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ORIGINAL RESEARCH

Assessment of characteristics of patients with occupational corneal foreign bodies

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ABSTRACT

Background: Eye injuries account for a substantial proportion of all work- related injuries. The present study was conducted to assess characteristics of patients with occupational corneal foreign bodies.

Materials & Methods: 84 patients with suspected occupational corneal foreign bodies in eyes of both genders were enrolled. Parameters such as education, type of activity at the time of injury, and whether they were wearing protective glasses at the time of injury etc. was recorded. Information regarding Reasons for not wearing eye protection, material used for self-removal was also recorded. Superficial or deep corneal foreign body was recorded.

Results: Out of 84 patients, males were 50 and females were 34. Age group 18-27 years had 10, 28-37 years had 26, 38-47 years had 18 and >47 years had 30 patients. Education level was grade 1-5 in 24, grade 6-10 in 26, graduation in 7 and illiterate in 27 patients. The difference was non- significant (P> 0.05). Activity at time ofinjury was welding in 15%, metal grinding in 55%, cement work in 4%, wood cutting in 6% and other in 20%. Business sector was construction industry in 25%, metal work industry in 45%, electrician in 7%, carpenter in 5% and other in 18%. Presenting vision was 6/6-6/9p in 82%, 6/12-6/18p in 14% and <6/24 in 4%. The difference was significant (P< 0.05). Reasons for not wearing eye protection was forgot to wear in 26%, removed protector for some time in 42%, protector uncomfortable in 20% and others in 12%. Material used for self-removal was tap water in 36%, paper in 30% and cloth in 34%. Corneal foreign body was superficial in 42% and deep in 58%. The difference was non-significant (P> 0.05).

Conclusion: Labourers working in metal industry found to be high prevalence of foreign bodies in eyes. Low education was one of the contributing factors.

Key words: Corneal foreign body, labourers, electrician

INTRODUCTION

Occupational ocular injuries are an important cause of ocular trauma. Eye injuries account for a substantial proportion of all work- related injuries, including 12% of all workers' compensation claims among carpenters and 11% of all injuries to construction workers requiring an emergency room visit.[1] Welders are at particularly high risk for eye injuries.In an Indian study occupation-related accident constituted 20.1% of all ocular trauma. Among occupational injuries, a corneal FB is the most common form of injuries. Such injuries are commonly seen in metal industry workers including welders and construction industry.A

corneal FB can cause scars on visual axis and also secondary infections ranging from keratitis to endophthalmitis thereby decreasing vision.[2]

Welding can also be performed by workers other than welders—for example, pipe fitters or construction workers.[3] A recent study of work- related eye injuries reported that workers who are ‘‘sometimes’’ or ‘‘often’’ exposed to welding had a fourfold increased risk of an eye injury compared with non-exposed workers.[4] However, little is known regarding the specific activities or circumstances involved in eye injuries among welders.[5]The healthcare costs of such injuries also cause economic burden. Since over ¾ of the injuries are preventable by personal protection equipment, taking measures toward their prevention is justifiable.[6]The present study was conducted to assess characteristics of patients withoccupational corneal foreign bodies.

MATERIALS & METHODS

The present study comprised of 84 patients with suspected occupational corneal foreign bodies in eyes of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, education, type of activity at the time of injury, and whether they were wearing protective glasses at the time of injury etc. was recorded. AN expert eye surgeon examined the eyes in all patients. Information regarding Reasons for not wearing eye protection, material used for self-removal was also recorded. Superficial or deep corneal foreign body was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 84		
Gender	**Males**	**Females**
Number	50	34

Table I shows that out of 84 patients, males were 50 and females were 34.

Table II Patient demographics

Parameters	Variables	Number	P value
Age group (years)	18-27	10	0.17
	28-37	26	
	38-47	18	
	>47	30	
Education	Grade 1-5	24	0.82
	6-10	26	
	Graduation	7	
	illiterate	27	

Table II shows that age group 18-27 years had 10, 28-37 years had 26, 38-47 years had 18 and >47 years had 30 patients. Education level was grade 1-5 in 24, grade 6-10 in 26, graduation in 7 and illiterate in 27 patients. The difference was non- significant (P> 0.05).

