



FREQUENCY AND CHARACTERISTICS OF OCULAR TRAUMA IN A TERTIARY CARE HOSPITAL

Dr Aarij Zaffar Khan

Senior Resident, Department of Ophthalmology, GMC Baramulla

Dr Tahleel Mohd Jeelani*Assistant Professor, Department of Anaesthesiology, GMC Baramulla
*Corresponding Author

ABSTRACT **Purpose:** To find the frequency and characteristics of ocular trauma in a tertiary care hospital in North kashmir. **Study Design:** Cross sectional study. **Sampling Technique:** Convenient non-probability sampling. **Place and Duration of Study:** This study was conducted at Deptt. Of Ophthalmology GMC Baramulla from December 2024 to September 2025. **Material and Methods:** Detailed history and ocular examination were performed with regard to age, gender, classification of ocular trauma, aetiology of trauma, place where trauma occurred, note of ocular damage, nature of object, activity at the time of injury, presenting visual acuity and time lapse before presentation to hospital after trauma were recorded. **Results:** There were 393 patients included in this study. Mean age of patients was 28.97 ± 12.59 years. There were 198 (50.4%) closed globe and 195 (49.6%) open globe injuries. In 53 (13.5%) cases injury was caused by metal object. In 132 (33.6%) cases injury was classified as contusion. In 146 (37.2%) cases cornea was involved. There were 95 (24.2%) cases that occurred in home. In 156 (39.7%) cases presenting visual acuity was less than 6/60. There were 272 (69.2%) males and 121 (30.8%) females. There were 342 (87.0%) patients who presented within 1 day after trauma. In 122 (31.0%) cases there was prolapse of ocular contents. **Conclusion:** Ocular trauma occurred more commonly in males. It was blunt and occurred in home setting in most of the times. Most of the eye injuries aetiological agent was metal and wood.

KEYWORDS : Blindness. Contusion. Corneal Injuries. Ocular Trauma.

Eye trauma is cause of ocular morbidity that can be prevented¹. It is one of the leading causes of blindness²⁻⁴. Every year about 1.6 million people become blind due to ocular trauma⁵. Eye injury results in a large number of hospital visits⁶. Ocular trauma results in significant physical, psychological and economical losses⁷. Eye injury results in functional disability, cosmetic blemish, economical loss and psychological distress. Impact of eye injury is long lasting and disturbing for the patient and the whole family. Impact of ocular injury and vision loss is greatest in magnitude compared to the loss of any other sensory organ of the body. Eye injuries can occur in a variety of settings like during playing, in home, at work or as a result of assault or accident⁸. Due to their anatomical location and consistency eyes are prone to get hurt even by trivial trauma. Ocular trauma can be profession specific as persons engaged in certain professions are likely to get hurt by certain objects⁹. Every year around 55 million people get injuries in their eyes. One out of every twenty patients coming for eye examination by an ophthalmologist is a sufferer of eye injury¹⁰. Trauma to eye can lead to immediate damage or it can lead to establishment of inflammation and infection afterwards. Sequel of ocular trauma can cause significant ocular morbidity even after months or years¹¹. Self medication by the patients or improper management by the quacks is another contributing factor in morbidity related to ocular trauma. Ocular trauma is often preventable and proper management of ocular injuries can significantly lessen the burden of blindness¹².

Data about ocular trauma is limited in developing countries in terms of aetiology, setting, extent of injury, pattern of injury and management strategies. As depending on occupation and socio-demographic factors, nature and characteristics of ocular injury differ from region to region, so we want to know the frequency and characteristics of ocular trauma in Baramulla. Good knowledge of aetiology of trauma, patterns and characteristics of trauma and at-risk population is needed to devise strategies for prevention and management of this disabling condition. Proper resource allocation for the prevention and treatment of ocular injuries can be planned according to burden of ocular injuries in the region.

MATERIAL AND METHODS

This cross-sectional study was conducted at Deptt. Of Ophthalmology GMC Baramulla from December 2024 to September 2025. Sample size was calculated according to the following formula:

$$S = Z^2 p(1-p) / M^2$$

S is sample size

Z is Z score its value is 1.96

P is population proportion assumed to be 50% or 0.5

M is margin of error that is taken 5% or 0.05

$$\begin{aligned} S &= (1.96)^2 (0.5)(1-0.5) / 0.05^2 \\ &= 384.16 \\ &= 384 \end{aligned}$$

All ocular trauma patients presenting in the out patients department and emergency department who+ required hospital admission were included in the study. All patients were told about the purpose of the study and informed consent was taken.

Demographic profile like age and gender of all patients were recorded. History regarding aetiology of injury, eye structures involved, place where injury occurred and pattern of injury were recorded.

