

ORIGINAL RESEARCH ARTICLE

Ocular trauma in Birnin Kebbi, Nigeria

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Abstract

Aim. The aim of the study was to determine the patterns of ocular trauma among patients presenting at the Federal Medical Centre in Birnin Kebbi, Nigeria.

Methods. A 1-year retrospective review was undertaken of all patients presenting with ocular trauma to the Federal Medical Centre in Birnin Kebbi.

Results. Ocular trauma was observed in 89 of 1800 (4.9%) patients attending the eye clinic during the study period, with 65 (73%) being males and 46 (51.7%) being children aged 0–16 years. Of these 89 cases of trauma, 59 (66.3%) were caused by blunt and 30 (33.7%) by penetrating injuries, with a majority (61.8%) occurring in the home during weekdays. The greatest numbers of injuries were inflicted by sticks (25.8%) and stones (20.2%). The cornea was affected in 47.2% of cases. Prior to presentation, 79.8% of patients used eye drops purchased over the counter and 7% used a harmful traditional eye medication. Sixty per cent presented 1 week after the trauma took place. At presentation, 33.7% of patients were blind; causes of blindness were corneal scarring (in 34.5% of blind patients), bullous keratopathy (in 27.6%), corneal blood staining (in 10.3%), aphakia (in 6.9%) and retinal detachment (in 20.7%). Visual acuity at presentation ($P = 0.001$) correlated with visual acuity at discharge, when the proportion of patients who were blind remained at 32.6% ($P = 0.002$). A relationship was found between both age ($P = 0.017$) and occupation ($P = 0.000$) and the location in which the injury occurred, but this was not so for sex ($P = 0.069$). No relationships were found between age ($P = 0.286$), sex ($P = 0.502$) or occupation ($P = 0.637$) and the causes of ocular trauma. Age ($P = 0.354$) and sex ($P = 0.511$) showed no connection with the part of the eye affected; however, there was an association between the site of the injury and the patient's occupation ($P = 0.001$).

Conclusion. Ocular trauma remains a significant cause of preventable blindness in developing economies. Renewed efforts are required to reduce cases of blindness from ocular trauma, especially among males and among children during school holidays.

Introduction

Worldwide, ocular trauma remains a common cause of ocular morbidity. The pattern, however, varies between developed and developing countries, with the latter reporting a higher number of cases. Although both eyes account for just 4% of the face and 0.27% of the total body surface, it ranks only below the hands and feet as the most common site of injury.¹ Ocular trauma is more widespread in males than in females, owing to their more aggressive behavioural tendencies² and dominant nature. Certain occupations also present an increased risk of sustaining ocular trauma. Studies have shown that approximately half of all patients presenting at eye clinics in the UK exhibit eye injuries.^{3,4} The total cost of ocular trauma in the USA, including treatment, rehabilitation, care for dependants and loss of income, runs into millions of US dollars each year.⁵ However, over 90% of cases of ocular trauma are preventable.⁶ In order to develop preventative strategies, it is important that we understand the patterns of ocular trauma. This study was conducted to determine such patterns among patients at the Federal Medical Centre in Birnin Kebbi, Nigeria.

Materials and methods

This was a retrospective study, conducted between January 2011 and December 2011. It included patients with ocular trauma who presented in the accident and emergency ward and at the eye clinic of the Federal Medical Centre in Birnin Kebbi. The Federal Medical Centre is the only tertiary eye centre in Kebbi State, serving a population of around 3.2 million.⁷ It also acts as a referral centre for the surrounding states (Sokoto, Niger and Zamfara) and

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countries (Benin and Niger Republic). All patients' files were retrieved from the hospital's central medical records unit. The following information was extracted from the patients' records: age; sex; occupation; cause of trauma; treatment received before presenting at the hospital; visual acuity (VA) at presentation; associated ocular complications; treatment offered at the hospital; operation performed; complications arising during the operation; and VA as at the last hospital visit. Patients with incomplete hospital records were excluded from the study. The VAs of patients at presentation and at their last hospital visit were categorized as good (6/6–6/18), borderline (6/24–6/60) or poor (<6/60), using the World Health Organization Expert Group's recommendations on Blindness Prevention Outcomes.⁸ An eye was considered blind if the best corrected distance VA was worse than 3/60.

Data were analysed using SPSS 16.0 statistical software (SPSS Inc., Chicago, IL, USA) to determine simple descriptive statistics. Correlation analysis of initial and final VA was performed using Spearman's rank order correlation. Variables were further compared using chi-squared tests. *P*-values <0.05 were considered statistically significant.

