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A Study of Occupation Related Ocular Trauma in a Tertiary Centre

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I. INTRODUCTION

Ocular trauma is one of the most important and common causes of ophthalmic morbidity and monocular blindness throughout the world(1). None the less it is a preventable cause of blindness.It is a major public health issue worldwide.

WHO has estimated that each year around 55 million eye injuries happen globally which result in restriction of activities for more than a day.There are approximately 1.6 million blind people from injuries, additionally

around 2.3 million people with bilateral low vision resulting from ocular trauma and almost 19 million people with unilateral blindness or low vision(2).

The age distribution in ocular trauma is bimodal with a peak incidence in young adults followed by elderly(3,4) The male to female ratio has been found to be 4:1 world over(5–7).

Our institution is situated in the city of Bhubaneswar, which is the capital of Odisha. It is geographically situated near the major roadways connecting Kolkata and Chennai. All along the highway are industrial towns with automobile, engineering and manufacturing, precision tool, explosives and service sector industries. There are industrial parks also.

There are many small unorganized sectors like the stone quarries, sand mining in the river bed and workshops along the highways for vehicles doing repairs. Many of these have unskilled labourers, working late hours and with minimal wages as they are the unregulated or small scale industries.

India is the second most populous nation in the world with a growing economy with rapid industrialization and globalization. The working age group of India constitutes about 64% of its population, of which only10% work in the organized sector. Based on past studies in the country and state ,a proposal was written to study in detail the occupation related trauma in a more detailed manner and understand the profile of occupations, injuries to the extraocular structures and intraocular structures, awareness of safety and protective devices and visual impairment following injury. This would then help us initiate a public health approach in decreasing the prevalence of a preventable cause of visual impairment and blindness.

II. AIMS AND OBJECTIVES

1.To study the profile of the patients who are presenting with occupation related ocular injuries to the Department of Ophthalmology, Hi-Tech Medical College, Bhubaneswar.
2.To describe the profile of ocular injuries ocuring in these patients.
3.To describe the risk factors associated with these occupation related injuries.

III. METHODS

This is an observational based hospital study, which was carried out in Hi-Tech Medical College and Hospital. The study was carried over a period of 6 months from 1st January 2019 to 1st July 2019.

Inclusion criteria

All patients, above the age of 18 years, who have had ocular trauma and presented to the department within 1 month of sustaining trauma from January 2019 to July 2019 and willing to be a part of this study were included. Patients who presented in casualty and outpatient section of the department were recruited.

Exclusion criteria

1. History of ocular trauma not related to the participant's occupation.
2. History of ocular trauma more than a month prior to the date of presentation.
3. History of ocular trauma occurring within the person's home environment.
4. Housewives who have trauma during cleaning or cooking.

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IV. METHODOLOGY

Those patients who presented with ocular trauma were asked the following questions from an initial screening
questionnaire –

Name of the patient-
Q1. Where did the eye injury occur?
a. At the place of work
b. At home while doing work
c. Outside home and workplace
Q2. When did the eye injury occur?
Specify time and date
Q3. What is your age?
A. below 18 years
B. 18 years and above

Patient selection: Participants were selected for the study based on the following inclusion and exclusion criteria. They were then recruited after obtaining informed consent. The questionnaire was used to determine the demographic, socioeconomic and occupational profile of patients.

The patient underwent A detailed ophthalmic clinical examination of the patient was done and appropriate investigations were carried out to aid the diagnosis and management. To start with a preliminary torchlight examination was done,which was followed by a detailed anterior segment examination using the slit lamp biomicroscopy. Intraocular pressure was recorded wherever possible with the help of applanation tonometry. Dilated fundus examination was carried out with slit lamp bio- microscopy and indirect ophthalmoscopy. An ultrasound (B scan) was done for patients in whom dilated fundus examination was not possible and for those patients in whom view to fundus was not appreciable. Investigations were carried out if indicated.

The ocular trauma was assessed and scored using the Ocular trauma score at the time of initial presentation was estimated for those with open globe injuries.

