



CLINICAL EVALUATION AND MANAGEMENT OF PAEDIATRIC CATARACT IN TERTIARY CARE CENTRE

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ABSTRACT

Paediatric cataract is one of the causes of childhood preventable blindness. Paediatric cataracts can cause social, economical, and emotional burden if no treated. Early Diagnosis and appropriate management prevents blindness. Knowledge of myopic shift and axial length growth in paediatric population has improved visual outcomes. Outcomes depend on effective surgery, meticulous postoperative care and proper visual rehabilitation.¹

KEYWORDS : Childhood blindness, intraocular lens in paediatric age group, paediatric cataract

INTRODUCTION

Childhood blindness is a priority of "vision 2020-Right to sight" global initiative for elimination of avoidable blindness. WHO estimates, globally of 1.4 million blind children. Cataract accounts for 12% of causes in developing world, ten times higher than the developed world.¹

Because cataract frequently interferes with normal visual development they represent important problem is pediatric ophthalmology. Unilateral cataracts are more likely to cause permanent visual loss than bilateral cataract because of competition between eyes. Most of the childhood cataracts are bilateral but in rubella, toxoplasmosis, congenital syphilis, trauma, it can present as unilateral condition. In children even minimal opacities are capable of producing dense amblyopia and surgery is only hope and should be done at earliest to prevent permanent ocular deprivation.²

IOL implants are being used with increased frequency in children, especially above age of 2 years. There is almost immediate post-operative visual rehabilitation which maximizes treatment of amblyopia. Aim is to render eye slightly hypermetropic after IOL implantation to compensate for a mild myopic shift later in life. Several techniques have evolved. Primary PCCC has significantly reduced incidence of PCO.³

METHODOLOGY

The material for the study was drawn from patients attending out-patient Department of Ophthalmology for cataract management.

Approval for study protocol and clearance were obtained from Ethical Review Committee of institute.

Sixty cases of pediatric cataract were included in study. Patients were admitted and data was categorized into etiology, age, and sex and analyzed. All cases were studied in following manner.

Parents were explained in detail regarding nature of disease, importance of timely intervention. Risks and benefits pertaining towards treatment were explained. Parents were also told chances of poor post-operative visual outcome and also possibility of need for additional visual rehabilitation therapy.

A detailed history from parents was taken regarding onset of symptoms, any prenatal exposure to teratogenic factors, viral diseases, particularly rubella was also asked for. Any significant birth history regarding fetal distress, neonatal apnoea, and need for prolonged oxygen therapy at time of birth, was also looked into. Family history related to ocular diseases such as night blindness, high refractive errors and cataracts were elicited as they give valuable clues towards

cause of cataract Visual acuity was recorded using Snellen's optotype equivalents for that particular age. Presence of nystagmus, strabismus and other ocular abnormalities were noted.

Anterior segment examination was done using slit lamp biomicroscope. Any abnormalities in corneal curvature, presence of glaucoma, anterior segment dysgenesis, iris abnormalities were noted. Density of cataract, morphology, location was noted after full pupillary dilatation.

Refraction was done in all patients using cycloplegics and fundus examination done to assess posterior segment using direct ophthalmoscope and indirect ophthalmoscope.

IOP was measured using Shiotz or Goldmann Applanation Tonometer. In un-cooperative patients, IOP was recorded under GA.

IOL power calculation was done using keratometer for measuring curvature of cornea and A-scan biometry for measuring AL using modified SRK-II formula. IOL power selected was corrected for age of patient as per guidelines suggested by Dahan.

INCLUSION CRITERIA:

All pediatric patients (below 15 years) with visually significant cataract.

Parents willing for surgery and regular follow-up.

EXCLUSION CRITERIA:

- Parents unable to comply with post-operative optical correction and regular follow-up visits.
- Co-existent ocular abnormalities
- Glaucoma
- Uveitis
- Previous intra-ocular surgery
- Cataracts with vitreous hemorrhage or exudates in vitreous.

