

# Visual Outcome and Pattern of Industrial Ocular Injuries

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**Purpose:** To evaluate the industry related ocular injury pattern and visual outcome.

**Material and Method:** The study was conducted in the Kulsoom bai Valika Social Security SITE Hospital from Nov. 2006 to Nov. 2008. This study includes 200 patients fulfilling the inclusion criteria. All the patients were worked up according to the protocol. The follow up period was 3 months.

**Results:** A total of 200 persons presented with diagnoses of industrial ocular trauma. Ocular injury requiring admission occurred in 25 cases (13%), The remaining 165 patients were treated on outpatient basis. The pattern of industrial ocular trauma was generally trivial. Upon presentation 40 (21%) patients had visual acuity of 6/6 on Snellen Chart, while on final follow up 167 (88%) patients had a visual acuity 6/6 on Snellen Chart.

**Conclusions:** Our study shows that the patients with industrial ocular injuries need urgent medical treatment. Prompt medical management can prevent the permanent visual loss.

Ocular trauma has always been and always will be a challenge to ophthalmologists<sup>1</sup>. Injury is the commonest cause of monocular blindness<sup>2</sup>. Worldwide more than half a million blinding injuries occur every year<sup>3-4</sup>.

The overall financial cost is estimated to be hundreds of millions of dollar annually<sup>5</sup>. There is a bimodal age distribution of severe ocular trauma, with a large preponderance of injuries affecting males<sup>6-10</sup>. Chiapella et al and Vernon estimated that approximately half of all patients who present to an eye casualty department do so because of ocular trauma<sup>11-12</sup>. Industrial accident statistics for 2005 indicated that ocular injuries accounted for 3% and it was attend for the last ten years<sup>13</sup>. Industrial accident related ocular trauma comprise a relatively large proportion of the patients requiring ophthalmic review at emergency level in Singapore<sup>14</sup>. It is commonly known that young adult males are more prone to ocular trauma and this has been traditionally endorsed to the relatively high risk-taking behaviour and the high proportion of work-related, assault-

related and sports-related eye injuries in which there is a significant male preponderance<sup>15</sup>.

The impact of eye injuries extend beyond the afflicted individual to social level in terms of loss of productivity and added costs to health care system. The quality of life of not only the patient, but also his families and friends is affected. It is perhaps a worthy reminder that the serious consequences of eye injuries such as visual impairment and physical disfiguration can also alienate the patient by imposing a barrier to social interaction both physically and psychologically. These repercussions are especially serious in the young individuals. Another study has shown that work is an important cause of eye injury<sup>16</sup>. This study was conducted to evaluate the effects of eye in injuries in SITE, Karachi.

## METHODS AND MATERIALS

A two years study was conducted from Nov. 2006 to Nov. 2008 at Kulsoom Bai Valika Social Security Hospital Karachi. All patients who sustained ocular

injures as a result of work related accident sewer included in the study.

A specific history was taken about age, occupation, time of injury and type of object causing injury. Patients had their visual acuity assessed by Snellen Chart. All patients had their anterior segments examined by slit lamp examination and IOP measured by applanation tonometry and fundus examination carried out.

Data with regard to clinical condition during subsequent follow up visit, and final visual acuity upon discharge or last visit was also recorded.

### **INCLUSION CRITERIA**

All industrial ocular trauma brought to the hospital were included in the study.

### **EXCLUSION CRITERIA**

1. Other causes of trauma such as road traffic accident, domestic assault, tennis ball and pellet injuries were not included in the study.
2. Patients who received industrial ocular trauma and associated life threatening injuries were not included in the study.

### **RESULTS**

A total of 200 patients presented with diagnoses of industrial ocular trauma during the study period. Ten patients (5%) patients were lost to follow up. The average age of the patients was 24-38 years. All patients were male.

Management of the patients included removal of corneal foreign bodies, irrigation of eyes for those with chemical injury, followed by appropriate medical management and follow up in the out patients clinic. Ocular injury requiring admission occurred in 25 cases (13%). Six of them required emergency surgery under general anesthesia, 4 of these required corneal and scleral suturing, 2 cases required removal of foreign body, impaled in the cornea with anterior chamber collapse. One of the admitted patients had sealed corneal tear. Nine of the admitted patients sustained severe chemical injury requiring intensive irrigation and topical medication. Three patients had hyphema caused by blunt trauma, one had endophthalmitis, 4 patients had welding arc corneal burn.

The remaining 165 patients were treated on out patient basis. They sustained superficial corneal and lid abrasion, management of these cases involved

removal of superficial corneal or upper tarsal conjunctival foreign bodies and firm patch for 24 hours, superficial lid laceration required no suturing. Six patients who did not require admission had mild chemical injury. Management of these cases required intensive irrigation of the eye followed by appropriate topical medication and follow up in the out patient clinic.

