www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v6i3.20

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Paediatric Cataract Management and Outcome-An Introspection

Authors
Dr N.Suhasini M.S[1]; Dr VVL. Narasimha Rao[2], Dr C.Srihari Rao[3]
[1]Asst.Prof-GIMSR, [2]Prof, HOD, Suptd REH, [3]GIMSR

Abstract
Aim: *To describe and analyze thecurrent techniques utilized in the management of paediatric cataracts and the visual out come.*
Materials & Method: *A retrospective study of 68 subjects who had ubdergon ecatarct surgery during 2007-08 in Govt REH. PMMA lens (12 mm) was implanted in the bag for children below 2 years. Intraocular lenses were not implanted for children aged less than 2 years.*
Results/Discussion: *Gender ratio is M: F 7: 1; Maximum 43.75% is in 6-9 age group; The mean IOL power used in these subjects is 21.72 D; Despite the continued threat of amblyopia, the visual prognosis for a child with a congenital, developmental or traumatic cataract has improved dramatically.*
Conclusions: *Role of rubella and trauma in childhood cataract should be investigated and addressed.. Cataract surgery with unilateral and bilateral IOL implantation can provide a beneficial effect on final visual outcome in children who are operated- on, before abnormal foveolar function develops.*
Keywords: *PMMA-Poly Methyl Methacrylate; REG:Regional Eye Hospital.*

Introduction

There were a number of interesting presentations related to pediatric ophthalmology, in American Academy of Ophthalmology meeting, held in New Orleans, Louisiana, on October 23-26, 2004. A symposium devoted to issues in pediatric cataract management attracted a lot of interest, as did findings on amblyopia, among others. The findings in this research work intended to highlight the management and visual out come of the paediatric cataract. Clearly, this data is important for more than just reasons of scientific curiosity, because of the difficulties in the management

Operating on Childhood cataract cases is a cost-effective intervention, second only to immunization to prevent vaccine-related diseases. Cataract constitutes 24.8, 43.8 and 29.4% of childhood blindness in high-income, middle-income and low-income countries respectively. There are around 190,000 blind children suffering from cataract worldwide.

There are few reports of prevalence and causes for blindness among children on a global or regional basis. A study from Andhra Pradesh suggested that congenital cataracts account for up to 11% of blindness among children. More than 40% of cataracts in children were due to preventable causes in these studies

An ideal time for early surgical intervention resulting in few complications and maximal visual outcome has not been identified with certainty. Development of hightech, children specific cataract techniques are mandatory because of their

low rigidity of sclera, increased anterior capsule elasticity and high vitreous pressure.

Propensity for increased postoperative inflammation and capsular opacification, a refractive state that is constantly in a state of flux due to growth of the eye, difficulty in documenting anatomic and refractive changes due to poor compliance, and a tendency to develop amblyopia, makes management of cataract in the child different from that in the adult.

Therefore, the goal of this work is to describe and analyze the techniques currently being utilized in the management of cataracts in a child and to study the visual out come in these different approaches.

Methodology

Background

Visual loss in congenital/infantile cataract is mainly due to amblyopia. The first attempt to review pediatric cataract, in central India, is done by Khandekar Rajiv et all, in 2003. There is limited information available about the long-term outcomes in children treated with modern surgical techniques especially about those treated for paediatric cataract in Visakhapatnam district of Andhra Pradesh. This study is designed to evaluate Paediatric cataracts and its visual out come by using modern techniques among outpatient population of ophthalmology in and around Visakhapatnam Township of Andhra Pradesh.

The aim is to improve the visual prognosis in these patients.

This is retrospective study and the study design with protocol are submitted to NTR University of Health Sciences for approval.

This study comprises a consecutive series of pediatric patients with congenital or developing cataract who received surgery between 2007 and 2008 at Govt.Regional Eye Hospital in Visakhapatnam. Each subject was interviewed, a brief history of the age of onset of visual loss, involvement of other members of the family, the place of residence, and whether the parents' marriage was consanguineous, was recorded.

