

Complication and Visual Outcome after Peadiatric Cataract Surgery with or Without Intra Ocular Lens Implantation

Mazhar-ul-Hasan, Umair A. Qidwai, Aziz-ur-Rehman, Nasir Bhatti, Rashid H. Alvi

Pak J Ophthalmol 2011, Vol. 27 No. 1

See end of article for authors affiliations

Correspondence to:
Mazhar-ul-Hasan
Isra Postgraduate Institute of Ophthalmology
Al Ibrahim Eye Hospital
Gaddap town, Malir
Karachi

Received for publication
November' 2010

Purpose: To compare the rate of complications and visual outcome after peadiatric cataract extraction with or without intraocular lens implantation.

Material and Methods: A total of 202 consecutive children (281 eyes) aged 10 years and younger with unilateral or bilateral congenital cataract, treated and followed up at our institution between March 1st, 2008 and July 30th, 2009, were included in this prospective study. The study was performed at Al-Ibrahim eye hospital, Karachi.

Results: Most frequent early complication seen in patients after cataract surgery was striate keratopathy, which was observed in 90 (32%) eyes, while the most common late complication was posterior capsular opacification in 95 (34%), which required either Yag laser capsulotomy or surgical capsulotomy. Among the early complications striate keratopathy was most commonly noted in patients of age older than 1 year having cataract surgery without IOL. Around 50 % patients of psuedophakic groups have visual acuity better than 6/60 while only 26 % of aphakic group patients achieved vision of better than 6/60 with spectacle correction ($p < 0.05$).

Conclusion: Correction of aphakia after peadiatric cataract surgery with primary IOL implantation results in improved visual acuity compared to spectacle correction but a higher rate of complications requiring reoperation.

Cataract in childhood is a most important cause of visual impairment and blindness. Lack of vision in early years of life can adversely affect overall development of child with far reaching effects on personal, educational, occupational and social aspects¹. Consequently early detection and treatment is crucial for maximizing visual development and preventing amblyopia². Treatment of congenital/developmental cataract poses a challenge to the ophthalmologists, patients and parents in terms of visual development and rehabilitation³. Advances and development of new microsurgical techniques and amblyopia management have improved the safety and effectiveness of peadiatric cataract treatment^{4,5}. On the other hand, management of congenital cataract remains a challenge and postoperative complications are still

common^{6,7}. In last few years, many retrospective studies have reported varying prevalence's of several postoperative complications after peadiatric lensectomy. However, most of these studies have estimated the risk of secondary cataract formation or aphakic glaucoma separately, and there are only few reports that include other complications^{8,9}.

MATERIAL AND METHODS

A total of 202 consecutive children (281 eyes) aged 10 years and younger with unilateral or bilateral congenital cataract treated and followed up at our institution between March 1st, 2008 and July 30th, 2009, were included in this prospective study. The study was performed at Al-Ibrahim eye hospital and Indus hospital Karachi. Informed consent was taken from the

guardians of the patients included in the study, as all patients included in this study were less than 10 years of age. Exclusion criteria were ocular trauma, infection, congenital glaucoma, anterior segment dysgenesis, Lowe syndrome, maternal rubella syndrome, trisomy 13, optic nerve or other fundus abnormalities, and prematurity. After detailed history and relevant investigations, ophthalmic checkup including visual acuity, slit lamp examination, fundus examination, retinoscopy, keratometry, B-scan ultrasonography and intra ocular lens power calculation wherever possible were done. Intra ocular lens power was calculated by using SRK II formula. Eyes of patients younger than 1 year were randomly allocated to either group A (patients in this group underwent lens material aspiration with anterior vitrectomy and intra-ocular lens implantation) and group B (patients in this group underwent lens material aspiration with anterior vitrectomy and without intra-ocular lens implantation). Similarly, patients between the age of 1 year to 10 years were randomly allocated to either group C (patients in this group underwent lens material aspiration with anterior vitrectomy and intra-ocular lens implantation) and group D (patients in this group underwent lens material aspiration with anterior vitrectomy and without intra-ocular lens implantation). Dilatation of pupil was done by using cyclopentolate 1% and phenylephrine 10% at 90, 60, 30 and 15 minutes preoperatively. In all cases irrigation and aspiration was done with wide anterior capsulotomy. Primary posterior capsulotomy was done in all cases. In children with bilateral lens opacities requiring surgery, eye with poorer vision was operated first and surgery for second eye was done three months later. All cases remained on topical steroids and mydriatic for six weeks. Patients were followed on 1st post operative day and 1st post operative week for early postoperative complications. Patients were followed after 3 months, 6 months and 1 year. On follow up after 1 year, patients visual acuity, if possible, were noted so is the strabismus if present. Visual acuity was assessed using the Teller Acuity Cards Test or the Lea Test depending on the age and with one eye occluded. All refraction readings were obtained after instillation of combination of cyclopentolate 1%, tropicamide 1%, and phenylephrine 2.5%. Data was analyzed using SPSS version 17. Frequencies of gender, age, and complications were noted. Statistical analysis of the prevalence of several postoperative complications was performed by the Fisher exact test. All tests were two-

