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TRAUMA VICTIMS TREATED IN A UNIVERSITY HOSPITAL

VÍTIMAS DE TRAUMA ATENDIDAS EM UM HOSPITAL UNIVERSITÁRIO

VÍCTIMAS DE TRAUMA TRATADAS EN UN HOSPITAL UNIVERSITARIO

Caroline Bueno de Moraes Pereira[1]
Amanda Diniz Silva[2]
Luana Vilela e Vilaça[3]
Eliana Maria Scarelli Amaral[4]
Rosali Isabel Barduchi Ohl[5]
Suzel Regina Ribeiro Chavaglia[6]

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Objective: to characterize the profile of trauma victims according to sociodemographic, event and care data in an emergency care unit of a public teaching hospital. Method: quantitative retrospective cross-sectional study. Results: victims with an average age of 43 years prevailed, male (72.4%), white (58.5%), traffic accidents (39.8%), upper extremity injuries (37.9%), overnight admissions (39.1%), Monday (15.1 million 4%) and in May (10.2%), orthopedic surgeries (56.5%), without complications (58.1%), hospitalization for one day (60.4%), mild incapacity at hospital discharge (28.8%). Hospital treatment cost ≥ US$ 100.00 (53.0%). Conclusion: the characterization of the profile of trauma victims treated in the emergency care unit of a public teaching hospital showed that trauma treatment involves many factors and the sequelae that cause the victim interfere in the performance of activities of daily living, in the occupation of beds and determine high costs of treatment.

Descriptors: Wounds and Injuries. Emergency Medical Services. Health Profile. External Causes.

Objetivo: caracterizar o perfil das vítimas de trauma segundo dados sociodemográficos, do evento e assistenciais em uma unidade de pronto atendimento de um hospital público de ensino. Método: estudo transversal retrospectivo quantitativo. Resultados: prevaleceram vítimas com idade média de 43 anos, sexo masculino (72,4%), cor branca (58,5%), acidentes de trânsito (39,8%), lesões em extremidades superiores (37,9%), admissões no período noturno (39,1%), segunda-feira (15,4%) e em maio (10,2%), cirurgias ortopédicas (56,5%), sem complicações (58,1%), internação por um dia (60,4%), incapacidade ligeira na alta hospitalar (28,8%). O tratamento hospitalar teve um custo ≥ US$ 100,00 (53,0%). Conclusão: a caracterização do perfil das vítimas de trauma atendidas em unidade de

[1] Nurse. Specialist in Urgency and Trauma. Member of the Research, Teaching and Extension Group in Emergency, Trauma and Intensive Care at the Universidade Federal do Triângulo Mineiro. Uberaba, Minas Gerais, Brazil. http://orcid.org/0000-0001-5616-4942.
[2] Nurse. MSc in Healthcare. Member of the Research, Teaching and Extension Group in Emergency, Trauma and Intensive Care at the Universidade Federal do Triângulo Mineiro. Uberaba, Minas Gerais, Brazil. http://orcid.org/0000-0001-5547-2652.
[3] Nurse. MSc in Healthcare. Member of the Research, Teaching and Extension Group in Emergency, Trauma and Intensive Care at the Universidade Federal do Triângulo Mineiro. Uberaba, Minas Gerais, Brazil. http://orcid.org/0000-0001-6469-5444
[4] Nurse. PhD in Nursing. Nursing Coordinator at the Universidade Paulista. Adjuct Professor at the Universidade Federal do Triângulo Mineiro. Uberaba, Minas Gerais, Brazil. http://orcid.org/0000-0002-6174-6821.
[5] Nurse. PhD in Nursing. Adjunct Professor at the Escola Paulista de Enfermagem of the Universidade Federal de São Paulo. São Paulo, São Paulo, Brazil. http://orcid.org/0000-0002-0760-2173.
[6] Nurse. PhD in Nursing. Head Professor at the Universidade Federal do Triângulo Mineiro. Uberaba, Minas Gerias, Brazil. suzel.ribeiro@yahoo.com.br. http://orcid.org/0000-0001-7033-0185.

pronto atendimento de um hospital público de ensino mostrou que o tratamento do trauma envolve muitos fatores e as sequelas que causam à vítima interferem na realização das atividades de vida diária, na ocupação de leitos e determinam altos custos de tratamento.