Patients' demographics, cataract type, presenting symptoms, surgical intervention, postoperative visual acuity, and follow-up refractive changes were recorded. Evaluation included visual assessment, and anterior and posterior segment examinatio

For the study, 68 subjects of 1 - 18 age groups from the hospital records are chosen who, at the time of admission underwent an extensive ophthalmologic screening examination, including measurements of visual acuity and the visual field and fundus photography. The causes of cataract or visual impairment were determined using all screening information and medical records.

Surgical technique

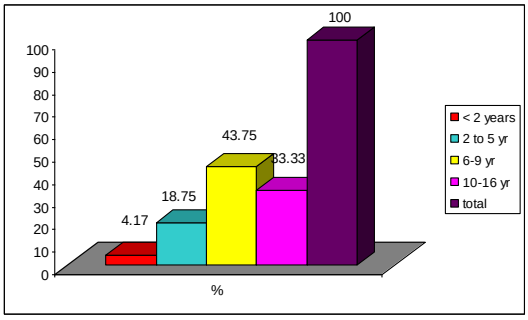
PMMA lens (12 mm) was implanted in the bag for children below 2 years. Intraocular lenses were not implanted for children aged less than 2 years. Children who did not receive IOL implants were rehabilitated postoperatively using spectacles or contact lenses. Patching was done if the cataract was unilateral and amblyopia was present.

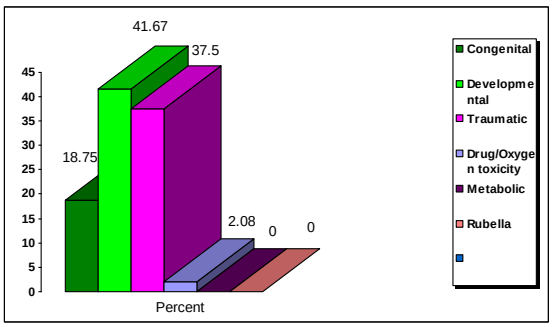
The surgical procedures included cataract extraction, intraocular lens implantation, posterior capsulorrhaxis and anterior vitrectomy in most of the cases. The visual status of eyes with cataract before and 6 weeks after surgery has been evaluated.

The results thus obtained are analyzed, and discussed in comparison with the existing studies in the literature. SPSS Version 10.1 software has been used for statistical analysis. Descriptive statistics are computed for baseline demographic, clinical and laboratory features according to etiology. Frequency tables were generated to reflect the etiology of paediatric cataract and all the values are determined at 5% significance level. Contingency tables were analyzed through chi square statistics.

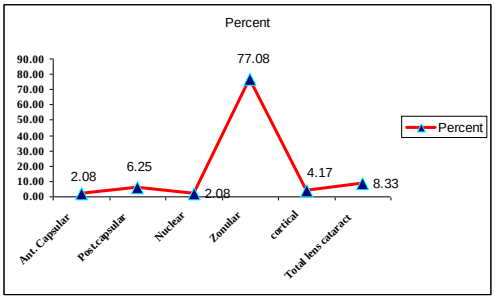
Results

Distribution of cases according to age groups

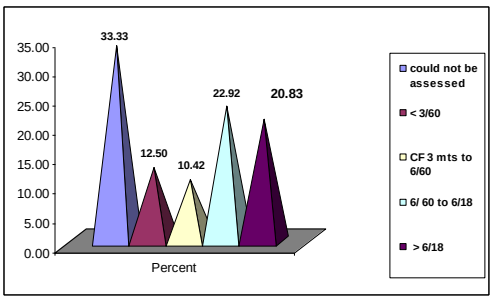




Type cataract in the current sample



Post-Operative Visual Acuity of patients



Discussion

Paediatric cataracts are an important cause of VA loss in children, mainly congenital cataracts and those which develop in the first stages of life. They constitute the first cause of preventable blindness in the world in the paediatric population (Wilson *ME, et al, 2003)*

Early diagnosis of Paediatric cataract is essential in ensuring that treatment, together with parental advice and support, can be provided promptly. There is increasing interest in establishing 1. The optimal age at which the clinical screening and examination should be carried out 2. The best health professional to undertake it 3. In some countries, the additional value of routine mydriasis for the examination. These questions are not easily addressed through trials. However, there is a good scope for investigating them using other approaches. With this back drop, the results are analysed and discussed as under in the light of available literature.