Ocular injuries were graded according to Birmingham eye trauma terminology into two types namely closed globe and open globe injuries. Closed globe injuries were further divided into contusion and lamellar laceration. Open globe injuries were divided into laceration and rupture. Mechanism of rupture was trauma with blunt object while trauma with sharp object resulted in laceration. Laceration was further divided into penetrating, perforating and presence of intraocular foreign body¹³. Periorbital and adnexa injuries were recorded.

Record was taken of the time elapsed between injury and presentation to hospital. Presenting visual acuity was recorded with Snellen's chart. Detailed ocular examination was performed with the help of slit lamp biomicroscopy. B-scan and X-ray imaging were performed when required.

All the information was gathered with the help of specially designed proforma. Statistical analysis was performed with SPSS version 23. Mean and standard deviation was calculated for age. Frequencies and percentages were calculated for gender, aetiology of injury, type of injury, structures involved, place of injury, presence of hyphaema, status of lens, presence of vitreous haemorrhage, status of retina, optic nerve status, presenting visual acuity, time lapse between injury and presentation to hospital and prolapse of intraocular contents.

RESULTS

Table 1: Distribution of cases according to gender and age. Age of Patient in years

Gender of Patient	Mean (Years)	Number of Cases	Std. Deviation
Male	28.20	272	14.108
Female	30.70	121	8.030
28.97	393	12.597	
Injury Aetiology	Frequency	Percent	

Metal	53	13.5
Wood/Vegetable matter	49	12.5
Stone	26	6.6
Road Traffic Accident	35	8.9
Welding arc	10	2.5
Acid (chemical)	18	4.6
Alkali (chemical)	18	4.6
Superglue (chemical)	16	4.1
Oil	15	3.8
Fist/hand	19	4.8
Fall	11	2.8
Fire work/Fire cracker	18	4.6
Fire	9	2.3
Pellet gun	27	6.9
Plant sap	7	1.8
Insect fall/bite	14	3.6
Animal attack	11	2.8
Glass	21	5.3
Plastic	12	3.1
Scale/Pencil/Pen		
Tennis Ball	4	1.0
Total	393	100.0

Place of Occurrence	Frequency	Percent
Work place	81	20.6
Road traffic accident	44	11.2
Home	95	24.2
Sports	31	7.9
Assault	58	14.8
At school	24	6.1
Outdoor	60	15.3
Total	393	100.0
Time to Presentation	Frequency	Percent
Within 1 day	131	86.2
Within 1 week	17	11.2
After 1 week	4	2.6
Total	152	100.0

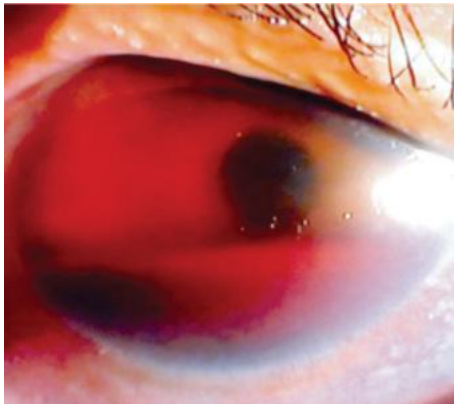


Fig. 1: Hyphema as a Result of Blunt Ocular Trauma

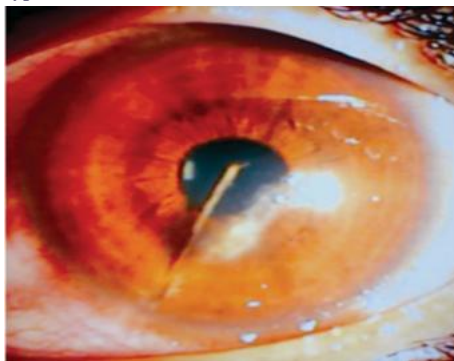


Fig. 2: Ocular Penetration With Vegetable Matter.

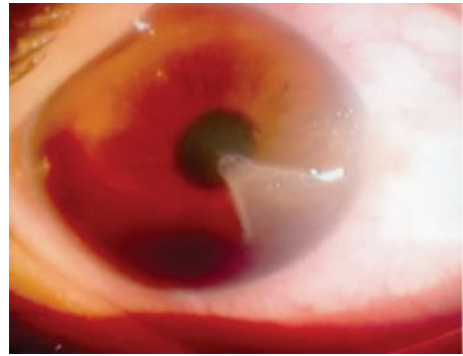


Fig. 3: Lamellar Corneal Laceration With Hyphema.



Fig. 4: Limbal Perforation, Iris and Vitreous Prolapsed Following Ocular Trauma With Key.

