Clinical profile of ocular trauma in a tertiary care hospital

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ABSTRACT

Aim: To study the profile of clinical presentation of ocular trauma in outpatients and inpatients in a tertiary care hospital. Materials and Methods: This is a prospective, open-label study and patients with a history of ocular injury from both outpatient and inpatient department in a tertiary care hospital were included in the study. Bedside visual acuity, detailed anterior and posterior segment evaluation was done. Surgical management was done when needed. Statistical analysis was done using percentage. Results: Out of 44 cases included, 40 were male, of which 35 cases had sustained the injury to both eyes. Age of 11 cases (25%) was in the active and productive age group of 16-25 years. Road traffic accidents accounted for 86% of the injuries. The most common structures affected were the periorbital region and the lids (38.6%). Lid tear was seen in nine patients which was sutured. Traumatic optic neuropathy was seen in five cases out of which three cases improved following treatment. Conclusion: The initial evaluation of ocular trauma, the decision making regarding treatment and counseling of the patient and family members are very important which requires skill, knowledge and experience. Careful documentation and appropriate surgical planning will help to assure the best possible outcome.

Key words: Adnexae, Ocular trauma, Periorbital

INTRODUCTION

Ocular injury is an important cause of uniconal morbidity and blindness in India.¹ Men at work in factories and construction sites, children and agricultural workers are more prone to ocular injuries.¹,² Road traffic accidents (RTA) and sports injuries also cause a significant number of ocular injuries. The majority of these injuries are sustained in active and productive age group.¹

Although eye represents only 0.1% of total body surface, their significance to the individual and society is disproportionately higher. Ocular trauma is the most common reason for extended hospitalization of ophthalmic patients in industrialized nations and the most common cause of uniconal blindness.

Aim

Our study attempts in studying the profile of clinical presentation of ocular trauma in patients attending the outpatient and inpatients in a tertiary care hospital.

Objectives

1. To determine the age and sex incidence and identify the causes of ocular injury
2. To find out incidence of different modes of eye injury
3. To determine the extent of eye injury in different levels of trauma
4. To suggest any possible method of reducing the incidence of ocular trauma and to assess the need for protective eyewear.

MATERIALS AND METHODS

Patients with history of injury to the eye were selected from both outpatients and inpatients in a tertiary care hospital. An informed consent was obtained from all the patients. In this study, 88 eyes of 44 patients

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examined between October 2013 and September 2014 were included. All patients who sustained a mechanical injury to one or both eyes were included. Patients with chemical injuries and other non-mechanical injuries were excluded from the study.

This is a prospective open label study. Statistical analysis was done using percentage.

A detailed history regarding age, sex, occupation, causative agent, duration of injury, activity at the time of injury and symptoms following injury were noted.

**Examination of the eye**

1. Bedside visual acuity was tested
2. Detailed torch light examination with the help of magnifying loupe was done to assess the anterior segment of the eye
3. Direct ophthalmoscopic examination of fundus was done
4. Extraocular movements were checked.

**Investigations**

Plain X-ray, skull posterior-anterior view, waters-view of peripheral nervous system were taken whenever necessary.

Computed tomography scan of brain and orbits was taken in RTA cases, history of fall, diplopia with extraocular movement restriction and in badly injured eyeball.

**OBSERVATION AND RESULTS**

Out of 44 cases, 40 were male and 4 were female. Of 40 male patients, 35 had both eyes injuries. About 11 patients (25%) were of 16-25 years which is the active and productive age group, and 3 patients (7%) were more than 55 years.

Out of 44, 38 cases (86%) were due to RTA and assaults (Figure 1 and Table 1).

Out of 88 eyes, 34 eyes (38.6%) had injury in the periorbital region in the eyelids (Figure 2 and Table 2).

**DISCUSSION**

Ocular trauma is one of the leading causes of uniocular blindness in developing countries. It can have varied presentation ranging from a simple subconjunctival hemorrhage to sight-threatening optic neuropathy. According to National Society of prevention of blindness one-third of vision loss in first decade of life is due to injury.[5]

In our study, maximum incidence of ocular trauma was seen in males (90%) out which majority were in 16-25 age group. Our study results coincide with the study by Harpton and Lambah,[4] they observed that

94.3% of males and 5.7% of females were affected. Studies by Nirmalan et al.[5] and Krishnaiah et al.[6] also concluded that ocular trauma incidence is more in males of productive age group. A possible explanation is that in a developing country like India males are actively employed and have greater mobility than females. Therefore, males are more prone for accidents and occupational injuries due to increased exposure.

