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Research Article

Profile of Eye Trauma in Children Aged 0 to 14 Years Old at Iota Chu

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Abstract

Introduction: Several children are victims of eye trauma of various origins. This work aims to study the profile of ocular trauma in children aged 0 to 14 years.

Materials and Methods: Prospective and descriptive study carried out over a period of 6 months, involving 164 subjects aged 0 to 14 years. All patients underwent a complete ophthalmological examination, followed by both medical and surgical treatment.

Result: The age group of 0 to 9 years was the most affected (76.23%). The average age was 7 years. The distribution of subjects showed a male predominance (57.3%). Nearly half (51.22%) consulted within the first 24 hours; games (39%) and domestic accidents (31.7%) were the major causes of trauma. Furthermore, the main agents of trauma were metal objects (28.1%). The lesions were most localized at the level of the eyeball (80.5%). The different types of trauma encountered were contusions (29.9%), deep corneal wounds (28.65). Depending on the lesions identified, 50.6% benefited from surgical treatment, including 73.5%.

Conclusion: There is a need for adequate and early care, to raise awareness among parents for prevention and good supervision of children during their movements.

Keywords: *Trauma; Profile; Children*

Introduction

Ocular trauma is defined as an attack suffered by the eyeball or its annexes, when it is suddenly subjected to quantities of energy which exceed the threshold of physiological tolerance. The energy in question can be mechanical, thermal, chemical or radiated [1].

In children, ocular trauma currently constitutes a real public health problem, due to its increasingly frequent occurrence and its medium- and long-term consequences [1]. They represent a major cause of acquired monocular blindness, which explains their severity [2]. The particularities in children, unlike adults, are linked to the fragility of childhood anatomy and reflect intra- and postoperative problems specific to pediatrics [3]. This is the basis, in addition to the severity of the lesions, of poor functional recovery at the end of treatment with risk of amblyopia in children under 7 years old [3]. Nearly 500,000 children become blind each year worldwide; the fight against blindness in children is a priority in the WHO 2020 plan (Vision 2020 Global initiative) [4]. In the United States of America, ocular

trauma is the leading cause of unilateral blindness in children under 20 years of age, apart from congenital pathologies. The American Academy of Pediatrics (AAP) reported that 66% of all eye trauma occurs in children 16 years of age or younger, with high frequency in the average age range of 9 to 11 [5]. In Africa, several studies have been carried out on ocular trauma. In Burkina Faso, Meda N., *et al*. found at Yalgado University Hospital an overall frequency of ocular trauma of 20.1% in children [6]. Sounouvou., *et al*. found in Benin that ocular trauma represents10.4% of Ophthalmology consultations [7]. In Mali, eye trauma in children is still taking on a worrying nature, due to the increasingly high frequency of children seen in emergency rooms, the severity of the lesions observed, as well as the delay by parents in bringing the children. to the hospital.

Aim of the Study

The aim of the present study is to study the profile of ocular trauma in children under 14 years old seen in the emergency department of CHU-IOTA, with a view to updating this problem.

Patients and Methods

We conducted a prospective and descriptive study in the ophthalmological emergency department of CHU-IOTA, from September 1, 2018 to February 28, 2019, a period of 6 months. This is the only service of its kind in the city, which receives ophthalmological emergencies 24 hours a day. Our study included all children aged 0 to 14 years, who consulted the emergency department for ocular trauma during the study period. Children over 14 years old and those who consulted for other pathologies or non-traumatic emergencies were not included. Some selected children of cooperating age were interviewed, unlike non-cooperating ones, whose parents we interviewed. They received a complete ophthalmological examination. Mechanical globe injuries were described according to the Birmingham Eye Trauma Terminology (BETT) classification [8] and those of chemical origin, according to the Dua classification [9]. The data was collected through a pre-established survey form. The parameters studied were age, sex, origin, level of education, consultation time, circumstances of occurrence of the trauma, the agent of the trauma, and physical examination data. The data were analyzed using Epi Info 3 software and the Chi square test was used to compare percentages.

Results

Over the study period, 164 children were included out of a total of 875, representing a frequency of 18.74%.

