RESEARCH ARTICLE

Visual outcome and its prognostic factors in patients presenting with ocular war injuries at an army hospital in Pakistan

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Abstract

Objective: To determine the visual outcome and its prognostic factors in patients presenting with ocular war injuries.

Methods: This descriptive, observational study was conducted at the Combined Military Hospital, Peshawar, Pakistan, from June 2012 to March 2016, and comprised soldiers with ocular war injuries. Informed consent was obtained from all participants. A predesigned proforma was used to record patient's demographic details along with the cause, side, type and severity of injury. Injuries were classified as open globe or closed globe injuries. Ocular trauma score grade was used to describe the severity of injury.

Results: There were 210 participants with an overall mean age of 29.34±5.35 years (range: 20-43 years). All of them were male. Left side was more frequently involved, i.e. in 126(60%) cases. The most frequent underlying cause was improvised explosive device blast injury 114(54.3%), followed by blunt trauma 42(20%) and road traffic accidents 24(11.4%). Closed globe injuries were more frequent and were recorded in 120(57.1%) patients. The visual outcome was good in 62(29.5%) patients, followed by fair in 51(24.3%) patients while 51(24.3%) patients had worst visual outcome. When stratified, there was no significant difference of worst visual outcome with patient's age (p=0.279). However, improvised explosive device blast (p=0.002), open globe injury (p=0.000), ocular trauma score grade 1; open globe (p=0.049), closed globe (p=0.003) were associated with significantly higher frequency of worst visual outcome. Zone-III injury was also prognostic of worst visual outcome, but the difference was significant only in case of open globe injury (p=0.003).

Conclusion: Improvised explosive device blast, open globe injury and ocular trauma score grade 1 were poor prognostic features and resulted in significantly higher frequency of poor visual outcome.

Keywords: Ocular war injuries, Visual outcome, Prognostic factors. (JPMA 67: 1853; 2017)

Introduction

Complete loss or impairment of vision is the most feared disability because vision is considered to be the most valuable sense.[1,2] Not only a serious public health concern, blindness also affects the economic and social wellbeing of an individual.[1-3] Perceptions about blindness result in public rejection of the blind who has limited opportunities left for education, employment and social life with worthlessness feeling and gradual decline in self-esteem.[1] Blindness also puts economic burden on the society. The estimated global economic loss from blindness in the year 2000 was $19 billion which is expected to rise to $50 billion in 2020. The estimated global economic loss from combined blindness and visual impairment in the year 2000 was $42 billion which is expected to rise to $110 billion in 2020.[3,4]

Saving the vision is therefore the primary aim of management of patients with ocular trauma, which requires emergency and timely treatment with regular follow-up so that blindness with associated shortcomings could be avoided.[5] Management of ocular war injuries is complicated and requires multiple specialised vitreo-retinal and oculo-plastic procedures along with management of associated injuries.[5,6] Knowing the factors which are associated with poor visual outcome in such patients could further add to this management process so that more vigilant and energetic approach can save as much vision as possible.[7]

The present study was planned to analyse patients with ocular war injuries in an attempt to highlight the magnitude of the problem, the visual outcome and its prognostic factors among such patients.

Patients and Methods

This descriptive, observational study was conducted at the Department of Ophthalmology, Combined Military Hospital, Peshawar, Pakistan, from June 2012 to March 2016, and comprised patients with ocular war injuries. Soldiers who presented with ocular war injuries were included for analysis after taking written informed

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consent. Patients who were dead on arrival or those who expired within 24 hours of presentation where examination could not be completed were excluded from this study. A predesigned proforma was used to record patient's demographic details along with the cause, side, type and severity of the injury. Injuries were classified as open globe or closed globe injuries. Ocular trauma score (OTS) grade was calculated to describe the severity of injury. Mean along with standard deviation (SD) of age was calculated amongst all cases and the different variables were analysed by chi-square test to determine the p-value. P<0.05 was considered significant. All the patients were assessed and managed by a single consultant ophthalmologist to eliminate bias.

Results

Of the 210 participants, 156(74.3%) were aged between 20-31 years. All of them were males. The overall mean age was 29.34±5.35 years (range: 20-43 years). Left side was more frequently involved 126(60%). The most frequent underlying cause was improvised explosive device (IED) blast injury 114(54.3%) followed by blunt trauma 42(20.0%) and road traffic accident (RTA) 24(11.4%). Closed globe injuries were more frequent and were recorded in 120(57.1%) patients (Table-1).

The visual outcome was good in 62(29.5%) patients followed by fair in 51(24.3%) patients (Table-2). Besides, 51(24.3%) patients had worst visual outcome (Table-3).

Table-1: Demographic features of study participants.

Characteristic	Study Participant (n=210)
Age years	29.34±5.35
Age Groups	
◆ 20-31 years	156 (74.3%)
◆ 32-43 years	54 (25.7%)
Gender	
◆ Male	210 (100.0%)
◆ Female	-
Side	
◆ Right	84 (40.0%)
◆ Left	126 (60.0%)
Cause of Injury	
◆ IED Blast	114 (54.3%)
◆ RTA	24 (11.4%)
◆ Blunt Trauma	42 (20.0%)
◆ Splinter	18 (8.6%)
◆ GSW	12 (5.7%)
Type of Injury	
◆ Open Globe	90 (42.9%)
◆ Closed Globe	120 (57.1%)

IED: Improvised explosive device
GSW: Gunshot wound
RTA: Road traffic accident.

Table-2: Visual Outcome for Ocular Trauma.

