Original Research Article

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Workplace eye safety: a neglected essential

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ABSTRACT

Background: An occupational hazard is a hazard experienced in the workplace. This includes many types of hazards like chemical hazards, biological hazards, psychosocial hazards and physical hazards. Occupational ocular trauma holds significant proportion of visual morbidity worldwide. This can be prevented with the use of proper protective eyewear and strict compliance. This survey was conducted to study occupational related ocular hazard in our tertiary health care system hospital having patients involved in various occupations.

Methods: A total of 90 occupational ocular injuries were recorded during study period. The age group of the patients to be studied was between 20 to 60 years. Brief history of present complaints, detailed clinical history and occupation history as like type of work, working environment, place, working hours was recorded. Required ophthalmological check-up was done. All valid responses were tabulated and analysed. Appropriate treatment was given.

Results: Our study showed that majority (85.6%) of patients were not wearing protective eye equipment. Male to female ratio was approximately 3:1. Major age group affected was between 31-40 years (41.1%). Welders (40%) were more prone to injury occupation wise.

Conclusions: Occupational eye injury is often severe and it contributes to significant loss. Incompliance of appropriate protective eye wear can lead to potential eye damage and permanent blindness.

Keywords: Eye, Occupational injury, Protective equipment

INTRODUCTION

Ocular trauma remains a global preventable cause of visual morbidity.¹ Occupational hazard affects workers and their families and imposes a huge burden with respect to manpower and social costs. The incidence of occupational hazards are higher in developing countries due to lower level of priority assigned for occupational health and workplace safety. Eye injuries at work are preventable and are attributable to negligence to workplace safety guidelines.² Major risk factors for ocular injuries include age, gender, socioeconomic status and lifestyle.³ In an Indian study, occupation-related accident constituted 20.1% of all ocular trauma.⁴

Eye protection should be routinely considered for use by welders, laborers, chemical process operators and

handlers, carpenters, electricians, machinists, mechanics, millwrights, plumbers and pipefitters, Sheetmetal employees and tinsmiths, assemblers, sanders, grinding machine operators, sawyers and timber cutting and logging workers.

Each type of protective eyewear is designed to protect against specific hazards.

Depending on occupation, safety spectacles, goggles, welding shields and laser safety goggles should be used.⁶

This study was carried out to find distribution of occupational ocular injury and to know awareness about using eye safety measures among the patients presenting at SSG Hospital, Vadodara.

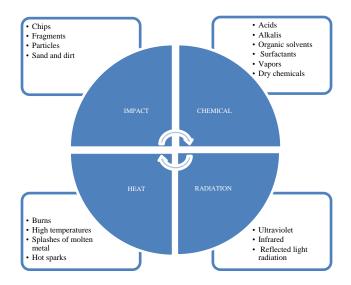


Figure 1: Types of occupational ocular hazards.

METHODS

A total of 90 patients were identified between February and July, 2020 as a case of occupational eye injury in Department of Ophthalmology, SSG Hospital, Medical College Baroda, Vadodara and observational study was done. Since SSG hospital, tertiary health care center of central Gujarat, with major industrial areas and factories in periphery of city and farming and related occupations being prevalent in rural areas of district, many patients present with various injuries which took place at their work area.

Inclusion criteria

Any patient (male/female) of age group of 20 to 60 years with history of occupational injury attending out-patients department and emergency.

Exclusion criteria

Patient with history of trauma due to causes other than related to occupation like injuries due to assault, accidental fall or road traffic accidents.

The demographic data of each patient including age, sex and address were recorded.

Occupation related history like type of work, working environment, place, working hours, use of personal protective measures was recorded.

Required ophthalmological assessment was carried out. Snellen's chart was used to record visual acuity. Slit lamp examination was carried out. Fluorescein staining of cornea was done to check for corneal abrasions and epithelial defect. Ophthalmological examination to check for subconjunctival hemorrhage, conjunctival tear, scleral tear, iris injury was done. Intraocular pressure was

measured by applanation tonometry wherever required. Radiological investigations like X-ray orbit, CT scan, MRI were done wherever indicated. Pupillary reflex was recorded in all cases. In all cases, posterior chamber examination was carried out by indirect ophthalmoscopy. USG B-scan was done in required conditions.

