

Clinical-epidemiological characterization of patients diagnosed with traumatic brain injury

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ABSTRACT

Introduction: head injuries are related to the greatest amount of loss of life for young adults. They are the fourth cause of death in Cuba and the first in the population under 41 years of age. **Objective:** to characterize clinically and epidemiologically patients over 18 years of age with head trauma. **Method:** it was carried out an observational, descriptive and cross-sectional study, in patients older than 18 years with head trauma, during the period between January and November 2018, at the "Gustavo Aldereguía Lima" University Hospital in Cienfuegos, Cuba. The universe consisted of 32 patients and all of them were studied. The variables age, sex, classification of head injury according to the Glasgow scale, cause of head injury and quality of discharge were studied. Descriptive statistics were used. **Results:** male patients with 11 (64, 71 %) between 21 and 40 years of age with 20 (62, 5 %) predominated. Mild head trauma with 21 (65, 63 %) and traffic accidents with 13 (40, 63 %) were the most prevalent. Most of the patients (31) were discharged alive (96, 88 %) male patients with 11 (64, 71 %) between 21 and 40 years of age with 20 (62, 5 %) predominated. Mild head trauma with 21 (65, 63 %) and traffic accidents with 13 (40, 63 %) were the most prevalent. Most of the patients (31) were discharged alive (96, 88 %). **Conclusions:** middle-aged male patients with mild head trauma predominated. The largest proportion of patients was discharged alive and the main cause of trauma was traffic accidents.

Keywords: Accidents; Skull; Incidence; Neurosurgery; Brain Injuries, Traumatic.

Within neurological diseases, traumatic brain injury (TBI) is among the first places, both in frequency and severity. TBI is defined as an alteration of the brain, both in its anatomy and in its functionality, due to violent exchanges of mechanical energy. It is reported as one of the main causes of morbidity and mortality in people under 45 years old^{1,2}.

In the basic process of trauma there is no problem in establishing the etiological diagnosis, but there is uncertainty about the pathogenesis of the immediate brain disorder and the late effects that can complicate the injury. Clinically, it is classified as mild (13-15 points), moderate (9-12 points) and severe (3-8 points)

using the Glasgow Coma Scale. Mild TBI occupies the majority of cases presented annually^{3,4,5}.

TBIs cause the majority of trauma deaths worldwide. The rate is 579 per 100,000 person per year, mainly due to falls or vehicular accidents; they may be associated with sex (predominantly in men), age or country (higher in developing countries). The incidence rate of TBI in Latin America is high in injuries caused by traffic accidents and violence. Those most involved in the first case are motorcyclists and pedestrians; in the second, countries with high rates of violence due to armed conflicts and different types of violence, such as domestic and child violence^{6,7,8}.

In addition, it is one of the main causes of lost years due to disability in people under 45 years old. According to statistics, globally, 12 % of adults in developed countries have had a TBI, but there are 2 high-risk populations: athletes and military personnel, due to exposure in their work^{9,10}.

In Cuba, TBIs are the fourth cause of death and the main cause of death in the population under 41 years old, which is why they represent a problem of medical-social importance with epidemiological significance, which is accompanied by a high cost to society and to the family. In addition, they are responsible for two thirds of the deaths that, in those under 41 years of age, occur in a general hospital. Although they are outnumbered by cerebrovascular diseases, they affect

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Conflict of interest

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a younger population with better life expectancy^{11,12}.

The study of this disease is essential in the design of intervention strategies both at the hospital and community level, for the adequate social reintegration of the patients who experience it. The objective of this research was to clinically and epidemiologically characterize patients over 18 years old with TBI, during the period from January to November 2018, at the “Gustavo Aldereguía Lima” University Hospital in Cienfuegos, Cuba.

METHOD

Type of study: an observational, descriptive, cross-sectional study was carried out in patients over 18 old with TBI, during the period from January to November 2018, at the “Gustavo Aldereguía Lima” University Hospital in Cienfuegos, Cuba.

Universe and sample: the universe was made up of 32 patients and it was studied as a whole. TBI patients older than 18 years old were included. Patients whose recorded information did not provide the necessary data to evaluate the study variables were excluded.

