

Patterns of Ocular Trauma at Rawalpindi General Hospital

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ABSTRACT

OBJECTIVE: To evaluate the patterns of ocular trauma, its causes and prognostic value of presenting visual acuity in final outcome of ocular injuries.

STUDY DESIGN: Retrospective.

PLACE AND DURATION OF STUDY: Rawalpindi General Hospital from April 2007 to April 2008.

PATIENTS AND METHODS: Medical records of all ocular trauma cases among 600 patients admitted during study period in Eye Ward were analysed. The details of patients regarding age, gender, causes and record of visual acuity at admission and discharge from hospital were entered into specially-designed performa.

RESULTS: Among 93 (15.5%) eyes that suffered globe trauma 73 (78.49%) were of males and 72 (77.42%) were presented in patients up to 30-years of age. The common causes of ocular trauma were occupational 35 (37.63%), play & sport injuries 24 (25.81%) and road traffic accident 19 (20.43%).

At the time of admission visual acuity of 42 (45.2%) eyes was near blindness, whereas at the time of discharge 69 (74.2%) had visual acuity <1/60.

CONCLUSION: Ocular trauma is a major health problem. Young male under age of 30 years were main victims. Majority of ocular trauma was due to occupational and sports injuries.

KEY WORDS: Ocular trauma (OT), Open-globe injury, Closed-globe injury, presenting visual acuity, cause, ocular trauma Scale (OTS).

INTRODUCTION

Ocular trauma is one of the leading causes of unilateral blindness worldwide. It is defined as the result of mechanical, thermal, electrical or chemical injury to the eye.¹ Blunt trauma is more common than penetrating injuries and it represent a spectrum from a mild corneal abrasion to forced blunt trauma causing a marked tissue disruption.²

Ocular trauma is also a public health problem leading to visual impairment and blindness that has an important socioeconomic implication. The cost of rehabilitation and care is tremendous, so prevention of injury is an opportunity to reduce morbidity and mortality with significant saving in both financial and functional terms.¹

Initial presenting visual acuity in ocular trauma has prognostic value and is an aid in counseling and in treatment of eye injury patient. It also directs attention towards resources needed and rehabilitation process.⁵ The aims of this study were to determine the pattern of ocular trauma at RGH Rawalpindi, causes of injury and prognostic value of presenting visual acuity in final visual outcome.

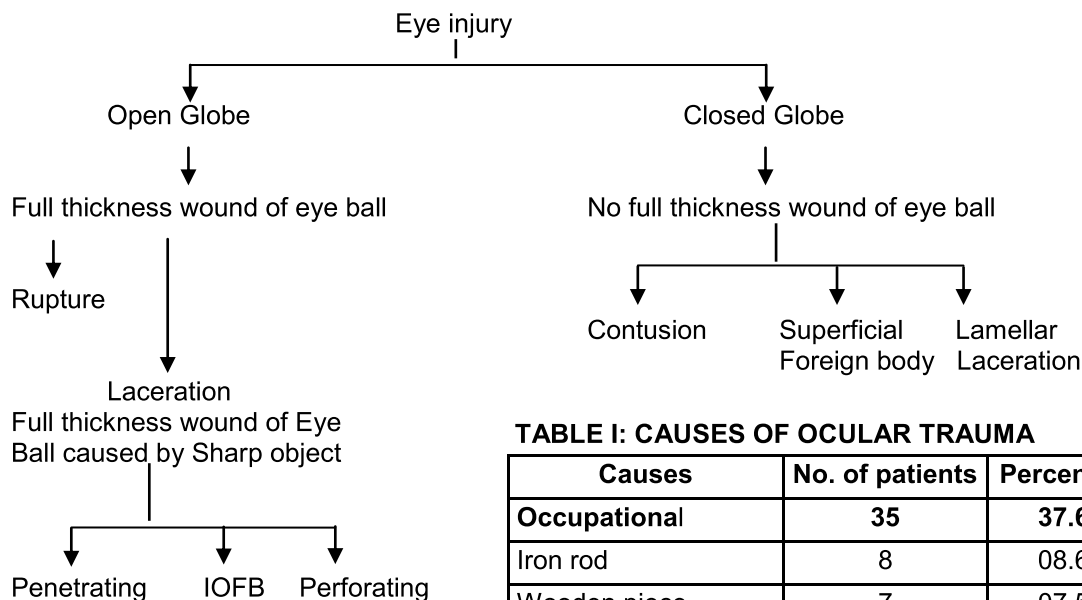
PATIENTS AND METHODS

This retrospective study was conducted at Rawalpindi General Hospital, Rawalpindi Pakistan. Records of

