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Original Article

Pattern of ocular injuries in stone pelters in Kashmir valley

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Abstract

Purpose: To describe the pattern and types of ocular injuries in stone pelters in Kashmir valley during recent turmoil.
Design: Cross sectional study.
Methods: Sixty patients with different types of eye injuries were assessed between June–September 2010 and initial visual acuity was recorded. The injuries were classified according to Systems for Classifying Ocular Injuries (OTCS) and Ocular Trauma Score (OTS) was calculated in order to estimate the probability of follow-up visual acuity range.
Results: Most of the victims (75%) were young boys between 16–26 years with a mean age of 20.95, 95% of cases were males. The main cause of injury was stones (48.3%) and pellets (30%) besides rubber bullets, sling shots and tear gas shells.
Most of the open-globe injuries due to stones were of Type B and A, Grade E, Zone II and III with Afferent Pupillary Defect (APD) in 30% of the cases. Closed-globe injuries were mostly of Type A, Grade C and D and Zone II and III.
Most of the open-globe injuries due to pellets were of Type D, Grade D, Zone II and APD in 33.3%. Pellets Intra Ocular Foreign Body (IOFB) was in 41.6%. Most of the closed-globe injuries were of Type A, Grade D and E and of Zone III.
Overall OTS of 1 was calculated in 16.6% and 3 in 53.3% of the cases.
Conclusion: In stone pelting demonstrations eye injuries can result in visually significant trauma. Injuries due to pellets are mostly perforating and pellet IOFB, and both tend to have a very poor prognosis. OTS can be used to estimate visual prognosis.

Keywords: Trauma, Eye (Globe), Retina, Treatment Surgery, Vision

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Introduction

Ocular injuries pose a significant global health problem. It has been recognized that ocular trauma is a leading cause of mono ocular blindness. Annual incidence of ocular trauma is 55 million, of which 750,000 require hospitalization, including some 200,000 open globe injuries.[1] The pattern of ocular injuries varies from area to area depending upon the activities of people residing in a particular area.[2]

Kashmir valley has been hit by a violent upsurge of civil unrest for the last four months which has resulted in death of more than 110 people and injured more than 200 civilians and there has been a significant rise in the frequency of eye injuries as well due to the present turmoil, causing concern to Ophthalmologists

The Ophthalmology Dept. of Govt. Medical College Srinagar, which is the apex centre of Ophthalmology in the valley has received many patients with eye injuries during this period, a large number of which have been caused by stones and pellet guns. We report the pattern of eye injuries in 60 cases, who were referred to our Department of Ophthalmology, Govt. Medical College Srinagar, between 11th June 2010 to September 2010.

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☆ The study was not registered with the institutional review board and no approval from the ethics committee of the institution was required. However, we certify that the study strictly adhered to the tenets of the Declaration of Helsinki for medical research involving human subjects, including research on identifiable human material and data.

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Patients and methods

60 patients who received different types of eye injuries were assessed and admitted in the hospital and managed accordingly. Patients were assessed and initial visual acuity was recorded. Injuries were classified according to BETT[3] and Systems for classifying ocular Injuries.[4,5] Ocular Trauma Score (OTS) was calculated in order to estimate the probability of follow up visual acuity range. We present the causes, pattern of eye injuries, initial visual acuity and the Ocular Trauma Score (OTS).[6]

The study strictly adhered to the tenets of the Declaration of Helsinki for medical research involving human subjects, including research on identifiable human material and data.

Results

Age distribution

Most of the victims, 75%, were young boys of school and college going age (16–26 years), who were pelting stones at security forces and got injured. Some of them were involved accidentally while going to and coming back from schools. The mean age was 20.95 years (Table 1).

Sex distribution

Overwhelming majority of the victims were males, there were only three females who got injured accidentally (Table 2).

Causes of injury

Majority of injuries were caused by stone pelting (48.33%). Next common cause was due to pellets fired from pellet guns (30%). There were 5 cases due to rubber bullets, 6 cases due to marbles fired from slings and from gas shells (Table 3).

Initial visual acuity and ocular trauma score (OTS)

The initial visual acuity was found to be between LP to HM in majority of about 43.3%, followed by 1/200 to 19/200 in 26.6%. NLP was found in 18.3% and ⩾20/40 in only 6.6% of cases (Table 4).

OTS score was calculated. Most of the patients, 53.3% had OTS of 3, followed by OTS of 2 in 18.3%, followed by OTS of 1 in 16.6%. OTS score of 4 was found in 1.6% of cases and OTS of 5 in about 10% of cases (Table 5).

