

# A Prospective Clinical Study to Evaluate the Ocular Findings in Patients with Head Injury

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## ABSTRACT

**Background:** Ocular trauma is the reason of blindness amongst more than half a million subjects around the world and for partial sight loss amongst many more and it is frequently the leading reason for unilateral loss of vision, especially amongst the people of developing nations. The present study was aimed to assess the ocular findings in patients with head injury.

**Materials and Methods:** The mode of injury along with the clinical characteristics of the patient were recorded in a standard proforma. Glasgow comma scale was used to evaluate the state of consciousness of the patients. Intraocular pressure estimation was performed using Goldmann applanation tonometer wherever required. CT scan of brain, skull and spine or MRI and B-Scan was done whenever required. The required medical and surgical treatment was given to the subjects as needed. All the data thus obtained was arranged in a tabulated form and analyzed using SPSS software.

**Results:** There were 75 males and 25 females. There was 1 subject less than 10 years of age. Majority subjects i.e. 30

were between 21-30 years of age. There were 40 cases of periorbital ecchymosis, 7 cases of lid laceration, 20 cases of subconjunctival hemorrhage, 4 cases of proptosis, 7 cases of ptosis, 8 cases of corneoscleral rupture, 5 cases of hyphema.

**Conclusion:** In our study, Periorbital ecchymosis was the most commonly observed finding in case of ocular trauma.

**Keywords:** Hyphema, Periorbital, Ocular, Head.

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## INTRODUCTION

Injuries to head are the reason for hospitalization of 200-300 persons amongst 100,000 population every year<sup>1</sup> and around 25% of them have related ocular and visual problems. Ocular trauma is the reason of blindness amongst more than half a million subjects around the world and for partial sight loss amongst many more and it is frequently the leading reason for unilateral loss of vision, especially amongst the people of developing nations.<sup>2</sup> Therefore, the role of ocular lesions secondary to head injury amongst the reason of blindness and the overall prognosis of subjects has become a topic of great importance.<sup>3</sup> Head trauma are commonly related with ophthalmic outcomes and consequently leading to visual morbidity, but various of the ophthalmic outcomes are frequently ignored and present later to specialist of the neuro-ophthalmic clinics.<sup>4</sup> So, clinical associations of the ophthalmic discoveries are important during the early localization of the site of the injury, for better patient management, and improved prognosis amongst subjects with head injury.<sup>5,6</sup> The present study was aimed to assess the ocular findings in patients with head injury.

## MATERIALS AND METHODS

The present prospective study was conducted amongst 100 subjects diagnosed with closed head injury by the Department of Ophthalmology, NIIMS, Jaipur, Rajasthan, India. All the subjects enrolled in the study were diagnosed during a period of 1 year. Complete demographic profile of the subjects was recorded. The details of demographic profile of the patient were noted. The mode of injury along with the clinical characteristics of the patient were recorded in a standard proforma. Glasgow comma scale was used to evaluate the state of consciousness of the patients. The study excluded uncooperative patients and the patients who failed to give the consent for the study. The study was approved by the ethical board of the hospital. Two levels of Ophthalmological examination were carried out. One bedside at admission and other in the outpatient department. Bedside examination comprised of extra orbital injury evaluation, pupillary response, vision by counting fingers, extra ocular movement examination, visual field estimation by finger confrontation, fundus testing with direct ophthalmoscope, intraocular pressure determination by

shiotz indentation tonometer. In the OPD, visual acuity was assessed using snellen's chart, anterior segment was evaluated with slit lamp, Posterior segment was assessed on dilated eye using direct and indirect ophthalmoscopy. Intraocular pressure estimation was performed using Goldmann applanation tonometer wherever required. CT scan of brain, skull and spine or MRI and B-Scan was done whenever required. The required medical and surgical treatment was given to the subjects as needed. All the data thus obtained was arranged in a tabulated form and analyzed using SPSS software.

