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## Eye injuries in children the Sagamu experience

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**Abstract:** *Objective:* To describe the pattern of eye injuries in children at Olabisi Onabanjo University Teaching Hospital (OOUTH), Sagamu, Nigeria.

*Methods:* The records of all children 16 years and below presenting with eye injuries to the Eye clinic between January 2007 and December 2011 were reviewed retrospectively. Demographic data, cause of injury, time of presentation, the injured eye, visual acuity at presentation, diagnosis, intraocular pressure, treatment given, post treatment visual acuities at one week, one month and three months were obtained and analyzed using SPSS

version 16.

*Results:* A total of 131 case notes were available for analysis. The age range of affected children was 9 months to 16 years: mean (SD) - 8.56 years (4.18). The male female ratio was 2:1. The majority of affected children were age 6- 10 years. The right eye was involved in 55.7% of cases. The most common agent of injury was stick (22.1%), followed by slap.

*Conclusion:* Intensifying health education to the children, parents and teachers will go a long way in reducing ocular injuries and vision loss in children.

### Introduction

Eye/ocular injuries are a common cause of unocular blindness in children. Ocular trauma is said to be a leading cause of visual impairment and blindness in young adults and children resulting in ophthalmic morbidity and monocular blindness all over the world<sup>1</sup>. According to the WHO, about 1.6 million patients become blind out of 55 million ocular injuries occurring yearly world wide<sup>2</sup>. The burden /impact of this is more and significant when one considers the number of blind years a child has to live compared to adults. Ocular injuries represent approximately 4-20% of all eye injuries<sup>3</sup> and is a significant cause of corneal scarring which is the most common cause of childhood blindness in developing countries. Prompt diagnosis and treatment of ocular injuries in children can help reduce morbidity however most cases have been found to report late to the hospitals<sup>3,4,5,6</sup>. Also even after treatment, visual acuity may not improve in affected children because of amblyopia. This study was carried out to determine the pattern of eye injuries among children presenting at Olabisi Onabanjo University Teaching Hospital (OOUTH) a semi urban city. Findings in this study will assist health planners in Ogun state plan appropriate prevention/healthcare for children in the state.

### Subjects and methods

This is a descriptive, cross-sectional study of patients presenting at OOUTH, one of the two tertiary centres in the state. It is located within a semi urban city with agrarian orientation.

The case notes of all children aged 16 years and below who presented with eye injuries to OOUTH between January 2007 and December 2011 were retrieved from the Information Management department of the hospital. Demographic data, cause of injury, time of presentation, the injured eye, visual acuity at presentation, diagnosis, intraocular pressure, treatment given, post treatment visual acuities at one week, one month and three months were recorded. Visual acuity was not checked in preverbal children while in verbal children vision was checked with Snellen's chart and E chart in those who could not read the letters of the alphabet. Ocular examinations were done with pen torches and Haagstreight Slit lamp where the child could co-operate. Intraocular pressures were checked with Goldman's applanation tonometer. Cases were defined according to the International classifications of Diseases (ICD) published by the WHO. Visual acuity was classified as category 1 ( $\geq 20/200 = 6/60$ ), category 2 ( $\leq 20/200$  to light perception) or category 3 (no light perception).

According to the ocular trauma classification system (OTS), mechanical injuries of the globe were divided into "Open globe" or "Closed globe" injuries. An open globe injury was defined as a full thickness wound of

the eyeball. A closed globe injury was defined as a contusion (defined as no corneal or scleral wound), a lamellar laceration (a partial thickness) or superficial foreign body.

Data was analyzed with SPSS statistical package version 16.0. Variables were calculated and inferential statistics calculated.

## Results

A total of 142 cases of eye injury were seen during the study period but only 131 (92.3%) case notes were seen for review. The age range of affected children was 9 months to 16 years with a mean of  $8.56 \text{ years} \pm 4.18 \text{ years}$ . There were 88 (67.2%) males and 43 (32.8%) females with a ratio of 2:1. The majority of affected children were aged 6-10 years (Table 1). The right eye was involved in 73 (55.7%) of cases while left eye was involved in 58 (44.3%). Open globe injuries constituted 52 (40%) of cases while closed globe injuries was much more common constituting 79 (60%) of cases. The most common cause of injury was stick (22.1%), followed by slap (8.6%), accidental hitting of face against the door (8.6%), broomstick (5.3%) pencil (4.6%) (Fig 1). Others include finger, scissors, cutlass, antenna fall etc. The earliest time of presentation was 30 minutes. Mean presentation time was  $37.5 \text{ days} \pm 9.41 \text{ days}$ : 34 (26%) presented within twenty four hours of injury. Blunt trauma was the most common mechanism of injury, accounting for 70 (53.4%) while penetrating trauma occurred in 58 (44.3%); chemical injury was 3 (2.3%).

