



Original article

Eye Injuries in Children Aged 0 to 15: Epidemiological, Clinical and Therapeutic Aspects at the Ophthalmology Department of Kankan Regional Hospital

Les traumatismes oculaires chez les enfants de 0 à 15 ans : Aspects épidémiologiques, cliniques et thérapeutiques au service d'ophtalmologie de l'Hôpital Regional de Kankan

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Résumé

But : Déterminer la fréquence des traumatismes oculaires chez les enfants de 0 à 15 ans au service d'ophtalmologie de l'Hôpital Regional de Kankan.

Méthodologie : Nous avons mené une étude prospective de type descriptif incluant les enfants reçus pour traumatisme oculaire et ayant bénéficié d'une prise en charge dans la période allant du 01 Mai au 31 Octobre 2020. Pour chacun des patients, nous avons recueilli les données socio-démographiques, les antécédents, les circonstances de survenue du traumatisme, la nature de l'agent traumatisant, le délai de consultation, le lieu et la nature des premiers soins reçus, le délai de prise en charge, les résultats de l'examen ophtalmologique et des examens complémentaires, le traitement reçu et les modalités évolutives.

Résultats : L'échantillon était constitué de 99 cas soit une fréquence de 11%, avec 70,7% d'enfants de sexe masculin et 29,3% d'enfants de sexe féminin. La tranche d'âge de 6 à 10 ans a été la plus notée avec une fréquence de 52,53%. Les enfants scolarisés ont

dominé l'échantillon avec 64,65%. 34,34% de nos patients avaient une AV à la réception supérieure ou égale à 3/10. La contusion a été le diagnostic le plus représenté 62,62%. L'atteinte conjonctivale a été le bilan lésionnel le plus noté 73,73%. Les accidents ludiques ont été la circonstance de survenue la plus notée 53,54%. L'agent causal le plus noté a été l'agent végétal 44,44%. La complication la plus fréquente a été la cataracte post traumatique 19,19%. La taie de cornée a été la séquelle la plus notée avec 13,13%. 58,59% de nos patients ont retrouvé une AV supérieure ou égale à 3/10 à la sortie.

Conclusion : Les traumatismes oculaires pédiatriques restent et demeurent un problème de santé publique dans notre pays ; il est nécessaire d'intervenir efficacement par la prévention et les dépistages précoces pour réduire le risque d'amblyopie et la fréquence des cécités infantiles.

Mots-clés : Traumatismes, oculaires ; enfant ; épidémiologique ; clinique ; thérapeutique.

Abstract

Aim: To determine the frequency of eye trauma in children aged 0 to 15 years in the ophthalmology department of the Kankan Regional Hospital.

Methodology: We conducted a prospective descriptive study including children admitted for eye trauma and who received treatment during the period from May 1 to October 31, 2020. For each patient, we collected sociodemographic data, history, circumstances of the occurrence of the trauma, the nature of the traumatic agent, consultation time, place and nature of the first aid received, treatment time, results of the ophthalmological examination and additional examinations, treatment received and evolutionary modalities.

Results: The sample consisted of 99 cases, i.e. a frequency of 11%, with 70.7% male children and 29.3% female children. The age group of 6 to 10 years was the most noted with a frequency of 52.53%. School children dominated the sample with 64.65%. 34.34% of our patients had a VA at reception greater than or equal to 3/10. Contusion was the most represented diagnosis 62.62%. Conjunctival involvement was the most noted lesion assessment 73.73%. Playful accidents were the most noted circumstance of occurrence 53.54%. The most noted causal agent was the plant agent 44.44%. The most frequent complication was post-traumatic cataract 19.19%. Corneal scar was the most noted sequela with 13.13%. 58.59% of our patients found a VA greater than or equal to 3/10 at discharge.

Conclusion: Pediatric eye injuries remain and continue to be a public health problem in our country; it is necessary to intervene effectively through prevention and early screening to reduce the risk of amblyopia and the frequency of childhood blindness.

Keywords: Trauma, ocular; child; epidemiological; clinical; therapeutic

Introduction

Eye injuries are defined as aggression of the eyeball and its adnexa by a blunt, pointed, or sharp body or object coming from the outside. They frequently cause serious injuries and often leave anatomical and/or functional sequelae [1].

According to Helveston, eye injuries are those that strictly affect the eyeball, its adnexa, and the optic pathways. They may consist of contusions, wounds, foreign bodies, or burns. The role of eye injuries as causes of vision loss is often underestimated [2].

In children, eye injuries constitute an important cause of morbidity and the leading cause of non-congenital unilateral blindness [3, 4].

They are also a cause of unilateral visual disturbances and have a number of particularities that often complicate management and prognosis, namely treatment difficulties, the risk of amblyopia, and long-term functional sequelae [5].

