



EPIDEMIOLOGY AND CLINICAL PROFILE OF OCULAR TRAUMA IN A TERTIARY CARE HOSPITAL OF SOUTH INDIA

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ABSTRACT

Introduction: Trauma is the leading cause of ocular morbidity in the present world. It leads to blindness and ultimately disability. Ocular trauma has not been given the importance that it deserves in this world. It has seen a lot of neglect. This study is aimed at analysing ocular trauma with respect to risk factors, clinical features, epidemiological profile and also the use of safety devices. Not many studies have been done in this part of India to analyse ocular trauma. This is a retrospective hospital-based study conducted from January 2018- March 2018 in a tertiary care multi-speciality hospital. All case records of patients who were admitted in the hospital in the specific time period with a history of trauma and were seen by the Ophthalmology unit were reviewed retrospectively. Their epidemiological details including age, sex, occupation, mode of trauma, time of presentation, place of injury etc were recorded. Clinical features including the visual acuity, anterior and posterior segment findings, treatment given were included. **Result:** 125 eyes of as many cases were included in the study with 108 (86.4%) males and 17(13.6%) females. The most common age of presentation was between 18-40 years. Most common cause of trauma was road traffic accidents in 52(41.6%) patients. Clinical examination showed visual acuity more than 6/18 in 62(49.6%) cases, 6/18- 3/60 in 15(11.6%) cases and less than 3/60 in 33(25.4%) cases. In 15(12%) cases visual acuity estimation could not be done due to poly trauma induced factors. Anterior segment involvement included corneal laceration in 20 (16%) cases, scleral injury in 6 (4.8%) cases. Posterior segment involvement included commotio retinae in 6(4.8%) cases. Worksite injuries were seen in 22(17.6%) cases. Use of safety devices were seen in only one (0.008%) case. **Conclusion:** Road traffic accidents, trauma at home and work place injury were the three most common causes of trauma. Lack of safety devices were seen in almost all 124(99.2%) patients. Most commonly injured were males in the age group of 21- 40 years.

KEYWORDS: Ocular Trauma, Clinical features, Road traffic accidents, Safety precautions.

INTRODUCTION

Ocular trauma is the leading cause of unilateral blindness and visual impairment in the world.^[1] Most of the cases encountered in the trauma unit are young males who have either no access to safety devices like in work place related trauma or are reluctant to use them like in road traffic accidents or may not be aware about safety precautions to be used like in house hold injuries. Paediatric population was a victim of ocular trauma either at school or in the confines of their homes. Ocular trauma affects the quality of life of an individual and may also adversely affect the productivity of the person in future and in turn results in an economic burden on the country.^[2,3]

MATERIALS AND METHODS

This retrospective study was conducted in a tertiary level multi-speciality hospital from January 2018 to March 2018. Case records of all patients who were admitted in

that specific time period with a history of trauma and were seen in the Ophthalmology unit were reviewed and data was collected. This was done after obtaining clearance from the Institutional Research Committee and the Ethics Committee of Government Medical College, Kozhikode.

125 cases of ocular trauma with or without multiple traumas were included in the study. Data collected included demographic details like age, sex, mode of trauma, time of presentation, safety devices used and the place of trauma. Clinical data included the visual acuity at the time of presentation, anterior and posterior segment findings. Treatment details were also recorded.

According to ocular trauma classification mechanical trauma was classified into open globe and closed globe injuries. An open globe injury was defined as full thickness wound of the eye while closed globe injuries

were subdivided into lamellar laceration, contusion or superficial foreign body.

Statistical analysis was done using Microsoft Excel and Statistical Package for Social Sciences (SPSS software).

RESULTS

125 patients were seen in the Ophthalmology emergency department. It included 108 (86.4%) males and 17 (13.6%) females.

22 patients (17.6%) were less than 18 years of age, 55 patients (44%) were between 18-40 years of age, 41 patients (32.8%) were between 40-60 years of age and 7 patients (5.6%) were more than 60 years of age (Table 1)

Table 1: Distribution of patients according to age.

