

Profile of Patients Presenting with Ocular Trauma with Emphasis on Posterior Segment Involvement: An Experience from Tertiary Care Hospital from Western India

Garima Agarwal¹, Manisha Shastri², Deepika Singhal³

ABSTRACT

Introduction: Human body with its constant activity is always prone to injuries. Ocular trauma may occur in isolation or with multisystem involvement. Trauma affecting posterior segment of eye is always taken as emergency because of late manifestation and may lead to blindness. Ocular trauma is considered as neglected disorder. Best treatment of ocular trauma is prevention itself. The aim of the study was to study profile of patients presenting with ocular trauma and to calculate the ratio of involvement of posterior segment and to study complications in ocular trauma patients involving posterior segment

Material and Methods: It is a prospective study done at Department of Ophthalmology in a tertiary care hospital from western India during 24 months extending from January 2008 to December 2009. The study includes a total of 50 patients attending eye OPD with a history of ocular trauma.

Results: Out of 50 cases studied most of the cases (40%) were in 11-20 years age group with majority presenting from urban area (94%). 96% of cases came to hospital within 24 hours of injury. About 64% patients had left eye involvement. Injury by metallic object was the commonest cause (36%). According to BETT, 58% cases suffered closed globe injury and 42% cases suffered open globe injury with grade IV involvement. B scan revealed vitreous hemorrhage to be most common finding (54% cases) for which vitrectomy was performed after 1 week in open globe type injury and wait and watch policy for three months was followed in blunt trauma type injury. Final visual outcome was poor in majority of patients having vision limited to finger counting in majority (60%) cases.

Conclusion: Ocular trauma is a preventable cause of ocular morbidity. Early intervention is associated with good visual acuity in cases affecting purely anterior segment. However with posterior segment involvement long term prognosis remains feeble

Keywords: Profile, Patients, Ocular, Posterior, Segment, Experience, Tertiary, Hospital, Western, India.

ocular trauma is quite poor and may lead to blindness. Ocular trauma is considered as neglected disorder. Best treatment of ocular trauma is prevention itself.¹

The aim of the study was to study profile of patients presenting with ocular trauma and to calculate the ratio of involvement of posterior segment and to study complications in ocular trauma patients involving posterior segment.

MATERIAL AND METHODS

It was a prospective study comprised of 50 patients having injury to eye with significant involvement of posterior segment. The patients admitted to department of Ophthalmology, in a tertiary care hospital from western India during 24 months extending from January 2008 to December 2009 were considered for study.

Inclusion criterion

1. Patient of all age group with history of eye injury affecting particularly posterior segment structures.
2. Patients admitted and treated at our hospital only.
3. Patients with one or more of the following ocular lesions: Traumatic vitreous hemorrhage, traumatic retinal dialysis and hemorrhage and RD, choroidal tear, commotio retinae, retained intraocular foreign body in posterior segment, optic nerve entrapment, posterior dislocation of PCIOL (post traumatic) and posterior sclera perforation.

Exclusion criterion

1. Eye injuries involving only anterior segment
2. Chemical eye injuries.

¹Consultant-Cataract and Cornea, Calgary Eye Hospital, Malviya Nagar, Jaipur, Rajasthan, ²Professor and Head, Department of Ophthalmology, SMIMER (Surat Municipal Institute of Medical Education and Research) Surat, Gujarat, ³Professor and Head, Department of Ophthalmology, GMERS (Gujarat Medical Education and Research Society) Medical College and Hospital, Sola, Gujarat, India

Corresponding author: Dr. Garima Agarwal, MS, PDF (Cornea and General Ophthalmology - Sankara Netralaya), Consultant-Cataract and Cornea, Calgary Eye Hospital, Malviya Nagar, Jaipur (Rajasthan), India

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INTRODUCTION

Human body with its constant activity is always prone to injuries. Eyes are very sensitive to trauma, even milder form of trauma may interrupt any part of process of vision, be it light passing from external world through cornea, lens, vitreous, retina or the passage of visual signal from retina to brain. Ocular trauma may occur in isolation or with multisystem involvement. Trauma affecting posterior segment of eye is always taken as emergency because of late manifestation and severity of injuries. The outcome on posterior segment

