



## Ocular Manifestations in Polytrauma Patients in Pediatric Age Group in Tertiary Care Center in Central India

Authors

**Dr Minal Vyawahare<sup>1</sup>, Dr Piyush A Madan<sup>2</sup>, Dr Swatie Kamble<sup>3</sup>, Dr Sunil Bhad<sup>4</sup>**

<sup>1</sup>M.B.B.S, M.S., Assistant Professor, Department of Ophthalmology, Government Medical College, Nagpur, Maharashtra – 440024

<sup>2</sup>JR3, Department of Ophthalmology, INMC, Sawangi (Meghe), Wardha

<sup>3</sup>JR 2, Department of Ophthalmology, Government Medical College, Nagpur, Maharashtra

<sup>4</sup>R 3, Department of Ophthalmology, Government Medical College, Nagpur, Maharashtra

Corresponding Author

**Dr. Piyush A Madan**

Address – 266, Near VMV College, Satnami Nagar, CA Road, Ambedkar Chowk, Nagpur, Maharashtra-440008

Mob No. 8087896559, Email: [pmadan01@gmail.com](mailto:pmadan01@gmail.com)

### Abstract

**Purpose:** In a tertiary center in Central India everyday many pediatric patients present with polytrauma to the emergency department with life threatening injuries. In such scenario ocular injuries remain the one of the cause of the co-morbidity. This study is to know the ocular involvement in pediatric patients with polytrauma in a tertiary care center in Central India.

**Method:** This was a retrospective cross-sectional study in tertiary care center in central India. All the patients under age 16 reporting to the emergency services from June 2016 to June 2017 were included. Data was collected from records and tabulated. Statistics analysis was done using spss software.

**Results:** 1483 cases were screened, of them 111(7.4 %) showed ocular manifestations. Males were predominantly involved (71.17%) as compared to females (28.83 %). Most common mode of injury was fall from height (45 cases) and then road traffic accidents (34 cases). Head injury was main association with ocular trauma (56 cases) followed by nasal bleed (32 cases). Periorbital edema is most common presentation (35 cases). Vision was affected in 19 cases (14.84%) ranges from No PL to 6/6. Most common cause of vision loss was traumatic cataract (9 cases), corneal perforation (7 cases) followed by vitreous hemorrhage (6 cases). Mortality is present in 4 cases.

**Conclusion:** Ocular involvement is present in many cases of polytrauma though vision threatening involvement is less. But care full assessment can help to prevent co morbidity.

### Introduction

Eye injuries are major and under-recognized cause of disability and ocular morbidity that especially affects the young<sup>1</sup>. Ocular trauma is a leading cause of acquired monocular visual disability and blindness in pediatric age<sup>2,3</sup>. Children are particularly subject to ocular trauma because of their predilection towards hazardous play and relative lack of judgment. Eye comprises as little as 0.27% total of body surface area. However,

injuries to the eye are found in 10–13% of all combat casualties<sup>4</sup>. Worldwide, 55 million eye injuries restricting activities more than one day occur each year; there are approximately 1.6 million blind people from injuries, an additional 2.3 million people with bilateral low vision from this cause<sup>5</sup>. In a tertiary care center in Central India everyday many pediatric patients present with polytrauma to the emergency department with life threatening injuries. In such scenario ocular

injuries remain the one of the cause of the comorbidity and treated lastly after patients get stabilized. This study is to know the ocular involvement in pediatric patients with polytrauma in a tertiary care center in Central India.

### Method

This was a retrospective cross-sectional study in tertiary care centre in central India. All the patients under age 16 reporting to the emergency services from June 2016 to May 2017 (total 1 year) were included. For the demographic and epidemiologic data, information related to patients and trauma circumstances was collected and included: age, gender, rural urban difference, socioeconomic status, nature and cause of injury, systemic association, place of injury, duration between injury and first presentation to the hospital (ophthalmologist) and ocular manifestations were recorded. Complete details of ophthalmic examination including visual acuity, intraocular pressure, lid abrasions and laceration, facial injury, subconjunctival haemorrhage, presence or absence of corneal/scleral perforation, hyphaema, traumatic cataracts, presence or absence of vitreous haemorrhage, retinal detachment, intraocular foreign body, intactness of orbital margins and ocular motility, endophthalmitis and optic nerve dysfunction etc. was noted. X-ray head with orbit was done in case of perforating and penetrating injuries.