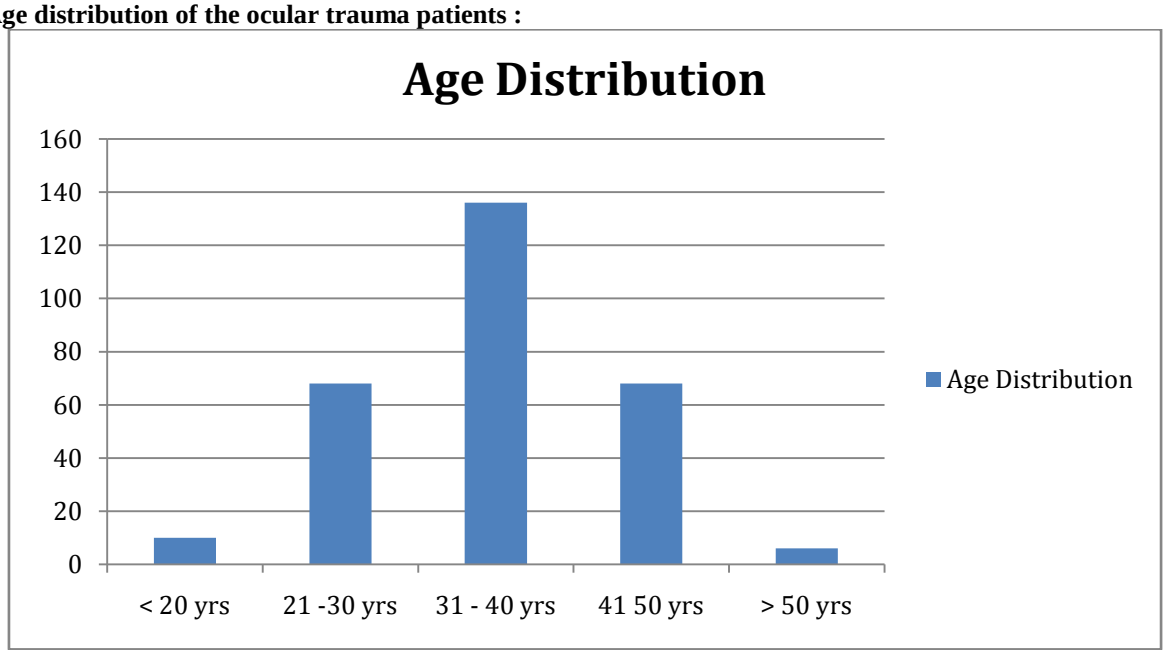
After the examination and relevent investigations the patient was treated as required in the department at their own expense. After appropriate management of the ocular trauma, patient was followed up at regular intervals in the department outdoor.

The patient was reviewed after 1 month from the date of presentation to hospital. Vision was recorded (including best corrected visual acuity if possible) using Snellen‘s chart and clinical examination including slit lamp examination was done as per department protocols. In the event of poor visual outcome, the cause for the poor outcome was also documented. Unaided vision and best corrected visual acuity using Snellen‘s chart was recorded at 1 month follow-up from the date of presentation to hospital.

V. RESULTS

A total of 288 people presented with occupation related ocular trauma to the department from January to July, 2019 who were willing to be part of the study.

Age distribution of the ocular trauma patients :