Descritores: Ferimentos e Lesões. Serviços Médicos de Emergência. Perfil de Saúde. Causas Externas.

Objetivo: caracterizar el perfil de las víctimas de trauma según datos sociodemográficos, de eventos y de atención en una unidad de atención de urgencias de un hospital público docente. Método: estudio transversal retrospectivo cuantitativo. Resultados: predominaron las víctimas con una edad promedio de 43 años, hombres (72,4%), blancos (58,5%), accidentes de tránsito (39,8%), lesiones en las extremidades superiores (37,9%), ingresos nocturnos (39,1%), lunes (15,1 millones 4%) y en mayo (10,2%), cirugías ortopédicas (56,5%), sin complicaciones (58,1%), hospitalización por un día (60,4%), incapacidad leve al alta hospitalaria (28,8%). El tratamiento hospitalario costó ≥ US$ 100.00 (53.0%). Conclusión: la caracterización del perfil de las víctimas de trauma atendidas en la unidad de atención de urgencias de un hospital público docente mostró que el tratamiento del trauma involucra muchos factores y las secuelas que provoca a la víctima interfieren en el desempeño de las actividades de la vida diaria, en la ocupación de camas y determinan los altos costos del tratamiento.

Descriptores: Heridas y Lesiones. Servicios Médicos de Emergencia. Perfil de Salud. Causas Externas.

Introduction

The word trauma comes from the Greek "traûma", which means wound. It is considered a harmful injury to the organism caused by violent, physical or chemical action, of external origin on the human body. It can lead to severe and simultaneous lesions in several organs that, when not adequately treated, can lead to sequelae or even death[1].

In the United States (USA), trauma assumes the first position with a rate of 55.9% of deaths per 100,000 inhabitants[2]. In Brazil, mortality data in 2017 show that, of the 1,317,000 deaths recorded, 158,657 were due to external causes. Of this total, 63,748 (40.1%) deaths were due to aggression, 36,430 (23%) corresponded to traffic accidents, 15,667 (9.9%) to falls, and 12,495 (7.8%) intentional self-inflicted injuries, with a higher index (54,809) in the Southeast[3-4].

Thus, trauma has been configured as a serious public health problem. It disaggregates the victim's organic functions and compromises the physiological balance and musculoskeletal structures of the individual, as well as the maintenance of his/her Activities of Daily Living (ADL)[5-6].

Victims of multiple traumas often require prolonged hospitalizations, rehabilitation when there are sequelae, continuity of care to maintain quality of life, including psychological assistance. For this, they need the assistance of a multidisciplinary team[7-8].

It is essential to identify the population groups most vulnerable to these events, so that strategies to prevent accidents and trauma deaths can be developed. For this, it is of fundamental importance to develop research and disseminate the results obtained in studies on this theme.

In this sense, this study aims to characterize the profile of trauma victims according to sociodemographic, event and care data in an emergency care unit of a public teaching hospital.

Method

Retrospective cross-sectional study of quantitative methodological approach. The research was carried out at the Clinical Hospital of a public university in Minas Gerais, through documental analysis of patients. The institution has 302 active beds, 32 Emergency Room beds, 22 adult care beds and 10 pediatric beds. It is a hospital of high complexity and reference for 27 municipalities that make up the health macro-region South Triangle of the State of Minas Gerais, serving 73% of all cases of medium and high complexity of the macro-region and 100%

of high complexity cases in the municipality, except in cancer treatment[9].

The calculation of the sample size considered a trauma prevalence of 60%, accuracy of 5% and a confidence interval of 95%, for a finite population of 3,598 trauma visits/year, reaching a number of 728 subjects. The sample was selected by simple random sampling. The records were randomly selected considering the report of the statistical service of the institution, in which the data have already been in a Microsoft Excel spreadsheet.

The inclusion criteria were medical records of patients over 14 years of age, since this is the minimum age for care in the research sector, victims of traumatic events, treated in the Adult Emergency Room Unit and who remained hospitalized until hospital discharge, transference or death. The visits for the year 2015 were selected.

