



PROFILE OF THE VICTIMS OF MOTORCYCLE ACCIDENTS ADMITTED IN THE INTENSIVE THERAPY UNIT IN A PUBLIC HOSPITAL

PERFIL DAS VÍTIMAS DE ACIDENTES MOTOCICLÍSTICOS ADMITIDAS NAS TERAPIAS INTENSIVAS DE UM HOSPITAL PÚBLICO

PERFIL DE LAS VÍCTIMAS DE ACCIDENTES DE MOTOCICLETA INGRESADAS EN LAS TERAPIAS INTENSIVAS DE UN HOSPITAL PÚBLICO

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ABSTRACT

Objective: to describe the epidemiological profile of motorcycle accident victims admitted in the intensive care unit in a public hospital. **Method:** this was an epidemiological and analytical study with a quantitative approach that included 86 charts from patients hospitalized in the ICU at the Neuro and General sectors in an urgent care facility in Teresina-PI. The data were tabulated in the Statistical software *Social Package for the Social Sciences* -SPSS, version 18.0 for Windows. The study was initiated following approval by the Ethics Committee, protocol No. 11984/04/2012. **Results:** 88.4% of the victims are men, 38.4% of these were single, with ages ranging from 15 to 25 years; 24.4% had middle school education level. Regarding the use of helmets, 94% of the records did not have information about its use at the time of the accident. **Conclusion:** motorcycle accidents constitute an undeniable serious public health problem and indicate the need for the planning of educational and preventive actions. **Descriptors:** Traffic Accidents; Prevention of Accidents; Epidemiology.

RESUMO

Objetivo: descrever o perfil epidemiológico das vítimas de acidentes motociclísticos admitidas nas unidades de terapia intensiva de um hospital público. **Método:** estudo epidemiológico e analítico de abordagem quantitativa com amostra de 86 prontuários dos pacientes internados nas UTIs da Neuro e Geral de um hospital de urgências em Teresina-PI. Os dados foram tabulados no Programa estatístico *Social Package for the Social Sciences* (SPSS), versão 18.0 for Windows. A pesquisa foi iniciada após a aprovação do projeto de pesquisa no Comitê de Ética, parecer nº 11984/04/2012. **Resultados:** 88,4% das vítimas eram homens, destes, 38,4% eram solteiros, com faixa etária dos 15 aos 25 anos; 24,4% possuíam nível de escolaridade fundamental. Quanto ao uso do capacete, em 94% dos prontuários catalogados não havia informação sobre o uso do equipamento momento do acidente. **Conclusão:** inegavelmente os acidentes motociclísticos constituem-se um grave problema de saúde pública e há necessidade de planejamento de ações educativas e preventivas. **Descritores:** Acidentes de Trânsito; Prevenção de Acidentes; Epidemiologia.

RESUMEN

Objetivo: describir el perfil epidemiológico de las víctimas de accidente de motocicleta ingresadas en las unidades de terapia intensiva de un hospital público. **Metodología:** estudio epidemiológico y analítico, con abordaje cuantitativo, con una muestra de 86 historias clínicas de pacientes ingresados en las UTI de Neurología y General de un hospital de urgencia en Teresina-PI. Los datos fueron ordenados en el Programa estadístico *Social Package for the Social Sciences* (SPSS), versión 18.0 for Windows. La investigación se inició después de la aprobación del proyecto de investigación por el Comité de Ética, nº 11984/04/2012. **Resultados:** un 88,4% de las víctimas eran hombres, de estos, un 38,4% estaban solteros, de la franja etaria entre los 15 y los 25 años; un 24,4% tenían la educación básica. Respecto al uso de casco, y un 94% de los históricos médicos no había información sobre el uso del elemento de protección al momento del accidente. **Conclusión:** no se puede negar que los accidentes de motocicleta son un grave problema para la salud pública y que es necesario planear acciones educativas preventivas. **Descriptores:** Accidentes de Tránsito; Prevención de Accidentes; Epidemiología.

