



Research Article

VISUAL OUTCOME OF CONGENITAL CATARACT SURGERY

Rabia Chaudhry, Nasar Khan, Wejai Kumar, Gaintry Vickash, Areej Riaz and Kanwal Adavani

Eye Ward no 11 Jinnah Postgraduate Medical Center Rafiqque Shaheed
Road Karachi

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ABSTRACT

Objective: To assess visual acuity after cataract extraction and implantation of intraocular lens in paediatric patients presenting to tertiary care hospital.

Study: Retrospective hospital based study.

Place and Duration: Ophthalmology Department of Jinnah Postgraduate Medical Centre, Karachi from January, 2016 to December, 2018.

Material and Method: This retrospective study was carried out at Ophthalmology Department of Jinnah Postgraduate Medical Centre, Karachi. A total of 147 eyes of children aged between 1-15 years, diagnosed with congenital cataract were included. All patients underwent cataract extraction and intraocular lens implantation. Data on patient demographics, preoperative visual acuity, intraoperative complications and postoperative visual acuity was obtained. Outcome was assessed on the basis of improvement in visual acuity after cataract surgery.

Result: Data entry and analysis was done on SPSS version 20. Total 147 eyes were included in our study according to inclusion criteria. Mean age of patients was 6.33 years. Preoperatively visual acuity was less than 6/60 in 94% and better in 6%. Postoperatively 64.9% had vision better than 6/24 and 35.1% had less than 6/24.

Conclusion: This study concludes that early cataract surgery in paediatric population gives good visual outcomes whereas delay in presentation leads to suboptimal visual rehabilitation.

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INTRODUCTION

The control of blindness in children is a priority area in WHO'S 2020 'The Right to Sight Program'. Cataract is a common and treatable cause of childhood blindness approximately 51.5%¹. The prevalence of childhood blindness is approximately 10 times higher in developing countries as compared to developed countries². Congenital cataract is responsible for 5-20% of paediatric blindness worldwide. A hospital based study conducted in Peshawar, Pakistan showed that 54.7% of the children are visually handicapped and 23% of them are due to congenital cataract³.

A congenital cataract is a clouding or opacification of crystalline lens which is present at birth. If cataract goes undetected it can lead to permanent visual loss or decrease vision and subsequent amblyopia⁴. Early cataract surgery with adequate visual rehabilitation contributes to a better visual outcome. The aim of paediatric cataract surgery is to provide and maintain a clear visual axis and a focused retinal image⁵. Delay in presentation and loss to follow up due to lack of awareness and other socioeconomic factors are major

hurdles in visual rehabilitation of children with congenital cataract⁶. Management of paediatric cataract is different from adult cataract, because it not only involves cataract extraction and implantation of intraocular lens but also posterior capsulotomy and anterior vitrectomy and postoperative refractive error correction and amblyopia therapy for which regular follow-up required^{7,8,9}. This procedure will give a clear visual axis. This retrospective study reviews pattern of presentation, preoperative vision, procedure done and postoperative vision of congenital cataract surgery at Jinnah Postgraduate Medical Centre, Karachi.

METHOD

This study was conducted at Ophthalmology Department of Jinnah Postgraduate Medical Centre, Karachi from January, 2016 to December, 2018. Study was conducted after approval of ethical board of hospital. It was a retrospective study in which 147 patients visited the outpatient department and fulfilled the inclusion criteria were recruited. Patients aged between 1 and 15 years who had a visually significant cataract diagnosed on the basis of history and complete ocular examination were included in the study after informed consent of parents/guardians. Patients who had other ocular pathology like microphthalmia, glaucoma, ocular trauma, squint, ptosis,

*Corresponding author: **Rabia Chaudhry**

Eye Ward no 11 Jinnah Postgraduate Medical Center Rafiqque Shaheed Road Karachi

retinal pathology and any systemic disease predisposing to cataract formation were excluded.

All patients underwent visual acuity assessment, slit lamp examination and funduscopy. B-Scan was done in cases where fundus was not visible due to cataract density. IOL power was calculated using contact ultrasonic biometry method and SRK-2 formula. Calculated IOL powers were reduced 20% in children less than one year of age and 10% in children between 2-8 years of age. Above 8 years, no reduction was done in calculated IOL power.

All surgeries were performed by the same experienced ophthalmologist. All patients underwent cataract extraction plus intraocular lens implantation, posterior capsulotomy and anterior vitrectomy in one sitting. Before surgery patient was dilated with 1% cyclopentolate. Under general anaesthesia, sterile draping was done. Main incision was given with 2.8mm knife and a side port was made with 15 degree. Anterior chamber was maintained with viscoelastic substance. Capsulorhexis was done with 26 gauge needle or with ultrata forceps. Using simcoe cannula, lens aspiration was done. In cases where the lens matter was hard and could not be engaged with simcoe, vitrectomy cutter was employed. Once again anterior chamber was maintained with viscoelastic substance and multipiece intraocular lens was implanted within the bag. After lens implantation, posterior capsulotomy and anterior vitrectomy was done with vitrectomy cutter in all cases. A single nylon 10-0 suture was applied at the main incision. Anterior chamber was maintained with air bubble. 0.8ml subconjunctival gentamicin and dexamethasone was given in all cases to reduce postoperative inflammation. The eye was padded for 24 hours.

