

**Original article:**

## **Clinical profile and post operative visual outcome of traumatic cataract patients**

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### **ABSTRACT**

**PURPOSE** – The aim of the study was to study the clinical profile and postoperative visual outcome of traumatic cataract patients in a rural institution.

**MATERIALS AND METHODS-** This was a Hospital based descriptive longitudinal study in which 50 cases of traumatic cataract coming to rural hospital , Loni over a period of 2 years (sept 2017 – Aug 2019) , giving consent for the study were studied. Patients data included demographic details, causative agents, initial visual acuity at presentation, intraocular pressure, slit-lamp examination findings, posterior segment finding, time of presentation to the hospital, surgery, final visual outcomes and causes of non improvement of vision and the data was studied thoroughly. Patients were subsequently followed up at post operative day (POD) 1, POD7, and upto 1 month .

**RESULTS** – 50 Traumatic cataract cases were studied . Out of total, a large number of patients (34%) were below 15 years of age with a male preponderance. Right eye was affected in 30 patients (60%) while left eye in 20 patients( 40 %) . 30 patients (60%) presented with closed globe injury and 20 (40%) presented with open globe injury. Wooden stick injury (14 %) was found to be the commonest object of injury. 24% patients attained best corrected visual acuity of 6 /9. Visual acuity of 6/6 was achieved by 22% and 6/12, 6/18, 6/24, was achieved by 14% patients each.

**CONCLUSION** – Trauma is an important cause of monocular blindness in developing world, although few studies have addressed the problem of trauma in rural areas. Patients with traumatic cataract if managed appropriately can have best possible visual outcome.

### **INTRODUCTION**

Injury is defined as damage to person or tissue/ organ caused by transfer of energy. Ocular trauma is an important, preventable public health problem worldwide. A study performed for the World Health Organization estimated that up to 55 million eye injuries occur annually worldwide, and up to 1.6 million people lose their sight due to eye trauma. Amongst total numbers of cases of blindness 1.2 % are contributed by injuries. In developed countries, it is a major cause of unilateral blindness. <sup>1</sup> In India, Broom Stick injury, Bow arrow injury, and Gulli Danda injuries are unique to this country while fire cracker injuries though not unique to this country but are more frequent due to poor compliance and enforcement of safety regulations.

High rates of ocular injury in young adults have been observed consistently in nearly all descriptive and controlled epidemiologic studies. This high incidence reflects a high proportion of work-, assault-, sports-, and motor vehicle crash-related ocular injuries in the young adult age group particularly among young men.<sup>2</sup>

Male to female ratio in ocular trauma is about 4:1.<sup>3</sup> The effect of trauma on the lens may manifest as Vossius ring opacity on the anterior capsule of the lens, Discrete sub epithelial opacities, Sub epithelial disseminated opacities, Traumatic Zonular Cataract, etc. It may cause --Subluxation of lens or Dislocation of Lens. There are various clinical presentations of traumatic cataract depending upon the cause and severity of injury. Any strategy for prevention requires knowledge of the cause of injury, which may enable more appropriate targeting of resources towards preventing such injuries. Eye trauma represents a large, potentially preventable burden on both victims and society as a whole.<sup>4</sup>

Traumatic cataract poses a significant medical and surgical challenge to an ophthalmologist. A detailed history, careful examination and a clear management plan can simplify these cases and provide the best possible visual outcome. The goal of our study is to devise a proper management in order to improve the visual outcome in these patients .

#### **AIMs AND OBJECTIVES**

Aim was to study the clinical profile and post operative visual outcome of traumatic cataract patients. Objectives of this study were to study clinical presentations and cases of traumatic cataract in different age groups and to assess the visual outcome in postoperative cases upto a follow up of 1 month.

#### **MATERIALS AND METHODS**

This is a Hospital based descriptive longitudinal study which included all traumatic cataract patients coming to rural hospital , loni over a period of 2 years (sept 2017 – Aug 2019) , giving consent for the study. They underwent cataract extraction surgery with intraocular lens implantation (primary or secondary). Patients with congenital anomalies of eye or having preexisting intraocular or systemic diseases leading to pre existing cataract were excluded. Detailed history of all the patients was taken. Visual acuity testing was done using snellens chart and anterior segment examination using slit lamp examination. Intraocular pressure was measured by noncontact tonometer.

