

Patient profile in superficial corneal foreign body injury at tertiary care hospital

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Abstract

Background: As the most anterior part of the globe, the cornea is the most exposed to foreign bodies. Ocular injury due to superficial corneal foreign body of metallic nature is a common occupational health hazard. Commonly this type of injury is combination of a lack of protective safety eye wear and high-risk activities. This includes grinding, hammering, drilling, and welding. Corneal FBs can cause significant damage if they are not removed quickly. Patient data is important to identify risk factors for prevention of future injury. **Material and Methods:** Our study is retrospective study in which 100 consecutive patients who came with history of corneal foreign body during month april 2019 to june 2019 in ophthalmology department at tertiary care hospital were included in study. Data analysis was performed by use of SPSS 19.0 software. P value < 0.05 is considered as statically significant. Patients presented with associated eye injuries with corneal foreign body were excluded from study. **Results:** Superficial corneal foreign body injury maximum in males 97% compare to females 3%. Among all 86% patients were between 20 to 50 years of age. Material of injury was metal in 83% patients. In all injuries 86% was occupational and 76% patients were from rural areas. There is significant association between patients occupation and locality as p value < 0.05. There is also significant association between recurrence of injury and use of safety eye wear as p value < 0.05. **Conclusion:** Superficial corneal foreign body injury is commonest occupation injury. Industrial and construction workers are prone to injuries. By identifying risk factors we can minimize injuries by taking preventive measures like use of safety eye wear and increase awareness.

Key Words: Superficial corneal foreign body, Occupation, Safety Eye Wear.

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INTRODUCTION

A corneal foreign body is an object that is superficially adherent or embedded in the cornea. As the most anterior part of the globe, the cornea is the most exposed to foreign bodies. Corneal foreign body injuries are divided

into two categories; superficial, not involving Bowman's membrane and deep, penetrating Bowman's membrane, but not rupturing Descemet's membrane. Corneal foreign bodies typically enter the epithelium but are prevented from penetrating deep into the tissue by the whirling and stiff Bowman's membrane.¹ Superficial corneal foreign bodies are much more common than deeply embedded corneal foreign bodies. Although superficial foreign bodies often spontaneously exit the cornea in the tear film, occasionally leaving a residual abrasion, other foreign bodies remain on or within the cornea. The longer the time interval between the injury and treatment, the greater the likelihood of complications. Ocular injury due to superficial corneal foreign body of metallic nature is a common occupational health hazard.^{2, 3, 4} Corneal FBs usually causes marked irritation, redness and watering often with pain and a repeated blink reflex. Patients are

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usually very good at localizing the corneal foreign body.⁵ Corneal foreign bodies can cause significant damage if they are not removed quickly. Infection generally does not develop from a metallic foreign body. However, corneal scarring and rust deposits can develop. Also, if a corneal foreign body is organic material, infection can develop. Corneal foreign body injury is commonest among industrial and construction workers. Most commonly it is a combination of a lack of protective eye-wear and high-risk activities. This includes grinding, hammering, drilling, and welding. Ocular injuries at work are preventable and are attributable to the misuse or nonuse of safety eyewear. In workers education level is very low and health and safety concerns come second to economic considerations and pressure to complete the work at hand.⁶ For reduction of accidents, many companies in the construction industry use the Construction Skills Certificate Scheme (CSCS) to improve education and certify awareness of these issues.

MATERIAL AND METHODS

Our study is retrospective study in which 100 consecutive patients who came with history of superficial corneal foreign body during month april2019 to june2019 in ophthalmology department at tertiary care hospital are included in study. Permission from Ethics committee was taken from hospital. Study is retrospective data analysis study. All statistics were performed using Statistical Product and Service Solutions (SPSS Version X; IBM, Armonk, NY, USA) 19.0 software. T test was performed for the comparison of mean value, and x2-test for the

