Original Article

# Epidemiological Survey of Traumatic Eye Injury in A Southwestern Nigeria Tertiary Hospital

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**Purpose:** To evaluate the prevalence, pattern and causes of ocular trauma in Nigerians.

**Material and Methods**: This is a prospective hospital based study over a 15 month period. Eighty five patients of all ages presenting with acute eye injuries to one or both eyes were included. Patients who had healed ocular trauma or had been given surgical treatment for trauma elsewhere were excluded from this study. All patients with eye trauma seen within this period were included in the study, relevant data was recorded with a structured questionnaire and analysed with SPSS version 13.

**Results**: There were 91 eyes of 85 patients which constituted about 4% of all new patients seen over the study period. Male to female ratio was 2:1 with age ranged between 4 years and 78 years (mean = 31.7 ± 19.7 years). More than half of the patients (53.1%) were in the working age group of 20–60 years. Two-third presented to the clinic after 24 hours of injury with about 43.5% presenting with blindness in the affected eye. Of the patients, 69.4% had applied various forms of medication before presentation. Closed globe injuries accounted for 87% of all injuries with occupational and leisure activities constituting a greater proportion of the activity at the time of injury. Majority (98.8%) of the patients were not wearing any protective device at the time of injury.

**Conclusion:** Ocular injuries affected mostly the economically active age group. Most injuries were either occupational related or related to play or assaults. Many patients engaged in some form of self-care before presentation.

**Key words:** Ocular trauma, open globe injury, blindness.

Ocular trauma is an important cause of visual impairment[1] and a leading cause of preventable uni-ocular blindness world wide.[2] It is an important cause of utilization of ophthalmic service resources.[3]

It has been rated as the third most common ophthalmic indication for hospitalization in the United States.[4] Even the most minor injuries can cause pain and discomfort, lost wages and health care expenses.[5] In Nigeria, ocular injuries are still rampant[6]. There are varying pattern and causes of ocular injuries from one country to another and even within regions in the same country. Many studies however report higher prevalence of eye injuries among males when compared with their female counterparts.[7,8] Most cases of trauma are avoidable.[9] Visual outcomes following eye injuries vary from full recovery to complete blindness with physical and psychological loss and enormous costs to society.[10] Blindness from trauma could be as a result of the direct impact of the trauma as well as the appropriateness and timeliness of the treatment technique utilized. Knowledge of the pattern and causes of eye trauma in this environment will help to know the common causes as well as get the facts necessary for health education materials for planning of preventive actions as well as need to seek

early and appropriate intervention for eye injuries when they occur.

## MATERIAL AND METHODS

A prospective observational study of all consecutive cases of trauma was seen at an eye care centre over a 15 month period from January 2012 to March 2013. Eighty five patients presenting with eye injuries were included. This included patients of all ages with acute injury to one or both eyes. Patients who had healed ocular trauma or had been given surgical treatment for trauma elsewhere were excluded from this study. A questionnaire was administered to each respondent by face to face interview. The interview was conducted in English language, with language translation into Yoruba when necessary. The interview elicited information on the following: Demographic data, affected eye, agent of injury, activity at time of injury, duration before presentation, associated injury, medication used, source of referral and protective spectacle wear at the time of injury. All the patients had their visual acuity checked with the Snellens chart (or illiterate E chart) placed at 6 metres. Visual acuity in the better eye of 6/6 – 6/18 was considered to be normal; < 6/18 - 6/60 was classified as visual impairment and < 6/60 – 3/60 as severe visual impairment while visual acuity less than 3/60 was classified as blindness. Eye examination was carried out with the aid of a pentorch, a slit lamp biomicroscope and a direct ophthalmoscope. Dilated examination with indirect ophthalmoscopy was carried out on those with poor view from hazy media. Ocular ultrasound was done for those with closed globe injuries when the view of the fundi was precluded by hazy media. Intraocular pressure check was conducted with the aid of goldman applanation tonometer for cooperative patients with closed globe injuries.

Data was recorded and all statistical analyses were performed with commercially available computer program, Statistical Package for Social Science (SPSS) version 13.0. Data are expressed as Mean ± Standard Deviation (SD) and frequency expressed as a percentage. The relationships between categorical data were analyzed using Chi- square ($X^2$) test. At the adopted confidence level of 95%, P value of 0.05 (i.e. 5%) or less was considered to be significant. Yates's corrected chi-square and the appropriate Fisher's exact p value were used where the value of any cell was less than 5.

