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Frequency, Profile and Outcomes of Motorcycle Accident Victims Hospitalized at Saint Joseph Hospital in Kinshasa

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Abstract

Introduction: Road traffic accidents are a major but neglected public health problem, which calls for concerted efforts to ensure effective prevention on a long-term basis. It is in this perspective that the present study aimed to assess the frequency, profile and outcomes of victims hospitalized at Saint Joseph Hospital. **Method:** It is a quantitative, descriptive and retrospective study, spreading over a period from 2015 to 2017. The documentary analysis method was used to identify the files of the victims and to collect the information useful to the study. 168 cases were identified, of which only 106 were concerned victims of motorcycle accidents. **Results:** After the analysis of the data, the results show a frequency of motorcycle accidents amounting to 63% for a period, the profile of the accident victims is characterized by an average age of 37 ± 18 years; the male sex is predominant with 59.4%; 52.8% of victims are married; these accident victims are respectively civil servants (25.5%), students (students) (21.7%), motorcyclists (19.8%), and vendors (his) (16.0%); most of them have a higher education level and university 49.1% and secondary 40.6%; 95% of victims were in normal physical condition (without psychopathy or intoxication); and finally, 71.7% of the victims come from the Mont Amba District. 50.9% had fractures and the others had either wounds, visceral trauma, or head trauma and associated injuries, and 46.2% of these injuries were to the lower limbs. There is no association between the clinical characteristics of victims and their accident outcomes.

Subject Areas

Public Health, Environmental Health, Road Safety

Keywords

Frequency, Profile, Outcome, Motorcycle Accident, Hospitalization

1. Introduction

According to the World Health Organization (WHO), with only 2% of the world's car fleet, Africa recorded 24.1% of road fatalities in 2016. 1.25 million people lost their lives on the road in the world in 2016, including 300,000 victims on the African continent. The carnage is disproportionate, compared to the road network as to the number of cars in circulation. Faulty regulations, dilapidated vehicles or roads, risky behavior at the wheel, growth in the level of income, alcoholism, corruption… many factors come into play [1].

Nowadays, with the mechanization of all sectors of the economy and especially the increasingly advanced modernization of road traffic, we are witnessing an exponential increase in the number of road accidents.

Traffic accidents will then be one of the main causes of morbidity in the world. This burden falls most heavily on low-income and middle-income countries where we now see 90% of deaths and disabilities resulting from road crashes. This trend should soon increase to 95%, which shows how much road accidents today constitute a major public health issue on a global scale [2].

Motorcycle injury accidents are more numerous in built-up areas, but the most serious occur outside built-up areas: 81% of fatal accidents occur outside built-up areas and on departmental roads. For motorcycle injury accidents, 66% occur outside an intersection and 79% on a straight section. For fatal motorcycle accidents, we go to 81% outside intersections and 60% in straight sections. 58% of fatal motorcycle accidents take place without the motorcyclist having changed direction, but in 15% of cases, the motorcyclist hits a vehicle in front of him, travelling in the same direction, in the same lane, which is about to turn left [3].

Weekend accidents (including Fridays, eves and public holidays) are more numerous (197 accidents over 5 years, or 52%) than on working days (180 accidents over 5 years, or 48%) but are also more serious (18 killed over 5 years, *i.e.*, 64% of motorbike deaths). 23% of personal injury and fatal motorcycle accidents occur at night (29% for all accidents in the department). In 18% of motorcycle accidents, whether fatal or not, the road surface is wet or its condition is unusual (gravel, slippery road…) [4].

In France, at the national level, between 2011 and 2015, fatalities on motorcycles are in constant decline. This mortality among motorcyclists represents approximately 18% of users killed in 2015. In Maine-et-Loire, the situation in terms of accident volume between 2011 and 2015 has improved compared to the

2005-2009 period, whether for all bodily accidents in the department (23% of bodily accidents for all users combined), or for accidents involving a motorcyclist (34%).

The number of motorcyclists killed between 2011 and 2015 (28) is lower than for the period 2005-2009 (51), as is the number of motorcyclists who are serious victims (−33%). Over the past 5 years, 28 bikers have lost their lives and there are 3 for the year 2016 (as of 10/12/2016). In 2009, there were 15 motorcycle fatalities out of the 55 fatalities for all users [4].

In Togo, the transport of motorcycles is now unavoidable, but they create certain problems that will have to be curbed. They endanger the lives of citizens because of the lack of professionalism that characterizes the profession and by this, they destroy the public transport sector under reconstruction in Togo. In addition, they are a factor in the deterioration of the quality of life because of the many problems they still generate, for lack of regulation and rigorous organization of the sector [5].