Variables and data collection: data collection was carried out by reviewing the individual medical records of patients. The variables under study were: age, sex, TBI classification according to the Glasgow scale (severe: 3-8 points; moderate: 9-12 points; mild: 13-15 points), cause of the TBI and the patient's condition at discharge (alive or deceased).

Statistical processing: for the processing and analysis of the information, a database was created in a Microsoft Excel 2016 spreadsheet; through the SPSS 23.0 statistical program, the corresponding descriptive indicators were obtained: absolute and relative percentage frequencies.

Ethical standards: this research was approved by the institution's Scientific Council and Medical Ethics Committee. As the direct involvement of the patients was not required, prior request for informed consent was not required. The ethical standards set forth in the II Declaration of Helsinki were respected. The bioethical principles of beneficence and non-maleficence, respect for autonomy and justice, respect for the confidentiality of the obtained data, which were only used for research purposes, were taken into account.

RESULTS

There was a predominance of ages from 21 to 40 years old with 20 (62,5 %); male sex with 11 (64,71 %) was the most frequent (Table 1).

Mild TBIs predominated with 21 (65,63 %); male sex with 13 (76,47 %) was the most represented (Table 2).

Traffic accidents with 13 (40,63 %) were the most frequent cause of TBI; the highest frequency corresponded to male sex, with 7 cases representing 41,18 % (Table 3).

Table 1. Distribution according to age and sex of patients with TBI. University Hospital “Gustavo Aldereguía Lima”, Cienfuegos, Cuba. January-November, 2018

Age	Male Sex		Female Sex		Total	
	No.	%	No.	%	No.	%
21-40	11	64,71	9	60	20	62,5
41-60	4	23,53	4	26,67	8	25
61-80	1	5,88	2	13,33	3	9,38
Over 80	1	5,88	0	0	1	3,13
Total	17	53,13	15	46,88	32	100

Source: individual medical records of patients.

Table 2. Distribution according to sex of the TBI classification according to the Glasgow scale.

Classification according to the Glasgow scale	Male Sex		Female Sex		Total	
	No.	%	No.	%	No.	%
Mild	13	76,47	8	53,33	21	65,63
Moderate	3	17,65	5	33,33	8	25
Severe	1	5,88	2	13,33	3	9,38
Total	17	53,13	15	46,88	32	100

Table 3. Distribution of the TBIs causes according to sex

TBIs Causes	Male Sex		Female Sex		Total	
	No.	%	No.	%	No.	%
Assaults	1	5,88	3	20	4	12,5
Work and sport accidents	4	23,53	2	13,33	6	18,75
Traffic accidents	7	41,18	6	40	13	40,63
Falls	5	29,41	4	26,66	9	28,13
Total	17	53,13	15	46,88	32	100

96,88 % of the patients were discharged alive with a total of 31 cases (Table 4).

DISCUSSION

In the carried out study, males predominated, from 21 to 40 years old, a result that coincides with that of Amado-Donéstevéz *et al.*¹³, in which male sex prevailed and the predominant age range was between 27 and 59 years

Tabla 4. Distribución de los pacientes según sexo y estado al egreso

Estado del paciente al egreso	Sexo Masculino		Sexo Femenino		Total	
	No.	%	No.	%	No.	%
	Vivos	16	94,11	15	100	31
Fallecidos	1	5,88	0	0	1	1,13
Total	17	53,13	15	46,88	32	100

old, with a mean of 42,2 years old. It also agrees with the research carried out by Ortega-Zufiría *et al.*¹⁴, in which men predominated. Bermúdez-Ruiz *et al.*¹⁵ presented in their research similar results to those found in this study, since male patients (92,11 %), aged from 36 to 64 years old, predominated. The authors suggest that this health problem affects a younger population with better life expectancy.

Most of the TBIs were mild according to the Glasgow Coma Scale, a result that coincides with the investigations carried out by Sierra *et al.*¹⁶, Amado-Donéstevez *et al.*¹³ and Quintanal-Cordero *et al.*¹⁷, in which mild TBI also predominated.

