



Ocular Injuries in a Tertiary Hospital

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Abstract

Background: Ocular injury is the commonest cause of uniocular visual loss and blindness which affects all ages.

Objective: To evaluate the mechanism, pattern and prevalence of ocular trauma at the eye clinic of ESUT Teaching Hospital.

Methodology: A two-year retrospective study of all the patients who presented with eye injury at the eye clinic from January, 2016 to December 2017. Information retrieved from the hospital records included patients' demography, causes of eye injury, pattern of ocular damage, affected eye and place of injury. Data was analyzed using SPSS version 21. A $p < 0.05$ was considered statistically significant.

Results: A total of 216 patients were reviewed, comprising of 55.1% males and 44.9% females (1.2:1). The subjects comprised of 29.6% of children (1 to 16 years) and 70.4% of adults (above 16 years) with a mean age of $28.7 \pm 1.25SD$ years. Subjects within age group of 21 to 40 years (39.8%) were mostly affected. The commoner mechanism of injury was assault related (64.8%). Most of the injuries occurred at home (50.9%) and were domestic related. Majority of the ocular damage were restricted to the anterior segment (86.6%). Unilateral ocular involvement was the vastly predominant form of injury (98.1%) and the left eye (52.4%) was more affected than the right (47.6%). The hospital prevalence of ocular injury in our centre within the period of review was 1.0% in males, 0.5% in females and 0.7% in all subjects with a p -value of 0.000.

Conclusion: Most of the ocular injuries were assault related, with anterior segment involvement, occurred at home and are seen in subjects within the age group of 20 to 40 years.

Keywords: ocular, injury, mechanism, pattern and prevalence.

Introduction

Ocular injury is the commonest cause of unocular visual loss and blindness which affects all ages¹. It is also an important cause of preventable morbidity globally². Annual incidence of ocular trauma is 55 million, of which 750,000 require hospitalization¹. Globally, there are approximately 1.6 million people blind from eye injuries, 2.3 million bilaterally visually impaired and 19 million with unilateral visual loss¹.

Ocular trauma occurs frequently in developing countries and constitutes a major health problem³⁻⁶. Although developing countries carry the largest burden of ocular trauma, they are the least able to afford the costs. Studies done in Nigeria also demonstrated that ocular trauma is a common cause of visual loss both in children and in adults³⁻⁶. Risk factors associated with ocular trauma include gender, age, occupation, and lower socio-economic status^{6,7}.

Recognition of the public health importance of ocular trauma has increased growing interest in studies on eye injuries. In our centre ocular trauma patients are usually seen first at the accident and emergency department before subsequent referral for ophthalmic review and management. Occasionally they are presented to the clinic.

This epidemiologic review studied the mechanism, pattern and prevalence of ocular injuries in patients who presented to Enugu State university of Science and Technology Teaching Hospital, Parklane Enugu, with the aim of evaluating the mechanism, pattern and prevalence of eye injuries in a view to recommend preventive measures.

Methods

This was a 2 year retrospective study of all the patients who presented with ocular trauma at the eye clinic of ESUT Teaching Hospital, from January, 2016 to December 2017. ESUT Teaching Hospital is situated within Enugu Metropolis which is the capital of old Eastern Nigerian. The institution was established in 1987 to cater for the health needs of patients from Enugu State and its

environs. Information retrieved from the hospital records included patients' demography, mechanism of eye injury, pattern of ocular damage, affected eye and place of injury. Data was analysed using SPSS version 21. A $p < 0.05$ was considered statistically significant.

Results

Two hundred and sixteen patients were studied, comprising 119 (55.1%) males and 97 (44.9%) females (sex ratio: M:F=1.2:1). The subjects comprised of 29.6% of children (1 to 16 years) and 70.4% of adults (above 16 years) with a mean age of 28.7 ± 1.25 SD years. Students have the highest cases of eye injuries. The participants' social demographics distribution was shown in table 1.

