

## VISUAL OUTCOME IN CONGENITAL RUBELLA CATARACT MANAGED IN A TERTIARY EYE CARE CENTRE

Chitra S<sup>1</sup>, Latha Hariharan<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Ophthalmology, Government Kilpauk Medical College and Hospital, Chennai.

<sup>2</sup>Professor and HOD, Department of Ophthalmology, Government Kilpauk Medical College and Hospital, Chennai.

### ABSTRACT

#### BACKGROUND

The aim of the study is to analyse the visual outcome in congenital rubella cataract.

#### MATERIALS AND METHODS

It is an analytical prospective study.

#### RESULTS

Defective vision and white reflex were the most common presenting complaint. Most of the patients were positive for IgG only in high titres. Comparing the visual acuity preoperatively and postoperatively, there was statistically significant improvement in vision.

#### CONCLUSION

Children with congenital rubella cataract should be operated as early as possible under topical antibiotics coverage. Postoperative should be properly treated with intensive cycloplegics and topical steroids. Proper follow up and visual rehabilitation should be done.

#### KEYWORDS

Congenital Rubella Cataract, IgM Antibody, IgG Antibody, TORCH Titre, IOL, PCO.

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#### BACKGROUND

Rubella constitutes about 5%-25% of childhood cataract in India. Cataract occurs when the maternal rubella infection occurs between the second and eleventh weeks of gestation, which is the period of maximum blood supply to the lens. The characteristic of rubella cataract is the persistent nuclei, which is present in the central mass of the lens are typically karyorrhectic.<sup>1</sup> This is virtually pathognomonic of rubella. The main stay of diagnosis of rubella infection is the serological investigation. In congenital rubella infected children, the specific IgM is present up to three months of age in all confirmed cases. Maternally transferred rubella specific IgG disappears around six months of age. Rubella specific IgG during the age of 1-2 years indicate congenital infection and also the persistent level of high IgG level.

Cataracts resulting from congenital rubella syndrome are characterised by pearly white nuclear opacification.<sup>2</sup> Cataract may occur alone or part of classic triad of congenital rubella syndrome, which are heart defects, cataracts and

inner ear defects, which is known as Gregg syndrome. Congenital rubella cataract removal maybe complicated by excessive postoperative inflammation caused by release of these live virus particles.<sup>3</sup> Live virus particles maybe recovered from the lens as late as three years after birth.

#### AIMS AND OBJECTIVES

1. To evaluate the visual outcome of congenital rubella cataract following cataract surgery.
2. To identify and treat postoperative inflammation earlier following cataract surgery.

#### MATERIALS AND METHODS

##### Inclusion Criteria

Children with congenital cataract who were found to be positive for rubella infection in TORCH titre.

##### Exclusion Criteria

Congenital cataract due to other intrauterine infections, metabolic disorders and hereditary causes.

#### METHODS

23 children of 34 eyes with congenital cataract were evaluated. Visual acuity, slit lamp examination and fundus examination were done. Children were screened for TORCH infections. Those children with rubella IgG, IgM or both were included in the study. The children were screened for systemic manifestations of congenital rubella syndrome and the general condition of the patients were assessed by paediatrician. Ocular investigation including B scan and IOL

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*Corresponding Author:*

*Dr. Chitra S,*  
*Assistant Professor, Department of Ophthalmology,*  
*# 7/510, 'D' Type, Sidco Nagar,*  
*Villivakkam, Chennai-49.*

*E-mail: akshuchitra@gmail.com*

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power calculation was performed. Anaesthetic fitness for general anaesthesia was obtained. For those children who were positive for rubella IgM, cataract surgery was postponed till IgM disappeared.

Among 23 children, 18 were bilateral cataract and 5 were unilateral. Preoperative antibiotic eye drops were given. Cataract surgery along primary PCCC was performed by phacoemulsification technique with intraocular lens implantation. Postoperatively, they were treated with topical antibiotics and topical steroids. Those children with iritis were treated with cycloplegics, systemic steroids and intensive topical steroid treatment. Postoperatively, visual acuity and anterior segment were assessed.

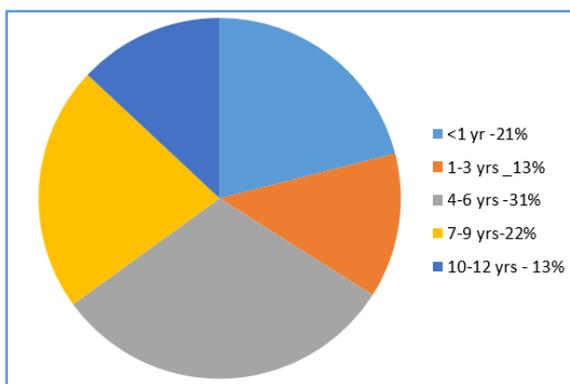
Follow up was done at weekly interval till six weeks, then biweekly or monthly till six months. Those children who had bilateral cataract were advised other eye surgery after two months. During each visit, visual acuity, slit lamp examination and fundus examination were carried out. Children were given refractive correction. Those children who had no full visual improvement with refractive correction were advised occlusion therapy. Further these children were followed up for improvement of vision with occlusion therapy.

