

# Clinical Profile of Patients Presenting with Corneal Foreign Bodies: A Cross-Sectional Study Conducted in a Tertiary Hospital in Jharkhand

Dr. Alina Kujur<sup>1</sup>, Dr. Marianus Deepak Lakra<sup>2</sup>, Dr. Manisha Kumari<sup>3</sup>

<sup>1</sup>Junior Resident, Department of Ophthalmology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India (Corresponding Author)

<sup>2</sup>Associate Professor, Department of Ophthalmology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

<sup>3</sup>Junior Resident, Department of Ophthalmology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

**Abstract:** ***Introduction:** Corneal foreign bodies (FBs) are one of the most common ophthalmological emergencies. A corneal foreign body (FB) refers to an object that is either superficially attached to or embedded in the cornea. Despite the fact that safety glasses can frequently prevent these injuries, their deliberate use remains rare. Ocular trauma represents 8% of emergency department visits, with 31% of these cases involving corneal foreign bodies. **Aim:** This study aimed to analyse the clinical profile of patients with corneal foreign bodies. **Materials and Methods:** A Hospital-based cross-sectional study was conducted among 50 patients presenting to RIO, RIMS Ranchi over a period of 6 months. **Results:** In our study 86% (n=43) were males and 14% (n=7) were females. 40% of cases were between the age group 21 – 30 years, followed by 31-40 years (36%). In 56% of cases right eye was involved and in 44% left eye was involved. 36% of patients worked in the Metal industry, followed by 24% were a construction worker. In 44% of corneal foreign bodies were metals, followed by dust (36%). In 56% location of the corneal foreign body was Peripheral, followed by Paracentral (34%) and Central (10%). **Conclusion:** Corneal foreign body occurs most commonly in males belonging to the middle age group, who are also active income generators in the community. We recommend the use of protective eyewear for all working in the vicinity of metal industry work or construction sites.*

**Keywords:** Corneal foreign bodies, Cornea, foreign body, ophthalmological emergencies, Corneal trauma

## 1. Introduction

The cornea is a transparent, avascular tissue that functions as a protective barrier, safeguarding the eye from infections<sup>[1]</sup>. Corneal foreign bodies (FBs) are one of the most common ophthalmological emergencies. A corneal foreign body (FB) refers to an object that is either superficially attached to or embedded in the cornea. Despite the fact that safety glasses can frequently prevent these injuries, their deliberate use remains rare<sup>[2,3]</sup>. Ocular trauma represents 8% of emergency department visits, with 31% of these cases involving corneal foreign bodies<sup>[4]</sup>. Corneal foreign bodies can lead to visual impairment that varies from mild blurriness to severe, vision-threatening corneal ulcers<sup>[5]</sup>. Patients with corneal foreign bodies experience a range of ocular symptoms, including redness, a sensation of something in the eye, irritation, tearing, pain, and blurred vision. The timely and appropriate removal of a corneal FB is necessary<sup>[6]</sup>. Most of these are workplace-related injuries occurring as sequelae of welding, hammering or farming<sup>[7]</sup>.

Corneal foreign bodies are common in clinical practice and can have significant consequences if not promptly and properly managed. These types of injuries can lead to various complications, such as corneal ulceration, scarring, and even vision loss if left untreated. (Reinhard & Larkin, 2013)<sup>[8]</sup>.

## 2. Aims and Objectives

The aim of this study was to analyse the clinical profile of patients with corneal foreign bodies.

## 3. Material and Methods

**Study Design:** A Hospital-based cross-sectional study

**Study Duration:** March 2023 to August 2023

**Study Population:** It consists of

- Patients visiting the Emergency department
- Patient attending outpatient department of Rajendra Institute of Medical Sciences, Ranchi

**Study Site:** RIO, RIMS, Ranchi

**Eligibility Criteria**

- Inclusion Criteria:** All cases of corneal foreign bodies attending the ophthalmology department were included in the study after obtaining written consent.
- Exclusion Criteria:** 1. Penetrating or Perforating corneal injury 2. Intraocular foreign body

**Method of Sample Collection**

All cases of corneal foreign bodies attending the ophthalmology department were included in the study after obtaining written consent. A detailed information from patients was obtained regarding name, age, gender, occupation, education, presenting complaints, activity at time of incident, time elapsed since injury.