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INTRODUCTION

According to comparative data conducted by the National Confederation of Municipalities (CNM), 57,116 deaths from traffic accidents for every 100,000 inhabitants were recorded in 2008 in Brazil. In the United States, 37,261 deaths were recorded from traffic accidents and in the European Union, 38,876. The data show that the Brazilian transit kills 2.5 times more than in the United States, and 3.7 times more than in the European Union.¹

In Brazil, such as in the rest of the world, the industrial development provided a considerable increase in the automobile fleet. A parallel significant increase of trauma by external causes is observed as mainly associated to inadequate human and behavioral issues in addition to insufficient government surveillance.² The motorcycles fleet stands out because these vehicles bring several attractive features that become incentives for their acquisition such as low maintenance cost, and because of this reason, the application for licenses has increased remarkably in all Brazilian States in the recent years. The big disadvantage is less protection, because motorcycles have no structure or devices that offer security to their users.³

The Brazilian Transit Code - CTB instituted laws among measures for the prevention of trauma by accidents, especially involving motorcycles, such as the use of helmets for drivers and passengers; the lack of use of helmets is liable to penalties. The CTB has also made mandatory that two-wheeled vehicles transit with the headlights on to be better perceived, which helps to reduce accidents and consequently trauma.⁴

The trauma is caused by a chain of events created between the individual and a high-risk situation for example: car accidents, produced by transfer of energy, injury from external agents, which include: physical, mechanical, and chemical. These are responsible for deaths or physical or psychological disabilities that burden the health system with prolonged hospitalizations and long-term recovery programs;⁵ despite its impact on public health and its high costs to society, traumas have long been neglected as an illness, in part, for being regarded as an "accident", something arising from a casual event, uncontrollable. However, what in fact most often occurs is that the trauma injuries happen in predictable situations, plausible of prevention.⁶

Due to the severity of injuries, the victims from trauma arising from accidents require

physical structure, availability of inputs, technological support, and specialized human resources to ensure permanent and continuous assistance in observation and maintenance of vital conditions and intervention in emergency situations. In this order, the intensive care units (ICU) are units of great importance in the maintenance of life and rehabilitation of victims; however, the lack of ICU beds for many patients contributes to their high mortality rates.⁷

Concerned about this scenario and realizing the gap of Brazilian studies about the profile of the victim of motorcycle accidents in the ICU, this study seek to provide subsidies for the formulation of multi-professional conducts in caring for these patients. This study aims to describe the epidemiological profile of motorcycle accident victims admitted in the intensive care units in a public hospital in Teresina. The specific objectives were to describe the socio-demographic and clinical data of patients, and analyze the relationship between the age by age groups with the occurrence of thoracic trauma, traumatic brain and skull injuries, and the clinical condition of patients at the time of discharge from the ICU.

METHOD

This was an epidemiological, descriptive, retrospective, and analytical study with a quantitative approach, which is characterized by the descriptions and analysis of data obtained from the charts of patients hospitalized in the ICU at the Neuro and General sectors from an urgent care facility in Teresina-PI, between January and December of 2010.

The study was conducted in a public hospital in the city of Teresina-Piauí, which was founded in May 5, 2008 and currently has 227 beds in six clinics and three intensive care units. Many of the specialties offered by the hospital make it a reference to the Northern and Northeastern regions.

The hospital has three intensive care units (neurological, general, and pediatric) with eight beds in each unit. It also stands out for being a teaching, research, and extension programs center with residency in Internal Medicine, General Surgery, and Orthopedics for several private and public colleges. All medical records from patients admitted to the hospital in the neurological and general ICUs, because of motorcycle trauma and in the period from January to December of 2010, were included in the study.

