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Original Research Article

Profile of ocular injuries amongst various trauma patients presenting to tertiary care centre of Punjab

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ABSTRACT

Purpose: To study the epidemiology and clinical profile of ocular trauma patients presenting to tertiary care centre.**Materials and Methods:** Prospective study. All patients of ocular trauma in OPD/Emergency were assessed for detail between 1/1/17 to 31/6/18 and data on demographic profile was established as per guidelines of Ocular Trauma Society of India. Patients were categorized in different segments and assessed/ followed for visual impairment in particular.**Results:** A total of 246 cases were examined out of which 87% were males. The most common mode of ocular injury was Road Traffic Accidents. Pediatric eye trauma constituted 16.7% of the total cases. 26.8% cases arrived to our centre between 4-24 hours and 62.6% cases presented after 24 hours. Amongst 131 cases of Road Traffic Accidents, none of them were using protective measures like helmets or goggles. Of these, 17.1% were under the influence of alcohol. 28.5% were involved in medicolegal proceedings. Majority of the cases comprised of monocular trauma (78.1%). Closed globe injuries constituted 88.94% of the total cases of which most cases presented with lid edema and ecchymosis. Chemical injuries were reported in 4.5% cases. 9 patients lost vision completely and 71 cases had vision from light perception to 6/18.**Conclusions:** Ocular trauma is one of the common causes of ocular morbidity. It has been seen predominantly in male population. Public needs to be educated about safety measurements and education about prompt need to specialised care to reduce ocular trauma related visual morbidity.This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.For reprints contact: reprint@ipinnovative.com

1. Introduction

Ocular trauma is a major but under-recognized cause of disability that has affected younger generation commonly. Approximately, 1.6 million people are blind owing to ocular trauma, 2.3 million are bilaterally visually impaired and 19 million have unilateral visual loss.¹ In India, the reported incidence of ocular trauma varies from 1-5%.² Different methods of study of ocular trauma result in geographical and referral bias leading to different conclusions and plenty

of misinformation. Data collected from developed countries like U.S.A cannot be applied to developing countries. Analysis of profile of ocular trauma is helpful in identifying the risk factors and planning strategies for the management of ocular injuries.

2. Material and Methods

This study was conducted for a period of eighteen months in the department of Ophthalmology at SGRD Charitable hospital according to the guidelines of the Declaration of Helsinki and after obtaining approval from

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ethical committee of Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar. Informed consent was obtained from all individual participants included in the study. All trauma related patients including past history of ocular trauma and those polytrauma patients associated with orbital and ocular injuries were included in the study. Patients in which clinical findings were of non-traumatic origin and with past history of trauma related surgery in the eye were excluded from the study. The patients were informed about the study and a prior written informed consent was taken from all the patients. Detailed history taking was done as per the proforma prepared. Focus was kept on age, sex, occupation, risk factors associated with trauma and location of trauma. Time lag between trauma and presentation to our centre was also documented. Documentation of presenting complaints, type of injury (open globe or closed globe) and extent of ocular involvement (monocular / binocular) was done. Matters of medicolegal concern were also recorded. Detailed ophthalmic work up of all the patients including slit lamp examination, +90D/+78D examination and indirect ophthalmoscopy was carried out. Investigations like B-Scan ultrasonography, CT-scan, MRI with or without contrast, Angiography, VER or any other specific investigation required in any patient was carried out before further management, solely or in collaboration with other speculation. Follow up of these patients was done till their final disposal over 1.5 years.

3. Results

246 patients fulfilled the inclusion criteria. Large proportion of these patients were males (87%). Pediatric age- group comprised 16.7% of the ocular trauma cases. Majority of the patients were from rural background (86.2%). Most of the patients had unilateral ocular involvement, right eye was involved in 102 (41.5%), left eye in 90 (36.6%) and both eyes were involved in 54 (22%) patients. The elapsed time between injury and presentation varied between 1-7 days in 111 (45.1%) patients followed by 4-24 hours in 66(26.8%) patients. (Table 1) Incidence with respect to place of occurrence of trauma and with respect to occupation of patients has been shown in Figures 1 and 2.

Majority (53.3%) of the patients had trauma on roadside and that too in students. 55 (22.35%) patients had injury on hard (cemented) floor followed by injury with metallic object (17.88%) and stone (17.88%) (Figure 3).

Maximum number of ocular injuries in children occurred in the month of January (10 cases) probably due to kite flying around the festival of Lohri while maximum number of ocular injuries in adults occurred in the month of May likely attributed to increased outdoor activities during vacations. Out of the total 235 cases of mechanical injury, closed globe injuries accounted for 209 (88.94%) cases and open globe injuries accounted for 26 cases (11.06%) (Table

2).

