common mechanism of injury, representing 30.8% of the patients. As to the female gender, the most common mechanism of injury were falls, representing 69.8% of the patients. The lower limbs were the most common location of injuries which required surgery, representing 52.3% of all accidents. Age group affected by trauma injuries (adults) is productive economically, which shows that these trauma injuries are responsible for a large portion of employees on leave and temporary or permanent loss of productive capacity.

Conclusion: Male young adults were shown as the main trauma affected patients. On the other hand, the most common females affected were elderly women, representing 33.3% of the patients, which have falls as the main mechanism of injury. It is also important to point out the importance of the joint performance of health professionals and other public sectors to stimulate preventive campaigns.

Keywords: Epidemiology; Orthopedics; Fractures; Bone; Accident prevention

Abbreviations

WHO: World Health Organization

Introduction

Trauma injuries are a major health problem, representing the main cause of death of individuals under 45 years old and are responsible for 80% of death of young adults between 18-24 years old [1]. In 2004, mortality from external causes ranked third place in quantity and was responsible for 124.000 deaths in the same year, leaving behind only mortality from circulatory diseases and neoplasia, representing 285000 and 140000, respectively [2].

About 10% of hospital admissions occur due to trauma, and most of these admissions are related to traffic accidents which, in Brazil, correspond to approximately 400000 per year [1]. One of the factors that contribute to this high mortality is the inadequate initial treatment, and in more than half of the cases, death occurs within 4 hours. Thus, the knowledge of the population, the most affected age group, and the type of trauma, have a great influence, optimizing the treatment [3].

Even though orthopedic injuries are not major severe injuries, decompensation may occur, progressing rapidly, starting complications that can be fatal if not treated urgently. The fracture causes instability which limits the patient and the medical staff regarding the care of other systems that may be affected [4].

Studies to assess the scale of the problem are very important to help treatment and prevention of trauma injuries [5]. A measure that can start with the time factor, since the elapsed time between the injury and the institution of the definitive treatment influences the functional recovery of the patient [6]. Open fractures correspond, mainly, to high energy traumas, males being more affected, as seen in general trauma, and motorcycle accidents account for a third of this type of condition [7].

Materials and Methods

The research site was the city of Belém located in Pará, Brazil, Brazilian Amazon. It was developed a cross-sectional study, the sample was chosen through convenience sampling and approved by the Human Research Ethics Committee at CESUPA, protocol CEP/TMC – Nº 282384/2013 CAAE: 13997413.8.0000.5169. The study was developed at the Metropolitano Hospital, which is a referral hospital for trauma care in the state of Pará. There was enough material for a thorough review of the epidemiology of these patients. Records of patients admitted to the Metropolitano Hospital from August to December 2012 were evaluated. The sample consisted of 300 medical records of orthopedic patients, 60 patients were analyzed each month. The records answered 6 questions systematically. The patients were divided, according to the age groups established by the World Health Organization (WHO), into 5 different groups: child (0 to 11 years), adolescent (12 to 18 years), adult (19 to 59 years), elderly (60 years or over) and total. A form was used to fill the epidemiological data of patients admitted at the Metropolitano Hospital. The form had 10 items: time and date of medical care, gender, origin, age, profession, location of injury, mechanism of trauma injury, diagnosis and medical conduct with the patient. To include the medical record in the study, it should contain at least six pieces of information to answer the questions to eliminate those that did not have the minimum information required. To analyze the epidemiological data and distribute the patients according to gender and age group in a sample containing 300 orthopedic patients, descriptive and inferential statistics methods were applied. Qualitative variables were presented by distributions of absolute and relative frequencies. The distribution of variables was assessed by the chi-square method. The time of treatment was assessed by Rayleigh distribution (Ayres et al., 2007, p. 238). Previously, the significant level alpha = 0.05 for rejection of the null hypothesis was fixed. All statistical processing was performed by BioEstat software version 5.3.

Results and Discussion

From a total of 300 medical records analyzed, 237 (79%) were males and 63 (21%) were females (Table 1). In male gender, the most common age group was "adult" (55.3%), while in the female gender the most frequent was "elderly" (33.3%). This difference between genders was considered highly significant ($p<0.0001^*$).

Group	Male		Female	
	N	%	N	%
Child	33	13.9	20	31.7
Adolescent	59	24.9	5	7.9
Adult	131	55.3	17	27
Elderly	14	5.9	21	33.3
Total	237	100	63	100
Font: Medical Records. p<0.0001*, G-Test				

Table 1: Distribution according to gender and age group of orthopedic patients treated at the Metropolitano Hospital from August to December 2012

This study confirms data presented in the literature [2,3] in which patients are mostly adults (55.3%) aged between 19 and 60 years old. In relation to gender, there was an agreement with other studies [8,9] in which males represented 79% of the cases. Such results are similar to several other studies [7,9,10] since males tend to show risky behavior, potentially causing accidents. This predominance of males tends to disappear with age, actually, there is a reversal of this predominance to females in old age [6]. In males, the highest incidence of fractures occurred in adults aged from 19 to 59.

