

ORIGINAL ARTICLE

Frequency and Characteristics of Ocular Trauma in Gilgit, Pakistan

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ABSTRACT

Objective: To study the frequency and characteristics of ocular trauma in Gilgit city, Pakistan.

Study Design: Observational survey.

Place and Duration of Study: This study was conducted at Gilgit Eye Hospital, Gilgit city from 1st January 2012 to 31st December 2012.

Materials and Methods: It was an observational study (case series) concluded at critical analysis of data collected. Patients presenting with the complaints of ocular trauma over a period of one year were included in the study. Detailed history was recorded using a structured questionnaire including age, gender, occupation, month and the season, the place, nature of object, activity at the time of injury and time lapsed after trauma and presentation at the hospital.

Results: Patients ranged from 2 years to 75 years, with a mean age of 44.07±13. Majority of the patients were males (62.61%). The age group range in 36.9 % of the patients was 31-45 years and 15-30 year in 22.4 % of the patients. The patients who presented within one hour after an eye injury were 45.32%. The highest number of injuries occurred in the summer season (52.7%). The most common cause of eye injury in the study group was related to wood cutting (19.1%). The commonest place where injury occurred was in woods and mountains (17.7%). The activity which was common at the time of injury was cutting wood followed by playing out door games. Most of the patients suffered from blunt trauma and had closed eye injuries (81.3%). Most of the patients had good visual acuity at presentation (6/6 to 6/18 in 39.3%). The commonest types of injuries were Periorbital swelling, ecchymosis and subconjunctival hemorrhages (40.1%). The cases were managed according to the clinical findings and investigations.

Conclusion: This study highlights the pattern and characteristics of ocular trauma presenting to an eye facility in Gilgit city. The frequency of ocular trauma is more in young males, mostly blunt, unilateral and work related. Majority of the ocular injuries are caused by wood and rocks in the mountains. Children suffer from ocular trauma at home and schools while playing games and sports.

Key Words: Ecchymosis, Ocular Trauma, Ocular Injury, Periorbital Swelling, Subconjunctival Hemorrhages

Introduction

Trauma to the eye and its surrounding structures is a leading cause of visual morbidity and blindness.¹ Even though, ocular trauma has been described as a neglected issue, it was highlighted as a major cause of visual morbidity more recently.² According to World Health Organization estimation, 55 million ocular injuries occur each year. A rough estimate is that one out of every twenty patients examined by

an ophthalmologist is suffering from ocular injury.³ Ocular trauma is considered to be one of the preventable causes of blindness in the world but annually 1.6 million people still become blind from ocular trauma.¹ The data available in the developing countries about ocular trauma is limited and does not indicate the magnitude of the problem, the risk factors, the circumstances and the population at risk.⁴ The limited available data is not admissible for every region as factors vary according to every city and region.

Gilgit city is located in the northern region of Pakistan having mountainous terrain, agricultural plains and tourist's recreational areas. People here belong to different customs and practices as compared to the rest of the country. Till now no research has been done in the study area on ocular trauma. We carried out this observational survey to know the frequency and characteristics of ocular trauma in Gilgit city with the hope that it may prove helpful to find preventive methods for minimizing such disabling injuries.

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Hence, this data may be representative for any of the surrounding region.

Materials and Methods

It was an observational survey conducted at Gilgit Eye Hospital, Gilgit from 1st January 2012 to 31st December 2012 that concluded at critical analysis of the collected data. The principles outlined in the Declaration of Helsinki (2008) were followed to conduct the study. With informed consent, data was collected from all the patients presenting with the history of ocular trauma at Gilgit Eye Hospital. Detailed history was recorded using a structured questionnaire including age, gender, occupation, the month and season, the place, nature of object, activity at the time of injury and time lapsed after trauma and presentation. The author recorded the details of anterior segment by slit lamp biomicroscopy, examined the posterior segment after dilating the pupils (using direct and indirect ophthalmoscope) and measured the intraocular pressure by Applanation Tonometer. All the ophthalmic findings were recorded on a proforma. To rule out intraocular foreign body, X-rays orbit (posterior-anterior and lateral view) and ultrasonography were carried out where and when required. All the cases were managed according to the ophthalmic findings. Data was entered and analyzed using the SPSS version 22. The age was analyzed by descriptive method with range and mean ± SD where as the qualitative variables were analyzed as frequencies and percentages.