Results

Ocular trauma accounted for 4.9% ($n=89$) of 1800 patients attending the Federal Medical Centre eye clinic during the study period. Fifty-six (62.9%) of these patients presented at the accident and emergency unit, and 33 (37.1%) at the general ophthalmology outpatient clinic. Sixty-five (73%) were males and 24 (27%) were females. The age range was between 1 year and 65 years, with a median of 16 years. The prevalence of ocular trauma was greatest in the 0–16 year age group (51.7% of all cases), with most of these cases occurring among schoolchildren (34.8% of all cases) (Tables 1 and 2). A relationship was seen between both age ($P=0.017$) and occupation ($P=0.000$) and the location of the injury, but not between sex and location ($P=0.069$). Blunt trauma accounted for 66.3% of injuries ($n=59$); the remaining 30 (33.7%) were penetrating eye injuries. Injuries to the right eye constituted 61.8% of cases. The injury was bilateral in one patient. Damage inflicted using sticks was the most common cause of ocular trauma, responsible in 25.8% of cases (Table 3). No relationships were found between age ($P=0.286$), sex ($P=0.502$) or occupation ($P=0.637$) and the causes of ocular trauma. Most injuries (61.8%)

occurred in the home (Figure 1), between 0800 h and 1200 h on weekdays. There were two peaks in incidences of ocular injury during the study period. The first peak occurred in March 2011 ($n=13$), and the second began in August 2011 ($n=9$) and was sustained through September ($n=10$) (Figure 2). The cornea was injured in 47.2% of patients, making it the most commonly affected anatomical site (Figure 3). There was no relationship between age ($P=0.354$)

TABLE 1 Age and sex distributions of patients presenting with ocular trauma

Age (years)	Sex		Total no. of patients
	No. of males	No. of females	
0–16	32	14	46
17–33	20	6	26
34–50	12	2	14
50+	1	2	3
Total	65	24	89

TABLE 2 Occupational distribution of patients presenting with ocular trauma

Occupation	No. of patients	% of total
School	31	34.8
Unemployed	22	24.7
Farmer	11	12.4
Business occupation	10	11.2
Housewife	9	10.1
Civil servant	6	6.7
Total	89	100.0

TABLE 3 Causes of ocular trauma

Cause of injury	No. of patients	% of total
Stick	23	25.8
Stone	18	20.2
Iron	10	11.2
Fist	8	9.0
RTA	7	7.9
Assault	7	7.9
Horsewhip	3	3.4
Rubber band	2	2.2
Nail	2	2.2
Ball	2	2.2
Others*	7	7.7
Total	89	100.0

RTA, road traffic accident.

*One (1.1%) each of gunshot, belt, rope, glass, comb, asbestos and bottle.

or sex ($P=0.511$) and the part of the eye affected; however, a relationship was found between the site of the injury and the patient's occupation ($P=0.001$).

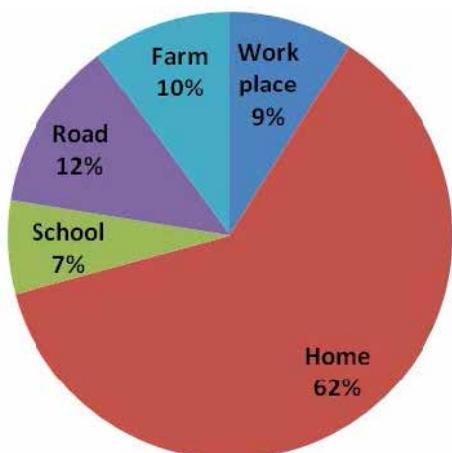


FIGURE 1 Distribution of ocular trauma by location in which the injury occurred ($n=89$).

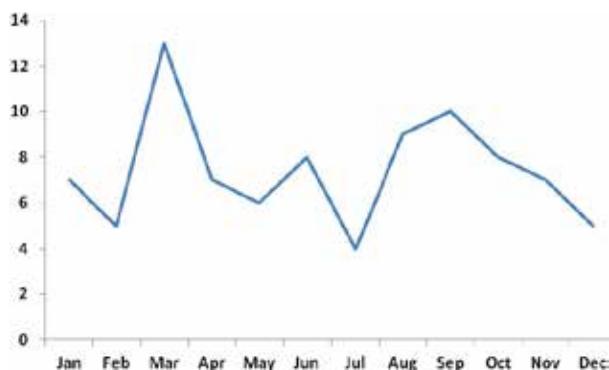


FIGURE 2 Frequency of ocular trauma by month.

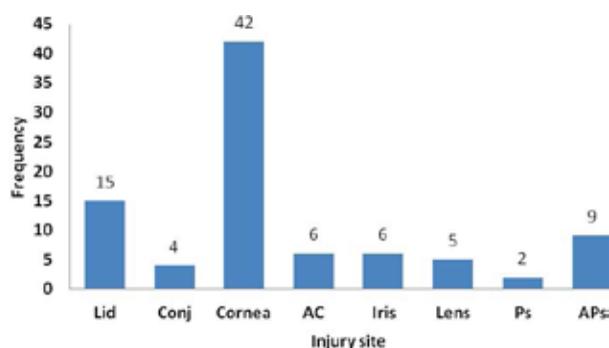


FIGURE 3 Distribution of ocular trauma by anatomical site. AC, anterior chamber; APs, anterior and posterior segment; Conj, conjunctiva; Ps, posterior segment.