Age	Number of patients
<than 18	22{17.6%}
18 – 40	55{44%}
41 -60	41{32.8%}
➤ Than 60	7{5.6%}

31 patients (24.8%) were students, 14 (11.2%) were construction workers, 12(9.6%) were drivers, 12 (9.6%) were homemakers, 24(19.2%) had small scale business, 6 (4.8%) were farmers, 10 (8%) were skilled workers. (Table 2)

Table 2: Distribution of patients according to occupation.

Occupation	Number of patients
Students	31{24.8%}
Construction worker	14{11.2%}
Driver	12{9.6%}
Homemaker	12{9.6%}
Small scale business	24{19.2%}
Farmer	6{8%}
Skilled worker	10{8%}

61 patients (48.8%) sustained trauma to their left eye while 64 patients (51.2%) sustained trauma to their right eye 28 patients (22.4%) were educated up to primary level, 25 patients(20%) were educated up to middle

school level, 31 patients (24.8%) up to high school and 20 patients (16%) up to secondary level. 14 patients (11.2%) had completed their graduation and only 4 patients (3.2%) were post graduates.(Table 3)

Table 3: Distribution of patients according to education level.

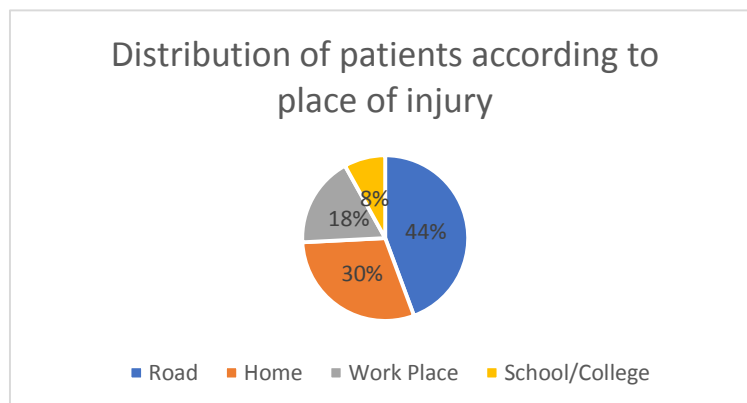
Education level	Number of patients
Primary level	28{22.4%}
Middle level	25{20%}
High school	31{24.8%}
Secondary school	20{16%}
Graduate	14{11.2%}
Post graduate	4{3.2%}

55(44%) patients sustained trauma in road traffic accidents, 8 patients (6.4%) with metal objects, 10(8 %) with stone, chemical injuries in 8(6.4%), sports related injuries in 5(4%), 14(11.2%) had injuries with wooden stick, injury with pen/pencil in 5(4%), 12 (9.6%) patients sustained trauma due to fall either from a height(4(3.2%) patients) and by slipping on the floor in 8(6.4%). Animal related trauma were seen in 2 patients (1.6%), and trauma with knife in 2 patients (1.6%) (table 4)

Table 4: Distribution of patients depending on mode of trauma.

Mode of Trauma	Number of patients
RTA	55{44%}
Metal objects	8{6.4%}
Stone	10{8%}
Chemical injury	8{6.4%}
Sports related	5{4%}
Wooden stick	14{11.2%}
Pen/pencil injury	5{4%}
Fall from height	4{3.2%}
Slipping on floor	8{6.4%}
Knife	2{1.6%}
Animal related	2{1.6%}

55 patients (44%) sustained trauma on the road, 37(29.6%) sustained trauma at home, 22 (17.6%) sustained trauma at their workplace and 11patients (8%) at their school /college. (figure1).



124 (99.2%) patients had not used any safety measures at the time of the accident.

78(62.4%) patients presented within an hour of the accident, 24 (19.2%) patients presented within 1-2 hours of accident, 12(9.6%) patients between 2-8 hrs of accident and 8(6.4%) patients between 8-24 hours.