It should also be noted, in addition to what was discussed in the previous item, that the age group affected by trauma injuries (adults) is extremely productive economically, which shows that these trauma injuries are responsible for a large portion of employees on leave and temporary or permanent loss of productive capacity, which makes this public health problem, also, a very relevant social and economic problem [3].

In relation to the location of injury, from 300 medical records reviewed, 135 (45%) suffered road traffic injuries and 67 (22%) suffered injuries at home (Table 2). The most common category among males was road traffic injuries (48.1%). As opposed to females, which showed the home environment as the most common location (55.6%)? This difference between genders was considered highly significant ($p<0.0001^*$).

Location of injury	Male		Female	
	n	%	N	%
Home environment	32	13.5	35	55.6
School	3	1.3	1	1.6
Traffic	114	48.1	21	33.3
Other	30	12.7	0	0
Not informed	58	24.5	6	9.5
Total	237	100	63	100
Font: Medical Records. p<0.0001*, G-Test.				

Table 2: Distribution of gender according to the location of injury of orthopedic patients treated at the Metropolitano Hospital from August to December 2012

The distribution of location of injury according to age groups (Table 3) showed that among children, the most frequent was home environment (50.9%). As to adolescents, the most common was road traffic injuries (51.6%), which can also be applied to adults (56.1%). Finally, for the elderly, the most common location of injury was the home environment (71.4%). The $p<0.0001^*$ indicated that this difference was highly significant.

Location of injury		Child		Adolescent		Adult		Elderly
	N	%	n	%	n	%	N	%
Home environment	27	50.9	3	4.7	12	8.1	25	71.4
School	4	7.5	0	0	0	0	0	0

Soccer field	0	0	3	4.7	4	2.7	0	0
Traffic	15	28.3	33	51.6	83	56.1	5	14.3
Work	0	0	1	1.6	14	9.5	1	2.9
Other	1	1.9	3	4.7	2	1.4	0	0
Not informed	6	11.3	21	32.8	33	22.3	4	11.4
Total	53	100	64	100	148	100	35	100
Font: Medical Records. p<0.0001*, G-Test.								

Table 3: Distribution of age groups according to location of injury of orthopedic patients treated at the Metropolitano Hospital in Ananindeua from August to December 2012

This study shows a predominance of road traffic injuries (45%), and the male gender (48.1%), data which agrees with a study developed in 200210 that points out that in relation to trauma injury mechanisms, the most common are road traffic injuries (30.4%) followed by "falls". This data agrees with the incidence of fractures in different age groups: high energy trauma that occurs mostly in road traffic injuries, which is the most frequent cause of death of young adults; fractures in the elderly are usually low energy traumas, such as falls in the home environment. In the female gender, there was a predominance of injuries in the home environment (55.6%), fall was the main trauma mechanism responsible for fractures in females (68.9%). For elderly women, the home environment was considered the main location of injury, once the most common trauma injury mechanism was "fall", causing fractures, which can be explained by their increased risk of developing osteoporosis.

As to trauma mechanisms (Table 4), there was predominance in males in motorcycle accidents as the most frequent, representing 30.8%. To the female gender, the most common was fall (69.8%). This difference was considered highly significant (p<0.0001*).

Mechanism of trauma	**Male**		**Female**	
	n	**%**	**N**	**%**
Aggression (fire weapon)	25	10.5	2	3.2
Run over	12	5.1	4	6.3
Bicycle accident	3	1.3	2	3.2
Motorcycle accident	73	30.8	11	17.5
Fall	50	21.1	44	69.8
Other	67	28.3	0	0
Not informed	7	3	0	0
Total	237	100.0	63	100
Font: Medical Records. p<0.0001*, G-Test.				

Table 4: Distribution of gender according to trauma mechanism of orthopedic patients treated at the Metropolitano Hospital in Ananindeua from August to December 2012

The distribution of trauma mechanisms according to age groups showed that among children the most frequent was fall (69.8%), in adolescents, the motorcycle accidents were most common (37.5%), as to adults, motorcycle accidents were also the main mechanism (37.2%) and, finally, in the elderly group, fall was the most frequent mechanism (82.9), the p-value<0.0001* indicated that this difference was highly significant. The aggressions were shown as an important cause for trauma in adolescents and adults, corresponding to 47 of the 212 patients in these age groups.

		Child		**Adolescent**		**Adult**		**Elderly**
Mechanism of trauma	N	%	n	%	n	%	n	%
Aggression (cutting weapon)	1	1.9	6	9.4	11	7.4	0	0
Aggression (fire weapon)	0	0	11	17.2	15	10.1	1	2.9
Motociycle accident	4	7.5	24	37.5	55	37.2	1	2.9
Run over	4	7.5	2	3.1	10	6.8	0	0
Physical aggression	1	1.9	0	0	3	2	0	0
Fall	37	69.8	7	10.9	21	14.2	29	82.9
Other	6	11.3	14	21.9	33	22.3	4	11.4
Total	53	100	64	100	148	100	35	100
Font: Medical Records. p<0.0001*, G-Test.								

