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Clinical Profile and Visual Outcomes of Traumatic Cataract in Patients Aged 5 - 40 Years: A Retrospective Study

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Abstract: ***This retrospective study investigates the clinical characteristics and visual outcomes of patients aged 5 to 40 years presenting with traumatic cataract. The research aimed to explore the mode of presentation, injury types causing traumatic cataracts, and subsequent visual prognosis following intervention. Conducted at the Outpatient Department of Ophthalmology, Assam Medical College Hospital, Dibrugarh, between July 2019 and June 2020, the study documented findings at presentation, performed cataract operations post pre - operative evaluation, and assessed complications. The study population comprised 46 patients with a male - to - female ratio of 2.3: 1, predominantly children aged 5 to 10 years from rural areas. Blunt injury emerged as the most common cause, often accompanied by other ocular injuries. Intra - operative complications were prevalent in 63 of cases, while post - operative Best Corrected Visual Acuity BCVA recorded at 6 weeks post - surgery indicated favorable outcomes, with a majority achieving BCVA better than 6/18. The study underscores the influence of injury type and associated ocular damage on visual prognosis and emphasizes the significance of prompt and meticulous management.***

Keywords: Ocular trauma, traumatic cataract, blunt ocular injury, penetrating ocular injury

1. Introduction

Ocular trauma can be regarded as the single most important cause of monocular blindness in the world. Traumatic cataract is the result of sudden acceleration imparted by the impact of blunt or penetrating force. It is the commonest sequel following ocular injury.[1] The visual acuity at presentation, age of the patient and the presence of other ocular structure injuries determine the management of traumatic cataract.[2] For better prognosis the treatment should be completed within a year after initial surgery in case of adult and within six months in children.[3, 4]

The present study was conducted to assess the clinical profile, modes of presentation, type of injury and the final visual outcome after management of traumatic cataracts.

Epidemiology: Ocular trauma is a major cause of monocular blindness in the world particularly in developing countries. There are about 6 million people blind due to eye injuries out of which 2.3 million are affected bilaterally and 19 million with unilateral visual loss.[5, 6]

Clinical Features: All patients of traumatic cataract give history of prior trauma and present with diminution of vision in the eye which may be sudden or gradual in onset with or without associated pain.

Management: Definitive management is cataract surgery with intra - ocular lens implantation. Approach to management differs in different types of cases. In cases with raised IOP, the IOP is taken care of first before surgery. In penetrating cases prior suturing of the wound is done and cataract surgery is deferred till the cornea heals.

Patients and Methods

All patients with traumatic cataract between ages 5 to 40 years attending Ophthalmology Department of Assam Medical College and Hospital, Dibrugarh, during the study period were included in the study. The cases which had other intraocular pathologies and those which had no light perception were excluded.

Ethical clearance was taken. Informed and written consent was sought.

Complete and detailed history was taken and examination done**.** Visual acuity for both distance and near was recorded. Slit lamp examination done and intraocular pressure recorded. Ultrasound B - scan was advised in blunt trauma cases with hazy media.

Routine investigations were done and clearance taken. Small incision cataract surgery with intraocular lens was performed under peribulbar anaesthesia in case of adults and general anaesthesia in case of children.

Intra - operative and post operative complications were recorded. Patients were followed upto a period of 6 weeks and the final visual acuity along with BCVA were recorded.

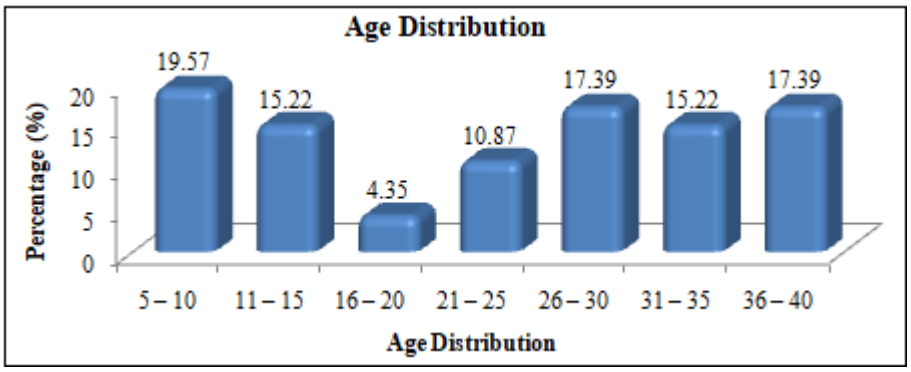
2. Results and Observations

In total 46 patients diagnosed as traumatic cataract during the study period were included in the study. The observations that were recorded from the presentation of the cases to their final follow up are documented below.

