

## Review of ocular trauma in Tamale Teaching Hospital, Tamale, Ghana

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### ABSTRACT

**Objective:** To establish the epidemiologic characteristics, referral pattern, interventions, visual outcomes and complications resulting in visual impairment/blindness among ocular trauma patients in Tamale Teaching Hospital (TTH) Eye Clinic, Tamale, Ghana.

**Materials and Methods:** This was a retrospective hospital-based case series in which all new patients of all ages with various eye conditions from 1<sup>st</sup> January to 31<sup>st</sup> December 2010 were reviewed from the outpatient/inpatient record books and the sex and age recorded. The files/ folders of patients with ocular trauma were selected and retrieved. The epidemiological characteristics, referral pattern, interventions, visual outcomes and complications resulting in visual impairment/blindness among ocular trauma patients were analysed.

**Results:** A total of 2,027 records of new patients with various eye conditions were retrieved. Three hundred and sixty one (377 eyes) new ocular trauma patients' files/ folders were analyzed. The Male: Female ratio was 1:1.1 ( $p=0.09$ ) for all new patients with various eye conditions whilst it was 1.8:1 ( $p<0.01$ ) for new ocular trauma patients. Ocular trauma patients were younger than general patients with 20 – 29 years age group having most new patients (27.4%) compared with the over 49 years age group for other new cases (23.4%). Approximately 68.4% of the ocular trauma patients were seen at TTH without a referral. Conjunctival lesions were the commonest finding affecting 124(32.9%) of the ocular trauma patients. The majority of patients 88.1% sustained closed globe trauma, 8.3% had adnexal trauma whilst 3.6% had open globe trauma. The commonest intervention rendered was medical treatment alone to 64.4% of the patients. By the WHO classification, majority 67.4% of traumatized eyes had normal vision, 13.9% were visually impaired and 18.7% were blind. Thus, 110 (32.6%) were visually impaired/ blind in the traumatized eye. The commonest complications resulting in visual impairment/ blindness were corneal opacities/ scars in 33(30.0%) cases.

**Conclusion:** Majority of ocular trauma patients presented with minor injuries which healed without complications. However, ocular trauma was a major cause of monocular blindness and visual impairment. Ocular trauma also tended to affect a younger age group and especially males compared to other eye diseases.

**Key words:** Ocular trauma, Epidemiology, Referral pattern, Intervention, Visual outcome, Complication

### INTRODUCTION

Ocular trauma can be defined as any injury to the eyeball, adnexa, orbital and/or periorbital tissues. It can be classified into closed globe injuries (contusions and lamellar lacerations), open globe injuries (globe rupture, penetrating injury, intraocular foreign bodies and perforations) and adnexal injuries. It may be due to direct contact with fixed or mobile object, blunt or sharp object, hot object, chemical substances, electrical power sources or radiation<sup>1, 2</sup>.

Ocular trauma is an important preventable cause of visual impairment and monocular blindness globally. Owens *et al*<sup>3</sup> carried out a statistical brief in the United States of America (USA) that compiled information from the Healthcare Cost and Utilization Project (HCUP) on Emergency Department (ED) visits related to eye injuries in 2008. There were about 636,619 ED visits related to eye injuries, a rate of 209 visits per 100,000 populations.

About 3.1% of patients seen in the ED for eye injuries were admitted to the hospital— compared to 8.1% of ED visits for all other types of injuries<sup>3</sup>. In a ten-year retrospective study done in New Zealand, the annual rate of ocular trauma was 20.5 per 100,000 populations<sup>4</sup>. In the Singapore Indian Eye Study, ocular trauma was reported in 5.1% of the study population, of whom 26.5% required hospitalization<sup>5</sup>. Cao *et al*<sup>6</sup> in China estimated that the annual incidence rate of hospitalized eye injury was 27.7 per 100,000. Ocular trauma accounted for 165 patients (1.03%) of 15,970 ocular patients seen at an Out Patient Department and Emergency in India<sup>7</sup>. Trauma to the eye is an important cause of visual impairment and monocular blindness. Trauma-related causes of visual impairment were corneal scars (80.0%, 4 eyes) and macula scar (20.0%, 1 eye). Whilst the trauma-related causes of blindness included corneal scars (30.0%, 3 eyes), phthisis bulbi (20.0%, 2 eyes), macular scar (30.0%, 3 eyes), and optic atrophy (20.0%, 2 eyes) as found in the Singapore