Visual acuity was noted and anterior segment examination was done using slit lamp biomicroscopy. Topical anaesthesia (proparacaine 0.5% eye drop) was instilled in the affected eye and the corneal foreign body was removed with the help

of a 26-gauge needle. The type of foreign body and its location were noted. After removal of the corneal foreign body, eye padding was done after the instillation of Antibiotic eyedrop and ointment and asked for follow-up the following day.

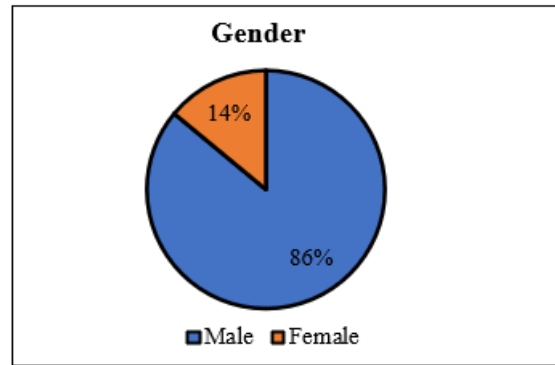
All the data was selected randomly and was entered in Microsoft excel and tabulated, then the data was analyzed with appropriate statistical tools “SPSS version 24”.

**4. Results**

**1) Gender Distribution:**

**Table 1:** Distribution of cases according to Gender

Gender Distribution	Number of Patients	Percentage
Male	43	86%
Female	7	14%



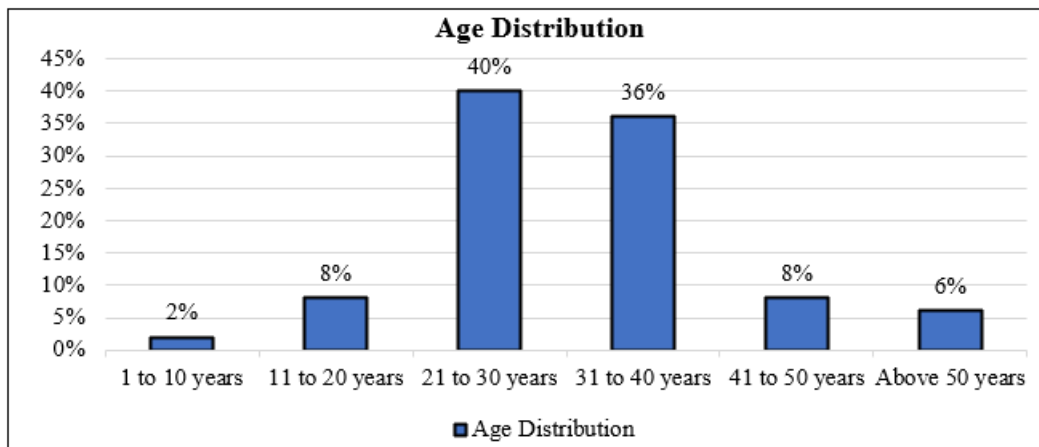
**Figure 1:** Graphical distribution of gender distribution

Table and the Pie chart show 86% (n=43) were males and 14% (n=7) were females.

**2) Age Distribution:**

**Table 2:** Distribution of cases according to Age

Age	Number of Patients	Percentage
1-10	1	2%
11-20	4	8%
21-30	20	40%
31-40	18	36%
41-50	4	8%
Above 50	3	6%



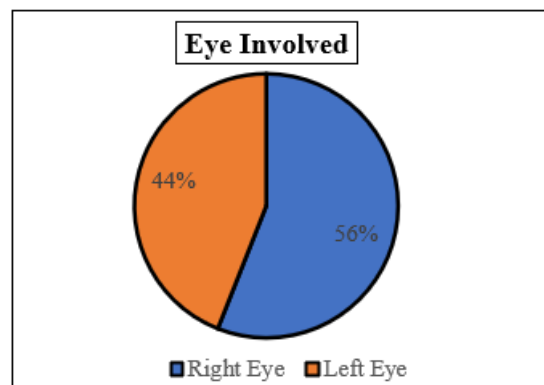
**Figure 2:** Graphical representation of Age Distribution

Table and bar graph show 40% of cases were between the age group 21 – 30 years, followed by 31-40 years (36%).