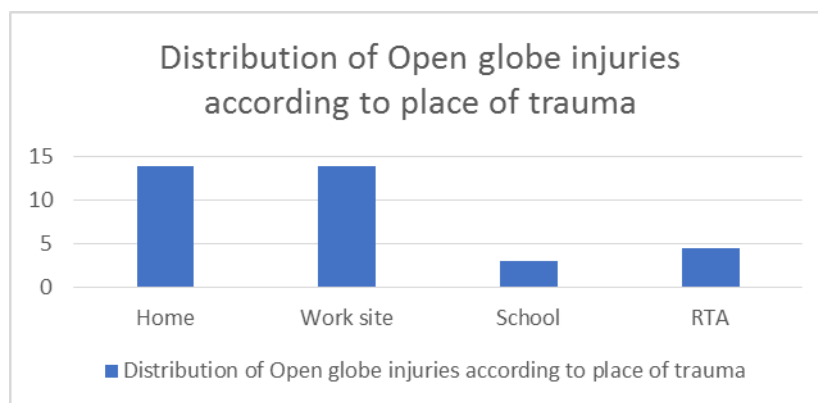
In the 22 (17.6%) cases belonging to paediatric age group 18 cases (81.8%) were closed globe injuries and rest 4(18.1%) patients were open globe injuries. Out of the open globe injuries, 3 cases (75%) happened at school either due to pencil or pen related injuries. 12 cases (54.5%) were at home, 5 cases (22.7%) were at

school and rest were road traffic accidents. Most common age (22.7%) involved was 11 years of age.

Clinical features

59 (47.2%) were cases of ocular trauma while 66 (52.8%) were cases of poly trauma in which 51 (77.2%) cases were due to road traffic accidents and 15 cases (22.7%) were due to fall.

97 (77.6%) cases were closed globe injuries, 28 (22.4%) were open globe injuries. 14 cases (42.4%) of open globe injuries occurred at home, 14 cases (42.4%) occurred at work site, 3 (9%) cases occurred at school and 2 cases (6%) occurred during road traffic accidents. (Figure 2)



Visual acuity more than 6/18 in 62(49.6%) cases, 6/18-3/60 in 15(11.6%) cases and less than 3/60 in 33(25.4%) cases. In 15(12%) cases visual acuity estimation could not be done due to poly trauma induced factors.

18(14.4%) patients had lacerated wound involving the lids with 5(27.7%) patients having lid margin injury and 1 (0.05%) patient having a canalicular injury. 77(61.6%) patients had periorbital edema.

12(9.6%) patients had a conjunctival tear, 15 (12%) patients had sub conjunctival haemorrhage.

20 (16%) patients had full thickness corneal tear, 6(4.8%) had corneoscleral tear, 7 (5.6%) had lamellar

corneal laceration, 6(4.8%) had epithelial abrasions with 2 (1.6%) having multiple foreign bodies on the cornea and 10(8%) had hazy cornea due to stromal oedema due to secondary glaucoma.

24(19.2%) patients had various grades of hyphema at the time of presentation, 1 (0.8%) had iridodialysis and 19(15.2%) patients had traumatic mydriasis with multiple sphincter tears. 2 (1.6%) patients had Grade 2 relative afferent pupillary defect. 3 (2.4%) patients had subluxation of the lens and 11(8.8%) patients had an increased intra ocular pressure.

6 (4.8%) patients had commotio retinae. 2 (1.6%) patients had intraocular foreign body.(table 5).

Table 5: Distribution of clinical features in patients with ocular trauma.

Clinical features	Number of patients
Lid laceration	18{14.4%}
periorbital edema.	77{61.6%}
Conjunctival tear	12{9.6%}
Sub Conjunctival hemorrhage	15{12%}
Full thickness corneal tear	20{16%}
Corneoscleral Tear	6{4.8%}
Lamellar corneal laceration	7{5.6%}
Epithelial abrasions	6{4.8%}
Secondary glaucoma	11{8.8%}
Hyphema	24{19.2%}
Iridodialysis	1{0.8%}
Traumatic Mydriasis	19{15.2%}
Relative Afferent Pupillary defect	2{1.6%}

Lens Subluxation	3{2.4%}
Commotio retinae	6{4.8%}
Retained Intraocular foreign body	2{1.6%}

