

Infectious Aetiology of Congenital Cataract Based on Torch

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ABSTRACT

OBJECTIVES: This study was done to determine the infectious association of congenital cataract based on presence of antibodies against TORCH (Toxoplasma gondii, Rubella virus, Cytomegalovirus and Herpes simplex virus) in the serum sample of congenital cataract patients.

METHODS: Serum Samples collected from 68 infants (10 days to 1 year) with clinically diagnosed Congenital Cataract at Department of Ophthalmology Unit-I, Dow Medical College and Civil Hospital, Karachi from June 2011 to January 2013.

RESULTS: Antibodies against TORCH organisms were present in 16 (23.52%) patients. 10 (14.7%) out of them were males and 6 (8.82%) were female. 11 (16.17%) patients had antibodies against one infectious agent and 5 (7.35%) patients had antibodies against two or more infectious agents.

CONCLUSION: Majority of Patients with positive antibodies were positive for Cytomegalovirus. Antibodies against Rubella and Herpes Simplex Virus were less commonly associated in this patient population. None positive for Toxoplasma gondii.

KEY WORDS: Congenital Cataract, Toxoplasma gondii, Rubella virus, Cytomegalovirus and Herpes simplex virus.

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INTRODUCTION

Cataract is a major cause of blindness throughout the world, particularly in developing countries¹. Congenital cataract is one of the most common treatable causes of visual impairment and blindness during infancy and accounts for around 10 % of all visual loss in children worldwide. The incidence of congenital cataract is about 3 in 10 000 live births. Two-thirds of cases are bilateral and about half of the time the cause can be identified². It is responsible for more than 1 million cases of childhood blindness in Asia³.

Viral infections in pregnancy are major causes of fetal mortality and morbidity. The infection might transmit through the transplacental route during the intrauterine period or even in the postnatal phase⁴. Viruses responsible for causing malformations in the human embryo include Rubella virus (RV) Cytomegalovirus (CMV) and Herpes simplex virus (HSV) these along with the parasite Toxoplasma gondii are collectively known as TORCH infections⁵. Congenital cataract is one of the manifestations of congenital viral infections⁶. The risk to the fetus is closely related to the stage of gestation at the time of maternal infection. Fetal infection is about 50% during the first 8 weeks, 33% between weeks 9 and 12, and about 10% between weeks 13 and 24¹.

In response to any infections IgM antibodies are formed in the fetus they are specific for fetus, as they

are too large to cross the placental barrier⁷. There are various methods that can be used to confirm infectious aetiology of congenital cataract like serum IgM levels and isolation of the pathogen from the fetal tissue but there is no comprehensive study for association of TORCH with congenital cataract in our region. This study was performed to know the infectious aetiology of congenital cataract on the basis of IgM antibodies in the serum of the infant.

Objective:

To determine the infectious etiology of congenital cataract based on presence of specific IgM antibodies against TORCH agents in the serum sample of congenital cataract patients.

METHODS AND MATERIALS

This study was conducted at Department of Ophthalmology Unit-I Dow Medical College & Civil Hospital Karachi, from June 2011 to January 2013.

Total 68 infants diagnosed as congenital cataract (with and without) other congenital manifestations were included in this study.

Peripheral blood samples were collected and tested at a private laboratory after the consent of parent or guardian of the children. Collected blood sample was tested for the presence of specific IgM and IgG antibodies to T gondii, Rubella virus, CMV, and HSV (TORCH).

RESULTS

Total number of subjects included in the study were 68, out of these 43(63.25%) were males and 25 (36.75%) were female, the patients were divided into two groups for analysis according to age the first group comprising patient with ages from 10 days to 5 months, and second group age between 6 months to 1 year.

In group 1 (age 10 days - 5 months) out of 36 total patients 10 (14.70%) had antibodies against TORCH infections whereas 26 (38.23%) were TORCH antibodies negative. In second group out of 32 patients 6 (8.82%) were TORCH positive and 26 (38.23 %) were negative. In all 23.52% of the total patients were positive and 76.46% were negative for TORCH serology.

11 (16.17%) patients had antibodies against one infectious agent (Table-3) and 5 (7.35%) patients had antibodies against two or more infectious agents (Table-4).

IgM alone was detected in 8.82% of the patients. IgM plus IgG in 1.47 % and IgG alone in 5.88%.

CMV antibody was most frequently seen it was positive in 8 patients, Rubella in 2 and HSV in 1 patient in group with one antibody. In infants with more than one antibody (Table 4) CMV, HSV and Rubella antibodies were present in almost similar number of patients.