Results

During the study period a total of 23179 patients with ocular complaints presented to the hospital among which 214 patients reported with the complaints of ocular injury (0.92%). Majority of the patients were males (62.61%), male to female ratio was 1.67:1. The presentation of the patients varied throughout the year; highest number of presentation was in the summer season (52.7%), followed by in spring season (30.8%) and least in the winter season (7.9%). The time elapsed between injury and presentation to the hospital was also noted. Around 66.82% of the patients presented within 24 hours after the injury, whereas 5.1% of patients presented with more than one year history of ocular trauma.

Patients ranged from the age of 3 years to 75 years with mean age of 44.07±13. The patients were divided into age groups of 3-14, 15-30, 31-45, 46-60 and 61-70 years. It was found that maximum number of patients i.e. 36.9% belonged to 31-45 age group, 22.4% were of age group 15-30 whereas 12.6% were in 3-14 age group. Table No. I shows the occupations of the study group.

Table I: Distribution of Patients according to their Occupation (n=214)

Occupation	No of Patients
Student (school/seminary)	29 (13.5%)
Miner/ Brick layer/Construction Worker	25 (11.6%)
Farmer / Sheppard	24 (11.2%)
Toddlers and infants	23 (10.7%)
Woodcutter /Saw miller/ Carpenter	23 (10.7%)
House Wife	16 (7.5%)
Motor Mechanic / Electrician / Welder	16 (7.5%)
Public Transport Drivers	16 (7.5%)
Teacher (school/seminary)	13 (6%)
Trader	9 (4.2%)
Retired	9 (4.2%)
Health Professional	7 (3.2%)
Office Job	4 (1.8%)

The most common cause of injury in the study group was related to wood (19.1%) followed by gunshot or pallet injury in 12.1% of the patients. (Table No. II)

Table II: Various Causes of Ocular Trauma (n=214)

Causative Agent	Male	Female	Total
Thorn /Tree Branch/Wood	23(10.7%)	18(8.4%)	41(19.1%)
Gunshot /Pallet	23(10.7%)	3(1.4%)	26(12.1%)
House Hold Utensils (Broom, Sewing Needles, kitchen Items)	5(2.3%)	18(8.4%)	23(10.7%)
Rocks /Stones (projectile /non projectile)	17(7.8%)	4(1.9%)	21(9.8%)
Pocket Knife/ Hunter Knife /Blade /Screw Driver	18(8.4%)	1(0.5%)	19(8.9%)
Animal Horn / Hoof	7(3.2%)	10(4.7%)	17(7.9%)
Fall / Wall Hit /Door Hit	4(1.9%)	10(4.7%)	14(6.5%)
Broken Glass (bottles ,windows, wind screen)	8(3.7%)	5(2.3%)	13(6%)
Hit by Slap /Fist /Nail /Cane	7(3.2%)	5(2.3%)	12(5.5%)
Sports gear	10(4.7%)	1(0.5%)	11(5.1%)
Pencils /pens	4(1.9%)	5(2.3%)	9(4.2%)
Vehicle Hit/ crash	8(3.7%)	0(0%)	8(3.7%)

The commonest place where injury occurred was in woods or mountains (Table No. III), accounting for 38 patients (17.7%). 25 patients sustained injury while in the playground and 21 patients were at school. Highway or road side trauma was in 5.6% of the patients.

Table III: Location Where the Ocular Injury Occurred (n=214)

Place of Injury	No. of Patients
Mountains /Woods	38(17.7%)
Fields/Farm	33(15.4%)
Home	27(12.6%)
Play Ground	25(12.6%)
School	21(11.6%)
Public Building	20(9.3%)
Office/Shop	19(8.8%)
Garage / Workshop /Construction Site	19(8.8%)
Highway /Road side	12(5.6%)

The activity which was commonest at the time of ocular injury was cutting wood, followed by playing games (Table No. IV).

Closed eye injuries were in 81.3% of the patients. Right eye involvement was in 52.3% and in 2.3% it was bilateral. On examination, 84(39.3%) patients had good visual acuity at presentation (6/6 -6/18) and 23(10.7%) patients presented with visual acuity < 3/60.

Table IV: Activities at the Time of Ocular Injury (n=214)

Activity	No of patients
Cutting Wood	31(14.5%)
Playing / Running /Walking	29(13.5%)
Fighting	28(13%)
Household Tasks	24(11.2%)
Farming	20(9.3%)
Standing	19(8.8%)
Helping / Learning	19(8.9%)
Driving/Travelling	17(7.9%)
Repairing / Constructing	15(7%)
Reading /Gazing	7(3.2%)
Writing/ Typing	5(2.3%)

The most common (40.1%) type of eye injuries were periorbital swelling, ecchymosis and subconjunctival hemorrhages combined (Table No. V). Then were corneal foreign body /abrasion (19.6%) followed by

traumatic cataract /dislocated lens (18.2%), lid tears (15.4%), Hyphema (1.5%) and Uveal prolapse (5.1%). We found corneal ulcers in 17 patients, retinal detachment and intraocular foreign body in 12 and tears (corneal, scleral, corneoscleral) in 11 patients. We also found corneal opacities, corneal abscesses and endophthalmitis in our patients. There were 4 cases of multiple ocular structure damage, 2 cases had optic atrophy, one had ptosis and one had a blow out fracture.