There were 393 patients included in this study. There were 272 (69.2%) males and 121 (30.8%) females. Mean age of patients was 28.97 ± 12.59 years. Distribution of cases according to gender and age is shown in table 1. There were 198 (50.4%) closed globe injuries and 195 (49.6%) open globe injuries. The most common cause of injury was trauma with metal object. The distribution of cases according to trauma is given in table 2. There were 132 (33.6%) cases of contusion, 99 (25.2%) cases of rupture, 66 (16.8%) cases of lamellar laceration, 59 (15.0%) cases of penetration, 27 (6.9%) cases of intraocular foreign bodies and 10 (2.5%) cases of globe perforation. Cornea was involved in 146 (37.2%) cases, corneoscleral injury was present in 126 (32.1%) cases, sclera in 46 (11.7%) cases and adnexa in 27 (6.9%) cases. There was lid tear in 12 (3.1%) cases, periorbital swelling in 16 (4.1%) cases and blow out fracture was noted in 2 (0.5%) cases. In 18 (4.6%) cases posterior segment was the predominant site of injury. Hyphema was present in 186 (47.3%) cases, lens damage was present in 128 (32.6%) cases, vitreous haemorrhage was present in 103 (26.2%) cases, retinal tear was present in 13 (3.3%) cases, retinal detachment was present in 29 (7.4%) cases, commotio retina was present in 22 (5.6%) cases. Optic nerve swelling was noted in 32 (8.1%) cases. Distribution of cases according to place of injury is given in table 3. Presenting visual acuity was 6/12 or better in 139 (35.4%) cases, between 6/12 and 6/60 in 98 (24.9%) cases and less than 6/60 in 156 (39.7%). Distribution of cases according to time to presentation in hospital is shown in table 4. Prolapse of intraocular contents was noted in 122 (31.0%) cases.

DISCUSSION

Ocular trauma is one of the major causes of preventable blindness and visual impairment¹⁴. Three hundred and ninety-three patients with ocular trauma were included in this study. Mean age of patients was 28.97 ± 12.59 years. Results of our study are similar with the findings of study done by Dhulikhel that showed the most vulnerable age group was 21-30 years¹⁵. Study of Godar and co-authors also recognized the most vulnerable age group for ocular trauma was between 21 to 29 years. Ocular trauma in young age group may be due to their increased risk-taking behaviour and active life style. Morbidity resulted thereof has great impact in terms of economical burden and quality of life.

There were 272 (69.2%) males and 121 (30.8%) females included in our study. Work performed by Sengupta and co-authors also showed the preponderance of male patients affected by ocular trauma¹⁶. Increase ocular trauma in male patients may be due to their increase outdoor activity and engagement in certain professions¹⁷.

In our study there were 198 (50.4%) closed globe injuries and 195 (49.6%) open globe injuries. Among closed globe injuries, contusion was the most common cause. Among open globe injuries, globe rupture was the most common cause. Our results are similar to findings of other studies. In our study most common cause of injury was metal object and cornea was involved in majority of cases. Our results are in accordance with the result of other studies¹⁸.

In our study most common place of injury was home. Our results are in contrast with the results of other studies¹⁹ where most of ocular trauma occurred at work place and during road traffic accidents. Our results are in accord with that of the study conducted by Shaeri and co-authors²⁰. Due to inadequate adoption of safety measures during common house hold activities may be reason for majority of ocular trauma at home. Most of the trauma among women and children occur at home. It is irony that home environment that is considered the safest accounted for majority of ocular trauma. Adoption of safety measures at home while doing house hold activities is as much needed as during outdoor activities.

In our study time to presentation to hospital was within one day in 342 (87.0%) cases, within 7 day in 41 (10.4%) cases and after 1 week in 10 (2.5%) cases. Our results are comparable to that of Godar and coauthors¹⁴.

In our study presenting visual acuity was less than 6/60 in 156 (39.7%) while in another study conducted by Sengupta and co-authors majority of patients presented with visual acuity less than 3/60¹⁶. This is in contrast with the result of study conducted by Iqbal and co-authors¹⁹. In their study majority of patients presented with good visual acuity. This difference in presenting visual acuity may be due to severity of ocular trauma. In our study we included patients who required hospital admission. Patients with minor ocular trauma were not included in our study.

Among the limitations of our study is the small sample size. This study may not be true representative of population as patients from high socioeconomic strata were unlikely to come to public hospital. Patients who needed hospital admission were included in our study. This is another limitation. Patients with minor injuries who did not need hospital admission or did not come to hospital were not included in the study.

Nevertheless, our study underscores the frequency and patterns of ocular trauma in particular locality. It will help establish preventive and management strategies to cope with ocular trauma. Future research is needed to study the impact of health education on adaption of safety measures in preventing ocular trauma. Moreover, it will be important to study the anatomical and physiological outcomes of ocular trauma management strategies.

CONCLUSION

Ocular trauma occurred more commonly in males. Ocular trauma was blunt and occurred in home setting in most of the times. The aetiological agent in most of the eye injuries was metal and wood. Ocular injuries resulted in substantial visual loss at the time of presentation.

Conflict of Interest: None.

Financial Disclosure: None

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