In closed globe injuries, Contusion (184 patients) was the most common presentation and in open globe injuries, penetrating type of injuries (17 patients) was the most common presentation. Conjunctiva was the ocular structure most commonly involved in injury (196 cases) followed by lids (177 cases), orbit (88 cases), cornea (50 cases), anterior chamber (28 cases) and iris (25 cases). Lacrimal apparatus was least involved in ocular injury (2 cases). In our study, lid edema was the most common finding in 154 cases (62.6%) which was followed by lid ecchymosis in 152 patients (61.8%), subconjunctival hemorrhage in 149 patients (60.6%), orbital fracture in 88 patients (35.8%), lid laceration in 47 patients (19.1%), chemosis and hyphaema in 14 patients (5.7%), corneal laceration, sphincter tear and traumatic optic neuropathy in 12 patients (4.9%), epithelial defect in 10 patients (4.1%), scleral laceration and iris prolapse in 7 patients (2.8%) (Figures 4, 5 and 6). Table 3 outlines the grades of visual loss in whole study population.

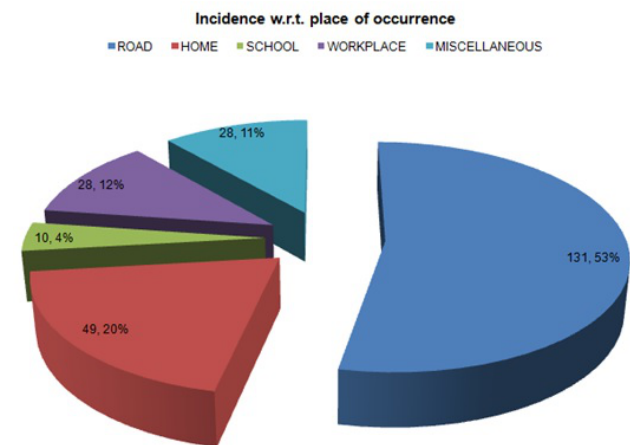


Fig. 1: Pie chart showing Incidence with respect to place of occurrence

4. Discussion

Blindness is a serious public health problem as it affects one's quality of life. It imposes major socioeconomic and psychological burden on patients and their relatives. Incidence of blindness varies in different communities ranging from 0.2-1 percent (WHO).⁹

The epidemiology of eye injuries varies in different parts of the world and in different age-groups. It depends on many factors including age, sex, profession, life-style, socioeconomic status, traffic behavior, sports and other creative activities. The epidemiology will vary with type of registration and recording of data.¹⁰

Though literature available on ocular injuries in developed countries is sufficient while data available on ocular injuries from developing countries is limited. The

Table 1: Profile of injured patients

Variable	Categories	Incidence
Location	Rural	86.2%
	Urban	13.8%
Sex	Male	87%
	Female	13%
Age	<15 Years	16.7%
	15-30 Years	45.9%
	31-45 Years	19.1%
	46-60 Years	13%
	61-75 Years	4.9%
Laterality	Monocular	78.1%
	Binocular	22%
Time of presentation	<4 hours	10.6%
	4-24 hours	26.8%
	1-7 days	45.1%
	After 7 days	17.5%
Medicolegal aspect	Yes	28.5%
	No	71.5%
Alcohol intake	Yes	17.1%
	No	82.9%

Table 2: Detailed distribution as per ocular trauma classification

		Open globe	Closed globe
Type of Injury	Rupture	4	-
	Penetrating	17	-
	Iofb	1	-
	Perforating	-	-
	Mixed	4	-
	Contusion	-	184
	Lamellar laceration	-	8
	Superficial F.B	-	17
Grade (V/A)	>6/12	2	155
	>6/60 TO <6/12	2	28
	>1/60 TO <6/60	2	11
	PL TO 1/60	15	11
	NLP	5	4
Zone	I	15	195
	II	7	11
	III	4	3
RAPD	+VE	3	14
	-VE	23	195

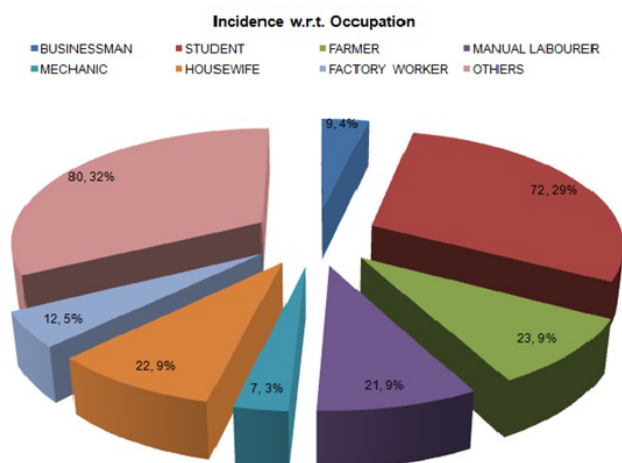
Table 3: Incidence of visual morbidity in children / adults