### Observation and Results

Total 1483 pediatric patients which were brought to emergency department at tertiary care center in central India with polytrauma were screened out of which 111 showed ocular involvement.

**Table: 1** Gender wise distribution

Gender	No. of patients	Percentage
Male	79	71.17%
Females	32	28.83%
Total	111	100%

We had 79 males and 32 females with male to female ratio of 2.46:1.

**Table: 2** Age wise distribution

Age in years	No.of patients	Percentage
<7 years	41	36.94%
7-<12 years	55	49.55%
12-16 years	15	13.51%
Total	111	100%

We divided patients into three categories according to age with <7 years, 7 to<12 years and 12 to 16 years. Children between age group 7 to <12 are most commonly involved with total of 55 (49.55%) patients.

**Table: 3** Place of injury

Place of injury	No.of patients	Percentage
Outdoor	70	61.26%
Indoor	41	38.74%
Total	111	100%

In our study we found that majority of patients 70 (61.26%) had injury when they were outdoors (street). In street, we have taken roads, playgrounds and schools.

**Table 4:** Rural-Urban difference

Rural / Urban	Number of patients	Percentage
Rural	72	64.86%
Urban	39	35.14%
Total	111	100%

We also noted that among 72 patients 39 patients were belonging to villages/ rural area and only 39 patients were belongs to place bigger than the village i.e. urban area.

**Table 5** Socio-economic status wise difference

S-E Status	No.of patients	Percentage
BPL	75	67.57%
APL	36	32.43%
Total	111	100%

S-E-Socio-economic, BPL-Below poverty line, APL- Above poverty line.

We also noted during our study that there is socioeconomic wise difference among the numbers of the patients. There were 75 patients who belong to below poverty line and only 36 patients who belong to above poverty line.

**Table: 6** Mode of injury

Mode of injury	No.of patients	Percentage
Fall from height	45	40.54%
RTA	36	32.44%
Animal bite	08	7.20%
Blast injury	02	1.80%
Others	20	18.02%
Total	111	100%

In our study we found that most common mode of injury is fall from height accounting upto 45 cases (40.54%) followed by RTA, 36 cases(32.43%)



**Fig.1** Corneal perforation

**Table: 7** Systemic associations

Systemic association	No.of patients	Percentage
Head injury	56	50.45%
Nasal bleed	32	28.82%
Others	23	20.73%
Total	111	100%

Most common systemic association was head injury accounting upto 56 cases (50.45%)



**Fig.2** Dog bite

**Table: 8** level of consciousness

Level of consciousness	No. of patients	Percentage
Conscious	102	91.89%
Unconscious	09	8.11%
Total	111	100%

**Table: 9** Ocular manifestations

Ocular manifestations	No. of patients	Percentage
Periorbital edema+/- Subconjunctival hemorrhage	35	31.53%
Lacerated wound lid	21	18.92%
Abrasions of lid	09	8.10%
Foreign body	08	7.20%
Perforation	07	2.70%
Traumatic cataract	09	8.10%
Hyphema	05	4.50%
Vitreous hemorrhage	06	5.40%
Retinal detachment	00	
Endophthalmitis	01	0.90%
Restriction of ocular motility	04	3.60%
Orbital fractures	05	4.50%
Optic nerve dysfunction	01	0.90%
Total	111	100%

Most common manifestation was periorbital edema constitute 35 cases (31.53%), followed by lacerated wound with 21 cases (18.92%)