tailed, and acceptable significance was recorded when P values were less than 0.05.

RESULTS

281 eyes of 202 patients were included in the study. All the patients were in the age between 2 months to 10 years with mean age of 4.67 years. Out of 202 patients included in the study, 124 (61%) were females while 78 (39%) were males. Group A included 43 eyes while group B included 48 eyes. Similarly group C and D included 102 and 88 eyes respectively. Most frequent early complication seen in patients after cataract surgery was striate keratopathy, which was observed in 90 (32%) eyes, while the most common late complication was posterior capsular opacification in 95 (34%), which lead to either Yag laser capsulotomy or surgical capsulotomy. Frequencies of different complications are shown in figure 1 and 2, among the early complications striate keratopathy was most commonly noted in patients of age older than 1 year having cataract surgery without IOL. Similarly among the late complications posterior capsular opacification was noted more in cases of lens material aspiration with IOL implantation in patients younger than 1 year. Distribution of different complications in all the groups is shown in table 1. We noted that visual acuity after 1 year of follow up was much better in the pseudophakic groups than aphakic groups when they were corrected with spectacles. Around 50 % patients of pseudophakic groups have visual acuity better than 6/60 while only 26 % of aphakic group patients achieved vision of better than 6/60 with spectacle correction ($p < 0.05$) table 2. Similarly, esotropia or exotropia of more than 8 prism diopters was noted more in the aphakic groups (46%) than in pseudophakic groups (14%) ($p < 0.05$) (Table 3).

DISCUSSION

In this study, we have tried to investigate the incidence of early and late postoperative complications after cataract surgery with or without IOL implantation in children younger than 1 year and between 1 to 10 years. In this study the most frequent early postoperative complication was striate keratopathy, which was treated successfully in almost all the patients with topical steroids. On the other hand common late complications were aphakic glaucoma in aphakic eyes while posterior capsular opacification in pseudophakic eyes. In other studies the reported prevalence of aphakic glaucoma in

Table 1: Distribution of complications among all the study groups

	Group A (LMA+IOL+av) <1 year n (%)	Group B (LMA+av) <1 year n (%)	Group C (LMA+IOL+av) 1-10 years n (%)	Group D (LMA+av) 1-10 years n (%)
No of eyes	43	48	102	88
Early complications				
Fibrinous reaction	5 (12)	11(23)	13 (13)	13 (15)
Hypphema	0	1 (2)	0	0
Striate keratopathy	10 (28)	22 (46)	22 (21.5)	36 (41)
Late complications				
Retinal detachment	0	2 (4)	1 (0.98)	4 (4.5)
Aphakic/pseudophakic glaucoma	0	2 (4)	1 (0.98)	1 (1.12)
Posterior capsular opacification	35 (81)	18 (37)	34 (33)	8 (9)

LMA=Lens matter aspiration

AV=Anterior vitrectomy

IOL=Intra ocular lens

Table 2: Visual acuity among pseudophakic and aphakic groups

	Pseudophakic group (145 eyes) n (%)	Aphakic group (136 eyes) n (%)
6/60 or better	73(50)	35(26)
Less than 6/60	20(14)	41(30)
Non recordable	52(36)	60(44)

Pseudophakic Group (145) = Group A (43) + Group C (102)

Aphakic Group (136) = Group B (48) + Group D (88)

children after cataract surgery varies between 6% and 59%^{8,9}. This variability has been linked to differences in the patient population, the type of cataract, the age at surgical correction, the definition of glaucoma, and the length of follow-up. The main reason of aphakic glaucoma is still poorly understood. It has been suggested that immaturity of the developing infant's angle leads to increased susceptibility to surgical trauma. Besides, the combination of difficult surgery, retained lens matter, and poor pupil dilatation may contribute to an increased postoperative inflammation leading to early-onset acute glaucoma. It seems

reasonable that with improvement of surgical techniques, including extensive removal of lens matter and anterior vitrectomy, this subtype of aphakic glaucoma may become less common.