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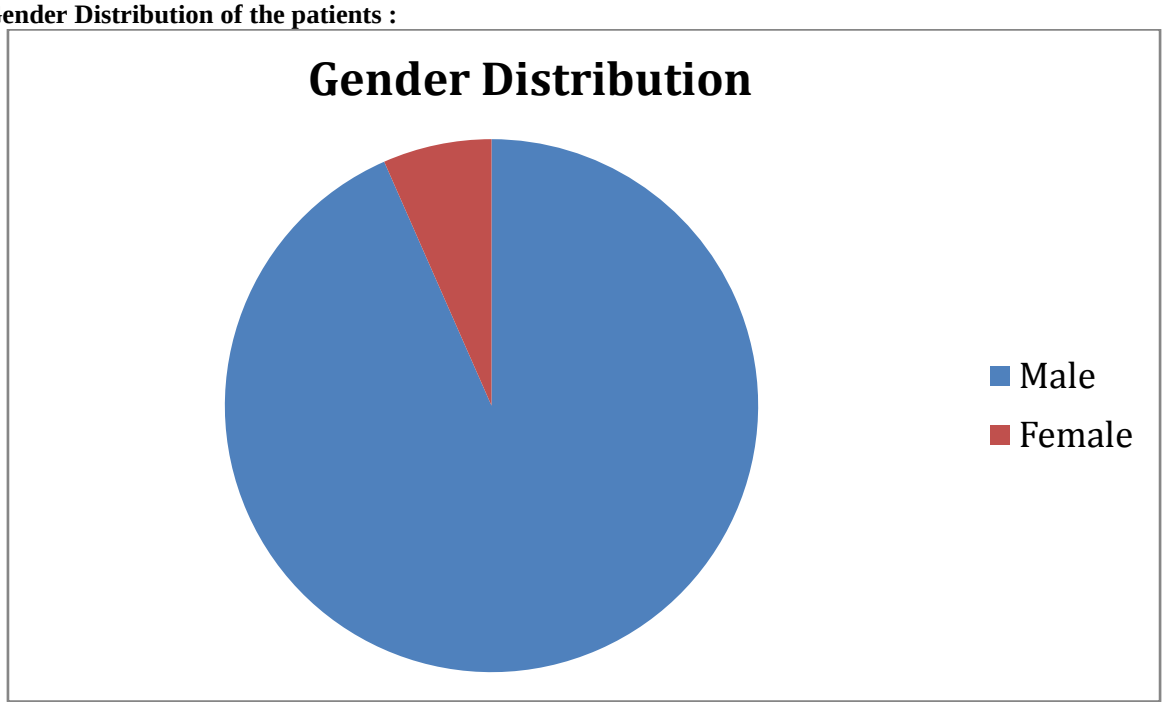
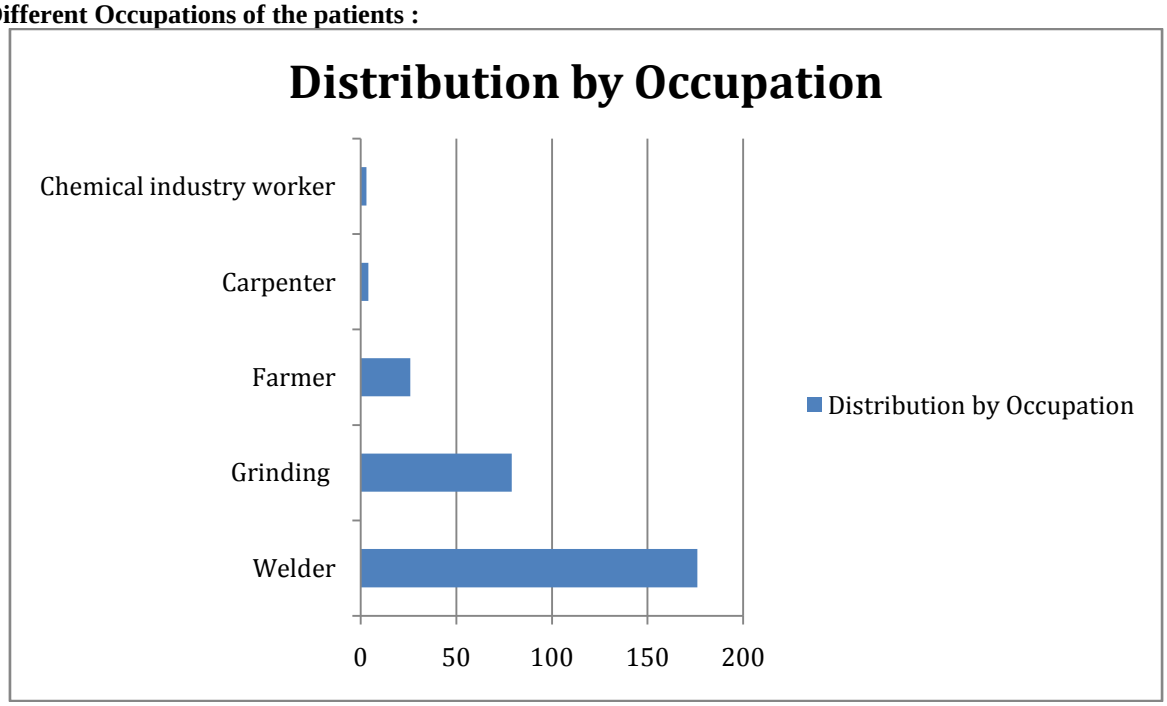
The age distribution of the patients in the study was between 18 years to 67 years. The mean age was 31.11. The most affected age group was between 31 – 40 years. (47.22%)

Gender Distribution of the patients :



Males (93.40%) were affected more than females (6.59%).

Different Occupations of the patients :



The workers most affected were welders (61.11%). Here metallic foreign body was the most common. In non industrial sector injury by vegetative matter was the most common.