In the DRC, according to the provincial division of road safety, "*one in three people die in a motorcycle accident every day in the province of Kongo Central*". According to the heads of some hospitals and health centers interviewed, the patients transported to their health institutions following accidents are the work of the motorcycle. "*Motorcycling currently kills more than AIDS*", regrets an orthopedic doctor. Despite the behavior of these uncivil drivers, Kinshasa pedestrians walk on the roads without taking into account the danger they run and do not fear any machine circulating there [6] [7].

However, road accidents can be avoided if public authorities invest in road safety, with the participation of several sectors (transport, police, health, education), focusing on road safety, vehicles, motorcycles and of course, users [2].

To do this, we initiated this study on "frequency, profile and outcomes of victims of motorcycle accidents hospitalized at Saint Joseph Hospital from 2015 to 2017" to deepen this situation which bereaves Kinshasa people every day.

In view of the data available in other skies, we postulate the hypothesis that:

1) Motorcycle accidents have a high frequency compared to other road traffic accidents;

2) Their profile is dominated by the following characteristics: age less than 30 years, men, lesions of the lower and upper limbs and of the skull;

3) Their outcomes are balanced by the presence of disabilities and secondary infections;

4) There are significant links between the profile of these victims and their use.

The aim of this study is to assess the frequency, profile and outcomes of motorcycle accident victims hospitalized at Saint Joseph Hospital.

2. Material and Method

2.1. Research Design and Description of the Study Environment

It is a quantitative, descriptive, retrospective and relational study. The study was carried out at the Saint Joseph Hospital in the surgical department during the pe-

riod from 2015 to 2017. And hospital which is located in the municipality of Limete, Residential District, between fourteenth and fifteenth streets.

2.2. Target Population, Sampling and Sample

All victims of ATR Road Traffic Accident by motorcycle for the years 2015, 2016 and 2017, hospitalized at Saint Joseph Hospital, constituted the population of our study.

To collect the data for our study, we used the exhaustive non-probability sampling technique, it amounts to the number of victim files found in the archives, *i.e.*, 106 files or victims for the years 2015-2017.

2.3. Technical Methods and Data Collection Instruments

To collect data in the field, the survey served as a method supported by documentary analysis as a technique and the data recording sheet as a measuring instrument. This sheet includes 3 parts, namely: the demographic parameters (age, sex), the history of the ATR (mode of onset), and the outcomes of the accident victims (deceased, injured, disabled).

2.4. Ethical Considerations

During our contacts with the medical director of Saint Joseph Hospital, we signed a document to promise the observation of confidentiality and anonymity of information as an obligation to access the archives. This study had been approved by the Interuniversity Ethics Committee of the city of Kinshasa.

2.5. Data Processing and Analysis

We had carried out the first check during the data collection, to reassure us that the data is complete, precise and correctly recorded. The second control, we did it before the treatment and the analysis of the data, that to check the coherence of the data.

Data encoding was done using Excel 2010 software and data analysis using Epi-info version 7.1.1.1 software. Using this same software, we used certain statistical parameters:

- Descriptive statistics: Frequency measurements, observed frequency and percentage, statistical mean, standard deviation;
- Inferential statistics: we used the application of the comparison test, Pearson's chi-square to determine and show the influence or relationship between variables.

3. Results

3.1. Univariate Analysis Results

In this graph (**Figure 1**), it is clearly shown that accidents caused by motorcycles alone represent 63% of cases, *i.e.*, with a number of 106 out of 168 cases received from 2015 to 2017.

In this bar graph (Figure 2), the first year (1), in 2015 the hospital had recorded 44 cases of motorcycle accidents, the second year, in 2016 it decreased to 33 cases and increasing in 2017 to 29 cases.

In view of Table 1, the age group of 18 to 54 years comes first with 67.0%, *i.e.* an average age of 37 ± 18 years, the Minimum age being 4 years and the Maximum age of 83 years, and the Modal age is 40 years; the male sex is predominant with 59.4%; 52.8% or the majority of victims are married; these accident victims are respectively civil servants (25.5%), students (students) (21.7%), motorcyclists (19.8%), and vendors (his) (16.0%); most of them have a higher education level and university 49.1% and secondary 40.6%; 95% of victims were in normal physical condition (without psychopathy or intoxication); and finally 71.7% of the victims come from the Mont Amba District.

