

# Bear Inflicted Ocular Injury its Prevalence and Visual Prognosis in Tribal Area of Jharkhand

Shiril Sandeep Sawaiyan<sup>1</sup>, Sarojini Murmu<sup>2</sup>, Marianus Deepak Lakra<sup>3</sup>, Taruni Kumari<sup>4</sup>, Shazia Tabassum<sup>5</sup>, Shilpa Hembrom<sup>6</sup>

## ABSTRACT

**Introduction:** Deforestation has forced animals to wander from core of the forests towards the border of forests. The study aims to understand the prevalence and visual prognosis in bear inflicted ocular injury in tribal area of Jharkhand.

**Material and Methods:** A prospective, observational, hospital based, interventional study was done between October 2019 to February 2020. Study was done on 23 patients attending eye OPD and emergency including all age groups with a recent history of Bear bite injuries. Age, gender, and severity of the eye injuries were noted. An exhaustive history in respect to attack site, activity and any primary treatment taken by the victim were recorded.

**Results:** 23 cases of bear bite victim were studied. Out of 23 victims 19 were male (82.6%) and 4 were female (17.4%). The age group 14 years to 56 years was most affected. Out of 23 patients, 1 case was found with adnexal tissue loss and 22(95.65%) patients had an open globe injury in one eye. Final corrected visual acuity at 4 months in 20 patients was PL +ve, 13 patients had no PL, 1 patient had vision better than 6/36, 7 Patients had vision between F.C 3 meters to 6/60, and 5 patients had vision between F.C. 2meters to hand movement.

**Conclusion:** A better understanding of the nature, severity and prognosis of Bear inflicted ocular and adnexal injury will help develop effective prevention approaches to reduce their occurrences in the future.

**Keywords:** Bear Bite, Open Globe Injury

## INTRODUCTION

Human wildlife conflict occurs when the needs and behavior of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife.<sup>1</sup> Deforestation has forced animals to wander from core of the forests towards the borders of forest. Of the 49 per cent rural poor population in Jharkhand, 75 per cent live either inside or on the periphery of the forests in Jharkhand.<sup>2</sup> The very close habitation of population nearby forest has given rise to frequent encounters between human and animal, in particular bear thus making the people vulnerable to bear attack. Bear typically charge on all fours with their head held low, before rearing on their hind legs and striking at their attackers with their claws and teeth causing different patterns of injury on any part of the body, the most affected parts being face and neck.<sup>3</sup> Injury could range from minor soft tissue injury to deep laceration, in some cases bony fracture and organ injuries.

The study was started with an aim to study the incidence, clinical picture, and visual prognosis in ocular and adnexal

injury in bear bite.

## MATERIAL AND METHODS

This is a clinical prospective, observational, hospital based, and interventional study done between October 2019 to February 2020 at a tertiary eye care centre. This study is strictly in line with declaration of Helsinki and is approved by Institutional ethical committee of institute. Written informed consent was taken from patients and in case of minor from their attendant.

Study was done on 23 patients who attended eye OPD and emergency and tenure of study ranged from October 2019 to February 2020. The study included all age group of patients with a recent history of Bear bite injuries. The patients were segregated based on age, gender, and severity of the eye injuries. An exhaustive history in respect to attack site and activity of the victim was also taken into record. Any primary treatment taken by the patient were also taken into consideration. The injuries were classified according to BETTS (Birmingham Eye Trauma Terminology). A detailed clinical examination was done of the reported injuries and an immediate first aid was given. The wounds were firstly cleaned with normal saline and betadine and the devitalised tissue if any, were debrided. Patients were put on follow up for 4 months to monitor the extent of damage caused over prolonged period. Corneoscleral tear was repaired with 10-0 ethilon suture. All the cases of vitreous haemorrhage and hyphema were treated conservatively and followed up every month, in 4 cases of hyphema anterior chamber wash was done, and in 3 cases of vitreous haemorrhage vitrectomy was done since it doesn't resolve on its own. Iridodialysis and dislocated lens was later corrected surgically. During follow

<sup>1</sup>Junior Resident, Department of Ophthalmology, RIO, RIMS, Ranchi, Jharkhand, <sup>2</sup>Senior Resident, Department of Ophthalmology, RIO, RIMS, Ranchi, Jharkhand, <sup>3</sup>Associate Professor, Department of Ophthalmology, RIO, RIMS, Ranchi, Jharkhand, <sup>4</sup>Junior Resident, Department of Ophthalmology, RIO, RIMS, Ranchi, Jharkhand, <sup>5</sup>Junior Resident, Department of Ophthalmology, RIO, RIMS, Ranchi, Jharkhand, <sup>6</sup>Junior Resident, Department of Ophthalmology, RIO, RIMS, Ranchi, Jharkhand, India

**Corresponding author:** Sarojini Murmu, C block, Afzal Residency, Joda talab road, Bariatu, Ranchi, Jharkhand, 834009, India

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up, post traumatic complications in patients, additional management to the injuries and visual acuity at the time of injury and final visual acuity after surgery was also studied.