Those children who had bilateral cataract were advised other eye surgery after two months. Follow up was given similar to the previous eye with visual acuity assessment, slit lamp examination, fundus examination, refractive management, amblyopia management and PCO management.

**RESULTS**

**Age Distribution**

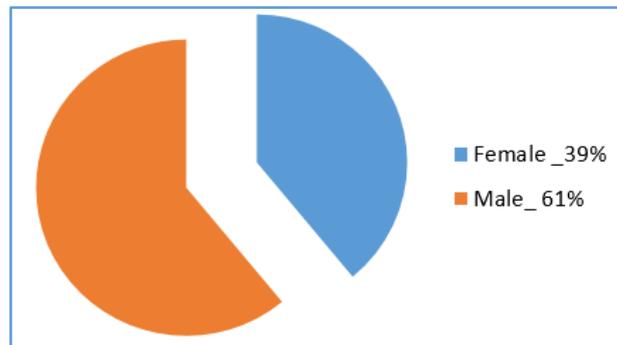
Among 23 patients, five patients (21%) were in the age group of less than one year. Three patients (13%) belonged to the age group of 1-3 years, seven (31%) in 4-6 years, five (22%) in 7-9 years and three (13%) in 10-12 years (Figure 1). Majority of the patients were in the age group of 4-6 yrs.



**Figure 1. Age Distribution**

**Sex Distribution**

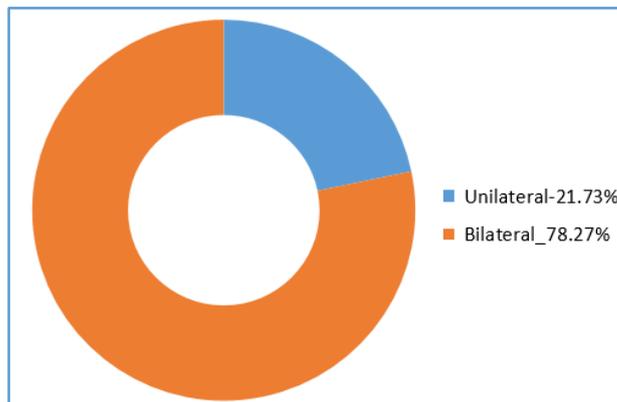
Male children were 14 in number (61%) whereas female children were nine (9%) (Figure 2). Male children dominated the study group.



**Figure 2. Sex Distribution**

**Laterality**

Cataract was unilateral in five children (21.73%) where it was bilateral in 18 children (78.27%) (Figure 3). Bilateral cataracts were more common.



**Figure 3. Laterality**

**Torch Titre**

Among the 23 patients with congenital cataract, three (13.04%) were positive for IgM only and all the three were less than one year of age. IgG alone (82.60%) was positive in 19 patients. Most of them were in the age group of 4-6 years. Only one child was positive for both IgG and IgM and the child was less than one year of age group. Mostly, IgG positivity was noted (Table 1). All of them had very high titre excluding the probability of appearance of antibodies from vaccination in which the titres were low.

	< 1 yr.	1-3 yrs.	4-6 yrs.	7-9 yrs.	10-12 yrs.	Percentage
IgM	3	0	0	0	0	13.04%
IgG	2	3	6	5	3	82.60%
IgM and IgG	1	0	0	0	0	4.45%

**Table 1. TORCH-Rubella Antibodies in the Study Children**

**Immediate Postoperative Visual Acuity**

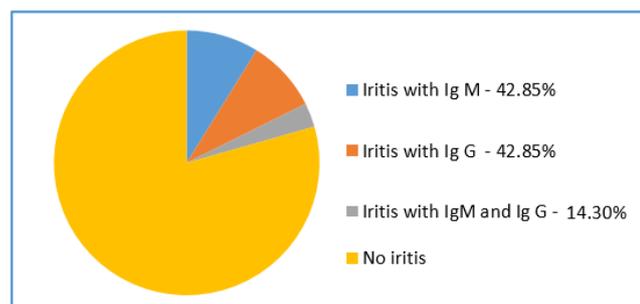
43% of the eyes were not fixing and following light. 5% developed fixing and following light. 3% had counting finger close to face. 8.8% had vision of 1/60-5/60. Vision in 26.4% was 6/60-6/36. 20.59% had vision of 6/24-6/18.2% had vision of 6/12-6/6 (Table 2). The improvement in vision compared with preoperative vision was statistically significant at  $p < 0.05$ .

