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Severe Musculoskeletal Injuries in Children during Play

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Abstract

Introduction: Musculoskeletal injuries are common in children but rarely severe. Their treatment varies according to the type of injury observed. The aim was to describe the epidemiological and therapeutic aspects of severe musculoskeletal injuries in children during play. **Patients and Methods:** This was a retrospective descriptive study conducted in the Orthopaedic-Traumatology Department and the Paediatric Surgery Unit of the University Hospital of Bouaké between January 2018 and December 2020. It concerned patients less than 16 years of age hospitalised for more than 24 hours for a musculoskeletal trauma following a gambling accident. The variables studied were epidemiological and therapeutic. **Results:** A total of 53 patients were collected. The frequency was 2.9%. The mean age was 9 ± 3.99 years. There were 38 (71.7%) boys and 15 (28.3%) girls. The sex ratio was 2.5. The patients were attending school in 79.3% (n = 42). The circumstances of occurrence were dominated by falls during play accidents (n = 35; 66%). Football was observed in 93.5% (n = 49). The thoracic limb (n = 35; 66%) was the preferred site of these injuries. The injuries were closed (86.7%) with a predominance of forearm fractures (n = 22; 41.6%). The average hospital stay was 2.8 ± 1.4 days. Most of the patients were treated orthopedically (n = 37; 69.9%). The evolution was favourable without complications. **Conclusion:** Musculoskeletal injuries during play were infrequent (2.9%). The circumstances were dominated by falls during play. The injuries were mainly closed fractures, most of which were treated orthopedically.

Keywords

Children, Fractures, Musculoskeletal Trauma, Orthopaedic Treatment

1. Introduction

Musculoskeletal injuries (MSD) include several injury entities: mainly bone fractures, ligament, joint, muscle and soft tissue injuries [1]. Injuries requiring hospitalisation for more than 24 hours are considered severe MSD [1] [2]. MSD are common in children but are rarely severe [2]. The incidence in children varies between 16% and 20% [3] [4]. Play is inherent to the child. Several sports and recreational activities carried out by children (football, running, skipping, etc.) are the cause of these MSD [1] [2] [5]. The injuries observed are mainly in the forearm, wrist, ankle and foot [6]. The growth plate is an area of weakness [1] [5]. Limb fractures (epiphyseal detachment fractures) are the most common injury of these MSDs, with a rate of between 54% and 72% [1] [4]. Their treatment varies according to the type of injury observed, but orthopaedic treatment is common [2]-[7]. Complications are dominated by compartment syndrome and sequelae (stiffness, limb length inequality, and epiphysiolysis) [7]. There is little data on severe MSD in children during play in developing countries [8] [9]. In Bouaké, no study has been devoted to this subject to our knowledge. The aim of this study was to describe the epidemiological and therapeutic aspects of severe MSD in children during play.

2. Patients and Methods

This was a retrospective descriptive study carried out in the Orthopaedic-Traumatology Department and the Paediatric Surgery Unit of the University Hospital Centre (CHU) of Bouaké. It took place over a 3-year period from January 2018 to December 2020. It concerned patients less than 16 years of age hospitalised for more than 24 hours for an MSD following a gambling accident. The variables studied were: age, sex, school level, circumstances of occurrence, side affected, time of year of injury, site and type of injury, and treatment performed. Descriptive statistics were performed for quantitative variables (mean, standard deviation, minimum and maximum) and qualitative variables (frequency).

3. Results

There were 53 patients during the study period. The frequency was 2.9% of admissions. The mean age of the patients was 9 ± 3.99 years [3]-[15]. There were 38 (71.7%) male and 15 (28.3%) female patients. The sex ratio was 2.5. The patients were 79.3% (n = 42) enrolled in school.

The epidemiological parameters are listed in **Table 1**.

The MSD occurred during the day in 47 (88.6%) cases and at night in 6 (11.4%) cases. Football was observed in 93.5% (n = 49).

The distribution of patients according to the month of the year was illustrated in **Figure 1**.

The injuries were closed (n = 46; 86.7%) and open (n = 7; 13%). Injuries were located in the thoracic limb (n = 35; 66%) and pelvic limb (n = 18; 44%). The lesions and their location are listed in **Table 2**.

Table 1. Epidemiological characteristics.

