

# An Epidemiological Report of Occupational Ocular Injury in Eastern Part of India

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## ABSTRACT

**Introduction:** Occupational eye injury is common among industrial worker and it is an important cause of preventable vision loss worldwide. Study was done to determine epidemiological characteristics of occupational ocular injury in Eastern part of India.

**Material and Methods:** All the patients reported to emergency department of a referral hospital for industrial worker in Eastern India with eye injury in between Jan 2016 to Mar 2017 were evaluated using an interviewer-administered questionnaire and detailed ophthalmological evaluation.

**Result:** Among 784 patient majority are male (89%) are in the age group of 31-40 year (44.6%). Accidental ocular injury are more common to temporary worker (63.2%) of manufacturing industry (52.8%) not having safety training (67.8%) and not using protective devices (88.3%). Most common diagnosis is foreign body over cornea and conjunctiva 58.4 (%) by metallic foreign body (71.5%).

**Conclusion:** This study described the epidemiological characteristics of occupational ocular injury in Eastern part of India. This study may be taken as base line epidemiological data for further research.

**Keywords:** Ocular Trauma, Preventable Blindness, Occupational Health, Eye Injury

## INTRODUCTION

Occupational eye injury causes more than 65,000 job absentee in United States.<sup>1,2</sup> Daily more than 2000 occupational injury occurs, out of which 10-20% causes temporary or permanent vision loss.<sup>3</sup> Fabricators, labourers, equipment workers and construction workers are more prone to ocular injury. In Hong Kong every year 8000 occupational eye injuries occur and it accounts for 8% of all occupational injury recorded in selected hospitals.<sup>4</sup>

In developed countries they have numerous epidemiological studies with help of which they formulate surveillance system and prevention strategies. In developing countries like India, we don't have enough epidemiological data or proper surveillance system based on which we can formulate the prevention strategy for occupational accidents.

This study was conducted in a referral centre for Industrial workers in Eastern India to report the epidemiological characteristics of occupational eye injuries which is probably reported first time in this part of India.

## MATERIAL AND METHODS

Haldia and Hooghly are two industrial areas in Eastern India having petro chemical, automobile assembly, food canning industries. We studied the epidemiological characteristics of occupational ocular injury presented in the Emergency

department of the referral centre for Industrial worker in Eastern India. Almost all accidentally injured patients of that industrial area requiring specialist eye treatment are referred to this hospital. Therefore, these data are representing major occupational ocular injury in this area

All the patients reported to Emergency Dept of that referral centre with eye injury in between Jan 2016 to Mar 2017 were included in this study. Patients below the age of 15 years were excluded from the study. Ethical Clearance was taken from institutional clearance committee.

Initially all the patients were evaluated using an interviewer-administered questionnaire and subsequently detailed ophthalmological evaluation.

## STATISTICAL ANALYSIS

Microsoft office 2007 was used for the statistical analysis. Descriptive statistics like mean and percentages were used for analysis.

## RESULT

In that time period 784 patients were treated at Emergency Dept. The average age was 34.5±0.34 years. Among all patients of occupational eye injury 31-40 years was the most common age group (44.6) followed by 21-31 years (28.7%), 41-51 years (19.6%). Among all patients majority were males (89%). As Table-1,2 shows that most of the injured patients were involved in manufacturing industry (52.8%) followed by constructional work (25.4%) and agriculture based industry (11.3%). Metallic foreign body injury is the most common cause (71.5%) followed by chemical injury (7.6%), thermal burn by hot liquid (7.5%) and arc rays (4.8%).

In this study the most common diagnosis among all injured patients is foreign body on the cornea and conjunctiva (58.4%) followed by contusion of the eye and adnexa (14.6%), superficial wound of the lid and adnexa (11.8%), burn confined to lid and adnexa (9.6%), open globe injury (2.4%) and others (3.2%) (Figure-1).

## DISCUSSION

Occupational eye injury is an important cause of preventable

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Age (%)	Sex	Factory (%)	Cause of Injury (%)		Diagnosis (%)	
			Foreign body	Others	Foreign body over cornea and conjunctiva	Others
Less than 21	M	Manufacturing	52.8	71.5	58.4	
21-30	F	Construction	25.4	7.6	14.6	
31-40		Agriculture	11.3	7.5	11.8	
41-50		Service	6.3	4.8	9.6	
51 and above		Others	4.2	2.1	2.4	
				1.2	3.2	
				5.3		

Table-1: Cause of Injury

blindness and it has an eminent economic impact, not only on the industry but also on the worker and their families.<sup>6</sup> Though there is great progress in management of ocular injury, primary prevention remains critically important.<sup>7-11</sup>

