

Child Victims of Road Traffic Accidents: Epidemiological and Clinical Aspects in the Medical and Surgical Emergency Department of the Donka National Hospital

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Abstract

Introduction: Children involved in road accidents most often suffer head or limb injuries. The severity of these injuries varies according to the age of the child, the type of road user and whether or not protective devices are used. The aim of this study was to carry out a census of admissions and to identify the epidemiological and clinical profile of children involved in road traffic accidents at Donka National Hospital. **Methods:** This is a descriptive cross-sectional study of children involved in traffic accidents over a 3-month period from September 1 to November 30, 2021. All children admitted to the emergency department for a traffic accident were included in the study. **Results:** During the study period, 435/530 children (82.1%) were victims of road accidents. Boys accounted for 54.94% of cases, compared with 45.06% for girls. The age group most affected was 12 - 17 years old (48.97%). October had the highest accident rate (36.4%). Pedestrians are most affected (52.87%). Bicycles and mopeds were involved in 59.77% of accidents. Head injury was the most frequent pathology (33.33%). The study showed that 12.64% of victims were referred to intensive care, pediatric surgery, etc. We recorded 8 cases of death (1.84%). **Conclusion:** This study highlighted the characteristics, incidence and risk factors for accidents in children admitted to emergency departments. Accident prevention, particularly serious accidents in children, requires more precise knowledge of

the factors and circumstances leading to their occurrence.

Keywords

Child, Accident, Public Highway, Donka

1. Introduction

In many places, the road network has been built without regard for children. However, children use them as pedestrians, cyclists, motorcyclists or vehicle passengers. They may live near a public road, play or even work in the street. All these interactions with the road network, along with a series of other risk factors associated with childhood, make children more vulnerable to road traffic injuries [1]. The number of children injured or disabled each year as a result of road accidents cannot be established precisely, but it is estimated to be around 10 millions. This figure is based on data provided by health establishments, which suggest that children account for between a fifth and a quarter of road accident victims hospitalized [2]. Available data indicates that the global child mortality rate from road traffic accidents is 10.7 per 100,000 population. However, in the South-East Asia region, this rate is 7.4 per 100,000 inhabitants, while in the African region, it is 19.9 per 100,000 inhabitants. This mortality rate is not as high in Europe, but road traffic injuries are nonetheless responsible for around a fifth of all child trauma deaths in the European Union as a whole [3]. Road traffic injuries are one of the main causes of disability in children. Recent surveys in Asia show that they are among the top five causes. The exact proportion of children disabled as a result of road traffic injuries varies by age group and from country to country [4]. In Guinea, traffic accidents account for the largest proportion (60%) of all forms of violence and cranial trauma recorded [5]. Road safety has deteriorated sharply in recent years, with the number of deaths and injuries on the roads rising sharply. Getting around Conakry is a real obstacle course. Anarchic driving, violations of the highway code, the absence of road signs and the considerable mechanical failure of vehicles exacerbate insecurity on the roads [6]. According to the results of the survey on feelings of insecurity and perceived causes of accidents, 36% of road users travel by public transport, 22.2% by motorbike (including motorbike taxis), 2.2% by bicycle, 5.9% on foot and 33.7% by car [6]. Car drivers are aware of the risks, the dangers of the road and the laws, but do not really feel concerned. The multifactorial nature of accident causation makes prevention difficult, and preventive strategies need to be developed from the usual three angles: education, safety standards and regulation. The high number of child victims of traffic accidents and the lack of research on this population led us to initiate this study, the aim of which is to carry out a census of admissions and to identify the epidemiological and clinical profile of child victims of traffic ac-

cidents in the medical-surgical emergency unit of the Donka national hospital.

2. Methods

This is a descriptive cross-sectional study of admissions to the medical-surgical emergency department of the Donka National Hospital of child victims of road traffic accidents during the period September 1, 2021 to November 30, 2021. All children admitted to the emergency department for a road traffic accident were included in this study. Excluded were all cases of accident resulting in the child's death at the scene of the accident, children hospitalized directly in other departments and children over 18 years of age. The definition of a road traffic accident used in this study is that of the World Health Organization, which considers it to be "any accident on the road in which at least one moving vehicle is involved, resulting in injury or material damage" [7].

To collect the data, we drew up a questionnaire and pre-tested it on a small sample for validation. It was completed for each child presenting to the emergency department for a road accident. The form included general information about the child (identity, sex, age), the date and time of admission, the time of the accident, the type of accident and the vehicle responsible. It also records the reason for consultation (the reason given by the family or emergency services when the child is registered in the emergency department). Other medical data are then provided: injuries observed and their location, additional examinations carried out, time taken for treatment and patient orientation on leaving the emergency department. The data were entered and analyzed using Epi-info software Version 6.