The data were collected by the authors with the use of the data collection instrument divided as follows: socio-demographic data as age, gender, marital status, education, and clinical data such as the use of helmets at the time of the accident, type of trauma, surgery, type of surgery, and discharge clinical conditions.

The data was tabulated in the Statistical software Social Package for the Social Sciences -SPSS, version 18.0 for Windows. Descriptive analyses of the socio-demographic and clinical data were performed using simple and absolute frequencies and measures of central tendency and dispersion.

Bivariate analyses were also carried out with the association between variables. Age by age groups was considered as an independent variable and the skull-encephalic trauma and clinical condition at the time of discharge from the ICU as dependent variables. A significance level of 5% ($p < 0.05$) was considered in all statistical tests using Pearson's Chi-square test or Fisher test when it was not possible to use the Chi-square test.

The study respected the confidentiality and anonymity of patients, was registered in the National System of Ethics and Research (BRAZIL PLATFORM), and subsequently submitted to the Research Ethics Committee

from the Emergency Hospital of Teresina (HUT) and the Committee of Ethics in Research from the Integral Diferencial College - FACLD, in accordance with resolution No. 196/96 from the National Health Council, which deals with guidelines and regulatory norms for research involving humans. The researchers obtained authorization from the institution through an Institutional Authorization Request and signature of the term of faithful depositary by the head of the Medical and Statistical File Service (SAME) in that hospital.⁸

RESULTS

The presentation of results is divided into three parts: in the first and second, the descriptive analyses of demographic data and clinical data are performed; in the third part, bivariate analyses were performed with association between the variable age and the variables skull encephalic trauma and clinical condition of patients at the time of discharge from the ICU.

• Socio-demographic Data

During the year of 2010 there were 394 admissions in the General and Neurological ICU; of these, 86 were victims of motorcycle accidents, 21.83%. These patients had the following demographic characteristics.

Table 1. Demographic distribution of the study population according to age, gender, and marital status. Teresina - 2012 (N = 86)

Age	n	%			
15 --- 25	41	47.7			
25 --- 35	22	25.6			
35 --- 45	12	14.0			
45 --- 55	5	5.8			
55 --- 65	6	7.0			
Total	86	100.0			
Average age = 28,85 years / dp ⁴ = 12,18 years					
Gender	Marital status				
	Married (%)	Single (%)	Other (%)	Notinformed (%)	Total (%)
Male	34.9	38.4	10.5	4.7	88.5
Female	1.2	9.3	0.0	1.2	11.6
Total	36.0	47.7	10.5	5.8	100.0

Source: SAME HUT, 2012.

The global analysis in Table 1 revealed that 47.7% of riders were in the age group of 15 to 25 years, with a variance between 15 and 65 years, average age of 29.85 years, and

standard deviation of 12.18 years. It also revealed that 88.4% of victims of motorcycle accidents are men, of these, 38.4% were single.

Table 2. Distribution of the study population according to education level. Teresina - 2012 (N = 86).

Education	n	%
Not informed	33	38.4
Middle school	21	24.4
Incomplete Middle school	13	15.1
Complete High school;	13	15.1
Incomplete High school	02	2.3
Complete college	02	2.3
Incomplete college	01	1.2
Illiterate or just reads and writes the name.	01	1.2
Total	86	100.0

Source: SAME HUT, 2012.

As for the education, Table 2 shows that the highest percentage of patients showed middle school level (24.4%).

