

Study of clinical profile of ocular blunt trauma patients at a teaching hospital

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Abstract

Background: Ocular injuries can be classified into mechanical and non-mechanical injuries. Mechanical injuries can be blunt injury or penetrating injury to the eye. Despite its public health importance, there is relatively less population-based data on the magnitude and risk factors for ocular trauma, especially from developing countries. Present study was aimed to study clinical profile of ocular blunt trauma at a teaching hospital. **Material and Methods:** Present study was prospective, observational study, conducted in patients with definite history of recent blunt ocular trauma of all age. **Results:** During study period, 66 patients of blunt ocular trauma were evaluated. Majority of patients were from 31- 50 years age group (56.06%), male (77.27%), right eye affected (53.03 %), farmer by occupation (50%), mode of injury was during agricultural work (50 %). On clinical examination, anterior segment pathologies were ecchymosis and lid edema (78.79%), sub conjunctival hemorrhage (72.73%), hyphaema (33.33%), lid laceration (22.73%), corneal abrasion (21.21%), traumatic iritis (9.09%), iris injury (9.09%), lens dislocation (1.52%) and traumatic cataract (1.52%). Posterior Segment Pathologies noted were Berlin's edema (4.55%), vitreous hemorrhage (4.55%), angle recession (4.55%), retinal detachment (3.03%), retinal/choroidal hemorrhage (1.52%), ruptured globe (1.52%) and choroidal rupture (1.52%). Majority of patients were managed on medical management (62.12%) while others required conservative management (28.79%), lens removal for traumatic cataract and lens dislocation (3.03%), laser (3.03%) and 2 cases were referred to higher center in view of retinal detachment (3.03%). Improvement in vision was noted at 2 months follow up in majority of cases. **Conclusion:** Blunt ocular trauma is common among male gender, in 3rd to 5th decade. Early detection of the extent of the injury and appropriate management is key for the prevention of further complications. Emphasis should be made about wearing protective goggles, face shields, availability of immediate emergency eye care management and health education regarding eye protection. **Keywords:** Blunt ocular trauma, lid edema, sub conjunctival hemorrhage, emergency eye care, eye protection.

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INTRODUCTION

The eyeball is a fairly well protected from direct injury by the lids, eyelashes, and the protecting margins of the orbit. Still ocular injury is a major cause of treatable visual

impairment and blindness and has a major socioeconomic and psychological impact on the patients and their families. In India reported incidence of ocular trauma varies from 1 to 5%. The global annual incidence of ocular trauma is around 55 million of which 750000 cases require hospital admission every year.¹ Trauma can result in wide spectrum of eye injury of the globe, optic nerve and adnexa ranging from superficial to vision threatening complications.² Ocular injuries can be classified into mechanical and non-mechanical injuries. Mechanical injuries can be blunt injury or penetrating injury to the eye. In the adult population, the cause is often blunt trauma (e.g., motor vehicle collisions, altercations, or work-related injuries involving hammering). In the elderly, globe rupture is most often a result of falling.^{3,4} Despite its public health importance, there is relatively less population-based data

on the magnitude and risk factors for ocular trauma, especially from developing countries. Present study was aimed to study clinical profile of ocular blunt trauma at a teaching hospital

MATERIAL AND METHODS

Present study was prospective, observational study, conducted in Department of Ophthalmology, BKL Walawalkar Rural Medical College, Kasarwadi, Cjiplun, India. Study duration was of 2 years (July 2019 to June 2021). Study was approved by institutional ethical committee.

Inclusion criteria: Patient with definite history of recent blunt ocular trauma of all age, willing to participate.

Exclusion criteria: Patients with history of penetrating ocular injury, Patients with orbital injuries involving fractures, old ocular injuries >1 month before.

Study was explained and a written informed consent was taken for participation. A detailed history was taken to know the sociodemographic profile, mode of injury and duration between injury/presentation, injury to other organs, whether there has been loss of consciousness, previous eye surgical history, status of tetanus prophylaxis, possible contamination of the wound.