The authors state that less importance has traditionally been given to mild TBI, but this represents a health problem of great interest due to the fact that a significant number of patients with mild TBI develop life-threatening complications that require urgent medical and neurosurgical interventions.

Traffic accidents were the predominant cause of trauma, a result that agreed with that of Bermúdez-Ruiz *et al.*¹⁵, where 50 % of traumas were due to traffic accidents; also with those of Ortega-Zufiría *et al.*¹⁴ and Quintanal-Cordero *et al.*¹⁷, where they occupied the highest percentage.

In Cuba, accidents are among the five leading causes of death from 0 to 64 years old, particularly for children over one year old and adolescents. It is estimated that for every traffic accident death there are between 10 and 15 serious injuries and 30 to 40 minor injuries^{7,8}.

TBI, in turn, constitutes the main trauma caused by accidents. The authors state that, in order to obtain significant improvements in health indicators, it is necessary to strengthen pre-hospital care and, within it, community care, because the correct management of these cases guarantees the reduction of secondary brain injury and contributes to save the patient's life. Therefore, it is necessary to strengthen the education of the population on the basic principles of lifesaving, since it has a proven impact on the morbidity and mortality of non-communicable diseases, such as TBIs.

The highest proportion of patients was discharged alive, which was similar to what was found by Bermúdez-Ruiz *et al.*¹⁵, with 73,68 %. The authors suggest that this result may be due to the fact that most of the injuries were mild, and the highest mortality is associated with severe TBI.

Among the limitations of the study was the small studied sample, which is why it is recommended to carry out studies with a similar methodology in the different provinces of the country.

CONCLUSIONS

Middle-aged male patients with mild TBI were the ones that predominated. Most of the patients were discharged alive and the main cause of trauma was traffic accidents.

AUTHORSHIP

Claudia Lissette Martínez-Suárez: conceptualization, data curation, research, methodology, project management, software, supervision, validation, visualization, writing-original draft, writing-revision and editing.

Carlos Rivero-Chau: conceptualization, formal analysis, research, methodology, resources, software, supervision, visualization, writing-original draft, writing-revision and editing.

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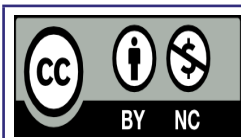
Caracterización clínico-epidemiológica de pacientes con diagnóstico de traumatismo craneoencefálico

RESUMEN

Introducción: los traumatismos craneoencefálicos se relacionan con la mayor cantidad de pérdidas de vidas para el adulto joven. Son la cuarta causa de muerte en Cuba y la primera en la población menor de 41 años de edad. **Objetivo:** caracterizar clínica y epidemiológicamente a pacientes mayores de 18 años con traumatismo craneoencefálico. **Método:** estudio observacional, descriptivo de corte transversal, en pacientes mayores de 18 años con traumatismo craneoencefálico, durante el periodo com-

prendido entre enero y noviembre del 2018, en el Hospital Universitario "Gustavo Aldereguía Lima" de la provincia Cienfuegos, Cuba. El universo estuvo conformado por 32 pacientes y se trabajó con la totalidad de los mismos. Se estudiaron las variables edad, sexo, clasificación del traumatismo craneoencefálico según la escala de Glasgow, causa del traumatismo craneoencefálico y calidad de egreso. Se empleó la estadística descriptiva. **Resultados:** predominaron los pacientes entre 21 y 40 años (62,5%) de sexo masculino con 17. El traumatismo craneoencefálico leve fue el predominante con 21 (65,63 %); y los accidentes de tráfico con 13 (40,63 %), los preponderantes. La mayoría de los pacientes (31) egresaron vivos (96,88 %). **Conclusiones:** los pacientes en edad media del sexo masculino, con traumatismo craneoencefálico leve fueron los que predominaron. La mayor proporción de los pacientes egresó viva y la principal causa de traumatismo fueron los accidentes de tráfico.

Palabras clave: Accidentes; Cráneo; Incidencia; Neurocirugía; Traumatismo Craneocerebral.



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