3. Patients absconded without taking any treatment or partially treated.

RESULTS

Patients from all the age group starting from 1 -40 years and above (>40 years) were included in the study. Age wise majority of the patient were in 11-20 years (40%) with male

Visual Acuity	No. of patients
No PL	3
PL+PR	9
HM + PR4	8
HM + <6/60	30
>6/60	0
PL-perception of light, PR- perception of rays, HM- hand movement	

Table-1: Distribution of study population as per their visual acuity at time of admission

B scan/Ophthalmoscopic findings	No. of patients
Vitreous haemorrhage	27
PVD	13
Choroidal detachment	1
Choroidal tear	8
Retinal haemorrhage	3
Macular odema	1
RD	12
Retinal tear or dialysis	1
Optic nerve atrophy	1
Endophthalmitis	3
Panophthalmitis	1
IOFB	5
PVD- Posterior vitreous detachment, RD-retinal detachment, IOFB- intra ocular foreign body	

Table-2: B Scan/Indirect ophthalmoscopic finding

Visual outcome	No. of patients
>6/18	0
6/36-6/60	0
6/60-HM+	30
HM+PL+PR	15
?PL	3
Pthysical	1
Evisceration	1
HM- hand movement, PL-perception of light, PR- perception of rays	

Table-3: Final visual outcome

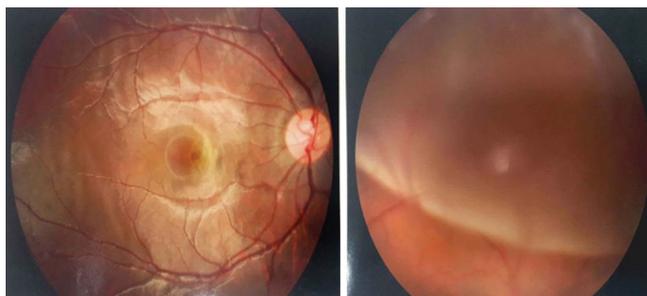


Figure 1 and 2:

preponderance in all age groups. 38 male and 12 female patients were studied (n =50). Majority of patients were from urban area(94%) as compared to rural area (06%). The distribution of study population analysis reveals majority of patients to be students-20 cases (40%) as compared to laborers-ten cases- (20%) and others (ten cases-20%) as teacher, farmer, mechanic, house wife and clerk. The predominant group of patients 96% (48 cases) came to hospital within 24 hours of injury while the remaining 04% within 24-72 hours. About 32 (64%) patients has left eye involvement as compared to 18 patients (36%) having involvement of right eye. Patients presenting with both eye involvement were none. Majority of patients (30 cases-60%) has a visual acuity of HM+ <6/60 at time of admission (table 1). Most of injuries were caused by metal -18 cases (36%) followed by wooden object- 11 cases (22%), glass piece-six cases (12%), tennis/cricket ball-four cases (08%), fire cracker-three cases (06%) and remaining eight cases (16%) due to other causes as knife, needle, pen, screw driver, comb, thread etc. In 41 (82%) cases injury was caused by moving object as compared to stationary object in remaining 9 (18%) cases. As far as type of injury was considered majority were occupational-25 cases (50%) followed by domestic-20 cases (40%), vehicular-three cases (06%) and the remaining two (4%) cases due to assault.

In 20(40%) cases with perforating eye injury majority of the wounds were between 1-5 mm in size involving cornea in 12, sclera in three and corneoscleral junction in five cases respectively. P value (0.09) was insignificant. In 34 (68%) cases patient has associated injuries over adnexa, lids including contused lacerated wound and lid tear, eyebrows, subluxated lens, hyphaema, iris prolapsed, iridocyclitis, sphincter damage along with injuries to surrounding structures like lens, orbit, forehead and other part of body.

B-scan/indirect ophthalmoscopy revealed vitreous haemorrhage to be the most common finding as found in 27(54%) cases. The spectrum of other findings of B scans (table2). In terms of treatment given, 13(26%) patients had sclera and corneal tear for which suturing was performed.27(54%) cases has vitreous hemorrhage for which vitrectomy was done after 1 week in open globe type injury and wait and watch policy for three months was followed in blunt trauma type injury . Resurgery was required in 17(34%) cases in which traumatic cataract extraction with secondary IOL was done in three cases, vitrectomy was required in nine cases presenting with non resolving vitreous hemorrhage and IOFB, rest four patients required sclera buckling and encircage which presented with retinal detachment and remaining one patient was eviscerated due to underlying panophthalmitis. Final visual outcome was poor in majority of patients having vision limited to finger counting in 60% (30) cases.