Grade of visual loss	Total cases	Adult cases	Children cases
NPL	9	9 (100.0%)	0 (0.00%)
PL To <1/60	27	21 (77.77%)	6 (22.22%)
>1/60 To <6/60	13	11 (84.61%)	2 (15.38%)
>6/60 To<6/18	31	27 (87.1%)	4 (12.90%)
>6/12	166	137 (82.53%)	29 (17.46%)
Total	246	205 (83.33%)	41 (16.66%)

Table 4: Comparison of our study with other studies

Study	Year	Place	Duration	Patients	Gender	Laterality	CG/OG	Visual Morbidity
Present Study	2015-2016	SGRDIMSR, Amritsar	18 months	246	M=214 F=32	R=102 L=90 B=54	CG=88.94% OG=11.06%	49
Soliman et al ³	2008	Kasr El Aini Hospital, CAIRO University	6 months	147	M=80% F=20%		CG=19.6% OG=80.4%	108
Omolase et al ⁴	2011	Owo, Nigeria	1 Year	132	M=77.3% F=22.7%		CG=84.1% OG=12.1%	
Dhasmana et al ⁵	2012	Himalyan Institute, Dehradun	1 Year	88	M=65.9% F=34.09%		CG=53.39% OG=38.83%	54
Misra et al ⁶	2013	Pravara Institute, Loni	2 Years	60	M=71.7%		CG=68.33% OG=31.67%	39
Titiyal et al ⁷	2013	Dr. Sushila Tiwari Govt. Hospital, Haldwani	1 Year	165	M:F= 10:1		CG=31.9% OG=45.5%	93
Gopinath et al ⁸	2015	K.R Hospital, Mysore	1 Year	60	M:F= 3:1		CG=66.6% OG=26.6%	15

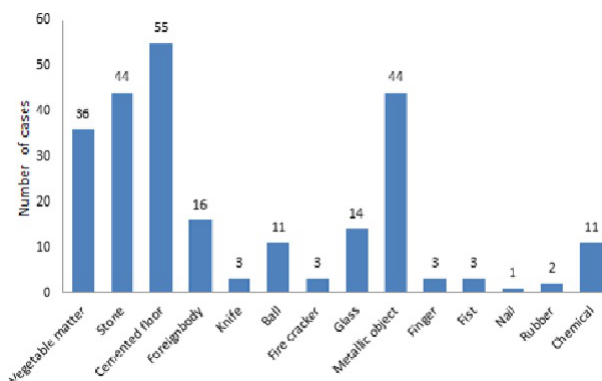
OG=Open globe, CG=Closed globe

**Fig. 2:** Pie chart showing Incidence with respect to occupation

purpose of this study was to make profile of ocular injuries and critically analyze these injuries for better treatment in developing country like India and especially in this northern region.

In our study, majority (86.2%) of the patients were from rural background. Incidence of ocular injuries is less in urban population because of increased awareness amongst them. This rural/urban disparity may be due to urban patients preferring private practitioners which seldom contribute to statistics.

The incidence of ocular trauma was found to be maximum in 15-30 year age group (45.9%), it being the

**Fig. 3:** Bar graph showing distribution as per causative agent

most active period of human life. A gradual decline in incidence was noted after 60 years of age (4.9%). This may be due to sedentary life style adopted by many people in this age-group. The incidence in children (less than 15 years of age) is reported to be 16.7% which may be because children of this age group in this region are more involved in outdoor activities and actively participate in games like bow and arrow and gilli-danda without understanding dangers associated with them. These children are often left to play without protective measures and being supervised by elders.

