

**PAEDIATRIC OCULAR INJURIES IN A TERTIARY CARE HOSPITAL**K. Vinayagamurthy<sup>1</sup>, A. Samarapur<sup>2</sup>, T. Kavitha<sup>3</sup><sup>1</sup>Professor, Department of Ophthalmology, Chengalpattu Medical College, Chengalpattu, Tamil Nadu.<sup>2</sup>Associate Professor, Department of Ophthalmology, Chengalpattu Medical College, Chengalpattu, Tamil Nadu.<sup>3</sup>Assistant Professor, Department of Ophthalmology, Chengalpattu Medical College, Chengalpattu, Tamil Nadu.**ABSTRACT****BACKGROUND**

Childhood blindness constitutes a burden on the economy of the country and produces psychosocial and emotional disturbance to the child and family at large. Similar to the visual impairment produced by vitamin deficiency state in children, ocular injuries form another group which if identified early and treated promptly can reduce irreversible damage. Eye injuries are responsible for the large scale ocular morbidity worldwide. At extremes of age, the incidence of eye injuries are common because of the negligence in their care.

The aim of the study is to determine the prevalence, various mechanisms, agents of injury and environmental influence causing eye injuries in children brought to Ophthalmic Outpatient Department of Chengalpattu Medical College in Kanchipuram District, Tamilnadu.

**MATERIALS AND METHODS**

A retrospective review of medical records of 230 children who attended Ophthalmic Outpatient in Chengalpattu Medical College Hospital between 01.09.2015 to 30.09.2016. Records of children of both genders between the age group of (0 to 12) years who attended the Ophthalmic Outpatient Department with history of ocular injury coming from both rural and urban areas of the district. Their data was collected and analysed and tabulated based on demography, mechanism and place of injury.

**RESULTS**

School going age groups (5-12 years), 84% sustained injuries more commonly. Children from rural areas sustained 54.7% injuries. Blunt trauma accounted for 65% injuries. 52.6% injuries occurred at home. 41.7% were due to stick and wood. Children were admitted to hospital for a mean of 4 days, range (1-25 days), 96% >6/12 v/a, 3% children had v/a (6/18-6/60), 1% blind 6/60 vision. Bilateral blindness was not reported. 1% visual impairment registered.

**CONCLUSION**

This study showed that rural children suffered more ocular injuries; commonest were injuries due to sticks followed by cracker injuries. Home-based injuries were more common. Visual prognosis was good because of prompt treatment. Facilities for treatment of ocular emergencies have significantly improved in tertiary hospitals located in mofussil areas.

**KEYWORDS**

Ocular Injuries, Children, Amblyopia, Blunt Trauma.

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**BACKGROUND**

Paediatric ocular injuries are a common cause of acquired unioocular blindness. It is mainly accidental and unique compared to adults. Common place of injury was at home.<sup>1</sup> Penetrating injuries involving posterior segment has poor prognosis. Ocular injuries not only lead to defective vision, but also produce emotional disturbance to the child and the parents. Paediatric ocular injuries are preventable, if children

are supervised<sup>2</sup> and early medical intervention is done for their ocular injuries.

This study was done to estimate the prevalence, identify various mechanisms and environmental influence on paediatric ocular injury and common agents causing injury.

**Aim-** Aim of the study is to find out the prevalence, various mechanisms and agents causing eye injury in children brought to Ophthalmic Outpatient Department in Chengalpet Medical College Hospital.

**MATERIALS AND METHODS**

A retrospective review of medical records of 230 children who attended Ophthalmic Outpatient in Chengalpet Medical College Hospital between 01.09.2015 to 30.09.2016.

**Study Population-** All children of both genders up to 12 years who attended Ophthalmology Outpatient Department

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following eye injuries from urban and rural areas. Their data was collected from the medical records. They were classified into two groups- preschool (0-4 years) and school going (5-12 years). All the data were collected in a standardised proforma. They were tabulated based on demography, cause of mechanism and place of injuries. Final visual acuity recorded. All patients were followed up for 4 months.

**Study Design-** For all children, history taking and clinical examination was done by qualified ophthalmologist.

**Inclusion Criteria-** Records of 230 children up to 12 years both sexes with incidence of eye injuries.

**Exclusion Criteria-** Children above 12 years of both sexes excluded.

**RESULTS**

During the study period, out of total 230 cases of children admitted and evaluated, males (140):females (90) ratio was 1.6:1. Children from school going age group (5-12 yrs.) constituted the largest 193 (84%) group. 37 children were aged between 0-4 yrs. Table 1 shows the common age groups affected by injuries.

