

Pediatric Cataract Surgery Audit at a Tertiary Care Center in Karachi

Rabia Khawar Chaudhry¹, Nasar Qamar Khan², Weijai Kumar Dembra³, Areej Riaz⁴, Gaintry Vickash⁵
^{1,3,4,5}Department of Ophthalmology, Jinnah Postgraduate Medical Centre, ²Hashmani Hospital, Karachi

ABSTRACT

Purpose: To perform pediatric cataract surgery audit at a tertiary care center in Karachi.

Study Design: Descriptive observational study.

Place and Duration of Study: From January, 2016 to July, 2018 at Ophthalmology Department of Jinnah Postgraduate Medical Center, Karachi.

Material and Methods: All patients with congenital cataract were included in study regardless of presence or absence of systemic association. Patients who were lost to follow up at three months were excluded from the study. Hospital records were reviewed retrospectively and data on patient demographics, preoperative presentations, intraoperative complications and postoperative visual outcomes was documented on predesigned proformas. All patients underwent lens aspiration, posterior capsulotomy and anterior vitrectomy. Surgeries were performed under general anesthesia. Preoperative and postoperative visual acuity was assessed with ability to fix and follow light/objects, Kay picture test and Snellen's chart according to patient's age.

Results: Three hundred and twenty six eyes underwent surgery for congenital cataract and sixty for traumatic cataract. Number of male patients was 54.93% and female was 45.07%. The average age of patients with congenital cataract was 5.01 years and that for traumatic cataract was 7.8 years. Amblyopia, nystagmus and strabismus were the commonest ocular comorbidities. Uncorrected visual acuity ranged from 6/18 to light perception preoperatively. Postoperatively 55% children with congenital cataract and 15% children with traumatic cataract had visual acuity better than 6/24.

Conclusion: Early surgery in congenital cataract gives good visual outcomes. In traumatic cataract extraction, the final visual outcome depends on other effects of trauma on ocular structures.

Key Words: Congenital cataract, Traumatic Cataract, posterior capsulotomy.

How to Cite this Article: Chaudhry RK, Khan NQ, Dembra WK, Riaz A, Vickash G. Pediatric Cataract Surgery Audit at a Tertiary Care Center in Karachi, Pak J Ophthalmol. 2020; **36 (1)**: 38-42.

DOI: <https://doi.org/10.36351/pjo.v36i1.898>.

INTRODUCTION

Control of blindness in children is a priority area in World Health Organization's VISION 2020–The Right to Sight Program¹. Approximately 1.5 million children are blind worldwide and 75% of them belong to developing countries². The estimated prevalence of

blindness in Pakistani children is 10 per 10,000³. Studies have shown that majority of causes of childhood blindness are either preventable or treatable⁴. Cataract, among them, remains the leading treatable cause of childhood blindness^{5,6}. Globally 5-20% of blindness in children is attributable to congenital cataract⁶. In a study conducted in Peshawar, Pakistan revealed that 23% of visually handicapped children had congenital cataract⁷.

Unlike adult cataract, the management of cataract in children involves not only extraction of cataract and

Correspondence to: Rabia Chaudhry
Consultant Ophthalmologist,
Jinnah Postgraduate Medical Center, Karachi
Email: rabiachaudhry19@gmail.com

implantation of intraocular lens but also includes postoperative refractive error correction and amblyopia therapy for which regular long term follow up is required⁸⁻¹¹. Delay at presentation and loss to follow up due to lack of awareness and other socioeconomic factors are major hurdles in visual rehabilitation of children with cataracts⁴. This retrospective study reviews the preoperative presentations, procedures done and the postoperative outcomes of pediatric cataract surgery at Jinnah Postgraduate Medical Center, Karachi.

MATERIAL AND METHODS

All patients between 2 months to 14 years who presented to Pediatric Ophthalmology, Outpatient Department of Jinnah Postgraduate Medical Center, Karachi and underwent surgery for congenital or traumatic cataract from January, 2016 to July, 2018 were recruited in this study. Patients were selected through convenience sampling. All patients with congenital cataract were included regardless of presence or absence of systemic association. Patients who were lost to follow up at three months were excluded. Hospital records were reviewed retrospectively and data on patient demographics, preoperative presentations, intraoperative complications and postoperative visual outcomes was documented on predesigned proformas. The study was approved by ethical review board of Jinnah Postgraduate Medical Center. Cataract existing at birth or developing within first four weeks of birth was considered congenital. Cataract developing any time after blunt or penetrating trauma was labeled as traumatic cataract. All patients underwent lens aspiration, posterior capsulotomy and anterior vitrectomy. Posterior capsulotomy was not done in those cases of traumatic cataract 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 underwent a second surgery for intraocular lens implantation after one year of age. Patients left aphakic were prescribed aphakic glasses. Intraocular lens power was calculated using SRK II formula. Calculated IOL power was reduced 20% in children less than one year of age and 10% in children 2-8 years of age. Surgeries were performed under general anesthesia by an experienced pediatric ophthalmologist. Postoperatively all patients were put on topical steroid and antibiotics for six weeks and

oral steroids for one week. Preoperative and postoperative visual acuity was assessed with ability to fix and follow light/objects, Kay picture test and Snellen's chart according to patient's age.

