

ORIGINAL ARTICLE

Occupational Eye Injuries and Gender: A Single Center Based Study

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ABSTRACT

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Background: ocular trauma is a major preventable cause for monocular morbidity and blindness. **Purpose:** Workplace injuries to the eyes are one of the leading causes of ocular trauma and can cause serious visual impairment, with even small injuries incurring considerable financial implications due to work unavailability. The current study tried to assess sex distribution among patients with ocular trauma present to Aswan University Hospital. **Patients & methods:** Over one year between Jan 2020 and Dec 2020, a descriptive hospital-based study was conducted. All patients with ocular trauma were enrolled. Descriptive statistical analysis was applied and comparison between sex distribution of the trauma was done by Chi² test. **Results:** A total of 701 eyes of 607 patients with ocular trauma were recruited. Mean age was 23.02 years with a male to female ratio of (3.9:1). Adnexal injuries were frequently seen (38.5%) followed by globe injuries (26.4%). Other injuries included extra global foreign body (18.1%), chemical injuries (2.7%) and intra mural foreign body (0.9%). Workers were the most frequent affected groups (34.1%) followed by students (28.2%). Male sex had significantly higher frequency of different types of causative agents either mechanical or non-mechanical. **Conclusion:** Ocular trauma is a primary cause of monocular morbidity and blindness. Workers and students who participated in street activities and workplaces were the most impacted. Males sex more liable to ocular trauma than females.

INTRODUCTION

Ophthalmic injury continues to be a major global public health issue. In contrast to other important blinding disorders such as cataract, trachoma, and xerophthalmia, where epidemiological research has made significant contributions, epidemiological data for ocular injuries is rare or nonexistent. The annual incidence of ocular trauma is estimated at 55 million, with roughly 200,000 (26.7%) having open globe injuries.¹⁻²

Since data collection is the initial step in any epidemiological study, once a sufficient amount of information is available on how injuries occur (to whom, where, and why, etc.), prophylactic measures can be planned for and implemented³.

The majority of ocular traumas can be avoided by using appropriate protective eyewear. Implementing established measures for eye injury prevention would significantly minimize its occurrence. The linked prevention methods include requiring approved eye protection in the workplace and athletic activities whenever practical, rather than making their use optional⁵.

There is a paucity in our locality about the epidemiology of ocular trauma and sex distribution of such injuries. So, we designed a descriptive study to determine epidemiological pattern of ocular trauma at Aswan University Hospital for one year.

PATIENTS AND METHODS:

Study setting& design

A cross-sectional descriptive study was conducted at the outpatient ophthalmology clinic and the emergency rooms in Aswan University Hospitals within one year period (Jan 1st, 2020 - Dec 31st, 2020).

Ethical approval

Institutional Research Board of faculty of medicine, Aswan University approved the study with No. (424/12/19) with consideration the tents of the Declaration of Helsinki.

Selection criteria

Any patients with ocular trauma during the study period was recruited. Patients with injuries in the blind or atrophic eye, comatose patients, old ocular trauma (> one month), surgically treated elsewhere were excluded from the study.

Participants

This study was carried out in the Ophthalmology department at Aswan University Hospital over one year period (Jan 1st, 2020 - Dec 31st, 2020). There were (607) patients who had sustained ocular trauma with (701) eye injuries (94 cases had bilateral eye injuries).

Methodology

All patients were subjected to full history taking and clinical evaluation included age, sex and mechanism of trauma. In this study, according to WHO definitions of the term 'blindness' was used for those who had VA (< 3/60) in the better eye, whereas 'moderate to low vision' was for those who had VA (less than 6/18 to 3/60) in the better eye.

Epidemiological and examination data were collected and analyzed. Follow-up was carried out according to the severity of the eye injury. Globe injuries were followed up for 3 months.

Statistical analysis

Data were statistically described in terms of; mean, standard deviation (\pm SD), frequency, and percentage (%). Comparison between the study groups was done using the "Chi-square (χ^2) test"; a probability value (*p*-value) less than (0.05) was considered statistically significant.