The latent period between occurrence of injury and reporting to the hospital has an important bearing on the outcome of vision in ocular trauma patients. In developing countries, people generally report late to the hospitals due to many reasons like ignorance, inaccessibility etc. In the



Fig. 4: Upper lid laceration extending to upper eyelid margin



Fig. 5: Black eye both eyes

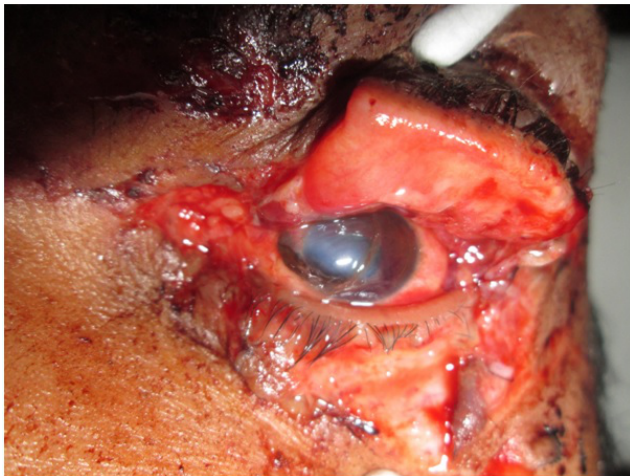


Fig. 6: Canalicular laceration extending to upper lid with corneoscleral laceration

present study, 92 (37.4%) cases of ocular trauma reported to the hospital within 24 hours of the occurrence of the injury. Most of these patients were injured in road traffic accidents and many of them were students. Other than this big chunk (45.1%) of the cases reported after 24 hours i.e. between 1-7 days of injury to the hospital. Only amongst them were few patients who reported late and also left the hospital against medical advice. Due to late reporting, chances of complications increase which in turn contribute to increased morbidity and poor visual outcome. Hence, time factor carries an important role in reducing the amplitude of visual morbidity in these ocular trauma patients. The findings in the other studies are different because of many factors like variability in awareness amongst people and accessibility to health care facilities. Table 4 gives the comparison of our study with other studies.

Visual prognosis in cases of ocular trauma is determined by multitude of factors like latent period between injury and reporting, mode, severity of injury and associated complications. In the present study, complete vision loss was observed in 9 adult cases. 40 cases had vision PL to 6/60 of which 32 were adults and 8 were children. 166 cases had vision more than 6/12 of which 137 were adults and 29 were children. Closed globe injuries were less severe and had better visual outcome than open globe injuries. Visual morbidity in our study was less as compared to other studies. This may be due to more number of benign injuries, prompt referral and close follow up and less industrial injuries (which are usually of severe nature) in our study.

5. Conclusion

Our study, inspite of having the limitation of short duration of study, gives a good idea of statistics of eye trauma. It will help to design appropriate preventive and therapeutic interventions. The same surveillance system is used to monitor the effectiveness of preventive, acute care and rehabilitative interventions. In a developing country like India, people should be made aware regarding early referral to tertiary care centres to reduce visual morbidity.

6. Source of Funding

None.

7. Conflict of Interest

The authors declare no conflict of interest.

References

1. Negrel AD, Thylefors B. The global impact of eye injuries. *Ophthalmic Epidemiol.* 1998;5(3):143-69.
2. Shukla B. Epidemiology of ocular trauma. In: Shukla B, Natrajan S, editors. Management of ocular trauma. Delhi: Meenakshi Printers; 2005. p. 3-4.
3. Soliman MM, Macky TA. Pattern of ocular trauma in Egypt. *Graefes Arch Clin Exp Ophthalmol.* 2008;246(2):205-12.
4. Osmolase CO, Omolade EO, Ogunleye OT, Omolase BO, Ihemedu CO, Adeosun OA. Pattern of ocular injuries in Owo, Nigeria. *J Ophthalmic Vis Res.* 2011;6(2):114-8.
5. Dhasmana R, Bahadur H, Jain K. Profile of ocular trauma in Uttarakhand. A Hospital Based Study. *Indian J Community Health.* 2012;24(4):297-303.
6. Misra S, Nandwani R, Gogri P, Misra N. Clinical profile and visual outcome of ocular injuries in a rural area of western India. *Australas Med J.* 2013;6(11):560-4.
7. Titiyal GS, Prakash C, Gupta S, Joshi V. Pattern of Ocular Trauma in Tertiary Care Hospital of Kumaon Region. *J Indian Acad Forensic Med.* 2013;35(2):116-9.
8. Gopinath GS, Hegde S, Vijaylaxmi P, Acharya AA, Sudharani BK. A Study of Clinical Profile and Visual Outcome in Ocular Trauma. *Int J Sci Stud.* 2015;3(2):57-60.
9. Resnikoff S, Pascolini D, Etya'ale D, Kocur I, Pararajasegaram R, Pokharel GP. Global data on visual impairment in the year 2002. *Bull World Health Organ.* 2004;82(11):844-51.
10. Al-Mahdi HS, Bener A, Hashim SP. Clinical pattern of pediatric ocular trauma in fast developing country. *Int Emerg Nurs.* 2011;19(4):186-91.

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