Exclusion criteria included medical records not found or incomplete, which did not provide data such as gender, age, skin color, mechanism of trauma, anatomical lesions caused, surgeries, frequency of trauma, length of hospital stay, complications in hospitalization, conditions at hospital discharge and/or costs of hospitalization of the patient. The lack of these variables impairs data collection and analysis.

Data collection was performed after approval by the Research Ethics Committee (REC) under Opinion n. 1.638.670. The ethical aspects followed the orientation of Resolution n. 466/12 of the National Health Council.

Data were collected from the Medical and Statistical Archive Service (SAME) from July to August 2016. The study used an instrument based on the investigation of the Violence and Accident Surveillance System (VIVA), which analyzes the trend of events and outlines the profile of victims of violence and accidents admitted to emergency services. The instrument considered the sociodemographic variables – gender, age, origin, skin color and level of education – the variables related to the traumatic event, the mechanism of trauma, affected anatomical regions and the frequency of these events according to the time, day of the week and month of the year. Regarding the care variables, the following were investigated: the length of stay in the hospital, the surgeries to which they were submitted, the complications during hospitalization, the conditions of hospital discharge and the costs of hospitalization. The data collection instrument was made by the authors and validated in layout and content by expert judges on the theme studied.

Data were collected by three previously trained researchers, in order to create intimacy with the instruments, have the ability to answer them, recognize incomplete medical records and acquire familiarity with the data collection site.

At the end of the collection, the data were entered in a spreadsheet of the Microsoft Office Excel 2013® program and imported into the Statistical Package for the Social Sciences (SPSS) version 2.1 program, for Windows 10®, for processing and analysis. Descriptive statistics (absolute frequency and percentage) and univariate analysis were performed between the variables (mechanism of trauma and age; mechanism of trauma and injured body area, mechanism of trauma and moderate disability, moderately severe disability, severe disability and death).

Results

A total of 728 medical records of trauma victims were analyzed. The age of the victims ranged from 14 to 91 years, with a mean of 43 years (standard deviation (SD) = 19.73), being the most affected age group between 20 and 39 years (40.3%), with a predominance of males (72.4%) and white skin color (58.5%). Most of the victims came from the municipality where the study was conducted (62.8%) and the most prevalent level of education was complete elementary school (8.1%).

Regarding the mechanism of trauma, most people (39.8%) were victims of traffic accidents (motorcycles, automobiles, cycling and running over), followed by falls (33.4%). Of all the trauma situations investigated, 866 injured body areas were raised in the 728 victims investigated (Table1).

Table 1 – Distribution of the number of injuries by injured bodily areas. Uberaba, Minas Gerais, Brazil - 2017. (N=728)

Variables	n	%
Upper end	276	37.9
Lower end	273	37.5
Skull	124	17.0
Chest	51	7.0
Face	45	6.2
Abdomen or pelvic content	41	5.6
Spine	23	3.2
Others	13	1.8
Neck	7	1.0
Skin Excoriations	7	1.0
Spleen	4	0.5
Others	2	0.3
TOTAL	866	100

Source: Created by the authors.

Note: Some victims had injuries in more than one anatomical segment.

It is important to highlight that trauma resulting from fall (29.2%), motorcycle accident (18.2%) and car accident (14.6%) were the main causes of injuries, followed by white weapon injury (2.2%) and beating (1.0%)

The night time (18:31 to 6:30) was the one that recorded the highest number of admissions (39.1%), followed by the evening period (12:31 to 18:30) (35.9%). The most prevalent days of the week were Monday (15.4%), Sunday (15.2%) and Friday (15.0%). In relation to the months of the year, there was a predominance of the months of May (10.2%), October (9.2%) and November (8.9%).

Among the surgeries to which the victims were submitted, the most prevalent were orthopedic (56.5%) followed by neurological (4.0%), thoracic (3.4%), plastic (2.3%) and abdominal surgeries (0.6%).