As for the clinical characteristics of the victims, 50.9% had had fractures and the others had either wounds, visceral trauma, head trauma and associated lesions. And his lesions had affected the lower limbs at 46.2% (Table 2).

Regarding the evolution (outcomes), 66 cases of the victims recovered without sequelae (62.3%) and 40 had complications (37.7%) (Figure 3).

This last image identifies that 65.9% (1) are disabilities that occurred afterwards; 19.5% of secondary infections and 14.6% are deaths recorded as a result

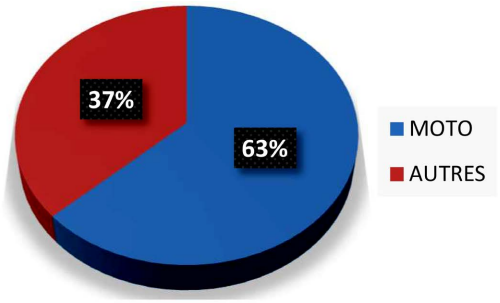

Figure 1. Frequency of motorcycle accidents from 2015 to 2017.

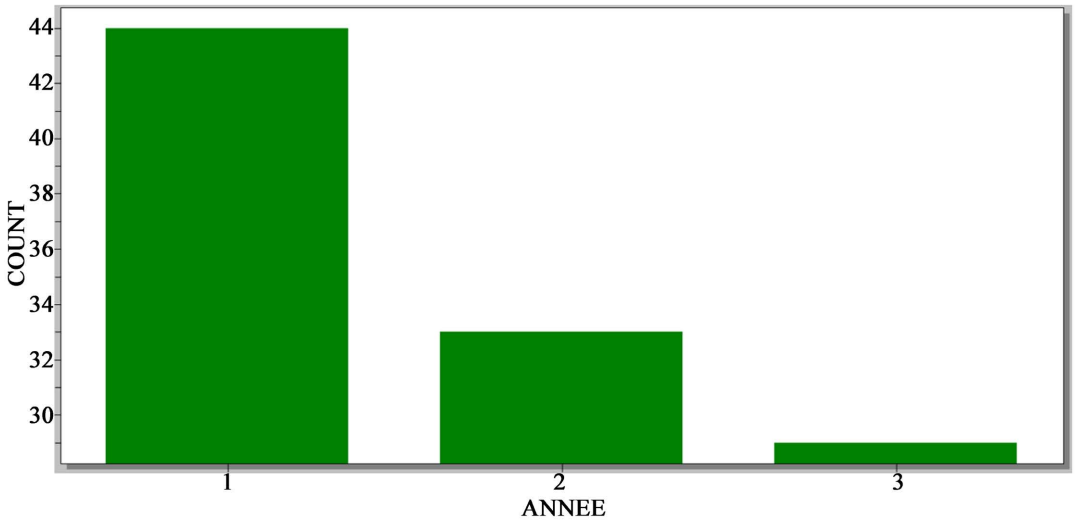

Figure 2. Frequency of motorcycle accidents per year.

Table 1. Profile of accident victims.

Characteristics	Effective (n = 106)	%
Age		
≤17 years old		
18 to 54 years old		
≥55 years old	12	11.3
Average age 37 ± 18 years old	71	67.0
Minimum age 4 years old	23	21.7
Maximum age 83 years old		
Modal age 40 years		
Sex		
Male	63	59.4
Feminine	43	40.6
Civil status		
Married	56	52.8
Single	34	32.1
Widower widow	1	0.9
Free union	15	14.2
Occupation		
Unoccupied	5	4.7
Seller(s)	17	16.0
Student (student)	23	21.7
State worker	27	25.5
Other private works	13	12.3
Bikers	21	19.8
Study level		
Without level	4	3.8
Primary	7	6.6
Secondary	43	40.6
Higher and university	52	49.1
Physical state		
Drunkenness	4	4.0
Child under 5 years old	1	1.0
Normal	94	95
Residence		
Mount Amba District	76	71.7
Out of district	30	28.3

Table 2. Clinical characteristics of victims.