Indian Eye Study<sup>5</sup>. In 2012, there was a reduction in visual acuity of 37.7% of subjects following treatment after ocular trauma in South Africa<sup>8</sup>. A retrospective case series done in Kenya by Misa<sup>9</sup> showed that most injured eyes (81.5%) were blind at admission and 63.8% were blind at discharge.

In Africa, few studies have been published on ocular trauma. In a two year review of 5,416 patients, 220 (4.06%) had at least one form of ocular trauma or the other in Nigeria<sup>10</sup>. In another study in Nigeria, 1,508 new patients were seen out of which 149 presented with monocular blindness, giving an incidence of 9.9%. Very few studies have been done in Ghana on ocular trauma especially in the last five years. In a retrospective case series, Gyasi *et al*<sup>11</sup> found that ocular injuries (23.2%) were the second most common cause of destructive eye procedures. Eye injuries are a serious burden economically. Ocular trauma is an important cause of visual loss and is frequently preventable<sup>4</sup>. Even though there is high coverage of national health insurance scheme in Ghana; most patients still do not have health insurance and have to pay from their pockets to access health hence the need for preventive measures.

The purpose of this study was to determine the epidemiologic characteristics, referral pattern, interventions, visual outcomes and the complications resulting in visual impairment/blindness among ocular trauma patients in Tamale Teaching Hospital, Ghana. This study shall provide data on the epidemiologic characteristics and outcomes of ocular trauma and may help to facilitate the provision of integrated eye care, formulation and enforcement of safety strategies for the prevention of ocular trauma in Ghana.

## MATERIALS AND METHODS

This study was a retrospective hospital-based case series. The study population included all new patients with a diagnosis of ocular trauma, who attended the Tamale Teaching Hospital (TTH) Eye Clinic on out-patient basis or admitted at TTH eye ward from 1<sup>st</sup> January to 31<sup>st</sup> December, 2010. Missing records of patients with ocular trauma were excluded. The study setting is a university teaching and referral hospital located in Tamale, Ghana. Ghana's population based on the 2010 Census was 24,658,823 and that of the Northern Region, Tamale, was 2,479,461<sup>12</sup>. The Eye Clinic is run by an ophthalmologist, optometrists and ophthalmic nurses. Majority of the patients are from Tamale and are mostly Ghanaian with few foreigners. There are however other public and private eye clinics in the region.