RESULTS

A total of 386 eyes of 279 patients were operated. Gender and age distribution is shown in table 1 and 2 respectively. Average age of patients with congenital cataract was 5.01 years whereas for traumatic cataract it was 7.8 years.

Table 1: Gender Distribution.

	Gender		Total
	Males	Females	
Traumatic	32 (53.34%)	28 (46.66%)	60 (100%)
Congenital	180 (55.22%)	146 (44.78%)	326 (100%)
	212 (54.93%)	174 (45.07%)	386

Table 2: Age Distribution.

Age	Congenital Cataract	Traumatic Cataract
2 months - 4 years	213 (65.34%)	10 (16.67%)
5 years - 9 years	66 (20.24%)	28 (46.67%)
10 years - 14 years	47 (14.42%)	22 (36.66%)
	326 (100%)	60 (100%)

At presentation, uncorrected visual acuity ranged from 6/18 to light perception. All patients presented with leucocoria. Amblyopia (30.98%), nystagmus (4.6%), strabismus (3.2%), microphthalmos (0.9%) and glaucoma (2.4%) were the associated ocular comorbidities in congenital cataract. Six children with congenital cataract had systemic association of cerebral palsy, four had patent ductus arteriosus, one had tetralogy of Fallot and one had homocystinuria. Four patients with congenital cataract had positive TORCH (toxoplasma, rubella, cytomegalovirus, herpes simplex) profile. Eighty percent cases of traumatic cataract were secondary to penetrating injuries and twenty percent were secondary to blunt trauma. In case of penetrating injuries, the primary corneal perforation repair had been done 1-2 months prior to the cataract surgery. Details of different procedures performed are given in table 2.

No intraoperative complications were recorded. All patients presented at 1 week for postoperative evaluation, 80% at 4 weeks and 60% at 12 weeks

postoperatively. The follow-up rate declined with time which precluded proper refraction and amblyopia management. Complications at 1 week included corneal edema (0.002%), retinobulbar detachment (0.002%), anterior chamber reaction (0.051%) and IOL capture (0.005).

Twelve weeks post-operatively (table 4 and 5), after the management of complications and amblyopia, 83% children with congenital cataract had visual acuity ranging from 6/6 to 6/60 and 17% had visual acuity ranging from 6/60 to light perception. As for traumatic cataract, 40% had postoperative vision better than 6/60.

Table 3: Procedures done.

Procedures	No. of Cases
Lens aspiration alone	98 (25.4%)
Lens aspiration + IOL	188 (48.5%)
Secondary IOL in bag	89 (23.1%)
Scleral fixation	11 (2.7%)

Table 4: Postoperative visual acuity at 3 months for congenital cataract.

Age	6/6 - 6/24	6/36 - 6/60	5/60 - 3/60	2/60 - PL	Total
2 mo - 4 yrs	140 (65.72%)	55 (25.82%)	16 (7.52%)	2 (0.94%)	213
5 yrs - 9 yrs	30 (45.45%)	20 (30.30%)	14 (21.21%)	2 (3.04%)	66
10 yrs - 14 yrs	10 (21.28%)	15 (31.92%)	19 (40.42%)	3 (6.38%)	47
Total	180 (55.22%)	90 (27.61%)	49 (15.03)	7 (2.14%)	326

Table 5: Postoperative visual acuity at 3 months for traumatic cataract.

