ORIGINAL ARTICLE

VISUAL OUTCOME OF PAEDIATRIC TRAUMATIC CATARACT IN PAEDIATRIC OPHTHALMOLOGY DEPARTMENT OF A TERTIARY CARE HOSPITAL

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Background: Paediatric traumatic cataract is one of leading treatable cause of childhood blindness. The purpose of this study is to analyse number of avoidable blindness in children and to access final visual outcomes, causative factors, strategies for the prevention and management. **Methods:** One hundred and twenty patients of ocular traumatic cataract age between 2 months to 14 years were treated in Department of Paediatric Ophthalmology from April 2019 till April 2020wasprospectivelyreviewed. Data included age, gender, time of presentation, type of injury, anterior segment with fundus examination, time and type of surgery, visual outcome at presentation and final visual outcome. Visual acuity was assessed by fixation and following, Snellen's chart according to patient's age. Some patients underwent for lens aspiration and rest underwent for lens aspiration, posterior capsulotomy and anterior vitrectomy followed by intraocular lens implantation under general anaesthesia. Patients who lost follow ups for two months were not included in study. Analysis of data was done using SPSS for window version 24.0. **Results:** One hundred and twenty eyes operated for traumatic cataract among which 64 (53.34%) patients were males and 56 (46.66%) were females. The average age of patients was 7.8 years with traumatic cataract. Initial Uncorrected visual out come at the time of presentation ranged from 6/60 to light perception. 15 %of children with traumatic cataract had post-operative final visual outcome of better than 6/18. **Conclusion:** The commonest cause of ocular injuries in our pediatric ophthalmology department was domestic, mostly in 5–9 years of age with greater number in males. In traumatic cataract extraction final visual outcome depends on initial visual outcome, source and type of injury, duration of presentation, duration of surgery and complications.

Keywords: Trauma; Cataract; Children

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INTRODUCTION

Leading cause of unilateral blindness of developed world is ocular trauma.[1] A study conducted in 2006 which showed that 52 thousand children are visually impaired or blind in Pakistan.[2] Annual number of ocular trauma estimated by a study was 55 million[3] with prevalence of 10 per 10,000[4]. Approximately 1.5 million children are blind worldwide[5] and blindness control in paediatric population has very much importance in WHO's The Right to Sight Program[5].

Ocular trauma is on the top among acquired causes of preventable and treatable blindness in children.[7,8] Among preventable causes of monocular visual deterioration, ocular trauma is 2nd most common following amblyopia.[9] Ocular trauma can cause cataract(10), which is among one of leading treatable cause of childhood blindness.[11,12] Due to close parental care for children the number of ocular traumas are less in children age lesser than 3 years but the incidence increases in school going age.[13] Traumatic cataract can be removed primarily or secondarily. Criteria for primary cataract removal includes if the pupillary block is caused by swollen lens, lens is fragmentized and in a case of posterior segment examination required which is obscured by dens cataract.[14] Secondary cataract removal is much valuable due to improved visibility, intraocular lens power calculation and lesser chance of postoperative inflammation.[14]

Long term follow up is required in management of cataract in children which includes postoperative refractive error correction and amblyopia therapy.[15–17]

The purpose of this study is to analyse number of avoidable blindness in children and to access final visual outcomes, causative factors, strategies for the prevention and management.

MATERIAL AND METHODS

One hundred and twenty cases of paediatric ocular traumatic cataract aged 2 months to 14 years were treated in Department of Paediatric Ophthalmology