General and systematic examination was done and findings were noted. In ocular examination, visual acuity testing (Snellen’s chart), anterior segment examination (slit lamp biomicroscopy), pupillary evaluation (reactivity to light, presence of afferent pupillary defect), assessment of extraocular movements and confrontational visual fields, Intraocular pressure measurement (Schiotz tonometer/Applanation tonometer), posterior segment evaluation (direct and indirect ophthalmoscope). Field charting, gonioscopy was carried out in relevant cases Investigation like X-ray orbit and/or computed tomography scan and/or ultrasound B-scan was done as and whenever indicated. All the cases received treatment according to the injury and were followed at regular intervals to assess the visual outcome and complications. Statistical analysis was done using descriptive statistics.

RESULTS

During study period, 66 patients of blunt ocular trauma were evaluated. Majority of patients were from 31- 50 years age group (56.06%), male (77.27%), right eye affected (53.03 %), farmer by occupation (50%), mode of injury was during agricultural work (50 %).

On clinical examination, anterior segment pathologies were ecchymosis and lid edema (78.79%), sub conjunctival hemorrhage (72.73%), hyphaema (33.33%), lid laceration (22.73%), corneal abrasion (21.21%), traumatic iritis (9.09%), iris injury (9.09%), lens dislocation (1.52%) and traumatic cataract (1.52%).

Posterior Segment Pathologies noted were Berlin’s edema (4.55%), vitreous hemorrhage (4.55%), angle recession (4.55%), retinal detachment (3.03%), retinal/choroidal hemorrhage (1.52%), ruptured globe (1.52%) and choroidal rupture (1.52%).

Table 1: General characteristics

Characteristics	Number of cases	Percentage
Age (in years)		
<15	7	10.61%
15-30	14	21.21%
31-50	37	56.06%
>50	8	12.12%
Mean age (in years)	37.33 ± 9.46	
Gender		
Male	51	77.27%
Female	15	22.73%
Occupation		
Farmer	33	50.00%
Student	15	22.73%
Homemaker	9	13.64%
Shopkeeper	7	10.61%
Others	2	3.03%
Eye involved		
Right	35	53.03%
Left	31	46.97%
Mode Of injury		
Agricultural	33	50.00%
Fall	12	18.18%
Road Traffic accident	9	13.64%
Sports related	8	12.12%
Assault	3	4.55%
Cracker-burst injury	1	1.52%

Table 2: Clinical findings

Location	Number of cases	Percentage
Anterior segment pathologies		
Ecchymosis and lid edema	52	78.79%
Sub conjunctival hemorrhage	48	72.73%
Hyphaema	22	33.33%
Lid laceration	15	22.73%
Corneal abrasion	14	21.21%
Traumatic iritis	6	9.09%
Iris injury	6	9.09%
Lens dislocation	1	1.52%
Traumatic cataract	1	1.52%
Posterior Segment Pathologies:		
Berlin’s edema	3	4.55%
Vitreous hemorrhage	3	4.55%
Angle recession	3	4.55%
Retinal detachment	2	3.03%
Retinal/choroidal hemorrhage	1	1.52%
Ruptured globe	1	1.52%
Choroidal rupture	1	1.52%

Majority of patients were managed on medical management (62.12%) while others required conservative management (28.79%), lens removal for traumatic cataract and lens dislocation (3.03%), laser (3.03%) and 2 cases were referred to higher center in view of retinal detachment (3.03%).

Table 3: Treatment given

Treatment	Number of cases	Percentage
Medical management	41	62.12%
Conservative	19	28.79%
Lens removal	2	3.03%
Laser	2	3.03%
Referred to higher center	2	3.03%

Improvement in vision was noted at 2 months follow up in majority of cases.