Age	6/6 - 6/24	6/36 - 6/60	5/60 - 3/60	2/60 - PL	Total
2 mo - 4 yrs	2 (20%)	2 (20%)	5 (50%)	1 (10%)	10
5 yrs - 9 yrs	3 (10.72%)	6 (21.42%)	18 (64.29%)	1 (3.57%)	28
10 yrs - 14 yrs	4 (18.18%)	7 (31.82%)	7 (31.82%)	4 (18.18%)	22
Total	9 (15%)	15 (25%)	30 (50%)	6 (10%)	60

DISCUSSION

In children, the most common cause of blindness is cataract^{4,12}. Approximately 5-20% of childhood blindness is attributable to pediatric cataracts worldwide⁶. The only treatment for cataract is surgery. For congenital cataracts, the average age at presentation was 5.01 years. Late presentation was mainly due to lack of awareness and poor socioeconomic backgrounds. Delay in presentation was a major hurdle in visual rehabilitation as amblyopia developed in most cases presenting after 3 years and earlier in those having dense cataracts. Good visual outcome was achieved in most children who presented early and did not have any associated ocular comorbidity whereas in the presence of nystagmus and strabismus, visual acuity was only slightly improved. Previous studies^{8,9} too showed that nystagmus and strabismus at presentation compromised the final visual outcome. Similar results were found in a study conducted by Latif et al, where it was revealed that improvement in visual acuity was seen in 96% of children presenting in 3-5 years of age whereas only in 2% of cases presenting in 6-8 years of age¹³. In case of traumatic cataracts¹⁴⁻¹⁶, visual outcome was affected by the type of trauma. Most cases were of penetrating trauma where a corneal tear had been repaired in a prior surgery. This resulted in corneal scarring and astigmatism that reduced the degree of final visual

improvement. In cases of cataract secondary to blunt trauma, often the presentation was late resulting in amblyopia. Therefore, awareness should be raised to prevent ocular trauma and to get an early ophthalmological examination done in case of any ocular injury.

One child with congenital cataract developed corneal edema from the first postoperative day, which was managed with hypertonic saline eye drops but still resulted in corneal decompensation and opacification. Choroidal and retinal detachment was seen in one child who underwent scleral fixation. Fibrinoid reaction¹⁷ was seen in 20 children and it was more commonly observed after traumatic cataract extractions in our study. It was managed successfully with topical and systemic steroids and in a few cases with sub-conjunctival mydracaine injection. Intraocular lens catch was seen in two children at one week and it required realling. Other studies showed posterior capsular opacification to be a common complication¹⁸⁻²⁰, but we avoided it in all cases by posterior capsulotomy and anterior vitrectomy at the time of primary surgery. The rate of posterior capsular opacification is very high in children and the primary aim of cataract surgery is to get a clear visual axis. Therefore, posterior capsulotomy with anterior vitrectomy has become the gold standard in treatment of congenital cataract¹⁸⁻²¹.

Most of the patients came for follow up visits till one month but after that follow up rate declined. This hindered the management of amblyopia where needed.

After management of postoperative complications and amblyopia therapy, Latif et al reported that 51% of eyes achieved best-corrected visual acuity (BCVA) > 6/24¹³. Kim et al reported improved visual acuity in 51.7% of patients⁶. Lai et al showed improvement in 50% of patients²¹. Magnusson et al reported 50% of children achieved improvement in vision after surgery²². Our study showed comparable results with visual acuity better than 6/24 in 55% cases of congenital cataract and in 15% cases of traumatic cataract.

It is important to raise awareness regarding early surgery of childhood cataract and also to teach parents of children with cataract to maintain good follow up so that maximal improvement in vision can occur. Awareness should also be raised among parents/guardians regarding prevention of childhood ocular trauma and about getting early ophthalmology opinion after any ocular injury.

CONCLUSION

This study concludes that early cataract surgery gives a good visual outcome in congenital cataract whereas in case of traumatic cataract extraction, the visual outcome depends on other manifestations of trauma.

Ethical Approval

The study was approved by the Institutional review board/Ethical review board.

Conflict of Interest

Authors declared no conflict of interest.

Authors' Designation and Contribution

Rabia Khawar Chaudhry; Consultant Ophthalmologist: *Data Collection, Manuscript Writing, final manuscript review.*

Nasar Qamar Khan; Consultant Ophthalmologist: *Data Collection, Manuscript Writing, final manuscript review.*

Weijai Kumar Dembra; Consultant Ophthalmologist: *Data Collection, Manuscript Writing, final manuscript review.*

Areej Riaz; Postgraduate Resident: *Manuscript Writing, final manuscript review.*

Gaintry Vickash; Postgraduate Resident: *Manuscript Writing, final manuscript review.*