51 patients (40.8%) required surgical intervention. Wound exploration with lamellar or full thickness corneal tear repair was done in 25 (75.7%) patients, corneoscleral tear repair was done in 7(21.2%) patients with foreign body removal in 2 patients. 1 (3%) patient required conjunctival tear repair. 18 (14.4%) patients required repair of the lid laceration

DISCUSSION

In this retrospective study we aimed at analysing all the aspects of the patients who were involved in the ocular trauma. The mean age of involvement was 34 years with an age range of 18 – 40 years (43.2%) and mostly males were involved in the trauma. This was similar to the findings in other studies in which the young male adults were the ones most commonly involved.^[3-5] This could be because of a greater number of males in high risk jobs or because of the risk-taking behaviour of males.

44% of the cases were due to road traffic accidents. Only 17.6% patients had work site injuries. This differed from the trends in the other parts of the world. In a study done at Oman by Al- Mahrouqi HH et al in 2017, most of the ocular trauma were work site trauma^[3] whereas another study conducted by Shaeri et al in 2016 found the most common cause of an injury as house hold trauma.^[4] This could be because the study conducted Al Mahrouqi HH was in an industrial area wherein the chance of work site injuries is high. Another reason could be the work site injuries which reported here may be minor in nature which may not have required hospital stay.

50% patients were manual labourers, 25% of the patients were students while the rest were either home makers or skilled workers. This was similar to findings in other studies^[3] where majority of affected patients belonged to the low socioeconomic group involved in manual labour. Only 14.4% patients were educated up to graduation or above.

17.6% of the cases were in the paediatric age group. The most common age involved was 11 years which was unlike the other study conducted in Egypt by Al Wadei EAY et al where the most common age was found to be 5 years and above.^[6] A study conducted in northern India found the most common age group to be between 2-6 years.^[7] In a study conducted in southern Iran no significant age trends were noticed in the pediatric population.^[8] 81.8% cases were closed globe injuries and 18.1% cases were open globe injuries. Majority of open globe injuries happened at school while 54.5% cases of the total cases happened at home. This was unlike the findings in the other studies where the number of open globe injuries were much higher than closed globe injuries.^[6] This calls for a greater degree of awareness about the risk of trauma among teachers, parents and

other care givers. Making homes, schools and play grounds safer for children so as to avoid innumerable cases of unilateral blindness is the need of the hour.

99.2% patients were not using any safety measures at the time of trauma. This was similar to the findings of Al Mahrouqi HH where none of the patients were found to be using any safety gear at the time of the accident.^[3] The study by Cai M et al in south west China found a lack of awareness about using safety gear among industrial workers inspite of the availability of the same.^[5]

52.8% patients were poly trauma cases caused in 77.2% cases due to road traffic accidents. This was similar to the findings of the study conducted in North India where 55% cases were poly trauma cases caused due to road traffic accidents in 16% and assault related trauma in 7.7% cases.^[9]

Most common clinical finding in 61.6% cases was periorbital edema. The second commonly injured tissue was the cornea in 40.8% cases which manifested as full thickness or lamellar corneal laceration or corneoscleral laceration or with multiple foreign bodies or corneal edema due to secondary glaucoma. The third most common finding was hyphema seen in 19.2% patients. This was unlike the findings in the study conducted by Al Mahrouqi HH in Oman and Aghadoosth et al in Kashan, Iran where cornea was found to be most commonly involved.^[3,10] In the study conducted by Cai M et al the most common finding was foreign body over the external eye.^[5]

40.8% cases required surgical intervention either for a lid injury, lamellar or full thickness corneal tear or corneoscleral tear with intraocular foreign body removal. This was similar to the study in north India by Maurya et al where 40% patients required surgery.^[9]

77.6% cases of closed globe injuries while 22.4% cases were open globe injuries. This was unlike the study in Oman in which only 6% cases were open globe injuries.^[3] Equal number of cases (42.4%) occurred at home and at worksite. None of these patients were using any safety precautions at the time of accident.

Making authorities and the general population aware about the disabling consequences of the lack of safety devices and precautions should be our utmost priority. Most of the injured population belong to the active work force or belong to our future work force, so keeping them safe should be our prerogative. In addition to that, the skilled manpower and scarce resources which are utilized for management of these avoidable trauma cases can be better utilized in a developing country like ours.