The diagnosis is usually easy; the patient or parents describe the circumstances of onset and the mechanism.

According to the WHO, nearly 1.5 million people are blind worldwide following eye trauma. A traumatic corneal ulcer that can lead to hypopyon and perforation; a seemingly minor puncture that can cause cataract and its complications, place eye injuries alongside other major scourges, as a major public health problem with significant socioeconomic repercussions [6].

Currently, for better management of trauma, it is recommended to apply the 3T theory: Everything, Immediately, and at the same Time [2].

Children occupy an important part of admissions for eye injuries. Thus, in studies conducted in hospital settings in the United States, Egypt, and Congo, children occupy 29 to 50% of eye injuries [7, 8, 9].

Thus, the absence of a specific study on eye injuries in children in Guinea motivated this work, which aimed to describe the epidemiological, clinical, and therapeutic aspects of eye injuries in children aged 0 to 15 years at the Kankan Regional Hospital.

Methodology

We conducted a prospective descriptive study lasting six (6) months from May 1 to October 31, 2020.

It concerned all cases of eye injuries in children aged 0 to 15 years received and treated from May 1 to October 31, 2020.

We included all children aged 0-15 years seen in consultation for eye injury, and we excluded children seen for eye injury who did not receive treatment.

For each of these patients, we noted: sociodemographic data, history, circumstances of occurrence of the trauma, nature of the traumatic agent, consultation time, place and nature of first aid received, treatment time, visual acuity, intraocular pressure, nature of lesions, complementary examinations performed, treatment received, and evolutionary modalities.

Visual acuity was classified according to the WHO objective criteria using the Monnoyer, Snellen, and Rossano scales depending on the age and literacy level of the child. Initial visual acuity and ocular tone were not assessed in small children and in severe trauma cases with globe or adnexal wounds.

Our data were analyzed using Epi-info 7.2.2.6 software.

Data entry was performed using Word and Excel software from Microsoft Office 2013. For bibliographic management, we used Zotero software. The collected data were processed anonymously and confidentiality was strictly observed. Informed consent from parents was obtained for the use of iconographic images.

Results

From May 1 to October 31, 2020, we received 99 children for eye injury out of a total of 928 children consulted, i.e., 11%, including 70 boys (70.7%) and 29 girls (29.3%).

The mean age of our patients was 8.30 +/- 4.10 years with extremes of 1 and 15 years. Patients aged 6 to 10 years represented 52.53% of cases, followed by those aged 11 to 15 years.

In our series, 64.65% of patients were schoolchildren versus 35.35% non-schoolchildren. Among these cases, 55.56% came from rural areas versus 44.44% from urban areas.

Ocular pain was the leading complaint among our patients with 84.84%, followed by redness (78.78%). Decreased visual acuity was the main complaint in 41.41% of our patients.

In our study, 50 patients (50.51%) were seen more than 72 hours after the trauma occurred, only 29 patients (29.29%) were seen within 24 hours following the trauma, and 20 patients (20.20%) between 24 and 72 hours after the trauma.

The circumstances of occurrence were dominated by playful accidents, followed by domestic accidents (20.20%) and physical abuse (13.13%).

The traumatic agent was of plant origin in 44.44%. Hand blows and whips represented 16% and 14% of cases respectively.

Regarding first aid, 70 patients (71%) resorted to self-medication, 10 patients were referred by non-specialized health facilities, and 19 patients (22%) received their first aid in our department.

In our series, 34 patients (34.34%) had a visual acuity $\geq 3/10$ at admission. Visual acuity was not assessable in 29% of cases and between 1/10 and 2/10 in 22% (Table I).

Conjunctival involvement dominated adnexal lesions with 73.73%. As for anterior segment involvement, they were dominated by corneal involvement in 61 cases (61.61%).

Closed globe injuries dominated our series with 74 cases (75%). Among them were 19 cases of traumatic cataract (19%), 14 cases of hyphema (14%), and 7 cases of superficial foreign bodies (7%).

Open globe injuries represented 25% of cases, including 15 cases of corneal wounds (15%), 5 cases of corneoscleral wounds (5%), 3 cases of globe rupture, and 2 cases of intraocular foreign bodies (Figure 1).

We encountered traumatic keratitis in 20% of cases.

We noted posterior segment lesions in 4 patients (4%). Among these lesions were 2 cases of intravitreal

hemorrhage (2%), 1 case of retinal edema (1%), and 1 case of retinal detachment (1%).

Treatment was exclusively medicinal in 46 patients (46.46%) and medicinal combined with surgery in 53 patients (53.54%).

