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Visual Outcome of Unilateral Paediatric Traumatic Cataract at R. M. Kedia Eye Hospital, Birganj, Nepal

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ABSTRACT

Background & Objectives: To evaluate the visual outcomes of children presenting with unilateral traumatic cataract. **Materials & Methods:** We conducted a retrospective study of 111 children (70 males and 41 females) below 16 years of age who were diagnosed with unilateral traumatic cataract between June 2013 and May 2015 and who underwent surgical intervention and completed at least six months follow up at Paediatrics department (supported by ORBIS International), R. M. Kedia eye hospital, Birganj, Nepal. Data regarding demographic profile, causative agent, clinical course and visual outcomes were recorded. **Results:** There was a male predilection with a male to female ratio of 1.70:1. The age group more frequently affected was five to nine years (58.5%). Commonest causative agent was trauma with wooden stick in 20 eyes (18%) followed by firecrackers in 15 eyes (14%) and pen in 11 eyes (10%). Pre-existing posterior capsular defects were observed intraoperatively in six eyes. Anterior uveitis was evident in 21 cases and Posterior capsular opacification in 10 eyes. Best corrected visual acuity of 6/6-6/60 at six months was achieved in 91 cases (81%). Duration between injury and cataract surgery did not affect the final visual outcome of traumatic cataract patients. **Conclusion:** The best possible visual outcome of traumatic cataract depends on its management and its complication. Ocular trauma and traumatic cataract formation can be avoided by taking protective measures in sports, work and patient education.

Key words: Ocular trauma; Posterior capsular defects; Posterior capsular opacification; Traumatic cataract.

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INTRODUCTION

Ocular trauma is the most common cause of unilateral blindness worldwide.[1] Traumatic cataract is a common sequelae of ocular injuries in paediatric populations, particularly in developing countries.[2,3] The incidence of ocular injuries varies in different parts of the world. From India the reported incidence is 20.53%[4] and from Pakistan it is 12.9%.[5] In Nepal, ocular trauma is considered as a second leading cause of blindness after cataract. An estimated 7.9% of all blindness in Nepal is caused by ocular trauma.[6] Management of traumatic cataract that results from either blunt or penetrating ocular trauma needs special consideration because of associated injury to ocular and periorbital structures.

Surgery of traumatic cataract can be primary or secondary. Primary cataract removal is recommended if the lens is fragmentized, swollen or if there is pupillary block. It allows to see the posterior segment otherwise blocked by lens opacity. Secondary cataract removal is more beneficial because of improved visibility, proper intraocular lens calculation, and less chances of post-operative inflammation.[6]

The aim of this study was to evaluate the final visual outcome of a series of patients with secondary extraction of traumatic cataract along with demographic features and modes of trauma.

MATERIALS AND METHODS

We conducted a retrospective study of 111 children (age<16 years) of both gender with unilateral traumatic cataract between June 2013 and May 2015 who underwent surgical intervention and completed at least 6 months follow up at Paediatrics department (supported by ORBIS International), R. M. Kedia eye hospital, Birganj, Nepal. Children with unsure history of trauma, unavailable post-operative visual acuity (usually due to age

limitation) or poor records were excluded from the study.

Cataract removal was performed as a second and separate procedure in patients of perforating ocular injury and intraocular lens implantation was performed only in patients with adequate capsular support. Patients without any capsular support were kept aphakic. Anterior vitrectomy was performed in children with posterior capsular tear and vitreous prolapse. At each follow up (one day, one week, six weeks, three months and six months) visual acuity was recorded. Final best corrected visual acuity (BCVA) was recorded on 5th post-operative follow up visit i.e. six months.

Data regarding demographic profile, mode of injury, onset and duration, types of injury, intra ocular pressure, laterality, slit lamp examination findings, B-scan findings, associated anomalies, pre -operative and post-operative BCVA and complications were noted. It was then analyzed using SPSS version 17.0 and expressed as frequencies, percentages, mean and standard deviation.

RESULTS

Out of a total 111 children with unilateral traumatic cataract, there were 70 (63%) males and 41 (37%) females with a male to female ratio of 1.70:1. The paediatric age group was studied below 16 years of age and the majority of the patients (49%) belong to the age group five to nine years. Laterality was more common in left eye (59%) than right eye (41%) and 71 (64%) eyes had blunt injuries compared to 40 (36%) sharp injuries. Average time to clinical evaluation was <1 month in 55 (49%) cases followed by one to months in 28 (25 %) cases (Table I).

Demographically, majority of children were from Bihar 69 (62 %) and Uttar Pradesh 10 (9%) of India while from Nepal there were 32 (29%) cases. Majority were Hindu 69 (62 %) compared to Muslim population 42 (38%).

The numbers of cases were more of closed globe injury 64% compared to open globe injury 36%. In majority of the cases i.e. 63%, intra ocular pressure was in 15-19 mm of Hg subgroups.

Out of the 71 injuries caused by blunt objects, most was caused by stick (28.2%) and fire crackers (21.1%). For injuries caused by sharp objects (n=40), the most common cause of injury was pen (27.5%) and iron nail (22.5%) (Table II).

The pre-operative visual acuity was PL (perception of light) in 60 (54%), HM (Hand movement) in 26 (23%), FC (Finger counting at 1m -5m) in 18 (13%) and 6/60-6/18 in seven (10 %) cases. BCVA post-operative vision (6/6-6/60) was majority in 91 (81 %), FC at 1m -5m in 11(10 %), HM in 5 (5 %) and cannot assess in 4 (4%) cases (Table III).

