

Different Types of Ocular Surface Foreign Bodies and their Location in the Eye: A Hospital Based Study

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Running Title: Different Types of Ocular Surface Foreign Bodies and Their Location

Abstract: *Purpose of the study: To find out the aetiology of ocular surface foreign bodies and their different location in the eye. Study Design: A hospital based cross sectional study. Total duration of the study was six month. Duration and Place: This study was conducted at Sagarmatha Choudhary Eye Hospital, Lahan, Siraha, Nepal from January 2019 to June 2019. Material and Methods: History was taken from all patients and slit lamp examination was performed. Age and sex were recorded for all patients. Different types of extra ocular foreign bodies were identified and their respective location in the eye was noted. Results: There were 120 patients with extra ocular surface foreign bodies included in this study. Corneal foreign bodies were most common. The common location for different ocular foreign bodies included small metal particle on cornea in 36 [30.15 %] eyes, vegetative particle on cornea in 27 [22.50 %], insect wing in upper eyelid sub tarsal plate in 18 [15.0 %], plastic particle on cornea in 9 [7.54 %], an insect body part in lower eyelid inferior fornix in 6 [5.03 %], cotton thread or cloth in upper eyelid sub tarsal space in 5 [4.02 %], dust or fire cracker particles on cornea in 18 [15.07 %] eyes and misplaced bandage contact lens in 1 [0.83 %] case. Conclusion: The common location of extra ocular surface foreign body was cornea and common aetiology of ocular surface injury was metal particle.*

Keywords: Corneal Injuries, Extra ocular Surface, Metallic Foreign Body, Location

1. Introduction

Trauma to the eye is one of the leading causes of ocular morbidity and preventable cause of ocular injury^{1, 2, 3}. The most common form of ocular trauma is superficial extra ocular surface foreign body injury. Eye injury is an emergency which is the most common cause of hospital visit⁴. It causes ocular irritation and if not properly managed can lead to permanent visual loss. An ocular injury may occur at home, at work, after assault, while playing sports or as a result of road traffic accident⁵. Mostly ocular foreign bodies are small to medium in size which includes particles of dust, iron, wings of insect, vegetative matter, human or animal hair and cotton threads⁶. The ocular surface foreign bodies found mostly on cornea, fornix, palpebral conjunctiva, and sub tarsal area. Patient may come with chief complain of redness, watering and ocular irritation. Untreated patient can lead to infection, corneal epithelial erosion, infective keratitis, conjunctivitis and endophthalmitis⁷. A detail slit lamp bio microscopic examination and diffuse illumination of eye is required in each patient of ocular injury. The examination includes detail history, double eversion of upper lid, fluorescein staining of eye, gonioscopy if possible, and dilated fundus examination. The foreign body or insect removed from the ocular surface should be examined. Identification of the type of foreign bodies and their respective location into the eye

will help in creating awareness and use of appropriate eye protective devices.

2. Material and Method

This is cross sectional prospective six - month study. This study was conducted at Sagarmatha Choudhary Eye Hospital [SCEH], Lahan, Siraha, Nepal from January 2019 to June 2019. The study was approved by ethical committee of our hospital. An informed consent was taken from all patients who were included in the study. All patients coming in outpatient department or hospital emergency room with extra ocular surface foreign body were included in the study. Detailed slit lamp bio microscopic examination was performed. Age and sex were recorded for all patients. Topical anaesthesia was given by instilling 4% lignocaine eye drop. Exact location of extra ocular surface foreign body was determined under slit lamp and with the help of fluorescein dye instilled in the eye. The superficial foreign bodies were removed with the help of forceps or cotton ear bud. Foreign body which is deeply impacted were removed with the help of 26or30 gauge needle. Topical antibiotic drops four times a day for one week were prescribed for one week. Nominal variables like sex or gender, type and location of foreign body were presented as percentages. Type of occupational work also noted. Different type of

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foreign body with their respective location in the eye was studied.

3. Results

There were 120 patients with extra ocular foreign bodies included in this study. There were 70 [58.33%] right eyes and 50 [41.67%] left eyes. There were 85 [70.83 %] males and 35 [35 %] females. Male to female ratio was 2.43. Percentages and frequency of type of foreign body were shown in following table 1

Table 1: Different types of extra ocular surface foreign bodies

Different Type of extra ocular surface foreign body	Frequency (n) in no of eyes	Percentage (%)
Small metal particle	36	30.15 %
Vegetative matter particle / straw	27	22.50 %
Small insect wing	18	15 %
Plastic particle on cornea	09	7.54 %
Insect wing or its body part / fly	06	5.03 %
Cotton thread / cloth particle	05	4.02 %
Dust particles / fire cracker powder	18	15.07 %
Bandage contact lens	01	0.83 %
Total	120	100 %

Frequency that is number of patients and percentage of location of foreign bodies is shown in table 2. Distribution of different location of foreign bodies in the eye is shown in table 2. The mean age of patients was approximately 38 ±4 years and mode ages were 42 years.