ocular trauma cases admitted in Eye Ward from April 2007 to April 2008 were reviewed. The details of all ocular trauma cases regarding socio-demographics, history, cause of injury, visual acuity at the time of presentation and discharge, any pre-existing ocular disease, ocular treatment, and presence of intra-ocular foreign body were noted on a predesigned performa. Visual acuity was classified with widely endorsed terminology as per description of American Academy of Ophthalmology.¹

Variables that influence the prognosis of visual outcomes were recorded, which included type of injury, grade of injury based on visual acuity at initial examination, presence of relative afferent papillary defect in involved eye, and zone of injury. Adnexal, eyelids, superficial abrasions and burns not conforming to this classification were excluded.

Visual acuity was recorded with the help of Snellen's chart that included E-chart, English alphabets, Urdu alphabets for adults, Snellen's pictures and E-chart for patients between 6 to 10 years age. In patients less than 6 years, visual acuity was recorded with the help of Kay pictures, Snellen's pictures chart and counting of fingers. In addition to visual acuity, slit lamp examination, intraocular pressure, direct and indirect ophthalmoscopy findings was recorded. X-rays, ultrasonography and CT scanning findings of injured eye was recorded in cases where suspicion of intraocular or



retrobulber IOFB and fracture of orbital walls were present.

Whole data collected was analyzed through SPSS (V.16). The quantitative data was presented as mean with standard deviation and qualitative data as frequency with percentages in the form of tables.

RESULTS

During the study period total 600 cases were admitted in Eye Ward. Out of these 93 (15.5%) eyes suffered globe trauma and 26 (4.3%) with adnexal eye injuries. Unilateral injured cases were 79 (91.86%) and bilateral injured cases were 7 (8.14%) due to coalmine blast, stone blast and road traffic accident.

Among 93 eyes of globe trauma 73 (78.49%) were of males and 72 (77.42%) were presented in patients up to 30-years of age. The common causes of ocular trauma were occupational 35 (37.63%), play & sport injuries 24 (25.81%) and road traffic accident 19 (20.43%) as detailed in **Table I**.

Open globe trauma was present in 66 (70.97%) cases with pure corneal (zone I) involvement in 26 (39.4%), coneoscleral (zone II) in 24 (36.4%) and postsclera (zone III) in 16 (24.3%) eyes. Closed globe injuries were present in 27 (29.03%) cases with external globe (zone I) injury in 15 (55.6%), anterior segment including posterior lens capsule and pars plicata (zone II) in 10 (37%), and posterior segment past posterior lens capsule (zone III) in 2 (7.4%) eyes. Comorbidities in these cases are detailed in **Table II**.

At the time of admission visual acuity of 42 (45.2%) eyes was near blindness, whereas at the time of discharge 69 (74.2%) ha visual acuity <1/60, as detailed in **Table III**.

TABLE I: CAUSES OF OCULAR TRAUMA

Causes	No. of patients	Percentage
Occupational	35	37.63
Iron rod	8	08.60
Wooden piece	7	07.53
Grinder piece	4	04.30
Metal piece	4	04.30
Coal mine blast	3	03.23
Stone blast	3	03.23
Metal pin	2	02.15
Rubber pipe	2	02.15
Bull horn	1	01.08
Lime burn	1	01.08
Play and sports	24	25.80
Ball & cricket related	11	11.83
Stone throwing	5	05.38
Wooden stick	2	02.15
Dog bite	2	02.15
Fire cracker	2	02.15
Safety pin	2	02.15
Road traffic accident	19	20.43
Domestic	5	5.38
Knife	1	01.08
Cane opener	1	01.08
Iron nail	1	01.08
Scissors	1	01.08
Acid burn	1	01.08
Firearm	5	5.38
Assault & fighting	5	5.38
Total	93	100%

