

Managing paediatric cataract: our experience

Mazhar-ul-Hassan

Abstract:

Objective: To compare the visual outcome after paediatric cataract extraction with and without intraocular lens implantation and also assess the frequency of different complications

Methodology: A total of 606 consecutive children aged 10 years and younger (843 eyes) with unilateral or bilateral congenital cataract, treated and followed up at our institution from March 1st, 2008 to March 30, 2011, were incorporated in this prospective study. The study was done at Al-Ibrahim eye hospital/ Isra Postgraduate Institute of ophthalmology, Karachi.

Results: The most frequent early complication seen in patients after cataract surgery was keratitis, which was observed in 270 (32%) eyes, while the most common late complication was posterior capsular opacification in 285 (34%), which lead to either YAG laser capsulotomy or surgical capsulotomy. Among the early complications keratitis was most commonly noted in patients of age older than 1 year having cataract surgery without IOL. Around 50 % patients of psuedophakic groups have corrected 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 paediatric cataract surgery with primary IOL implantation results in better visual acuity as compared to spectacle correction and less occurrence of strabismus, but a higher rate of associated late complications requiring reoperation.

Keywords: Intraocular lens, Cataract extraction, Posterior capsular opacification

Introduction:

Cataract in childhood is the most significant cause of visual impairment and blindness. Impaired vision in early years of life can adversely affect overall development of child with far reaching effects on personal, educational, occupational and social aspects¹. Therefore, early detection and treatment is very crucial for maximizing visual development and preventing amblyopia². Treatment of congenital/developmental cataract poses a challenge to ophthalmic society, patients and parents in terms of management, visual development and visual rehabilitation of these patients³. Advances and progress of new microsurgical techniques and amblyopia management have improved the safety and usefulness of pediatric cataract treatment.^{4,5} On the other hand, treatment of congenital cataracts remains a challenge and postoperative complications are still common.^{6,7} Many retrospective

studies have reported varying prevalence of several postoperative complications after pediatric lensectomy. However, most of these studies have anticipated the risk of secondary cataract formation or aphakic glaucoma separately, and there are only few reports including various other complications.^{8,9}

Methodology:

A total of 606 successive children aged 10 years and younger (843 eyes) with unilateral or bilateral congenital cataract, treated and followed up at our institution between March 1st, 2008 and March 30th, 2011, were included in this prospective study. The study was done at Al-Ibrahim eye hospital and Indus hospital Karachi. Informed consent was taken from the guardians of the patients included in the study. Patients who had ocular trauma, infection, congenital glaucoma, anterior segment dysgenesis, Lowe

Isra Postgraduate
Institute of
Ophthalmology, Al-
Ibrahim Eye Hospital,
Karachi
Mazhar-ul-Hassan

Correspondence:

Dr Mazhar-ul-Hassan
Assistant Professor, Isra
Postgraduate Institute
of Ophthalmology, Al-
Ibrahim Eye Hospital,
Old Thana Village, Malir,
Karachi

syndrome, maternal rubella syndrome, trisomy 13, optic nerve or other fundus abnormalities, and history of prematurity were excluded from the study. All those patients who were selected underwent relevant investigations, ophthalmic examination including visual acuity, slit lamp examination, fundus examination, retinoscopy, keratometry, B-scan ultrasonography and intra ocular lens power calculation wherever possible was 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 1 (patients in this group underwent lens material aspiration with anterior vitrectomy and intra-ocular lens implantation) and group 2 (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 3 (patients in this group underwent lens material aspiration with anterior vitrectomy and intra-ocular lens implantation) and group 4 (patients in this group underwent lens material aspiration with anterior vitrectomy and without intra-ocular lens implantation). Dilatation of pupil was done with cyclopentolate 1% and phenylephrine 10% at 90, 60, 30 and 15 minutes preoperatively. Surgical procedure included irrigation and aspiration with wide anterior capsulotomy. Primary posterior capsulotomy was done in all eyes. In children with bilateral lens opacities requiring surgery, eye with poorer vision was operated first and surgery for second eye was performed three months later. All cases remained on topical steroids and mydriatic eye drops for six weeks. Patients were followed one day and one week for early postoperative complications. Patients were also followed after 3 months and 6 months. On follow up after 6 months, patients corrected visual acuity, if possible, were noted along with strabismus if present. Visual acuity was evaluated using the Teller Acuity Cards Test or the Lea Test depending on the age and with one eye occluded. All refraction readings were taken after instillation of combination of cyclopentolate 1%, tropicamide 1%, and phenylephrine 2.5%. Data analysis was done using SPSS version 17.