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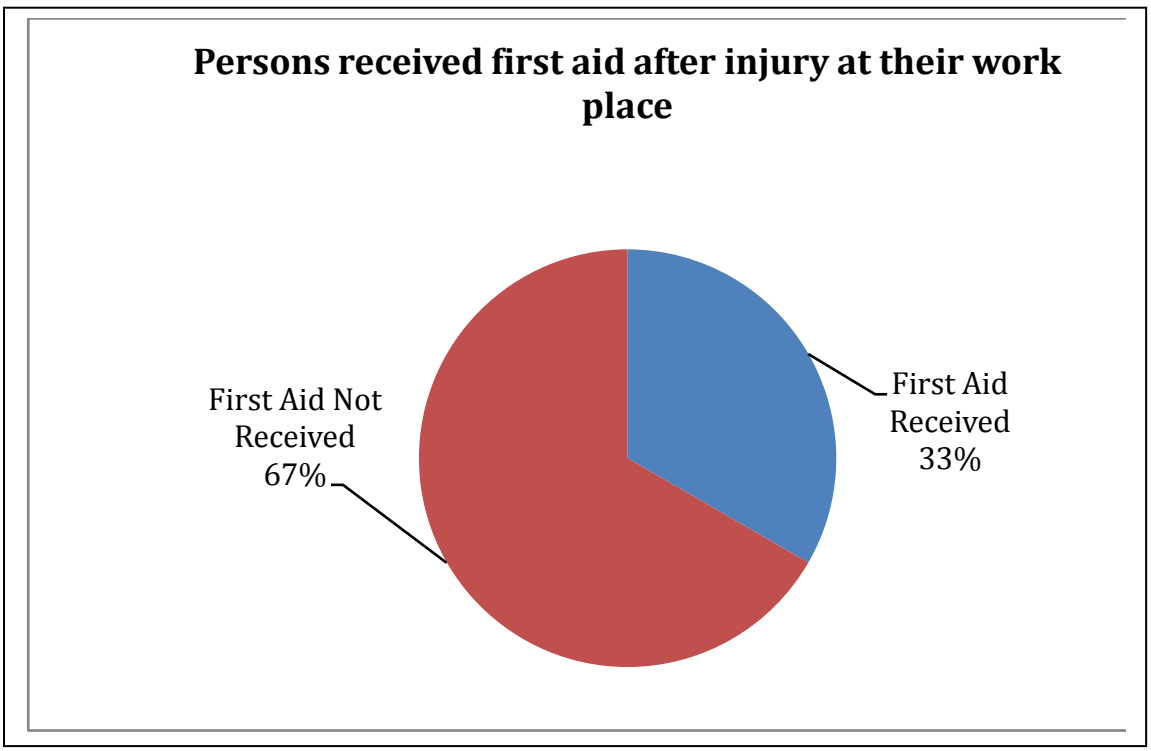
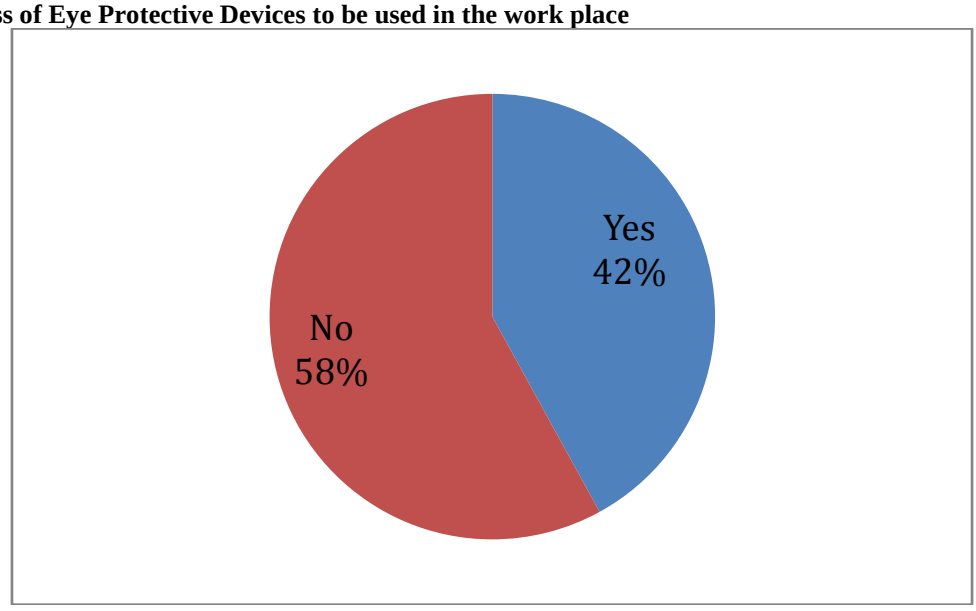


The persons who received first aid after injury was only 33%.