According to this study majority of workers i.e 44.6% falls in the age group of 31-40years. Therefore it shows that the work experience fails to reduce the occupational eye injury. This study shows that injuries are more common in males (89%), which is consistent with Kanoff et al. and Bauza et al.<sup>12-13</sup>

According to this study majority of the injured workers were working in manufacturing industries(52.8%), followed by constructional work (25.4%), agriculture based industry (11.3%), and services (6.3%). This findings corroborated with Chi et al. conducted in southeast China but not with the findings of Yu et al. conducted in Hong Kong.<sup>4,14</sup> This discrepancy among different studies was probably due to unequal distribution of industries in different areas or may be due to inadequate sampling. However it is apparent that manufacturing industry workers had the highest risk of injury.

As shown in Figure-1 majority of patients (58.4%) were diagnosed with corneal or conjunctival foreign body, which is followed by contusion injury of the eye and adnexa (14.6%) which tallies with previous studies.<sup>4,6,17</sup> Among all the patients metallic foreign body injury was the most common cause (71.5%) followed by chemical injury(7.6%), thermal burn by hot liquid and arc rays. Protective devices have an important role in the prevention of occupational ocular injuries. But in this study, majority of the workers (88.3%) were not wearing protective glasses at the time of accident. This was also

observed by Thompson et al. in their study, they showed that only 13% of the workers were documented wearing eye protection at the time of injury.<sup>15</sup> Another study by Chen et al. showed that protective devices reduced ocular injury by 60%, even though 18.4% workers were wearing protective glasses at the time of injury.<sup>16</sup> Thompson et al. also observed a large percentage of workers who sustained injury (92.9%) did not wear protective glass at the time of injury even though it was available or they were aware that the protective glasses was necessary for protection against ocular injury.<sup>3,15</sup>

The present study shows that only 32.2% of the injured workers have safety industrial training. In occupational injury there is always a sequence of events involving man, material and machine. So alteration of any of the factors may prevent the accidental injury. Maintaining the safe working condition requires cooperation from both employer and employee, in terms of safety training, awareness generation, protective device use, good maintenance of machine, implementation of machine guarding.<sup>14</sup>

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This study also has some limitation. Although this study was conducted in a referral centre for industrial workers of Eastern India. Many patients of occupational ocular injury are

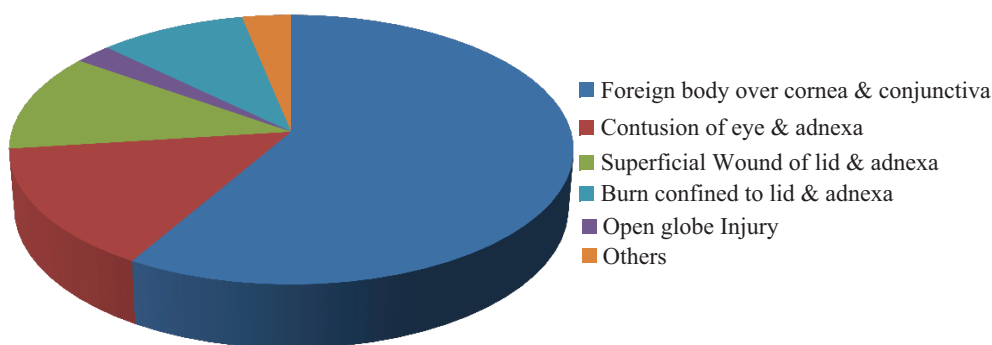


Figure-1: Diagnosis

Protective Device at the time of injury (%)		Employment (%)		Safety training (%)	
Present	11.7	Temporary	62.3	Present	32.2
Absent	88.3	Permanent	37.7	Absent	67.8

Table-2: Protective Device at the time of injury

managed in other Govt or Private Hospitals. So this data may not be representative of occupational ocular injury.

Unlike developed countries, in developing country like ours we don't have a reporting and surveillance system for occupational injuries. Therefore it is very difficult to conduct epidemiological research and safety policy planning. So mandatory reporting of occupational injuries by employer and health care provider will be helpful in evolving policy making and enhancing preventive measures.

## CONCLUSION

This study showed the epidemiological characteristics of occupational ocular injury in Eastern part of India. This study showed that the male workers in the age group of 31-40 years are most susceptible for sustaining ocular injury. Lack of adaption of basic safety measures like avoidance of protective glasses make them more vulnerable for ocular injuries. Adoption of basic safety measures and proper safety training will go a long way in reducing the ocular morbidity and industrial absentee, thereby enhancing economic productivity. This study may be taken as base line epidemiological data for further research.

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