Globe wound suturing and cataract surgery were the most performed surgical procedures with 41.82% and 34.54% of surgical cases respectively. Two cases of

globe rupture were eviscerated (Table II).

Final visual acuity was greater than 3/10 in 70.71% of cases, between 2/10 and 1/10 in 7.07%, and not assessed in 13.13% of our patients (Table III).

In our series, we noted anatomical sequelae in 25 patients (25%). Corneal opacities represented 72% of sequelae. We recorded 3 cases of phthisis bulbi.

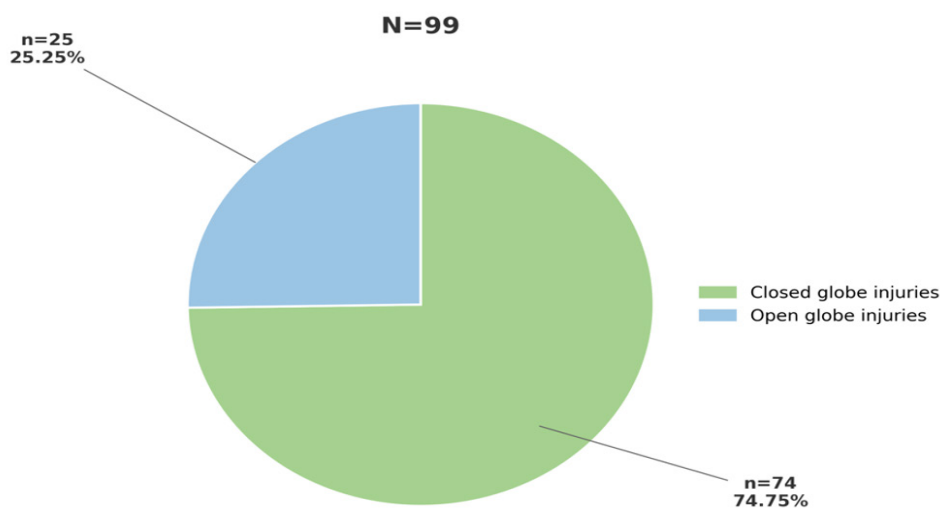


Figure 1: Distribution by type of trauma

N=99, Closed globe injuries: n=74 (74.75%), Open globe injuries: n=25 (25.25%)

Table I: Distribution of patients according to the visual acuity of the traumatized eye at admission

Visual acuity	Number	Percentage (%)
< 1/10	14	14.14
1/10 - 2/10	22	22.22
>= 3/10	34	34.34
Indeterminate*	29	29.30
TOTAL	99	100

Table II: Distribution of patients according to surgical procedures performed

Surgical procedures	Number	Percentage (%)
Globe wound suturing	22	41.51
Phacophagia	19	35.85
Foreign body removal	2	3.77
Evisceration	1	1.89
PLCA	2	3.77
Eyelid surgery	7	13.21
Total	53	100

Table III: Distribution of patients according to visual acuity at discharge

Final VA	Number	Percentage (%)
< 1/10	9	10
1/10 - 2/10	7	8
>= 3/10	70	70
Indeterminate*	13	12
Total	99	100

Discussion

From May 1 to October 31, 2020, we conducted a prospective descriptive study. This study aimed to describe the epidemiological, clinical, and therapeutic aspects of eye injuries in children aged 0 to 15 years at the Ophthalmology Department of Kankan Regional Hospital. The assessment of visual acuity in small children was the main limitation encountered during this study.

Although data vary from one author to another, studies agree that eye injuries constitute a very common nosological entity in pediatric ophthalmology consultation.

Epidemiology

In our series, 11% of all children seen in our department were seen for eye injury. This frequency is lower than that of ZAOUALI S et al. in Tunisia who reported a frequency of 39% [10]. This variability in frequencies could be due to patient selection criteria and study duration.

The mean age of our patients was 8.30 +/- 4 years. This result is comparable to that of Li C et al. who reported a mean age of 9 years [11]. It shows that eye injuries in children generally occur in young school-aged subjects, as this is a period when children escape parental supervision and authority, allowing them to engage in dangerous activities and games that are sometimes sources of eye injuries.

The sex ratio in our study was 2.4. Similar results have been observed in China showing that male children

are the main victims, notably in the study conducted by GISE R who reported a frequency of 66.5% for males. This male predominance could be explained by the turbulent attitude of young boys compared to girls. They engage in risky and sometimes dangerous practices and activities, most often exposing them to eye injuries [12].

The majority of our patients (64.65%) were schoolchildren. This result is comparable to that of Shaeri M who, in 2016, found that 35.4% of respondents were illiterate [13].