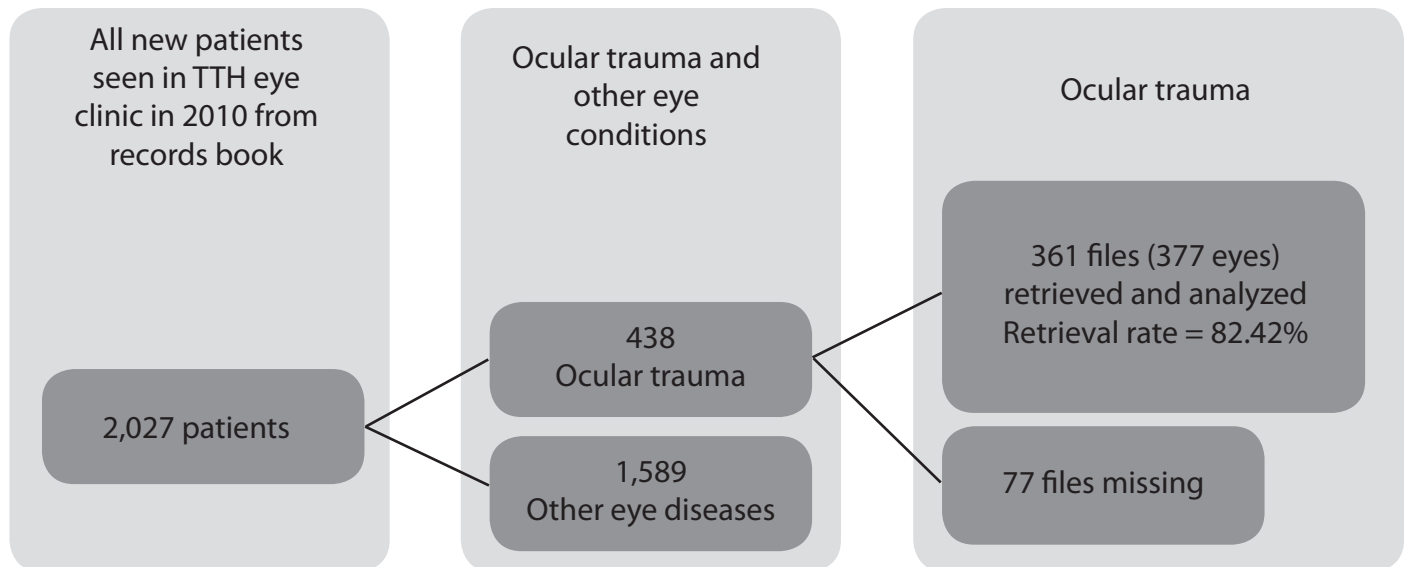
*Data collection procedure:* Data was collected by liaising with the medical information/record officers working at the records office. All new patients of all ages with various eye conditions from 1<sup>st</sup> January to 31<sup>st</sup> December 2010 were reviewed from the outpatient/inpatient record books and the sex and age recorded. The date of attendance/ hospitalization, name, age, and the patient number was obtained from the out-patient attendance record and the in-patient record book in the clinic and the ward, respectively. This information was then used to retrieve all new files at the medical information and records department. The patients' files which met the inclusion criteria were retrieved. The relevant data such as epidemiological characteristics, referral pattern, interventions, visual outcomes and complications of ocular trauma were reviewed, collected and entered into a structured questionnaire on perusal of the medical records. Any additional information or clarification was obtained from the medical staff where necessary.

*Data management and analysis:* Each questionnaire had a serial number which was the unique key identifier variable and each patient's medical record/file was linked to this serial number. A separate code book was used to store this information including the out-patient and in-patient numbers. Each questionnaire was cross checked for completeness after data collection for each day. The original medical record was used to fill in missing blanks. Data was validated prior to entry. Double entry of questionnaire into computer's Microsoft Excel data base 2010 was done to reduce errors. The data was then exported into STATA version 12 (Stata Corp, College Station, Texas) and analyzed with the help of a statistician. Descriptive analysis was done to determine the frequencies and proportions for the various variables (continuous/categorical) and presented in figures or tables where appropriate. Significant differences and associations were determined by p-values of less than 0.05.

## RESULTS

The total number of new patients with various eye diseases that attended the Tamale Teaching Hospital (TTH) Eye Clinic from 1<sup>st</sup> January to 31<sup>st</sup> December, 2010 was 2,027 from the outpatient and inpatient record books with 438 of them being of new ocular trauma patients. A total of 361 files for 377 eyes with ocular trauma were found giving a retrieval rate of 82.4%. A flow chart for the data collection is shown in Figure 1.