Classification of injuries

Most of the injuries i.e. 60% were of closed globe type and 40% were of open globe injuries. Stones were the leading cause of injury in closed globe type (52.7%), while pellets were the leading cause of open globe injuries (50%) (Table 6).

Most of the Open Globe Injuries due to stones were of Type B (50%) and Type A (40%), Grade E (50%), Zones II & III (40%), each with APD in 30% of the cases. Most of the Open Globe Injuries due to pellets were of Type D (50%), Grade D (58%), Zone II (42%) and APD in 33.3%. 41.6% of the cases were of pellet Intra Ocular Foreign Body (IOFB). Open Globe injuries due to rubber bullets were of Type E – 100%, Grade E – 100%, and Zones II and III – 50% each and APD present in all cases (Table 7). An X-Ray (Fig. 1) and a CT Scan (Fig. 2) show Intra Ocular Pellets.

Most of the Closed Globe injuries due to Stones were of Type A (79%), Grade C & D (42%) and Zone III (58%) with APD present in 10% of cases. Most of the Closed Globe injuries due to Pellets were of Type A (83%), Grade D (33%), and Zone III (50%) with APD present in 16.6% of cases. The Closed Globe injuries due to rubber bullets were of Type A – 100%, Grade D – 66.6%, and Zones III – 100% and APD present in 33.3% cases. Both Sling shots and Tear Gas caused closed globe injuries with most of them being Type A, Grade D, Zone III (Table 8).

Table 1. Age distribution.

	5–15 years	16–26 years	27 years and above
Number of cases	6 (10%)	45 (75%)	9 (15%)

Table 2. Sex distribution.

Gender	Number	Percentage
Males	57	95
Females	3	5

Table 3. Causes of injury.

	Stones	Pellets	Rubber bullets	Sling shots (marbles)	Tear gas
No. of cases	29 (48.33%)	18 (30%)	5 (8.33%)	6 (10%)	2 (3.33%)

Table 4. Initial visual acuity.

N L P	11	18.33%
LP to HM	26	43.33%
1/200 to 19/200	16	26.66%
20/200 to 20/50	3	5%
⩾20/40	4	6.66%

Table 5. Ocular trauma score.

OTS	No. of patients	Percentage
1	10	16.66
2	11	18.33
3	32	53.33
4	1	1.66
5	6	10

Table 6. Classification of Injuries.

	Stones	Pellets	Slings	Rubber bullets	Tear gas	Total
Open globe	10	12	–	2	–	24 (40%)
Closed globe	19	6	6	3	2	36 (60%)

Table 7. Open globe injuries.

Open globe injuries	Due to stones		Due to pellets		Due to rubber bullets	
	Number	Percent	Number	Percent	Number	Percent
Type of injury						
A. Rupture	4	40	3	25	–	–
B. Penetrating	5	50	3	25	–	–
C. Intraocular Foreign Body	0	0	5	41.6	–	–
D. Perforating	0	0	6	50	–	–
E. Combined	1	10	–		2	100
Grade of injury (Visual acuity)						
A. ⩾ 20/40	0	0	–	–	–	–
B. 20/50–20/100	1	10	–	–	–	–
C. 19/100 – 5/200	2	20	3	25	–	–
D. 4/200 – L P	2	20	7	58.3	–	
E. NLP	5	50	2	16.7	2	100
Zone of injury						
I. Cornea	2	20	4	33.4	–	
II. Limbus to 5 mm posterior into sclera	4	40	5	41.6	1	50
III. Posterior to 5 mm from Limbus	4	40	3	25	1	50
Relative afferent pupillary defect						
A^{+ve}	3	30	4	33.4	2	100
B^{-ve}	7	70	8	66.6	–	–

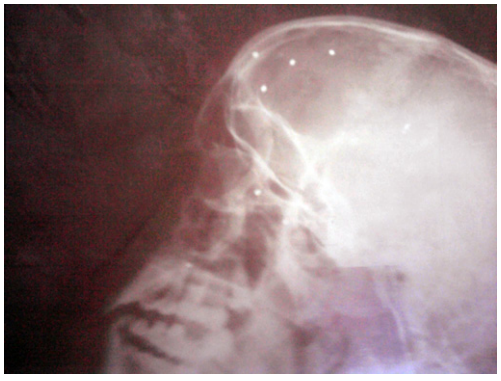

Figure 1. X-ray showing Intra ocular pellets.