Table 4: Extent of visual loss at presentation and BCVA at two months follow-up

Visual Acuity	No. of Cases at presentation	Percentage	No. of cases at 2 months follow-up	Percentage
>6/60	19	28.79%	47	71.21%
6/60 – 3/60	26	39.39%	9	13.64%
3/60 – 1/60	18	27.27%	8	12.12%
PL present	2	3.03%	1	1.52%
No PL	1	1.52%	1	1.52%

DISCUSSION

Blunt trauma forms a major part of ocular trauma. Squash balls, elastic luggage straps, falls and champagne corks are the most common causes of blunt ocular trauma.⁵ The basic patho-physiology is that the volume of a closed space cannot be changed and therefore, when the eye is compressed along its anterior–posterior axis, it must either expand in its equatorial plane or rupture.⁶ Ocular blunt trauma causes ocular damage by the coup and contrecoup mechanism or by ocular compression. These can result in a wide spectrum of ocular complications ranging from trivial injuries like subconjunctival hemorrhage to grievous sight-threatening injuries such as optic neuropathy, retinal detachment, and traumatic cataract. Also, open globe injuries were significantly more likely to have retinal detachment than closed globe injuries. This can be explained by higher incidence of vitreous disturbance, incarceration and resultant traction in open globe injuries.⁷ In study by S. Padmanaban⁸ the commonest age group affected by ocular blunt trauma ranged 26 – 40 years of age with mean age of 39.34 years. Males are more frequently injured than females because males are more active in indoor and outdoor activities.⁹ Similar findings were noted in present study. The pathophysiology of traumatic cataract is believed to involve direct rupture of capsule or coup, countercoup and equatorial expansion due to hydraulic forces transferring the energy of trauma to the opposite side of the eye. It can be accompanied by anterior and posterior segment abnormalities depending on the force of trauma and depth of globe penetration.¹⁰ The cataract removal can be done in the same sitting or planned later on depending upon the comorbidities in the eye. The benefits of secondary removal are improved visibility, ease of tissue manipulation and less chance of postoperative complications.^{11,12} Misra S *et al.*,¹³ studied 60 patients of

ocular injuries, injuries were more commonly seen in adults (55 %) associated with agricultural work (43.33 %), in male patients (71.67 %). Closed globe injury (68.33 %) was more common than open globe injury (31.67 %). Both in open and closed globe injuries, the commonest object causing injury was a wooden stick. Just 26.7 % of the patients had a visual acuity better than 6/60 at presentation; while after completed treatment at two months follow-up, 68.3 % had best corrected visual acuity better than 6/60. Shailaja K *et al.*,¹⁴ noted that among closed globe injuries, 133 cases had contusion (41.05%), superficial foreign body (34.88%), lamellar laceration (20.37%) and mixed injuries (3.70%). 255 cases (78.70%) of closed globe injuries involved zone 1, 39 cases (12.04%) involved zone 2 and 30 cases (9.26%) involved zone 3. In study by Rahul D *et al.*,¹⁵ most of the patients were from age group of 31-40 years (20.3%), males (66%), 20% cases of RTA and 80% cases of non-RTA. Clinical features noted were lid oedema with chemosis of conjunctiva (82.5%), subconjunctival hemorrhage (84.4%), corneal abrasion (15.5%), traumatic hyphaema (31.06%), traumatic optic neuropathy (1.9%), Berlin's oedema (6.7%) and angle recession glaucoma (8.1%). Final visual outcome of patients were, 1 patient (0.97%) had no perception of light, 4 patients (3.8%) had visual acuity of perception of light and projection of rays inaccurate. 7 patients (6.7%) had vision perception of light and projection of rays accurate. 45 (43.68%) patients regained visual acuity of 6/6. Maiya AS *et al.*,¹⁶ studied 95 cases of blunt ocular trauma, male to female ratio was 4.5:1; majority of the patients (44.2%) belonged to the 21–40 years age group. About fifty patients (52.6%) were from agricultural class. In 46 patients (48.4%) the injuries were agricultural in nature. Subconjunctival hemorrhage was the most common finding (37.89%) followed by traumatic uveitis (28.42%) and lid and adnexal injuries (22.10%). Commotio retina,

also known as “Berlin’s edema,” is characterized by a transient, well defined greyish-white opacification of the retina occurring after blunt ocular trauma. The impact of ocular trauma in terms of need for medical care, loss of income and cost of rehabilitation services points towards the need for strengthening of preventive measures worthwhile. Mass awareness regarding potential risk factors and agents causing injury can prevent number of ocular hazards.