TABLE II: CO-MORBIDITIES AMONG OPEN AND CLOSE GLOBE TRAUMA

Co-morbidities	Open Globe Trauma	Close Globe Trauma
Cataract	25 (37.87%)	9 (33.33%)
Uveal tissue prolapsed	22 (33.33%)	0 (0%)
Hyphema	05 (7.57%)	9 (33.33%)
Vitreous hemorrhage	02 (3.03%)	0 (0%)
Intra-Ocular Foreign Body	06 (9.09%)	0 (0%)
Corneal foreign bodies	02 (3.03%)	2 (7.41%)
Chorioretinal damage	02 (3.03%)	1 (3.07%)
Glaucoma	02 (3.03%)	1 (3.07%)
Subluxation/ dislocation of lens	0 (0%)	2 (7.41%)
Blow out fracture	0 (0%)	1 (3.07%)
Retinal detachment	0 (0%)	2 (7.41%)

TABLE III: GRADING OF OCULAR TRAUMA BASED IN PRESENTING VISUAL ACUITY & VA ON DISCHARGE FROM HOSPITAL

VA-Visual Loss	Visual Acuity at admission	Visual Acuity at discharge
NPL-Complete Blindness	14 (15.05%)	14 (15.05%)
PL-CF at 1/2m-Near Blindness	42 (45.16%)	35 (37.6%)
1/60-5.5/60-Severe to Profound Visual Loss	13 (14%)	18 (19.35%)
6/30-6/18-Mild to Moderate Visual Loss	15 (16%)	16 (17.20%)
≥6/12	9 (9.7%)	10 (10.7%)

DISCUSSION

Ocular trauma is present in all societies but the nature varies according to environment and socioeconomic background.

In our study and other local & international OT studies, males were more exposed than females, (78.5% versus 21.5%). These figures are similar to that quoted by Baber TF⁶ 79.66%: 20.33% and 75.5%:24.5% by Abeba Bejiga⁵ and by Khan et al⁷, (84.7%: 15.3%), 4:1 by Strahlman⁸ and 86% by Monestam & Bjornstig⁹. It

is due to fact that males remain engaged in outdoor activities playing, driving, fighting and other laborious physical work; more prone to OT as well as general physical injuries.

The most vulnerable age group is <30 years (87.43%). This corresponds to 84% quoted by Shahwani MA¹⁰ and 75.5% by Abeba Bejiga⁵. Children <10 years suffered 22.6% and 11-30 years got 54.83%. Children <10yrs inflicted OT due to unsupervised games like cricket, stones & sticks throwing, firecrackers and playing with dogs. Age between 11-30 yrs is full of zeal and enthusiasm, full of activities. Young least bothered about preventive measures during playing, driving and during wheeling of motorbikes are more prone to general as well as OT.

After cataract, glaucoma and trachoma, OT and especially occupational OT is one of the leading cause of unilateral blindness and low vision in Pakistan.¹¹

In our study occupational trauma is the major cause of OT 37.63% followed by play & sport in 25.80%. This differs from Baber TF⁶ study where violence related OT is 37.37% & occupational is 24.4%. Fasih U¹¹ reported 72.00% occupational trauma in her study at Abbasi Shaheed Hospital Karachi. Differences in percentage are due to particular environment in which studies were done. Karachi is well industrialized as compared to Rawalpindi. Moreover, workers at small as well as large industries are not provided with good protective ocular goggles and facial helmets. Study at Peshawar reported violence; the common etiology might be due to traditional and environmental background and civil unrest due to Afghan war. A study carried out at Lahore, occupational OT was found to be 54% of all OT. The sufferer were mostly adult between 21-30 years old. Another study Victoria Eye Injury Surveillance System found that work related OT was 15% of all OT¹². This figure show remarkable difference in results from our study. This may be due to proper use of protective measures by worker during work in developed countries.