Awareness of Eye Protective Devices to be used in the work place



Only 42% were aware of the eye protective devices, when asked.

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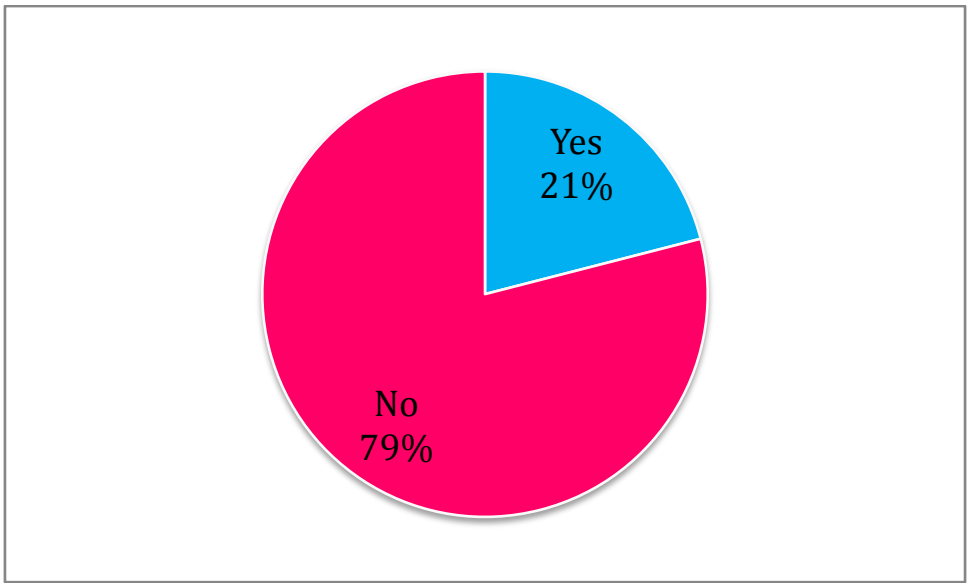
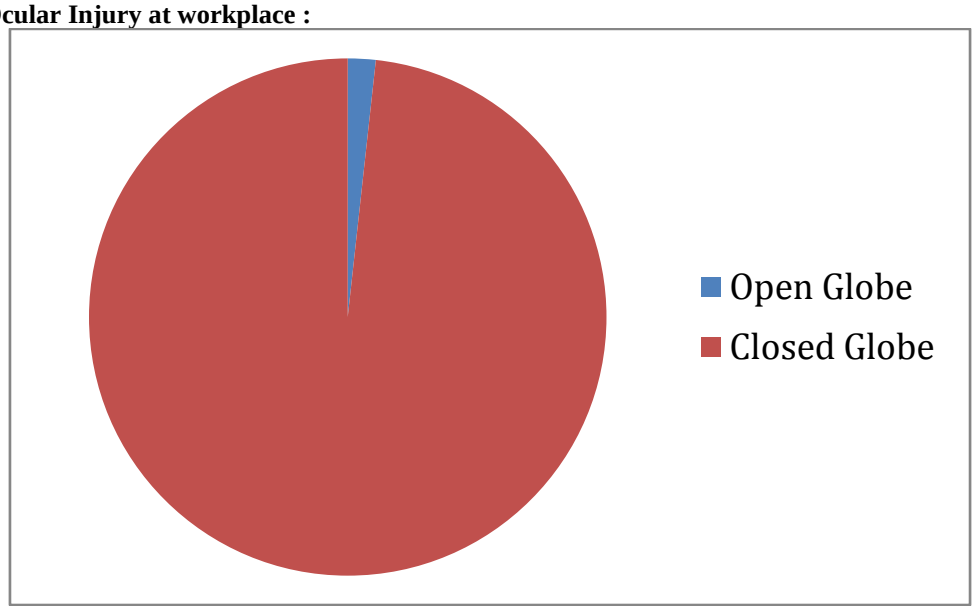
Use of eye protective devices at the time of injury



Only 21% of the total were using eye protective devices at the workplace while injured.