	Age Group (Years)		
	0-4	5-12	Total
Blunt trauma	16 (43.2%)	135 (69%)	151 (65%)
Cracker injury	12 (32.4%)	26 (13%)	38 (31%)
Penetrating	4 (10.8%)	24 (12.3%)	28 (12%)
Domestic chemicals	0 (0%)	8 (4.1%)	8 (3.4%)
Other	5 (13.5%)	0 (0%)	5 (2.1%)
Unknown	2 (1.03%)	3 (1.5%)	5 (2.1%)
<b>Total</b>	<b>37</b>	<b>193</b>	<b>230</b>

**Table 1. Mechanism of Injury**

Injuries sustained at home accounted for 121 cases (52.6%) followed by school 72 cases (31.3%). The third common site was playground, 20 cases (8.6%). Table 2 shows the place of injury.

	Age Group (Years)		
	0-4	5-12	Total
Home	30 (81%)	91 (47%)	121 (52%)
School	0 (0%)	72 (37%)	72 (31.3%)
Sport	0 (0%)	20 (10.30%)	20 (8.6%)
Street or road	4 (10.8%)	7 (3.6%)	11 (4.7%)
Others	3 (8.1%)	3 (1.5%)	6 (2.0%)
<b>Total</b>	<b>37</b>	<b>193</b>	<b>230</b>

**Table 2. Place of Injury**

65 children had blunt injury (65%) followed by cracker injury 31%. Penetrating injuries without IOFB accounted for 12%. Table 3 shows the agents of injury and demography of cases and sex distribution.

Agents of Injury		Urban			Rural	
		Boys (%)	Girls (%)		Boys (%)	Girls (%)
Stick/wood	44 (42.3%)	24 (54%)	20 (54%)	52	42 (80.7%)	10 (19.2%)
Cracker injury	21 (20.1)	12 (57.7%)	9 (42.8%)	18	13 (72.2)	5 (27.7%)
Stone	12 (11.5%)	7 (58%)	5 (42%)	24	14 (24%)	6 (41.6%)
Fall/sports	7 (6.7%)	2 (28.5)	5 (71.4%)	9	6 (66.6%)	3 (33.3%)
Fist	6 (5.7%)	4 (66.6%)	2 (33.3%)	7	5 (71.4%)	2 (28.5%)
Pieces of metal	4 (3.8%)	1 (25%)	3 (75%)	11	5 (58.3%)	6 (54.5%)
Domestic chemicals	4 (3.8%)	1 (25%)	3 (75%)	0	0 (0%)	0 (0%)
RTA	3 (2.8%)	1 (33.3%)	2 (66.0%)	1	1 (100%)	0 (0%)
Finger nails	2 (1.9%)	0 (0%)	2 (100%)	2	0 (0%)	2 (100%)
Glass	1 (0.9%)	1 (100%)	0 (0%)	1	1 (100%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)	1	0 (0%)	1 (0%)
<b>Total</b>	<b>104</b>	<b>53</b>	<b>51</b>	<b>126</b>	<b>87</b>	<b>39</b>

**Table 3. Agents of Injury and Demography of Cases and Sex Distribution**

126 cases (54.7%) were reported from rural areas and 45.2% from urban areas. Injury in RE were 131 (57%), LE were 94 (41%) cases and BE were 4 (2%) cases. 96% cases had final visual acuity of >6/12 and 1% with visual acuity <6/60 were blind.

Visual Acuity	No. (%)
>6/12	96%
6/18-6/60	3%
<6/60	1%

**Table 4. Final Visual Acuities**

**DISCUSSION**

Eye injuries remain a major cause of morbidity worldwide. They constitute 8-14% of total injuries in children. Next to amblyopia, eye injuries constitute the second common cause of childhood blindness.

Common reported injuries varied from blunt injury, abrasion and corneal tear consistent with another study by MacEwen et al.<sup>1</sup> Ignorance and lack of awareness led to late presentation to eye care treatment. Seeking native treatment at first instance led to increased risk of complications. Early treatment can prevent irreversible loss of vision.

