



## OCULAR SURFACE FOREIGN BODIES, THEIR AETIOLOGY AND ROLE OF PERSONAL PROTECTIVE EQUIPMENT(PPE).

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**ABSTRACT** **INTRODUCTION** Ocular surface foreign body (OSFB) or a superficial foreign body is the most common and preventable eye injury. Ocular trauma though largely preventable causes immense discomfort to patients and reason for them to attend ophthalmic outpatient department. OSFB's are graded as mild according to ocular trauma classification based on the severity of the injury. Usually ocular surface foreign body are small in size they are particles of iron dust ,insects wings, straw of vegetable matter ,animal or human hair and threads of cotton or plastic. These foreign body (FB) particles impinge upon the cornea or conjunctiva and cause redness, watering, FB sensation and pain in the eye. If left untreated and not properly managed ,they can lead to erosions of underlying surface ,establishment of infections, spread of infections leading to keratitis, conjunctivitis and endophthalmitis. **MATERIALAND METHODS:** The study was conducted on 642 patients attending ophthalmology OPD for a period of one year from January 2021 to January 2022. All cases of ocular surface foreign body attending the ophthalmic OPD were included. Consent was obtained from all the patients who were included in the study. A thorough slit lamp examination was performed which includes instillation of fluorescein dye to delineate foreign body and residual abrasions. Superficial foreign body and rust ring were removed using 26 guaze needle under topical anesthesia. Topical antibiotic treatment was prescribed after successful removal of foreign body. **RESULTS:** Out of 642 patients , majority of foreign body were found in cornea (59.9%) followed by palpebral conjunctiva(12.5%) , subtarsal conjunctiva(14.8%) , inferior fornix (3.9%) , caruncle(5.5%), punctum (1.5%).Metallic foreign body accounted for 51.1% followed by dust 18.1%, wood 11.2%, vegetative matter in 7.8% , insects in 3.7% ,glass in 2,8% and others like plastic,hair follicle etc in 5.3%. **Conclusion:** . Most common aetiology was metallic particle and most common location was found to be cornea. Persons in profession related to metals and farming are to be educated for use of personal protective equipments and taking other necessary preventive measures in order to avoid this work place hazard.

### KEYWORDS : OSFB, PPE

#### INTRODUCTION

Ocular Surface Foreign Bodies (OSFB) or Superficial foreign bodies are basically small particles that impinge upon the conjunctiva or cornea [1]. A superficial foreign body or ocular surface foreign body is the most common [2] and preventable eye injury[3]. It causes significant discomfort and if not managed properly can lead to permanent visual impairment[4]. According to the Classification of Ocular Trauma based on severity of the trauma , the injuries caused by superficial foreign bodies (FBs) are graded as mild[5]. Usually ocular surface foreign body are small in size they are particles of iron dust ,insects wings, straw of vegetable matter ,animal or human hair and threads of cotton or plastic. Patient experience pain, foreign body sensation,watering and redness . If left untreated and not properly managed ,they can lead to erosions of underlying surface ,establishment of infections, spread of infections leading to keratitis, conjunctivitis and endophthalmitis[6].

#### AIMSAND OBJECTIVES:

The aim of the study was to know the aetiology of ocular surface foreign bodies and role of protective eye wear.

#### MATERIALAND METHODS:

A hospital based prospective study was conducted on 642 patients at ophthalmology department over a period of 1 year from january 2021 to january 2022. All cases of ocular surface foreign body attending the ophthalmic OPD were included. Consent was obtained from all the patients who were included in the study. A detailed history was taken with special reference to occupation of the patient and timing of infliction of foreign body. A thorough slit lamp examination was performed which includes instillation of fluorescein dye to delineate foreign body and residual abrasions. Superficial foreign body and rust ring were removed using 26 guaze needle under topical anesthesia. Topical antibiotic treatment was prescribed after successful removal of foreign body.

#### RESULTS:

A total of 642 patients who presented in Ophthalmology Out Patient Department with ocular surface foreign body from jan 2021 to jan 2022 were studied. aajority of the patients presented with foreign body

in cornea 71.9% (n=231) and 28.03% (n=90) lodged in various sites like conjunctiva, fornices etc. aajority of the patients presented with foreign body in cornea 71.9% (n=231) and 28.03% (n=90) lodged in various sites like conjunctiva, fornices etc.