Characteristics	Workforce (n = 106)	%
Types of lesions		
Open wound	8	7.5
Fracture	54	50.9
Visceral trauma	7	6.6
Head trauma	6	5.7
Visceral fracture and trauma	8	7.5
Fracture and head trauma	15	14.2
Visceral trauma and head trauma	1	0.9
Fracture, visceral trauma and head trauma	7	6.6
Location of the lesion		
In the head	11	10.4
In the chest	2	1.8
Upper limbs	13	12.3
Inferior member	49	46.2
At the head and upper limbs	7	5.7
At the head and lower limb	8	7.5
To the thorax and lower limb	1	0.9
Upper and lower limbs	11	10.3
To the head, to the thorax and to the lower limb	1	0.9
At the head, upper and lower limbs	3	2.8

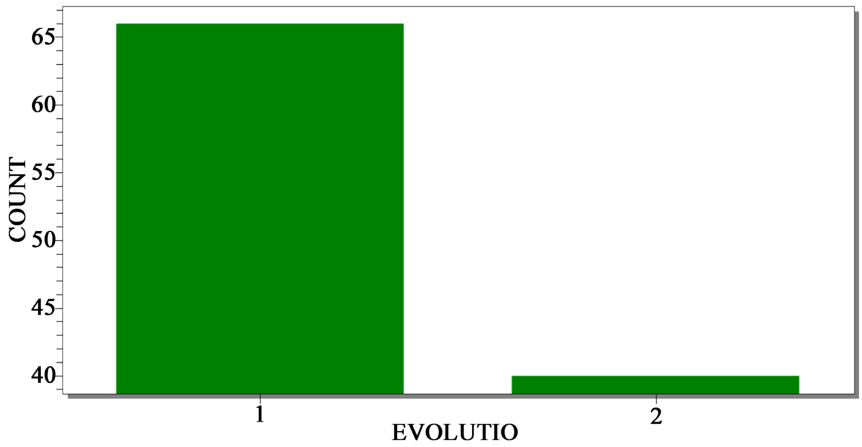

Figure 3. Outcomes (evolution) of victims.

of the accident (Figure 4).

3.2. Results of Bivariate Analyzes

Table 3 reveals that there is no association between the clinical characteristics of victims and their accident outcomes, the p value is greater than 0.05.

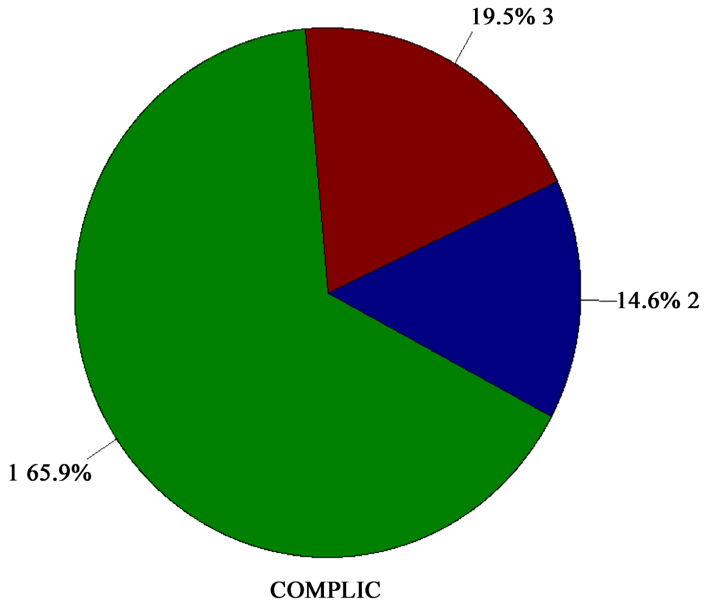

Figure 4. Types of complications.

Table 3. Association between clinical characteristics and accident outcomes.

Characteristics	Issues		x2-	p	Meaning
	Complication n = 40 (%)	Good recovery n = 66 (%)			
Types of lesion					
Complicated lesions	37 (37.8)	61 (62.2)	0.0002	0.9885	NS
Simple lesions	3 (37.5)	5 (62.5)			
Location of the lesion					
To the head and to the thorax	16 (36.4)	28 (63.6)	0.0603	0.8060	NS
Upper and lower limbs	24 (38.7)	38 (61.3)			

NS: not significant.

4. Discussion

4.1. Results of Univariate Analyzes

Our results revealed that the prevalence of motorcycle accidents is 63% for a period from 2015 to 2017.

In this percentage, more cases were recorded in the first year (1), in 2015, with a downward curve in the second year, in 2016 and this increasing in 2017 to 29 cases.

The history of transport by motorcycles revealed that in the city province of Kinshasa Taxi motorcycles have been used for urban transport in Kinshasa since the year 2008. The downward trend can be explained by the fact that in the stronghold authorities and users, certain precautions are taken to avoid this type of ac-

cident.

