



A Study of Occupational Hazards To the Eye

KEYWORDS

Ocular injury, Occupational eye hazards, prevention.

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ABSTRACT A hospital based prospective study involving 46 patients was undertaken to find out the various agents responsible for occupational eye injuries. Majority of the patients suffered from blindness following injury with physical agents (41.3%). Few cases of severe thermal burns were found in teenagers working in fireworks factories. The ocular injuries predominantly affected the young adult population who were the sole earning members of the family. Since occupational eye injuries are common and preventable, there is an urgent need to set up safety precautions to prevent disabling eye injuries.

INTRODUCTION:

Ocular trauma is an unfortunate, yet common condition which can lead to irreversible blindness. The effects of trauma can be profound and so each and every case requires a complete ocular examination, even in innocuous looking injuries. The great increase and diversification of mechanization in industry and our daily lives has brought an increase in eye injuries and subsequently an increased awareness for better eye care for occupational hazards. Eye, the most delicate structure of our body can be injured from simple work like house keeping and sports to the most sophisticated occupations of this era like those involving visual display terminals. It is a dire necessity for every ophthalmologist to be aware of the occupational eye hazards, its effective and prompt management. Ocular injuries are an important cause of monocular blindness in USA (1²). According to a Finnish report, eye injuries account for 12% of all work related injuries (3).

This study presents the different types of occupational hazards which may lead to traumatic blindness. Emphasis has also been laid on the different protective measures which can reduce the number of occupational eye injuries.

MATERIALS AND METHODS:

A hospital based prospective study involving 46 patients was undertaken from January 2012 to December 2012. All the patients presented to the emergency department of Shri C H Nagri Eye Hospital, Ahmedabad with various types of eye injuries which took place at their work area. The clinical data recorded included the age and gender of the patient, the type of occupational and work environment, the time interval between injury and treatment received; and details about the use of protective eye wear.

All the patients underwent a complete history taking, anterior segment examination by a slit lamp, measurement of intra ocular pressure by non contact tonometer in close globe injuries, fundus examination, B Scan ultrasonography in eyes with hazy media, X ray orbit to look for fractures and intra ocular foreign bodies and CT scan of orbits in required cases. Conjunctival swabs in infected cases and vitreous tap in patients with post traumatic endophthalmitis were taken.

Appropriate medical/surgical treatment was given. Superficial conjunctival and corneal foreign bodies were removed; lid lacerations were cleaned and sutured; intra ocular foreign bodies were removed surgically; corneo sclera tears were repaired immediately and patients with hyphaema, vitreous hemorrhage, retinal hemorrhage and Berlin's edema were treated medically. Retinal dialysis and detachments were treated by cryotherapy and surgery. Copious irrigation of the eye with distilled water was done in all chemical injuries, ad-

herent particles of chemicals were removed, cycloplegic eye drops, topical antibiotic and anti-inflammatory drops with anti glaucoma medication and topical vitamin C drops were given. Cases with symblepharon underwent surgical correction, corneal vascularisation was treated by laser photocoagulation and penetrating keratoplasty was done in cases with corneal opacities.

Patients were followed up weekly for one month and monthly for next three months. The visual acuity of both eyes were recorded on presentation and on every follow up. A careful watch was kept on the fellow eye for sympathetic ophthalmitis.

RESULTS:

Out of 46 patients included in our study, majority were males (40 cases, 86.9%). 50% of the patients were aged between 30 and 45 years. The right eye was affected in 34 patients (73.9%), left eye in 10 patients (21.7%), while 2 patients (4.3%) had bilateral injury (One case of alkali chemical burns and the other case was a driver having bilateral globe perforation following road traffic accident). 32 patients (69.5%) presented within 2 hours and 8 patients (17.3%) between 2 to 6 hours of injury.

19 patients (41.3%) had physical injuries in the form of either corneo scleral perforation (12 cases), vegetative foreign bodies (4 cases), intra ocular foreign body (2 cases) or total retinal detachment (1 case who was a sportsman and had a history of blunt trauma by a cricket ball). 2 patients had lid lacerations along with corneal tears (both were females working as maid servants and had a history of injury by a knife).

All the patients with history of injury with vegetative foreign bodies (thorn, wooden stick) were farm workers. They developed endophthalmitis / panophthalmitis and ultimately loss of the eye. The globe perforation was caused by metal chips and screw drivers in 8 cases and vehicular accidents in 4 cases (all of them were truck drivers).