All responses were recorded and tabulated on Microsoft excel and analysed using SPSS software.

RESULTS

Following tables show sex wise distribution and age wise distribution of patients.

Table 1: Sex wise distribution.

Total	Male	Female
90	69 (76.7%)	21 (23.3%)

Table 2: Age wise distribution.

Age group	Cases	Percentage
20-30	15	16.6%
31-40	37	41.1%
41-50	29	32.2%
51-60	09	10.1%

Occupation wise distribution

In this distribution, maximum patients were welders (40%) having superficial corneal foreign body and welding arc exposure.

Table 3: Occupation wise distribution.

Occupation	Cases	Percentage
Welders	36	40%
Farmers	13	14.5%
Labourers and industrial workers	27	30%
Chemical factory workers	07	7.8%
Health care and hospital workers	04	4.4%
Carpenters	01	1.1%
Others	02	2.2%

Laborers and industrial workers (30%) presented most commonly with mechanical injuries.

Mechanical injuries, injuries by vegetative matters and chemical exposure (insecticides) were seen in farmers (14.5%).

7.8% of patients had history of chemical exposure to acid, alkali and fumes and splash injury.

Two health care workers (2.2%) presented with conjunctivitis and 2 (2.2%) hospital care worker had injury by disinfectant exposure.

One carpenter (1.1%) presented with in situ corneal foreign body leading to corneal perforation.

2.2% patients were involved in occupations with problem like computer vision syndrome and ocular injury while cooking.

Type of ocular injury

Type of ocular injury is presented in Table 4.

Table 4: Type of ocular injury.

Туре	Cases	Percentage
Lid laceration and abrasion	07	7.8%
Conjunctival tear and abrasion	13	14.4%
Corneal foreign body and epithelial defect	58	64.5%
Corneal perforation	03	3.3%
Anterior chamber hyphema	05	5.6%
Posterior chamber involvement	04	4.4%

Out of 90 patients, only 13 (14.5%) patients were wearing adequate protective equipment.

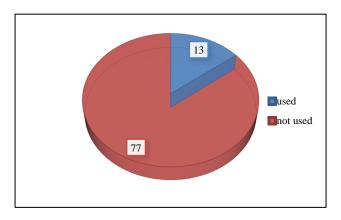


Figure 2: Usage of personal protective equipments.

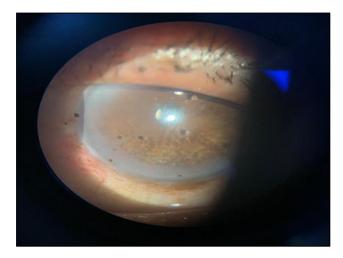


Figure 3: Multiple superficial corneal foreign bodies in welding workers.



Figure 4: Metal pin in situ with corneal perforation in carpenter.

DISCUSSION

Welder (40%), laborers and industrial worker (30%) were more prone to injury as significant prevalence of industrial area in Vadodara, followed by agricultural workers (14.5%) having injuries by mechanical trauma by agricultural tools, insecticides and fertilizers. Male to female ratio was approximately 3:1.

Corneal epithelial defect and superficial corneal foreign body (64.5%) was most common type of ocular injury. Majority of patients (85.6%) were not wearing adequate protective measures.

Comparing our results with similar other results, it showed that agricultural (19.9%) and industrial (12.24%) occupations are more prone for having eye injuries.

It also showed that most affected individuals are young adults.⁷ Occurrence of injury also depends on the nature of jobs they perform, their inherent risky nature, deficiency/lack of safety equipment at workplace, improper execution of labor laws and ignorance due to poor education, and lack of integration in to the practice.

Comparative statistics of the Bureau of Labour in the USA also show that 59% of the workers do not wear protective eye wear during work.⁸

CONCLUSION

Occupational eye injury is often severe and it contributes to significant loss. It leads to loss of productivity and it is a major cause of absence from work. Incompliance of appropriate protective eye wear can lead to potential eye damage and permanent blindness. By providing sound work environment, proper education and training regarding ocular safety and usage of protective eye equipment, significant numbers of workplace eye injuries can be prevented. Though small amount of eye injury can happen even with protective eye wears.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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