RESULTS

Baseline data of the studied patients (table 1)

Mean age of patients was (23.02 \pm 11.52) years. Males were (484) cases (79.7%) and females (123) cases (20.3%) with male to female ratio (3.9:1). Most of the patients were workers 207 (34.1%) and students 171 (28.2%), followed by housewives 84 (13.8%) and farmers 83 (13.7%).

The street-related injuries accounted for 280 (46.1%) of cases, workplace-related injuries accounted for 147 (24.2%), home-related injuries accounted for 91 (15%), injuries in the farms accounted for 75 (12.4%), and injuries within the schools accounted for 14 (2.3%).

Causative agents based on sex of the patients (table 2)

There was an association between the place of trauma and gender and the difference was statistically significant (*p*-value is < 0.001). In males; street-related injuries (53.1%) and workplace-related injuries (29.3%) were more common than in females ((18.7%) and (4.1%) respectively), while in females; home-related injuries (68.3%) were more common than in males (1.4%).

There was a difference in the causative agents of ocular trauma between both sexes (*p*-value is 0.021). Sharp objects caused injury in (20.3%) of all patients; fingernails were

a more frequent cause (11.9%) of ocular trauma cases, followed by glass (2.3%) and scissors (2%). Chemical injuries were found in 19 (3.1%) cases.

Details of ocular injuries based on sex (table 3):

There was a significant difference in the distribution of globe injuries between males and females but there was no significant difference in the frequency of right vs. left eye injuries (98 (52.9%) right vs. 87 (47.1%) left) (p -value is 0.051).

Males are more affected than females, however, the difference was statistically insignificant (p -value 0.514 Chi-square test), also the frequency of right vs. left eye injuries (39 (55.7%) right vs. 31 (44.3%) left) was not statistically significant.

There was a significant difference in the distribution of (EFB) between males and females (p -value is <0.001 Chi-square test). Meanwhile, there was no significant difference in the frequency of right vs. left eye injuries (65 (51.2%) right vs. 62 (48.8%) left).

DISCUSSION

This is a cross-sectional hospital-based study that included cases of ocular trauma at the outpatient ophthalmology clinic as well as emergency cases brought to the Ophthalmology department at Aswan University Hospitals throughout a one-year period. All subjects had their histories obtained and an ophthalmological examination performed.

Each case sheet was evaluated, and ocular trauma epidemiology and examination data were gathered and analyzed. Radiological evaluations were performed on injured patients utilizing x-rays, B-scans, and/or CT scans. Intraoperative data was obtained, and all subjects were followed up following surgery with visual acuity testing, slit lamp, and B-scan (as needed).

The mean age of the participants was (23.02 ± 11.52) with age ranges from 3 months to 66 years. The majority of the participants were adults and older. Elhesy,⁶ reported mean age of 25.7 ± 17.1 years with wider age range (1-80 years). Other studies reported eye trauma with age about 35 years^{4,5}.

Ocular trauma in the current study had male predominance (79.7%) with male to female ratio: 4 to 1. El-Sobky et al.,⁷ reported also increased incidence of ocular trauma among males (69.1%) with a male to female ratio of (2.2:1). Male predominance regarding eye trauma was reported in other studies Wang et al, 2017, Wong et al, 2018^{5,8}.

Male patients are more likely to experience ocular trauma, which may be attributed to their increased exposure to trauma risks at work. Across all age categories, males were more likely to suffer ocular trauma. This is in conjunction with another study⁹.

Pandita and Merriman⁴ found that employment was the second most common cause of eye injury, whereas outdoor activities were the top, which is consistent with the current study. According to Elhesy⁶, home is the third most common source of injury after work and the street. El-Sobky et al.⁷ showed a comparable prevalence of ocular injuries among workers and students, as well as between the workplace and the streets.

In this study, the location of the trauma varied between males and females. Males had the highest rates of street and work-related injuries, whereas females had the highest rate of home injuries. This refers to the study's demographic structure, as the majority of males are hand workers and the majority of females are housewives in the investigated community, with more interior work than outdoor work.

