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Study of visual outcomes and complications of cataract surgery in congenital cataract cases in tribal population of Jharkhand

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Abstract

Aim: To study the visual outcome and complications of phacoemulsification and IOL implantation in patients of congenital cataract among tribal population of Jharkhand.

Methods: This was a retrospective observational study. Congenital cataract cases who underwent cataract surgery during 2017 to 2019 were included. Patient's demographics, pre and postoperative visual acuity and complications were recorded. The outcome of surgery measured as VA achieved and evaluation of complications.

Results: Thirty six eyes of 24 children (16 bilateral) with age ranging from 1 month to 11 years were recorded. Mean follow up period 20.03 month (range 6-24 month). Postoperatively, visual acuity could be assessed by Snellen acuity chart in 20 children out of which 13 children (65%) best had corrected visual acuity $\geq 6/18$. Most common postoperative complication was posterior capsular opacification (6 eyes, 18.75%) followed by IOL deposits (5 eyes, 15.62%), Uveitis (4 eyes, 11.11%), optic capture (3 eyes 9.37%), Glaucoma (2 eyes, 5.55%) retinal detachment (1 eye, 2.77%).

Conclusion: Primary IOL implantation in congenital cases is safe. PCO was the most common complication. Primary posterior capsulotomy with anterior vitrectomy helps in reducing rate of PCO in younger children.

Keywords: Visual outcomes, cataract surgery, tribal population

Introduction

Congenital cataract is a leading cause of treatable childhood blindness^[1-3]. Foster *et al.*^[1] reported that about 200000 children are blind as a result of cataract. The global incidence of congenital cataract has been reported to be 1-15/10000 live births^[4]. Outcomes of surgery has improved dramatically in recent years but management of congenital cataract still remains a challenge. Use of posterior chamber (PC) intraocular lens (IOL) implantation is increased in management of cataract in children with visually significant cataract^[5-8] but it still poses problem in younger infants. Visual outcomes depend on several factors such as early detection, timing of surgery, risk of amblyopia and complications, intraocular lens power calculations. According to several studies amblyopia and posterior capsular opacification are major complications^[5-7]. The aim of this study was to assess visual outcome and surgical complications after congenital cataract surgery and IOL implantation.

Material and Methods

This retrospective study included 24 children (36 eyes) with congenital cataract who underwent surgery at RIMS, RANCHI between 2017 to 2019. Children of age group 1 month to 11 years were included. Eyes with traumatic cataract and associated with systemic diseases, neurological diseases were excluded. Twelve children underwent unilateral and twelve children underwent bilateral cataract surgery. Complete ocular examination including VA assessment if possible and slit lamp biomicroscopy were performed in all the children. Posterior segment was examined using indirect ophthalmoscopy or using B-scan ultrasonography in cases of dense cataract.

Biometry was performed and axial length measured. Lens power was calculated using SRK-II formula in cooperative patients. In uncooperative patients axial length of the eye was used for IOL power calculation using Dahan formula^[9].

Preoperatively, topical moxifloxacin 0.5% was instilled three times a day prior to surgery. Eye were dilated with tropicacyl plus every 10 min for 30 min before surgery. Informed consent was taken from parents. Surgery was performed under general anaesthesia.

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Anterior capsulorrhexis was performed using continuous curvilinear capsulorrhexis technique of approximately 5mm followed by hydrodissection. Lens material was aspirated. Intraocular lens was implanted in capsular bag. Primary posterior capsulotomy and anterior vitrectomy was done through limbal route in children < 6years.

Postoperatively all children were prescribed topical moxifloxacin 0.5% four times a day, atropine sulphate ointment 1% twice a day for 2 weeks, prednisolone acetate 1% 6 times a day which was gradually tapered over 6 weeks. All children were examined on first postoperative day, 1 week, 2 weeks, 1month and then 6 months. The outcome of surgery measured as VA achieved and evaluation of complications.

Postoperatively, refraction/ retinoscopy was done to assess refractive status at 2 weeks after surgery and again repeated after 2 months. Amblyopia treatment was advised as part time occlusion therapy wherever necessary. Slit lamp examination under retroillumination was done to check visual axis clarity. PCO was considered significant if it involved visual axis. Glaucoma was diagnosed if IOP >20mm Hg with progressive optic disc changes and /or myopic shift.

In uncooperative children with PCO membranectomy was performed and in cooperative children Nd-YAG laser capsulotomy of 3.5-4mm.

Study parameters included age at surgery, preoperative visual acuity, ocular alignment, presence of nystagmus, IOL power, postoperatively visual outcome, complications

Results

Twenty-four patients (17 males, 7 females) were included in this study. Sixteen patients underwent for bilateral cataract surgery and eight patients unilateral. Mean age at the time of surgery was 3.28 years (range 1month to 11 years), and mean follow up period was 20.03months (range 6month to 24month). The mean axial length was 20.52 ± 2.09 mm (16.01-27.02mm). Of the 24 patients 5 patients had strabismus and 3 patients had nystagmus prior to cataract surgery.

All 36 eyes underwent phacoemulsification, in which IOL was implanted in 32 eyes, 4 eyes were left aphakic due to shorter axial length <16mm and younger in age. Among 32 eyes, 24 eyes of children (< 6years) underwent a primary posterior capsulotomy with anterior vitrectomy and in 8 eye (>6 years) posterior capsule left intact.