from April 2019 till April 2020 was prospectively reviewed. Data included age, gender, type of injury, time of presentation, slit lamp examination, time of surgery, initial and final visual outcome. Visual acuity was analysed by fixation and following, Snellen's chart according to patient's age. Some patients underwent for lens aspiration and rest underwent for lens aspiration, posterior capsulotomy and anterior vitrectomy followed by intraocular lens implantation under general anaesthesia. Posterior capsulotomy was not done in those patients where the posterior capsule was already deficient. Intraocular lens (IOL) was implanted in the same sitting in children older than one year of age whereas children less than one year old were left aphakic with aphakic glasses and underwent a secondary intraocular lens implantation after the age of one year. Patients were followed on weekly, monthly, and 3 monthly after surgery. SRK II formula was used for IOL power calculations. Power of IOL was reduced up to 20% in children less than one year of age and up to 10% in children 2–8 years of age. Inclusion criteria included patient younger than 14 years old, patients of either gender, patient underwent for lens aspiration with primary or secondary IOL implantation for traumatic cataract, patient given informed consent. Exclusion criteria included patients with hypopyon, cases that IOL implantation was not possible, trauma to posterior segment and patients who were lost to follow up for two months. Analysis of data was done using SPSS for window version 24.0.

RESULT

Over a period of 1 year 120 patients were operated for traumatic cataract among which 64 (53.34%) patients were males and 56 (46.66%) was females. Most of the patients presented were with age between 5–9 years (46.67%) with average age of 7.8 years. Gender and age distribution is shown in table 1, 2.

Most common type of injury was domestic. Seventy-eight (65.1%), among them most were caused by sharp objects 36 (30%) followed by blunt object 25 (20.9%). Domestic injuries are followed by road traffic accidents 24 (20%). Table-3

Open globe injuries were 96 (80%) while closed globe injury was 24 (20%). In case of penetrating injuries, cataract surgery was performed with in 1 month of the primary corneal perforation repair. Details of different procedures performed are given in table-4.

Among all patients, 67 (55.83%) presented within 12 hours of injury while 26 (21.67%) presented between 12–24 hours, rest presented after more than 24 hours of trauma. Table-5

No complications were recorded during any surgery. Complications at 1 week included corneal oedema (0.002%), retinochoroidal detachment (0.002%), anterior chamber reaction (0.051%) and IOL capture (0.005%).

Final visual outcome has strong association with initial visual outcome, type and source of injury and management. At presentation, most of the patients presented with uncorrected visual outcome ranged from 6/60 to light perception.

Final visual acuity which was measured at 3rd months of follow up was 6/6–6/18 in 18 eyes (15%), 6/24–6/60 in 30 eyes (25%), 5/60–3/60 in 60 eyes (50%), less than 2/60 in 12 eyes (10%). Table-6.

Among patients of open globe injury 50% were having final visual outcome of better than 6/60 while patients with closed globe injuries were having 46.6% with visual outcome better than 6/60. Among patients which were having final visual outcome better than 6/60, 72.9% of them presented within 12 hours of injury.

Table-1: Distribution of cases by Age

Age	n	Percentage
2 months 4 years	20	16.67
5–9 years	56	46.67
10–14 years	44	36.66
Total	120	100

Table-2: Distribution of cases by age gender

Gender	n	Percentage
Males	64	53.34
Females	56	46.66
Total	120	100

Table-3: Distribution of cases by source of injury

Source of injury	n	Percentage
Sharp object	36	30.0
Blunt object	25	20.9
Fall	17	14.2
Traffic accidents	24	20.0
Wood	8	6.6
Sport equipment	10	8.3
Total	120	100

Table-4: Procedures done

Procedures	No. of Cases
Lens aspiration + IOL	80 (66.67%)
Lens aspiration alone	20 (16.67%)
Secondary IOL in bag	09 (07.50%)
Scleral fixation	11 (09.17%)
Total	120(100%)

Table-5: Distribution of Cases by Time of presentation

Time of Presentation	n	Percentage
Before 12 Hours	67	55.83
12 – 24 Hours	26	21.67
After 24 Hours	27	22.5
Total	120	100

Table-5: Distribution of cases by time of presentation

Age	6/6–6/18 n (%)	6/24-6/60 n (%)	5/60-3/60 n (%)	2/60-Pl n (%)	Total
2 m– 4yrs	4 (20.00)	4 (20.00)	10 (50.00)	2 (10.0)	20
05 –09yrs	6 (10.72)	12 (21.42)	36 (64.29)	2 (3.57)	56
10 –14yrs	8 (18.18)	14 (31.82)	14 (31.82)	8(18.18)	44
Total	18 (15.0)	30 (25.00)	60 (50.00)	12 (10)	120