**Figure 1:** Flow chart showing the data collection of new patients' records reviewed at TTH Eye Clinic

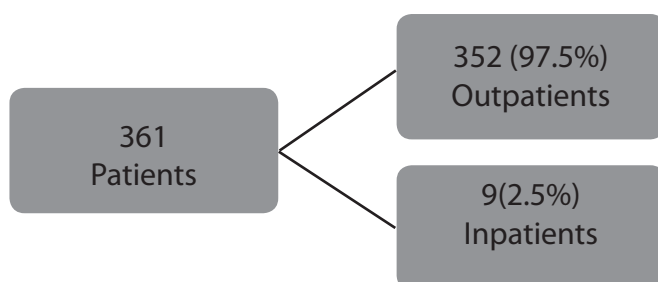


**Table 1:** Demographic characteristics of all new patients in TTH Eye Clinic, Ghana, 2010

Demographic characteristic	All new patients No. (%)	Ocular trauma patients No. (%)
<b>Sex</b>		
Male	971 (47.90)	224 (62.05)
Female	1026 (50.62)	128 (35.45)
Unrecorded	30 (1.48)	9 (2.5)
Total	2027 (100)	361 (100)
<b>Age group</b>		
0 – 9	302 (14.90)	61 (16.90)
10 – 19	327 (16.13)	53 (14.68)
20 – 29	386 (19.04)	99 (27.42)
30 – 39	334 (16.48)	76 (21.05)
40 – 49	204 (10.06)	38 (10.53)
>49	474 (23.38)	34 (9.42)
Total	2027 (100)	361 (100)

The male: female ratio of all patients attending TTH Eye Clinic with various eye conditions was 1:1.1 ( $p=0.09$ ) and that for ocular trauma patients was 1.8:1 ( $p<0.01$ ). Majority of patients with various eye conditions were older than 49 years whilst ocular trauma patients were mainly in the 20 – 29 year age group as shown in Table 1. Most patients were treated on outpatient basis as shown in Figure 2.

**Figure 2:** Flow chart showing inpatient and outpatient distribution



**Table 2:** Characteristics of ocular trauma patients

Characteristics	No. (%)
<b>Occupation</b>	
Child/ Student	127 (35.18)
Manual	100 (27.70)
Farmer	40 (11.08)
Professional	38 (10.53)
Unrecorded	30 (8.31)
Unemployed	22 (6.09)
Retired	4 (1.11)
Total	361 (100)
<b>Place of residence</b>	
Urban	253 (70.08)
Rural	84 (23.27)
Unrecorded	24 (6.65)
Total	361 (100)
<b>Education level</b>	
Unrecorded	137 (37.95)
No formal education	70 (19.39)
Tertiary	63 (17.45)
Pre school	36 (9.97)
Primary	28 (7.76)
Secondary	27 (7.48)
Total	361 (100)

Table 2 shows, ocular trauma occurred commonly among children/ students. Most patients resided in urban areas. The educational level was unrecorded in the majority.

**Table 3:** Agents causing ocular trauma

Agent	No. (%)
Unrecorded	224 (59.41)
Organic*	60 (15.92)
Other**	58 (15.39)
Metallic***	22 (5.84)
Chemical****	13 (3.45)
Total	377 (100)

\*organic (stick, wood, broom stick, branch, twig, insect, goat horn, cow's kick), \*\*other (stone, sand, dust, knife, fist, blow, slap, fall, football, glass, bottle, rubber band, hot flame, air blast), \*\*\*metallic (nail, wire, bullet, pellet), \*\*\*\*chemical (acid, alkaline, gun powder shots)

Table 3 shows the agents causing ocular trauma was unrecorded in the majority of ocular trauma patients.

**Table 4:** Circumstance and place of ocular trauma

Ocular trauma patients	No. (%)
<b>Circumstance of ocular trauma</b>	
Unrecorded	175 (48.47)
Accidental	158 (43.77)
Attack/ Assault	28 (7.76)
Total	361 (100)
<b>Place of ocular trauma</b>	
Unrecorded	236 (65.37)
Home	55 (15.24)
Workplace	25 (6.93)
Farm	18 (4.99)
Road	17 (4.71)
School	10 (2.77)
Total	361 (100)

Table 4 shows, the circumstance and place of ocular trauma was unrecorded in the majority.

