

Corneal Foreign Bodies in Occupational Exposures: A cross-sectional study**Chetan Saoji¹, Sakshi Chhavan²**¹Associate Professor, Dept. of Ophthalmology Datta Meghe Medical College Shalinitai Meghe Hospital and Research Centre Nagpur, India²Junior Resident, Dept of Ophthalmology Datta Meghe Medical College Shalinitai Meghe Hospital and Research Centre Nagpur, India

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Conflict of interest: Nil

Abstract:

Introduction: Corneal foreign bodies (CFBs) brought on by occupational exposure have received little attention, notably in the case of non-metal workers in Indian literature. In order to understand the causes of CFB in the local Indian community, our study examines a wide range of professions and environments. The goal of the study was to identify the professions, degree of education, and demographics of patients who presented with CFB acquired while doing their job duties.

Methods: A hospital-based retrospective study with the time duration of 10-months in a Shalinitai Meghe Hospital Nagpur, Maharashtra. A series of questions were posed to the patients who had CFB on their occupation, education level, awareness of possible problems from CFB, and demographics.

Results: The study consisted of 117 subjects in total. CFB was exclusively found in men. Patients between the ages of 14 and 29 made up 70% of the population. Patients aged 30-44 made up 25% of the patient population, while patients aged 45 to 60 made up 5% of the patient population. 47% of presentations came from the metalworking sector, 27% of presentations were from the building and construction sector, 26% of presentations were made collectively by electricians, carpenters and other industries' workers.

Conclusion: CFB is found in a variety of occupations, not just metals workers and construction workers. Work-related hazard awareness is essential to address this problem among a population that is typically less literate and has a minimal grasp of the repercussions that CFB can have on eyesight.

Keywords: Corneal foreign body, corneal trauma, foreign body, metallic foreign body, occupational injury.

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Introduction

The most frequent ocular emergencies reported in the ophthalmology emergency are corneal foreign bodies. The majority of these involve work-related accidents brought on by metal industry workers, hammering or welding, farming, building workers. According to certain studies, occupational injuries account for 20.1% of all occurrences of ocular damage in India.¹ Welders and construction workers frequently sustain such wounds while working in the metal and construction industry.^{2, 3, 4} This study was done to assess the situations in which such injuries occur and the alertness of workers regarding eye safety.

Methods

Data Source: In the urban area of Nagpur, Maharashtra at Shalinitai Meghe Hospital and Research centre conducted this hospital-based study. All patients who presented with a CFB incurred while doing occupational labour were assessed between 16th March 2022 to 16th December 2022. All patients were subjected to a

series of questionnaires, which were orally asked and filled out suitably by the ophthalmologist in their respective appropriate language. In accordance with the Declarations of Helsinki, this study received institutional review board approval. Before completing the questionnaire, all patients provided verbal consent.

Variables: Along with other demographic information, every patient's age, gender, and degree of education were documented. We enquired about the business sector in which they worked, the kind of job they were performing when they were hurt, and if they were wearing safety glasses in order to ascertain the specifics of the occurrence. Time spent in the present profession, similar prior injuries, the use of safety glasses at work, the patient's attempts to get rid of their own FB, and the technique they used if they were successful, were all noted. We questioned the participants about the time period between the incident and the visit to the ophthalmologist, whether or not they were conscious that work might result in injury to the eye,

that repeated foreign body injuries could cause serious visual impairment, and that self-removing foreign bodies could potentially harm the eyes in order to gauge their knowledge of occupational eye safety.

Data measurement: Each patient underwent a slit lamp examination. The location and depth of the foreign body were documented. We looked for rust rings, any signs of superadded infection, and corneal scars from prior FB injuries.

Results

Before the patient arrived at the hospital, the severity of their symptoms varied. Symptoms persisted for 0 to 2 days in 77% of individuals. 6% of people reported symptoms for more than 5 days, whereas 17% had symptoms for 3 to 5 days. When patients were asked about receiving enough health education on protection from occupational dangers, 45% said they had, while 55% said they had not. When asked if they were aware that their line of work posed a risk for eye injury, 70% of patients responded "yes," while 30% said "no", 74% of patients arrived with their first CFB, while 26% had previously experienced CFB. 70% of patients were aware that such CFB might seriously impair vision. The potential for substantial visual impairment caused by such accidents was unknown to 30% of patients. Protective glasses were given to 51% of patients by their workplace whereas no protective glasses were given to 49% of patients. 90% of patients lacked glasses at the time of injury, compared to 10% of patients who were donning them. The duration of patients' employment in the field was questioned. 20% of those in the sector worked there for less than a year, 47% for between one and five years, 16% for between five and ten years, and 17% for longer. When asked if they were aware that self-removal could result in major infection, 30% said they were, while 70% said they were unaware of any danger of serious infection.