A considerable part of the victims evolved with no complications (58.1%). Among the complications were: bronchopneumonia (3.2%), pressure injuries (2.7%), sepsis (1.4%), surgical site infection (1.1%), urinary tract infection (1.1%) and phlebitis (0.1%).

Regarding the duration of hospitalization, most patients remained hospitalized for one day (60.4%), followed by five days (32.0%) and more than ten days of hospitalization (2.2%).

Regarding hospital discharge, the majority presented mild disability (28.8%), followed by moderate disability (18.8%), disabling symptoms (18.3%), moderately severe disability (11.4%). Lower percentages stood out in asymptomatic (9.2%), severe disability (5.9%) and death (4.8%).

When relating the discharge condition of the victims with the mechanism of trauma suffered, fall (26.5%) was the most frequent mechanism of trauma, both for mild disability and for moderate, moderately severe, severe disability and death, followed by motorcycle accident (14.8%) and automobile accident (8.2%).

In view of the variables and based on descriptive statistical analysis, the distribution between the mechanism of trauma and the injured body area was verified (Tables 2 and 3).

Table 2 – Percentage of the variables mechanism of the trauma due to accidents distributed by injured body area of the victims of trauma. Uberaba, Minas Gerais, Brazil - 2017. (N=728) (continued)

	Trauma Mechanism %			
Injured Body Areas	Automobile accident	Cycling accident	Sport accident	Motorcycle accident
Skull	4.10	0.40	-	2.50
Face	1.20	0.40	-	0.70

Table 2 – Percentage of the variables mechanism of the trauma due to accidents distributed by injured body area of the victims of trauma. Uberaba, Minas Gerais, Brazil - 2017. (N=728) (conclusion)

	Trauma Mechanism %			
Injured Body Areas	**Automobile accident**	**Cycling accident**	**Sport accident**	**Motorcycle accident**
Neck	0.30	-	-	-
Spine	1.10	-	-	0.40
Chest	1.60	0.30	-	0.70
Abdomen or pelvic content	1.10	0.30	-	1.00
Spleen	0.10	-	-	0.10
Upper end	4.10	0.30	0.40	7.10
Lower end	3.30	1.00	0.70	10.70
Skin Excoriations	0.40	-	-	0.10
Total	17.3	2.70	1.10	23.3

Source: Created by the authors.

Note: Conventional signal used:
- Data numeric equal to zero not resulting from rounding.

Table 3 – Percentage of the variables trauma mechanism distributed by injured body area of trauma victims. Uberaba, Minas Gerais, Brazil - 2017. (n = 728)

	Trauma Mechanism %					
Injured Body Areas	**White weapon**	**Firearm**	**Running over**	**Beating**	**Fall**	**Burn**
Skull	0.10	0.40	2.10	1.50	5.20	-
Face	0.10	0.50	0.10	1.10	0.50	0.70
Neck	0.10	-	-	-	0.10	0.10
Spine	0.10	0.10	0.30	-	0.80	-
Chest	1.50	0.70	0.70	-	1.00	-
Abdomen or pelvic content	1.10	0.30	0.30	-	1.20	0.50
Spleen	-	-	0.10	-	0.10	-
Upper end	1.90	0.70	1.50	0.70	11.40	1.00
Lower end	0.10	0.40	2.20	-	14.70	0.40
Skin Excoriations	-	-	-	0.10	0.30	-
Total	5.00	3.10	7.30	3.40	35.30	2.70

Source: Created by the authors.

Note: Conventional signal used:
- Data numeric equal to zero not resulting from rounding.

When analyzing the distribution of the trauma mechanism with the injured body areas, traffic accidents (automobile, cycling and motorcycle) were the most responsible for the injured body areas of trauma victims, followed by the fall mechanism.

Another analysis was between the subjects' age variables and the mechanism of trauma. Some events were more prevalent in the adult population between 18 and 43 years, such as: drowning (100%), sport accident (100%), beating (38.0%), firearm accident (33.3%), white weapon wound (21.4%), traffic accidents (motorcycle (13.6%), automobile (11.7%), cycling (11.1%)) and running over (7.5%). On the other hand, trauma stemming from fall (13.5%) and burns (90%) prevailed in the adult and elderly population between 18 and 84 years.