The age groups of 0 - 4 years and 5 - 9 years were the most affected with 39.63% and 36.6% respectively. The average age was 7 years with extremes of 6 months and 14 years. There was a male predominance with a sex ratio of 1.3 (94M/70F). There was a delay in consultation with 21.3% of children who consulted between 24 - 48 hours and 27.4% after 48 hours compared to 51.3% before 24 hours. According to the circumstances in which the trauma occurred, gaming accidents and domestic accidents constitute the main circumstances of occurrence, representing respectively 39% and 31.7% as summarized in table 1. Metallic objects constituted the main traumatic agent, i.e. 28.1%, followed by sticks/wood which represented 15.2% (Table 2). The involvement was bilateral in 1.8% and unilateral in 98.2%. In case of unilateral involvement, the right eye was affected in 71 cases (44.1%) and the left eye in 90 cases (55.9%). The lesions were located on the eyeball in 132 cases or 80.5% of cases, on the appendages in 24 cases or 14.6%, and were mixed in 8 cases or 4.9% of cases. According to the BETT classification, contusions were the most frequent as shown in figure 1. These traumas caused corneal damage in 51.7% of cases, and table 3 summarizes all the lesions. The management of these lesions was medical in 49.4% of cases and surgical in 50.6%. Surgical treatment of patients occurred for 67.5% of cases, between 6 and 12 hours, for 18.1% of cases between 12 and 24 hours and for 10.8% of cases in the first 6 hours of the patients whose cases required surgical treatment, 73.5% benefited from suture of the corneal wound, 21.7% from suture of the eyelid wound and 2.4% of cases from puncture-washing of the eyelid anterior chamber.

	Effective	Percentage
Games	64	39%
Domestic accident	52	31.7%
Brawl	13	7.9%
AVP	10	6.1%
Punitive corrections	10	6.1%
Accident during work	04	2.4%
Sport	02	1.2%
Others	09	5.5%
Total	164	100%

Table 1: *Distribution according to the circumstances of occurrence of the trauma.*

Agent of trauma		Effective	Percentage
Metal objects	Braid needle	13	28.1%
	Knife	08	
	Lock handle	03	
	Broken iron	22	
Stick/Wood		25	15.2%
Punch		21	12.8%
The falls		17	10.4%
Whip		12	7.3%
Stone throw		11	6.7%
Vegetable straw		06	3.7%
Chemical substances		04	2.4%
Kick		02	1.2%
Others		20	12.2%
Total		164	100

Table 2: *Distribution according to the agent of trauma.*

	Effective	Percentage
Corneal damage	93	56.7%
Eyelid wounds	18	11%
Eyelid edema	14	8.5%
Cataract	11	6.7%
Hyphema	10	6.1%
Superficial foreign bodies	8	4.9%
No lesions	8	4.9%
Subconjunctival hemorrhages	7	4.3%
Orbital fracture	2	1.2%
Retinal edema	1	0.6%
Ocular hypertonia	1	0.6%

Table 3: *Distribution according to type of lesions.*

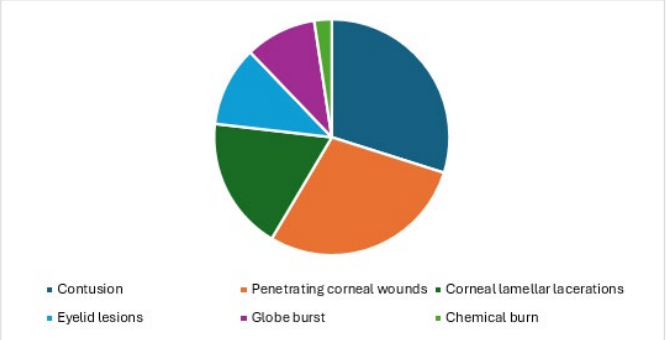

Figure 1: *Distribution according to types of trauma.*

Discussion

We collected 164 children out of a total of 875, representing a frequency of 18.74%. This frequency is close to that of Sidibé., *et al.* [8] who found 17.2%.

The age groups of 0 - 4 years and 5 - 9 years were the most affected with 39.63% and 36.6% respectively. These results agree with those of Sidibé [10] who found a predominance of preschool age with 63.6%. The slight male predominance (57.3%) observed corroborates the results of G. Yaya and Al who found 58.3% [11], while Sidibé [10] found a female predominance in his series on braid needle trauma. More than half of our patients consulted within the first 24 hours after the trauma (51.22%). These results are contrary to those of Mayouego., *et al*. who found a proportion of 59.19% of patients who consulted in the first 6 hours [2]. This is explained by easy access to the emergency department for the majority of our patients living in Bamako and surrounding areas. However, we found a significant proportion of 27.44% of respondents who consulted after 48 hours. The reasons are multiple, including self-medication, negligence, lack of financial means and distance for patients living outside Bamako.

Accidents games represent 39% in our study. Our results corroborate those found by A. Lam in Senegal, where gambling accidents represent 42%, followed by domestic accidents (24.5%) and brawls (14%) [1]. Meda N., *et al*. in Ouagadougou found in their series, a proportion of 46.1% of play accidents followed by 23.7% of domestic accidents [6]. These results reveal that most of the games that children play present a risk, in the absence of any supervision from an adult whose presence would allow regulation and a choice of less dangerous games. Most of the time, children are left to their own devices during their leisure time and domestic activities, thus falling victim to accidents that could be avoided with supervision.