Frequencies of gender, age, and complications were recorded. Statistical analysis of the frequency 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:

843 eyes of 606 patients were included in the study. All patients were between the age of 2 months to 10 years with mean age of 4.67 years. Out of 606 patients included in the study, 124 (61%) were females while 78 (39%) were males. Group 1 included 129 eyes while group 2 included 144 eyes. Similarly group 3 and 4 included 306 and 264 eyes respectively. Most frequent early complications seen in patients after cataract surgery was keratitis, which was observed in 270 (32%) eyes, while the most common late complication was posterior capsular opacification in 285 (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 keratitis was most commonly noted in patients

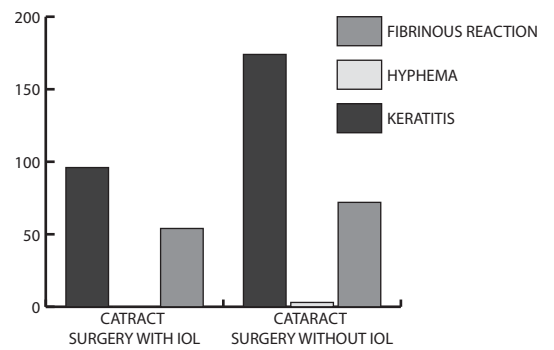


Figure 1: Early complications of paediatric cataract surgery (N = 843 eyes)

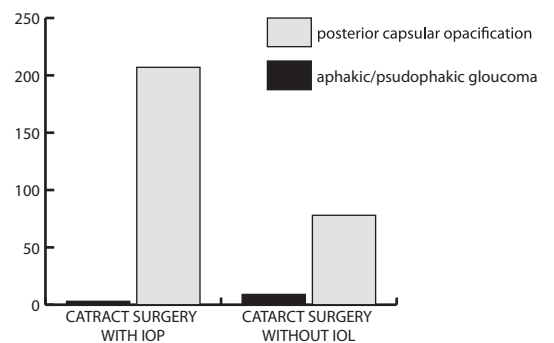


Figure 2: Late complications of paediatric cataract surgery

Table 1: Distribution of complications among all the study groups

	Group 1 (LMA+IOL +AV) <1 Year	Group 2 (LMA+AV) <1 Year	Group 3 (LMA+IOL +AV) 1-10 Years	Group 4 (LMA+AV) 1-10 Years
No of Eyes	129	144	306	264
Early Complications				
Fibrinous Reaction	15 (12%)	33(23%)	39 (13%)	39 (15%)
Hyphema	0	3 (2%)	0	0
Keratitis	30 (28%)	66 (46%)	66 (21.5%)	108 (41%)
Late Complications				
Retinal Detachment	0	0(0.0%)	0 (0.0%)	1 (0.4%)
Aphakic/Pseudophakic Glaucoma	0	6 (4%)	3 (0.98%)	3 (1.12%)
Posterior Capsular Opacification	105 (81%)	54 (37%)	102 (33%)	24 (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)	Aphakic Group (136 eyes)
6/60 or Better	219(50%)	105(26%)
Less than 6/60	60(14%)	123(30%)
Non recordable	156(36%)	180(44%)

Pseudophakic Group (435) = Group 1 (129) + Group 3 (306)

Aphakic Group (408) = Group 2 (144) + Group 4 (264)

Table 3: Strabismus in pseudophakic and aphakic groups

	Pseudophakic group (435 eyes)	Aphakic Group (136 eyes)
Esotropia/exotropia of more than 8 prism diopter	63 (14%)	186 (46%)

Pseudophakic Group (435) = Group 1 (129) + Group 3 (306)

Aphakic Group (408) = Group 2 (144) + Group 4 (264)

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 in 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 ($p < 0.05$), as shown in Table-2. Similarly, esotropia or exotropia of more than 8

prism diopters was observed more in the aphakic groups (46%) than in pseudophakic groups (14%) ($p < 0.05$), it is shown in Table-3.

Discussion:

In this study, we have tried to look into 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 keratitis, which was treated effectively in almost all the patient with topical steroids. On the other hand common late complications was posterior capsular opacification in pseudophakic eyes.

It is well recognized that the pediatric cornea reaches adult thickness at between two and four years of age.⁸ 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.

In our study vitreous hemorrhage and retinal detachment was very rarely noted. One study reported a very low frequency of 0.5% of these complications.⁹ Because, in our study, vitreous hemorrhage cleared considerably in each case within three weeks, we recommend conservative management in children for the first postoperative weeks.

In our study, all children underwent posterior capsulorrhexis and anterior vitrectomy. We observed secondary cataract formation in 285 eyes (34 %). In one study they have shown an association of posterior capsulorrhexis and anterior vitrectomy with a decreased risk of PCO in children.¹⁰ But there is still no consensus about the management of the posterior capsule during cataract removal in a child.⁸ According to our results, we would recommend performing primary posterior capsulorrhexis with anterior vitrectomy in young children without primary IOL implantation. Besides, we observed young age at

the time of surgery to be a strong risk factor for the development of PCO. This is also consistent with another study in which they concluded the younger the child at cataract surgery, the greater the risk of secondary membrane formation.¹⁰ Although many authors,¹⁰ suggested 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.^{11,12} But, controversy still exists about this, as there are few studies on children younger than 1 year of age.

The surgical treatment of pediatric cataracts is constantly changing. It may be hypothesized that improved surgical techniques have contributed to a lower incidence of postoperative complications. Further research will be required to investigate the ideal timing in pediatric 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 re-

operation. Further studies, with larger pediatric patient groups are necessary to confirm the optimal treatment of aphakia after paediatric cataract extraction.

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