**Figure 3:** Referral pattern of ocular trauma patients (n = 361)

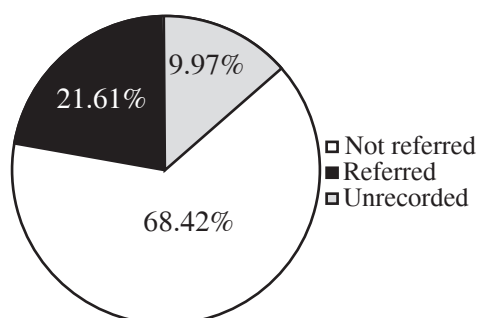
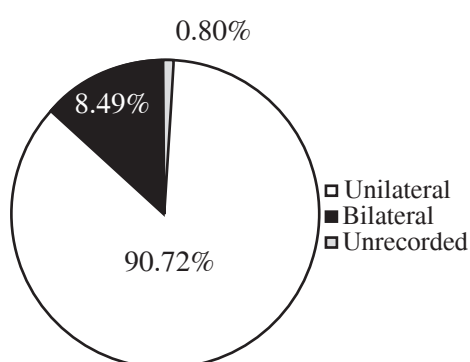


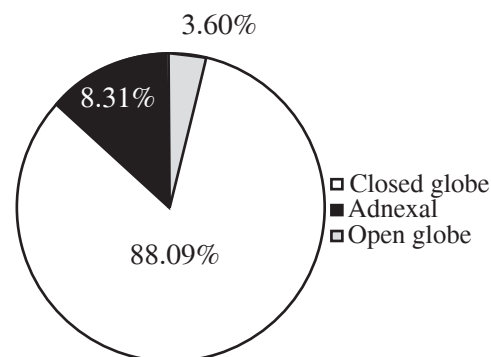
Figure 3 shows out of a total of 361, the majority, 247, of ocular trauma patients were seen at TTH without a referral.

**Figure 4:** Laterality of traumatized eyes (n = 377)



Unilateral ocular trauma was the commonest, 342, presentation as shown in Figure 4 above.

**Figure 5:** Distribution of patients by the type of ocular trauma sustained (n = 361)



Majority of ocular trauma patients sustained closed globe trauma, 318. Thirty had adnexal trauma whilst 13 had open globe trauma (Figure 5).

**Table 5:** Distribution of eyes by adnexa, orbit and globe findings

Ocular findings*	No. (%)
Conjunctival lesion	124 (32.89)
Ocular surface foreign body	85 (22.55)
Corneal epithelial defect/ ulcer	36 (9.55)
Cataract	30 (7.96)
Others**	24 (6.37)
Lid contusion	19 (5.04)
Corneal opacity/ scar	10 (2.65)
Uveitis	10 (2.65)
Lid laceration	9 (2.39)
RAPD	8 (2.12)
Hyphaema	7 (1.87)
Optic atrophy	6 (1.59)
Corneal perforation and uveal prolapse	5 (1.33)
Corneal perforation	4 (1.06)
Total	377 (100)

\*Most significant finding, \*\*Others include: Hypopyon, Phthisis bulbi, Endophthalmitis and Vitreous haemorrhage 3 (0.80%) each; Corneoscleral perforation and uveal prolapse, and Dislocated lens 2 (0.53%) each; Ptosis, Orbital fracture, Oclusio seclusion pupillae, Iridodialysis, Ruptured globe, Chorio retinal scar, Retinal detachment and macula hole, Retinal detachment and Vitro retinal haemorrhage 1 (0.27%) each.

Conjunctival lesions and ocular surface foreign bodies were the commonest findings at presentation following ocular trauma as shown in Table 5.