Pre-operative preparation:

Mydriasis of eye to be operated was achieved with 1% atropine eye ointment used two times a day for three days, 5% Phenylephrine, 0.8% Tropicamide or 1% Cyclopentolate and 0.03% Flurbiprofen eye drops every 15 min for 1 hour before surgery. Parents were instructed to keep child nil orally for about eight hours prior to surgery.

Operative procedure:

A 6.5 mm scleral incision made at 12 O' clock position. With help of crescent blade, sclerocorneal tunnel was made. Paracentesis done with side port blade and trypan blue injected for staining anterior capsule thus aiding in visualization of anterior capsule during capsulorrhexis..A

keratome blade was used to enter into AC from main sclerocorneal tunnel. With help of extension blade, corneal entry was completed. Thorough irrigation – aspiration was done to remove cortical matter. PCCC may be performed before or after PCIOL implantation.

Ideally one should aim for a 3.5-4 mm posterior capsulotomy, which is circular and centric. Consensus is to perform PCCC with anterior vitrectomy in all children under 7 years. Following elective PCCC, PCIOL was implanted in capsular bag and dialed into position. Once IOL is in place, irrigation – aspiration is done to remove remaining viscoelastic substance. 10-0 nylon suture is placed at scleral wound in order to maintain complete wound opposition. Fornix based conjunctival flap repositioned and subconjunctival injection of dexamethasone and gentamicin given. Antibiotic eye ointment applied and pad and bandage done.

Postoperative Management

Postoperatively, a child's eye tends to show more tissue reaction due to greater inflammatory response. Close follow-up and early detection and management of complications (if any) is necessary.

A combination of antibiotic – corticosteroid eye drops were instilled hourly for first postoperative week and then gradually tapered.

Homatropine 2% eye drops instilled twice daily for 1 week and then tapered depending on inflammatory reaction.

If inflammatory reaction was intense, systemic steroids were started and gradually tapered off. Oral prednisolone 1mg/kg body weight was started for first five days, reduced by one third for next five days and reduced again by half for final five days.

All patients were followed-up on 1st day, 7th day, 15th day, 1st month and 6th month postoperatively. In each follow-up visit, visual acuity, refraction and fundus examination were done. IOP was measured during follow-up.

Amblyopia therapy by occlusion of dominant eye for 75-95% of child's waking hours was instituted in patients younger than 9 years old, within one week of surgery, if required. Maintenance therapy continued as needed until 9 years of age.

Spectacles were prescribed as early as 1-2 weeks after surgery and any change of 0.5D or more was incorporated in spectacle power.

RESULTS

Total of 110 eyes of 60 patients were enrolled in study and operated. Unilateral cataracts comprised 64% of cases and 36% of cases were bilateral. In this study, zonular and total cataracts have shown equal incidence of 32%. Traumatic cataracts with tear in anterior capsule were grouped in others and comprised 28%. were idiopathic, 16% due to hereditary. Rubella accounted for 8% of cases. In traumatic group, penetrating trauma was more common (28%) than blunt trauma.

Visual outcome after surgery and various causes of visual impairment following surgery was assessed in 110 eyes of 60 patients below age of 15 years of varied etiology. Children were distributed in age groups of < 5 years, 5-8 years, 8-10 years, more than 10 years. 56% of children fell into age group of 5-10 years and remaining children i.e. 44% were older than 10 years of age. Only one case was reported in <5 years age group. In our study, major postoperative complications were Posterior Capsular Opacification(PCO) and anterior uveitis.

In our study PCO was present in 58.8% of eyes. Fibinous uveitis was common in early post-operative period, which reduced with use of systemic and topical steroids.

DISCUSSION

During past two decades, enormous changes occurred in the management of cataract in children. Evolving improvised surgical technique, availability of newer IOLs, better understanding of amblyogenic process and more appropriate rehabilitation methods have transformed nearly hopeless condition of pediatric cataract into a therapeutically rewarding experience.