We sought and obtained permission from the head of the emergency department at Donka National Hospital before proceeding with the study. Free and informed oral consent was obtained from the children, supplemented by parental assent, prior to their inclusion in the study. Confidentiality and anonymity were respected throughout the procedure.

3. Results

During the study period (1 September 2021 to 30 November 2021), 530 children were seen in medical and surgical emergency departments. Of these, 82.1% were victims of road traffic accidents (435/530). October was the month with the highest accident rate (36.4%) compared with 33.56% in September and 30.34% in November. Admissions for road accidents occurred mainly during the day (320/435), *i.e.* 73.56%, compared with 26.44% (115/435). In terms of admission time (288/435), *i.e.* 66.21% of children were admitted to emergency within the first 6 hours, compared with 33.57% (147/435) of those admitted after the 6 hours preceding the accident mainly occurred during the day (73.56%), compared with 26.44% at night. The children involved in the accidents were mainly urban in 94.25% of cases, compared with 5.75% for those living in the suburbs. Only 50.34% of victims had undergone additional examinations (X-rays), compared with 49.66% who had not. Bicycles and mopeds were the cause of acci-

dents in 59.77% of cases, compared with 42.23% for cars. With regard to the cause of the accident, the pedestrian was most involved (52.87%), followed by the passenger (25.05%) and the driver (22.07%). In terms of reasons for consultation, simple contusions were the most common (91%), and were associated with pain in 98% of cases. The age group most affected was 12 - 17-year-olds (48.97%). Boys accounted for 54.94% of casualties, compared with 45.06% for girls. Pupils accounted for 68.04% of victims (**Table 1**).

As can be seen in **Figure 1**, 84.37% of children involved in accidents were lucid, compared with 7.13% in comas.

Of the children involved in the accident, 12.64% (55/435) were referred to different departments for hospitalization, including 4.83% to traumatology, 4.14% to neurosurgery, 12.72% to intensive care, 9.09% to pediatrics surgery, 3.64% to thoracic surgery and 3.64% to maxillofacial surgery. Nearly 85% (84.59%) were treated as outpatients. Eight (8) cases of death, *i.e.* a rate of 1.84%, were recorded during this study (**Figure 2**).

The child admitted to the emergency room presents in 33.33% of cases head trauma, in 28.1% a limb trauma, in 17.38% a chest trauma, in 7.36% a spine trauma, in 5.29% abdominal trauma and in 4.14% maxillofacial trauma (**Figure 3**).

Table 1. Socio-demographic characteristics of child victims of road accidents.

Characteristic	All	%
Age (in years)		
0 - 5	68	15.63
6 - 11	154	35.40
12 - 17	213	48.97
Gender		
Female	196	45.06
Male	239	54.94
Profession		
Student	296	68.05
Merchant	59	13.56
Apprentice driver	27	6.21
Apprentice worker	21	4.83
Housekeeper	17	3.90
Others	15	3.45

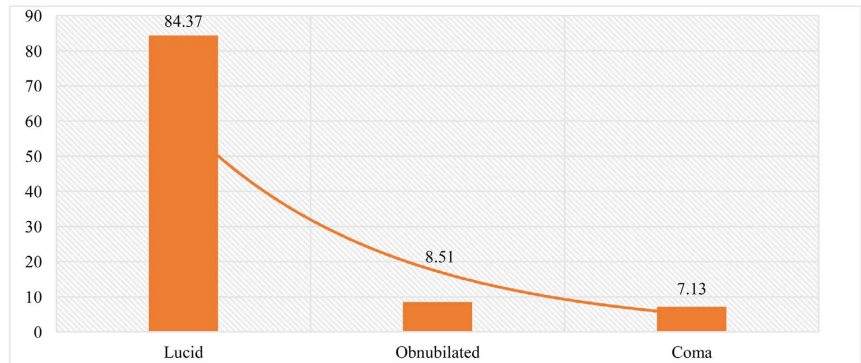


Figure 1. Distribution of victims according to state of consciousness.