**3) Eye Involved**

**Table 3:** Showing laterality of corneal foreign body

Eye Involved	Number of Patients	Percentage
Right Eye	28	56%
Left Eye	22	44%



**Figure 3:** Graphical representation showing laterality of corneal foreign bodies

The table and pie chart show in 56% right eye was involved and in 44% left eye was involved.

4) Occupation

Table 1: Showing distribution of cases according to Occupation

Occupation	No. of patients	Percentage
Metal Industry	18	36%
Construction worker	12	24%
Agriculture	9	18%
Automobile repair/ mechanic	5	10%
Others	6	12%

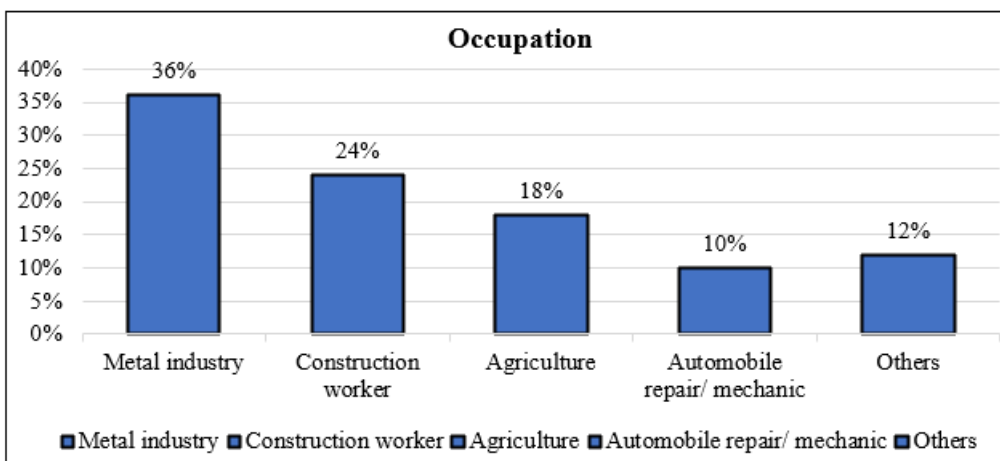


Figure 4: Showing graphical representation of distribution of cases according to Occupation

The table and bar graph shows that 36% of patients worked in the Metal industry, followed by 24% were a construction worker

5) Type of corneal foreign body:

Table 5: Showing distribution of patients according to type of corneal foreign body

Foreign body material	Number of Patients	Percentage
Metal	22	44%
Dust	18	36%
Insect	1	2%
Wood	3	6%
Glue	4	8%
Stone	2	4%