TABLE I: AGE DISTRIBUTION OF PATIENTS (n=68)

Age Group	Male	%	Female	%	Total	%
Group 10 days to 5 M	21	30.88 %	15	22.05 %	36	52.94 %
Group 6 M to 1 Yr	22	32.35 %	10	14.70 %	32	47.05 %
Total	43	63.23 %	25	36.76 %	68	100%

TABLE II: RATIO OF TORCH REACTIVE & NON REACTIVE PATIENTS

Age	Torch Reactive				Non-Reactive				Total
	Male	%	Female	%	Male	%	Female	%	
Group 10 days to 5 M	6	8.82 %	4	5.88 %	15	22.05 %	11	16.17 %	36
Group 6 M to 1 Yr	4	5.88 %	2	2.94 %	18	26.47 %	8	11.76 %	32
	10	14.70%	6	8.82%	33	48.52 %	19	27.94%	68

DISCUSSION

The most common aetiologies of all paediatric cataract include intrauterine infections, metabolic disorders and genetically transmitted syndromes⁸.

The detection of the IgM antibody against TORCH is the best approach for the identification of these infections.

In present study IgM antibody against TORCH infectious agents was positive in 8.82 % patients. Study conducted by Mahalakshmi, K et al, at Chennai India

TABLE III: CONGENITAL CATARACT PATIENTS SUFFERING FROM ONE ORGANISM (n=11)

Organism to which antibodies were tested	IgM alone detected	IgG detected	IgM + IgG
Toxoplasmosis	-	-	-
Rubella	-	2 (2.94%)	-
Cytomegalovirus	5 (7.35%)	2 (2.94%)	1 (1.47%)
Herpes Simplex	1 (1.47%)	-	-

TABLE IV: CONGENITAL CATARACT PATIENTS SUFFERING FROM TWO OR MORE ORGANISMS (n=05)

Organism to which antibodies were tested	Number of congenital cataract patients		
	IgM alone detected	IgG detected	IgM + IgG
Toxoplasmosis	-	-	-
Rubella	-	4	-
Cytomegalovirus	-	4	1
Herpes simplex	-	2	2

showed 37(8.3%) patients developed IgM antibodies against different TORCH infectious agents⁹.

In a study conducted in India by Deorari et al¹⁰ screening of 1302 cord blood samples was performed and specific IgM against Cytomegalovirus (CMV), Rubella and Toxoplasma were estimated, Specific IgM for Rubella was found to be positive in eight (0.6 per cent), Specific IgM for CMV was found to be positive in 23 (1.8 per cent), None of the babies was found to have specific IgM against Toxoplasma. In this study IgM for

CMV was found to be positive in 5 (7.35%) of the patients and IgM for HSV were found in 1(1.47%), none of the patients were found positive for toxoplasma and rubella specific IgM.

According to the estimates based on a statistical model derived from the seroprevalence data from SEAR during 2000-2009, 46,621 infants with Congenital Rubella Syndrome(CRS) are born annually in South East Asian Region (SEAR) alone¹¹. In previous Pakistani study¹², screening of children with suspicion of Rubella revealed, during the one year study period only three cases (3%) were positive for IgM against Rubella, whereas, 34 (34%) infants were found to be positive for IgG antibodies.

In India, a study conducted on¹³ infants with anomalies compatible with congenital infections, were tested for anti-rubella IgM, 9 infants (9.8%) tested positive for rubella infection.

Ballal, et al¹⁴ in a similar study evaluated sera from 342 infants suspected of having congenital infections were screened for IgM total 342 infants, 52 (15.2%) were found to be positive for IgM antibodies to Rubella virus. On the contrary in our study none of the patients were positive for Rubella specific IgM but 2.94% of patients were found to have IgG against Rubella.

This discrepancy might be due to the fact that 47% of our patients were aged 1 year and above and for most congenitally infected infants, IgM is detectable till to 1 month of age. The rate of IgM positive infants declines over the first year of life, until at 1 year most infants are negative for IgM antibodies¹⁵. Since In this study antibodies to TORCH were not analyzed in mother serum, the clinical significance of the presence of IgG antibodies to TORCH agents in the patients could not be analyzed.

Lego et al in 2007 suggested that screening for IgM for T gondii in infants can be helpful as their screening of 10,000 infants, seven were found to be positive for T gondii-specific IgM. Six of the seven patients were confirmed to have congenital toxoplasmosis. In our study none were found to have T gondii specific IgM or IgG.

Neonatal Herpes which can be acquired in utero from maternal infections, is quite severe and it is associated with a high morbidity and mortality.

In a recent study in India prevalence rate of the anti HSV IgM antibodies against HSV-2, was detected to be 33.5%¹⁶ in our study IgM for HSV was positive in only one patient.

Co-infection with more than one infectious agent was detected in 7.35% patients in this study compare to 33.3% by Thapliyal et al¹⁷.

CONCLUSION

The results show association of congenital cataract with antibodies against Cytomegalo- virus in the majority of seropositive subjects. Antibodies against Rubella and Herpes Simplex Virus were less commonly associated.

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