ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 08 | August - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

OUTCOME OF PAEDIATRIC CATARACT SURGERY AFTER PHACOEMULSIFICATION AND INTRAOCULAR LENS IMPLANTATION.

Ophthalomology

Dr Dinesh Kumar MS, Senior Resident, Ophthalmology, Regional Institute of Ophthalmology, GMC Amritsar

Dr Karamjit Singh* MS, Professor, Ophthalmology, Regional Institute of Ophthalmology, GMC Amritsar *Corresponding Author

Dr Prempal Kaur MS, Professor, Ophthalmology, Regional Institute of Ophthalmology, GMC Amritsar

Dr Diksha MS, Senior Resident, Ophthalmology, Regional Institute of Ophthalmology, GMC Amritsar

ABSTRACT

Purpose: To study postoperative visual outcome and postoperative complications after paediatric cataract surgery. **Methods and Material:** In this prospective interventional study in a tertiary centre Children between ages 1-15 years were operated on for cataract surgery and postoperative visual acuity was compared to preoperative visual acuity and postoperative complications were noted and managed. Visual rehabilitation was done using optical correction and amblyopia therapy. **Statistical Analysis:** Comparison between groups was performed using independent sample t-test and Chi-square test using IBM® SPSS® Statistics version 28. **Results:** The mean age at surgery of 50 children was 6.8 ± 3.82 years. Out of 50, 32% had congenital cataract and 68% had developmental cataract. Intraocular lens was implanted in 75 out of 80 eyes. Postoperative visual acuity was <6/60 in 21 (25.3%) eyes as compared to 60 (72.28%) eyes preoperatively (P < 0.001). 24 (28.9%) eyes had visual acuity >6/18 postoperatively. Poor postoperative visual acuity of <6/60 was significantly higher in eyes with congenital cataract as compared to developmental cataract. Fibrin reaction was most common early (7.2%) and PCO was the most common late complication. **Conclusions:** Early diagnosis and surgery are necessary for better visual outcome followed by optical rehabilitation and amblyopia therapy.

KEYWORDS

Paediatric cataract, Intraocular lens, Complications, Visual outcome, Amblyopia.

1. INTRODUCTION:

Cataract is a treatable cause of childhood blindness, accounting for 7.4%–15.3% of blindness in the paediatric age group.[1,2] The prevalence of paediatric cataracts is between 1 and 15/10000 children.[3,4] Decreased vision at an early age has far-reaching implications on a child's life. It can hinder education, hamper personality development, and deprive the individual of career opportunities, thus increasing the socioeconomic burden on the family and the community.[5]

Paediatric cataract surgery is the first step in visual rehabilitation in children. Management of paediatric cataracts is often difficult and tedious. The timing of paediatric cataracts surgery is an important aspect. Visual deprivation for a long time can impair the development of the visual system. In a visually significant cataract, surgery should be done as soon as possible.

Paediatric cataract surgery differs from adult cataract surgery in many ways like the sclera is less rigid, the axial length and refractive status of the eye keep on changing, and chances of postoperative inflammation and posterior capsule opacification are higher. Surgical techniques for paediatric cataracts are constantly evolving to minimize the complication rate. Recent advances in surgical techniques, intraocular lens (IOL) composition, and designs increased understanding of the neurobiology of visual development, and early postoperative use of contact lenses for optical rehabilitation have contributed to improved outcomes after paediatric cataract surgery.

Surgical timing and adequate visual rehabilitation are paramount to avoiding irreversible visual damage secondary to amblyopia. This study aimed to assess the visual outcome and complications after paediatric cataract surgery.

2. MATERIAL AND METHODS:

The present prospective interventional study was conducted in a Regional Institute of Ophthalmology, in Northern India, between first January 2020 and 31st December 2020 after due permission of institutional ethical committee. It was a prospective, longitudinal, interventional study. A total of 50 children having congenital and developmental cataract between one year to 15 years of age were enrolled in the study. Children with traumatic cataracts, aged less than 1 year of age, and critically ill were excluded from surgery The visual acuity of each eye was evaluated with appropriate methods, depending on the child's age. Snellen charts for school-going children, Cambridge cards for preschool children (3–5 years) and Cardiff cards for toddlers (1–2 years). Presented vision was recorded and refraction was tried wherever possible to check any improvement in vision.