Before presenting at the hospital, most of the patients (79.8%) used topical eye medications purchased over the counter. Seven per cent used a harmful traditional eye medication. Sixty per cent of patients did not present at the hospital until 1 week after the trauma. Thirty-six per cent were treated as inpatients; of these, 32.6% were admitted for <5 days. The most common complications following eye injuries were corneal abrasion (occurring in 19% of those with eye injuries) and hyphaema (occurring in 17% of those with eye injuries). The most common operation performed was for the purpose of foreign body removal (13.5% of all operations) VA at presentation was correlated with VA at discharge: of 30 patients (33.7% of all patients) who were blind at presentation ($P=0.001$), 29 (32.6% of all patients) remained blind at discharge ($P=0.002$) (Table 4). The causes of blindness included corneal scarring (in 34.5% of blind patients), retinal detachment (in 20.7%), bullous keratopathy (in 27.6%), aphakia (in 6.9%) and corneal blood staining (in 10.3%).

Discussion

The preponderance of male subjects to suffer ocular trauma, in this study, matches that observed in previous studies.^{9,10} This may be attributable to more aggressive tendencies among males compared with females. A majority of injuries occurred in patients under 16 years of age. This result differs from that reported by Okoye,⁹ who found that 65.9% of patients were in the active and economically productive age range of 16–65 years. This may be explained by differences in the sociocultural environments of the two societies in which the studies were conducted. However, the high proportion of children in the study group may reflect a lack of supervision of children at play, as well as the tendency among children to partake in risky activities. Ocular trauma may occur in either eye; however, the right eye was affected

TABLE 4 Visual acuity at presentation and at last hospital visit

VA	No. of patients (%)	
	At presentation	At last hospital visit
6/5–6/18	37 (41.6)	39 (43.8)
6/24–6/60	7 (7.8)	6 (6.7)
<6/60	30 (33.7)	29 (32.6)
Uncooperative	15 (16.9)	15 (16.9)
Total	89 (100.0)	89 (100.0)

in 61.8% of cases in this study. This is similar to figures reported in other studies, including those by Okoye⁹ and Omolase *et al.*,¹⁰ both in Nigeria, and by Mallika *et al.*¹¹ in Malaysia. The reason for this is a potential subject for another study. Around 62% of injuries occurred in the home, and this finding was similar to that of Mallika *et al.*¹¹ Sticks were the main cause of ocular trauma among patients at the Federal Medical Centre; this differs from the findings of Omolase *et al.*,¹⁰ who identified vegetation as the predominant cause. Only one patient in the present study suffered an ocular injury caused by a firearm. This may be attributed to the prevailing peace within the community during the study period.

Most patients in the study group presented with blunt trauma; in contrast, Okoye⁹ reported penetrating eye injury in a majority of cases. The high incidence of ocular injury among children in the present study is reflected by the increased numbers of injuries observed during the months of March, August and September, when schools are on holiday. The majority of patients (79.8%) used topical eye medications purchased over the counter before presenting at the hospital. This agrees with the findings of previous studies^{12,13} in developing countries. However, 7% of the study population used a traditional eye medication – a lower proportion than previously reported in the developing world.^{12,13} This may be a result of increased public awareness of the harmful effects of this traditional medication. Most of the patients came to hospital 1 week after sustaining their injuries. This is similar to the findings of Babar *et al.*¹⁴ in Pakistan, but contrasts with those of Omolase *et al.*,¹⁰ who reported that 37.9% of their patients presented within 24 hours. The late presentation may have contributed to poor visual outcomes following treatment, and is perhaps explained by the distance of the hospital from many of its patients, given that the Federal Medical Centre is the only tertiary eye hospital in the state. The importance of facility location was previously emphasized by Qureshi,¹⁵ who reported that the farther a patient lived from an eye care facility, the later they presented after injury. Twenty-nine of the patients in this study remained blind at his or her last hospital visit. This may be explained by many factors, including the severity of the ocular injury at first presentation, delayed presentation, and a lack of certain services such as corneal grafting and vitreoretinal surgery within the hospital.

Conclusion

Ocular trauma remains a significant cause of preventable blindness in developing economies. Renewed efforts are required to reduce cases of blindness from ocular trauma, especially among males and among children during school holidays. Early presentation for specialized eye care, and the avoidance of harmful self-medication, would improve visual outcomes in patients with ocular injuries.

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