

Epidemiology of ocular trauma in the rural population of Northern India

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Abstract

Objective: To discover the epidemiology of ocular trauma and its effect on visual impairment and blindness in a rural population of northern India.

Methods: It is a population-based cross-sectional study. We surveyed 1024 people who visited the out patient department of U.P.U.M.S. Saifai during the study period from January 2017- June 2017. 100 cases of the ocular trauma of all age group, due to various causes enrolled in the study. All cases went through a rational interview and comprehensive examination of anterior and posterior segments of the eye.

Results: We obtained a history of ocular trauma from 100 (9.7%) persons in which 6 persons were with bilateral involvement. Mean age of the persons was 27.1 years including 82% males. A significant association was recorded between gender and ocular trauma ($p=0.0001$) although relation of the age at trauma with gender was not statistically significant ($P = 1.0$). Blunt trauma is the most common mode of ocular injury involving 94% persons. Poor visual acuity was noted with penetrating injuries as compared to blunt injuries. The Most common setting of ocular trauma was agricultural work (48%). Blindness was significantly correlated with the site of ocular trauma ($P = 0.02$).

Conclusion: The magnitude of visual impairment and blindness due to trauma is considerably high, therefore to reduce the burden, educational programmes with the focus on providing at least appropriate first aid care should be implemented to increase awareness regarding eye health in the rural population.

Keywords: Blindness, Epidemiology, Ocular trauma, Rural.

Introduction

Ocular trauma is one of the important causes of visual impairment and blindness in the world.^(1,2) There are about 6 million people blind due to eye injuries out of which 2.3 million are affected bilaterally.^(2,3) Despite the public health importance, there is relatively less population-based data on the magnitude and risk factors for ocular trauma.⁽³⁾ Information on ocular injuries requires population-based studies.⁽⁴⁾ Most studies are based on hospital records, but such data do not accurately indicate the population at risk. The present study is designed to study the epidemiology of ocular trauma and the percentage of blindness due to trauma in a rural population of northern India.

Materials and Methods

It is a cross-sectional study done in 1024 people at the outpatient department of U.P.U.M.S. Saifai during the study period from January 2017- June 2017. 100 cases of the ocular trauma of all age group, due to various causes were enrolled in the study. The study was approved by the ethical committee of the institute. We offered comprehensive ocular examinations, including visual acuity with Snellen visual acuity charts, refraction, anterior segment examination with

slit-lamp biomicroscopy (Haag Streit, Switzerland), intraocular pressure measurement with applanation tonometry, dilated posterior segment examination with direct and indirect ophthalmoscope and automated visual field examination (Humphrey visual field analyzer, Carl Zeiss Ophthalmic Systems, Inc., Dublin, CA). The participants were examined with an informed consent. Demographic data and detailed history were recorded from each participant which includes the mode of injury and place of ocular trauma, the age at trauma and treatment for the trauma was taken from an ophthalmologist. The data collected were suitably coded and entered into pre-designed Microsoft Access software. Data analysis was done with SPSS 11.0 Package.

Results

Table 1: Distribution of ocular trauma among participants with respect to gender and age

| | <18 years | 18-40 years | >40 years | Total |
|---------------|-----------|-------------|-----------|-------|
| Male | 24 | 46 | 12 | 82 |
| Female | 4 | 12 | 2 | 18 |

Table 2: Type and mode of injury in the study population

| Best corrected visual acuity | Total (n=100) | Type of injury | | Mode of injury | |
|------------------------------|---------------|----------------|--------------------|----------------|------------|
| | | Blunt injury | Penetrating injury | RTA | NON RTA |
| >6/60 | 64 | 60 (93.8%) | 4 (6.2%) | 18 (28.1%) | 46 (71.9%) |
| <6/60 | 36 | 34 (94.4%) | 2 (5.6%) | 12 (33.3%) | 24 (66.7%) |

Table 3: The place of ocular trauma in the study population

| S. No. | Place of trauma | Frequency in percentage (%) |
|--------|-----------------|-----------------------------|
| 1 | Home | 8 |
| 2 | Workplace | 48 |
| 3 | Pavement | 4 |
| 4 | RTA | 30 |
| 5 | others | 10 |