The Direction Départementale des Territoires de Maine-et-Loire (2016) also adds that its survey conducted in France shows that weekend accidents (including Fridays, eve and public holidays) are more numerous (197 accidents over 5 years, *i.e.*, 52%) than on working days (180 accidents over 5 years, *i.e.*, 48%) but are also more serious (18 killed over 5 years, *i.e.*, 64% of motorcycle fatalities). 23% of personal injury and fatal motorcycle accidents occur at night (29% for all accidents in the department). In 18% of motorcycle accidents, fatal or not, the road surface is wet or its condition is unusual (gravel, slippery road…) [4].

With regard to the Profile of accident victims in our study, the age group from 18 to 54 years comes first with 67.0%, *i.e.*, an average age of 37 ± 18 years, the Minimum age being 4 years and the Maximum age of 83 years old, and Modal age is 40 years old; the male sex is predominant with 59.4%; 52.8% or the majority of victims are married; these accident victims are respectively civil servants (25.5%), students (students) (21.7%), motorcyclists (19.8%), and vendors (his) (16.0%); most of them have a higher education level and university 49.1% and secondary 40.6%; 95% of victims were in normal physical condition (without psychopathy or intoxication); And finally 71.7% of the victims come from the Mont Amba District.

The characteristic occupation of the victims, really shows the most exposed professional categories in our city, the learners by their course of the crossings while going as well as on the return from class; the bikers who are the drivers of motorcycles; the sellers by their proximity along the arteries of the city. But despite the behavior of these uncivil drivers, Kinshasa pedestrians walk on the roads without taking into account the danger they run and do not fear any machine circulating there) [5].

Compared to Mirindi [8], in his study on the epidemiological profile of road traffic accidents in Bukavu, 72.3% of these subjects were male and 23.7% were female, with a sex ratio of 2.6, while 70% of the study population is between 15 and 44 years old. Compared to the location of the accident, almost half (42.6%) of ATR victims experienced the accident in the urban area of Kadutu. The results of the characteristics described in his study are close to ours.

As for the clinical characteristics of the victims, 50.9% had had fractures and the others had either wounds, visceral trauma, head trauma and associated lesions. And his lesions had affected the lower limbs at 46.2%.

In contrast, the MAID Research Project in its in-depth study of motorcycle crashes, most injuries are minor lacerations, abrasions or bruises. Injuries to the lower limbs represent 31.8% of all injuries, followed by the upper limbs (23.9%). Head injuries account for 18.7% of all injuries. Most limb injuries result from impact with the AV or the road. There have been cases where the rider has lost his helmet, due to a bad locking of the attachment system or damage to the helmet due to impact. In 69% of cases, helmets were effective in preventing or reducing the severity of head injuries [9].

4.2. Bivariate Analysis Results

The association between the clinical features and the outcomes of the accident victims did not reveal any association. This means that in this study, the types of injuries after the accident and the anatomical site of their location did not influence the occurrence of the different complications, especially since many of the victims recovered without sequelae.

4.3. Testing of Assumptions

Considering the assumptions made at the beginning, the first and third are confirmed because the frequency is 63% compared to other road traffic accidents, on the other hand, the second and fourth are invalidated. That is to say that these other hypotheses are not confirmed by our results.

5. Conclusions

Road traffic accidents are a major but neglected public health problem, which calls for concerted efforts to ensure effective prevention on a long-term basis. This study, which aimed to assess the frequency, profile and outcomes of victims hospitalized at Saint Joseph Hospital, used the method of documentary analysis to identify the files of victims and collect useful information for the study. 168 were identified, of which 106 were concerned the victims of motorcycle accidents.

After analyzing the data, which involved 106 victim files, we were led following: the frequency of motorcycle accidents is 63% for a period from 2015 to 2017; the profile of accident victims is characterized by the age group of 18 to 54 years, *i.e.*, an average age of 37 ± 18 years; the male sex is predominant with 59.4%; 52.8% of victims are married; these accident victims are respectively civil servants (25.5%), students (21.7%), motorcyclists (19.8%), and vendors (16.0%); most of them have a higher education level and university 49.1% and secondary 40.6%; 95% of victims were in normal physical condition (without psychopathy or intoxication); and finally, 71.7% of the victims come from the Mont Amba District.

As for the clinical characteristics of the victims, 50.9% had fractures and the others had either wounds, visceral trauma, or head trauma and associated lesions, and 46.2% of these injuries were to the lower limbs.

There is no association between the clinical characteristics of victims and their accident outcomes.

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Conflicts of Interest

The authors declare no conflicts of interest.

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