CONCLUSION

Blunt ocular trauma is common among male gender, in 3rd to 5th decade. Early detection of the extent of the injury and appropriate management is key for the prevention of further complications. Emphasis should be made about wearing protective goggles, face shields, availability of immediate emergency eye care management and health education regarding eye protection.

REFERENCES

1. Shukla B. Epidemiology of ocular trauma. In Shukla B, Natarajan S, editors. Management of Ocular Trauma. 1st ed. Delhi: Meenakshi Printers; 2005. p. 3-4.
2. Krishnaiah S, Nirmalan PK, Shamanna BR, Srinivas M, Rao GN and Thomas R. Ocular Trauma in a Rural Population of Southern India. *Ophthalmology*. 2006; 113(7):1159-1164.
3. Sen E, Celik S, Inanc M, Elgin U, Ozyurt B, Yilmazbas P. Seasonal distribution of ocular conditions treated at the emergency room: a 1-year prospective study. *Arq Bras Oftalmol*. 2018 Apr;81(2):116-119. \
4. Puodžiuvienė E, Jokūbauskienė G, Vieversytė M, Asselineau K. A five-year retrospective study of the epidemiological characteristics and visual outcomes of pediatric ocular trauma. *BMC Ophthalmol*. 2018 Jan 18;18(1):10
5. Kanski JJ. *Clinical Ophthalmology*. 6th edition. Elsevier; 2008. p.854
6. Pai SG, Kamath SJ, D'Souza S, Dudeja L. A Clinical Study of Blunt Ocular Trauma in a Tertiary Care Centre. *Online J Health Allied Scs*. 2013;12(2):10.
7. Sharma, Yog Raj and Dinesh K Talwar. “Profile of Ocular Trauma at Tertiary Eye Centre.” *JK Science*, Vol. 7 No. 1, January-March 2005.
8. S.Padmanaban "Original Research Article A Clinical Study Of Visual Outcome In Ocular Blunt Trauma "IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 5, 2018, pp 11-18
9. Kuhn F. Epidemiology of ocular trauma. In: Kuhn F, Morris R, Mester V, Witherspoon D, editors. *Ocular Traumatology*. Berlin, Heidelberg: Springer-Verlag; 2005. p. 47-77.
10. Mulrooney BC. Traumatic cataract. *E Med J* 2002;3(7):21-5.
11. Greven CM, Collins AS, Slusher MM, Grey WR. Visual results, prognostic [4] indicators, and posterior segment findings following surgery for cataract/ lens subluxation-dislocation secondary to ocular contusion injuries. *Retina*. 2002;22:575-80.
12. Ganesh A, Al-Zuhaibi S, Mitra S, Sabt BI, Ganguli SS, Bialasiewicz AA. Visual rehabilitation by scleral fixation of posterior chamber intraocular lenses in Omani children with aphakia. *Ophthalmic Surg Lasers Imaging*. 2009;40:354-60.
13. Misra S, Nandwani R, Gogri P, Misra N. Clinical profile and visual outcome of ocular injuries in a rural area of western India. *AMJ* 2013, 6, 11,
14. Shailaja Karve, Ankush Kolte, Ansari Alfia, Hemangi Rathi. Study of clinical profile of ocular trauma at a tertiary eye care centre. *International Journal of Contemporary Medical Research* 2017;4(12):4-7.
15. Rahul Dagwar, Sandeep Jawade, Ravi Chauhan, Clinical Profile and Visual Outcome of Blunt Ocular Trauma in a Tertiary Care Centre of Central India: A Prospective Study, *International Journal of Medical Science and Clinical Invention* 7(11): 5063-5069 2020
16. Maiya AS, Dharmesh AM, Jayaram R. Clinical profile of ocular blunt trauma in a rural hospital. *Journal of Clinical Ophthalmology and Research*, 2018; 6(1): 3-7.

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