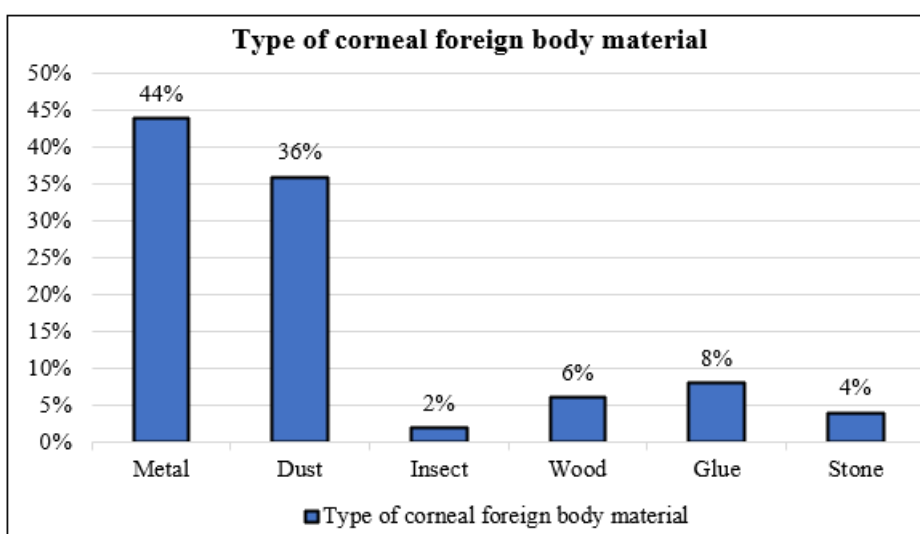


Figure 5: Graphical representation showing distribution of patients according to type of corneal foreign body

The table and bar graph shows that 44% of corneal foreign bodies were metals, followed by dust (36%)

6) Location of corneal foreign body:

**Table 6:** Showing distribution of cases according to location of corneal foreign body

Location of Corneal foreign body	Number of Patients	Percentage
i)Paracentral	17	34%
ii)Central	5	10%
iii)Peripheral	28	56%

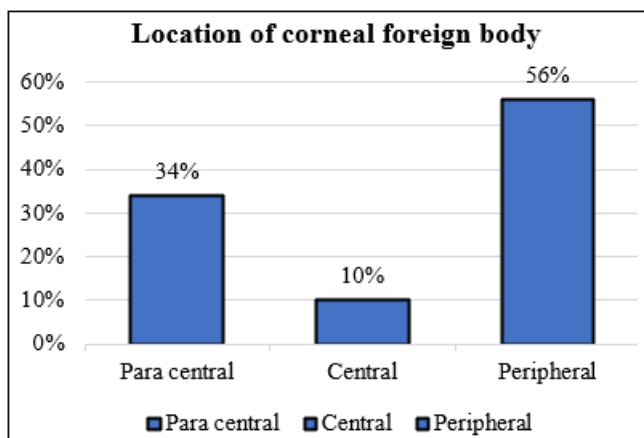
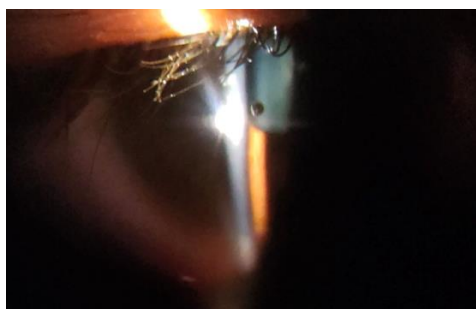
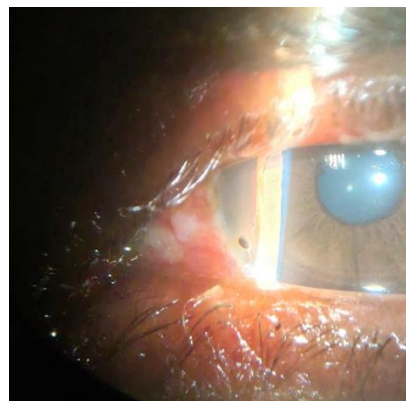
**Figure 6:** Graphical representation of distribution of cases according to location of corneal foreign body

Table and bar graph show that in 56% location of corneal foreign body was Peripheral, followed by Paracentral (34%) and Central (10%).

#### Photo Gallery

**Figure 1 (a)** Showing corneal foreign body in paracentral location**Figure 1 (b):** Showing corneal foreign body in Central location**Figure 1 (c):** showing corneal foreign body in Peripheral location

#### 5. Discussion

A corneal foreign body is categorized as minor ocular trauma, suggesting that it is less severe compared to other types of eye injuries. If removed on time, may not lead to any complications, but if delayed or ignored, may lead to keratitis and endophthalmitis.