Khandekar R,et al (2007) in their retrospective study in central India, found that the proportion of cataract was higher in males than in females. Variation in 'number of cataracts' among different age groups was noted.

In the current study also males (87%) are more predominately affected than females (13%) and the ratio is M: F 7: 1 as shown in table No.1 and figure No.1.

PERUCHO-MARTÍNEZ S, et al in their prospective study (2007) on epidemiology of paediatric cataract noted that congenital cataracts group, 17% of cases appeared at birth, 40% during the first 3 months, 13.5% between 3-6 months, 5% between 6-12 months, 11.8% between 12-48 months and 5% over 48 months. In the group of acquired cataracts, not a single case appeared at birth and only one (5%) appeared in the first year of life, 30% of cases between 12-48 months, 20% between 48-96 months and 45% of cases appeared at 96 months of life or more.

The mean age of the subjects in the present sample is 7.94 years, median being 8.35 years and of course mode is 9 years,

The frequency distribution of different age groups in the present sample of paediatric cataract is as follows. Maximum 43.75% is in 6-9 age group(school going children), followed by 10- 16 year adolescent age group 33.33% and 18.75% in 2-5 years age group, least being below 2 years age group 4.17% Intraocular lens power calculation

for the growing pediatric eye poses several problems. The accumulating evidence on the myopic shift that occurs in pseudophakic children has led to an almost unanimous agreement that the IOL power should aim for a certain amount of residual hypermetropia following surgery.

All IOL power calculation formulas have been shown to be unsatisfactory in achieving the target refraction in some studies.

Dahan, et al in 1997, suggested a very practical approach for younger children. In order to reduce rates of IOL exchange and resurgery, they suggested that an infant should receive 80% of the IOL power needed for emmetropia while in toddlers IOL power should correct 90% of aphakia. The K-readings in the newborn are ignored and replaced by the average adult K-reading that is 44.00D. IOL power suggested for 21mm is (22.00D), 20mm (24.00D), 19mm (26.00D), 18mm (27.00D) and for 17mm axial length 28.00D.

The mean IOL power used in these subjects is 21.72 D, median being 21 D and Mode is 20 D .

People of high social status do not attend Govt. Institutes and they prefer corporate sector hospitals. Maximum people belongs to Lower socio economic group 85.42% followed by middle class people i.e. 14.58% in the current sample.

PERUCHO-MARTÍNEZ S, et al in their prospective study (2007) on epidemiology of paediatric cataract noted that the most frequent **presenting feature** was leucokoria, seen in 44% of patients. 75% of congenital cataracts were diagnosed within one month of clinical manifestation.

Maximum number of cases presented with white reflex in pupillary area 47.92% followed by defective vision in 35.42%, rest being misaligned eyes and Jerky eye movements, each 8.33% .

By knowing the age of cataract development, clinical presentation and the age at which it is diagnosed it is possible to know how long it took to diagnose the pathology in that region since its first clinical appearance. In this way, PERUCHO-MARTÍNEZ S, et al in their prospective study (2007) on epidemiology of paediatric cataract could see that in the group of congenital cataracts, 70% of cases the diagnosis was made at the latest 2-3 weeks after first clinical appearance, in 7% of cases after one month, in 7% of cases between 1-3 months, 2% cases between 3-6 months and in 14% over 6 months elapsed between the clinical appearance and the diagnosis.

In the current study, most common age group is 5 years 29.17% followed by 3 years 20.83%, least being one year age group 8.33%

83.33% of these cataracts are progressive in nature and 16.67 % are non-progressive or stationary.

Khandekar R,et al (2007) in their retrospective study in central India observed that Congenital cataracts were 17.5% .Traumatic cataracts were noted in 33.9% and the rest were developmental

In subjects of present study maximum cataracts are congenital and developmental 60.42% followed by traumatic 37.5% and steroid induced only 2.08% Cataracts induced due to metabolic diseases or due to maternal rubella infection are not recorded in the current study. This may be due to better Antenatal care provided by National MCHC programs.

