

Characterization of patients treated with traumatic brain injury in a public hospital in the state of Minas Gerais**Caracterização dos pacientes atendidos com traumatismo cranioencefálico num hospital público de Minas Gerais****Caracterización de los pacientes tratados por lesión cerebral traumática en un hospital público de Minas Gerais****J**ânio Eduardo Siqueira¹, **C**íntia Machado Dutra¹, **L**úcia Aparecida Ferreira²**Received:** 02/03/2024 **Accepted:** 28/05/2024 **Published:** 12/07/2024

Objective: to describe the sociodemographic characteristics of patients treated for traumatic brain injury in a public hospital. **Methods:** descriptive, cross-sectional study, with a quantitative approach, with the collection of secondary data obtained from the Information Technology Department of the Unified Health System, between 2022 and 2023, considering the following mandatory variables of the Hospital Information System: gender, age range, color/race and deaths. Data were analyzed using descriptive statistics. **Results:** 464 hospitalizations for traumatic brain injury were recorded, with the highest frequency being in males, in patients who declared themselves to be white and aged between 40 and 69 years. Of the total of 64 deaths due to traumatic brain injury, there was a higher frequency also in males, in mixed raced patients and aged 40 to 69 years. **Conclusion:** understanding the sociodemographic characteristics of patients with traumatic brain injury can contribute to the improvement of treatment and prevention protocols, and highlights the need for personalized approaches that consider the different facets of the sociodemographic profile of affected individuals.

Descriptors: Brain Injuries, Traumatic; Epidemiology; Hospitalization; Mortality.

Objetivo: descrever as características sociodemográficas dos pacientes atendidos com traumatismo cranioencefálico em um hospital público. **Método:** estudo descritivo, transversal, de abordagem quantitativa, com o levantamento de dados secundários obtidos no Departamento de Informática do Sistema Único de Saúde, período de 2022 e 2023, consideradas as seguintes variáveis de preenchimento obrigatório do Sistema de Informações Hospitalares: sexo, faixa etária, cor/raça e óbitos. Os dados foram analisados por meio de estatística descritiva. **Resultados:** foram registradas 464 internações por traumatismo cranioencefálico, sendo a maior frequência no sexo masculino, em pacientes que se declaram de cor branca e com faixa etária de 40 a 69 anos. Do total de 64 óbitos por traumatismo cranioencefálico, houve maior frequência também no sexo masculino, em pacientes de cor parda e com idade 40 a 69 anos. **Conclusão:** a compreensão das características sociodemográficas dos pacientes com traumatismo cranioencefálico pode contribuir para a melhoria dos protocolos de tratamento e prevenção, e aponta a necessidade de abordagens personalizadas que considerem as diversas facetas do perfil sociodemográfico dos indivíduos afetados.

Descritores: Lesões Encefálicas Traumáticas; Epidemiologia; Hospitalização; Mortalidade.

Objetivo: Describir las características sociodemográficas de los pacientes atendidos por lesión cerebral traumática en un hospital público. **Método:** estudio descriptivo, transversal, con abordaje cuantitativo, a partir de datos secundarios obtenidos del Departamento de Informática del Sistema Único de Salud, para el período 2022 y 2023, considerando las siguientes variables que deben ser rellenas por el Sistema de Información Hospitalaria: sexo, grupo de edad, color/raza y muertes. Los datos se analizaron mediante estadística descriptiva. **Resultados:** Se registraron 464 ingresos por lesión cerebral traumática, con mayor frecuencia en hombres, pacientes de color blanco y de edades comprendidas entre 40 y 69 años. De las 64 muertes por lesión cerebral traumática, también hubo una mayor frecuencia entre los hombres, los pacientes pardos y los pacientes de entre 40 y 69 años. **Conclusión:** Comprender las características sociodemográficas de los pacientes con lesión cerebral traumática puede ayudar a mejorar los protocolos de tratamiento y prevención, y apunta a la necesidad de enfoques personalizados que tengan en cuenta las diversas facetas del perfil sociodemográfico de las personas afectadas.

Descriptores: Lesiones Traumáticas del Encéfalo; Epidemiología; Hospitalización; Mortalidad.

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INTRODUCTION

Traumatic brain injury (TBI) is defined as any injury that affects the skull and brain¹. This type of injury occurs when there is an impact on the head, which can result in damage to the brain due to the force exerted on the skull². TBI can vary in severity, from mild injuries to more serious and potentially fatal cases¹⁻².

