

# CHILDHOOD OCULAR TRAUMA

Sadia Sethi and Muhammad Daud Khan

*Khyber Institute of Ophthalmic Medical Sciences  
Hayatabad Medical Complex, Peshawar*

## SUMMARY

*It is a retrospective study covering a period of one year from January 2000 - December 2000. Objectives of the study were to: (1) To find out prevalence of Childhood ocular trauma in North West Frontier Province. (2) To identify the possible etiological risk factors. (3) To analyze sex distribution of ocular trauma. (4) To recommend measures to reduce the incidence and prevalence of ocular trauma. The files of all children admitted with serious eye injuries to Hayatabad Medical Complex at Peshawar during a period between January 2000 and December 2000 were obtained and studied. Out of a total of 958 ocular trauma patients admitted to Eye unit of Hayatabad Medical Complex, 470 children sustained eye injuries severe enough to necessitate hospital admission over a period of one year are included in this study. Child Ocular trauma accounted for 49% of the ocular trauma. It was bilateral in 1.1% patients. Only 38% of patients presented to the hospital within 24 hours. Males constituted 81% of patients and females only 19%. This gave a male to female ratio of 4.2:1. The most common cause of eye injury was sports followed by occupational activities. Open Globe eye injury was the most common type of trauma, affecting 64.3% eyes out of which 6.3% eyes also had retained intraocular foreign body. Infection occurred in 11% of patients.*

## INTRODUCTION

Ocular trauma is a leading cause of visual impairment and blindness in young adults and children. Eye injury is one of the most common causes of ophthalmic morbidity and monocular blindness in all parts of

the world.<sup>1</sup> Eye injuries have a significant impact on individual and society, in terms of sufferings, medical cost and loss of productivity.

Epidemiology of ocular trauma varies from country to country depending on its geographic location, level of education,



Fig. 1: Children suffering trauma at Eid due to toy pistols

socioeconomic development and availability of preventive and curative health infrastructure. Ocular injuries form almost 5-10% of Ophthalmic hospital admissions in non Industrialized area while in industrial community a figure of 39-42% has been quoted.<sup>2</sup> No age is immune to ocular trauma although few age groups show more predilections for eye injuries. There is a distinct male preponderance among ophthalmic casualties.<sup>3,4</sup>

## MATERIAL AND METHODS

The files of all patients admitted with eye injuries to Hayatabad Medical Complex all at Peshawar during a period between January 2000 and December 2000 were obtained and studied. Activity at the time of injury was classified as sports, occupation, Domestic, Bomb Blast, Fire arm injuries and Road traffic accidents. Those in



Fig. 2: Trauma occurring during sports.

whom the injury could have been due to a variety of activities or history was not clear were designated as unknown. In the final analysis only the most severe injury was recorded. For example if the patient suffered hyphaema and retinal detachment, only retinal detachment was recorded. Ocular trauma was classified into Open Globe injury and Closed Globe injury<sup>5</sup>. The examination of injured eye included slit lamp biomicroscopy, direct and indirect ophthalmoscopy, tonometry, a detailed evaluation under general anesthesia and x-ray of orbit. Better diagnostic methods (ultrasonography and computerized tomogram) and improved means of management (Viscoelastic material, Intraocular lenses, vitrectomy and Yag laser) were available and were used in the study (fig 1-3).

## RESULTS

Out of a total of 958 ocular trauma patients admitted to Eye unit of Hayatabad Medical Complex, 470 children sustained eye injuries severe enough to necessitate hospital admission over a period of one year are included in this study. Childhood Ocular trauma accounted for 49% of the Ophthalmic admission. Males constituted 81% of patients and females only 19%. This gave a male to female ratio of 4.2:1. It was bilateral in 1.1% of patients. Only 38% of patients presented to the hospital within 24 hours of occurrence of injury, 31% pre-



Fig. 3: Trauma occurring at work place.

## CHILDHOOD OCULAR TRAUMA OVER A PERIOD OF ONE YEAR IN N.W.F.P.

Percentage of Childhood Ocular Trauma  
in Eye Unit

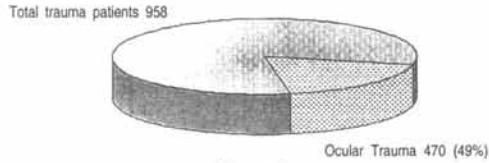


Fig. 4

sented in one week time, 12% presented within a month and 19% more than a month. The most common cause of eye injury was sports followed by occupational activities. Sports was responsible for 41% of Ocular trauma, occupation for 23%, domestic for 14%, bomb blast for 6%, fire arm injury for 8%, road traffic accidents for 3% and in 5% ocular trauma could not be attributed to any cause. Open Globe eye injury was the most common type of trauma, affecting 64.3% patients out of which 6.3% eyes also had retained intraocular foreign body. Closed Globe injury accounted for 35.65% of all eye injuries. In closed globe injuries cataract occurred in 19.6%, hyphaemas in 8.3%, chorioretinal and vitreous damage in 3.48%, glaucoma in 0.18%, proptosis in 0.11%, cranial nerve damage in 0.05%, blow out fracture in 0.06% and adnexal injuries in 3.69% of patients. Infection occurred in 11% of patients.