Khandekar R,et al (2007) in their retrospective study in central India noticed that Cataract was bilateral in12.95% of children and in 87.05% it was unilateral.

In the current sample also maximum number of paediatric cataracts are bilateral amounting to 55% and unilateral cases being only 45%

Dr. Jagat Ram, Dr Gagandeep S Brarin their retrospective study on Paediatric Cataract Surgery in 2007, found Zonular cataract as one of the most common type. Lamellar or Zonular cataract is usually progressive and may require surgery in late infancy or early childhood.

Zonular cataracts are the maximum amounting to 65%, followed by total cortical cataract and anterior subcapsular being 10.33% each, in the present study.

The vision (pre-operative) is only HM to < 3/60 in maximum number of cases 39.09%, least being

subjects with vision better than 6/60, amounting to 4.17%. In 20.83% of children vision could not be assessed

Surgery is nearly always indicated for total cataract in childhood. Regardless of the degree of amblyopia that may persist after treatment, recovery of some useful vision can be anticipated.

For children over 2 years of age, IOL implantation is now considered the standard of care. In a recent survey, M. Edward Wilson, MD, found that hydrophobic acrylic lenses are now used in approximately 70% of children. He noted that the paediatric anterior lens capsule has 5 times the tensile strength of an adult capsule, and therefore capsulotomy is more difficult in children.

In the current study also, majority 60.75% are SICS with PC IOL, next commonly done operation 30.92% is Phaco with PC IOL. In a 4.17% of the cases only ECCE without any IOL has been done. ECCE with PC IOL and PPC has been tried in 2.08% of the cases. ECCE with ACIOL has been placed in 2.08% of the cases.

Intra operative complications

1. Difficult capsulorrhexis:
2. Wound leak:
3. Pupillary contriction:

These complications are seen only in 16.5% of the cases, commoner being difficult rhexis 6.08%. Wound leak and Intra operative miosis 6.08% and 4.17% of cases respectively. Least is PC Tear in 2.08% of cases.

Postoperative complications

Despite the continued threat of amblyopia, the visual prognosis for a child with a congenital, developmental or traumatic cataract has improved dramatically

M. Eckstein, P Vijayalakshmi et al from Madurai obsevered (1998) that there were no serious operative complications. Clinically significant posterior capsule opacification was almost universal (92%) and YAG capsulotomy or membranectomy was performed on these eyes. Some degree of pupil capture affected 35% of eyes and was complete in 6%.

Sharma N, et al in 1999, observed PCO as a frequent complication after cataract surgery in children. The reported risk of PCO in children can be as high as 95%,

Muzaffar Iqbal et al, (2004) observed that the most common postoperative complication was posterior capsule opacification 51.72% followed by fibrinous exudative 20.68% membrane in the anterior chamber.

Pupillary capture

The incidence of Pupillary capture among children is high, varying from 8.5% to 33%. Fixation of posterior chamber IOL in the capsular bag or optic capture decreases the incidence of this complication.

In the present study, PCO is the major and most common complication amounting to 60.58%, next being Amblyopia 29.17%. Pupillary captures of IOL and Uveitis have occurred only in 4.17% and 6.08% of cases respectively. Out of 60.58% of cases in which PCO developed, Nd-YAG laser capsulotomy was done in 50% of cases. Amblyopia was managed with occlusion therapy in nearly 20% of cases.

Visual outcome following paediatric cataract surgery (P.O.BCVA)

Paediatric cataract, if not treated early, may be associated with dismal results. P D Wade (2007) in his study on the visual out come of pediatric cataracts among African children noted that 9.9% eyes had visual acuity between 6/6-6/18 while 58.0% eyes had visual acuity less than 6/60.

Melanie Chak et al in 2006 study noted Median postoperative visual acuity as 6/18 in the eyes of children with bilateral cataracts was better than the median acuity (6/60) of the eyes with cataract of children with unilateral disease

N. Congdon et al in their (1999), observed that 40% of eyes achieved a final visual acuity of 6/18 or better. Amblyopia (observed in 40% of patie-nts) was the major cause for poor visual out come.