Table 4: Clinical findings in eyes with blinding ocular trauma

| Clinical findings | No. of patients (n=36) |
|----------------------------|------------------------|
| Ptosis | 2 |
| Corneal epithelial defects | 4 |
| Corneal perforation | 4 |
| Hyphema | 4 |
| Iridodialysis | 2 |
| Angle recession | 2 |
| Traumatic cataract | 12 |
| Retinal detachment | 4 |
| Optic neuropathy | 2 |

We collected data on ocular trauma from 1024 persons. History of ocular trauma was there in either eye of 100 (9.7%) participants in which 6 patients were having bilateral ocular involvement. The mean age at which ocular trauma sustained was 27.1 ± 15.2 years (range 8-75 years) including 82% male. The distribution of ocular trauma with respect to age and gender is displayed in (Table 1). The association between gender and ocular trauma was statistically significant ($p=0.0001$). The place of ocular trauma was significantly associated with blindness ($p = 0.02$). 61 persons who reported ocular trauma were literate studied upto 10th standard or more 48% of those who reported ocular trauma, were agricultural laborers. The age at trauma did not differ significantly between genders ($p = 1.0$).

In this study population, Blunt trauma (94%) had been the most important cause of ocular injury (Table 2). We found that the most common setting of ocular trauma was agricultural labor (48%), which is More than one - third of all ocular trauma took place in a rural population. The places where ocular trauma eventuated are listed in (Table 3). Education of the subject was not associated with seeking treatment from an ophthalmologist ($p=0.64$).

56 participants had milder trauma with vision impairment ($BCVA > 6/18$). Blinding ocular trauma ($BCVA < 6/60$) was found in 36 persons (3.4% of the total studied population). Out of 36 subjects, 4 subjects were PL denied. Clinical findings in eyes with blinding ocular trauma are listed in (Table 4).

Discussion

Data from our study suggests that ocular trauma is a major problem for the rural population. The prevalence of ocular trauma is higher than that reported for glaucoma, diabetic retinopathy or age-related macular degeneration.^(5,6) however unilateral ocular trauma is more common and did not lead to bilateral blindness. Although annual incidence of ocular trauma was lower in hospital-based studies, a population-based study reported an annual incidence of 0.97% significantly high to require treatment.⁽⁷⁾ A rural population (4.5%) may have a higher prevalence as compared to an urban one (3.97%).^(5,6) Our study also observed men and young adults are at greater risk for ocular trauma and the majority of ocular injuries eventuated either at home or place of work. The rates of ocular trauma among males and agriculture workers were higher. The result was consistent with other studies worldwide. Literacy has no effect on the occurrence of ocular trauma. The setting of injury in our study was also similar to that reported from rural Nepal, with domestic or agricultural injuries being the most common.⁽⁸⁾

Blunt injuries (94%) were the major cause of trauma reported in our study while this is consistent with some studies, others have found injuries by sharp objects, such as arrows, to be more common.⁽⁹⁾ Consultation with an ophthalmologist (76%) was similar to that reported by others, but the source of treatment is not significantly correlated with blindness, as noted in previous studies.⁽⁵⁾

In our study education of the participants was not associated with seeking treatment from an ophthalmologist. Previous studies have consistently reported poor utilization rates for eye care services in rural populations of India, although these reports have primarily focused on chronic diseases like the age-related cataract.^(10,11) Poor utilization of eye care among rural populations has been attributed to the lack of available and affordable eye care services.^(10,11) Nearly 76% of those with a history of ocular injuries consulted for treatment. It may be due to the severity of ocular injuries. Education, occupation, or type of injury was not associated with seeking treatment.

Our study reports epidemiology of ocular trauma among the rural population of northern India, revealing ocular trauma is one of the major causes of blindness and visual impairment affecting mainly the young adults. Therefore appropriate first aid care should be provided and educational strategies and eye care programs should be initiated to increase awareness regarding eye care in the rural population which is essential to reduce ocular morbidity due to ocular trauma.

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