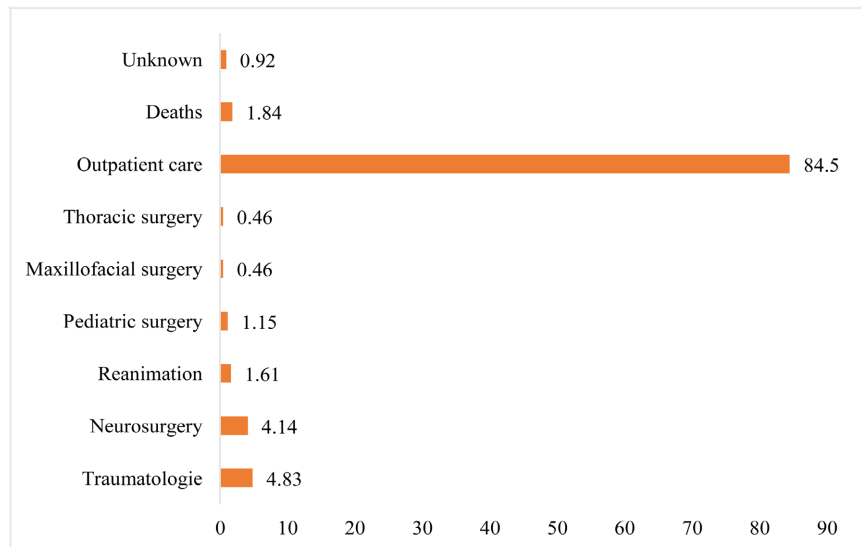


Figure 2. Distribution of victims according to orientation.

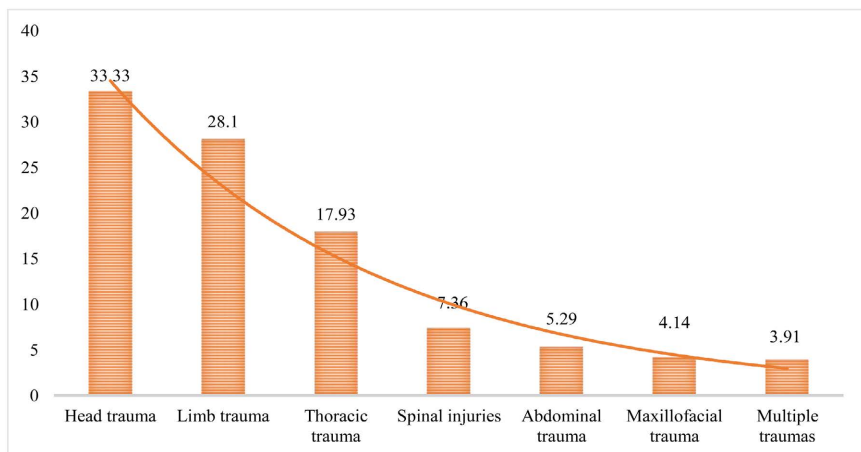


Figure 3. Distribution of accident victims according to the type of trauma.

4. Discussion

In this study, we found that 82.1% of children in medical and surgical emergencies were victims of road traffic accidents. This high rate could be explained by

the rapid increase in traffic and the adoption of new transport systems (2-wheelers, 3-wheelers and cars) in the city of Conakry, which has a significant influence on the incidence of road traffic accidents in children. Other factors include failure to observe the rules of good behavior and the highway code; carelessness on the part of pedestrians; abandoning children on public roads; speeding; and the involvement of children and young people in driving two-wheeled vehicles. In this study, more boys than girls were involved in MVAs, with a sex ratio equal to 1.22 (Table 1). This male predominance is due to the fact that in the city of Conakry, some parents have given up and are not making enough effort to improve the living conditions of their offspring. Boys from poor families are often used to fill certain family needs. It is not uncommon to see them wandering the streets all day long with goods on their heads. Older children are often involved in driving motorbike taxis. All these risk factors associated with childhood make boys more vulnerable to road traffic injuries. Children's exposure to the risk of trauma also depends on the laws in force and the extent to which they are enforced. These include laws setting the legal age for entering the formal labour market, driving a vehicle or drinking alcohol [1]. Studies carried out on children in road traffic show that young children do not possess the knowledge, skills and level of concentration required by the particular conditions of the road environment, however benign they may appear [8]. Our observations are similar to those of several authors [9] [10] [11], who have also reported this male predominance. According to Lavaud J. [12], boys often take more risks to release stress, compensate for frustrations, and seek their own identity and new sensations. In our series, the age group most affected was 12 - 17 (48.97%). This can be explained by the fact that up to the age of nine, children are most often accompanied by their parents when they travel, either as passengers in a vehicle or as pedestrians, whereas older children generally travel more independently, first on foot, then on a bicycle or motorbike, and finally at the wheel of a car. For children under 15, road traffic injuries are the eleventh leading cause of death and the tenth leading cause of morbidity. Worldwide, road traffic injuries in this age group are responsible for the loss of 9482 disability-adjusted life years—1.7% of all disability-adjusted life years lost [1]. The breakdown by occupation shows that schoolchildren represent the largest group of children injured (68.04%). Their exposure on the streets and their need to travel to school could explain this result. Cycling and mopeds were the most accident prone means of transport (59.77%), compared with 42.23% for cars. This high rate could be explained by the fact that in Guinea, children cycle as a form of leisure, but also as a means of transporting luggage. Motorized two-wheelers are commonly used for family travel, and it is not uncommon to see very young children sitting on the petrol tank of a motorbike or behind the driver. In Conakry, where motorized two-wheelers are the most common mode of transport, and where children are allowed to drive small motorbikes from the age of 15, two-wheeler accidents are the main cause of morbidity among adolescents. In terms of the cause of the accident, pedestrians were most often involved (52.87%), followed by passengers (25.05%) and