Some studies have revealed a high frequency of physical abuse as a circumstance in which trauma occurs. Yaya., *et al*. in CAR [11] found a proportion of 25.9%, Lam., *et al*. in Senegal [12] found 11% and Meda., *et al*. in Burkina [6] found 8.8%. In our series, we found 6.1% mainly during punitive corrections by parents and at school. The main agent of trauma found in our series is made up of metal objects (28.1%) such as the braid needle, the knife, the lock handle and broken iron; followed by stick/wood (15.2%), punch (12.8%). Contrary to our results, Meda., *et al*. [6] in his series found 33.6% of trauma by projectiles, 25% by stick/wood, 14.8% by metal objects. Lam., *et al*. [12] found 34.5% of trauma caused by punches, followed by projectiles (28%) and sharp objects (21.5%). A significant rate of trauma caused by metal objects is a worrying factor, especially since these elements are the cause of serious trauma.

In our study, the lesions were located on the eyeball in 132 cases or 80.5% of cases, on the appendages in 24 cases or 14.6%, and were mixed in 8 cases or 4.9% of cases. Our results are similar to those found by J. Mayouego., *et al*. in Ile-de-France [2], where they found

81.13% of eyeball trauma, followed by 22.26% of eyelid lesions and 2.26% of orbital lesions. This reveals that the preferred target in the event of ocular trauma remains the eyeball. Among our respondents, 49 presented a contusion of the globe (29.9%); which presents a slight difference from what Lam., *et al*. [12] found in Senegal (23%) and Meda., *et al*. [6] in Burkina (22.5%). Penetrating corneal wounds and globe bursting were found respectively in 47 and 16 of our respondents, which represents 28.65% and 9.75% respectively. Among the 47 cases of penetrating wounds, 21 (12.8%) presented with iris herniation. This is due to a high number of children who have been traumatized by metal objects, often sharp, as well as sticks which are responsible for serious injuries. Lam., *et al*. [12] found in their series a high proportion of globe rupture (26%) and 24% of penetrating wounds. On the other hand, in the series by Meda., *et al*. [4], penetrating wounds accounted for 48.3% and 8.6% for globe bursting. Lamellar corneal lacerations represent 18.3% in our series. Meda., *et al*. [6] found 8.2%. Furthermore, we recorded 18 cases (11%) of eyelid wounds, including 4 cases of tear canaliculus section. Mayouego., *et al*. [2] found 22.26% in their series, which is high compared to our results; and Yaya., *et al*. in Bangui [11] found 8.6%. In our series, we found no cases of intracorneal foreign bodies or perforating wounds.

Of the 164 patients who made up our study, 83 required surgical treatment, or 50.6%. Our results are far superior to those of Mayouego., *et al*. [2] who found in their series, 6.79% of cases requiring surgical treatment. Furthermore, 81 of them benefited from exclusively medical care, or 49.4%.

Of the 83 patients whose cases required surgical treatment, only 9 were treated within the first 6 hours following their admission, which represents 10.8% of cases. These are usually those who arrived, finding the operating room team available before the end of the working day. The vast majority (56) of them were treated within 6 to 24 hours of their admission, which represents 67.5%; followed by 15 children (18.1%) whose care took place between 12 hours and 24 hours. This is linked to several elements, including the lack of financial means to cover the costs of surgery for some, a contraindication to general anesthesia for others due to fasting of less than 6 hours for children who must receive general anesthesia and the unavailability of the operating room team outside of service hours, which requires the mobilization of the surgeon and the anesthesiologist. Among them, 61 (73.5%) benefited from suture of the globe wound, the 18 cases (21.7%) presenting an eyelid wound were sutured including 4 cases of canaliculoplasty.

We recorded two cases (2.4%) of anterior chamber puncture for hyphema. This happened following the persistence of the hyphema, despite the medicinal means and the hygienic-dietary measures put in place. One patient (1.2%) among those with a ruptured globe was eviscerated hot because the globe showed significant damage to the anatomical structures, and another, in addition to suture of the globe, benefited from extraction of the globe cataract.

Conclusion

This study shows that ocular trauma remains common in our environment and mainly affects children of preschool and school age. Games and domestic accidents prove to be the most frequent causes, following the uncontrolled handling of metal objects and sticks, which lead to serious lesions most often localized at the corneal level, which is the basis of serious after-effects. despite the treatment. The management of surgical cases took place in an intermediate time interval compared to that indicated.

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