## CHILDHOOD OCULAR TRAUMA IN EYE UNIT

(Fig. 2) Causes of Eye Injuries

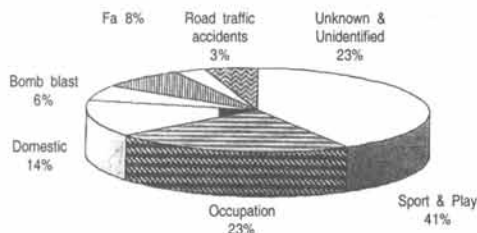


Fig. 5

## DISCUSSION

Out of a total of 958 ocular trauma patients admitted to Eye unit of Hayatabad Medical Complex, 470 children sustained eye injuries severe enough to necessitate hospital admission over a period of one year are included in this study. Childhood Ocular trauma accounted for 49% of the total ocular trauma (fig 4). In United States over 2.4 million eye injuries are said to occur annually. Estimated 288,000 patients with eye trauma are treated in the hospital based emergency rooms annually.<sup>5</sup> These are the figures for United States despite the fact that there is excessive use of protective measure in sports and domestic activities and wide spread public health education. In developing and underdeveloped countries, the situation is much worse because of the total lack of the above mentioned factors.<sup>3,4</sup> In this study male to female ratio of ocular injury was 4.2:1. This is supported by other surveys done in Europe and United State where average male to female ratio is 4.1.<sup>7,8,9</sup> This ratio is much lower to ratio of 5:1 and 8:1 quoted in series of Ali Imtiaz<sup>10</sup> and Khan M.D-et al<sup>11</sup> in Pakistan. This male preponderance is mainly because of injuries occurring at work. Moreover in our culture the females live in relatively more sheltered environment and are thus protected from many hazards to which male counter parts are exposed. Children show more predilections for ocular trauma because they engage in aggressive games and because of lack of supervision by elders especially in lower middle class families. More over in our country toys are manufactured and sold without proper legislation. The fact that trauma preferentially affects children and young adults has serious education, social, and economic consequences for the individual, family and country. Sport injury accounted for 41% of ocular trauma (fig 5). Most of the injuries were caused by stones, mudball, golidanda, toy pistols, firecracker

and sport ball. These findings are similar to other hospital-based surveys in Pakistan. One recent and dreadful type of injury occurring in Pakistan is caused by disposable syringes. These syringes are ineffectively disposed off after their use, are picked up by young children to squirt water at each other and during the process inadvertently insert the needles in either their own or their play mates eye.<sup>13</sup> In one series in United States although sports related activities were responsible for only 34% of all eye injuries, they accounted for 60% of hyphaemas and 10% of ruptured globes.<sup>14</sup> Occupational injury occurred in 23% of patients. The magnitude of industrial injuries varies greatly with level of industrial development of the region and the use of protective devices. National institute of occupational safety and health estimated 900,000 on job injuries in 1982 in USA.<sup>15</sup> In 1923 Garrows reported that occupational injuries accounted for 70% of all eye injuries.<sup>1</sup> Domestic trauma was responsible for 14% of the admission. This can be compared with other studies where domestic trauma accounted for 7-38% of ocular trauma,<sup>3,8,9,10,11,15</sup> In this study road traffic accidents accounted for 3% of ocular trauma. In majority of cases of road traffic accidents the actual damage is inflicted by fragments of glasses from a windscreen shattered by impact of the head of the victim. Frequently the victim is the front seat passenger, whose eye / eyes are severely damaged leading to unilateral or bilateral open globe injuries. Many workers reported more than 50% reduction in incidence of penetrating ocular trauma following compulsory use of seat belts, protective air bags and seat belts<sup>16</sup>. Fire arm injuries (8%) and bomb blast (6%) injuries accounted for 14% of ocular trauma. Most of these were victims of Afghan war, and most of the bilateral injuries occurred in these cases. Ocular trauma from violent behavior accounts for considerable portion of ocular injuries. Assault related injuries

have a worse prognosis compared to injuries from other causes. Dannenberg et al reported that 74% of assault related eye injury victims compared to 43% of occupational injury victims had a visual acuity of hand movements or worse on initial examination.<sup>17</sup>