DISCUSSION

This prospective hospital based study throws light on the pattern of serious ocular injuries with emphasis on posterior segment involvement in patients admitted to a tertiary care

center. Epidemiological spectrum of ocular trauma varies in developing and developed countries. Public awareness, economical background and availability of resources are attributable for these differences. This data is helpful in defining target population and accordingly, preventive measures can be taken. The ratio of patients admitted with ocular injuries with posterior segment involvement to total number of patients with ocular injuries was 25% in present study which is comparable (16.09%) to a study done by Matti.¹

Majority of the patients who sought treatment for ocular trauma were males as highlighted by male preponderance in all age groups. Similar results were obtained by Misra² with male dominance of 71.6% and Wong³ whose study revealed that males are four times vulnerable to ocular trauma as compared to females. This may be explained by the health-seeking behavior of the population under study, where males are offered preferential treatment as compared to females. Studies in the past⁴⁻⁶ have highlighted this aspect citing male gender preponderance attributable to their common involvement in agricultural and industrial work. However, this does not particularly hold true for our study, where majority of the patients (40%) were students.

Children and young adults in age group 11-20 years were the commonest group to be afflicted (40%) which is comparable to study done by Vats⁷ and various other literature published from developing and developed world confirming to this aspect of ocular trauma.⁸⁻¹⁰ This disproportionate statistics could be explained by adventurous and risky activities of children and young adults; playing bow and arrow and unsupervised fireworks as compared to sedentary lifestyle and negligent behavior of elderly population.

Lack of data in present study limits the comparison between urban and rural population however the majority of patients (94%) presenting with eye injury belong to urban background in the index study.

The reporting time of majority (96%) of patients was <24 hours of ocular injury which is on higher side as compared to Kirti singh¹¹ of 68% and Gyasi¹² to be 57.3% cases conferring medical attention within 48 hours of injury. Early presentation (within 48 hours) was one of the main determinants of good visual outcome as compared to poor outcome in cases presenting beyond 48 hours of injury.

In the present series left eye was more commonly involved (64%) than right eye which is comparable to Sukhuma¹³ who found a involvement of left eye in 50 cases (53.1%, n=94) as compared to 34 cases (36.1%, n= 94) with involvement of right eye in his study.

Various objects made up of wood or metal including other agents as vegetable matter, foreign bodies, animal body parts or sports objects can cause ocular injuries of various degree. In our study sharp objects (made up of wood or metal) constituted major cause (in 60% cases) of injury which is similar to study done by Sukhuma¹³ who found a preponderance of 41.49% cases having ocular perforation attributable to sharp objects and 40.42% caused due to blunt trauma.

According to BETT (Birmingham eye trauma terminology)¹⁴ a system of classification of ocular trauma where the entire globe is used as a tissue of reference, 29 cases (58%, n=50) suffered closed globe injury and 21 cases (42%) suffered open globe injury which is different from Karve¹⁵ who reported 85.04% cases with closed globe injury and 14.96% cases with open globe injury. BETT has been endorsed by several eminent organizations as American academy of Ophthalmology, International society of ocular trauma and World eye injury registry. Four grades of injury (from grade A to grade E) has been defined in BETT based on penetrating visual acuity along with three zone of injury (Zone I-III). All the patients graded according to BETT revealed 58% (n=29) cases presented with grade IV (VA-4/200-light perception) injury in patients suffering from closed globe injury and 42% (n=21) cases presented with grade IV injury in patients suffering from open globe injury respectively.

B scan or indirect ophthalmoscopic findings revealed vitreous hemorrhage to be most common (54%) finding followed by retinal detachment (24%) (Figure 1) in patients presenting with posterior segment trauma which is comparable to Kirti singh¹¹ who found vitreous hemorrhage in 40% (20 cases, n=50) and retinal detachment in 32% (16 cases, n=50) of patients taking into account the data of patients involving posterior segment alone from his study.