Common causes of TBI include traffic accidents, falls, physical assaults, contact sports, and other traumatic events involving impact to the head. Depending on the force of the impact, direct damage to the brain may occur, such as contusions, hemorrhages, diffuse axonal injuries and other complications, being more common in males³.

The trauma mechanism can be penetrating, blunt; and injuries can be classified into primary, which occur at the time of trauma, and secondary, which evolve over hours and days after the occurrence of the initial injury, caused by inadequate supply of nutrients and oxygen to cells and symptoms can vary from according to intensity and mechanism⁴.

The diagnosis and treatment of TBI are carried out by healthcare professionals, often in hospital settings. It is essential to seek immediate medical attention if TBI is suspected for proper assessment and management of the injury⁵. Treatment may involve measures such as observation, medication, surgery and rehabilitation, depending on the severity and specific characteristics of each case⁶.

Understanding the sociodemographic profile of patients affected by TBI is essential to guide prevention, treatment and rehabilitation strategies specific to the local reality, and contribute to the prevention of deaths considered avoidable, through health education strategies.

Thus, this study aims to describe the sociodemographic characteristics of patients treated for traumatic brain injury in a public hospital.

METHODS

This is a descriptive, cross-sectional study with a quantitative approach, with the collection of secondary data obtained from the Information Technology Department of the Unified Health System (DATASUS), an information system of the Brazilian Ministry of Health, available for access by anyone, which provides data related to the number of hospitalizations in the public health system, recording cases of hospital admission, as well as length of stay and mortality⁷. Part of the scope of this system is the responsibility for providing SUS information and IT support services, necessary for the planning, operation and control process⁷.

The inclusion criteria were all patients treated for traumatic brain injury at the Hospital de Clínicas of the Universidade Federal do Triângulo Mineiro, between 2022 and 2023, registered electronically in the DATASUS. Data collection took place in January 2024, and the following mandatory variables from the Hospital Information System were considered: sex, age group, color/race and deaths.

After collection, the data was entered into the Microsoft Office Excel™ 2017 program, analyzed using descriptive statistics, simple frequency and percentage, presented in tables.

As it is secondary and government-based data in the public domain and does not directly involve human beings and their identification, it became unnecessary to submit the project to the Ethics Committee for its execution.

RESULTS

Between 2022 and 2023, 464 patients with TBI were treated at HC-UFTM, of this total number of hospitalizations, 258 occurred in 2022 and 206 occurred in 2023, as shown in Table 1.

Of the 258 hospitalizations in 2022, 210 (81.4%) were male patients and 48 (18.6%) were female. Of the 206 hospitalizations in 2023, 160 (77.7%) were male and 46 (22.3%) were female.

Regarding color/race, it was observed that in 2022, there was underreporting of information, since in 255 (98.8%) of hospitalizations the information was not described, followed by white people with 3 (1.2%) records. In 2023, 78 of the patients declared themselves to be white, and 61 to be mixed race (Table 1).

Regarding the age range of patients treated with TBI, it was observed that, in 2022, a prevalence between 40-69 years old, with 110 (42.2%), followed by 20-39 years old with 81 (31.4%), following the same age profile in 2023, 83 (40.3%) of patients between 40-69 years old, followed by those aged 20 to 39 years old with 56 (27.2%) (Table 1).

Of the total of 464 patients treated with TBI at HC-UFTM, 64 died, and in 2022, 30 (78.9%) were male and, in 2023, 19 (71.3%) were male. sex (Table 2).

Table 1. Sociodemographic characterization of patients treated for traumatic brain injury at the Hospital de Clinicas of UFTM. Uberaba/MG, Brazil, 2024.

	2022		2023	
	N	%	N	%
Sex				
Male	210	81.4	160	77.7
Female	48	18.6	46	22.3
Color/Race				
White	3	1.2	78	37.9
Black	0	0	7	3.4
Mixed	0	0	61	29.6
Asian	0	0	9	4.4
No information	255	98.8	51	24.8
Age group				
Under 1 year	2	0.8	2	1.0
01 - 09 years	7	2.7	6	2.9
10 - 19 years	11	4.3	14	6.8
20 - 39 years	81	31.4	56	27.2
40 - 69 years	110	42.6	83	40.3
70 years or more	47	18.2	45	21.8

Regarding the color/race of the individuals who died, there was an underreporting of information, since, in 2022, 37 (97.4%) of these deaths were not classified according to race/color. In 2023, 9 (34.6%) were classified as mixed race, followed by white people who had 8 (30.8%) deaths (Table 2).