## RESULTS

Ninety one eyes of eighty five patients were seen during this study period with their ages ranging from 4 years to 78 years and a mean age of 31.7 ± 19.7 years. This constituted 3.8% of all the outpatients seen in the clinic during the study period. Eighteen (21.2%) were children while 67 (78.8%) were adults with 45 (53.1%) of these aged between 20 – 60 years. There were more males than females across the age groups with a male to female ratio of 2:1. The affectation was unilateral in 79 patients (93%) (39 on the left and 40 on the right) and bilateral in 6 (7%). There was associated injury involving the head in 1 patient (1.2%), and face in 8 (9.4%). There were no associated injuries in 76(89.4%). The activities at the time of injury are as shown in Table 1 below. Injuries were work-related in 34 (40.0%). Open globe injuries occurred in 11 (12.9%) of the subjects while a larger percentage 74 (87%) had closed globe injuries. There were no cases of retained intraocular foreign bodies. Majority 84 (98.8%) of the patients were not wearing protective eye spectacle at the time of injury. The commonest agent of injury was non-organic matter in 49 (57.6%) of the subjects, another 32 (37.6%) was due to injury from organic matter as shown in Table 2. Table 3 shows that only 20 (23.5%) of the patients presented within 24 hrs of injury. Visual acuity at presentation was less than 6/60 in 37 (43.5%) of the affected eyes of the patients. Other details are as shown in Table 4. Majority of the patients 60 (70.6%) self presented to the hospital without any referral letter. The significant eye findings at presentation are as shown in Table 5. The types of medications applied to the eyes before presentation are as shown in Figure 2. 58 (68.2%) of the patients had medical intervention while 27 (31.8%) had surgical intervention.

## DISCUSSION

Traumatic eye injuries have been found to be a common phenomenon in developing countries like ours[11]. They are an important cause of utilization of ophthalmic service resources.[4,12] In this study, there were 2 times more males than females. This finding is in line with previous reports stating that there is a higher involvement in trauma among the male gender because the males are more active and engage in a lot more outdoor and risk – ladened activities than their female counterparts.[5,13,14] More than half of the study population were aged between 20 – 60 years. These are mostly people in the active and economically productive age similar to the findings by some other

authors.[5,15-17] The greater percentage of unilateral cases than bilateral suggests a reason why trauma has been found to be the commonest cause of unilateral blindness. There was no left-right preponderance in the eye affected contrary to studies where the left eye has been found to be more commonly affected compared with the right.[14,18] There were many more cases of closed globe injuries (87%) in this study with the impact of trauma extending from the surrounding eyelid to the retina. A similar finding has been reported by other authors in other regions of the country.[15,16,19] In a study in Pakistan closed globe injuries were also reported to be commoner accounting for 50.6% of cases.[20] A possible explanation to this is the fact that most of the agents of injuries are possibly blunt objects like fist / finger and other non organic and organic matters. Near half (43.5%) of the patients were blind in the affected eye at presentation while another (9.4%) had low vision. All these patients claimed to have normal vision in the affected eye before the injury. This reinforces the possibility of variable effects of injuries to the globe. The effect of trauma on the eye may vary with the agent of injury, impact site and force as well as timeliness and appropriateness of interventional measures. It may also vary with the type and appropriateness of protective eye device worn at the time of injury. Only one (1.2%) of our patients was wearing a protective eye device at the time of injury. There could also be concomitant injuries to other surrounding structures

**Table 1:** Activity at the time of injury

| | |
|---|---|
| Play | 12 (14.1) |
| Fight / assault | 15 (17.6) |
| Domestic chores | 03 (3.5) |
| Farmwork | 16 (18.8) |
| Road traffic accident | 17 (20) |
| Workshop | 18 (21.21) |

**Table 2:** Agent of injury

| Agent of Injury | Frequency N (%) |
|---|---|
| Organic Matter | 32 (37.6) |
| Non-organic Matter | 49 (57.6) |
| Not known | 4 (4.8) |
| Total | 85 (100) |

**Table 3:** Duration before presentation

| Duration | Frequency N (%) |
|---|---|
| < 24 hours | 20 (23.5) |
| 24 - 72 hours | 13 (15.3) |
| 72 hours - 1 week | 15 (17.6) |
| > 1 week | 37 (43.5) |
| Total | 85 (100) |

**Table 4:** Visual acuity at presentation

| Visual Acuity | Other Eye N (%) | Affected Eye N (%) |
|---|---|---|
| 6/18 - 6/24 | 68 (80) | 40 (47.1) |
| >6/18 - 6/60 | 12 (14.1) | 8 (9.4) |
| ≤3/60 | 4 (4.7) | 26 (30.6) |
| NLP | 1 (1.2) | 11 (12.9) |