Post traumatic morphological associated anomalies included corneal opacity in 35 (31%), posterior synechiae in 30 (27%) cases while secondary glaucoma in 2% and retinal detachment in 2% of the cases.

Eyes were operated once a week on general anesthesia day under supervision of an expert anesthesiologist and paediatric ophthalmologist. PCIOL (posterior chamber intraocular lens) was implanted successfully nearly in all the cases and anterior vitrectomy was done with PPC (primary posterior capsulotomy) in children below five years. The major post-operative complications included anterior uveitis in 21 (19%), PCO (posterior capsular opacity) in 10 (9%) and corneal edema in 10 (9%) cases which responded to medical therapy and RD (retinal detachment) in three (3%) cases. In cases of PCO, Nd Yag laser was done and visual acuity improved to 6/9-6/18. On first post-operative day, majority of patient had visual acuity ranging between <3/60 to 6/36, on sixth week greater part had between 6/36 to 6/6; at sixth month the BCVA was 6/18 or better in majority of the patients. The main causes of no improvement in visual acuity were corneal opacity and high astigmatism.

Table 1: Demographics and injury characteristics of paediatric patients with unilateral traumatic cataract (n=111)

Characteristics		No	%
Age range (yrs)	1-4	13	11.71
	5-9	54	48.65
	10-14	37	33.33
	>15	7	6.30
Gender	Male	70	63
	Female	41	37
Laterality	Right eye	46	41.4
	Left eye	65	58.6
Type of injury	Penetrating	40	36
	Blunt	71	64
Onset	<1 month	55	49.5
	1-6 month	28	25.2
	7-12 month	5	4.5
	>12 month	23	20.7

DISCUSSION

This study included 111 cases of unilateral traumatic cataract managed at the Paediatrics department, R.M. Kedia eye hospital, Birganj. Traumatic cataract is one of the most common outcomes of ocular injuries. There is a one to 15 % incidence of traumatic cataract in ocular injuries.[7] Trauma is the leading cause of 90% of acquired paediatric cataracts.[8]

In this study, male preponderance was found with a male to female ratio of 1.70:1. It is due to more involvement of males in fields, streets and outdoor activities. Worldwide, males are more commonly involved in traumatic cataract than females.[9-11]

Zaman et al stated that majority (50.64%) of traumatic cataract patients ranged between five to 15 years, 10 which is consistent with the present findings i.e. 49% of patients ranged between 5-9 years of age.

Most of the injuries were caused by blunt objects similar to previous studies.[12-14] In above studies, stick was the most common object which could be attributed to the fact that agriculture is the main profession of the people living in these areas. It could also explain the sharp trauma caused by grass tips and bamboo and the blunt trauma caused by buffalo/cow/goat horns.

Fifty five percentage of the patients presented in less than 24 hours while 28% patients presented after two weeks. A very large population of patients with ocular traumatic cataract showed a delay of more than 24 hours before arrival at hospital. This percentage is 10% less than Zaglbaum et al[14] study on urban eye trauma.

In our study more than 28% patients waited for more than two weeks before seeking help. Since majority of people residing around our hospital are poor, economic factors might have influenced their decision to wait for things to get better. Delay in presentation of trauma more than one week caused a significant worse visual outcome. The population will need to be educated about the possible consequences of ocular injury and delay in presentation at hospital.

In this study, 54% of patients preoperative BCVA were perception of light only where as 29% patients have visual acuity of only >=5/60. This may be due to fact that patients in these areas present late in hospital.

The associated injuries with traumatic cataracts are corneal opacity in 31%, posterior synechiae in 27%, secondary glaucoma in two percent and retinal detachment in two percent of the cases. Ozer et al reported lower incidence of secondary glaucoma in four percent of the cases. Our study findings are consistent with the above findings.[15]

The BCVA post-operative visual acuity was better than 6/60 in 80% of the patients. This may be due to the fact that many patients had corneal opacity obscuring the visual axis. Sohail zia et al[16] showed a final visual acuity of more than 6/60 was achieved. Delay in management affects the visual outcome seriously.

Post-operative complications included anterior uveitis in 21 cases, PCO in 10 cases, corneal edema in 10 cases which responded to medical therapy and RD in three cases. Cheema et al[17] reported that the

Table 2: Agents of ocular trauma

Agents		No	%
Blunt (n=71)	Stick	20	28.2%
	Fire-Cracker	15	21.1%
	Iron	8	11.3%
	Ball	7	9.9%
	Stone	7	9.9%
	Mud	7	9.9%
	Lattu	4	5.6%
	Leaf	3	4.2%
Sharp (n=40)	Pen	11	27.5%
	Iron nail	9	22.5%
	Finger	5	12.5%
	Needle	4	10.0%
	Glass	3	7.5%
	Knife	3	7.5%
	Gully danda	3	7.5%
	Arrow	2	5.0%

Table 3: Pre and Post-operative best corrected visual acuity (BCVA)

Best corrected visual acuity (BCVA)		No	%
Pre-operative visual acuity (n=111)	6/60-6/18	7	6
	FC at 1- 5m	18	16
	HM (CF)	26	24
	PL	60	54
Post-operative visual acuity (n=111)	6/6-6/60	91	81
	FC at 1- 5m	11	10
	HM (CF)	5	5
	PL	4	4

FC: Finger count
HM: Hand movement
PL: Perception of light

fibrinous uveitis was the most common postoperative complication (25%).

CONCLUSION

Blunt injuries were seen more in these children. The best possible visual outcome of traumatic cataract depends on its management and complications. Ocular trauma and traumatic cataract formation can be avoided by taking protective measures in sports, work and patient education.

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