significant difference between count data. Comparisons between groups were conducted using least significant difference (LSD) method. $p < 0.05$ suggested the difference was statistically significant. Patient data collected was about patient name, age, sex, residence, education, occupation, present and past history, use of safety eye wear. Patients presented with associated eye injuries with corneal foreign body are excluded from study. Generally corneal foreign body injuries present as an emergency following acute injury, making them a common urgent clinical entity of ophthalmic practice. Patients with corneal foreign body present with acute pain, photophobia, watering, difficulty in eye opening foreign body sensation, blurry vision depending upon the location of the particle and a history of having something in them Eye.^{2,7,8,9,10} In ocular trauma patients were administered adequate pain control to assist in obtaining an accurate and thorough exam. Following pain control eyes examined for visual acuity and papillary reflex. All patients suspected of having a corneal foreign went undergone a slit lamp examination. In all Patients of corneal foreign body removed with bended 26 no needle attach with 2 cc syringe after application of local anesthetic eye drop for local anesthesia of cornea. After removal of foreign body Moxifloxacin eye drop qid for 10 days with two to three day follow ups were given. Some patient with large and multiple foreign bodies were patched after application of Moxifloaxcin and lubricating eye ointment application and examined on next day at ophthalmology department for further treatment.

RESULTS

After complete analysis of 100 patient data we got following results.

Table 1: Age and sex distribution of patients

Age in years	Sex		Total
	Male	Female	
<20	3	2	5
20 to 50	85	1	86
>50	9	0	9
Total	97	3	100

Table 1 showing 86% people were between 20 to 50 years of age. Males 97% affected most commonly.

Table 1: Education of patients

Education status	Sex		Total
	Male	Female	
<5 Class	62	3	65
5 to 10 Class	27	0	27
>10 Class	8	0	8
Total	97	3	100

Table 2 showing 65% patients were education status less than 5 Class.

Table 3: Mode of injury in patients

Occupation	Work	No of patient
Construction and industrial work	Grinding	37
	Welding	18
	Drilling	13
	Hammering	11
Agricultural work	Farming	7
Other	Driving	13
	Playing	1
Total		100

According to table 3 most common mode of injury was while grinding which is 37%.

Table 4: Type/origin of foreign body

Type/origin of foreign body	No of patient
Metal	83
Vegetative	8
Plastic	2
Glass	2
Insect	5
Total	100

Table 4 showing in 83% patient superficial foreign body was metal in origin.

Table 5: Locality and occupation

	Locality of patients		Total
	Urban	Rural	
Occupational	14	72	86
Non occupational	10	4	14
	24	76	100

Table 5 Showing significant association between patient locality and occupation as p value <0.05. Table 5 shows 76% patients were from rural area and 86% injury was occupational

Table 6: Use of safety eye wear and recurrence

Recurrence	Use of safety eye wear		Total
	Yes	No	
Present	1	21	22
Absent	18	53	78
Total	19	81	100

Table 6 showing significant association between use of safety wear and recurrence as p value is 0.03 which is <0.05.

Table 7: Attempt for self removal

Self attempt to remove foreign body	Sex		Total
	Male	Female	
Present	61	1	62
Absent	36	2	38
Total	97	3	100

Table 7 showing 62% of patients were try to remove foreign body before coming to hospital.

DISCUSSION

At Tertiary Care Hospital in ophthalmology department we routinely treat many cases of superficial foreign body on cornea. We got important multiple findings after examine data of 100 patients at ophthalmology department and going to discuss about it. Purpose of this study is to identify risk factors for this type of injuries and take some appropriate action to reduce incidence of injuries. Superficial Corneal foreign body is common and

serious but preventable occupational injury.¹¹ Symptoms of corneal foreign body include foreign body sensation, tearing and red eye. Vision generally less affected. According to table no 1 Incidence of Superficial corneal foreign body was maximum in males 97% than females 3% compared to 99.3% in males and 0.7% in females in another study.¹² Table no 1 also shows that 86% patients were between 20 to 50 years of age, Comparing to other study were mean age was 39 ± 13