Table 1: Socio Demographics

Variables	Frequencies	Percentage	Mean (S.D)
Sex			
Female	97	44.9	
Male	119	55.1	
Total	216	100.0	
Age group (years)			28.72(18.5)
1-20	80	37.0	
21-40	86	39.8	
41-60	39	18.1	
61-80	11	5.1	
Total	216	100	
Youth (1-16)	64	29.6	
Adult (Above 16)	152	70.4	
Total	216	100.0	
Occupation			
Artisan	7	3.2	
Civil service	27	12.5	
Clergy	2	0.9	
Driving	3	1.4	
Farming	10	4.6	
House wife	8	3.7	
Public service	13	6.0	
Pupil	38	17.6	
Retired civil servant	6	2.8	
Student	64	29.6	
Teaching	3	1.4	
Trading	35	16.2	
Total	216	100.0	

The left eye was affected in 111 (51.4%) subjects, 101 (46.8%) of the right eye was affected and there were 4 (1.9%) bilateral cases [as shown in table 2].

Seventy nine (35.2%) cases of the eye injury were accident related while one hundred and forty (64.8%) were due to assault [table 2].

One hundred and eighty seven (86.6%) persons had ocular manifestations restricted to the anterior segment and 29 (13.4%) cases involved both the anterior and posterior segment [table 2].

One hundred and ten (50.9%) cases occurred at home, 27 (12.5%) took place on the road, 38 (17.6%) happened at school, and 41 (19%) occurred at work place [table 2].

Table 2: Distribution of affected eyes, mechanism, segments and place of eye injury

Affected eyes	Frequency	Percent
Both eye	4	1.9
Right eye	101	46.8
Left eye	111	51.4
Total	216	100.0
Mechanism		
Accident	79	35.2
Assault	140	64.8
Total	216	100.0
Segments		
Anterior	187	86.6
Posterior	29	13.4
Total	216	100.0
Places of injury		
Home	110	50.9
Road	27	12.5
School	38	17.6
Work place	41	19.0
Total	216	100.0

Place of eye injury is associated with mechanism of ocular trauma which is statistically significant, p value = 0.000 (table 3).

Table 3: Cross tabulation of Mechanism versus Place of injury

Place of injury	Mechanism		Total	P-value
	Accident	Assault		
Home	31	79	110	0.000*
	(40.8%)	(56.4%)	(50.9%)	
Road	25	2	27	
	(32.9%)	(1.4%)	(12.5%)	
School	2	36	38	
	(2.6%)	(25.7%)	(17.6%)	
Work place	18	23	41	
	(23.7%)	(16.4%)	(19.0%)	
Total	76	140	216	
	(100.0%)	(100.0%)	(100.0%)	

*Significant P<0.05

The ocular segment affected is associated with the mechanism of eye injury, P value = 0.006. [Table 4].

Table 4: Cross tabulation of Mechanism versus Segment

Segment	Mechanism		Total	P-value
	Accident	Assault		
Anterior	59	128	187	0.006*
	(77.6%)	(91.4%)	(86.6%)	
Posterior	17	12	29	
	(22.4%)	(8.6%)	(13.4%)	
Total	76	140	216	
	(100.0%)	(100.0%)	(100.0%)	

*Significant P<0.05

Ocular segment affected is not associated by gender (table 5).

Table 5: Cross tabulation of Segment versus Gender

Segment	Sex		Total	p-value
	Female	Male		
Anterior	86	101	187	
	(88.7%)	(84.9%)	(86.6%)	
Posterior	11	18	29	0.548
	(11.3%)	(15.1%)	(13.4%)	
Total	97	119	216	
	(100.0%)	(100.0%)	(100.0%)	

The hospital prevalence of ocular injury was 1.0% in males, 0.5% in females and 0.7% in all subjects with a statistically significant p-value of 0.000[table 6].

Table 6: Prevalence of eye injury in ESUTH Enugu disaggregated by gender

Gender disaggregation	Eye injury Frq. (%)		95% Confidence interval for having Eye Injury		Fisher's exact/ Chi-square	P-value
	Yes	No	Lower	Upper		
Male	119(1.0)	12296(99.0)	0.8	1.1	23.121	0.000*
Female	97(0.5)	19178 (99.5)	0.4	0.6		
All	216(0.7)	31474(99.3)	0.6	0.8		

*Significant P<0.05

Discussion

The burden of ocular trauma in developing countries such as Nigeria is widely believed to be under-reported due to a tenuous health system framework and extant cultural practices⁸. The interpretation of available statistics can be misleading but it is still discernible that ocular trauma is a largely avoidable source of human suffering and even early death in our society⁹. The present study is an institution-based retrospective review of all patients who presented to ESUT Teaching Hospital, Enugu covering a two-year period of January 2016 to December 2017, on account of ocular trauma. A total of 216 patients were seen in that period representing 0.7% of all patients that we consulted in the interval. This is higher than the 142 ocular trauma patients representing 1.8% of all patients seen by Rafindadi et al in a similar 2-year study done in Zaria northeastern Nigeria a decade ago (2006-2007)¹⁰.