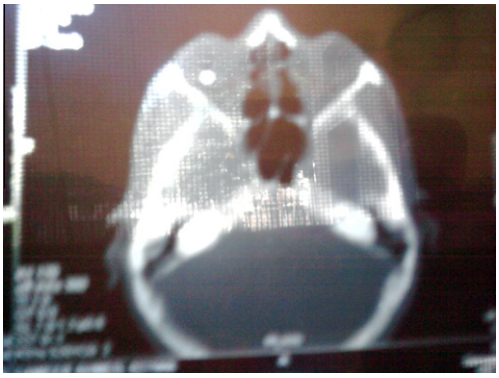

Figure 2. CT Scan showing Intra Ocular pellets.

Discussion

The causes of ocular trauma have changed continuously over the course of this century. Almost 100 years ago more than 70% of all serious injuries occurred in work places.[7] With heavy industry and no knowledge of protective devices, industrial accidents were common. In Kashmir there being hardly any heavy industries, the causes of eye injury are entirely different.[8] Kashmir valley has witnessed an unprecedented increase in violent demonstrations in the summer of 2010. The eye injuries resulting from violence are increasing in both civilians and wartime settings in recent years.[9,10] There were 60 patients who sustained eye injuries. Most of the patients (75%) were young adults between the ages of 16–26 years. The eye injury has been mostly reported in young adults in many studies.[9,11–13]

The age distribution in the present study is seen mostly in young adults as is expected, as the stone pelting has been seen to involve young adults in the present turmoil. Overwhelming majority of the patients were males (95%) versus females (5%) as is expected, the stone pelters are only males. The three female patients who suffered eye injury were involved accidentally. This is consistent with previously reported series of ocular trauma.[9,12,13]

Majority of the patients who suffered eye injury had the trauma due to stone pelting (48.33%). Stone pelting has gained importance in recent turmoil as the agitators were using only stones as a form of weapon as against guns which were in use some years back. This pattern of stone pelting is similar to that in the study reported by Elder in Palestine.[14] The other causes of eye injury were due to Pellets (30%), rubber bullets (8.33%) and sling shots (10%).

In our study the most common cause of injuries was stones (%) which were mostly Closed Globe involving higher zones and are more likely to result in visually significant trauma[14] and most of the Open Globe Injuries were also posterior, thus portending a worse outcome.[14] Next common cause of injuries was pellets which caused mostly perforating injuries and pellet IOFB, and both tend to have a very poor prognosis.[14] All other injuries due to pellets, rubber bullets, tear gas shells and marbles were mostly closed globe injuries involving higher zones. The para-military force and the police use Rubber Bullets to control the violent mob. However, rubber bullets can cause severe damage to the victims. There have been few deaths also due to rubber bullets.

OTS was found to be three in majority which translates into final VA of >20/40 in only 44% patients and in-fact we

Table 8. Closed globe injuries.

Closed globe injuries	Due to stones		Due to pellets		Due to rubber bullets	
	Number	Percent	Number	Percent	Number	Percent
Type of injury						
A. Contusion	15	78.94	5	83.3	3	100
B. Lamellar laceration	1	5.26	–	–	–	–
C. Superficial foreign body	0	0	–	–	–	–
D. Mixed	3	15.78	1	16.7	–	–
Grade of injury (Visual acuity)						
A. $\geqslant$ 20/40	3	15.78	1	16.6	–	–
B. 20/50–20/100	0	0	1	16.6	–	–
C. 19 /100 – 5/200	8	42.1	1	16.6	1	33.3
D. 4/200 – L P	8	42.1	2	33.4	2	66.7
E. NLP	0	0	1	16.6	–	–
Zone of injury						
I. External	3	15.78	1	16.6	–	–
II. Anterior Segment	5	26.31	2	33.4	–	–
III. Posterior Segment	11	57.89	3	50	3	100
Relative afferent pupillary defect						
A^{+ve}	2	10.52	1	16.6	1	33.3
B^{-ve}	17	89.47	5	83.4	2	66.7

even had patients with an OTS score of 1 in about 16% patients which translates to a final visual acuity of >20/40 in only 1%.[12] This indicates that most of the injuries sustained by people during the turmoil were significantly visually disabling.

Conclusion

- During any public demonstration, even with supposedly harmless forms of protests like stone pelting, eye injuries can result in visually significant trauma. Injuries due to pellets are mostly perforating and pellet IOFB, and both tend to have a very poor prognosis. OTS can be used to estimate the visual prognosis.
- Controlling violent mobs is a risky job, while it may restrict violence to some extent, at the same time it can cause serious damage to vital organs.
- Given the seriousness of the damages caused by the methods used during such demonstrations, use of less lethal weapons by both mobs as well as combating forces, becomes imperative.

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Proprietary interest

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