The most common visual acuity group at presentation was category 1 (37.4%) - (Table 2). Visual acuity was not done in preverbal children. Many of the patients defaulted before the three months follow up hence at this time only 33 visual acuities were available for analysis (Table 3). These are category 1- 10 (30.3%), category 2- 10 (30.3%) and category 3- 13 (39.4%). Of these 33, 7 (21.2%) were initially in category 1, 16 (48.5%) were in category 2 and 10 (30.3%) were in category 3. There was thus a 9.1% (3) improvement in visual acuity and 9.1% (3) had worsened visual acuity (Table 4).

**Table 1:** Age group distribution of study subjects

Age group years	Number (%)
0 to 5	36 (27.5)
6 to 10	48 (36.6)
11 to 16	47 (35.9)
Total	131 (100.0)

**Table 2:** Visual acuity of 107 eligible children at presentation

Category	Visual acuity	Number (%)
1	$\geq 20/200$ (6/60)	49 (45.8)
2	$\leq 20/200$ to LP	42 (39.3)
3	No LP	16 (15.0)
Total		107 (100.0)

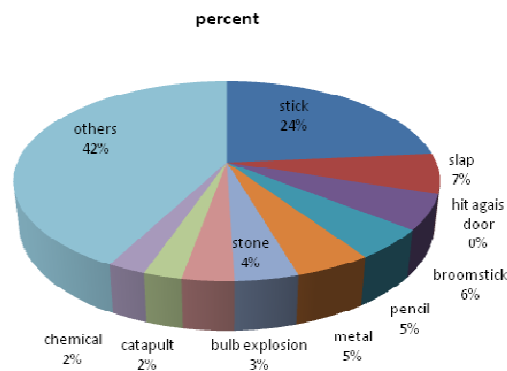
LP = light perception

**Table 3:** Visual acuity at presentation of 33 subjects at the 3-month follow-up

Category	Visual acuity	Number (%)
1	$\geq 20/200$ (6/60)	10 (31.6)
2	$\leq 20/200$ to LP	10 (31.6)
3	No LP	13 (36.8)
Total		33 (100.0)

LP = light perception

**Fig 1:** Causes of injury



**Table 4:** Comparison of visual acuity at presentation and at 3-months follow-up

At presentation	At 3 months	Category 2	Category 3
Category 1: n = 07	Category 1		
Category 2: n = 16	Category 2		
Category 3: n = 10	Category 3		
All: n = 33	10	10	13

## Discussion

Eye injuries in children though very common are usually accidental and can affect any age. In this study the mean age was  $8.56 \pm 4.18 \text{ years}$  and this is similar to the findings of Hamid et al in Iran<sup>7</sup> whose mean was  $7.6 \pm 3.6 \text{ years}$ . Also in this study, there was a male preponderance of ratio 2:1 similar to the findings of others<sup>3,7,8,9</sup>. This has been related to the greater degree of freedom and stimulus to aggressiveness given to boys in all societies<sup>8</sup>. Ocular trauma was more common among the 6-10 years age group and this is also similar to findings in other countries<sup>8,10,11</sup>. According to Glynn the estimated risk of sustaining ocular trauma increases by 80% when comparing older persons to those who are 10 years or younger<sup>12</sup>.

In our study the right eye was involved in 55.4% of cases which was similar to the findings of Thompson et al<sup>13</sup> but in contrast to the findings of Dasgupta et al<sup>8</sup> and Koval<sup>14</sup> who found that the left eye was more affected<sup>8,14</sup>. The difference may be related to the socioeconomic conditions and the larger sample size in our study. Closed globe injuries were found to be commoner than open injuries in this study, as previously reported by Ching who found close globe injuries in 78.1% of his case<sup>9,15,16</sup>.

Like in other studies, stick was the most common cause of injury<sup>8,10,16</sup>. Many of these occurred while the children are being reprimanded for erring either at home or in schools<sup>16</sup>. Hence teachers, parents and caregivers should be taught to be extremely careful to avoid the face or hands held close to the face in beating erring children. If anything, corporal punishment should be administered on the buttocks and legs. Of note is that bomb blast, bows and arrows, and toys reported by some authors are not found in this study,<sup>7,8</sup>. Also broomstick injury is much more dangerous because majority of cases presenting with this actually developed endophthalmitis before presentation. This is not unexpected since the broom has been used to sweep dirt's making it contaminated in most cases. Unlike developed countries, only 24% presented within twenty-four hours of injury, a factor that has been found to affect prognosis and visual outcome<sup>10</sup>. Health education of school chil-

dren, teachers and parents will go along way in helping to correct this.

A high default rate was noted in this study, hence ophthalmologists and other eye care workers need to educate the masses on the danger of this and increase awareness on problems associated with ocular trauma among children. We therefore conclude that intensifying health education to the children and their teachers and intensive parental education will go a long way in reducing ocular injuries and vision loss in children.

#### Authors' contribution

BOT: Conception and design of study

AAD: Data analysis

AOA: Data collection

**Conflict of interest:** None

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