**Table 6:** Distribution of traumatized eyes by intervention rendered

Intervention*	No. (%)
Medical treatment alone	243 (64.46)
Removal of ocular surface foreign body	102(27.06)
Lid repair	10(2.65)
Cornea repair	5 (1.33)
Lens washout and primary intraocular lens implant	4 (1.06)
Primary evisceration	4 (1.06)
Uveal abscission and cornea repair	3 (0.80)
Anterior chamber washout	2 (0.53)
Lens washout	2 (0.53)
Lens washout anterior vitrectomy and primary intraocular lens implant	1 (0.27)
Cornea repair lens washout and anterior vitrectomy	1 (0.27)
Total	377 (100)

\*most significant intervention recorded

The most common intervention rendered to ocular trauma patients was medical treatment. One hundred and thirty four (35.5%) eyes had surgical intervention of which removal of ocular surface foreign bodies were the commonest as shown in Table 6.

By the WHO classification, majority of ocular trauma patients had normal vision at presentation whilst 110 (32.6%) were blind/ visually impaired in the traumatized eye. Patients who were blind in the affected eye following ocular trauma were more likely to come for follow up compared to those with normal vision ( $p<0.01$ ) as shown in Table 7.

**Table 7:** Distribution of visual acuity (VA) at presentation and up to 2 years of follow up

WHO classification	VA of eyes at presentation	BCVA at follow-up period (eyes)			
		3 Months	6 Months	1 Year	2 Years
6/6 - <6/18 (Normal vision)	227 (67.36%)	6 (21.43%)	5 (35.71%)	3(27.27%)	3(37.50%)
6/18 - <6/60 (Visual impairment)	41 (12.17%)	7(25.00%)	5 (35.71%)	3(27.27%)	0
6/60 - <3/60 (Severe impairment)	6 (1.78%)	1(3.57%)	0	0	0
3/60 – NPL (Blind)	63(18.69%)	14(50.00%)	4(28.57%)	5(45.45%)	5(62.50%)
Total	337 (100%)	28 (100%)	14 (100%)	11 (100%)	8 (100%)

**Table 8:** Distribution of traumatized eyes by complications that resulted in visual impairment/ blindness

Eyes	No. (%)
Corneal opacities/ scars	33 (30.00)
Other*	24 (21.82)
Cataract	20 (18.19)
Optic atrophy	14 (12.73)
Secondary glaucoma	11 (10.00)
Uveitis	8(7.27)
Total	110 (100)

\*Others include: Hypopyon, Phthisis bulbi, Endophthalmitis and Vitreous haemorrhage 3 (0.80%) each; Corneoscleral perforation and uveal prolapse, and Dislocated lens 2 (0.53%) each; Ptosis, Orbital fracture, Oclusio seclusion pupillae, Iridodialysis, Ruptured globe, Chorio retinal scar, Retinal detachment and macula hole,

Retinal detachment and Vitro retinal haemorrhage 1 (0.27%) each.

Table 8 shows corneal opacities/ scars were the most common complications of ocular trauma resulting in visual impairment/ blindness.

## DISCUSSION

In this study a total of 2,027 new patients with various eye conditions were seen out of which 438 were ocular trauma patients but 361 patients' files/ folders consisting of 377 eyes were retrieved and reviewed. The Male: Female ratio was 1:1.1 ( $p=0.09$ ) for all new patients with various eye conditions whilst it was 1.8:1 ( $p<0.01$ ) for new ocular trauma patients. There was no statistically significant difference among males and females attending the eye clinic with various eye conditions but in terms of ocular trauma males were more affected compared to females. This is in keeping with a study in the USA in 2011, where eye injuries were 1.7 times higher for males than females<sup>3</sup>. Momanyi<sup>13</sup> also found a higher male to female ratio of 2.5:1 in Kenya. These findings may be due

to the fact that generally males are usually more involved in adventurous activities and manual jobs.