It is well recognized that the pediatric cornea reaches adult thickness at between two and four years of age¹⁰. There is increasing data that central corneal thickness (CCT) has a clinically major effect on IOP measurements in patients with pediatric glaucoma. Nonetheless, the question of exactly how much to adjust the measured value remains controversial. Therefore, our study cannot rule out the possibility that the IOP was overestimated in some eyes.

Table 3: Strabismus in pseudophakic and aphakic groups

	Pseudophakic Group (145 eyes) n (%)	Aphakic group (136 eyes) n (%)
esotropia/exotropia of more than 8 prism diopter	21 (14)	62 (46)

Pseudophakic Group (145) = Group A (43) + Group C (102)

Aphakic Group (136) = Group B (48) + Group D (88)

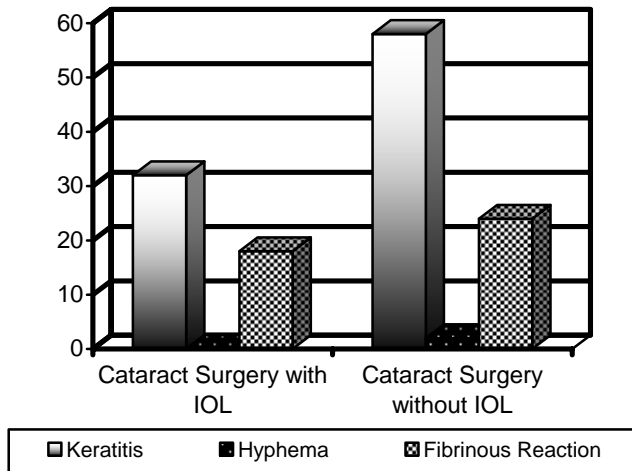


Fig. 1: Early complications of paediatric cataract surgery
N = 281

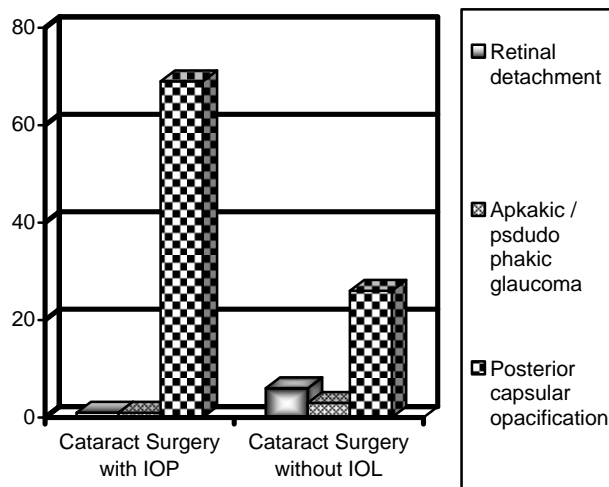


Fig. 2: Late complications of paediatric cataract surgery

In our study vitreous hemorrhage and retinal detachment were very rarely noted. One study by Chen and associates reported a very low prevalence of 0.5%¹¹. In our study, vitreous hemorrhages cleared significantly in each case within three weeks, we recommend conservative management in children for the first postoperative weeks.

In our study, all children underwent posterior capsulorhexis and anterior vitrectomy. We observed secondary cataract formation in 90 eyes (34 %). One study by Hosal and Biglan, have shown an association of posterior capsulorhexis and anterior vitrectomy with a decreased risk of PCO in children¹².