Table 5: Distribution of age groups according to trauma mechanisms of 300 orthopedic patients treated at the Metropolitano Hospital in Ananindeua from August to December 2012

The main groups affected (adolescents and adults) demonstrated great imprudence of drivers as 37.5% of adolescents and 37.2% adults are victims of motorcycle accidents, aside from the run over victims [7,8]. Falls are the second most frequent cause of trauma injuries in adults, however, the most worrying fact shown was the high number of aggression cases, which correspond to 16.3% of the 300 patients evaluated, including aggressions by cutting weapons, fire weapons, and physical aggressions.

In the evaluation of medical conduct, the most frequent in males was emergency surgery (68.4%), while in females, the most common was elective surgery (52.2%). The main reason was that trauma injuries in females were mostly low energy traumas, while in males, high energy traumas and open fractures were more common [7]. Thus, it is known that prevention is the most inexpensive and effective alternative to act on the issue of trauma. Three measures represent great value strategies: education, adoption of laws and actions in

technology. The adoption of administrative rules, penalties and orientation should be the focus to change people's behavior in accordance with the first two strategies. The third strategy focuses on agents or factors involved in the accident, which seek to protect any victim of trauma [11].

Conclusions

Analyzing the statistics of patients in the orthopedic ward of the Metropolitano Hospital, it was observed that male young adults were the most common cases of trauma injuries. The most affected females were elderly women, representing 33.3% of the cases, according to the medical records evaluated, which indicated that falls were the most common mechanism of injury in this group. The most frequent mechanism of injury shown in the study were road traffic accidents (motorcycle accidents and pedestrian accidents), representing 33.3% of the trauma injuries. The lower limbs (52.3%) were the most common location of injuries, more specifically the femur (29.7%). Only pediatric patients showed greater injuries in the upper limbs, representing 64.2% of the patients. Aside from the mechanisms of injuries, there was a high index of emergency surgery.

It is important to point out the importance of the joint performance of health professionals and other public sectors, along with the society, stimulating preventive campaigns, such as traffic safety education.

Acknowledgement

This study had no funding. It was done after approval by the Research Ethics Committeeprotocol nº 282384/2013 CAAE: 13997413.8.0000.5169.

References

1. Sizínio H, Moura e Alimena LJ (2011) Ortopedia Exames Diagnósticos: Consulta Rápida. (3rdedn), Artmed Press, Rio de Janeiro.
2. Katz M, Okuma MAA, Santos ALG, Guglielmetti CLB, Sakaki MH, et al. (2008) Epidemiology of high-energy trauma injuries among the elderly. Acta Ortopédica Brasileira 16: 279-283.
3. Junior WL, Segal AB, Carvalho DE, Fregoneze M, Santili C (2005) Statistical analysis of infantile-juvenile Orthopaedic trauma in a tropical metropolis' orthopaedic emergency room. Acta Ortopédica Brasileira 13: 179-182.
4. Franciozi CES, Tamaoki MJS, Araújo EFA, Dobashi ET, Utumi CE, et al. (2008) Epidemiology, treatment and economical aspects multiple of trauma in children and adolescents in a public hospital. Acta Ortopédica Brasileira 16: 261-265.
5. Guarniero R, Junior RMG, Junior EA, Guarniero JRB, Martins GB, et al. (2011) Estudo observacional comparativo de fraturas em crianças e adolescentes. Rev Brasileira de Ortopedia 46: 32-37.
6. Dias MVF, Goldsztajn F, Guimarães JM, Grizendi JA, Correia M, et al. (2010) Epidemiology of acetabulum fractures treated at the Instituto Nacional de Traumatologia e Ortopedia (INTO). Revista Brasileira de Ortopedia 45: 474-477.
7. Arruda LRP, Silva MAC, Malerba FG, Fernandes MC, Turíbio FM, et al. (2009) Open fractures: prospective and epidemiological study. Acta Ortopédica Brasileira 17: 326-330.
8. Silveira DCG, Duarte MS (2007) Estudo Epidemiológico sobre a Incidência e Prevalência de Lesões do Setor de Traumato–Ortopedia de um Hospital Estadual da Baixada Fluminense do Rio de Janeiro. Rio de Janeiro.
9. Pereira AFF, Portela LED, Lima GDA, Carneiro WCG, Ferreira MAC, et al. (2009) Epidemiological evaluation of the thoracic and lumbar spine fractures of patients treated in the Orthopedics and Traumatology Service at Hospital Getúlio Vargas in Recife/PE. Coluna/Columna 8: 395-400.
10. Grecco MAS, Junior IP, Rocha MA, Barros JW (2002) Epidemiology of Tibial Shaft Fractures. Acta Ortopédica Brasileira 10: 10-17.
11. Chavaglia SRR, Amaral EMS, Barbosa MH, Bittar DB, Ferreira PM (2008) Vítimas de trauma por causas externas na cidade de Uberada-MG. O Mundo da Saúde São Paulo 32: 100-106.