Gordon et al.¹⁰ found that ocular accidents occurred more frequently at home than at work in Canada, with males and females having equal rates. Other researchers have reported similar findings^{8,11}. Fighting was the leading source of trauma in males, followed by working. Working from home was the most prevalent activity among females. Other researches have shown the same conclusions.¹²⁻¹³

The current study had the advantage of being performed on large number of populations. Also it included considerable number of patients in both sexes and included wide range of age groups. Variability in causes and types of ocular trauma gives strength points to the study. Different treatment modalities were used and studied.

The study had the limitation of lack of randomization and absence of control group. Few patients had poor visual acuity at time of presentation which limited our ability to study risk factors associated with loss of vision. And yet this considered the first reported study that discussed such issue in our locality

CONCLUSION

Males were more likely to experience ocular injuries, which decreased as they grew older. Males were more likely to experience fight and work-related stress, whereas females had more indoor trauma. Adnexal and closed globe trauma are more likely to occur with a positive outcome than open globe trauma. Proper treatment could be performed either medically or surgically and associated with generally favorable outcomes in terms of visual acuity.

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LIST OF TABLES

Table 1: Baseline data of the studied patients

N= 607	
Age	23.02 ± 11.52
Sex	
	Male 484 (79.7)
	Female 123 (20.3)
Occupation	
	Workers 207 (34.1)
	Students 171 (28.2)
	Housewives 84 (13.8)
	Farmers 83 (13.7)
	Drivers 25 (4.1)
	Preschoolers 24 (4)
	Others 13 (2.1)
Place of Trauma	
	Street 280 (46.1%)
	Workplace 147 (24.2%)
	Home 91 (15%)
	Farm 75 (12.4%)
	School 14 (2.3%)

Data was expressed as mean (SD), frequency (percentage)

Table 2. Causative agents based on sex of the patients

Causative agent	Category	M	F	T (%)	P-Value
Mechanical agents		466	122	588	0.021*
	Blunt objects	317	81	398 (67.7)	
	Sharp objects	89	34	123 (20.9)	
	Motor vehicle/bicycle	59	7	66 (11.2)	
	Gunshot pellets	1	0	1(0.2)	
Non-mechanical agents		18	1	19	
	Chemical injury	18	1	19 (100)	
Sharp objects					0.042*
	Nail	44	28	72 (11.9)	
	Glass	13	2	15 (2.5)	
	Scissors	9	3	12 (2)	
	Pen / Pencil	8	1	9 (1.5)	

	Metal border	6	0	6 (1)	
	Knife	5	0	5 (0.8)	
	Plastic	4	0	4 (0.6)	
Blunt objects					<0.0001**
	Stones	136	48	184 (30.3)	
	Metal stick	130	1	131 (21.6)	
	Wood	22	9	31 (5.1)	
	Fist	9	18	27 (4.4)	
	Metal bar	11	5	16 (2.6)	
	Animal kick	5	0	5 (0.8)	
	Ball	4	0	4 (0.6)	
	Total	317	81	398	

Table (3) Types and representation of globe injuries in the study

Type of injury	M	F	Total	Pediatric trauma (≤ 15 y)	% in OGIs (70 eyes)	% in globe injuries (185 eyes)	% in total eye injuries (701)
Open globe injury	50 (71.4%)	20 (28.6%)	70	26 (37.1 %)	100 %	37.8%	10%
• Rupture globe	44 (73.3%)	16 (26.7%)	60	21 (29.5%)	83.6 %	32.4 %	8.6%
• Penetrating injury	3 (50%)	3 (50%)	6	4 (6.5%)	9.8 %	3.2 %	0.9%
• IOFB	2	1	3	1(1.6)	4.9 %	1.6 %	0.4 %
• Perforating injury	1	0	1	0	1.6 %	0.5 %	0.1 %
Closed globe injury (CGI)	77 (67%)	38 (33%)	115	35 (31.3%)	100%	62.2%	16.4%
• Contusion	25	6	31	9	27%	16.8%	4.4%
• Lamellar laceration	52	32	84	26	73%	45.4%	12%