Play and sports were 25.80% & was the second frequent cause of OT in this study. This correlates with N.W.F.P. study by Khan et al⁷ in which 33.7% fell into accident at play. A study from India by Panda et al¹³ in which commonest cause of OT was attributed to sports and play. Cricket ball and stone throwing during playing were the common causes. Unattended children playing with dogs, with wooden sticks & with fire crackers were the next common etiologies. Use of protective facial guards and supervised games in children can prevent this visual loss significantly during play & sports.

Road traffic accidents were the third common factor (20.43%) in this study. Baber TF⁶ quoted 3.52% and Ali⁹ reported 7.46% road traffic accident cases. Higher

percentage in our study may be attributed to non use of seat belts, rash driving and young driver not observing the traffic's laws.

In our study open globe injuries contributed 70.96% that correspond with Soliman Mahmoud M¹⁵, hospital based, in Egypt that is 80.4% but percentage higher than Baber TF⁶ that is 46.18% and Khan⁷ et al, 61.64%. This is due to fact that closed injury like corneal foreign body conjunctival laceration and partial scleral found and photo-keratitis like cases were repaired on OPD bases and are not included in our study as compared to study by Baber TF⁶ where corneal and conjunctival laceration, odema, corneal foreign, conjunctival foreign body were included in study. Closed globe cases were 29.06%. Out of these 33.33% presented with cataract and 29.62% with hyphema those are comparable with local as well as international studies. Incidence reported by Baber TF⁶ 43% comprising of 6.33% cataract & hyphema 24.79%. Ali⁷ reported traumatic cataract 54% hyphema 36%. Soliman¹⁵ reported 33% hyphema. Modeled on the Apgar test, the OTS (ocular trauma scale) uses initial visual acuity and injury type to predict an outcome at the time of presentation. By using OTS system Dr. Kuhn¹⁶ can quickly, and with a high degree of accuracy predict to patients their chances for visual recovery.

In this study, presenting visual acuity in 93 patients (93 eyes) consisted of 14 (15.05%) presented with No Perception of Light, 42 (45.16%) with Counting Finger-Hand Movement (near blindness) at ½ meter, 13 (14%) with 1/60-5.5/60 (severe to profound visual loss), 15 (16.13%) with 6/30-6/15 (mild to moderate visual loss) and 9 (9.7%) with ≥6/12 (minimal visual loss).

This corresponds to Soliman¹⁵ findings i.e. presenting VA in 80% cases was less than 1/60 in 8% was between 1/60 to 6/60 (moderate) and in 15% was good in our study visual acuity on leaving the hospital, 49 (62.65%) eyes had VA of 1/60 (VA of 14 cases (15.05%) was No Perception of Light and in 35 (37.63%) was Counting Finger at 1/2 meter)¹, in 18 (19.35%) was 1/60-5.5/60, in 16 (17.20%) was 6/30-6/18 and 10 (10.75%) was =or> 6/12. In Soliman's study¹⁵ VA on leaving the hospital was as follows: 77.1% had <1/60, 3.9% had between 1/60-6/60 and 19% had 6/36. The comparison of this study and Soliman's study showed that poor initial VA correlates with poor final VA outcome.

The management of a patient's expectations in regard to their visual prognosis following severe OT is highly important. After sustaining a serious OT, the first question patients ask is whether they will lose some or all of their vision. Record of presenting initial VA and zone of OT is the answer.

Ocular trauma is a major cause of preventable monocular vision impairment throughout the world. So provision of full facial guards at places of work, at playground, wearing of seat belts during driving, obeying of traffic's rules and supervision of children during play can prevent eye injuries, the morbidity and economic losses associated with OT. Public awareness programs regarding prevention of OT should be launched through newspapers, radio, and T.V. and school health services.

CONCLUSION

Ocular trauma is a major public health problem. Majority of cases were male under the age of 30 years. Open globe injuries are more frequent. Occupational, play & sports and road traffic accidents are the major causes. Presenting initial visual acuity has its prognostic value in final visual outcome and an aid in counseling, treatment of eye injury patients and ability to direct attention towards resource needs and rehabilitation during the treatment process, may bring better outcome.

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