In terms of type of treatment given 54%(n=27) of patients presenting with vitreous haemorrhage had to undergo vitrectomy after 1 week of trauma and 24% of patients presenting with retinal detachment were offered sclera buckling alone or vitrectomy followed by encirclage with endolaser gas/oil. Resurgery was required in 34% (17 cases) in which vitrectomy was done in 18%(nine cases) with non resolving vitreous haemorrhage and intra ocular foreign body. Scleral buckling and encirclage was done in four (8%) cases presented with retinal detachment. Patient presenting with traumatic cataract (06%, three cases) were offered cataract extraction with secondary IOL implantation. Evisceration was done in one (2%) case presented with panophthalmitis. Final visual outcome was poor in majority of patients having vision limited to finger counting in 60%(30) cases, 30% patients has HM and 6% patients have PL (table 3). While patient with blunt injuries with only macular edema (Figure 2) or retinal/vitreous hemorrhage showed good vision after settlement of absorption of hemorrhage and reached a vision upto 6 meter finger counting. Our findings are comparable to Kirti singh¹¹ who in his study of 103 patients showed a poor visual outcome (final vision <6/60) in 49.5% (51 cases) in which 48 patients had concomitant posterior segment involvement along with anterior segment.

CONCLUSION

Ocular trauma is a preventable cause of ocular morbidity in urban areas with majority of cases of trauma being closed globe mechanical injuries affecting young population. Early intervention is associated with good visual acuity in cases affecting purely anterior segment. However with posterior segment involvement long term prognosis remains feeble.

REFERENCES

1. Niiranen M, Raivio I. Eye injuries in children. *Br J Ophthalmology* 1981;65:436-438.
2. 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;6:560-4.
3. Wong TY, Klein BE, Klein R. The prevalence and 5-year incidence of ocular trauma. The Beaver Dam Eye Study. *Ophthalmology* 2000;107:2196-202.
4. Gupta A, Srinivasan R, Babu KR, Setia S. Comparison of the clinical presentation and visual outcome in open globe injuries in adults and children over 30 months. *Eur J Ophthalmol* 2010;20:590-5.
5. Choragiewicz T, Nowomiejska K, Wertejuk K, *et al.* Surgical treatment of open globe trauma complicated with the presence of an intraocular foreign body. *Klin Oczna* 2015;117:5-8.
6. Jonas JB, Knorr HL, Budde WM. Prognostic factors in ocular injuries caused by intraocular or retrobulbar foreign bodies. *Ophthalmology* 2000;107:823-8.
7. Vats S, Murthy GVS, Chandra M, Gupta SK, Vashist P, Gogoi M. Epidemiological study of ocular trauma in an urban slum population in Delhi, India. *Indian J Ophthalmol* 2008;56:313-6.
8. De Juan EJ, Sternberg PJ, Michels RG. Penetrating ocular injuries: Types of injuries and visual results. *Ophthalmology* 1983;90:1318-22.
9. Thylefors B. Epidemiological patterns of ocular trauma. *Aust N Z J Ophthalmol* 1992;20:95-8.
10. Cao H, Li L, Zhang M. Epidemiology of patients hospitalized for ocular trauma in the Chaoshan region of China, 2001-2010. *PloS One* 2012;7:e48377.
11. Singh K, Mutreja A, Bhattacharyya M, and Dangda S. Epidemiology and implications of ocular trauma admitted to a tertiary care hospital in north India. *US Ophthalmic Review* 2017;10:64-8.
12. Gyasi ME, Amoaku WMK, Adjuik MA. Epidemiology of hospitalized ocular injuries in the upper east region of Ghana. *Ghana Med J* 2007;41:171-175.
13. Warrasak S, Euswas A, Hongsakorn S. Posterior segment trauma: types of Injuries, result of vitreo-retinal surgery and prophylactic broad encircling scleral buckle. *J Med Assoc Thai* 2005; 88:1916-30.
14. Sahraravand A, Haavisto AK, Holopainen JM, Leivo T. Ocular traumas in working age adults in Finland - Helsinki Ocular Trauma Study. *Acta Ophthalmol* 2017;95:288-294.
15. Karve S, Kolte A, Alfia A, Rathi H. Study of clinical profile of ocular trauma at a tertiary eye care centre. *IJCMR* 2017;4:4-7.

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