Thorough anterior segment examination was done. The type and density of opacification of the lens were noted, along with the presence of any subluxation, dislocation or zonular dehiscence. Posterior segment examination was done using an indirect ophthalmoscope with +20D lens. Ultrasound B-scan was done in all cases. In cooperative children keratometric readings were obtained, and intraocular lens (IOL) power was calculated. In small and uncooperative children ocular examination including biometry was performed under anaesthesia. Intraocular pressure was recorded with Tonopen.

The standard paediatric cataract surgery either cataract extraction or aspiration with or without posterior chamber IOLs (PCIOLs) implantation was done. Primary posterior capsulotomy and anterior vitrectomy were done in all children <5 years of age and in children who were considered uncooperative for subsequent laser capsulotomy. IOL implantation was not done in children <2 years of age.

All the children were examined the next day. Oral antibiotics and oral anti-inflammatory drugs were given in all cases for 5 days from the day of surgery. The topical regimen consisted of steroid-antibiotic combination eye drops 2 to 3 hourly (1% prednisolone acetate with 0.5% moxifloxacin) along with mydriatic agent twice or thrice daily (either 2% homatropine eye drops or eye ointment atropine 1%). Tapering of topical steroids was done over 6 weeks. Mydriatic agents were stopped after 1 week.

The follow-up was done on day 1, day 3, 1 week, 3 weeks, 6 weeks and 12 weeks post-surgery. Uncorrected visual acuity was recorded and a thorough ocular examination was carried out. Any complication observed was managed appropriately. At 6 weeks, best-corrected visual acuity (BCVA) both for distance and near was determined after refraction. Spectacle prescription was given with appropriate near addition. Postoperative amblyopia treatment, wherever applicable, was given in the form of 6 hours of compulsory patching at home. Near tasks were given to the child during that period for at least an hour.

Statistical Analysis:

All data were statistically analyzed using SPSS version 28 (Armonk, NY: IBM Corp.) Data were summarized using mean ± standard deviation, median, and percentiles for quantitative variables or

frequency and percentage for qualitative ones. Comparison between groups was performed independent sample t-test, Chi-square or Fischer's exact test. A *P* value of < 0.05 was considered statistically significant.

RESULTS:

This study was conducted on 83 eyes of 50 children. The mean age of children was 6.8 ± 3.82 years with a range from 1.5 years to 15 years and was grouped into 4 age groups [Table 1].

Table 1: Demographic profile

Age group	Males	Females	Total
1-3 years	7	4	11
4-6 years	10	6	16
7-10 years	9	6	15
>10 years	5	3	8
Total	31	19	50

There were 31 (62%) males and 19 (38%) females. Unilateral cataract was present in 17 (34%) children and 33 (66%) had bilateral cataract. Lamellar type of cataract was present in 54 (65.06%) eyes, 18 (21.68%) had the total type of cataract, posterior subcapsular cataract was present in nine (10.84%) eyes and two (2.4%) eyes had nuclear cataract. The most common type of cataract was the Lamellar type cataract. In this study, 16 (32%) children had congenital cataract and 34 (68%) had developmental cataract. Out of 83 eyes, 16 (19.2%) eyes had squint, 16 (19.2%) had nystagmus, microcornea in four (4.8%) and microcornea with coloboma in two (2.4%) eyes. Bilateral type of squint was present in six children (alternate type of squint) and unilateral in four children (exotropia in three eyes and esotropia in one eye). In the preoperative ocular examination, the mean IOP was 14.36 ± 2.4 mm/Hg.

Preoperative best-corrected visual acuity (BCVA) was <6/60 in 60 (72.28%) eyes of 28 children [Figure 1].

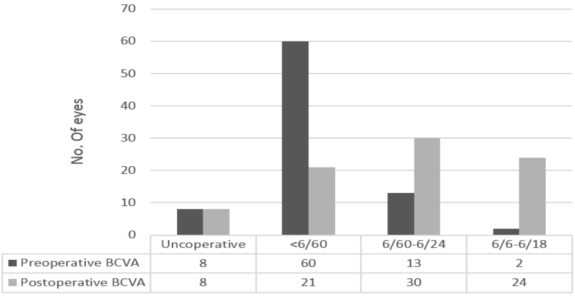

Figure 1: Comparison of Preoperative and Postoperative visual acuity

Mainly three types of surgical procedures were performed [Figure 2].