The aim of cataract surgery in children is restoration of normal visual function. Visual outcome depends on age of onset of cataract, type of cataract, laterality, method of optical rehabilitation, amblyopia therapy, other associated features and operative, post-operative complications.⁴

Traditionally, aphakic optical correction in children was undertaken with spectacles and contact lenses. These external devices carry many inherent disadvantages. Spectacles cause optical aberrations, cosmetically unappealing, not suitable for unilateral aphakia because of high degree of aniseikonia they induce. Contact lenses may be used in patients with unilateral or bilateral aphakia, but they require diligent care on part of parents as well as patient.⁵ Alternative to external optical correction is intraocular lens implantation. Implantation of IOL in pediatric patients remains controversial issue even with newer refinements in surgical technique and encouraging visual results reported in past.

CONCLUSION

Cataract surgery is a rewarding ocular surgery all over world. Visual results are vastly satisfying to patient and surgeon. But still pediatric cataract continues to be challenging, inspite of advances made in instrumentation, accuracy in biometry, IOLs and surgical techniques. PCO, amblyopia and change in refractive status of eye are most important limiting factors.

In this study, 72% of cases' etiological diagnosis could be established, of which 16% were hereditary and 48% were traumatic. Rubella accounted for 8% of cases. Etiology remained undetermined in 28% of cases even with thorough systemic examination and relevant investigations.

Visual outcome was better in traumatic cataract group followed by bilateral developmental cataract group and poor in unilateral developmental cataract group. Poor visual outcome in developmental cataract group was due to late age of presentation, deep amblyopia and presence of strabismus and nystagmus.⁶

In our study, surgical procedures were grouped into two groups on basis of whether or not PPC was done as decided by surgeon's choice and preference. It was seen that cases in group 2 where in PPC was done, visual outcome was good. However comparison of visual outcome between groups could not be done as numbers of cases in group 2 were too few. From data of present study it appears that exact post-operative refractive error of a child's eye is not easily predictable. However, 44.1% patients showed a myopic residual refractive error between -1 to -3D and only 35.3% patients showed a hyperopic residual refractive error between +0.5 to +3D.

Amblyopia therapy is most neglected aspect of visual rehabilitation following cataract surgery in children. This should start as early as possible following surgery, earnestly. In this study many of patients have presented themselves at a

later age.⁷The most common post-operative complications were PCO and anterior uveitis. Uveitis resolved with use of topical and systemic steroids. Patients with PCO were advised Nd:YAG capsulotomy. Long term follow up is necessary in children to note visual outcome and also to study delayed complications and myopic shift.

REFERENCES

1. Wilson ME, Pandey SK, Thakur J. Pediatric cataract blindness in developing world : Surgical techniques and intraocular lenses in new millennium. *Br J Ophthalmol* 2002;87:14-9.
2. Wilson ME, Pandey SK, Thakur J. Pediatric cataract blindness in developing world : Surgical techniques and intraocular lenses in new millennium. *Br J Ophthalmol* 2002;87:14-19.
3. Foster A, Gilbert C. Epidemiology of cataract in childhood. A global perspective. *J Cataract Refract Surg* 1997;23:601-4.
4. Gimbel HV, DeBroff BM. Surgical Management of Pediatric Cataracts. In : Steinert RF. *Cataract surgery techniques, complications and management*. 2nd ed, Saunders 2004;p.273-93.
5. Shamanna BR, Muralikrishnan R. Childhood cataract : Magnitude, Management, Economics and Impact. *Community Eye health*, 2004;17: p17-8.
6. Spencer TS, Mavalis N. pathology of cataracts. In: Steinert RF, ed., *Cataract surgery techniques, complications and management*. 2nd edn. Saunders; 2004. p. 1-8.
7. Khurana AK, Khurana I. Crystalline Lens. In: *Anatomy and Physiology of Eye*. 2nd Ed. New Delhi. CBS Publishers. 2006; p.86-90.
8. Edward W. Anterior lens capsule management in pediatric cataract surgery. *Trans Am Ophthalmol Soc* 2004;102:391-422