Type of Ocular Injury at workplace :



Only 1.74% of the workers presented with open globe injury.

Visual acuity of the workers at initial visit was better than 6/12 in 57.34%. Visual acuity was worse than 6/60 in 12.54%.

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Profile of ocular injuries related to work place related trauma

Orbit and adnexa	Orbital fracture –3	
Lid	Full thickness upper lid tears –5 Full thickness lower lid tears –6 Lower lid tear along with canalicular injury –2	Marginal lid tear –12 Lid oedema –34
Sclera	Scleral tears –2	
Conjunctiva	Conjunctival tear – 9 Subconjunctival haemorrhage – 3 Foreign body –13	Epithelial defect – 3 Conjunctivitis –16 Limbal ischaemia –2
Cornea	Foreign body –198 Abrasions –16 Epithelial defect – 9 Corneal ulcer –7 Infiltrate –3	Superficial punctate keratopathy – 43 Full thickness corneal tear –1 Partial thickness corneal tear –3 Limbal corneal tear –1
Anterior chamber	Hyphaema –2 Uveitis – 18	Hypopyon –2 Exudative membrane –1
Uveal tissue	Iris foreign body –1	Uveal tissue prolapse –1
Lens	Anterior capsule rupture –2	
Vitreous	Vitreous prolapse to the wound –1	Vitreous haemorrhage –2
Retina	Commotion retinae –3	Retinal tear –2

Ocular injury in workplace may range from minor injuries such as conjunctival congestion and inflammation , corneal abrasions, allergic reactions to very severe injuries such as corneoscleral tears, retinal tears. The minor injuries not threatening vision can be adequately managed medically or by minor surgical interventions. The severe injuries may often result in vision threatening situations with loss of days at work.

VI. DISCUSSION

One of the most important causes of monocular loss of vision is ocular trauma. Almost 1.6 million patients go blind each year worldwide due to ocular trauma. Wong et al, 200(8) estimated a prevalence of almost 20% for ocular trauma in entire lifetime.

1 in 125 persons tend to loose their eyesight due to ocular trauma in India. The problem takes a larger magnitude as India is a heavily populated country with a large number of unskilled workers.

Workplace is the most common place for injuries to happen as people spend a lot of time there. Multiple studies have shown that workplace contributes to about 50% of ocular trauma (9,10,11-13,14-17).

Certain high risk occupations are welders (18), agricultural workers (19,20), carpenters (21), stone quarry workers, surgeons and dentists (22,23). Certain activities which are high risk are welding, grinding, hammering,soldering and smelting.

Almost 90% of the ocular injuries are preventable if proper safety measures are taken (24) and by using personal protective equipments (25-27).

The ensuing visual impairment which is caused affects the quality of life.

The age distribution showed that maximum workers were affected most in 31 – 40 yrs age group. The oldest person was 68 years.The minimum age was 18 which was set as the cut off.

Males were 14 times more affected than females in our study. The study by Dhasmana et al showed that 20 men and 5 women were affected in workplace. (28) Titiyal et al reported similar results with 30 men and 3 men affected by eye injuries at their workplaces. (29)

The workers most affected belonged to industrial sector followed by agriculture. The workers were mostly from lower socio economic status and were

either semi-skilled or unskilled. Metallic foreign body was the most common object followed by vegetative matter.

This study showed that only 96 workers received first aid out of the 288 workers who came with ocular injury. Most of them preferred to go to a hospital instead.

The study showed that 70.14% workers were aware of the protective devices. But only 24% were using protective equipments at the time of injury. The lack of goggles was the cause of the highest number of workplace injuries.

VII. CONCLUSION

Occupation related trauma to the eye is a preventable cause of ocular trauma and ensuing loss of vision in some cases. The adequate use of protective equipments can very notably decrease serious ocular trauma. The age group 31 -40 years was most vulnerable to workplace ocular trauma.

The industrial sector presented with the highest number of ocular trauma.This was followed by agricultural sector.

The incidence of occupation related ocular trauma could be decreased substancially by enforcement and implementation of stricter laws regarding the use of protective equipments. The highly vulnerable occupational groups could be targeted particularly.

Inclusion of awareness of occupation related ocular trauma and its prevention should be included in the public agenda.

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