Characteristics	Number (n)	Percentage %
Age range (*Year*)		
[10 -15]	11	20.7
[6 - 9]	34	64.2
[2 - 5]	8	15.1
Total	53	100
Level of education		
Primairy	28	52.8
Secondairy	14	26.5
Not in school	11	20.7
Total	53	100
Circumstances		
Recreational accident	35	66
Sport accident	14	26.5
Domestic accident	4	7.5
Total	53	100
Affecteted side		
Right	28	52.8
Left	25	47.2
Total	53	100

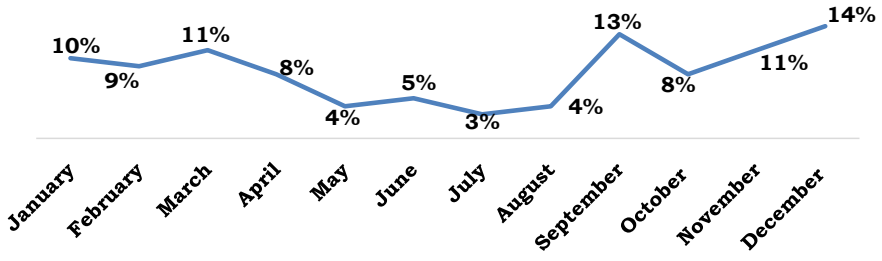

Figure 1. Distribution of patients by month in the year.

The mean time to hospital was 2.8 ± 1.4 days [2]-[10]. The evolution was favourable without complications. The treatment was summarized in **Table 3**.

4. Discussion

Severe MSD during play in children were uncommon (2.9%). Boys aged 6 to 9 years were the most affected. The thoracic limb was the preferred site for these injuries. They were essentially closed fractures. Most of them were treated orthopedically. The frequency (2.9%) observed in this study was lower than in some series in the literature (16%) [3] [4].

Table 2. Distribution of lesions and their location.

Characteristics	Number (n)	Percentage %
Pathological type		
Fractures	32	60.4
Tendon sections	9	17
Muscle contusions	5	9.4
Dislocations	5	9.4
Spinal cord contusions	1	1.9
Acute osteomyelitis	1	1.9
Total	53	100
Site of injury		
Thoracic limb		
Cervical spine	1	1.9
Clavicle	2	3.8
Arm	4	7.5
Elbow	3	5.6
Forearm	22	41.6
Wrist	2	3.8
Hand	1	1.9
Pelvic limb		
Hip	1	1.9
Thigh	5	9.4
Knee	1	1.9
Leg	2	3.8
Ankle	5	9.4
Foot	4	7.5
Total	53	100

Table 3. Distribution of patients according to the treatment performed.

Treatment	Effectif (n)	Pourcentage (%)
Orthopaedic	37	69.9
Surgical	11	20.7
Medical	5	9.4
Total	53	100

This difference could be explained by the study period which varies from one series to another. Also, some children with MSD are not admitted to the university hospital. Therefore, the frequency observed in this study does not reflect the real data in the population. Traditional treatment is common in Bouaké, which

would reduce hospital data [7].

The observed male predominance is consistent with the literature [6]-[12]. The age range observed was similar to that of Shegal *et al.* [13]. Children at this age are generally very turbulent. They are discovering their environment and are attracted by multiple games, both dangerous and not. This turbulence at this period of growth favours MSD. Various circumstances of occurrence were observed, but falls were the most frequent. These results were consistent with the literature [4] [13] [14] [15] [16]. These injuries were mostly observed in school children. They occurred most often during the months of September and December, corresponding to the month when school activities were resumed. During this period, the lack of supervision of children, their carelessness and lack of awareness of danger, and the transformation of the streets into a playground are at the origin of these MSD [5]. Football was the most common type of sport (fun and sporty); it is a popular sport and causes serious injuries [15].

The thoracic limb was the most affected with a predominance of forearm fractures. This result differed from those of some authors who had observed a predominance of femur fractures [4] [15] [17]. The closed lesions (86.7%), which were frequent in this study, were not consistent with those of Lyons *et al.* [18]. The latter noted 90.6% of open lesions. Treatment was orthopaedic in the majority of patients in relation to the lesions observed [19] [20] [21]. The evolution was favourable without complications were related to the lesions observed. the quality and timeliness of care could also explain it. This study has limitations, it is retrospective and the sample size is small, but it could be used as a database for future studies on severe MSD.

5. Conclusion

Musculoskeletal injuries during play accounted for 2.9% of admissions to the Bouaké University Hospital. They are concerned more about male children. The circumstances were dominated by falls during play. The injuries were essentially closed fractures, most of which were treated orthopaedically. Raising parents' awareness of the need for increased supervision of children during play would significantly reduce the number of serious forms of musculoskeletal trauma.

Conflicts of Interest

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

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