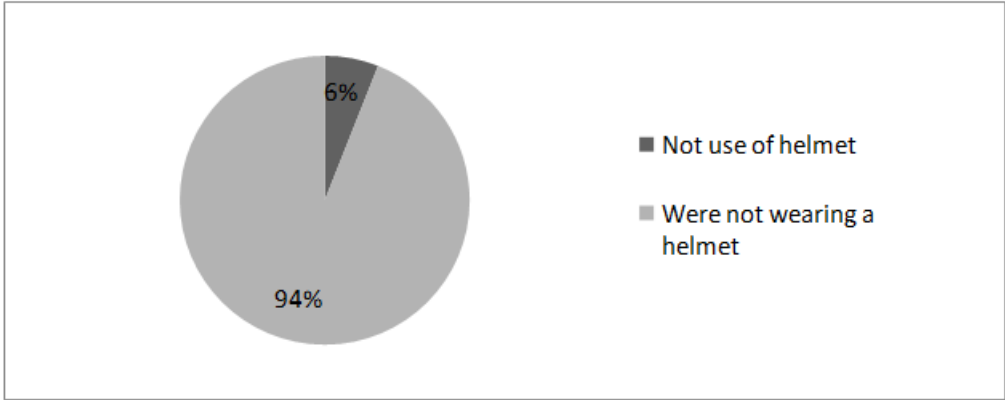


Figure 1. Information about the use of helmets at the time of the accident. Teresina - 2012 (N = 86). Source: SAME HUT, 2012.

Figure 1 reports that in 94% of the records there was no information about the use or not of helmets at the time of the accident; 6% of the charts with information showed that these patients were not wearing a helmet.

• Clinical data

Table 3 reveals that 93% of patients suffered skull encephalic trauma followed by skull encephalic trauma with 91.9%, the spinal

cord trauma showed the lowest percentage with 3.5%. The table also shows that 74 patients underwent surgical procedures, of these, 86.5% had neurosurgery and 71.6% general surgery. The orthopedic surgeries and vascular surgeries showed a percentage of 19%, the lowest percentage was of thoracic surgeries, with 13.5%.

Table 3. Types of traumas suffered by the patients. Teresina - 2012 (N = 86).

Types of Traumas	Yes		No	
	n	%	n	%
External Surface lesions	80	93.0	06	7.0
Skull-Encephalic Trauma	79	91.9	07	8.1
Trauma in the limbs	22	25.6	64	74.4
Thoracic Trauma	20	23.3	66	76.7
Abdominal Trauma	10	11.6	76	88.4
Spinal cord Trauma	03	3.5	83	96.5
Types of surgery				
Neurosurgery	74	86.5	10	13.5
General Surgery	53	71.6	21	28.4
Orthopedic Surgery	14	19	60	81.1
Vascular Surgery	14	19	60	81.1
Thoracic Surgery	10	13.5	64	86.5

Source: SAME HUT, 2012.

• Bivariate Analyses

The statistical analyses were conducted with association to the variable age by age groups with the following variables: skull encephalic

trauma and clinical condition of patients at the time of discharge from the ICU.

Table 4. Association between age, brain and skull encephalic trauma and clinical conditions of patients at the time of discharge from the ICU. Teresina - 2012 (N = 86).

Age	Skull-Encephalic Trauma		Total %	p
	YES	NO		
	%	%		
15 --- 25	47.7		47.7	
25 --- 35	23.3	2.3	25.6	
35 --- 45	10.5	3.5	14.0	= 0.01*
45 --- 55	4.7	1.2	5.8	
55 --- 65	5.8	1.2	7.0	
Total	91.9	8.1	100.0	
Clinical condition				
Age	Withsequelae%	Without sequelae%	Death%	
15 --- 25	30.2	2.3	15.1	47.7
25 --- 35	14.0		11.6	25.6
35 --- 45	7.0	2.3	4.7	14.0
45 --- 55	3.5		2.3	5.8
55 --- 65	2.3		4.7	7.0
Total	57.0	4.7	38.4	100.0

Fonte: SAME HUT, 2012.

The data in Table 4 show that the age groups with the highest percentages of skull encephalic trauma were from 15 to 25 years old and 25 to 35 years old with 47.7% and 23.3%, respectively, and significance of $p = 0.01$. Regarding the clinical condition at the time of discharge, the numbers show that 30.2% of patients in the age group between 15 and 25 years old were discharged with sequelae, most deaths occurred in this same age group (15.1%) and thus, the test did not have statistical significance ($p = 0.397$).