**Table 1: Demographic characteristics of the study**

| Gender                  | Frequency |
|-------------------------|-----------|
| Male                    | 75        |
| Female                  | 25        |
| <b>Age distribution</b> |           |
| <10 yrs.                | 1         |
| 11-20                   | 6         |
| 21-30                   | 30        |
| 31-40                   | 23        |
| 41-50                   | 12        |
| 51-60                   | 12        |
| >60yrs                  | 2         |

**Table 2: Ocular injuries sustained by the subjects in the study**

| Type of injury                           | Frequency |
|--|-----------|
| <b>A. Soft tissue injury</b>             |           |
| 1. Periorbital ecchymosis                | 40        |
| 2. Lid laceration                        | 7         |
| 3. Sub conj.hemorrhage                   | 20        |
| 4. Proptosis                             | 4         |
| 5. Ptosis                                | 7         |
| 6. Corneoscleral rupture                 | 8         |
| 7. Hyphema                               | 5         |
| 8. Vitreous hemorrhage                   | 3         |
| 9. Macular edema                         | 3         |
| 10. Retinal detachment                   | 1         |
| <b>B. Orbital fracture</b>               |           |
| 1. Lateral wall                          | 4         |
| 2. Medial wall                           | 4         |
| 3. Floor                                 | 2         |
| 4. Roof                                  | 2         |
| <b>C. Neuro ophthalmic complications</b> |           |
| 1. Abnormal pupil reaction, (RAPD)       | 25        |
| 2 EOM restriction                        | 20        |
| 3. Disc edema                            | 15        |

## RESULTS

The present prospective study was conducted amongst 100 subjects with ocular findings. There were 75 males and 25 females. There was 1 subject less than 10 years of age. Majority subjects i.e. 30 were between 21-30 years of age. there were 6 subjects between 11-20years of age. There were 23 subjects between 31-40 years of age. There were only 2 subjects more than 60 years of age. There were 12 subjects each between 41-50 years and 51-60 years. (Table 1)

Table 2 elaborates the ocular injuries sustained by the subjects. There were 40 cases of periorbital ecchymosis, 7 cases of lid laceration, 20 cases of subconjunctival hemorrhage, 4 cases of proptosis, 7 cases ptosis, 8 cases of corneoscleral rupture, 5 cases of hyphema, 3 cases of vitreous hemorrhage, 3 cases of macular edema and 1 case of retinal detachment. Amongst orbital fractures, 4 cases of lateral wall fracture, 4 cases of medial wall fracture and 2 cases of floor and roof fracture each. Amongst neuro ophthalmic complications, 25 cases of abnormal pupil reaction, 20 cases of EOM restriction and 15 cases of disc edema were observed.

## DISCUSSION

In developing nations like India progression towards more multicultural standards, Road Traffic Accidents have a major role in the physical griefs of young working era. Head injury is one of the prime reason and eyes are the most frequently involved in majority of head injury subjects, it has to be safeguarded that adequate ophthalmic evaluation occurs at the time and appropriate treatment is delivered accordingly for the prevention of permanent visual impairment. India is responsible for around 10% of RTA around the globe.<sup>4,7,8</sup> In our study, there were 40 cases of periorbital ecchymosis, 7 cases of lid laceration, 20 cases of subconjunctival hemorrhage, 4 cases of proptosis, 7 cases ptosis, 8 cases of corneoscleral rupture, 5 cases of hyphema, 3 cases of vitreous hemorrhage, 3 cases of macular edema and 1 case of retinal detachment. Amongst orbital fractures, 4 cases of lateral wall fracture, 4 cases of medial wall fracture and 2 cases of floor and roof fracture each. Amongst neuro ophthalmic complications, 25 cases of abnormal pupil reaction, 20 cases of EOM restriction and 15 cases of disc edema were observed. It may be attributed to the type of impact during the road traffic accidents where the lateral wall gets damaged most often on the verge of protection of the eyeball dissimilar to other forms of injury to the orbit like the blowout injury where the direction of the impact is from the front side, orbital injury during road traffic accidents is frequently due to the force of impact on the lateral portion of the orbit. Though the most commonly observed orbital fracture is the blowout fracture, commonly involving the floor of orbit with or without the medial wall, Lateral wall fracture is commonly associated with malar complex fracture.<sup>9,10</sup> lateral wall of orbit is strongest amongst the other walls however is most commonly fractured in case of severe face traumas fracture commonly occurs at spheno zygomatic suture.<sup>11</sup> In general subjects with fracture of lateral orbital wall are commonly young males that present with swelling in the mid facial region and deformity. Joint between the zygomatic bone and the greater wing of sphenoid is broad. This region is the commonest region for fracture of lateral orbital wall that is commonly accompanied by disturbance of zygomatic bone joints with the frontal bone and maxillary bone.<sup>11</sup>

## CONCLUSION

Ocular trauma cannot be ruled out in cases of head injury. Fractures of the orbital wall must be carefully examined for in cases of road traffic accidents. In our study, Periorbital ecchymosis was the most commonly observed finding in case of ocular trauma.

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