In relation to the age group observed, in 2022 of the total of 38 deaths, it was observed that 16 (42.1%) affected individuals aged 40 to 69 years, followed by victims aged 70 years or over. In 2023, of the total of 26 deaths, 10 (38.5%) were recorded in individuals aged 40 to 69 years, as shown in Table 2.

Table 2. Sociodemographic characterization of patients who died due to traumatic brain injury at the Hospital de Clinicas of UFTM. Uberaba/MG, Brazil, 2024.

	2022		2023	
	N	%	N	%
Sex				
Male	30	78.9	19	73.1
Female	8	21.1	7	26.9
Color/Race				
White	1	2.6	8	30.8
Black	0	0	0	0
Mixed	0	0	9	34.6
Asian	0	0	0	0
No information	37	97.4	9	34.6
Faixa Etária				
Under 1 year	0	0	0	0
01 - 09 years	1	2.6	2	7.7
10 - 19 years	0	0	1	3.8
20 - 39 years	7	18.4	5	19.2
40 - 69 years	16	42.1	10	38.5
70 years or more	14	36.8	8	30.8

DISCUSSION

The data presented in this study showed that males were predominant among TBI victims. This fact can be attributed to the greater exposure of these individuals to behavioral and sociocultural factors related to gender, such as carrying out risky maneuvers, driving at excessive speeds, adventurous and reckless behavior and greater consumption of alcoholic beverages^{2,3,5,6}.

Regarding age group, several studies have shown that the age group of 20 to 29 years was the most affected by TBI, being justified by the immaturity of their age, the search for strong emotions, the desire to overcome challenges and the pleasure they feel in situations of risk^{4,10}.

In this study, there was an emphasis on individuals over 40 years of age or older, both for incidents and deaths, corroborating another study¹¹, which shows a prevalence of TBI in this age profile, being associated with factors such as comorbidities, such as arterial hypertension disease and diabetes, which present greater susceptibility to TBI and post-traumatic complications.

There is a greater tendency for individuals over 70 years of age to be affected, accompanied by high mortality rates¹² and, according to another study¹³, there was a greater occurrence of deaths among people aged 70 years or over, with 253 deaths (31,70 %), than 50 to 69 years old, with 203 deaths (25.43%).

And a study published in 2023, data on deaths occurring in the analyzed period, which corresponded to 8.85% of hospitalizations, the highest prevalence occurred in male patients (80.29%), aged 50 to 59 years (14.21%), of mixed race (46.28%), corroborating the information found in this study¹⁴.

A reduction in the number of deaths due to TBI was observed between the years analyzed, corroborating several authors who report the reduction in cases, attributed to various factors, such as preventive measures, improvements in emergency medical care or changes in behavior patterns^{1,5,13,14}.

It is important to highlight the underreporting of information in both years, by color/race, this underreporting can affect the analysis of racial disparities in TBI events, corroborating the work of Dantas¹³ who also found underreporting, of which 336 (42, 10%) victims were not identified as to color/race.

CONCLUSION

In this study, 464 records of hospitalizations for TBI were found in the years 2022 and 2023, with a greater frequency of males and mixed race. In relation to the occurrence of deaths, relevance was observed in individuals with these same characteristics.

The research contributed with relevant information about the characteristics of patients treated with TBI at the Hospital de Clínicas of the Universidade Federal do Triângulo Mineiro, to understand the impact of this type of injury, which could be used as an instrument for the development of health actions and strategies that can improve prevention.

The results of this study highlight the complexity and diversity of factors that influence the incidence and characteristics of TBI cases and the importance of considering factors such as gender and age group in prevention and treatment. It is observed that TBI does not discriminate in terms of age, affecting everyone from children to the elderly, although there are variations in severity and causes according to age groups.

Limitations include: insufficient recording of causes/occurrences, including underreporting of specific causes, lack of details regarding color/race. Therefore, continuing education actions are suggested to better complete data.

In turn, understanding the sociodemographic characteristics of patients with TBI can contribute to the improvement of treatment and prevention protocols, and highlights the need for personalized approaches that consider the different facets of the sociodemographic profile of affected individuals..

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