Khandekar R,et al (2007) in their retrospective study in central India found that Vision following surgery was more than 6/18 in 16.4% cases. The vision could not be assessed in 44% of cases eyes

M. Eckstein, P Vijayalakshmi et al from Madurai obsevered (1998) that Visual acuity was 6/12 or better in 67% of eyes at the last follow up examination.

In the current sample many i.e 16.67% improved to visual acuity better than 6/60, another 4.55% could get visual acuity better than 6/18. In 27.25% of the subjects the vision could not be improved beyond 6/60. In another major chunk of subjects i.e. 20.8% vision could not be assessed.

Conclusions

Role of rubella and trauma in childhood cataract should be investigated and addressed.. Cataract surgery with unilateral and bilateral IOL implantation can provide a beneficial effect on final visual outcome in children who are operated-on, before abnormal foveolar function develops. Primary posterior chamber lenses are recommended for children six years of age and older. If nystagmus has developed, the amblyopia is unfortunately irreversible. Concerted efforts must be made to educate people about the prevention of blindness due to cataract in all age groups in general and the importance of continued follow up in the paediatric age group in particular. Apart from school screening programmes, training programmes must be conducted to equip teachers to identify vision problems and to sensitise them about the significance of early reporting. The facilities at primary Health care institutes need to be upgraded and the staff trained to provide postoperative follow up care to paediatric patients. Although the treatment of childhood cataract has evolved considerably over the years, providing high quality standard eye care still remains a challenge for the providers. The eye care providers should collaborate with the programs related to child health care and address the underlying causes of cataract in children

References

1. Dahan, et al (1997)- Dahan E, Drusedau MU. Choice of lens and dioptric power in pediatric pseudophakia. J Cataract Refract Surg 1997; 23 (Suppl):618-623.
2. M. Eckstein, P Vijayalakshmi et al (1998)- M. Eckstein, P Vijayalakshmi, M. Killedar, C. Gilbert, and A. Foster, 1998, Use of intraocular lenses in children with traumatic cataract in south India; Br J Ophthalmol. 1998 August; 82(8): 911–915\
3. Khandekar R,et al (2007)- Khandekar R, Sudhan A, Jain BK, Shrivastav K, Sachan R., 2007; Pediatric cataract and surgery outcomes in Central India: A hospital based study; Indian J Med Sci 2007; 61:15-22
4. Muzaffar Iqbal et al, (2004)- Muzaffar Iqbal, Sanaullah Jan, Mohammad Naeem Khan, Arshad Iqbal, Shad Mohammo, 2004; Pakistan J. Med. Res.Vol. 43 No.3, 2004
5. Melanie Chak et al (2006)- Melanie Chak, Angela Wade Jugnoo Sangeeta Rahi on behalf of the British Congenital Cataract Interest Group,2006'Long-Term Visual Acuity and Its Predictors after Surgery for Congenital Cataract: Findings of the British Congenital Cataract Study; Investigative Ophthalmology and Visual Science. 2006;47:4262-4269.)
6. PERUCHO-MARTÍNEZ S, et al(2007)- PERUCHO-MARTÍNEZ S, DE-LA-CRUZ-BERTOLO J, TEJADA-PALACIOS P; PEDIATRIC CATAR-ACTS: EPIDEMIOLOGY AND DIAGNOSIS. RETROSPECTIVE REVIEW OF 79 CASES; ARCH SOC ESP OFTALMOL 2007; 82: 37-42
7. Sharma N, et al (1999)- Sharma N, Pushker N, Dada T, Vajpayee RB, Dada VK. Complications of pediatric cataract surgery and intraocular lens implantation. J Cataract Refract Surg 1999;25:1585-8.

8. Wilson ME, et al, (2003)-Wilson ME, Pandey SK, Thakur J. Paediatric cataract blindness in the developing world: surgical techniques,and intraocular lenses in the new millennium, Br J Ophthalmol 2003;87: 14-19.