Table III Assessment of parameters

Parameters	Variables	Number	P value
Activity at time of injury	Welding	15%	0.04
	Metal grinding	55%	
	Cement Work	4%	

	Wood cutting	6%	
	other	20%	
Business sector	Construction Industry	25%	0.05
	Metal work Industry	45%	
	Electrician	7%	
	Carpenter	5%	
	other	18%	
Presenting vision	6/6-6/9p	82%	0.01
	6/12-6/18p	14%	
	<6/24	4%	

Table III, graph I shows that activity at time ofinjury was welding in 15%, metal grinding in 55%, cement work in 4%, wood cutting in 6% and other in 20%. Business sector was construction industry in 25%, metal work industry in 45%, electrician in 7%, carpenter in 5% and other in 18%. Presenting vision was 6/6-6/9p in 82%, 6/12-6/18p in 14% and <6/24 in 4%. The difference was significant (P< 0.05).

Graph I Assessment of parameters

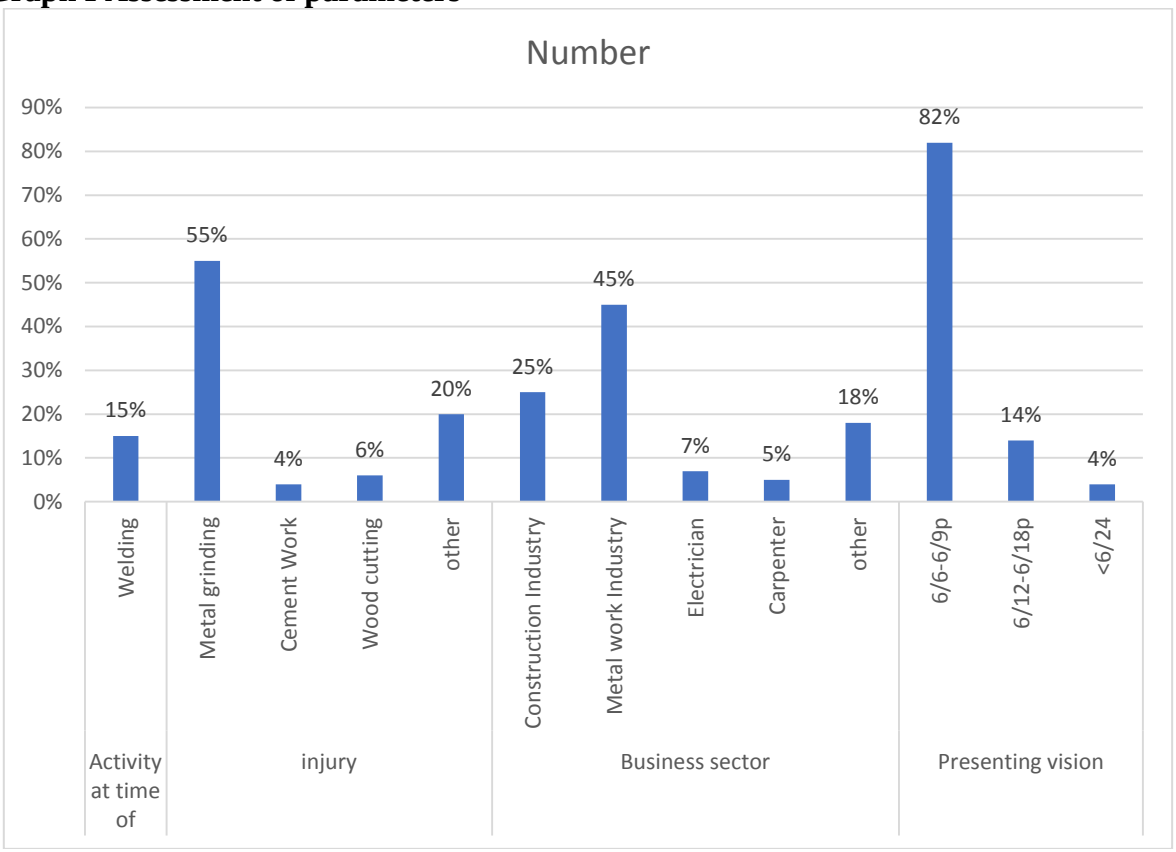

Table IV Response to questionnaire

Questionnaire	Variables	Response	P value
Reasons for not wearing eye protection	Forgot to wear	26%	0.05
	Removed protector for some time	42%	
	Protector uncomfortable	20%	
	others	12%	
Material used for self-removal	Tap water	36%	0.91
	Paper	30%	
	cloth	34%	

Corneal foreign body	Superficial	42%	0.94
	deep	58%	

Table IV shows that reasons for not wearing eye protection was forgot to wear in 26%, removed protector for some time in 42%, protector uncomfortable in 20% and others in 12%. Material used for self-removal was tap water in 36%, paper in 30% and cloth in 34%. Corneal foreign body was superficial in 42% and deep in 58%. The difference was non- significant (P> 0.05).