Postoperatively, corrected and uncorrected visual acuity with a Snellen acuity chart could be checked in 20 eyes. Other methods used for visual acuity testing were observation of fixation behaviour, Cardiff test, picture matching. Details of visual outcome are given in Table1.

Unilateral congenital cataract showed poor outcomes than bilateral cataract. Patients with strabismus and nystagmus showed significantly poorer outcomes than cataracts without strabismus and nystagmus.

Visually significant PCO was observed in 6/32 eyes (18.75%). Visually significant PCO was seen in 1/24 eyes where primary posterior capsulotomy with anterior vitrectomy was performed and in 5 out of 10 eyes with intact capsule. Out of 6 children who developed PCO, 4 were < 6 years of age and 2 were > 6 years of age. All eyes underwent membranectomy or Nd-Yag capsulotomy.

5 eyes (15.62%) developed intraocular lens deposits. This was not visually significant in any of case. Increased fibrinous reaction/Uveitis in anterior chamber was seen in 4 eyes (11.11%). This resolved with frequent use of steroids. Optic capture was noticed in 3 eyes (9.37%). 2 eyes (5.55%)

developed glaucoma. Retinal detachment was seen in 1 eye (2.77%). Different postoperative complications were shown in Table2.

Discussion

Visual outcomes of congenital cataracts have been improved. It mainly depends on early detection, advances in microsurgical technique and management of amblyopia^[10, 11]. Recently PCIOL implantation has become procedure of choice in management of congenital cataract.

In this study through overview of general clinical features and surgical outcomes we concluded that in congenital cataract, presence of strabismus, nystagmus are associated with poor visual outcome which confirms previously published data^[12].

In pediatric cataract surgery, postoperative complications such as posterior capsular opacity, posterior synechia, secondary glaucoma, fibrinoid reaction, pupil decentration is more often seen as compared to adult cataract surgery^[13]. PCO was most common and most vision threatening complication. In our study significant PCO was seen in 18.75%. Nd-Yag capsulotomy and membranectomy was performed for pco removal. Fenton and o' Keefe^[14] reported that 15.6% of children with PCO who underwent PCCC and no vitrectomy required Nd- Yag capsulotomy. Aasuri *et al.* reported that visually significant PCO in 75% where PPC and Anterior vitrectomy were not done^[15]. Trivedi *et al.* reported PCO in 37.9% eyes in children <1year despite PPC and anterior vitrectomy requiring secondary surgical intervention^[16]. Our study showed that anterior vitrectomy should performed routinely because vitreous opacification may occur due to contact between anterior vitreous face and IOL haptics. Vasavada and Desai suggested that anterior vitrectomy with posterior continuous curvilinear capsulorrhexis was desirable in children with congenital cataract younger than 5 years^[17]. Dhan and Salmeson suggested posterior capsulorrhexis and anterior vitrectomy in children younger than 8 years^[18]. Vitrectomy may results in complications like macular edema, increased IOP, IOL decentration, vitreous traction. Gimbel and DeBroff^[19] first found that IOL implantation with optic capture prevented the development of PCO without vitrectomy. To minimize the above complications vitrectomy avoided but in another study by Koch and Kohnen^[20] reported that 4 of 5 patients who underwent optic capture without anterior vitrectomy developed secondary cataract at 2.5 years postoperatively. We concluded that anterior vitrectomy is beneficial if it is performed with posterior capsulorrhexis with optic capture.

Two eyes in our study developed glaucoma both were in aphakic case. Trivedi *et al.* reported an incidence of glaucoma 3.8% in pseudophakic eye and 17% in aphakic eyes^[21]. Lundvall and Kugelberg^[11] reported that 80% of children with bilateral congenital cataract developed glaucoma who underwent cataract surgery during first 4 weeks of life. In the present study, 2 eyes underwent cataract surgery within first 6 month after birth, developed secondary glaucoma, which is comparable with the reports of previous study mentioned above.

So, present study is congenital cataract surgery with intraocular lens implantation reporting visual outcome and rate of complications. We found that anterior vitrectomy had additional effect in reducing postoperative complications. We also detected those complications such as PCO, synechia were higher in children of younger age. This study focuses not only surgical techniques, materials and instrumentation but also early detection and occlusion

therapy to manage amblyopia and finally to improve visual prognosis in cases of congenital cataracts.

Table 1: Preop and Postop BCVA in 20 eyes having congenital cataract.

	Pre op N (%)	Post op No (%)
6/6-6/18	0 (0)	13(65)
<6/18-6/60	2(10)	6(24)
<6/60-3/60	3(15)	0(0)
<3/60	15(75)	1(5)
Total	20(100)	20(100)

Table 2: Postoperative complications

S. No	Complications	N (%)
1.	Posterior capsular opacification	6(18.75)
2.	Intraocular lens deposit	5(15.62)
3.	Uveitis	4(11.11)
4.	Optic capture	3(9.37)
5.	Glaucoma	2(5.55)
6.	Retinal detachment	1(2.77)

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Conflict of interest

None

Author's Contribution

Not available

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