![Figure 1: Cause of injury](image1)

![Figure 2: Ocular structure affected](image2)

**Table 1: Cause of injury**

<table>
<thead>
<tr>
<th>Cause of injury</th>
<th>Number of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTA, assault</td>
<td>38</td>
<td>86</td>
</tr>
<tr>
<td>Occupational injuries</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Sports and play</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cause of injury</th>
<th>Number of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTA: Road traffic accidents</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Ocular structure affected**

<table>
<thead>
<tr>
<th>Ocular structure</th>
<th>Number of eyes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periorbital region and lids</td>
<td>34</td>
<td>38.6</td>
</tr>
<tr>
<td>Conjunctiva</td>
<td>17</td>
<td>19.3</td>
</tr>
<tr>
<td>Cornea</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td>Anterior chamber</td>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td>Iris</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>Posterior segment</td>
<td>4</td>
<td>4.5</td>
</tr>
</tbody>
</table>

94.3% of males and 5.7% of females were affected. Studies by Nirmalan et al.[5] and Krishnaiah et al.[6] also concluded that ocular trauma incidence is more in males of productive age group. A possible explanation is that in a developing country like India males are actively employed and have greater mobility than females. Therefore, males are more prone for accidents and occupational injuries due to increased exposure.
In our study, we observed that RTA is the most common cause of eye injury (86%) (Table 1 and Figure 1). High-speed travel, overcrowding in vehicles, not respecting traffic rules are factors which contribute to high incidence of RTA.\(^6\)

Most of the injuries involved periorbital structures and ocular adnexae (38.6%) (Table 2 and Figure 2). Macewen\(^7\) in 1989 studied 5,671 patients with ocular trauma and found that 98.3% of all injuries involved periorbital structures only. Closed globe injuries were more common than open globe injuries.

Anterior segment injury (95%) is more than posterior segment injury (5%). Lid edema and ecchymosis (Figure 3) account for about 17% of eye injuries. Partial thickness lid laceration was seen in 7% and full thickness lid tear (Figures 4 and 5) was seen in 3.4% of our study population (Table 3). Subconjunctival hemorrhage (Figure 6) and chemosis are seen in 17% and 11% respectively.

Traumatic optic neuropathy accounts for about 5.6% of eye injuries (Table 4). Out of five cases, three patients regained vision due to timely management; two were treated with an intravenous injection. Solumedrol, and in one patient surgical decompression of optic nerve was done. The other two patients presented late and hence visual prognosis was poor. According to Linberg\(^8\) traumatic optic neuropathy is a compartment syndrome in the confined space of optic

### Table 3: Ocular adnexae and periorbital structure involvement

<table>
<thead>
<tr>
<th>Ocular structure involved</th>
<th>Number of eyes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lid edema and ecchymosis</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Partial thickness lid laceration</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Full thickness lid laceration</td>
<td>3</td>
<td>3.4</td>
</tr>
<tr>
<td>Orbital fractures</td>
<td>12</td>
<td>13.6</td>
</tr>
</tbody>
</table>

### Table 4: Cranial nerve involvement

<table>
<thead>
<tr>
<th>Cranial nerve</th>
<th>Number of eyes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optic nerve</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td>Oculomotor nerve</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>Facial nerve</td>
<td>2</td>
<td>2.2</td>
</tr>
</tbody>
</table>

**Figure 3:** Lid edema with ecchymosis and subconjunctival hemorrhage  

**Figure 4:** Full thickness lid tear pre-operative picture  

**Figure 5:** Full thickness lid tear post-operative picture  

**Figure 6:** Cracker injury with subconjunctival hemorrhage
canal, hemorrhage and edema lead to ischemia and further damage.

CONCLUSION
The initial evaluation of ocular trauma, the decision making regarding treatment and counseling of the patient and family members are very important which requires skill, knowledge and experience. Careful documentation and appropriate surgical planning will help to assure the best possible outcome.

General public should be educated about methods of prevention of ocular trauma. Facility for first aid should be provided. Stringent implementation of traffic rules, to avoid high-speed travel, safety measures like helmet and seat belts is to be emphasized. Workplace strategies to minimize ocular trauma include provision, training and monitoring the use of protective eyewear. Education of parents about the consequences of ocular trauma and ensuring supervised safe environment for play.

Eye care programs need to consider ocular trauma as a priority in our population and create trauma care units at all regional eye hospitals. An integrated approach is needed for managing complicated cases.

REFERENCES