DISCUSSION

In regards to ICU admissions, Brazilian and international studies specifically elaborate on this topic, and when approached, it is done as part of research about trauma. A study on this topic was held in the capital of Tanzania, an African country, in which the researchers described that in the 841 ICU admissions between 2008 and 2010, 152 (18%) were motorcycle riders.⁹ These figures are disquieting because despite that the African study analyzed the issue over two years, which differs from the present research that was only over one year, it stands out that the percentages found in the current study are proportionally double of those reported in Tanzania, showing that the indexes are higher in Brazil.

In addition to this theme, other authors state that the admission to the ICU is crucial to the final outcome of patients presented with multiple serious traumas because these require human, logistic, and financial support, only found in this specialized environment.¹⁰

With respect to gender and age groups, a study on the profile of patients with trauma caused by motorcycle accidents admitted in an emergency service in the city of Teresina, showed percentages close to this study, with 37.54% of victims at ages ranging from 15 to 24 years, 95.02% male, and 53.16% singles.²

Similar numbers were found in a study conducted in the State of Ceará. The patients were between the ages of 18 and 29 years, with a predominance of males, 45.1% and 98.4%, respectively. Another investigation held in Brasília-DF with 580 deaths that occurred from 1996 to 2007 has shown that 94.3% were males and 73.8% were between 20 and 39 years old.¹¹⁻² International studies show similar numbers; a quantitative research with patients from Nigeria showed that 82.7% were men and 37.1% in the age group between 20 and 30 years old. Accordingly, another study conducted in Jamaica revealed that 93.7% were men with an average age of 23 years.¹³⁻⁴

This predominance of young males in the national and international research is assigned, according to some authors, to the age's immaturity, self-confidence, and the tendency to defy limits. A qualitative study conducted in São Paulo, which aimed to describe the social representations of motorcycle accident victims, noted that some speeches revealed that the motorcycle is a synonym of freedom, excitement, adrenaline, and the act of infringing the laws and living dangerously is worshipped like a heroic act.^{3,15}

With regard to education, most victims had middle school level, which characterizes the low level of education in the studied population, a factor that can influence on little or no education in driving.

A previous study conducted in the State of Piauí showed that many of the casualties were using the motorcycle in farms where they work; many of these riders did not go through any preparation or supervision of responsible authorities because many vehicles were not licensed.² Another study found that 51.6% of studied victims of motorcycle accidents did not possess a driver's license and they were mostly from the countryside of the State of Ceará.¹¹

Conversely, the studies conducted in the Southern and Southeastern regions in Brazil show that the social profile of motorcyclists is different. For example, in a study conducted in São Paulo in 2005, out of 1,519 patients, only 0.5% was illiterate and, 41.5% had complete middle school education. Another work done in Brasília showed that only 12.4% of respondents had middle school education, as well as a study conducted in Porto Alegre - Rio Grande do Sul, that revealed that 6.7% had higher education.^{12,16-7}

With these results, it can be stressed that the high rates of people with low education levels influence the knowledge of laws and traffic signals, noting that education is paramount to the reduction of the existing socio-economic differences between the Northeast, Southern, and Southeastern regions in the country.

With reference to the use of helmets, the results showed that in 94% of the records there was no information about the use or not of helmets, therefore, it was not possible to identify the percentage of motorcycle riders who wore a helmet; in addition, the 6% who showed this information in their records were not wearing a helmet. These are important data because the use of individual protection equipment is mandatory as it reduces the severity of cranial lesions. A study conducted in Sergipe report similar numbers in which it

was observed that 69.1% of victims had no record on the charts about wearing a helmet.³

International and Brazilian studies are unanimous in stating that the helmet reduces significantly the incidence of deaths by cranial brain trauma (TCE). However, it is common for motorcyclists to ride without a helmet; many are the reasons for such behavior including decreased vision, risk of neck injuries, and reduction in noise from the traffic.^{3,18-20}