Nearly a quarter, 474 (23.4%) of all new patients with various eye conditions were more than 49 years old, whilst a little more than a quarter 99 (27.4%) of ocular trauma occurred in the 20 – 29 year age group. The minimum age at which ocular trauma occurred was 0.4 years and the maximum age was 80 years. The median age was 26 years with an interquartile range, IQR, of 19 years. These findings are consistent with a study in Kenya where Momanyi<sup>13</sup> found the most common age group to be 21-30 years (28.4%) and a median age of 24 years. Also in South Africa, young patients between 21 and 30 years old incurred more ocular injuries (31.4%)<sup>8</sup>. Thus, the commonest age group within which ocular trauma occurred was in the prime age and this reduces the productivity of the individual and the families as a whole since such people turn to be the breadwinner of their families. Of concern is the age group 0-9 years, 61 (16.9%) because of the many disability adjusted life years (DALYs) ahead of them and they are also at high risk of developing amblyopia. This is similar to a South African study where 13.8% of patients incurring ocular injuries were children up to the age of 12 years<sup>8</sup>.

The vast majority of ocular trauma patients, 352 (97.5%), in this study were treated on outpatient basis whilst 9 (2.4%) were inpatient/admitted. This is consistent with a study in the USA where about 3.1% of patients with eye injuries were admitted to the hospital<sup>3</sup>. In this study, clients who had closed globe trauma were more likely to be treated on outpatient basis compared to those with open globe trauma ( $p < 0.01$ ).

In terms of occupation, ocular trauma occurred commonly among children/ students, 127 (35.2%) and manual workers, 100 (27.7%). This is in keeping with a study in Kenya where children/ students were commonly affected, 63 (55%)<sup>13</sup>. Majority, 253 (70.1%) of ocular trauma patients resided in urban areas and a few 84 (23.3%) in rural areas. This may be explained by the fact that the study was carried out in an urban hospital. The agent, the circumstance and the place of ocular trauma was unrecorded in the majority 137 (38.0%) patients, 242 (59.4%) eyes, 175 (48.5%) patients and 236 (65.4%) patients, respectively. This reflects poor records/ clerking of patients and one cannot make any meaningful inferences with regards to these variables.

Majority, 247 (68.4%), of ocular trauma patients were seen at TTH without a referral whilst 78 (21.6%) were referred after first aide and/or treatment at other health facilities.

Unilateral eye trauma was the commonest 342 (90.7%) whilst both eyes were injured in 32 (8.5%) ocular trauma patients due to hot flames, chemical burn, air blast and accidental gun powder shots. This is consistent with a study in South Africa where unilateral injuries were more frequent than bilateral injuries (97.5% versus 2.5%, respectively)<sup>8</sup>. The right eye was most often injured compared to the left, 177 (47.3%) and 165 (44.1%), respectively. This is in keeping with a study in Nigeria where the right eye was involved in 60 (45.5%) subjects, the left eye in 59 (44.7%) cases and bilateral in 13 (9.9%)<sup>14</sup>.

Majority of ocular trauma patients sustained closed globe trauma, 318 (88.1%). Thirty (8.3%) had adnexal trauma whilst 13 (3.6%) had open globe trauma. This agrees with studies in Nepal where the commonest type of trauma was closed globe injury 784 (73.3%) and open globe 57 (5.3 %),<sup>15</sup> in New Zealand where 253 open globe injuries (OGI) and 568 closed globe injuries (CGI) ( $p < 0.001$ ) were reported<sup>4</sup> and in India where closed globe injury was 41 (68.33%) and open globe injury 19 (31.67%)<sup>16</sup>.

Visual acuity at first presentation was recorded in 327 (90.6%) of ocular trauma patients. It was unrecorded in 29 (85.3%) of patients under 10 years. Clients from rural areas were more likely to have monocular visual impairment/ blindness, 24 (17.0%) ( $p < 0.01$ ) compared to those who came from urban areas. Nine out of 11 ocular trauma patients who had open globe trauma were immediately blind and none had normal vision on presentation. Two hundred and thirty two (70.1%) patients with normal vision after ocular trauma had closed globe trauma. This is in keeping with a study in Ethiopia where blindness was associated with open globe injury (85.2%,  $p < 0.001$ ) and rural residence (66.7%,  $P < 0.001$ )<sup>17</sup>.