REFERENCES

1. **Gogate P, Gilbert C.** Blindness in children: a worldwide perspective. *Community Eye Health*, 2007; **20 (62)**: 32-33.
2. **Sethi S, Sethi MJ, Saeed N, Kundi NK.** Pattern of common eye diseases in children attending outpatient eye department Khyber Teaching Hospital. *Pak J Ophthalmol.* 2008; **24**: 166-71.
3. **Mahdi Z, Munami S, Shaikh ZA, Awan H, Wahab S.** Pattern of eye diseases in children at secondary level eye department in Karachi. *Pak J Ophthalmol.* 2006; **22**: 145-51
4. **Umar MM, Abubakar A, Achi I, Alhassan MB, Hassan A.** Pediatric cataract surgery in National Eye Centre Kaduna, Nigeria: Outcome and challenges. *Middle East Afr J Ophthalmol.* 2015; **22 (1)**: 92-96.
5. **Chandna A, Gilbert C.** When your eye patient is a child. *Community Eye Health*, 2010; **23 (72)**: 1-3.
6. **Kim KH, Ahn K, Chung ES, Chung TY.** Clinical outcomes of surgical techniques in congenital cataract. *Korean J Ophthalmol.* 2008; **22 (2)**: 87-91.
7. **Butt IA, Jalil M, Waseem S, Abdul Moqeeet, Inam-ul-Haq M.** Spectrum of congenital and developmental anomalies of eye. *Al Shifa J Ophthalmol.* 2007; **3**: 56-60.
8. **Shah MA, Shah SM, Shah AH, Pandya JS.** Visual outcome of cataract in pediatric age group: does etiology have a role. *Eur J Ophthalmol.* 2014; **24 (1)**: 76-83.
9. **Sethi S, Sethi MJ, Hussain I, Kundi NK.** Causes of amblyopia in children coming to ophthalmology outpatient department, Khyber Teaching Hospital, Peshawar. *J Pak Med Assoc.* 2008; **58 (3)**: 125-8.
10. **Lim Z, Rubab S, Chan YH, Levin AV.** Management and outcomes of cataract in children: the Toronto experience. *J AAPOS.* 2012; **6 (3)**: 249-254.
11. **Amaya L, Taylor D, Russell-Eggitt I, Nischal KK, Lengyel D.** The morphology and natural history of childhood cataracts. *Surv Ophthalmol.* 2003; **48 (2)**: 125-144.
12. **Foster A, Gilbert C, Rahi J.** Epidemiology of cataract in childhood: a global perspective. *J Cataract Refract Surg.* 1997; **23 (S.1)**: 601-604.
13. **Latif K, Shakir M, Zafar S, Rizvi SF, Naz S.** Outcomes of Congenital Cataract Surgery in a Tertiary Care Hospital. *Pak J Ophthalmol.* 2014; **30 (1)**: 28-32.
14. **Sharma AK, Aslami AN, Srivastava JP, Iqbal J.** Visual Outcome of Traumatic Cataract at a Tertiary Eye Care Centre in North India: A Prospective Study. *J Clin Diagn Res.* 2016; **10 (1)**: 5-8.

15. **Adlina AR, Chong YJ, Shatriah I.** Clinical profile and visual outcome of traumatic paediatric cataract in suburban Malaysia: a ten-year experience. *Singapore Med J.* 2014; **55 (5):** 253–256.
16. **Kinori M, Tomkins-Netzer O, Wagnanski-Jaffe T, Ben-Zion I.** Traumatic pediatric cataract in southern Ethiopia—results of 49 cases. *J AAPOS.* 2013; **17:** 512-15.
17. **Nishi O.** Fibrinous membrane formation on the posterior chamber lens during the early postoperative period. *J Cataract Refract Surg.* 1988; **14 (1):** 73-7.
18. **Vasavada A, Desai J.** Primary posterior capsulorhexis with and without anterior vitrectomy in congenital cataracts. *J Cataract Refract Surg.* 1997; **23 (S1):** 645-51.
19. **Petric I, Lonèar VL.** Surgical technique and postoperative complications in pediatric cataract surgery: retrospective analysis of 21 cases. *Croat Med J.* 2004; **45:** 287-91.
20. **Astle WF, Alewenah O, Ingram AD, Paszuk A.** Surgical outcomes of primary foldable intraocular lens implantation in children: understanding posterior opacification and the absence of glaucoma. *J Cataract Refract Surg.* 2009; **35 (7):** 1216-22.
21. **Lai J, Yao K, Sun ZH, Zhang Z, Yang YH.** Long term follow-up of visual functions after pediatric cataract extraction and intra ocular lens implantation. *Zhonghua Yan Ke Za Zhi.* 2005; **41 (3):** 200-4.
22. **Magnusson G, Abrahamsson M, Sjostrand J.** Changes in visual acuity from 4 to 12 years of age in children operated for bilateral congenital cataract. *Br J Ophthalmol.* 2002; **86 (12):** 1385-9.