In opposition to the research cited above, a study reports that in some municipalities of Ceará, representatives of the municipalities prepared organic laws by releasing the mandatory use of helmets, which clearly violates the Brazilian transit code.³

Another research also stresses that 49% of victims of motorcycle accidents have undergone surgical procedures, including neurosurgery.² As for the types of traumas, another author also describes in his study that the lesions with external surface and TCE stood out among traumas of greater predominance suffered by motorcyclists. This can be associated to the lack of protective gear.²¹

Statistical tests showed that there was a significant association between the age group of 15 to 25 years and the occurrence of skull-encephalic trauma ($p = 0.01$). After assessing these numbers, Graph 1 shows that the vast majority of patients did not use helmets, or used it incorrectly at the time of the accident. One study supports this assertion, reporting that in 432 victims of an accident with motorcycles, 61% reported not wearing the helmet correctly, and had more severe cranial injuries.²²

The percentage of TCE in this study was very high when compared with other studies, such as those held in Goiânia, Fortaleza, São Paulo, and Porto Alegre that showed the following percentages, respectively: 4.1%, 37.2%, 9%, and 6.17%.^{11-2,16-23}

The TCE is seen by the WHO as a 21-century epidemic, similar to malaria and HIV/AIDS, mainly in developing countries. These injuries, when associated with patients who are victims of motorcycle accidents, lead to increased chances of mortality because the encephalic trauma not only reaches the brain but can cause multi-systemic disorders. Another fact is the occurrence of associated lesions that occur in 20% of cases, which include complex neurological deficits and neuroendocrine and neuroclinical complications causing sequelae that are mostly irreversible.¹⁶⁻²⁴

A multicenter study performed by a group of Brazilian scholars corroborates such information and shows that traffic-related deaths represent almost 30% of all deaths by external causes in Brazil, and the mortality trend has grown in the recent years. This growth is not explained just by increasing the fleet of motorcycles, but mainly by the severity of injuries that they suffer because the rider only has the helmet as protection in a frontal crash; and, in the present study, it was not possible to say whether they use it or not.²⁵

CONCLUSION

The patients in this study were mostly young, male, and single. Their fate is most likely attributed to the immaturity of age, self-confidence, and a tendency to defy limits. The low level of education of the victims was identified, most of them had completed middle school, and this factor can influence their knowledge about laws and traffic signals.

Regarding the use of helmets, this study had one limitation because in almost all consulted charts there were no records on the use of personal protective equipment, and this fact is extremely important since this information can guide clinical and educational conducts in traffic.

On the admission of these victims of motorcycle accidents in the ICU, most suffered TCE and underwent neurosurgery, characterizing the severity of trauma and injuries arising from these accidents.

Concerning the clinical conditions at the discharge from the ICU, patients were discharged with sequelae generating a social and economic burden for the government and their families; a high number of deaths was observed among young people.

The data presented in this study are similar to the characteristics of motorcyclists found in other studies. This is why the growing number of motorcycles is worrisome; because it is a low-cost way of transportation to which many have access, it has been causing damages that are most often irreversible. This highlights the need for greater attention to the education of drivers, better monitoring and enforcement of traffic laws, and greater public exposure to the consequences of these accidents, especially those involving motorcycles.

The results obtained in this study confirmed the importance of motorcyclists among victims of traffic accidents in the State of Piauí. Thus, the competent authorities

need to implement effective programs for the education and establishment of preventive actions in order to warn and educate the population about the dangers of risky behaviors in driving a motorcycle, aimed at reducing the quantity and intensity of bodily injuries; thus, sequelae and deaths can be avoided.

It is expected that the results obtained can serve as the basis for the multi-professional conduct, it is also hoped that further research are carried out aiming at complementing the results found in this study.

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