Visual Outcome of Ocular Trauma	Frequency n(%)
Good >/= 6/12	62 (29.5%)
Fair 6/60-6/18	51 (24.3%)
Poor CF- <6/60	46 (21.9%)
Worst< PL, PR	51 (24.3%)

CF: Counting finger
PL: Perception of light
PR: Projection of rays.

Table-3: Visual outcome for ocular trauma across cause.

Cause	Outcome				Total	P value
	Good	Fair	Poor	Worst		
IED	20	24	32	38	114	0.002
	17.5%	21.1%	28.1%	33.3%	100.0%	
RTA	8	6	5	5	24	
	33.3%	25.0%	20.8%	20.8%	100.0%	
Blunt Trauma	20	12	5	5	42	
	47.6%	28.6%	11.9%	11.9%	100.0%	
Splinter	9	6	3	0	18	
	50.0%	33.3%	16.7%	.0%	100.0%	
GSW	5	3	1	3	12	
	41.7%	25.0%	8.3%	25.0%	100.0%	
Total	62	51	46	51	210	
	29.5%	24.3%	21.9%	24.3%	100.0%	

IED: Improvised explosive device
GSW: Gunshot wound
RTA: Road traffic accident.

Table-4: Visual outcome for ocular trauma across type of injury.

Cause	Outcome				Total	P value
	Good	Fair	Poor	Worst		
Open Globe	19	12	23	36	90	0.000
	21.1%	13.3%	25.6%	40.0%	100.0%	
Closed Globe	43	39	23	15	120	
	35.8%	32.5%	19.2%	12.5%	100.0%	
Total	62	51	46	51	210	
	29.5%	24.3%	21.9%	24.3%	100.0%	

When stratified, there was no significant difference of worst visual outcome with patient's age (p=0.279). However, IED blast 70(33.3%) (p=0.002), open globe injury 84(40%) (p=0.000), OTS grade 1; open globe 109(51.9%) (p=0.068), closed globe 88(41.7%) (p=0.003) were associated with significantly higher frequency of worst visual outcome. Zone-III injury was also prognostic of worst visual outcome, but the difference was significant only in case of open globe injury 122(58.3%) p=0.003) (Table-4, 5).

Table-5: Visual outcome for ocular trauma across zone of injury.

Type	Zone of Injury	Outcome				Total	P value
		Good	Fair	Poor	Worst		
Open Globe	I	10	3	5	0	18	0.000
		55.6%	16.7%	27.8%	.0%	100.0%	
	II	6	7	8	15	36	
		16.7%	19.4%	22.2%	41.7%	100.0%	
	III	3	2	10	21	36	
		8.3%	5.6%	27.8%	58.3%	100.0%	
	Total	19	12	23	36	90	
		21.1%	13.3%	25.6%	40.0%	100.0%	
Close Globe	I	33	30	13	8	84	0.111
		39.3%	35.7%	15.5%	9.5%	100.0%	
	II	6	8	7	3	24	
		25.0%	33.3%	29.2%	12.5%	100.0%	
	III	4	1	3	4	12	
		33.3%	8.3%	25.0%	33.3%	100.0%	
	Total	43	39	23	15	120	
		35.8%	32.5%	19.2%	12.5%	100.0%	

Discussion

The mean age of the patients in our study was 29.34±5.35 years and IED blast injury (54.3%) was the most frequent cause. Closed globe injuries were more frequent and were recorded in 120 (57.1%) patients. The visual outcome was good in 62(29.5%), fair in 51(24.3%) patients and worst in 51 (24.3%). In another local study, Alam et al. reported the mean age of 23.43±10.67 years with open globe injuries being more frequent (62.03%) among blast victims. They also reported similar visual outcome of patients; good (31.48%), fair (12.03%), poor (19.43%) and worst (37.03%).[8] Islam et al.[9] also reported IED blast to be the most frequent cause of combat ocular injury and observed it in 42.5% patients. But similar to the study by Alam et al. they also observed open globe injuries being the most frequent (69.23%). Nadeem et al. reported good visual outcome in 44.58% and worst visual outcome in 30.12% patients.[10,11] In our study, IED blast, open globe injury and OTS grade 1 were associated with significantly higher frequency of worse visual outcome. In case of open globe injury, zone-III injury was a poor prognostic factor of visual outcome. Agrawal et al.[7] in a similar study also reported zone-III injury (odds ratio [OR]=-0.828, p=0.048) to be prognostic of worse visual outcome in patients presenting with open globe injuries. Similar association of zone of injury with visual outcome has been reported by Meng et al.[13] (OR=2.71, p=0.023).[12] Knyazer et al. observed low OTS score upon admission and a zone III injury as prognostic of worst visual outcome.[14]

The results of the present study are in line with the previously published material in this regard. However, all the above-reviewed studies addressing prognostic factors of visual outcome have been done in patients with open globe injuries while the present study is first to discuss both the open globe and closed globe injuries along with the associated visual outcome and prognostic factors. Depending upon the observation made in the present study, it is advocated that patients presenting with IED blast, open globe, zone-III injury and OTS grade 1 at presentation should be suspected of poor visual outcome and meticulous care should be provided to save as much vision as possible to minimise the social and economic effects of blindness. The major limitation of our study was lack of long-term follow-up beyond six months. This aspect may need to be addressed in further studies on the topic with prolonged follow-up.

Conclusion

IED blast, open globe injury and OTS grade 1 were poor prognostic features and resulted in significantly higher frequency of adverse visual outcome. In addition, in case of open globe injury, zone-III injury was an additional poor prognostic factor.

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Conflict of Interest: None.

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