Okeigbem et al carried out a 3-year review (2009-2011) in Benin City and had only 125 patients¹¹. It appears that these disparities maybe related to the location of the facility and consequently, the level of patronage. Males constituted 55.1% of our

patients while the remaining 44.1% were females, representing a male to female ratio of 1.2:1. This appears to represent a major shift in the status quo of ocular trauma demographic characteristic¹²⁻¹⁵. The “restive” male sex is traditionally known to be drawn to careers and recreations that are trauma-prone. This is amply supported by a body of literature^{10,11,16-20}. The lowest ratio we encountered in our literature search was in a study in children aged 1-15 years where a ratio of 2.1:1 male majority was seen¹⁶. Adamu et Al, on the other hand, described a male to female ratio as high as 5:1 in a study in northwestern Nigeria where the practice of female indoor sequestration as part of Islamic Purdah system is widespread¹⁷. Under such orientation, Care-seeking behavior of female subjects is expected to be negatively impacted. The near-gender parity in our study may reflect changing socioeconomic trends including improving enrollment in girl child education and the influx of female gender into the pool of working population^{18,19}. Another plausible explanation is the outsized role of assault in this study, accounting for 64.8% of all traumas. There was a significant correlation between trauma at home and assault (p<000). Assault was

responsible for 53.7% of ocular trauma requiring hospital admission according to Okoye in a work also done in the same geographic and cultural context as this study²⁰. It is possible that domestic violence against women is increasing. Accidents occurring at home and on the road is largely responsible for ocular trauma in other studies with different geocultural background^{5,10,11,17}.

The young and active between the ages of 1 and 40 years have continued to represent the at-risk demographic group^{5,17,20} and accounted for 76.8% of the subjects in our study with a mean of 28.72+18.5 SD. Data from the western hemisphere and other affluent societies usually highlight another rise in ocular trauma among the elderly as falls become common in this age group^{21,22}. This phenomenon was not observed in this study considering the relatively short life expectancy in our country²³. The lingering paucity of industries within the country in general has front-lined students as the bulk of our active population and was therefore the group that was commonly affected accounting for 29.6%. This was also observed in other studies^{10,11,17}. Affected artisans who constituted 3.2% of our subjects were not wearing any protective eyeglasses at the time of their injury. Other studies have made similar observation but this trend has unfortunately persisted^{10,17}.

There was unilateral ocular involvement, in 98.3% of our subjects which is strongly significant ($p < 0.000$). Four subjects representing 1.9% had bilateral ocular involvement. Monocular involvement is the rule globally of which trauma is the commonest cause of monocular blindness²⁴⁻²⁶. The left eye was slightly more affected (51.4%) than the right eye (46.8%). There was no significant association between the mechanism of injury and the eye affected ($p = 0.237$). Laterality of ocular injury still appears to be a largely random event^{10,11,16,17,5,19-22}. Isolated anterior segment involvement was the commonest injury seen in our series (86.6%) as shown in other studies^{5,17} while the affectation of posterior segment, which portends a grimmer prognosis,

was noted in the remaining 13.6%. A significant correlation was observed between the segment affected and the mechanism of trauma, with accidental injuries causing more posterior segment injuries ($p < 0.006$). We did not observe this association in the literatures reviewed.

Conclusion

Ocular trauma is a double-edged sword causing significant ocular morbidity and mortality in the productive. The data presented in this study regarding the circumstances surrounding ocular trauma and the factors associated with it demonstrate a clear need for primary prevention and control measures. Most of the accidents could have been avoided if simple prevention measures had been in place. Education targeting parents, schoolteachers, and children regarding hazardous objects and toys, dangerous activities, the devastating effects of eye injuries, and preventive measures is urgently needed to reduce the incidence of ocular trauma and its consequences. Specific recommendations for home safety, avoidance of hazardous toys and furniture, and close supervision of play activities by parents and caretakers should be emphasized.

Limitations

This study is limited by its retrospective nature. Since medical records are not completed in a standardized manner, recording bias may cause underreporting of specific findings. Also, because the institution is a referral center, more severe injuries that needed transfer to a tertiary-level center may be present. Since no data are available on those cases that were not referred, it is impossible to determine whether any differences exist.

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