Conjunctival lesions were the commonest, 124 (32.9%), findings in traumatized eyes at presentation followed by ocular surface foreign bodies 85 (22.6%) and cornea epithelial defects/ ulcers 36 (9.6%). In Nigeria, Emem *et al*<sup>10</sup> found that lid /conjunctival injuries were most common 85 (38.6%).

Three (0.8%) patients had endophthalmitis in this study, two were injured by organic matter (goat's horn and stick), and the other agent of trauma was unrecorded. They presented with a visual acuity of no light perception (NPL). Two were open globe and one was closed globe trauma. One had primary evisceration done whilst the other two developed phthisis bulbi.

The most common intervention rendered to traumatized eyes in our study was medical treatment alone, 243 (64.5%), of which topical antibiotics alone/ combination were the commonest, 360 (95.5%), followed by analgesics alone/ combination 170 (40.1%). This is consistent with a study in Ethiopia, where topical antibiotics and analgesics were the most common modality of treatment (63.4%)<sup>17</sup>. One hundred and thirty four (35.5%) eyes had surgical intervention of which removal of ocular surface foreign bodies were the commonest, 102 (27.1%).

Four (3.0%) patients had primary evisceration done in our study, the circumstance of ocular trauma was farming/ hunting. All of them presented with a visual acuity of no light perception (NPL). They included three corneoscleral perforations with uveal prolapse and one endophthalmitis.

By the WHO classification, out of 337 traumatized eyes (whose vision was recorded), majority 227 (67.4%) had normal vision. Forty seven (13.95%) were monocularly visually impaired and 63 (18.42%) were monocularly blind immediately after sustaining ocular trauma in this study. Patients who were monocularly blind following ocular trauma were more likely to come for follow up compared to those with normal vision ( $p < 0.01$ ). In a prospective observational study in Ethiopia, out of 254 new patients (265 eyes), about 81

(34.3%) injured eyes were blind and 35 (14.8%) were visually impaired<sup>17</sup>. Though, in our study, the accuracy of visual assessment might have been interfered by the failure to record visual acuity in 40 (10.6%) patients.

One hundred and ten eyes (32.6%) were visually impaired/ blind in the traumatized eye. The commonest complications resulting in visual impairment/ blindness were corneal opacities/ scars 33 (30.0%). Corneal opacities were the commonest post-treatment complication 14 (20%) among inpatients<sup>13</sup> and during follow up (45.6%)<sup>9</sup> in studies done in Kenya. Thus, corneal opacities/ scars commonly complicates ocular trauma and should be addressed adequately in the management of such patients.

Ocular trauma was a relatively common health problem especially among males in the economically active age group and a significant cause of monocular visual impairment/ blindness in TTH, Tamale, Ghana. Public awareness campaign on preventive measures need to be instituted to reduce the incidence and debilitating effects of ocular trauma as it has the potential of increasing the incidence of poverty in the community and the country as a whole because visual impairment/blindness from trauma has the potential to reduce ones productivity and that of the family as a whole since most affected persons turn to be the breadwinner of their families. Children with visual impairment/ blindness from trauma have many disability adjusted life years (DALYs) ahead of them and they are also at high risk of developing amblyopia.

## CONCLUSION

Ocular trauma was 1.8 times higher for males than females and almost half were in the economically active age group. Majority of ocular trauma patients were seen at TTH without a referral. The commonest intervention was medical treatment alone. Removal of ocular surface foreign bodies was the next most frequent intervention. Ocular trauma was a significant cause of monocular visual impairment/blindness though majority of ocular trauma patients had no complications due to ocular trauma.

## RECOMMENDATIONS

Proper documentation and record keeping is needed at presentation and follow up for proper management and as a reference for research, medico-legal purposes and compensation claims. There is the need for public awareness campaign on the prevention of ocular trauma as severe cases presents with poor vision with poor prognosis even with appropriate intervention.

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