Patients data included demographic details, causative agents, initial visual acuity at presentation, intraocular pressure, slit-lamp examination findings, posterior segment findings , time of presentation to the hospital, surgery, final visual outcomes and causes of non improvement of vision and the data was studied thoroughly.

Patients were subsequently followed up at post operative day (POD) 1 , POD7 , and upto 1 month . Patients visual acuity was recorded at each visit and detailed anterior and posterior segments were examined to look for any complications post operatively . Final best-corrected visual acuity was recorded at 1 month. Ethical clearance was taken from Ethics committee of institute and written informed consent was taken from all the patients.

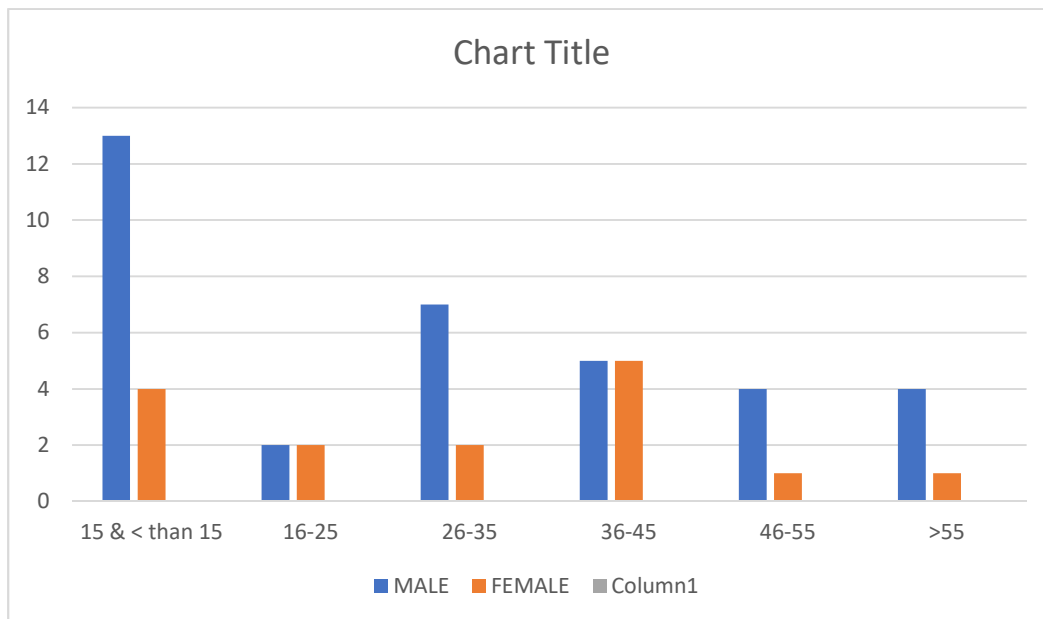
**RESULTS**

A total of 50 traumatic cataract eyes of 50 patients were studied.

This study shows highest cases of traumatic cataract in paediatric age group (34 %).

And that the incidence is more common in males (70%) as compared to females (30 %).

It was also seen that Right eye is more commonly affected (60%) than left eye (40%).



Study showed higher percentage of closed globe injuries due to blunt trauma (60%) leading to development of traumatic cataract as compared to open globe injuries which is 30%. 21 (42 %) patients had traumatic cataract due to injuries sustained during agricultural work and 18 (36%) patients due to injuries during sports. Maximum number of injuries during agricultural work can be justified as agriculture is the main occupation in rural areas and injuries during sports to children can be said to be more because of negligence of parents towards children and as most of the work is outdoor. In this study, common objects causing trauma leading to traumatic cataract were wooden stick (14%) , followed by tree branch ( 10% ) ,stone (8%), and ball (5%). 60 % of cases with open globe injury presented to hospital within 24hrs, 15% within 1 week and only 10% within 1 month. Also in our study, among patients with closed globe injuries, 33.3 % presented within 6 months followed by another 20 % within 1 year and 10% within 1 month.

58 % cases presented with visual acuity drastically reduced to perception of light and projection of rays.