On hospitalization costs, most of the victims burdened the Unified Health System (UHS) in ≥ US$ 100.00 (53.0%), followed by costs below US$ 20.00 (26.0%) and, with

lower prevalence, costs between US$ 20.00 and US$ 100.00 (21.00%).

Discussion

The analysis of the sociodemographic profile of trauma victims admitted to the Adult Emergency Room showed that the most victims were adults between 20 and 39 years of age (40.3%). A study[10] developed in the metropolitan region of the city of Natal (RN) had the analysis of over 10,000 medical records, with a prevalence of adults aged 21 to 30 years, characterizing victims in young adults. This data coincides with those presented in this research.

Studies conducted in the countryside of the states of São Paulo and Piauí found a higher prevalence of male victims, with 72% and 71%, respectively, data that corroborate this investigation, in which there was a predominance of males (72.4%). The most present risk behavior in men is inferred as a cause for such high numbers[11-12].

White skin color predominated in this study. However, an investigation on deaths from external causes, conducted in 60 Brazilian cities, observed 67.6% of the victims with black skin color[13].

Regarding the origin, in this study, there was a predominance of victims originating in the municipality investigated, since it coincides with investigations from other municipalities and other states of the country, as identified in a study conducted in the Federal District, demonstrating that 69.6% of the victims assisted in that service came from the place of origin of the study[14].

Traffic accidents are those involving automobiles, motorcycles, bicycles and also pedestrians. In this study, the highest number of victims occurred from traffic accidents. A study conducted in Santa Catarina corroborates this result, showing that subjects between 20 and 59 years old were the main ones involved in traffic accidents[15].

The present study pointed out, in addition to adults, the elderly as the main victims of falls. A study conducted in Bahia showed a similar result, manifesting a higher frequency of the event in adult and elderly patients, with an even greater presence between the ages of 30 and 59 years[16].

The trauma caused by the fall has a strong connection with the aging process, and can be justified by the weakness, dysfunctions and chronic diseases present in this phase. They are considered morbid events, which cause injuries, suffering, emotional, functional disorders and death[17].

When associating the trauma mechanisms with the age of the subjects, the mechanisms drowning, sport accident, beating, firearm wound, motorcycle accident, cycling accident and running over affect, in particular, adults. The mechanisms fall and burn had as main victims adult and elderly.

Corroborating the pointed out thus far, a study conducted in Hungary showed that the adult population is the most involved in drownings, especially between the ages of 20 and 59 years[18]. In another study, conducted in the state of Alagoas, firearm wounds were present in adults[19].

The most injured body areas were the upper and lower extremities, a result confirmed by a study conducted in the Northeast of the country, which indicated the upper and lower limbs as the most injured in trauma victims[20].

The period with the highest number of admissions was the night (18:31 to 6:30), followed by the evening, which converges with data from a study conducted in the city of Novo Hamburgo (RS), which observed the predominance of visits by the Mobile Emergency Care Service (SAMU) at night (18:00 to 6:59), with 45.72% of the cases, followed by the evening, with 29.5%[8].

As for the days of the week, there was a higher incidence of care for trauma victims on Monday, Sunday and Friday. Investigations carried out in the state of Piauí and São Paulo found that, on weekends (Friday, Saturday and Sunday), there was a greater number of care for trauma victims[11-12].

The months with the highest occurrence rate were May, October and November. A study

conducted in the state of Rio Grande do Norte on this theme found a higher rate of trauma records from January to March[21].

Regarding surgical procedures, orthopedic surgeries were the most observed, since it is equivalent to the research conducted in a university hospital in the countryside of São Paulo, where the medical specialty with the highest number of care for trauma victims was orthopedics/traumatology, resulting in a 95.78% prevalence of orthopedic surgeries[12].

There were no complications in trauma victims treated, however bronchopneumonia was the main consequence resulting from hospitalization, followed by pressure injuries, sepsis, surgical site infection, urinary tract infection and phlebitis. Similar to this result, a study conducted in Londrina (PR) showed that the main infectious sites were lung, urinary tract, surgical site, bloodstream and cardiovascular infections and skin and subcutaneous infections, which corroborates the data obtained in this study[22].