Limitations of the study includes the small size and the retrospective nature of the study which means only hospitalized patients could be included which in turn results in excluding those patients who received care on an outpatient basis. In our study work site injuries form only the third important cause of ocular trauma but the real picture may be different. The injuries received may not be severe enough to warrant hospitalisation but does result in morbidity which results in loss of working hours which in turn adversely affects the productivity of the individual. Minor cases of ocular trauma were excluded from the study which may have skewed the data to actually result in under reporting.

CONCLUSIONS

Educating the public about the risk of ocular trauma and the need for proper utilisation of safety precautions at home, school, work place and roads is the need of the hour.

REFERENCES

1. Khattry SK, Lewis AE, Schein OD, Thapa MD, Pradhan EK, Katz J. The epidemiology of ocular trauma in rural Nepal. *Br J Ophthalmol* [Internet]. 2004 Apr [cited 2020 Jun 9]; 88(4): 456–60. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1772092/>
2. Fujikawa A, Mohamed YH, Kinoshita H, Matsumoto M, Uematsu M, Tsuiki E, et al. Visual outcomes and prognostic factors in open-globe injuries. *BMC Ophthalmol* [Internet]. 2018 Jun 8 [cited 2020 Feb 6]; 18. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5994054/>
3. Al-Mahrouqi HH, Al-Harhi N, Al-Wahaibi M, Hanumantharayappa K. Ocular trauma: A tertiary hospital experience from Oman. *Oman J Ophthalmol* [Internet]. 2017 [cited 2020 Feb 6]; 10(2): 63–9. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5516465/>
4. Shaeri M, Moravveji A, Fazel MR, Rangraz Jeddi F. Status of ocular trauma in hospitalized patients in Kashan, 2011: As a sample of industrial city. *Chin J Traumatol* [Internet]. 2016 Dec [cited 2020 Feb 6]; 19(6): 326–9. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5198933/>
5. Cai M, Zhang J. Epidemiological Characteristics of Work-Related Ocular Trauma in Southwest Region of China. *Int J Environ Res Public Health* [Internet]. 2015 Aug [cited 2020 Feb 6]; 12(8): 9864–75. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4555316/>
6. Al Wadei EAY, Osman AA, Macky TA, Soliman MM. Epidemiological Features of Pediatric Ocular Trauma in Egypt. *J Ophthalmol* [Internet]. 2016 [cited 2020 Feb 6]; 2016. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5069374/>
7. Qayum S, Anjum R, Rather S. Epidemiological profile of pediatric ocular trauma in a tertiary hospital of northern India. *Chin J Traumatol* [Internet]. 2018 Apr 1 [cited 2020 Jun 9]; 21(2): 100–3. Available from: <http://www.sciencedirect.com/science/article/pii/S10812751730086X>.
8. Hosseini H, Masoumpour M, Keshavarz-Fazl F, Razeghinejad MR, Salouti R, Nowroozzadeh MH. Clinical and Epidemiologic Characteristics of Severe Childhood Ocular Injuries in Southern Iran. *Middle East Afr J Ophthalmol* [Internet]. 2011 [cited 2020 Jun 9]; 18(2): 136–40. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3119282/>
9. Maurya RP, Srivastav T, Singh VP, Mishra CP, Al-Mujaini A. The epidemiology of ocular trauma in Northern India: A teaching hospital study. *Oman J Ophthalmol* [Internet]. 2019 May 1 [cited 2020 Jun 11]; 12(2): 78. Available from: <http://www.ojonline.org/article.asp?issn=0974-620X;year=2019;volume=12;issue=2;spage=78;epage=83;aulast=Maurya;type=0>
10. Aghadoost D, Fazel MR, Aghadoost H, Aghadoost N. Pattern of ocular trauma among the elderly in Kashan, Iran. *Chin J Traumatol* [Internet]. 2013 Dec 1 [cited 2020 Jun 9]; 16(6): 347–50. Available from: <http://www.sciencedirect.com/science/article/pii/S108127515302261>