years and 78% of the patients was aged between 21 and 50 years.¹² Another Comparing study reveals that mean age was 32.46 ± 1.03 years.³ According to table no 2 Educational level in 65% patient was less than class 5, Less education is significant risk factor for eye injury particularly in occupational injuries. Table no 3 showing that 79% patients had history of foreign body fall in eye while working at construction and industrial site and most common mode of injury is while grinding which is 37% compare to 22.5% in another study.¹³ As shown in table 4 in our study 83% superficial corneal foreign bodies were metal Comparing to another study were it was 59%.³ Table no 4 shows that vegetative material was present in 8% of corneal foreign body patients. Vegetative material is most dangerous among all corneal foreign body injuries as it causes fungal corneal damage if not treated properly in time with appropriate medications. Vegetative matter foreign body is common among agricultural workers. In developing where there is less mechanization of farming corneal ulceration is commonly found against developed countries where farming is mostly mechanized.^{14, 15} Insects and plastic foreign body common in farmers followed by drivers. Glass particle found in work related to glass factory. Occupational corneal foreign body injuries seen commonly in those working in metal industry and construction workers.¹⁶ Occupational ocular injuries constitute a major cause of eye trauma and causes significant morbidity.¹⁷ According to table no 5 among all superficial corneal foreign bodies 86% was occupational and 76% patient were from rural areas. There is significant association between occupation and locality as p value is less than 0.05. A study from India reported that a majority of individuals incurring eye injuries residing in rural areas did not use any eye protection.¹⁸ Occupational injuries is commonest cause of corneal superficial foreign body. Low education in rural population with very less awareness on using safety eye wear while working make them prime candidate for occupational injury. Table no 6 showing that only 19% patients using safety eye wear and among all patients 22 % patient has history of foreign body fall in eye in past. According table no 6 there is significance association between recurrence and use of safety eye wear as p value is less than 0.05. Comparing to our study data 45.9% of the patient safety eye wear in another study which is higher.¹² Some of the reasons for not using the protective eye devices include discomfort and poor visibility and inadequate appreciation of the necessity to wear it.¹² Decrease work capacity due to getting dirtiness of safety eye wear in hot and humid areas of daily working is also prohibiting factors in workers. According to another study average rate of safety eye wear usage was 35%.¹⁶ Some studies have noted that safety training at the workplace is effective in

changing workers attitude toward safety measures and motivates them to actively adopt the same in daily work.^{19,20} Work-related eye injuries can be prevented by wearing safety eyewear. While the use of safety eyewear is universally known and advocated by industry, compliance with safety guidelines among workers is poor.^{16, 21, 22, 23, 24} There is requirement of further studies within the work area are to investigate the adequacy of the safety eye wear, the reasons for non-use and whether workers and employers are aware of the results of Noncompliance. Table no 7 shows that 62% of patients who try to remove foreign body before coming to hospital at comparing to other study which was 52%.³ Patients were not giving significant importance towards corneal foreign body in eye while working as it did not cause marked visual impairments while working and continue their working just by giving some wash with water and even try to remove foreign body by himself or by help of co workers at local site. Less awareness about seriousness of lesion in eye in patients worsen conditions of eye and produce extra damage to cornea like corneal ulceration and opacity. After discussing above data we come to know about many preventable risk factors which causes superficial corneal foreign body injury and necessary steps should be taken for it.

CONCLUSION

Superficial corneal foreign body injury causes less visual impairment and less affects quality of patient daily life. Most of superficial corneal foreign body is preventive type. Industrial workers are most commonly affected by superficial corneal foreign body injury. Vegetative matter injury less common but dangerous if not treated properly in agricultural workers. Occupation and safety eye wear use are most important parameter. Awareness about use of safety eye wear is very less in community people. Those who have safety eye wear are not using according to safety guide line in industries and constructional sites. Educating patients about not to rubbed eye and not attempt to remove the foreign body by own is also important. There is urgent requirement of increase awareness for this of preventive ocular injury require on large scale by government, local higher authorities, social workers, social media messages and news channels.

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