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Original Research Article

Frequency and Pattern of ocular trauma in children

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Abstract: Ocular trauma is a public health problem. It is a leading cause of blindness and vision impairment in children. Ocular trauma has some particularities in children. Indeed young children do not complain about their vision; so they insidiously develop amblyopia and even blindness. The aim of our work was to study the pattern of ocular trauma in children in a tertiary hospital.
Keywords: Ocular trauma, frequency, pattern, children.

INTRODUCTION

Ocular trauma is a leading cause of preventable monocular blindness worldwide and is a serious public health concern in developed and developing countries [1, 2].

Ocular trauma in children is a leading cause of visual morbidity. Ocular injuries account for approximately 8-14% of total injuries suffered by children [3]. In the United States, a population-based study reported that the annual incidence of ocular trauma in children was 15.2/100,000. Worldwide, the incidence of severe visual impairment or blindness caused by ocular trauma in children varies from 2% to 14% in different studies [4, 5]. Pediatric ocular injuries are distinct from those in adults in many ways. Ocular trauma in children is mainly related to sports and recreational activity [6]. Children are more prone to injuries because of their inability to avoid hazards [2]. Functional prognosis after ocular trauma worsens in the child, especially because their visual rehabilitation is more difficult [7]. Such injuries cannot always be prevented, but by identifying underlying factors in their etiology, it may be possible to determine the most effective methods of reducing the incidence of visually damaging trauma [8]. The characteristics of children at risk, the agents of injury, and the environmental determinants of ocular trauma must be identified so that appropriate preventive measures can be recommended [9]. The objective of our study was to determine the pattern of ocular trauma in children in a tertiary hospital.

MATERIAL AND METHOD

We conducted a retrospective study from January 2011 to 2013 in the pediatric Department of the Institute of African Tropical Ophthalmology. The study included all the children aged 0-15 years who were admitted with the diagnosis of ocular injury and whose medical files were complete and correctly filled.

Operational definitions: we adopted the Birmingham Eye Trauma Terminology (BETT) [10, 11].

Closed globe injuries:
- Cornea and the sclera are not breached through and through.
- Contusions result from blunt trauma without an open wound of the eyeball.
- Lamellar lacerations are partial-thickness wounds of the cornea or sclera.

Open globe injuries:
- Defined by full-thickness wound of the eyeball.
- Ruptured globes are caused by blunt trauma.
- Lacerations are produced by sharp objects.
- Penetrating injuries are characterized by the presence of an entrance wound.
- Perforating injuries are characterized by the presence of both an entrance and an exit wound.
- Intraocular foreign bodies (IOFBs) are technically penetrating injuries but they are grouped separately because they have different clinical implications.

Ethical issues:

The informed consent of patients' legal guardians was obtained prior to their enrolment.

Data analysis:

Data were collected using a questionnaire; their analysis was done using SPSS 16 software.

RESULTS

Of a total of 18029 patients admitted during the study period, 647 were victim of ocular trauma. The frequency of ocular trauma was 3.6%. Of these, 476 were male (73.57%) and 171 (26.43%) were female; with a sex ratio Male: Female=2.78. The age ranged from 0 to 15 years. Children of the age group 6-10 years and those of the age group 11-15 years were predominant; they accounted respectively for 44.04% (n=285) and 45.92% (n=297). Children of the age group 0-5 years accounted for 10.04% (n=65). 51 (7.9%) patients had no perception of light (NPL) on admission and after discharge. The visual acuity of 155 (24%) patients was below 6/60, whereas 51 (8%) had a visual acuity (VA) below 6/60 after discharge.