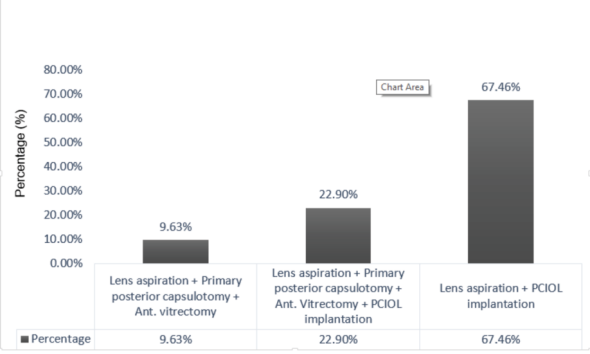

Figure 2: Types of surgical procedures performed

Out of 83 eyes, a posterior chamber intraocular lens (PCIOL) was implanted in 75 eyes and eight eyes were left aphakic.

All 50 children completed the follow-up of 12 weeks. Twenty-one (25.3%) of eyes had visual acuity <6/60 as compared to 60 (72.2%) eyes preoperatively [Figure 1]. Out of 32 eyes with congenital cataracts, 14 eyes had postoperative BCVA less than 6/60 and out of 51 eyes with developmental cataracts, only seven had BCVA less than 6/60. So, eyes with congenital cataracts were significantly more in number as compared to eyes with developmental cataracts that had postoperative BCVA less than 6/60.

In 15 eyes (9.6%) near vision addition was not applicable, either children were less than two years of age or near vision could not be assessed. Out the remaining 68 eyes, 18 eyes (21.68%) had a near vision of N6, N8 in 25 (30.1%), N10 in 15 (18.07), N12 in four (4.8%), N18 in two eyes (2.4%), and N36 in four (4.81%) eyes.

The most common early complication encountered was fibrin reaction in the anterior chamber present in 7.22% of eyes [Table 2]. It presented in the first follow-up of surgery and was managed by the use of topical steroid prednisolone acetate 1% and atropine eye ointment.

Table 2: List of complications

Postoperative Complications	No. of eyes
Early postoperative complications	
Raised Intraocular pressure	2(2.40)
Corneal oedema	5(6.02)
Pupillary membrane	4(4.81)
Fibrin reaction	6(7.22)
Late postoperative complications	
Pupillary Capture	7(8.43)
Corectopia	6(7.22)
Posterior lens capsule opacification in Eyes with PPC	4 (4.81)
Posterior lens capsule opacification in Eyes without PPC	41(49.39)

*PPC – Primary posterior capsulotomy

The most common late postoperative complication was posterior capsule opacification (PCO) presented in 54.2% of eyes in this study. Twenty-seven eyes in which PPC was done, only four eyes developed PCO and 41 eyes out of 56 in which PPC was not done were having PCO.

DISCUSSION:

The mean age of the children was 6.8 ± 3.82 years, which is similar to the study conducted by Sathish Kumar and colleagues who had a mean age of 7.83 ± 4.07 years.[6] Another study by Nikhil R et al. also had a mean age of 7.6 ± 4.2 years with a range of 2 months to 16 years of age.[7]

Our study included 62% males and 38% females and the difference is not significant. This is similar to the study conducted by Khanna et al.[8] Another study by Verma A and Jain Pin Indore also showed no significant difference in the male to female ratio.[9] But in contrast to our study findings in a study conducted by Chidire et al., showed significantly higher male children than females.[6]

In our study, 33 (66%) children had bilateral cataracts, and 17 (34%) presented with unilateral cataracts. Similar findings were shown by a study conducted by Verma A and Jain P in which children with the bilateral cataract were more in number.[12] But the study by Chidire et al. showed no significant difference in bilateral and unilateral cataracts.[6]

The lamellar type of cataract was found to be the most common type of paediatric cataract. Similar findings were concluded by Chidire et al. in their study in a tertiary care centre in Andhra Pradesh.[6] This is also in concordant with the study by Hirachan A et al.[10]