Gender Distribution

Of the 46 patients, 32 (70%) were male and the rest 14 (30%) were female.

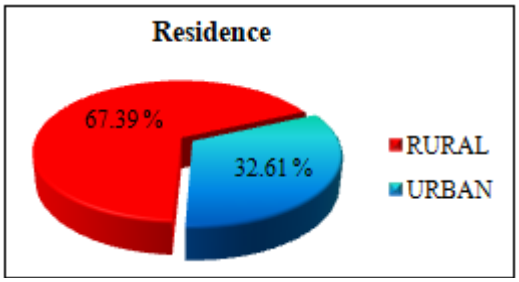
Age Distribution



The younger age group i. e. from 5 to 10years had more (19.57%) patients of traumatic cataract compared the other age groups.

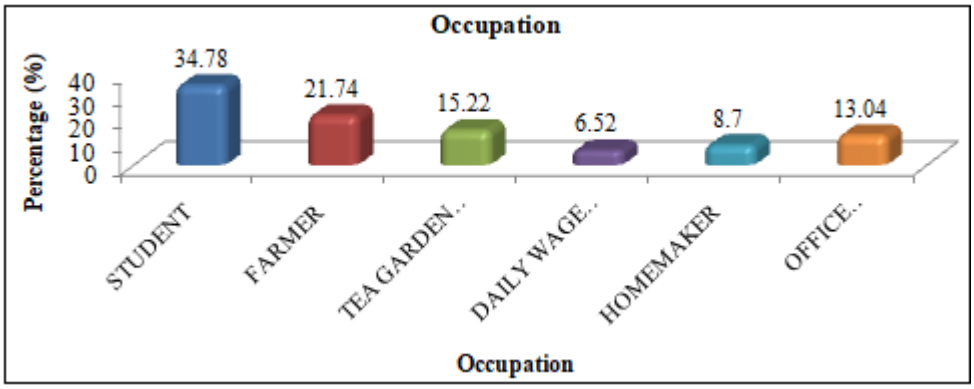
Distribution according to place of residence

Out of 46 patients, 31 patients (67%) belonged to rural areas whereas the rest 15 patients (33%) were from urban areas.



Distribution according to Occupation

Most of the patients were students i.e. 16 (35%), followed by farmers (22%) and tea garden workers (15%). Other occupations like daily wage earners, office workers and home makers constituted small percentage of the reporting patients.



Causes of Trauma

Causes	Number of Eyes	Percentage (%)
Childhood Accidental Injury	15	32.61
Accidental injury at home	10	21.74
Accidental injury at work	19	41.30
Road Traffic Accident	2	4.35

Most of the patients (41%) were injured while working, followed by accidental injury at childhood while playing (32.6%), injury at home (21.7%) and road traffic accident (4.35%).

Distribution of eyes

The right eye was involved in 26 (56.5%) patients and left eye was involved in 20 (43.5%) patients.

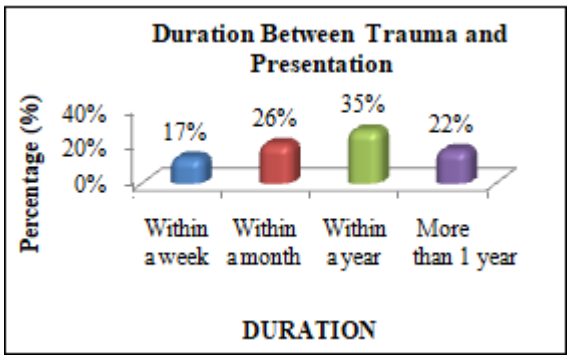
Type of Injury

Injury	Number of Eyes	Percentage (%)
Blunt Injury	38	83%
Penetrating Injury	8	17%
Total	46	100%

Of the 46 patients, history of blunt injury was present in 38 patients (83%) and history of penetrating injury was present in the rest 8 patients (17%).