Table 1: Time of presentation after injury

Time of presentation after injury (hour)	N	%
<12	91	14.1
[12-24]	105	16.2
[24-48]	125	19.3
[48-72]	156	24.1
>72	170	26.3
Total	647	100

Table 2: Type of trauma

Type of trauma	N	%
Blunt trauma	568	87.8
Superficial foreign body	33	5.0
Penetrating	29	4.5
Chemical burn	17	2.7%
Total	647	100

Table 3: Classification of trauma

Classification	N	%
Restricted to eyelid	20	3.1
Closed globe injuries	585	90.4
Open globe injuries	42	6.5
Total	647	100

Table 4: Laterality of trauma

Laterality	N	%
Right eye	335	51.8
Left eye	301	46.5
Both eyes	11	1.7
Total	647	100

Table 5: Place of injury

Place of injury	N	%
Home	368	56.9
School	32	5.0
Leisure	156	24.1
Motor vehicle	91	14.0
Total	647	100

Table 6: Visual acuity of affected eye

Visual acuity	On admission	After discharge
NPL	51 (7.9%)	51 (8%)
[PL-6/60[	155 (24%)	59 (9.1%)
[6/60- 6/19[	110 (17.0%)	85 (13.1%)
[6/19-6/9[	222 (34.3%)	301 (46.5%)
[6/9-6/6[	109 (16.8%)	151 (23.3%)
Total	647	100

DISCUSSION

Of a total of 18029 patients admitted during the study period, 647 were victim of ocular trauma. The frequency of ocular trauma was 3.6%. Of these, 476 were male (73.57%) and 171 (26.43%) were female with a sex ratio Male: Female=2.78. Our results are consistent with those of many authors. Indeed, many studies have shown that boys tend to be affected more commonly than girls, with male-female ratio varying from 2:1 to 4:1 [12, 13]. The age distribution showed that Children of the age group 6-10 years were more affected by ocular trauma. The results of our study corroborate those previously conducted in other countries, which showed that male children below the age of 10 years were predominant [14, 15, 16]. About the time of presentation, only 14.1% (n=91) were admitted within 12 hours after the injury; the majority, 26.3% (n=170) came more than 72 hours after the trauma. In developing countries, with scarce resources and few means of transportation, patients attend health facilities late. The delay before admission found in the current study is consistent with many findings from researchers of developing countries; In Nigeria, Okoye in his study on ocular trauma showed that 46.3% of patients were admitted between 3 and 7 days after being injured [17]. The prognosis of trauma is partly dependent on the time interval between the injury and the healthcare; the shorter this interval, the better the prognosis. Blunt trauma was the most frequent type of injury; it accounted for 87.8% (n=568) whereas superficial foreign bodies accounted for 5% (n=33). Our rate is greater than the one of Noorani *et al.;* in Pakistan [18] who found 49.4% of blunt trauma. In spite of the difference between these two studies, we can notice the predominance of blunt trauma in both of them. In our study, the trauma was unilateral in 98.3% (n=636); the right eye was more involved (51.8%) than the left (46.5%); both eyes were involved in only 1.7% (n=11). Most of the injuries were classified closed globe injuries, 90.4% (n=585). Similar findings were noticed

by Angelino et al. in Brazil. In their study, the right eye was involved in 139 (50.9%) children, the left eye in 131 (48.0%) and both eyes in 3 (1.1%) children [19]. The injuries occurred most frequently at home (56.9%); in 156 patients (n=24.1%), the trauma occurred during leisure activities. These findings are consistent with those of Mowatt *et al.;* in their study, the most common place of injury was in the home for 47.5% and 50% of females and females, respectively [20]. Noorani *et al.;* [18] in Pakistan found the same predominance of home (46.5%) followed by leisure (33.4%). Young children ignore their vulnerability, boys are particularly active either home or during leisure activities; that is why they get commonly injured. Children are particularly subject to ocular trauma because of their predilection towards hazardous play activities and relative lack of judgment [13]. 51 (7.9%) patients had no perception of light (NPL) on admission and after discharge. The VA of 155 (24%) patients was below 6/60 whereas 51 (8%) had a VA below 6/60 after discharge. This state of blindness is common in children victim of ocular trauma. Ophthalmic trauma is a leading cause of acquired unilateral blindness in childhood, being responsible for up to one third of cases of vision loss in the first decade of life [21, 22].

CONCLUSION

Ocular trauma in children is a public health and social problem owing to its frequency and its consequences on the future of these fragile people. It is one of the main causes of blindness and vision impairment in children with a big social and economic burden. Preventing ocular trauma is highly vital for their wellbeing. Parents, teachers and all the stakeholders have to combine their efforts in order minimize the occurrence of injuries.

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