Younger individuals between the ages of 14 and 29 account for 70% of CFB presentations [Table 2].

Table 2

Patient demographics n =117	
Age	%
14-29 years	70%
30-44 years	25%
45-60 years	5%
Gender	%
Male	93%
Female	7%
Education	%
Illiterate	28%
Grade 1-5	24%
Grade 6-10	43%
Grade 12 and above	5%

The patient's occupation, activities, and visual acuity at presentation are listed in Table 3, together with the patient's occupational type and time of injury.

Table 3: Summary of job and engagement during the time of injury, presenting vision

Business sector	Patient %
Metal Industry	47%
Construction Industry	27%
Electrician	4.50%
Carpenter	4.50%
Others	17%

In our study, 6% of the participants simply forgot to wear their glasses, while 12% said the eye protection was too painful to use [Table 4].

Table 4: An overview of the justifications presented for not using eye protection, self-removal techniques and materials, and CFB depth.

Reasons for not wearing eye protection	%
Removed protector for some time	39%
Forgot to wear	13%
Protector uncomfortable	24%
Others	24%

Material used for self-removal	%
Self-removal not attempted	54%
Tap water	24%
Cloth	13%
Currency note	5%
Paper	4%

Discussion:

A study by Zghal- Mokni et al. found that the mean age of CFB associated with employment was higher, at 31 years old.⁵ Younger employees are more prevalent, which may indicate that older workers have a tendency to care more. The education of workers with CFB connected to their jobs was evaluated. 90% of patients had completed at least 10th grade. This was consistent with prior writing that examined a niche Indian audience. According to the study done by Kumar et al., 86.6% of patients have at least a 10th-grade education.⁶ This could indicate a connection between better education and a decreased risk of CFB due to occupational exposure.

Certain vocations necessitate health education addressing the possibility of eye damage. According to our study, 30% of the patients who presented with CFB had received health education on such workplace hazards, while 70% of the patients had not. The degree of awareness and knowledge among workers in the construction and metallurgical industries, two of the most affected economic sectors, was noticeably lower. It is claimed that receiving health information on ocular dangers falls short of serving as a preventative measure for eye injuries caused by the workplace. On the other hand, a study carried out in Southwest China⁷ discovered that out of 453 patients, 22.5% underwent safety training. Despite having inadequate health literacy,

67% of the patients knew that eye injuries were a possibility due to their line of work. Only 58% of those polled knew that substantial visual impairment could arise from injury to the eyes. This suggests that even though most workers are aware of the possibility of eye injuries, they are not aware of how severe these injuries can be.

We were able to ascertain that only 51% of patients had received protective eyewear, while 49% had not, based on the precise demographics examined in our study. At the time of the incident, only 10% of these patients were wearing safety glasses. In a study done in Southern India⁸, none of the wounded welders were using eye protection at the time. This demonstrates that workplace eye protection policies are not being properly enforced and that ergonomics may be a challenge for employees.

Limitations: Our investigation was subject to a number of limitations. Recall bias was evident in terms of the specifics of prior CFB injuries. As the study was conducted at a specialised eye care facility, it was possible that patients who may have had serious facial burns or injuries associated with ocular symptoms and sought treatment at a multispecialty hospital would have been overlooked. Considering Nagpur is a rapidly industrialising area, the jobs that applied to work at our hospital were specific to the local construction, which led to selection bias. sample size & some patients lost on follow up

Conclusion

CFB is not just a problem for jobs utilising metal or the building industry. To address this issue in a community that is often less educated and has little understanding of how CFB could damage vision, education is necessary. In order to prevent such catastrophic situations for their staff in the near future, it may be prudent for all business sectors, particularly the more affected metal and construction industries, along with eye care organizations, to develop regular and thorough educational seminars or awareness drives. Given the high level of illiteracy among the patient population, such education has been demonstrated to be effective at the local level.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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