Duration between trauma and presentation

Most cases (35%), presented within 1 year of trauma. 26% of cases presented within 1 month, 22% in more than 1 year and 17 % in within a week.



Associated Ocular Findings

Associated Ocular Injuries	Number of Eyes	Percentage (%)
Corneal Injuries	10	21.7
Injury to Iris	22	47.8
Anterior Capsular tear with lens matter in Anterior chamber	7	15.2
Posterior Synechia	10	21.7
Raised IOP	6	13.0
Subluxated lens	7	15.2

Most of the cases of traumatic cataract in the study suffered other ocular injuries also during the trauma.47.8% eyes suffered iris injuries and 21.7% eyes had corneal injuries. There were posterior synechiae in 21% eyes, anterior capsular tear with lens matter in anterior chamber and subluxated lens in 15% eyes. Raised IOP was recorded in 13% eyes.

Pre – Operative Status of Visual Acuity

Pre –Operative Visual Acuity	Number of Eyes	Percentage (%)
≥6/60	4	9
FC	10	22
HM +ve	22	48
PL +ve	10	22
Total	46	100

48% of the eyes had visual acuity of hand movement positivity. Only perception of light was present in 22% cases. Counting fingers was also present in 22%. Visual acuity was 6/60 or slightly better in 9% of the cases.

Intraoperative Difficulties and Complications

Complications	Number of Eyes	Percentage (%)
Hyphaema	2	4.35
PC rupture	4	8.7
Vitreous loss	9	19.57
Vitreous thrust	4	8.7
Excessive pigment dispersion	10	21.74

63 % of the eyes had intra - operative difficulties and complications.21.7 % eyes had excessive pigment dispersion, 19.57% of eyes had vitreous loss during surgery mostly due to posterior capsular rupture and subluxated lens.

Early Post - Operative Complications

Complications	Number of Eyes	Percentage (%)
Irido - cyclitis	32	69.6
Striate keratopathy	17	37
Residual cortical matter	7	15.2
Distorted pupil	5	10.9

Within 1 week of surgery, 69.6 % had iridocyclitis, 37% had striate keratopathy, 15.2 % had residual cortical matter in them and in 10.9 % of eyes the pupils were irregular or distorted.

Delayed Post - Operative Complications

Complications	Number of Eyes	Percentage (%)
Posterior Capsular Opacification	9	19.6
Distorted or irregular pupil	5	10.9
No complication detected	33	71.7

At 6 week post - operative check up 19.6% of the 46 eyes had posterior capsular opacification and 10.9% of eyes had distorted or irregular pupil.

Post Operative Best Corrected Visual Acuity (At 6 weeks)

Post – Operative Visual Acuity	Number of Eyes	Percentage (%)
Total IOL Implanted	45	99
6/6 – 6/9	14	30.4
6/12 - 6/18	12	26.1
6/24 – 6/60	14	30.4
<6/60	6	13.0

Of the 46 eyes in the study, intraocular lens was given in all except in 1 eye where the lens couldn't be given as the posterior capsule and the iris were grossly damaged due to trauma.

The Best corrected visual acuity (BCVA) of the involved eyes as recorded at 6th week post - operative check up are shown in the above table.30% of the eyes had BCVA of 6/6 or 6/9.26% of eyes had 6/12 or 6/18 vision.19.6% of eyes had post - operative vision of 6/24 or 6/36 and 23.9% of eyes had post - operative BCVA of 6/60 or less in the affected eye.

3. Discussion

Ocular trauma is the cause of blindness in approximately half a million people worldwide, and many more have suffered partial loss of sight. The impact of ocular trauma, in terms of need for medical care, loss of income and cost of rehabilitation services when indicated, clearly makes the strengthening of preventive measures very worthwhile. Trauma as a cause of visual loss is of undeniable public health importance.[5, 6]

Although, there has been continuous improvement in surgical techniques in recent years, the treatment of traumatic cataract in children and its final visual outcome has always been complicated by corneal opacity, amblyopia and strabismus. The type of injury, timing of surgery, associated ocular findings and the surgical technique used are important determining factors in the final visual outcome.[7]

In our study 70% cases were male. Studies conducted by **Jagannath C. et al.**[8] in 2015, **M Krishnatreya et al.**[3] and **Shazia Qayum et al.**[9] in 2016, **Beena and Jeyalatha**[10] in 2017, **Anitha S. Maiya et al.1**[1] and **Yu Du et al.** [12] in 2018

and **Cetin Akpolat et al.**[13] in 2019, observed that the percentage of males was high.