Table 1 shows majority of foreign body were found in cornea (59.9%) followed by palpebral conjunctiva (12.5%), subtarsal conjunctiva (14.8%), inferior fornix (3.9%), caruncle(5.5%), punctum (1.5%)

**Table 1: Location of foreign body**

Location of FB	Frequency	Percent
Corneal	385	59.9
Palpebral conjunctiva	80	12.5
Upper lid subtarsal	95	14.8
Inferior fornix	25	3.9
Superior fornix	12	1.9
Caruncle	35	5.5
Punctum	10	1.5
Total	642	100

Table 2 shows aetiology of ocular surface foreign body. Metallic foreign body accounts 51.1% followed by dust 18.1%, wood 11.2%, vegetative matter in 7.8% , insects in 3.7% ,glass in 2,8% and others like plastic,hair follicle etc in 5.3%

**Table 2: Aetiology of OSFB**

TYPE OF foreign body	Frequency	Percent
Metallic	328	51.1
Dust	116	18.1
Wood	72	11.2
Vegetative matter	50	7.8
Glass	18	2.8
Insects	24	3.7
Others(plastics etc )	34	5.3

Table 3 shows distribution of cases as per occupation. Welding workers (42.8%) accounts for majority of cases followed by grinding

workers (23.6%), 17.1 % of presenting patients were involved in agricultural work. Rest are the people working in dusty environment ,wood furniture, machinery work and domestic work also presented with ocular surface foreign body.

**Table 3 :Distribution of cases as per occupation**

occupation	No	% age
Welding	275	42.8
Grinding	150	23.3
Agriculture	110	17.1
Work in dusty environment	41	6.4
Wood furniture	25	3.9
Machinery work	30	4.7
Domestic work	11	1.7

Table 4 shows age wise distribution of patients. 39.9% of patient belong to 31-40 yrs with mean age of presentation was 34 years. As this age group is more involved in industrial, construction and agricultural work.

**Table 4: Age wise distribution**

Age in yrs	No of patients	Percentage
<10	20	3.1
11-20	65	10.1
21-30	222	34.57
31-40	256	39.87
41-50	59	9.2
>50	20	3.1

Table 4 shows gender wise distribution which shows 76.3% males and 23.7% females as males are more involved in industrial and agricultural work

**Table 4 Gender wise distribution**

Sex	Number of patients
Males	480 (76.3%)
Females	162 (23.7%)

Table 5 shows distribution of cases on the basis of use of protective eye wear and other preventive measures. It has been seen that majority of patients involved in welding and grinding are using protective eye wear still some of them presented with OSFB. Others involved in agricultural work or other in dusty environment are not using any preventive measures.

**Table 5: Use of Protective eye wear/PPE**

Use of Protective eye gear	No of patients
Yes	267(41.5)
No	375 (58.5)

## DISCUSSION

On an average 2 patients of ocular surface foreign body came in every OPD . Our study shows majority of subjects were males accounting 76.3% while only 23.7% were females . Male female ratio was 2.96:1. Similar results were presented by Muhammad Luqman Ali Bahoo and co authors[6] which shows in their study male female ratio of 2.5: 1 and 3:1 as per Jahangir Tehmina et al [7]. The reason being males are more involved in construction and agricultural work .Though female take part in agriculture, farming, factories and household working as a result work related ocular surface foreign bodies are seen in female patients.

The age commonly affected is 31-40 yrs. The mean age found to be 34 years. Jahangir T and et al reported mean age of 28.6 +/- 17.6 years [7]. Similar reports were presented by Guerra Garcia RA et al shows mean age ranging from 29 to 35 yrs [8]. As this age group is more involved in such activities.

Our study shows, in 59.9 % cases cornea is involved. This finding was consistent with the study conducted by Charu et al where corneal foreign body was found to be present in 69% occupational related injuries[9] . Superficial corneal injuries most commonly occur due to metallic foreign body in welding and grinding [10]

Our study shows workers involved in welding ( 42.8%) are more exposed to foreign body followed by grinding (23.36%) In a canadian

study 21% eye injury occurred during welding[11]. Agricultural workers (17.1%) are also prone to ocular foreign body in developing countries like ours.

In our study, metallic particles ( 51.1%) are seen in most of the patients working in welding and grinding. This is similar to study conducted by Yigit Ozlem et al which shows majority of cases were metal fragments followed by dust particle [12]. Vegetative matter injury is more common among farmers . Our results are in accord with the result of Dass and Gohel where metallic foreign body were most common in industrial workers and vegetative matter more common among farmers [13]. In 3.7 % of population ,insect bodies were recovered from the eye It may be due to people not wearing helmets during driving. Glass particles were found in the eyes of workers linked with glass industry. As per our study it has been seen that 41.5% of patients are using protective eye wear and 58.5% of them are not using at the time of injury. The reason being lack of awareness, lack of institutional training. Though ocular surface foreign bodies occur in some patients using protective eye gear .A Study conducted by Radha I et al shows that 78.4% of OSFB injuries were prevented by protective devices [13]. A study conducted by Pritam Dutta shows that 50% of subjects engaged with activities such as welding, grinding reported no usage of Protective equipment at the time of injury.[14]

## CONCLUSION:

Ocular surface foreign bodies are common form of ocular trauma and is the most common cause of presentation to eye department. Most common aetiology was metallic particle and most common location was found to be cornea. Persons in profession related to metals and farming are to be educated for use of personal protective equipments and taking other necessary preventive measures in order to avoid this work place hazard.

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