DISCUSSION

Ocular trauma is foremost cause of ninety percent of acquired paediatric cataract.[18] The chance of traumatic cataract is 1–15% in ocular injuries.[19] In our study on traumatic cataract we found that most common age group prone to paediatric ocular trauma was 5–9 years of age. The involvement of this age group is due to heroic nature and activities without care and inability to recognize the essence of harmful objects. Good parental care in children below this age decreases the risk while age above this limit has a better sense of hazards. Some studies already proven that age between 5–9 years are more prone to ocular trauma.[20,21] Boys had a higher rate of ocular trauma than that to girls and the reason behind that was found their more involvement in outdoor activities and sports as other studies also stated the same.[22–24]

In our study domestic injury (65.1%) was the leading cause of ocular trauma which is similar to other studies.[25–27] 67(55.83%) cases presented before 12 hours of injury while 26 (21.67%) between 12–24 hours, rest presented after 24 hours of trauma. Patients who presented before 12 hours were having better final visual acuity than those who presented late and this has been also proven in study.[28]

Causative agents of ocular trauma are different in different region of world. In our study sharp objects (30%) like knife, pen, scissor, and broken glass were on the top. Source of trauma were also same in a study done in India[21] but it was different in countries that is stone in Norway, metallic objects in Turkey and toys in United Kingdom[29–31].

Final visual acuity was affected by the type of trauma, corneal scarring, astigmatism secondary to primary corneal tear repair and amblyopia due to late presentation in cataract caused by blunt trauma.

Intraocular lens (IOL) Implantation in traumatic eyes after cataract removal depends on capsular support. In case of sufficient capsular bag and zonular support, capsular bag or sulcus fixation is preferred. Patients with insufficient capsular or zonular support Anterior chamber IOL, Scleral fixation IOLs, and Artisan lenses are preferred.[32–34]

Posterior chamber IOLs was implanted in 89 patients in our study while in 11 patient's scleral fixation was performed. Most of these surgeries done within month of trauma.

Postoperative complications were managed accordingly. Corneal oedema was managed with hypertonic saline eye drops, Fibrinoid reaction which was also reported as a common complication by cheema[35], managed with topical and systemic steroids and in a few cases with sub-conjunctival mydricaine injection. Intraocular lens catch were fixed with redialing. Posterior capsular opacification is avoided by posterior capsulotomy and anterior vitrectomy at the time of primary surgery. Posterior capsular opacification is shown a common complication in many studies.[36,37]

Our study shows a pleasing final visual outcome of traumatic cataract removal and IOL implantation. We concluded that final visual outcome was 6/6–6/18 in 18 eyes (15%), 6/24–6/60 in 30 eyes (25%), 5/60–3/60 in 60 eyes (50%), less than 2/60 in 12 eyes (10%).

The main factors that cause no further improvement in final visual outcome were corneal scars, high astigmatism, and amblyopia and retinal complications secondary to trauma.

Limitations of our study are many. Patients who lost their follow ups, poor hygienic control and have poor drug compliance could affect the overall visual outcome. The study does not reflect the epidemiological aspects of paediatric traumatic cataract because of being a small-scale study.

CONCLUSION

The study concludes that leading cause of ocular injury in our paediatric ophthalmology department was domestic with most of the injuries were in 5–9 years of age with greater number in males. In traumatic cataract extraction final visual outcome depends on initial visual outcome, type and source of injury, duration of presentation and time taken for surgery.

Therefore, more awareness is required in parents or guardians regarding prevention of childhood ocular trauma and by using protective glasses during high-risk activities to prevent ocular trauma and to get an early ophthalmological opinion after any ocular trauma.

AUTHORS' CONTRIBUTION

RKC: literature search and conceptualization of study design. AUR: Data analysis and data interpretation.

MNQK, MD: Data collection and write up. GQK: Proof reading.

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