Table V: Ophthalmic Findings after Ocular Trauma (n=214)

Ophthalmic findings	Male	Female	No of Patients
Periorbital Swelling /Ecchymosis/Sub Conjunctival Hemorrhage	49(22.9%)	37(17.3%)	86(40.1%)
Corneal Foreign Body /Abrasion	36(16.9%)	5(2.3%)	42(19.6%)
Cataract /Dislocated Lens	32(15%)	7(3.2%)	39(18.2%)
Lid Tear/ Ectropion	18(8.4%)	15(7%)	33(15.4%)
Hyphema	23(10.7%)	6(2.9%)	29(13.5%)
Corneal / Scleral /Corneoscleral Tear	18(8.4%)	1(0.5%)	19(8.9%)
Corneal Ulcer	8(3.7%)	9(4.2%)	17(7.9%)
Flat Anterior Chamber	15(7%)	1(0.5%)	16(7.5%)
Corneal Edema	7(3.2%)	5(2.3%)	12(5.6%)
Uveal Prolapse	9(4.2%)	2(0.9%)	11(5.1%)
Corneal Opacity	3(1.4%)	6(2.8%)	9(4.2%)
Corneal Abscess	2(0.9%)	5(2.3%)	7(3.2%)
Endophthalmitis	3(1.4%)	4(1.9%)	7(3.2%)
Macular / Retinal Edema	5(2.3%)	2(0.9%)	7(3.2%)
Retinal Detachment	7(5.6%)	0	7(5.6%)
Iris Dehiscence	3(1.4%)	3(1.4%)	6(2.8%)
Intraocular Foreign Body	5(2.3%)	0	5(2.3%)
Raised Intraocular Pressure	3(1.4%)	2(0.9%)	5(2.3%)
Phthisis Bulbi	1(0.5%)	3(1.4%)	4(1.9%)
Multiple Ocular Structure Damage	4(1.9%)	0	4(1.9%)
Optic Atrophy	0	2(0.9%)	2(0.9%)
Ptosis	1(0.5%)	0	1(0.5%)
Blow Out Fracture	1(0.5%)	0	1(0.5%)

The cases were managed according to the clinical findings and investigations. Adenexa and anterior

segment injuries requiring surgical intervention were operated. The cases requiring posterior segment surgery, corneal opacities with potential of visual improvement, patients with phthisis bulbi and one case with blow out fracture were referred to the appropriate centers. Patients having no visual potential were counseled and those in need were referred for rehabilitation with low vision aids.

Discussion

In this study we found the magnitude of ocular trauma to be 0.92% in relation to the total patients presenting to the hospital. It is comparable to the findings of the study conducted in Karachi.⁵ But it is significantly low as compared to the findings of a study done at JUDO, south west Ethiopia,¹ where it was found to be 6.9%. We found bilateral eye involvement in 2.3% cases while Karaman K⁶ has given figures of bilateral involvement in 3.7% and Khan MD⁷ has given figure of 4.9%. In this study closed globe injuries were found to be more common than open globe injuries accounting for 81.3% of patients. Arfat M Y⁸ also reported blunt ocular trauma to be most frequent whereas Karaman K found 67.3% were closed and 32.7% were open globe injuries in his study.⁶

This study shows a male predominance. Many studies have shown that; males who are in the active and economically productive age (30 to 45 years), tend to have more eye trauma as compared to females.^{2,3,5} This may be due to the fact that young males are more likely to be involved in hazardous activities either work-related or related to sports and 30 to 45 years age being more volatile and less responsible.⁹

According to Jan S, 60.75% ocular emergencies were below 20 years of age.¹⁰ Okeigbemen VW stated that 44.8% of his patients suffering from ocular trauma were dependants (toddlers, pupils and students).¹¹ In comparison to these incidences in our study 35 % of patients were less than 15 years (13.5% students and 10.7% toddlers and infants). These are alarming figures which need to be addressed because according to Dandona L et al majority of the trauma resulting in blindness occurs during childhood and young adulthood.¹²

