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Trauma of limbs in children victims of road traffic accidents

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Abstract
The trauma of the musculoskeletal system in children linked to road traffic accidents is a public health problem both epidemiologically and prognostically. Few studies have been done on this trauma in children in Africa. Our study aims to contribute to the knowledge of this type of lesion.
It was a prospective, descriptive and analytical study of the files of patients under 15 years of age admitted for trauma to the musculoskeletal system linked to a road traffic accident during the period from January 1, 2016 to June 31, 2016, i.e. six month.
A total of 1973 patients were admitted for trauma, including 171 children for musculoskeletal injuries related to a road traffic accident, representing a frequency of 8.6% of all injuries. There were 130 boys (76%) for 41 girls (24%), a sex ratio of 3.16. The average age was 8.7 years with extremes ranging from 2 to 15 years. The functional signs were dominated by pain and functional impairment. The pelvic limb is affected in 80.11% of cases. A loss of substance is present in 8.10% of cases. Orthopedic treatment is the most indicated treatment (74.8%).
Trauma to the musculoskeletal system in children caused by traffic accidents remains common in Niamey. The improvement of this situation requires the implementation and strict application of road safety rules.

Keywords: road traffic accident, trauma, musculoskeletal system, children

Introduction
Road traffic accidents are a public health and safety problem that deserves special attention. Indeed, road traffic accidents represent the sixth cause of death in the world with 1.2 million deaths and 50 million injured per year, the mortality and the handicap resulting from these accidents are more important in developing countries [1].
Child trauma depends on their activity depending on their age and stage of development. Trauma is one of the primary reasons for the child's hospitalization. The child's vulnerability exposes him to trauma that can hamper his psychomotor development and academic performance.
In Niger, no study has been carried out on limb injuries in children linked to road traffic accidents. This is why it seems to us necessary to study the epidemiological, clinical and therapeutic aspects of these lesions in children.

Patients and methods
It was a prospective, descriptive and analytical study of 171 patients under the age of 15 admitted to the surgical emergency department of Niamey National Hospital for musculoskeletal injuries related to a road traffic accident.
The study took place over a six-month period from January 1 to June 31, 2016. Patients over the age of 15 admitted for trauma related to a road traffic accident as well as patients aged under 15 years admitted for trauma not related to a road traffic accident were not included in our study.
The parameters studied were age, sex, circumstances of the accident, clinical appearance and the methods of patient management. The parameters studied were mainly the frequency, age, sex, nature and type of lesion, mode of transport as well as treatment methods.

Results
In our study, the frequency of trauma in children was 8.6%. Males predominated with a sex ratio of 3. The 6 to 10 year age group was the most represented (38.6%). The average age was 8.7 years with extremes ranging from 2 years to 15 years (see Table I).

Table 1: Distribution of patients by age

Age	Frequencies	Percentages (%)
0 – 5	45	26,4
6 - 10	66	38,6
11 - 15	60	35
Total	171	100

The two-wheeled vehicle was the most involved with 56.7% of the cases. The admission time was less than an hour in 56.2% of the cases. Transport was not medicalized in 59.6% of the cases. At admission, the pelvic limb was most affected with 80% of the cases. Skin opening was found in 29.80% of cases, most often it was an open fracture type I of Gustillo and Anderson. A loss of substance was present in 8% of the cases. Vascular and nervous disorders are present with 0.60% and 1.8% of cases respectively.

In 61.3% of cases, the fracture line was common to that of adults with a simple or complex line (see Table II).

Table 2: Distribution of fractured patients by fracture line

Line type	Frequencies	Percentages (%)
Simple line	96	56,1
Complex line	9	5,2
Green wood	36	21
Epiphyseal detachment	20	11,7
Plastic	2	1,2
Butter ball	2	1,2
No fracture	6	3,5
Total	171	100

In our series, orthopedic treatment was the reference treatment for 75%, racking up was the most appropriate surgical option and 4.7% of our patients were discharged against medical advice (see Table III).

Table 3: distribution of patients according to the type of treatment

Treatment	Frequencies	Percentages (%)
Orthopedic treatment	128	74,8
Surgical treatment	33	19,3
Trimming	2	1,2
Discharge against medical advice	8	4,7
Total	171	100 %

Discussion

In our series, the frequency of trauma in children was 8.6%. The frequency of these injuries is still frequent in our regions due to the resurgence of road traffic accidents. In fact, this children trauma is considered inevitable despite the prevention of traffic strategies [2]. Prevention is all the more difficult since the epidemiological data available in this area do not allow a precise understanding of the circumstances and a definition of its avoidability.

Children aged 6 to 10 are the most affected in our study (38.6%). In addition, a high frequency was noted in children aged 0 to 5 years (26.4%), a frequency which is alarming for this fragile age group. Several authors have made the same observation [3, 4, 5]. Trauma from road traffic accidents is a common pathology in children due to the parents' lack of vigilance, according to all the authors. Added to this is the proximity of primary schools to crossroads and the non-respect of traffic signs by drivers [6]. Indeed, the child has a behavior different from the adult and his curiosity prevents him from seeing and understanding the dangers. Therefore, it is the driver's responsibility to pay close attention to children.

In our series, we noted a male predominance. A predominance that is conventionally found in the literature [7, 8, 9]. This could be explained by the fact that the boy is generally more agitated, more aggressive and more brutal compared to the girl.

In our study, the motorcycle remains the vehicle most involved in trauma in children with motorcycle-pedestrian accidents. Ayouba *et al*. as well as Uwamahoro *et al*. [7, 10] have already made this observation. In Niger today, the two-wheeler fleet largely dominates that of vehicles since the introduction on the Nigerian market of motorcycles from Asia at an affordable cost. The country has suddenly gone from traveling on foot to individual motorized transport. This allowed a large number of users to access these vehicles without complying with the Highway Code. The small size of the child makes it frowned upon by drivers, especially at night.

In our study, the pelvic limb was the most affected in 80% of cases, where the leg was the most frequent localization. Hoekmann *et al*. confirmed this aspect since 1996 [11]. In reality, trauma to the limbs is a major cause of disability and death, mainly due to the seriousness of the injuries [12].

The treatment is orthopedic up to 75% of the cases in our series. The therapeutic choice in the management of trauma in children is on a case-by-case basis, but orthopedic treatment remains the preferred indication in fractures.

In our study, 4.7% of patients were discharged against medical advice, a finding also made by certain authors [13, 14]. The low socioeconomic level is one of the reasons that pushes parents to go out against medical advice. However, the main motivating factor for parents is the traditional treatment, which is still widely used in Africa, particularly in Niger, although it carries a high risk of complications. Today, it is indisputable, traditional treatment is the first cause of amputation in surgery and disability in socio-professional environment in our regions. These complications are largely related to the means and techniques used to treat fractures.

Conclusion

Trauma of the limbs in children is common in Niger due in particular to the upsurge in road traffic accidents. These lesions mainly affect boys under the age of ten and are dominated by fractures most often found in the pelvic limbs. Thus, given the high morbidity of these traumas in children and their increasing frequency, preventive measures must be taken to reduce them. Prevention that requires the involvement of all stakeholders in road safety, from parents to public authorities, including schools.

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