Upon presentation 40 (21%) patients had visual acuity of 6/6 on Snellen Chart, 110 (58%) patients had a visual activity 6/9, 2 cases (1%) had a visual acuity 6/18, 17 cases (8.9%) had a visual acuity 6/24, 15 (7.9%) cases had a visual acuity 6/36, 5 (2.6%) patients had a visual acuity < 6/60, 1(.52%) case had a visual acuity of light perception (pl + ve).

On final follow up 167 (87.9%) patients had a visual acuity 6/6 on Snellen Chart, 5 (2.6%) patients had a visual acuity 6/9 on Snellen Chart, 7 (3.68%) cases of chemical injury those required admission had a visual acuity 6/12 on Snellen Chart, 7 (3.68%) of the admitted cases those sustained corneoscleral tear and intraocular foreign bodies (anterior chamber) had visual acuity of 6/18 on Snellan Chart, 2 (1%) of chemical injury out of 9 those required admission had visual acuity of 6/24 on Snellen Chart, 1 (0.52%) case of sealed corneal tear had visual acuity of 6/60 on Snellen Chart. 1 case (0.52%) of endophthalmitis did not improve and ended up with therapeutic evisceration.

Only 10 (5.26%) of the reporting patients had worn protective goggles. Common causes of accidents were ill fitting or non-availability of protective eyewear and poor vision due to fogging from sweat. The electrical industry (where tube light and bulbs are manufactured) was the most common cause of superficial lid, corneal and conjunctival laceration. Grinding, cutting metal, welding, hammering, drilling and chemical injury (car battery industry, soap industry and beverage industry) were the specific activities in the majority of the cases. Average loss of days of work was 4.5 days.

### **DISCUSSION**

Careful examination and appropriate treatment are necessary because ocular traumatic emergencies may have a poor visual prognosis even when seemingly mild<sup>18</sup>. It has been observed that industrial ocular trauma is a characteristic of particular industry. Manual Occupational industries are a constant source of perforated ocular injuries with or without foreign

bodies<sup>19</sup>. In our study, the cases of ocular injuries that required admission were caused by high-speed machinery involving grinding drilling activities and chemical injuries.

**Table-1:** List of ocular injuries sustained.

	Ocular injuries required admission n (%)	Ocular injuries seen as out-patients n (%)
Lid laceration	0	09 (4.5)
Superficial lid conjunctival and corneal abrasion /laceration	0	150 (78.9)
Sealed corneal tear	1 (0.52)	0
Scleral tear	2 (1.05)	0
Full thickness corneal tear	3 (1.57)	0
Intra ocular foreign body with anterior chamber collapse and corner tear	2 (1.05)	0
Chemical injury	9 (4.7)	6 (3)
Hyphema	3 (1.57)	0
Endophthalmitis	1 (0.52)	0
Welding arc corneal burn	4 (2.10)	0

**Table-2:** Visual acuity readings

No of patients n (%)	Visual acuity at Presentation	No of patients n (%)	Visual acuity upon discharge
40 (21.05)	6/6	167 (87.8)	6/6
110 (57.89)	6/9	05 (2.63)	6/9
02 (1.05)	6/18	07 (3.68)	6/12
15 (7.89)	6/36	07 (3.68)	6/18
17 (8.9)	6/24	02 (1.05)	6/24
05 (2.63)	<6/60	01 (0.52)	6/60
01 (0.52)	Pl + ve	01 (0.52)	NPL
190		190	

**Table 3:** Sources of Injury

Source	No of patient's n (%)
Grinding	153 (76.5)
Welding	04 (2.01)
Hammering on metal	08 (4.02)
Drilling	06 (3.01)
Nailing	01 (0.52)
Chemicals	15 (7.5)
Blunt Trauma	03 (1.57)

Negligence, lack of protection and poor vision due to fogging from sweat were the common causes of ocular injuries in our study. An earlier study by Khan et al stated that criminally negligent attitudes, lack of protective devices and severe aggression were the causes of much ocular trauma in the Khyber Pakhtun Khawah<sup>20</sup>.

The Visual Outcome of ocular injuries depends on the type of trauma sustained and the time lapse between injury and report to hospital Emergency. Average time after which the pts reported to the hospital was 1.2 days. Ocular trauma in the industrial setting is largely preventable with the use of well-fitted protective eyewear and strict compliance.

Employees in every industry are at risk of eye injuries. Occupational eye injuries can result in serious morbidity and great economic loss<sup>21</sup>. Eye injuries remain a significant risk to worker's health especially among men in jobs requiring intensive manual labour<sup>22</sup>.

In Our Country there is an urgent need for better education on work place, safety measures and effective preventive strategies for both employers and their employees.

## CONCLUSION

The study shows that the patients with industrial ocular trauma need urgent medical treatment. Prompt medical management can prevent the permanent visual loss. These patients are usually young males their injuries are generally minor and majority have good final visual acuity. These injuries are largely preventable with the use of well-fitted protective eyewear with good visibility and strict compliance on its use. This would greatly reduce the unnecessary loss

of work-days, economic loss and worker disability from ocular injury.

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