DISCUSSION

Occupational injuries are a global public health concern with more than 2.78 million fatalities and approximately 374 million non-fatal occupational injuries sustained annually at workplaces.[7,8] In the recent years, Low and Middle- Income Countries (LMICs) have accounted for three quarters of the global burden of fatal occupational injuries which is not the case in developed countries that have seen a steady decline.[9,10]The present study was conducted to assess characteristics of patients withoccupational corneal foreign bodies.

We observed that out of 84 patients, males were 50 and females were 34.Alexander et al[11]studied the frequency of health problems and the usage of PPE among welders in unorganized welding units.A cross-sectional survey was conducted among 150 welders to determine the frequency of skin, ear, eye, and respiratory morbidity and the usage of PPE. A group of 150 non-welders were chosen for comparison.Significant differences in the frequency of skin burns, redness, hyper pigmentation, itching, eye injuries, and sensorineural deafness were observed among the welders and non-welders (P< 0.001). Hypertension was noted in 12.6% of the welders as compared to 0.7% among the non-welders. None of the welders used appropriate PPE. For welders, low educational attainment was associated with an increased risk of eye injury. There was also a significant difference between sensorineural deafness and a welder having less than 10 years of welding work experience which could probably be accounted for by the healthy worker effect.

We found that age group 18-27 years had 10, 28-37 years had 26, 38-47 years had 18 and >47 years had 30 patients. Education level was grade 1-5 in 24, grade 6-10 in 26, graduation in 7 and illiterate in 27 patients. Lombardi et al[12]determined the activities and circumstances proximal to a welding related occupational eye injury, a hybrid narrative coding approach derived from two well developed classification systems was developed to categorize and describe the activity, initiating process, mechanism of injury, object and/or substance, and the use of protective eyewear from the narrative text data reported for each injury.1353 welders and 822 non-welders were analyzed.During 2000, eyes as the primary injured body part accounted for 5% (n = 26 413) of all compensation claims. Eye injuries accounted for 25% of all claims for welders. Subjects were mainly male (97.1%) and from manufacturing (70.4%), service (11.8%), or construction (8.4%) related industries. Most injuries were foreign body (71.7%) or burn (22.2%) and 17.6% were bilateral. Common activities include welding (31.9%) and/or grinding (22.5%). Being struck by an airborne object occurred in 56.3% of cases. Non-welders showed similar patterns except that burns (43.8%) were more frequent and more often initiated by another worker (13.9%).

We observed that activity at time ofinjury was welding in 15%, metal grinding in 55%, cement work in 4%, wood cutting in 6% and other in 20%. Business sector was construction industry in 25%, metal work industry in 45%, electrician in 7%, carpenter in 5% and other in 18%. Presenting vision was 6/6-6/9p in 82%, 6/12-6/18p in 14% and <6/24 in 4%. We found that reasons for not wearing eye protection was forgot to wear in 26%, removed protector for some time in 42%, protector uncomfortable in 20% and others in 12%. Material used for self-removal was tap water in 36%, paper in 30% and cloth in 34%. Corneal foreign body was superficial in 42% and deep in 58%. Agrawal et al[13]determined the occupations, level of

education and demographics of patients presenting with CFB acquired during occupational work. A total of 83 patients were included in the study. CFB were attributed only to males. 66% of patients were in the age group of 14-29 years. 30% of patients were in the age group 30--44 years and 4% of patients were between 45 and 60 years old. The metal work industry was responsible for 47% of presentations. The construction industry was responsible for 27% of presentations. Electricians and carpenters combined were responsible for 10% of presentations and 17% of presentations occurred in other sectors.
The limitation the study is small sample size.

CONCLUSION

AUTHORS found that labourers working in metal industry found to be high prevalence of foreign bodies in eyes. Low education was one of the contributing factors.

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