Nonetheless, there is still no consensus about the management of the posterior capsule during cataract removal in children¹⁰. According to our results, we would recommend performing primary posterior capsulorhexis with anterior vitrectomy in young children without primary IOL implantation. Besides, we determined young age at the time of surgery to be a strong risk factor for the development of PCO. This is also consistent with a study by Hosal and Biglan, who concluded the younger the child at cataract surgery, the greater the risk of secondary membrane formation¹². Although several authors,¹² suggest that the presence of an IOL increases the risk of secondary membrane formation, there is increasing evidence that a well-placed IOL for example optic capture, can reduce the incidence of secondary cataract in children^{13,14}. But, this is still a matter of controversy, and there are little data on children younger than 1 year of age.

The surgical treatment of paediatric Cataract is constantly changing. It may be hypothesized that improved surgical techniques has contributed to a lower incidence of postoperative complications. Further research will be required to investigate the ideal timing in paediatric cataract surgery.

CONCLUSION

Correction of aphakia after paediatric cataract surgery with primary IOL implantation results in improved visual acuity compared to spectacle correction and less occurrence of strabismus, but a higher rate of complications requiring reoperation. Further studies with a larger pediatric patient group are necessary to confirm the optimal treatment of aphakia after paediatric cataract extraction.

Author's affiliation

Dr. Mazhar-ur-Hasan
Isra Postgraduate Institute of Ophthalmology
Al- Ibrahim Eye Hospital
Karachi

DR. Umair A. Qidwai
Isra Postgraduate Institute of Ophthalmology
Al- Ibrahim Eye Hospital
Karachi

DR. Aziz-ur-Rehman
Isra Postgraduate Institute of Ophthalmology
Al- Ibrahim Eye Hospital
Karachi

DR. Nasir Bhatti
Isra Postgraduate Institute of Ophthalmology
Al- Ibrahim Eye Hospital
Karachi

DR. Rashid H. Alvi
Isra Postgraduate Institute of Ophthalmology
Al- Ibrahim Eye Hospital
Karachi

REFERENCE

1. **Wilson ME, Pandey SK, Thakur J.** Paediatric cataract blindness in the developing world: Surgical technique and intraocular lenses in new millennium. *Br J Ophthalmol.* 2003; 87: 14-9.
2. **Lambert SP.** Management of monocular congenital cataract. *Eye.* 1999; 13: 474-79.
3. **Angra, Mohan SK.** Management of Rubella cataract. *Ind J Ophthalmol* 1982; 30(2): 13-16.
4. **Lundvall A, Kugelberg U.** Outcome after treatment of congenital bilateral cataract. *Acta Ophthalmol Scand.* 2002; 80: 593-7.
5. **Robb RM, Petersen RA.** Outcome of treatment for bilateral congenital cataracts. *Ophthalmic Surg.* 1992; 23: 650-6.
6. **Keech RV, Tongue AC, Scott WE.** Complications after surgery for congenital and infantile cataracts. *Am J Ophthalmol.* 1989; 108: 136-41.
7. **Lundvall A, Zetterström C.** Complications after early surgery for congenital cataracts. *Acta Ophthalmol Scand.* 1999; 77: 677-80.
8. **Chen TC, Bhatia LS, Halpern EF, et al.** Risk factors for the development of aphakic glaucoma after congenital cataract surgery. *Trans Am Ophthalmol Soc.* 2006; 104: 241-51.
9. **Rabiah PK.** Frequency and predictors of glaucoma after pediatric cataract surgery. *Am J Ophthalmol.* 2004; 137: 30-7.
10. **Ehlers N, Sorensen T, Bramsen T, et al.** Central corneal thickness in newborns and children. *Acta Ophthalmol. (Copenh)* 1976; 54: 285-90.
11. **Chen TC, Bhatia LS, Walton DS.** Complications of pediatric lensectomy in 193 eyes. *Ophthalmic Surg Lasers Imaging.* 2005; 36: 6-13.
12. **Hosal BM, Biglan AW.** Risk factors for secondary membrane formation after removal of pediatric cataract. *J Cataract Refract Surg.* 2002; 28: 302-9.
13. **Koch DD, Kohnen T.** Retrospective comparison of techniques to prevent secondary cataract formation after posterior chamber intraocular lens implantation in infants and children. *J Cataract Refract Surg.* 1997; 23: 657-63.
14. **Kohnen T, Lüchtenberg M.** Surgical treatment of congenital cataracts. *Ophthalmologie.* 2007; 104: 566-71.