## RESULTS

In the present study 23 cases of bear bite victim were taken into account. Most of our victims were male. Out of 23 victims 19 were male (82.6%) and 4 were female (17.4%). The age group of bear encounter ranged between pediatric age group to middle age i.e., from 14 years to 56 years, middle age group being the predominant among them (Table 1). Most of the cases were reported after 36 hours of the eye injury, only 7 (30.43%) cases were reported within 24 hours of the injury.

We had studied 46 eyes on 23 patients, among them a single case was found with adnexal tissue loss and the rest 22(95.65%) patients had an open globe injury in one eye. Out of the 22 patients, 9 patients had a closed globe injury on another eye as well.

In our study visual acuity of 13 eyes had no PL (perception of light), 17 eyes had perception of light, 09 eyes had hand movement close to face, and 1 eye had visual acuity 6/18 (Table 2).

The final corrected visual acuity at 4 months, 20 eyes presented with PL+ve, 13 patients with no PL, 1 patient had vision better than 6/36, 7 Patients presented with visual acuity between F.C 3 meters to 6/60, and 5 patients had vision between F.C. 2meters to hand movement.

Most of the patients of open globe injury were admitted in the department for further investigation, observation, and intervention. All patients with open globe injury and some of the patients with closed globe injury were found to have lacerated lid, corneal tear, scleral tear, zonular dialysis, iridodialysis, hyphema and vitreous hemorrhage. Lacerated

Age Distribution	No. of patients
0-10 years	00
11-20 years	01
21-30 years	16
31-40 years	00
41-50 years	04
51-60 years	02
>61 years & above	00
Total	23

**Table-1:** Age distribution of patients with ocular injury

Visual Acuity	Visual acuity at the time of presentation (No. of eyes)	Corrected visual acuity after operation (No. of eyes)
6/36 to 6/6	01	01
F.C. at 3 m to 6/60	06	07
H.M. to F.C. at 2m	09	05
PL present	17	20
No PL	13	13
Total	46	46

**Table-2:** Pre-Op visual acuity

Types of injury	No. of eyes	%
Lid laceration	1	2%
Lid laceration along with Corneo-scleral tear	13	28%
Hyphema	4	9%
Vitreous hemorrhage	3	7%
Globe rupture	22	48%
Iridodialysis	2	4%
Dislocation of lens	1	2%
Total	46	100%

**Table-3:** Various type of ocular injury



**Figure-1:** Showing different type bear inflicted ocular injury in the studied patients

eye lid was debrided and an immediate repair was done after the admission. Corneoscleral tear were repaired with 10-0 ethilon suture. Out of 22 open globe injuries 13 cases were inoperable and later evisceration was done in these patients (Table3).

Out of 23 patients most of the cases were presented late because of this visual prognosis was hampered in a greater degree than those who presented early.

## DISCUSSION

Asiatic Black Bear is a large and powerful animal with average weight of about 130 kg, average height of about 3 feet and body length of 4 - 6 feet. It attacks with paws, claws and teeth.<sup>4</sup> In India bear maul injuries constitute only 0.1% of animal attacks, although they are most common wild animal inflicted injuries.<sup>5</sup> Out of the injuries reported maximum injuries were due to sudden encounters while doing their morning routine chores, for e.g., defecation, collecting wood, grazing cattle etc. The next most common injury was when a bear perceived human as a threat and attacked in self-defence. Of the cases reported only one injury case was

where the victim was mauled when bear entered the village residential area and started attacking people (Fig.1).

We had administered tetanus prophylaxis to all the patient, at the time of admission. Most of the eyes had multiple type of ocular injury. Eye with lid laceration alone were sutured within two layers, with 6-0 vicryl suture. Since the patient's presenting globe rupture eyesight cannot be reinstated, so after proper counselling, and under due medical care and measure the eyes were eviscerated. Patients with corneoscleral tear were repaired and patients with hyphema were washed with ringer lactate to form anterior chamber. Secondary IOL was done in patients with dislocated lens.

In our study the visual prognosis of most of the patients were poor due to numerous reasons such as lack of continuous follow up, late presentation in the hospital, time lag between injury and accessible reach to tertiary care centre, less availability of ambulance services etc. It was found that the complications that arose after injury lead to serious eye conditions like exposure keratitis, lagophthalmos, ectropion, entropion, permanent disfigurement. It also had a negative impact on the patient's psychological health, most of the patient underwent post-traumatic stress disorder. Alternatively, it also posed a detrimental effect on the socio-economic condition of the patient.

## CONCLUSION

A better understanding of the nature, severity and prognosis of Bear inflicted ocular and adnexal injury will help develop effective prevention approaches to reduce their occurrences in the future. The people inhabiting in the nearby area of forests should be encouraged to do their activity when there is minimal chance of a bear encounter. Imparting knowledge and educating about the threats of a bear bite injury and tactics to survive a bear attack to the people residing in the close vicinity of forests may lessen the frequency of the attacks.

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