drivers (22.07%). Worldwide, pedestrians make up the largest group of child victims of road accidents. In high-income countries, between 5% and 10% of children injured in road accidents are pedestrians, while in low- and middle-income countries the figure is between 30% and 40% [1]. Child pedestrian injuries are highest in Africa, where people are accustomed to walking along roads [13]. Admissions for road accidents occur mainly during the day (73.56%) compared with 26.44% at night. The low rate of night-time admissions could be explained by the fact that children sleep during this period. October was the month with the highest accident rate (36.4%), compared with 33.56% in September and 30.34% in November. This high proportion of children involved in accidents could be due to the start of the school year in October. Starting secondary school at the age of 11, for example, marks the first break with the home-school environment, which forms a protective whole for most children. This trend continues from the age of 12, when a significant proportion of parents let their children go out alone during the day. In this study, head trauma was the most common pathology (Figure 2) among children admitted to emergency departments for traffic accidents. According to Bachy B *et al.*, the high frequency of head trauma (80% of polytraumatised children) is explained by a larger head, a thinner skull and a less myelinated brain, which is less resistant to impact than in adults [14]. Referral is based on severity. If the child's condition required it, he or she was admitted to hospital for treatment of his or her injuries for a variable length of time, depending on the nature of the injuries and any complications. The departments concerned were orthopedics, neurosurgery, intensive care, pediatric surgery, thoracic surgery, digestive surgery and maxillofacial surgery (Figure 2). Those whose condition was stable and who had only benign lesions returned home to continue their care. During this study, we recorded 8 cases of death, or 1.84%. This is lower than the worldwide rate (2% of all child accident deaths). However, there are significant geographical variations. In South-East Asia, the percentage of child deaths resulting from road traffic injuries is no more than 1.3%, but in the Americas, it is as high as 4.7% [1].

Limitations of this study: this is a cross-sectional study carried out in a single university hospital. Therefore, we cannot extrapolate this study to the national level.

5. Conclusion

This study highlighted the characteristics, incidence and risk factors for accidents among children admitted to the medical-surgical emergency department of Donka National Hospital. A total of 435 children were involved in accidents during the study period. More boys than girls were involved. The 12 - 15 age group was the most affected. Preventing accidents, particularly serious accidents among children, requires more precise knowledge of the factors and circumstances that lead to them: possible influence of social profile, place of residence (suburban/urban) and environment. Road safety measures aimed at children have always focused largely on education, since it is assumed that children need to be shown how to adapt their behaviour to the demands of a motorised society.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix

Questionnaire

I. General information:

- Ageyears Sex: M F
- Profession:Place of accident:.....
- Responsible person: parent Company
- Insurance (name of insurance company)
- If other, specify:.....
- Accompanied child; Yes No if yes specify

II. Motif admission:

- Door of knowledge
- Functional impotence of limbs
- Bleeding and or sore
- If other, specify:.....

III. Evolution:

- 0 - 1 h ; 1 h 1 mn - 6 h ; 6 h 1 mn - 24 h
- If others, specify:.....

IV. Circumstance of occurrence

- Crossed the road Approaching a school
- On board a vehicle Approaching a market
- Other (explain, list)
- Depending on the type of machine involved:
- Bike Motorbike Taxi Personal car Bus Truck

V. Reason for delay:

- Residence far from the hospital
- Problem of means of transport
- Economic problem
- Poor appreciation of the severity of the injury
- Consulted in another health structure
- Trust in traditional practitioners

Reason for choosing Donka

- Trust in Donka
- Proximity
- Low cost of care and medications
- Other (explain, list...)

VI. Antecedent:

- Medical:.....
- Surgical:.....
- Family:.....

VII. Mechanisms

- Choc : Direct Indirect Delivery time: Diligence rate:
- Normal (≤ 45 mn) Abnormal (> 48 mn)

VIII. Settings

TA = mm Hg; FR = Cycles/mn II = bat/mn SG = /15

IX. Balance and diagnostic

- R(x); Bilan sanguin; Scanner

Diagnostic.....

.....

CCMU

X. Proposed treatments

- Resuscitation

- Surgical treatment

- Orthopedic treatment

XI. Become:

Released; Hospitalized Dump Escape Deceased

Other (explain, list)

Orientation Service: