

## ORIGINAL ARTICLE

## Pattern of Eye Injuries in Children in Benin City, Nigeria

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## ABSTRACT

**Background:** Ocular trauma is a leading cause of visual loss and blindness and though it affects all age groups, it remains a very important cause of monocular blindness amongst children

**Objective:** The aim of this study is to determine the pattern, causes and visual outcome of ocular injuries among children aged 15 years and below.

**Methodology:** A 3-year retrospective study was carried out in the Eye Department of University of Benin Teaching Hospital, Benin City, Edo State, Nigeria from January 2009 to December 2011. The information retrieved included age, gender, type of injury, cause of injury, location where injury occurred, eye involved, time of presentation at the hospital following injury, presenting visual acuity and visual outcome after treatment.

**Results:** Fifty-four children made up of 64.8% males, with a male:female ratio of 1.84:1, were managed for eye injuries. Majority of the eye injuries were lacerations (50%). Sharp objects were responsible for 53.7%, followed by blunt objects 31.5%. Injury in the home constituted 72.2% of all injuries, while those sustained in school were 22.2% and the left eye was more affected (57.4%). Seventy-four percent (74%) presented within one week of eye injury, with 37% presenting within the first day. There was vision in 98.1% of the children prior to occurrence of injury, but visual outcome was good in only 9.3% after 6 months of treatment.

**Conclusion:** Most of the accidents in this study occurred at home. There is a need to supervise children as much as it is possible when playing at home. It is also important to educate parents and caregivers on the likely risk of injury that could occur at home and how to prevent it.

**Keywords:** Accident, domestic, injuries, ocular, playing

## INTRODUCTION

Ocular trauma is a leading cause of visual loss and blindness and though it affects all age groups, it remains a very important cause of monocular blindness amongst children.<sup>1,2</sup> Children account for between 20% and 50% of all ocular injuries.<sup>3,4,5</sup> In general, children are more susceptible to eye injuries because of

their immature motor skills, limited common sense, tendency to imitate adult behaviour without evaluating risks, lessened emotional control, relative ignorance and natural curiosity.<sup>6</sup> They are also at risk because of their relative inability to detect and avoid hazards.<sup>7</sup>

Studies have shown that ocular trauma tends to occur more at home and during unsupervised play followed by in school.<sup>8,9,10,11</sup> Trauma occurs more commonly in boys than girls.<sup>8,9</sup> In a study on ocular trauma in Benin City, the most common causes of ocular injuries were sticks and stones.<sup>8</sup> In another study on children admitted in Wills Eye Hospital Philadelphia, USA the most common cause was sporting activity.<sup>9</sup>

Visual outcome has been found to be dependent on the type of injury, its severity and the initial visual acuity at the time of presentation at the hospital following the injury.<sup>6</sup> In an epidemiological study carried out in Northeastern Colombia, severe visual impairment and blindness were caused mainly by open-globe injuries.<sup>6</sup>

The aim of this study is to determine the pattern and causes of ocular injuries among children seen in the University of Benin Teaching Hospital, Benin City, Nigeria, a tertiary health facility which serves Edo and other surrounding States. It will also determine the visual outcome, and make recommendations on the prevention of blindness from ocular trauma. This will help in creating awareness of preventive measures to be taken in order to avoid ocular trauma in children.

#### METHODOLOGY

A three year retrospective analysis was carried out in the eye department of University of Benin Teaching Hospital, Benin City. The case notes of all children 15 years and below managed for ocular injury from January 2009 to December 2011 was documented. Data that were collected included age, gender, type of injury, cause of injury, location where injury occurred, eye involved, time of presentation at the hospital following injury, presenting visual acuity and visual outcome after treatment.

Frequency distribution tables were generated for all data collected, and the ranges and means were determined. Data collated were analyzed using *Statistical Package for Social Sciences* (SPSS) 15. The relationships between categorical data were analyzed using *Chi-square* ( $\chi^2$ ) test. At the adopted confidence level of 95%, a *p-value* of 0.05(5%) or less was regarded as significant.

#### RESULTS

A total of 54 children were managed for eye injuries in the Ophthalmology Unit of the University of Benin Teaching Hospital (UBTH), between January 2009 and December 2011. There were 35 (64.8%) males and 19 (35.2%) females, giving a male: female ratio of 1.84: 1. The age and sex distributions are shown on *Table 1*.

**Table 1.** Age and Sex Distribution

Age Group (Yrs)	Number of Patients		Total (%)
	Male	Female	
0-3	2	6	8 (14.8)
4-7	17	5	22(40.7)
8-11	9	7	16(29.6)
12-15	7	1	8 (14.8)
<b>Total</b>	<b>35</b>	<b>19</b>	<b>54(100)</b>

$$\chi^2 \text{ (Fischer's exact)} = 8.705, df = 3, p = 0.03$$

The age range was 7 months -15 years with a mean age of 7.3 years  $\pm$ 3.89 years (SD). The peak age for occurrence of ocular injury in this study was 4-7 years accounting for 22 patients (40.7%). The peak age among the males was 4-7 years while among the females it was 8-11 years. This relationship was statistically significant (*p value* 0.03). Majority of the patients were in primary school 24 (44.4%) followed by secondary school 10 (18.5%), kindergarten 8 (14.8%) and pre-kindergarten 3 (5.6%).

Injuries from sharp and blunt objects were common to all age groups, with the age group 0-3 years having the highest proportion of injuries caused by sharp objects (62.5%) and the age group 8-11 years having the highest proportion of injuries caused by blunt objects (43.8%).

**Table 2.** Cause of injury related to Age

Cause of Injury	Age Group				Total
	0 - 3	4 - 7	8 - 11	12 - 15	
Sharp objects	5 (62.5)	13 (59.1)	7 (43.8)	4 (50.0)	29 (53.7)
Blunt objects	2 (25.0)	5 (22.7)	7 (43.8)	3 (37.5)	17 (31.5)
Burns	1 (12.5)	0 (0.0)	1 (6.2)	1 (12.5)	3 (5.6)
Others	0 (0.0)	1 (4.5)	1 (6.2)	0 (0.0)	2 (3.7)
Not known	0 (0.0)	3(13.6)	0 (0.0)	0 (0.0)	3 (5.6)
<b>Total</b>	<b>8 (100)</b>	<b>22 (100)</b>	<b>16 (100)</b>	<b>8 (100)</b>	<b>54(100)</b>

$\chi^2$  (Fischer's exact) = 13.329, df = 15, p = 0.531

Chemical burns from caustic soda were found only in the age group 0-3 years (12.5%) while burns from other sources such as thermal injury were found in the age group 8-11 years (6.2%), and 12-15 years (12.5%). These relationships were not statistically significant (p 0.531), as shown in Table 2.

**Table 3.** Place of injury

Place of Injury	Frequency(n=54)	%
Home	39	72.2
School	12	22.2
Farm	2	3.7
Road	1	1.9
<b>Total</b>	<b>54</b>	<b>100</b>

Majority of ocular injuries occurred in the home environment in 39 patients (72.2%),

followed by the school, 12 patients (22.2%). Table 3 shows the location where injuries occurred.

**Table 4.** Time of presentation at hospital following injury

	Number of patient	Percent %
Within a day	20	37.0
> 24 hours to 1 week	20	37.0
> 1week to 1 month	8	14.8
> 1 month to 1year	4	7.4
>1 year	2	3.7
<b>Total</b>	<b>54</b>	<b>100</b>

The left eye was more affected in most injuries, 31 patients (57.4%), compared to the right eye in 23 (42.6%). As shown in Table 4, only 20 (37%) presented within 24hours of occurrence of injury.

Vision was present in 53 (98.1%) prior to injury, and Table 5 shows visual acuity at presentation and after treatment. At presentation, 2 (3.7%) had good visual acuity, 4 (7.4%) had visual impairment, 10 (18.5%) had severe visual impairment and 38 (70.4%) were blind (WHO definition). After six months, only 5 patients (9.3%) had good visual outcome.