**Fig.3** Periorbital edema



**Fig.4** Lacerated wound





**Fig.5** Abrasion

**Table: 10** Type of injury and ocular manifestations

Type of injury	Ocular manifestations	No.of cases	Percentage
A.Blunt Trauma	1.Periorbital Edema+/- Subconjunctival haemorrhage	35	31.53%
	2.Lacerated Wound of lid	21	18.92%
	3.Abrasion	09	8.10%
	4.Traumatic cataracts	09	8.10%
	5.Hyphema	05	4.50%
	6.Vitreous Hemorrhage	06	5.40%
	7.Retinal detachment	00	0%
	8.Orbital fracture	05	4.50%
	9.Restriction of Ocular motility	04	3.60%
B.Perforating Injury	1.Corneal Laceration	07	6.30%
	2.Extraocular Foreign Body	08	7.20%
	3.Intraocular Foreign Body	00	0%
C.Penetrating Injury	1.Optic nerve Dysfunction	01	0.9%

We divided ocular manifestations according to type of injury vis. a vis. blunt trauma, perforating injury and penetrating injury. Maximum no. of cases occurs due to blunt trauma followed by perforating injury and penetrating injury.

**Discussion**

Ocular trauma can be a devastating injury in children and may cause lifelong disability. More than one third of serious eye injuries occur in pediatric age group. Children are more susceptible

to eye injuries because of their immature motor skill and their tendency to imitate adult behavior without evaluating risk (Thordarson U Ragnasson AT et al)<sup>6</sup>.

In the present study, boys outnumbered girls in the injury by a ratio of 2.46:1. Our results were consistent with Strahlman E et al., Cascairo MA et al, Khattry SK et al and Vasnaik A et al<sup>7,8</sup>. Most eye injuries occurred among boys, which could be attributed to their more active behavior and their tendency to spend more time outdoors compared to the girls.

In our study we have found that almost 49.55% occurred in children more than 7 years of age. Higher incidence of ocular trauma in this age group consistent with the studies done by Gorden YJ et al<sup>9</sup> and Niramem M et al in Finland<sup>10</sup>. This is the age group when children try to do things on their own but they do not have adequate maturity to make right decisions on their own and are also influenced by their peer groups to do the adventurous activities. Our study also showed a predominance of injuries occurring in the toddler to school-age population similar to previous studies. At these ages, toddlers are discovering their world and exploring their surroundings. A higher incidence of trauma in school-aged children was present since they spent most of their time in school where they were more exposed to the environment and were more physically active and lack of supervision. There was also less parental guidance in schools or recreational centers.

In our study most of the ocular injuries 73 (67.32%) occurred when children were outside their home (on street, road, playground etc.) This is consistent with the studies done by Dalia M Sebaity et al and Kaimbo et al<sup>11</sup>

In our study we found that most common mode of injury is fall from height while playing accounting for almost 45 cases(40.54%) followed by RTA accounting for 34 cases(30.54%) and these observations are consistent with most of the previous studies done by Niramem et al<sup>12</sup>, Rapaport et al<sup>13</sup>, Moreira et al.

In our study we found that most common systemic association was head injury, accounting for almost 56 cases and 50.45% which was followed by nasal bleed with 32 cases (28.82%). Most of patients had stable general condition and about 91.89% were conscious at the time of presentation, only 8.11% patient presents with loss of consciousness.

In our study we found that lid is the most commonly injured part with periorbital edema+/- subconjunctival haemorrhage is the most common presentation accounting for 35 cases(31.53%) followed by Lacerated wound 21 cases(18.92%), Abrasions 9 cases(8.10%), Traumatic cataracts 9 cases (8.10%), foreign body 8 cases(7.20%), Hyphema 5 cases(4.50%), Perforation 7 cases (6.30%), Vitreous hemorrhage 6 cases (5.4%), Retinal detachment 0 case, Endophthalmitis 1 case (0.9%), Restriction of ocular motility 4 cases (3.60%), Orbital fractures 5 cases (4.50%), Optic nerve dysfunction 1 case (0.9%).

### Conclusion

Ocular trauma is extremely common and especially so in the developing countries. A wide spectrum of injuries in terms of cause and mechanism exists. In such cases, though the vision threatening involvement is less, but care full assessment can help to prevent co morbidity. Emergency department physicians and health personnel must be made aware of the basic treatments in case of ocular emergencies and about prompt referral to ophthalmologists when needed. Public education, general awareness and aggressive primary management may be indicated to optimize visual outcome.

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