Table 2: Distribution of location of different types of extra ocular surface foreign bodies

Location	Frequency (n) in no of eyes	Percentage (%)
Cornea	90	75 %
Conjunctiva (palpebral and bulbar)	01	0.83 %
Sub tarsal area	23	19.17%
Fornix (both upper and lower)	06	5 %
Total	120	100 %

Table 3: Month wise incidence of ocular surface foreign bodies out of total number of ocular trauma patients attends hospital outpatient department or emergency room per month

Month	Frequency (no of foreign body)	Total no. of ocular trauma patients	Incidence
Jan	25	75	33.33 %
Feb	20	65	30.77 %
March	22	72	30.56 %
April	24	50	48 %
May	18	46	39.13 %
June	11	42	26.19 %

4. Discussion

There were 120 patients with extra ocular foreign bodies included in this study. There were 70 [58.33%] right eyes and 50 [41.67%] left eyes. There were 85 [70.83%] males and 35 [35%] females. Male to female ratio was 2.43. Similar study done by Reddy et al in Dec 2016 where male to female ratio was 2.48.8 Ocular injury with ocular surface foreign body was more common in male than female

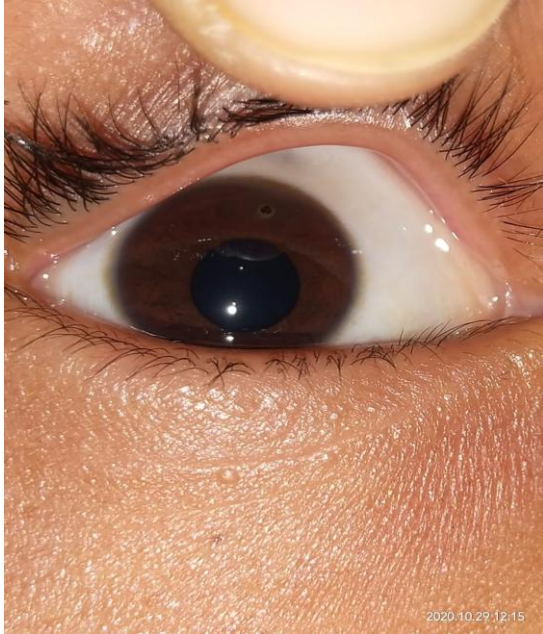
because males are at greater risk to ocular trauma due to their common exposure in farming or outdoor occupation, travelling and assaults ⁹. In 75% cases cornea was involved, in 19.17 % cases sub tarsal area, 5% cases fornix and 0.83 % cases gross conjunctiva was involved. This is in contrast to study conducted by Ahmad Zeeshan Jamil et al in 2018 where cornea was involved in 40.2 % cases, in 18.5% cases palpebral conjunctiva and 5.3% cases caruncle were involved ¹⁰. Similar study controlled by Ozlem et al showed cornea was concerned with 72.6 % cases ¹¹. Our study was performed mostly in a rural - pastoral area where nearly all of the population taking part in farming, husbandry and field works. The majority of corneal lesion takes place due to small insect wing and dust particle. This sort of injury is commonly seen in profession associated with agriculture and outdoor activities. Study conducted by Subhasis Jana et al in June 2012 to May 2013 shows most common mode of agriculture induced ocular injury was due to rice grain ¹². Ocular surface foreign bodies are located in different places in the eye. Meticulous and detail eye examination will be required in case with complain of foreign body in the eye. In our study metallic particle was seen in 30.15 % cases. Study conducted by Ozlem Yigit et al shows 37.6 % of metal fragments which is most common foreign body and 31.1 % of dust particle ¹³. 15 % cases insect wing and 5.03 % cases insect body part other than wing or small fly was retrieve from the eye. It may be due to driving, farm work in midnight and riding a vehicle. As our study belongs to village area so literacy rate and awareness was so less. Most of the people riding a bike and cycle do not use protective eye wears ¹⁴. In 22.50 % cases vegetative matter or straw particle were found. This is due to farming or agricultural surrounding of the region ¹⁵. In our study right eye was involved in 58.33 % cases as compared to left eye in 41.67 %. Similar study done by Muhammad Luqman Al Bahoo et al in 2018 where left eye was more commonly injured. Ocular surface foreign bodies are appearing in all structures of the ocular surface. The more reveal portion like cornea, conjunctiva and sub tarsal area are mostly get injuries. Location wise 75% cases cornea was involved conventionally subsequently 19.17 % cases sub tarsal area was involved.

Sub tarsal area gets ocular surface foreign body attributable to its anatomical layout ^{16, 17}. In our study there was no statistically notable association of type of ocular surface foreign bodies with their position of placement in the eye. We could not consider profession and job of the patients in our study design; however our article study is restricted to rural village area only.

5. Conclusion

Most common form of ocular trauma was considered with ocular surface foreign body over cornea because it is superficial and most exposed part. There was no significant co relation was found between ocular surface foreign body with their respective location in the eye.

Image A: foreign body over cornea (at 12 o'clock)



D: insect wing stuck over cornea



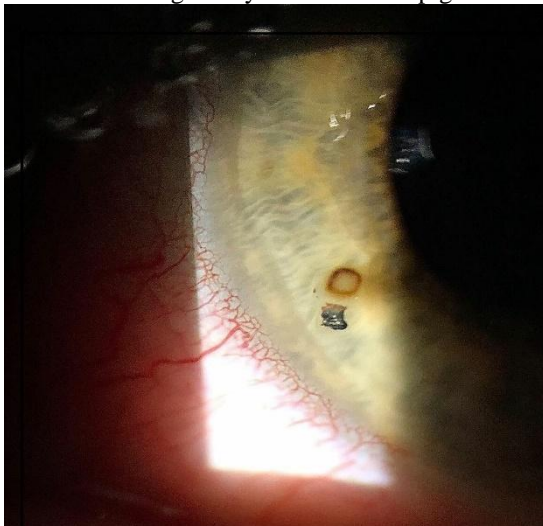
B: long standing EOFB with infiltration



E: fire cracker (dust particle)



C: metallic foreign body removed with pigmentation



F: plastic particle attached in sub tarsal area



Manuscript presented in other meetings or conference –
No

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