In our study 34.8% of the cases were in between 5 to 15 yrs of age. In 2011, **Nisar Ahmed et al.**[14] found that 83.3% cases were of age less than 35 years. **Ashish K Sharma et al**.[15], in his study in 2014, observed that 50% of the cases were of age less than 15 yrs. **Anitha S Maiya et al.**[11] in 2018, on the other hand observed that most of their cases fell in between the age group of 20 to 40 yrs.

In the present study 67% of the patients belonged to rural areas similar to studies conducted by **Mehul A. Shah et al.**[16] in 2011 and **Beena and Jeyalatha**[10] in 2017.

In studies conducted by **Samarth Mishra et al**.[17], **Shazia Qayum et al.**[9] and **Ying Qi et al.**[18] in 2016, it was observed that most of the patients were farmers.

Studies done by **M. Krishnatreya et al**.3 in 2016 and **Cetin Akpolat et al.**[13] in 2019, showed that most of the cases suffered from blunt trauma, just like the present study. On the other hand in studies by **Siddharam Janti et al**.[19] in 2014, **Ashish K. Sharma et al.**[15]and **Shazia Qayum et al.**[9] in 2016 and **Yu Du et al**.[12] in 2018, it was observed that most of the cases had penetrating injury.

In our study most patients presented within 1 yr of injury. In studies by **Jagannath C. et al.**[8] and **Ashish K. Sharma et al**.[15], the patients presented within 1 month of injury.

Our study showed iris injury to be most commonly associated finding. While studies by **Jagannath C et al**.[8], **Ashish K Sharma et al**.[15], **M Krishnatreya et al**.[3], **Beena and Jeyalatha**[10], **Anitha et al**.[11] found that the most common associated finding was corneal lesions. This again was due to the fact that most of the cases were due to penetrating injuries.

In the study conducted by **Siddharam Janti et al.**[19] in 2014, posterior capsule rupture was the most frequent intra - operative complication seen in 20% of the cases unlike our study where excessive pigment dispersion was most frequently observed. Again, **M Soleimani et al**.2[0]in their study found vitreous prolapse to be the most frequent on - table complication.

Within 1 week of surgery, 69.6 % of our patients had iridocyclitis similar to studies by **Siddharam Janti et al**.[19] and **Beena and Jeyalatha**[10] in 2017.

At 6 week post - operative check up 19.6% of our cases had posterior capsular opacification as late post - operative complication similar to study by **Beena and Jeyalatha**[10]

Similar to our study, in most other studies the best corrected visual acuity of majority of the patients was more than 6/18. In the study by **Beena and Jeyalatha**[10], the unaided post - operative visual acuity was 6/18 or better in 18.79%. In a study by **M Mangrane et al**.[21] in 2016, 82.97% of the eyes had best corrected visual acuity of better than 6/18.

4. Conclusion

Traumatic cataract is an important treatable cause of visual defect following ocular trauma. It can present both as an early or delayed consequence. It is common in children, who are always playful and ignorant and in young adults who are physically very active.

Males are the most common sufferers being exposed to outdoor and hazardous activities. Also most of the cases belong to outdoor workers in rural areas who are unaware of the consequences that may follow after ocular trauma.

Penetrating injuries are treated mostly in a two - step procedure where corneal repair is done first followed by cataract extraction and lens implantation at a later date.

Most important visual prognostic factor in case of traumatic cataract is the presence of injury to different other ocular structures. Injury to the cornea along the visual axis is the most important cause of low vision.

What can be done/What we derive from our study

It is important to make the general population aware about the consequences of ocular trauma and educate them to adopt precautionary measures, traumatic cataract patients should undergo prompt evaluation and prompt decision should be made regarding the treatment process as per the uniqueness of each individual case,

They should receive timely and adequate surgical intervention and proper management of complications, Compliance of the patients should be ensured with regard to application of medications and attending regular check - ups. With all measures taken positively, the burden of traumatic cataract can be grossly reduced in the population and excellent visual prognosis can be obtained in the traumatized eye.

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