The time elapsed between the occurrence of the accident and the first aid received in the department ranges from a few hours to months. In our study, 50.51% of cases were seen beyond 72 hours after the trauma, 29.29% of cases before 72 hours, and 20.20% in the first 24 hours after the accident. Du Y in China in 2018 reported that all patients were managed in less than 24 hours [14]. In our context, recourse to traditional practices, difficulties for the child to express their complaint, geographic and financial difficulties in accessing a specialized facility are factors that contribute to delaying the management of trauma cases.

Playful accidents were the main circumstance of occurrence at 53.54%, followed by domestic accidents in 20.20% of cases. Our results are close to those observed by ZAOUALI S et al. in Tunisia and Shaeri M in the USA who found play accidents as the first circumstance of occurrence with 56.62% and 50.55% of cases respectively [10, 13]. On the other hand, road

accidents were the most frequent circumstances in the study of Iftikhar M [15]. However, in rural areas, the frequency of trauma remains high in children engaged in professional activities (agricultural, labor) during which their immaturity and lack of experience sometimes cause serious eye injuries.

As reported in most African series, physical abuse should not be neglected as it constitutes the third circumstance of occurrence with 13.13% of our cases. Indeed, corrective punishment is considered a means of child education in our African societies.

Clinical

The causal agent of the trauma was of plant nature in 44.44% of cases, followed by hand blows at 16.16% and projectiles: stones (14.14%), ball (12.12%). This differs from the results of LINGLING Z in China in 2019 who reported sharp objects as the causal agent (n = 131, 59.5%) [16]. This result would be explained by the fact that in our living environments, plant materials (wood, twigs, darts...) are part of children's play instruments. These plant materials used for various playful activities sometimes cause eye injuries.

The evaluation of the functional impact of eye injuries in children is difficult due to the lack of appropriate equipment for visual acuity assessment. Thus, it was evaluated in 70% of our patients. This visual acuity was considered good according to WHO criteria ($\geq 3/10$) in 34.34% of cases. Patients who presented with low vision (1/10 - 2/10) represented 22.22% of the total number of our patients. Blindness (visual acuity $< 1/10$) was noted in 14.14%. YU D noted a VA $\leq 1/10$ in 43.25% of cases. This difference could be explained by the fact that the majority of our patients were victims of closed globe eye trauma with a predominance of superficial lesions that do not significantly alter visual acuity [14].

Conjunctival and palpebral involvement dominated adnexal lesions with 73.73% and 29.29% of cases respectively. This rate is clearly higher than that of Shaeri M [13]. These results show that the adnexal structures of the globe, playing a mechanical role in the defense of the eye, are the first to be injured in

case of trauma.

Closed globe eye injuries were observed in the majority of our patients and represented 74.75%. These results corroborate those of Yucef OE in Turkey in 2016, but differ from the results of Chang YS in Taiwan who noted a predominance of open globe eye injuries [17, 18]. This difference could be explained by the force of the trauma and/or the traumatic agent that caused the ocular lesions.

Posterior segment involvement found in 4% of our patients was also reported by Chang YS [18]. Given these various results, we agree that eye injuries can affect both the structures of the anterior segment and those of the posterior segment of the eyeball, sometimes responsible for blindness.

Treatment

All our patients received medicinal treatment. However, 53.54% required surgical treatment combined with medicinal treatment. Globe wound suturing (41.82%) followed by phacophagia (35.54%) were the most performed surgical procedures. Due to insufficient technical platform, posterior segment involvement was not managed surgically. In the series of Kouam JM et al., only 6.79% required surgical treatment [19].

Prognosis

Functionally, the outcome was favorable in 70.71% of our patients with a visual acuity $\geq 3/10$ at discharge. However, blindness was observed in 9.09% of our patients. This result is different from that of MEDA N et al. who noted blindness in 39.6% of their followed patients [20]. The high frequency of open globe injuries in these two studies could explain this difference.

The anatomical sequelae of eye injuries depend on the initial lesion and the treatment time. The frequency of these sequelae, varying according to authors, reaches more than 50% in the study of Lam A et al [21]. Thus in our series, 25% of our patients retained anatomical sequelae.

Limitations

The inability to assess visual acuity in small children was the main limitation encountered during this study due to incomprehension and lack of appropriate visual acuity scale.

Conclusion

At the end of our study, we note that eye injuries in children are frequent and constitute a child public health problem, as they are responsible for unilateral blindness. This study allowed us to understand that they mainly concern male children, most often occur during play, and the most incriminated traumatic agent is plant material. All ocular structures can be affected. These lesions, often multiple, manifest immediately or remotely from the initial episode with long-term impact on visual function. Management must be early to avoid complications. Thus, the implementation of awareness programs on safety, child supervision, and the improvement of technical platforms should reduce the frequency of eye injuries and improve their prognosis.

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