Chemical injuries were seen in 9 cases (19.5%). All were factory workers. 2 cases had superficial acid burns by sulphuric acid and 6 cases had alkali burns (5 cases by calcium hydroxide and 1 case by sodium hydroxide). Out of the 9 cases of chemical burns, 2 cases (acid burns) recovered completely, 4 developed infected corneal ulcers resulting in leucomatous opacities and 3 cases developed symblepharon which required surgical correction. One patient who presented with retro bulbar neuritis had a history of chronic exposure to carbon tetrachloride and carbon disulphide fumes.

3 cases (6.5%) presented with thermal injuries caused by

splashing of molten metal while working in metal factory. All the 3 cases had grade 4 chemical burns.

5 Patients (10.8%) presented with radiational injury. 4 cases had history of exposure to welding light and presented with photokeratitis. One elderly male working with radio active substances for last 18 years presented with a large basal cell malignant tumour of the upper eye lid.

8 cases (17.3%) developed ocular problems secondary to improper illumination at the work place. 6 patients (all aged 20 to 25 years) were visual display terminal workers and presented with symptoms of dry eye and ocular fatigue . 2 patients were coal miners who presented with nystagmus.

We had 2 teenage boys with a history of fire cracker blast injury while working in a fire work factory. Both of them presented with intraocular hemorrhage and retinal detachment.

Only 12 workers (26%) were wearing safety glasses at the time of injury. Out of them 8 cases had moderate to severe eye injuries.

At the end of 3 months, 7 patients (15.2%) lost their vision completely. 24 patients (52.1%) had poor visual acuity (< 6/60), 12 patients (26%) had fair visual acuity (between 6 /60 and 6/18) and only 3 patients (6.5%) had good vision (between 6/12 and 6/60).

DISCUSSION AND CONCLUSION:

Occupational eye trauma is usually severe and affects the young male population. It leads to loss of productivity and is one of the common causes of absence from work. The lower socio economic group of the society was mostly affected in our study. The risks of ocular trauma have been reported to

have increased among small scale industrial workers in developing countries because of poor working conditions, longer hours of work and poor safety precautions (4). Physical agents accounted for the majority of cases of eye trauma. A study done in western India also shows that activities like agriculture, carpentry, chiselling and hammering are responsible for many eye injuries (5).

In this study, 34 cases (73.90%) were not using any protective eye wear during work. Comparative statistics of the Bureau of Labour in the USA also shows that 59% of the workers do not wear protective eye wear during work (6). Prevention of ocular hazards in industrial and occupational field is a matter of prime social significance. Every worker should be examined thoroughly for his visual acuity and colour vision before getting employed for a particular job. Periodical medical examinations and medical care services should be provided to all employees. General measures in the form of adequate illumination at the place of work, proper design and painting of work shop so that the dangerous machines stand out clearly, providing warning labels on tools to alert users of the hazards, proper disposal and drainage of harmful chemical fumes and adequate ventilation are necessary. Workers should be educated regarding their own occupations. Protective goggles, face masks and shields appropriate for the occupation should be used. The industrial safety advisory committee recommendations on the use and care of protective goggles should be strictly followed (7). Lastly, child labour should be discouraged.

REFERENCE

1. Kahn H.A., Moorhead H.B. Statistics on blindness in the model reporting area 1969-1970, US Department of Health, Education and Welfare Publication. Bethesda: National Institute of Health, National Eye Institute ; 1973: 23-27. | 2. National Society to prevent blindness: Vision problems in the United States: Data Analysis. New York: National Society to prevent blindness. 1980. | 3. Saari KM , Parvi V. Occupational Eye injuries in Finland. *Acta Ophthalmol Suppl.* 1984; 161; 17-28. | 4. Gordon, J.J. ; C.M., Darwin and R. Wale, 1993. *The Epidemiology of Eye Diseases. Ocular Trauma at the work place.* 1st Edn; Cambridge University Press, U.K., pp: 278. | 5. Thylefors B Ocular trauma. In: Thylefors B. editor. *Strategies for the prevention of blindness in national programmes- A primary health care approach.* Geneva: World Health Organisation; 1997;74-80. | 6. Bureau of Labour Statistics. *Accidents Involving Eye Injuries.* Washington DC: US Dept. of Labour; 1980. US Dept. of Labour Publication 597. | 7. Indian Standards Institution. *Code of practice for maintenance and care of Industrial safety equipment for eye and face protection.* Indian standard 1978; 158940:1-8. |