Preoperative mean LogMAR BCVA was 1.42 ± 0.40. Similar findings were noted by Chidhire et al. in their study, the mean preoperative BCVA was 1.23 ± 0.87 in their study.[6]

The mean logMAR postoperative best-corrected visual acuity (BCVA) was 0.7105 ± 0.39. Postoperative BCVA was significantly better than logMAR preoperative BCVA (p-value < 0.05). Twenty-four (28.9%) of eyes had postoperative visual acuity better than 6/18. Similar results were shown in a study by Nikhil et al., which showed that 27% of children had postoperative visual acuity of ≥ 6/18.[7]

The most common early complication encountered was fibrin reaction in the anterior chamber, similar findings are reported by Khanna et al. and Cassidy L et al.[8,11]

The most common late postoperative complication was posterior capsule opacification presented in 54.2% of eyes in this study. Similar findings are shown by a study conducted by Nikhil et al. in which 48.6% of eyes developed PCO.[7] In our study, PCO occurred in 73.2% of eyes that don't undergo PPC similar to a study conducted at Postgraduate Institute (PGI), Chandigarh, in 25 eyes (78.12%) out of 32, developed PCO in which no PPC was done.[16]

CONCLUSION:

It was concluded from the present study that the majority of pediatric cataracts were developmental in origin. Congenital cataract cases showed poor outcomes as compared to developmental cataract especially those who were operated on at a later age in our study. The timing of surgery is an important factor for visual development and rehabilitation in children with cataracts so, early diagnosis and surgery, good optical correction and amblyopia management are essential for good visual outcomes in children.

REFERENCES:

1. Gilbert C, Foster A. Childhood blindness in the context of VISION 2020--the right to sight. Bull World Health Organ. 2001;79(3):227-32. Epub 2003 Jul 7.
2. Rahi JS, Sripathi S, Gilbert CE, Foster A. Childhood blindness in India: causes in 1318 blind school students in nine states. Eye (Lond). 1995;9 (Pt 5):545-50.
3. Rahi JS, Dezateux C. National cross sectional study of detection of congenital and infantile cataract in the United Kingdom: role of childhood screening and surveillance. The British Congenital Cataract Interest Group. BMJ. 1999 Feb 6;318(7180):362-5.
4. Foster A, Gilbert C, Rahi J. Epidemiology of cataract in childhood: a global perspective. J Cataract Refract Surg. 1997;23 Suppl 1:601-4.
5. Refractive errors: magnitude of the need. Community Eye Health. 2000;13(33):1-2.
6. Chidire SK, Karanam S, Fatima A. Visual Outcome After Pediatric Cataract Surgery In A Tertiary Eye Care Hospital. The Official Scientific Journal of Delhi Ophthalmological Society. 2021 Jul 13;31(4):56-8.
7. Nikhil R, Shubhi T, Anushree KA, Sudhir T, Madan D. Evaluation of visual outcomes after pediatric cataract surgery in a Tertiary Eye Care Hospital in Western Maharashtra. Journal of Clinical Ophthalmology and Research. 2016 Jan 1;4(1):13.
8. Khanna RC, Foster A, Krishnaiah S, Mehta MK, Gogate PM. Visual outcomes of bilateral congenital and developmental cataracts in young children in south India and causes of poor outcome. Indian J Ophthalmol. 2013 Feb;61(2):65-70.
9. Verma A, Jain P. Congenital cataract-a riddle to be solved to prevent childhood blindness.
10. Hirachan A, Bajracharya K, Rai SK, Bhari AM, Chandra A. Visual outcome of congenital and developmental cataract surgery in Lumbini Eye Institute. Asian Journal of Medical Sciences. 2018 Mar 1;9(2):36-9.
11. Cassidy L, Rahi J, Nischal K, Russell-Eggitt I, Taylor D. Outcome of lens aspiration and intraocular lens implantation in children aged 5 years and under. Br J Ophthalmol. 2001 May;85(5):540-2.
12. Ram J, Brar GS, Kaushik S, Gupta A, Gupta A. Role of posterior capsulotomy with vitrectomy and intraocular lens design and material in reducing posterior capsule opacification after pediatric cataract surgery. J Cataract Refract Surg. 2003 Aug;29(8):1579-84.