**Table 5:** Examination findings at presentation

| | |
|---|---|
| Lid laceration | 5 (5.9) |
| Subconjunctival hemorrhage | 13 (15.3) |
| Cornea foreign body | 9 (10.6) |
| Cornea/corneoscleral laceration | 11 (12.9) |
| Cornea infiltrates | 5 (5.9) |
| Cornea ulcer | 17 (20) |
| Hyphema | 8 (9.4) |
| Mydriasis | 7 (8.2) |
| Cataract | 12 (14.1) |
| Ruptured lens | 4 (4.7) |
| Subluxated lens | 1 (1.2) |
| Commotio retina | 1 (1.2) |
| Retinal detachment | 1 (1.2) |
| Disc edema | 1 (1.2) |

like the face and head as shown in our study and also in a study on maxillofacial injuries in Abuja[21] Many injuries were occupationally related (44.7%) occurring either in a workshop (24.7%) or during farmwork (20.0%). Work related eye injuries have been found to constitute a substantial proportion of eye injuries.[22,23] They are found to be largely preventable especially if adequate eye protections are worn and appropriate guards are positioned over obvious hazards.[24] Some injuries were related to leisure activities like playing (14.1%) or fighting (17.6%) similar to the finding by Desai et al[25] where they observed that domestic and leisure activities were common causes of ocular trauma especially in women and children. Domestic related eye injuries were however very few (3.5%) in this study just like it constituted 4.85% (100 out of 2061) of all ocular emergencies seen in a study in Iran.[26] Contrary to a study in another region of the country where it was reported as the commonest cause of eye injury accounting for 55 eyes out of 230 eyes. A study in south Nigeria reported assault as the commonest source of injury accounting for 62.2% of cases of eye injuries.[27] More than half of the patients presented after 24 hours of injury. This shows a late pattern of presentation among our patients. The reasons for late presentation were not determined in this study however we discovered that many of our patients 59 (69.4%) had utilized one form of selfcare or the other before presentation to our centre. Top on the list of this self care materials was antibiotics in 32 (37.6%) of the patients. Other things utilized are as shown in figure 2. This may contribute to delayed presentation by the patients. Other factors that may contribute to delayed presentation include awareness of existing eye care facilities, proximity to eye care facility and cost of care. The modality of management could vary depending on the extent and impact of trauma to the eye as shown in our study. As shown in Table 5 the impact of trauma to the globe were of varying extent from lid laceration (5.9%), subconjunctival hemorrhage (15.3%) cornea affectation in 49.4%, lens affectation in 18.8% and retina affectation (2.4%). About 32% had surgical intervention while the other larger group were managed medically as shown above. The determinants of modality of intervention include presence of foreign body as well as the violation of the structural and functional integrity of the wall of the globe.

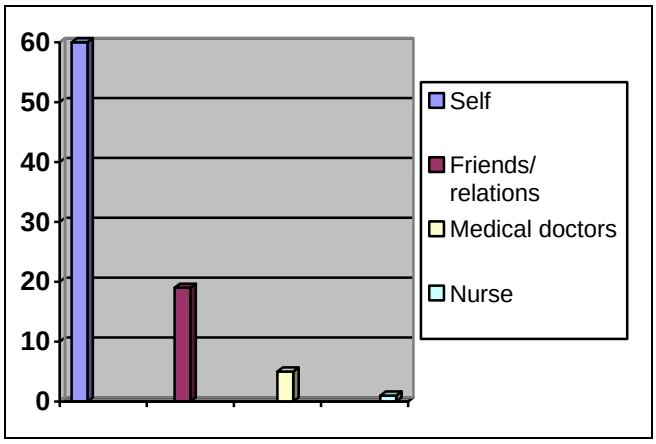


**Fig. 1:** Source of referral

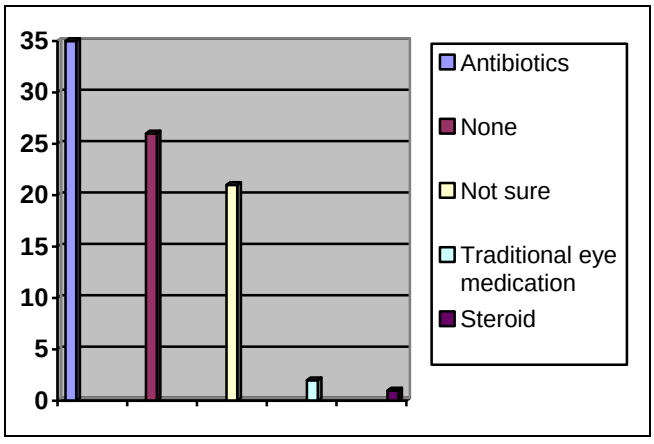


**Fig. 2:** Medications utilized before presentation

## CONCLUSION

Ocular injuries are still common in our community. The age group that are most predisposed are the working and economically active group. Most injuries were either occupational related or related to leisure activities like play or assault. Many of the patients engaged in some form of self care before presentation. Many of them presented to the clinic after 24 hours of injury with about 43.5% presenting with blindness in the affected eye.

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