Postoperatively, all patients were put on topical steroids and antibiotics for six weeks and on systemic steroid (according to weight of patient) and antibiotics for one week. After six weeks, the port sutures were removed. Visual acuity was assessed at eight weeks. Patient who had suboptimal vision at eight weeks, were advised patching according to the age to deal with amblyopia. Final visual acuity was assessed at six months. Depending on the patient's age, Sheridan Gardiner chart and Snellen's chart were used to assess visual acuity. Patients lost to follow up in this period were excluded from the study. All data on patient demographics, pre-operative presentation, intraoperative complications and postoperative visual acuity was entered in a pre-designed proforma.

RESULT

This study included total 147 eyes of patient with visually significant congenital cataract aged between 1-15 years. Mean age at which patients presented was 6.09 years. 99 patients were male (67 %) and 48(33%) were female. 79 eyes were operated for right eye cataract (53%) and 68 (47%) were operated for left eye cataract.

Table 1 Age distribution of patients

Age in years	Percentage
1-4	35.68%
5-8	34.62%
9-12	29.7%

Preoperatively, 94% patients had visual acuity less than 6/60 whereas 6% had vision better than 6/36 (table 2).

Table 2 Preoperative visual acuity

Visual acuity	Percentages
Follows light	12.16%
Follows objects	9.4%
Hand movement –light perception	31.2%
5/60 - 1/60	14.1%
6/36 - 6/60	36.3%
6/12 - 6/24	6.1%

In our study, we observed no complication other than occasional intraoperative pupillary constriction which was easily managed with adrenaline wash. The postoperative complications noted at first week included corneal edema(0.002%), anterior chamber reaction (0.051%) , IOL catch (1.3%), loose port suture and pupil distortion. For anterior chamber reaction, we gave the patient subconjunctival depomedrol and mydricaine which led to resolution of the inflammation. Loose port sutures were removed under sedation in younger children and under topical anaesthesia in older children. IOL catch was managed with IOL redialling under general anaesthesia. Pupil distortion was insignificant and as visual axis was clear, it was left as such.

At six months, 64.9 % patients had good (better than 6/24) visual acuity and 35.1 % had poor (6/36 and below) vision (table 3 and 4).

Table 3 Postoperative visual acuity

Visual acuity	Percentages
6/9 - 6/12	35.9%
6/18 - 6/24	29.0%
6/36 - 6/60	23.1%
< 6/60	12.0%

Table 4 Age wise distribution of postoperative visual acuity

	6/9 – 6/12	6/18 – 6/24	6/36 – 6/60	< 6/60
1 – 4 years	24.4%	4.6%	4.08%	2.6%
5 – 8 years	9.5%	17.0%	6.12%	2.0%
9 – 12 years	2.0%	7.4%	12.9%	7.4%

DISCUSSION

Sensory deprivation at the time when visual pathway develops in a child, results in visual impairment and in extreme cases blindness. The commonest cause of blindness due to sensory deprivation is congenital cataract.¹⁰ 5-20% of childhood blindness worldwide is due to paediatric cataracts.¹¹ Cataract in paediatric population can be idiopathic, traumatic, due to some metabolic or systemic disorder but in this study, we only considered the management of idiopathic congenital cataracts. Management of childhood cataract includes early cataract surgery along with aggressive amblyopia therapy.

In our study, mean age at presentation of congenital cataract came out to be 6 years. Henning *et al* reported median age of presentation as 7 years. In Rajani *et al* study, median age at which they did cataract surgery was 11.80 + 6 years¹³.

The most acceptable surgical technique to treat congenital cataract is posterior chamber intraocular lens implantation along with posterior capsulotomy and anterior vitrectomy in the same sitting¹⁴ Different studies have discussed the age at which posterior capsulotomy and anterior vitrectomy should be done. Basti *et al* performed primary posterior capsulotomy and anterior vitrectomy in children younger than 8 years of age¹⁵ Dahan and Salmenson recommended posterior capsulorhexis and anterior vitrectomy in children younger than 8 years¹⁶ Vasavada and Desai suggested that anterior

vitrectomy and posterior capsulorhexis is desirable in children younger than 5 years of age¹⁷ Kanwal *et al* performed posterior capsulotomy and anterior vitrectomy in the same sitting to reduce the rate of posterior capsular opacification¹⁸ We too, in our study, did posterior capsulotomy and anterior vitrectomy in one sitting irrespective of age. It decreased the rate of posterior capsule opacification later on in life thereby giving a better visual outcome and reducing the frequency of surgical posterior capsulotomy in case of younger children.

In our study, best corrected visual acuity after amblyopia correction at six months, was >6/24 in 68%. Birch *et al* documented a best corrected visual acuity after cataract surgery of 6/24 or better only in 53% of children¹⁹ Kim *et al* reported improved visual acuity in 51.7% of cases²⁰ Tomkins *et al* showed an improvement in visual acuity from light perception to 6/9 with better results with early surgery²¹ Hennig *et al* document a BCVA of 6/6 to 6/18 in 53.5%²² Frequency of postoperative complications particularly anterior chamber inflammation was insignificant in our study. This was most likely attributable to subconjunctival gentamicin and dexamethasone injection that was routinely given in all of our cases at the end of the procedure.

CONCLUSION

According to this study, early presentation and detection can lead to better visual outcome, however delay in presentation and management can result in decreased visual acuity. Proper surgical technique including anterior capsulorhexis, lens aspiration, IOL implantation and posterior capsulotomy leads to better visual outcome. Management of congenital cataract is not complete when the postoperative period is over. In fact the most important part of management is postoperative refractive correction with glasses. Regular follow up is required and refraction is done on regular basis to avoid development of amblyopia.

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