- Gender Distribution:** In our study, 86% were males, while in a study conducted by Ozkurt et al [9] 100% of patients were males and according to Macedo et al. [10] 92% were males.
- Age Distribution:** In the study conducted by Reddy et al. [11], 50.16% cases were between age group 31-40 years, followed by 41-50 years (20.87%), 21-30 years (16.20%), > 50 years (7.47%), <21 years (5.30%), while in our study 40% cases are of age group between 21-30 years, followed by 31-40 years (36%).
- Occupation:** In our study, 36% of patients worked in the Metal industry, while in a study conducted by Gumus et al. [12] 59% of patients worked in the metal industries.
- Type of corneal foreign body:** In the present study, 44% of corneal foreign bodies were metals, followed by dust (36%), while in a study conducted by Reddy et al. [11] 51.04% of cases had metallic foreign bodies followed by dust in 18.7% and wooden particles in 11.21%.
- Location of the corneal foreign body:** The most common location of the corneal foreign body in our study was peripheral i.e. 56%, followed by paracentral i.e. 34%, and then central i.e. 10%. However, in the study conducted by Reddy et al (2016) [11], they found the paracentral location to be the most common i.e. 61% followed by peripheral i.e. 23% and then central i.e. 26%.

#### 6. Conclusion

Corneal foreign body occurs most commonly in males belonging to the middle age group, who are also active income generators in the community. Although easily treatable, delay can cause various degrees of ocular morbidity ranging from simple epithelial defects to vision-threatening corneal ulcers. We recommend the use of protective eyewear for all working in the vicinity of metal industry work or construction sites.

## References

- [1] DelMonte DW, Kim T. Anatomy and physiology of the cornea. *J Cataract Refract Surg.* 2011; 37:588–98.
- [2] Pizzarello LD. Ocular trauma: time for action. *Ophthalmic Epidemiol.* 1998; 5:115-116.
- [3] Henderson D. Ocular trauma: one in the eye for safety glasses. *Arch Emerg Med.* 1991; 8:201-204.
- [4] Ahmed F, House RJ, Feldman BH. Corneal abrasions and corneal foreign bodies. *Prim Care* 2015; 42:363–75.
- [5] McCarty CA, Fu CL, Taylor HR. Epidemiology of ocular trauma in Australia. *Ophthalmology* 1999; 106:1847-52.
- [6] Guier, Christian P. and Thomas J. W. Stokkermans. “Cornea Foreign Body Removal.” (2020).
- [7] Welch LS, Hunting KL, Mawudeku A. Injury surveillance in construction: Eye injuries. *Appl Occup Environ Hyg.* 2001;16(7):755–62. doi: 10.1080/10473220117500.
- [8] Kaufman, Herbert. (2014). Reinhard T, Larkin F (eds), *Corneal Disease* 2013, ISBN: 978-3-642-28746-6, Springer. Graefe's Archive for Clinical and Experimental Ophthalmology. 253. 10.1007/s00417-014-2744-x.
- [9] Ozkurt ZG, Yuksel H, Saka G, Guclu H, Evsen S, Balsak S. Metallic corneal foreign bodies: An occupational health hazard. *Arq Bras Oftalmol.* 2014;77(2):81–3. doi: 10.5935/0004-2749.20140020.
- [10] Macedo Filho ET, Lago A, Duarte K, Liang SJ, Lima AL, Freitas D. Superficial corneal foreign body: laboratory and epidemiologic aspects. *Arq Bras Oftalmol.* 2005;68(6):821-3. doi:10.1590/s0004-27492005000600019.
- [11] Reddy PS, Nirmala K, Radhika S, Ravi S, Mary C, Paul P, et al. Original Research Paper Commerce Ophthalmology Incidence of Ocular Surface Foreign Body and its Correlation with Specific Occupation and Preventive Measures Associate Professor, Department of Ophthalmology, ACS Medical College, Chennai Senior Resident. 2016;(12):56–8.
- [12] Gumus K, Karakucuk S, Mirza E. Corneal injury from a metallic foreign body: An occupational hazard. *Eye Contact Lens.* 2007;33(5):259–60. doi: 10.1097/ICL.0b013e31802c140c.