**EXTENT OF VISUAL LOSS AT PRESENTATION**

<b>PREOPERATIVE VISUAL ACUITY</b>	<b>NO. OF PATIENTS</b>	<b>PERCENTAGE</b>
<b>6/60 or more</b>	1	1.5%
<b>Finger counting</b>	12	24%
<b>Hand movements close to face</b>	8	16%
<b>Perception of light (PL) Projection of rays (PR)</b>	29	58%
<b>TOTAL</b>	50	

Late consultation can be one of the causes for the same. On slit lamp examination, corneal tear constituted - 44 % ; and corneal opacity -18 %. Uveal tissue prolapse was seen in 18 % cases.

In our study vitreous haemorrhage was seen in 6 % patient, Vitreous loss in 4 % and choroidal rupture in 2 % patients.

Majority of patients i.e 86 % underwent small incision cataract surgery with intraocular lens implantation and 6 % underwent phacoemulsification along with iol implantation. Cases in which IOL implantation was not possible in 1<sup>st</sup> setting underwent secondary IOL implantation and gave good best corrected visual outcome.

Final visual acuity of 6/6 was achieved by 22% and 6/12, 6/18, 6/24, was achieved by 14% patients each. As value of  $p < 0.01$ , there is a highly significant improvement of visual acuity from postoperative day 1 { mean HMCF, LogMAR 2.419 ±8.51 } to visual acuity after 1month {mean 6/36, LOGMAR 0.890±3.16 } clinically and confirmed statistically.

**CORRECTED VISUAL ACUITY AT THE END OF 1 MONTH -**

<b>VISUAL ACUITY</b>	<b>NO. OF PATIENTS</b>	<b>%</b>
<b>6/6</b>	11	22
<b>6/9</b>	12	24
<b>6/12</b>	7	14
<b>6/18</b>	7	14
<b>6/24</b>	7	14
<b>6/36</b>	1	2
<b>6/60</b>	0	0
<b>FINGER COUNTING</b>	5	10
<b>TOTAL</b>	50	100 %

Major cause of non improvement in vision was found to be astigmatism with corneal opacity which was 20 % followed by individual astigmatism and corneal opacity, contributing 16% each.

## DISCUSSION

This was a prospective study of 50 cases of ocular trauma presenting with traumatic cataract. We observed that at our hospital, which caters to the rural population, the number of trauma patients were significantly high. The incidence of traumatic cataract reflected in ophthalmic literature varies from 1% to 15% of all ocular injuries.<sup>5</sup>

In India 14% of all cases of cataract in children are due to trauma.<sup>6</sup>

In our study out of total 50 patients, a large number (34%) were 15 years or less than 15 years of age. Study also points clearly towards a male preponderance i.e 35 were males (70%) and 15 were females (30%). It can be said that this is because of the greater involvement in outdoor activity and recreational activity and work pattern of people. Jagannath C et al in their study of 40 patients of traumatic cataract, found that a large majority of the cases were aged less than 40 years (67.5%) and males constituted a higher proportion (62.5%) than females (37.5%).<sup>7</sup> Daljit Singh et al in their study of 53 patients with traumatic cataract found incidence of traumatic cataract to be 43% in paediatric age group. 83.29% of these patients were males and 61.71% were females.<sup>8</sup>

Our study witnessed that right eye was affected in 30 patients (60%) while left eye in 20 patients (40%). 30 patients (60%) presented with closed globe injury and 20 (40%) presented with open globe injury. Abdul-Rahim Adlina, et al studied 29 cases of traumatic paediatric cataract and found that, right eye was more frequently injured compared to the left eye (62.07% vs. 37.93%) like our study.<sup>9</sup> Parikshit Gogate et al studied 82 traumatic cataracts in children in rural area and found that Forty (48.8%) eyes had blunt injury while 32 (39%) eyes had sharp injury. Eighteen (21.9%) eyes had open globe injury while 64 (78.1%) had closed globe injury.<sup>10</sup> Kinderan YV et al studied eleven hundred eyes of 1,069 patients of ocular injury, and found that blunt trauma accounted for 56.5 % and was the commonest of all, followed by sharp injury accounting for 16.7 %. The commonest type of trauma was closed globe injury (73.3 %). The visual outcome was poorer in open globe injury as compared to closed globe injury.<sup>11</sup>