Visual Acuity	Number of Patients	Percentage of Patients
Not fixing and following light	11	32.35
Fixing and following light	2	5.88
HM (hand movements)	0	0
CFCF (counting finger close to face)	1	2.94
1/60-5/60	3	8.83
6/60-6/36	9	26.47
6/24-6/18	7	20.59
6/12-6/6	1	2.94

**Table 2. Immediate Postoperative Visual Acuity**

**Postoperative Iritis with TORCH Titre**

Among those with iritis, [seven patients] three were positive for rubella IgM (42.85%) only, three occurred in those with IgG only (42.85%) and one occurred in patient with both IgM and IgG (14.30%). Among those who were IgG positive, 15% had iritis. Among those who were IgM positive and both IgG and IgM positive, iritis was present in all cases. This implies a high occurrence of iritis in those with rubella IgM positivity (Figure 4).



**Figure 4. Postoperative Iritis Vs. Rubella Positivity**

**Postoperative Visual Acuity at Six Months**

After follow up for six months, fixing and following light was present in 13 patients (38.23%), 5/60 in one patient (2.94%), 6/60-6/36 in four patients (11.76%), 6/24-6/18 in six patients (17.64%). 6/12-6/6 was noted in ten patients (29.41%) (Table 3). This was statistically significant at  $p < 0.010$ .

Visual Acuity	Number of Patients	Percentage of Patients
Not Fixing and following light	0	0%
Fixing and following light	13	38.23%
HM	0	0%
CFCF	0	0%
1/60-5/60	1	2.94%
6/60-6/36	4	11.76%
6/24-6/18	10	29.41%
6/12-6/6	1	2.94%

**Table 3. Postoperative Visual Acuity at Six Months**

**Pre- and Postoperative Visual Acuity Improvement**

Comparing the visual acuity with preoperative status, there was definite improvement in visual acuity at statistically significant levels (Table 4).

Visual Acuity	Preop	Postop- 6 Months
Not fixing and following light	38.23%	0%
Fixing and following light	-	38.23%
HM	14.70%	0%
CFCF	17.64%	0%
1/60-5/60	26.47%	2.94%
6/60-6/36	2.96%	11.76%
6/24-6/18	0%	17.64%
6/12-6/6	0%	29.41%
P Value	0.019*	0.007*

**Table 4. Pre- and Postoperative Visual Acuity Improvement**

**DISCUSSION**

Children with congenital cataract were screened for rubella antibodies by TORCH titre. Those who were found to be positive for rubella antibodies were followed up.

Recent rubella infection can be diagnosed by;

1. Identification of rubella specific IgM or four fold increase in IgG titre in samples tested 2-3 weeks.
2. Rising titres of antibodies in haemagglutination inhibition test and ELISA.
3. Seroconversion.

In congenital rubella infected children, the specific IgM is present in 86% at the age of 3-6 months, 62% at 6 months to one year and 42% at 12-18 months, rarely above 18 months. Maternally transferred rubella specific IgG disappears around six months of age. Rubella specific IgG during the age of 1-2 years indicate congenital infection and also the persistent level of high IgG level.

Most of the children presented with defective vision and white reflex. This was mainly because of the central dense

nature of the cataract.<sup>4</sup> Nystagmus and strabismus were noted even in younger age group, which may be due to the dense cataract and severe vision deprivation.

Vaccination can also result in raise in TORCH titre, but the raise in antibody titre due to infection is very high. Those with high antibody titres presumably due to infection were taken into the study.<sup>5</sup> Most of the children had very high IgG levels. Children with IgM antibodies were in the younger age group.

Cataract surgery with IOL implantation was done. Postoperative inflammation was severe in children who were IgM positive. They were treated with intensive cycloplegics and steroids.<sup>6,7,8</sup> Rubella cataract extraction is associated with severe postoperative inflammation. Live rubella virus has been isolated from the lens till three years of age. While performing cataract surgery, the intralenticular virus are released, which causes severe postoperative inflammation. The postoperative inflammation is due to delayed hypersensitivity reaction or due to direct viral insult.<sup>9,10</sup> The postoperative inflammation can be very severe that can lead to phthisical eye also. The intensive cycloplegics and topical steroids are given for a longer period to control postoperative inflammation.

Visual improvement was good in all children. 11% of children did not have full visual recovery probably because of the long duration of disease process and dense cataractous changes going in for amblyopia. Best visual correction was given to all children. Occlusion therapy was given to amblyopic children. Postoperative follow up is given with regular visual assessment and rehabilitation. Posterior capsular opacification is a major cause of gradual loss of vision following uneventful paediatric cataract surgery. So, occurrence of PCO is decreased by doing primary PCCC. All children with rubella cataract should be treated with cataract extraction as early as possible with intensive control of postoperative inflammation.

## CONCLUSION

Comparing the visual acuity preoperatively and postoperatively, there was statistically significant improvement in vision. So, children with congenital rubella

cataract should be operated as early as possible under topical antibiotics coverage. Postoperative should be properly treated with intensive cycloplegics and topical steroids. Proper follow up and visual rehabilitation should be done.

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