We found that ocular trauma occurred in 12.6 % cases at home though higher incidences have been reported in other studies. Babar TF reported that

most of ocular trauma took place at home¹³ and according to Mowatt L home is the most common place for eye injury.¹⁴ In our study, 11.6% cases suffered ocular trauma at school and Oluyemi F have reported in 5.9%.¹⁵ These incidences are alarming as home and schools thought to be safe are on the contrary. Moreover such accidents are probably underreported. 12.6% of our patients suffered an ocular trauma while in play ground and 5% cases suffered from sports gear related ocular injury. Augmenting our findings are reports by Tseke A¹ who reported sports related ocular injury in 7.3% and by Jan S who noted that ocular trauma during playing games was in 66.66% and in 27.77% it was with sports gear related.¹⁰

Knyazer B et al reported that most of the injuries are work related.¹⁶ In any occupation, ocular injuries can occur at random but some occupations are always at risk of sustaining eye injury. Occupations like mining; construction work, wood cutting, carpenter, motor mechanic and welding are exposed to hazardous conditions and can suffer from trauma. In our study 40.7% of the ocular trauma was work related. Our setting, being a mountainous area, people are more involved in occupations related to wood, mining and farming. Therefore are prone to occupational hazards. We had ocular trauma with wood (19.1%), stones (9.8%) and knives/ screw drivers (8.9 %) signifying the need of providing preventive care to the workers and necessary gear for prevention. Similarly animal handlers who sustained ocular injuries (7.9% in our study compared to Enock ME 19.2%) need education regarding non hazardous animal care.¹⁷ Furthermore there were bus drivers and pedestrians who suffered from highway /road side accidents and there were others, being retired and health professional that were exposed to either violent conditions or domestic accident. Other researchers have reported the same. Enock ME¹⁷ reported that ocular trauma caused by road traffic accident and assault was in 30.8% and 22% respectively. Tseke A¹ reported that violence caused ocular injury in 37.2% and domestic accidents in 29.2% of cases.

The causes of injury, although remained variable in all the cases, most common was related to wood and rock. Researchers have augmented our findings. Oluyemi F¹⁵ reported the common mechanism of

injury was from a chip of metal or vegetative matter impacting the eye. Jan S¹⁰ reported 44.44% cases received ocular trauma with stone and Omolase CO et al reported that vegetative materials were the most common offending agent.¹⁸

According to Rahman I, good visual acuity at presentation is correlated with good visual outcome.¹⁹ In our study 39.3% patients had good visual acuity at presentation (6/6 -6/18). Patients who presented less than 1 hour after ocular injury were 45.32% where as 5.1% presented as late as one year after ocular injury. In the JUDO study 31.6 % patients presented within 48 hours whereas 28.6% arrived after one week or later.¹ In a study by Enock ME delayed presentation was more common.¹⁷ 22 patients presented within 24 hours of injury and 63.61% patients presented after one week. The prognosis of vision is adversely affected by delay before proper management or presentation to the hospital and by administration of inappropriate treatment.¹³ The delay in presentation can lead to complications like phthisis bulbi, optic atrophy and endophthalmitis as found in our study.

Oluymi F¹⁵ reported corneal wounds (43.7%) or corneo-scleral (41.5%), Uveal prolapse in 68.1%, hyphema in 47.4%, and cataract in 28.1% in his study. We found corneal involvement in 19.6%, lens involvement in 18.2%, hyphema in 1.5% and uveal prolapsed in 5.1%.

The presentation of the patients varied throughout the year. There were more cases of ocular trauma in summer season as compared to winter due to the extreme cold weather. Karaman K⁶ also reported that the majority of injuries occurred during July, August, and September and the frequency was lowest in February and November (5.7%). The reason being, because of snow fall and people get more confined to their homes, children are out of school and people are less involved in outdoor activities.²⁰

There are certain limitations of our study; as the study is based on data from a particular hospital and it is not a population based; hence does not give a true measure of the incidence and prevalence of ocular trauma in the population of Gilgit city. The comparison of our study data with the studies reviewed was difficult in many aspects due to non similar classifications and different reporting methods but it might be helpful for further

population based studies and prevention of ocular trauma.

Conclusion

This study highlights the pattern and characteristics of ocular trauma presenting to an eye facility in Gilgit city. The frequency of ocular trauma is more in young males, mostly blunt, unilateral and work related. Majority of the ocular injuries are caused by wood and rocks in the mountains. Children suffer from ocular injuries at home and schools while playing games and sports. Attention should be aimed at preventing ocular trauma at workplace, home and schools.

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