In our study, Traumatic cataract developing due to injuries sustained during agricultural work constituted 42 %, sustained during sports constituted 36 % and domestic injuries constituted 18 % of the total. Pravin K Nirmalan et al studied ocular trauma in either eye in 229 persons. The most common setting where the ocular trauma occurred was during agricultural labor (n = 107; 46.9%).<sup>12</sup> A. Barr et al in their study of 416 patients admitted because of ocular injury, 52 patients (12.5%) resulted from playing a sport.<sup>13</sup> Mansouri MR et al studied 2016 patients amongst which domestic ocular trauma represented 4.85% of all ocular emergencies.<sup>14</sup> Prajwalli Reddy et al studied 209 cases of vehicular accidents. According to their study it was found that ocular injuries due to vehicular accidents accounted for 7.6% of all injuries of due to vehicular accidents.<sup>15</sup>

Our study found that most of the injuries leading to traumatic cataract were due to wooden stick (14%) ,followed by tree branch ( 10% ) ,stone (8%), and ball (5%).The value of is  $P < 0.05$ , i.e it is Significant .This statistically proves that there is significant association between nature of objects and type of injury (Open and closed globe ). Mehul Shah et al studied 687 cases of which 496 were open-globe cases. They concluded that Wooden sticks were the most common object of injury in their study (55.9%).<sup>16</sup>

60 % of cases with open globe injury presented to hospital within 24hrs, 15% within 1 week and only 10% within 1 month.

Also in our study, among patients with closed globe injuries, 33.3 % presented within 6 months followed by another 20 % within 1 year and 10% within 1 month.

In our study, 58% patients presented with visual acuity reduced to perception of light and projection of rays. 12 (24%) patients had finger counting vision and 8 patients (16%) had vision of hand movements close to face. Dakshayani, Rakesh et al studied 50 cases of traumatic cataract. In their study, 82 % of the patients had vision less than counting fingers, and only two patients had visual acuity more than 6/60.<sup>17</sup>

Anterior segment finding of corneal tear was present in 44 %; and corneal opacity in 18 %. Uveal tissue prolapse was seen in 18 % cases. 12 % patients had posterior segment pathology. 6% of cases were of Vitreous haemorrhage followed by 4 % cases of vitreous prolapse through wound and only 1 patient (2%) had choroidal rupture. Bigar et al, who studies 35 patients of traumatic cataract and found that 10 % of patients had posterior segment pathology.<sup>18</sup>

Majority of patients i.e 86 % underwent small incision cataract surgery with intraocular implantation and 6 % underwent phacoemulsification along with intraocular lens implantation. In this study, 24% patients attained best corrected visual acuity of 6 /9. Visual acuity of 6/6 was achieved by 22% and 6/12, 6/18, 6/24, was achieved by 14% patients each. Akshay J Bhandari et al in their study in a rural institute studied 50 cases of traumatic cataract and saw that Best-corrected visual acuity was 6/6–6/9 in 20 (48.8%) patients and 6/18 or better in 29 (70.8%) patients.<sup>19</sup>

The most common cause of non improvement of vision was found to be astigmatism with corneal opacity (20 %). Astigmatism could be either induced by iatrogenic or corneal tear suturing and opacity due to corneal scarring post injury. Individually, astigmatism and corneal opacity constituted 16% of the patients each. Rubsamen et al performed a study and found astigmatism (45%) as the commonest cause of non improvement of vision. It was followed by centrally located corneal scar in 15% patients.<sup>20</sup>

## CONCLUSION

Traumatic cataract can occur in any age group, but is more common in paediatric age group. Hence proper supervision by parents is required during play, And responsibility of preventing eye injury in children rests with the guardians. Trauma is an important cause of monocular blindness in developing world, although few studies have addressed the problem of trauma in rural areas. Patients with traumatic cataract if managed appropriately can have best possible visual outcome, but is unpredictable because it is not only lens that decides visual outcome. There is no standard classification, investigation, or treatment guidelines for the same. Agricultural trauma is an important cause of traumatic cataract with stick being the most common object as majority of Indian population lives in rural area and farmers do not appreciate hazards of workplace.

In patients with traumatic cataract, useful vision is obtained when intraocular lens implantation is done.

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