Therefore, health professionals need to pay attention to patients, highlighting the importance of in-hospital care to prevent complications of the condition and, consequently, ensure better discharge conditions.

This investigation indicated that most of the victims remained hospitalized for one day, followed by a period of five days. This fact may be associated with the severity of the traumas treated, the time elapsed between the trauma suffered and the pre-hospital care and the admission to the hospital service, in addition to the care provided to the client. Data from a study conducted in Fortaleza (CE) indicated that most victims treated remained hospitalized for a period of zero to ten days, and a smaller part, for a period above 10 days, which differs from this study[23].

Regarding the condition of hospital discharge, mild disability was indicated as more prevalent, followed by moderate disability. In order to meet this result, data from a study conducted at the Integrated Medical Care Center of Fortaleza, with individuals in post-trauma condition, showed a higher percentage for mild disability, because 77% of the patients in this study showed complete independence and autonomy to perform their activities[24].

In this study, the costs generated by the hospitalization of victims burdened the UHS in amounts above US$ 100.00, implying expensive expenses to public coffers. Many of these patients, even after hospital discharge, may require care continuity by public health services, either for rehabilitation, health monitoring, guidance for the use of medications and new examinations, or for a new hospitalization. It is noteworthy that trauma victims may also require high complexity surgeries, as well as permanence in high-cost intensive care units.

Epidemiological, national and international data show that trauma remains the leading cause of death in people under 65 years of age. In Brazil, trauma is the main cause of death among young people under 44 years of age and 12.4% of all deaths[25]. Thus, recognizing the epidemiological profile of trauma victims is essential to describe their morbidity, deficiencies and resulting limitations, besides allowing the definition of more relevant goals that lead to the prevention of the severity of injuries.

The results of the study allow outlining the sociodemographic profile of trauma victims, the main trauma mechanisms, the time, day and month with the highest number of visits, complications during hospitalization and the patient's discharge condition.

The research evidences data that contribute to the management and organization of hospital and nursing services, assisting trauma patients and preparing teams to meet this type of demand. In addition, they demonstrate the need to carry out institutional and public prevention policies, such as education campaigns and awareness of the population of the municipality investigated.

Despite the importance of the data presented, this study has some limitations, such as being cross-sectional and having been conducted in a single health institution, which hinders

generalizations. Another aspect refers to data collection performed through medical records, which favors loss of information.

Conclusion

This study allowed knowing the profile of trauma victims treated at the teaching hospital studied, especially clients aged between 20 and 39 years, with an average age of 43 years, male gender, white skin color, with complete elementary school.

The most prevalent trauma mechanisms were traffic accidents and falls, responsible for disabilities and injured body areas.

The body area with the highest percentage of injuries was the upper extremities. Most of the victims underwent orthopedic surgeries, who were admitted at night, on Monday, in May. The main complication resulting from hospitalization was bronchopneumonia, and the prevalence of hospitalization time was one day. Most of them were discharged from the hospital with mild disability. The victims burdened the UHS at a maximum of US$ 100,00 per subject.

The treatment of trauma involves many factors and the sequelae caused to the victim interfere in the performance of activities of daily living, in the occupation of beds and determine high costs of treatment.

In this sense, it is necessary that the Government and professionals in the area promote health education campaigns in order to make the population aware of the risks and consequences of trauma and how to avoid it.

Collaborations

1 – conception, design, analysis and interpretation of data: Eliana Maria Scarelli Amaral, Amanda Diniz Silva and Suzel Regina Ribeiro Chavaglia;

2 – writing of the article and relevant critical review of the intellectual content: Caroline Bueno de Moraes Pereira, Amanda Diniz Silva, Luana Vilela e Vilaça, Rosali Isabel Barduchi Ohl and Suzel Regina Ribeiro Chavaglia;

3 – final approval of the version to be published: Caroline Bueno de Moraes Pereira, Luana Vilela e Vilaça, Rosali Isabel Barduchi Ohl and Suzel Regina Ribeiro Chavaglia.

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