**Age Group-** In this study, school going children (age group 5-12 years) were prone for ocular injury more frequently. It was similar to other study by MacEwen et al.<sup>1</sup> In this study, the incidence of injuries in the (0-4 years) age group was less, reason could be due to closeness of this children to the parents and relatives. Frequency can be due to rural origin of children's habits of playing with sticks and stones and poor parental supervision of children while playing. They are the adventure seeking group and love to play more independently. In this study, male children from both urban and rural was more (140 cases) when compared to female children (90 cases) similar to a study by Onakoyo AO et al.<sup>3</sup>

**Place of Injury-** Children sustained more injuries during their stay at home. This is the place they seek independence to play followed by school. Both preschool and school children got injured during their stay at home. More time at home and easy accessibility to toys, sharp objects and exposure to household chemicals might be reasons. This report was similar to another study done by Apjit Kaur et al<sup>2</sup> and Umeh R.E. et al.<sup>4</sup> Children are not taken to playground. Both parents may be employed or preoccupied with their work. Children under custody of elderly grandparents or babysitters tired of supervising the children for a long period. Similarly, unsupervised play was found to cause ocular trauma in the study by Ayanniyi et al.<sup>5</sup>

**Agent of Injury-** In this, study sticks 42% and cracker injury 21% were found to be common causative agents of injury. Cracker injury appeared to be the third common agent in a study by Serrano et al.<sup>6</sup> Sticks are easily accessible to children in rural areas. In India, during the festival of Diwali where crackers are busted, children actively take part in this festival. Children when left unsupervised sustain injuries of face and eyes. Habit of collecting residual explosive chemicals from defective crackers and lighting fire increased the risk of injury to face and eyes. Cracker injuries more often involved both eyes.<sup>7</sup> Injury due to toys was found to be common in preschool age group. Sports injuries were the fourth common injury. A decrease in the incidence of sports injuries was noted; reason could be due to waning interest in outdoor sports. Children spend more time playing with gadgets like mobile phones and computer games.

**Mechanism of Injury-** In this study, ocular injuries in children were predominantly due to blunt trauma compared to perforating or penetrating injuries similar to study by Caroline J. MacEwen et al.<sup>1</sup> The study by Nirmalan et al<sup>8</sup> also showed blunt trauma to be the major cause of trauma. It is also similar to the study by Takvam et al<sup>9</sup> where contusion was the most common cause of injury. Nearly, 65% of children had blunt injuries followed by cracker injuries 31%. Penetrating injuries without IOFB accounted for 12%.

**Environmental Influence-** In this study, environment plays a crucial role in the incidence of ocular injuries. It was more common in rural children when compared to urban children. Similar study showed no difference between urban

and rural areas by Nonso et al.<sup>10</sup> Sticks and stones are easily available to rural children than toys. Injury due to fall was also more in rural children. Generally speaking rural children were more prone for ocular injury, probably due to poor supervision of parents, easy accessibility and aggressive behaviour, similar to that of other studies. Another reason for the higher incidence of injury in the rural children could be due to illiteracy when compared to the urban children. They are not aware of the harmful effects of the playing objects and risk involved in the games. The same has been reported in a study by Pinaki Sengupta et al.<sup>11</sup> The same finding was reported by Liggett<sup>12</sup> and Glynn.<sup>13</sup> Children from less educated and poor family take part in cheap and high-risk games and likely to be injured.

## CONCLUSION

Prevention of ocular injuries in children remains a challenge. IEC activity to children, parents and teachers must be improved. Monitoring of play activities by parents must be ensured at homes. Alternate safe games must be taught. Early diagnosis, referral and treatment will help in achieving good visual prognosis. Legislation to ban use of crackers by young children must be promulgated. The mode and cause of injury varies between urban and rural population. Strategy for primary prevention must be taken into consideration of this aspect and aim at evolving a proper strategy. Field health workers at the primary care level must be trained to manage the eye injuries with first aid. They can help in early referral of cases. Similarly, teachers in school level must be given health education about eye injuries and the importance of early referral. Though the data provided by the study reflects the incidence of ocular injuries in a small population. It can be used to assess the magnitude of this problem involving the paediatric population as a whole at the national level and help the healthcare planners to devise new strategies to reduce the burden of childhood blindness by bringing in new healthcare programmes to prevent ocular injuries at the grass-root level.

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