Table 5 shows the sequelae of ocular injury at presentation. Most of the eye injuries seen were lacerations accounting for 25 patients (48.1%), followed by blunt injuries in 22 (40.7%).

**Table 5.** Sequelae of ocular injury

Injury	Frequency	Percent %
Corneal/scleral lacerations	25	44.4
Traumatic cataract	9	16.7
Hyphaema	5	9.3
Traumatic iritis	5	9.3
Abducens palsy	1	1.9
Broomstick orbital cellulitis	1	1.9
<b>*Corneal pathologies</b>	<b>3</b>	<b>7.6</b>
Foreign body	1	1.9
Lower lid laceration	1	1.9
Subconjunctival haemorrhage	2	3.7
Ruptured globe	1	1.9
<b>Total</b>	<b>54</b>	<b>100</b>

*\*Corneal opacity with adherent leucoma, corneal ulcers*

**Table 6.** Visual acuity at presentation and post-treatment

	At Presentation (%)	After treatment (%)	6 months after treatment (%)
<b>Visual Acuity</b>			<b>Affected Eye</b>
6/5 - 6/18	2 (3.7)	3 (5.6)	5(9.3)
<6/18 - 6/60	4 (7.4)	3 (5.6)	3 (5.6)
<6/60 - 3/60	10 (18.5)	9 (16.6)	6 (11.1)
<3/60-LP	32 (59.3)	33(61.1)	33(61.1)
NPL	6 (11.1)	6 (11.1)	7 (12.9)
<b>Total</b>	<b>54 (100)</b>	<b>54 (100)</b>	<b>54 (100)</b>

CF = Count Finger LP= Light Perception  
NPL= Nil light perception

**DISCUSSION**

This study has revealed, like previous studies, that more males (64.8%) are affected than females, with a ratio of 1.84:1.<sup>5,8,11,12</sup> This is not surprising, as males are usually more active and engage in outdoor activities and more aggressive play. The age that was most affected was 4-7 years (40.7%) and they were all at the primary level of education. This was also found in other studies.<sup>6,8,12</sup>

The most common cause of ocular injury in this study across all the age groups was sharp object (53.7%). This was similar to findings by Otoibhi and Osahon, although in a study carried out at the University of Nigeria Teaching Hospital, Enugu blunt injury was the most common cause.<sup>8,12</sup> This implies the need for sharp objects such as broomsticks, pencils, pens, knives, nails, hooks and dangerous toys to be kept out of the reach of younger children in order to prevent ocular injury, and the need to educate the older children on the safe use of these objects.

It is rather disturbing, that majority of injuries occurred at home (72.2%), as in previous studies.<sup>6,8,13</sup> This buttresses the necessity of creating awareness among parents and caregivers of the increased risk of ocular injury at home as well as the precautions which need to be taken to prevent such injuries.

The left eye was more involved (57.4%). This is almost the same as that found by Okoye<sup>14</sup> at Enugu. This may be because the left eye is more likely to be hit when slapped with the right hand or when hit with a cane by a person who is right-handed.

Thirty-eight eyes (70.4%) were found to be blind (WHO definition) at presentation, while 40 (74%) remained blind after treatment. This shows the high risk of visual loss associated with ocular trauma, and this is avoidable blindness that is preventable.

Corneal/corneo-scleral laceration was the most frequent diagnosis at presentation and this was similar to the findings in previous studies.<sup>6,8</sup> However, Onwasigwe differed as he found traumatic cataract to have the highest frequency.<sup>12</sup>

#### CONCLUSION

Since most injuries occurred at home and while playing, there is a need for children to be supervised as much as possible while they are playing.

Parents, teachers and caregivers must be educated on the need to create a safe environment for children. Dangerous objects should be taken out of the reach of younger children as much as possible, and children should also be educated on the inherent dangers of playing with stones, dangerous toys and sharp objects. The home environment should be made safe and accident free.

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