In this study, infection of some kind occurred in 11% of the cases. Traumatic ocular injuries frequently occur with dirty objects that harbour bacteria or fungi. Viable organisms may be introduced with penetrating ocular injury, even if minute and are self-healing. Endophthalmitis complicates 2-7% of all penetrating ocular injuries in developed world<sup>18</sup> and 3-7% with retained intraocular foreign bodies.<sup>19</sup>

## CONCLUSIONS

The Conclusions that we can draw from this study are :

Childhood Ocular Trauma was common in North West Frontier Province accounting for 49% of the total Ocular trauma. It was unilateral in 98.9% of patients. It was more in males than in females with a ratio of 4.2:1. Only 38% of patients presented within 24 hours. Sports was the most commonest cause accounting for 41% of the Ocular trauma. Infection was present in 11% of the patients. Open globe injuries accounted for 64.35% within the group intraocular foreign bodies were present in 6.3% of patient.

## RECOMMENDATIONS

Trauma in developing countries is a major public health hazard. The mainstay in the management of Ocular trauma therefore lies in its prophylaxis. This can be achieved through the following ways:-

The national magnitude of the problem should be determined. Public awareness should be created through public health

education about hazards of dangerous toy pistols, firecrackers. Special attention should be given to proper disposal of disposable syringes after use. The Ophthalmological Society of Pakistan (OSP) should establish TRAUMA INTEREST GROUP (TIG) to do advocacy so that Government authorities should enforce mandatory laws in: Compulsory usage of protective eye wear in sports, industry and during war. Compulsory usage of seat belts in transportation vehicles. Certain dangerous games and toys should be banned or modified to make them safe. Ocular trauma Centers should be established in different parts. They should not only provide excellent management but also should conduct research into etiology, mechanism effects and prophylaxis of ocular trauma. A legislation is required to curb the unlawful blasting of rock in hilly areas.

## REFERENCES

1. Roper Hall MJ. Prevention of Blindness from trauma. *Trans Ophthalmol* 1978; 314.
2. D Stegmann. Treatment of Anterior Segment Ocular trauma. *Montreal Medicopia* 1986; 7.
3. Khan Muhammad Daud, Muhammad Shad, Islam Zafar ul and Khattak Naem. An 11 1/2 year review of Ocular trauma in North West Frontier Province of Pakistan. *Pak J Oph* 1991; 15.
4. A Panda I, M Bhatia and Y Dayal. Ocular Injuries a socioeconomic importance. *Afro Asian J Oph* 1985; 170.
5. Frenc Kuhn, Robert Morris, Douglas. A standardized classification of Occular trauma *Oph J* 1996; 240.
6. Feist RM, Farber. Ocular trauma epidemiology *Arch Oph* 1989; 503.
7. Bruce M, Zagelbaum MD, lean-R. Urban Eye Trauma, a one year prospective study, *Oph* 1993; 851.
8. Peter E Ligget, Keith J Prince. Ocular trauma in Urban population. *Oph* 1990; 581.
9. Caroline J. Macewen. Eye Injuries a perspective survey of 5671 cases. *Br J Oph* 1989; 888.
10. Ali Imtiaz Syed. The Anterior Segment trauma. *Pak J Oph* 1993; 35.
11. Khan Muhammad Daud, Naimatullah Kundi, Zia Muhammad, Eye Injuries in North West frontier Province. *Pak J* 1998; 5.
12. Khan Muhammad Daud, Ul Islam Zia, Nawaz Khalid, Ul Islam Zafar , Khan Aman. Perforating Eye Injuries by Disposable Syringes. *Pak J Oph* 1990; 97.
13. Waryne I, Larrison. Sport Injuries in Albert and Jakobiec. *Principles and Practice of Ophthalmology* 1994; 3494.
14. Oliver D Schein and Paul . *Epidemiology and Prevention of ocular injures. Principles and Practice of Ophthalmology* 1994; 3498.
15. G Went. A 10 year survey of penetrating eye injuries 1976-95 *Br J Oph* 1988; 607.
16. Hall NF, Denning AM. The eye and seat belt in Wessex. *British J Oph* 1985; 69: 317.
17. Dennenberg AL, Parver LM. Penetrating eye injuries related to assault. *Arch Oph* 1992; 849.
18. Christopher T, West fall, John W Shoe. The role of ophthalmologist in Trauma setting. *Albert and Jackobiec* 1994; 3359.
19. Khan Mushammad Daud, Naimatullah Kundi, Zia Muhammad, Aneesha Fatima Nazir. A 6-1/2 year survey of intraocular and intraorbital foreign bodies in the North West Frontier Province of Pakistan. *Br J Oph* 1987; 716.