

SCREENING FOR TORCH INFECTIONS IN PREGNANT WOMEN: A REPORT FROM DELHI

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Abstract. Primary TORCH infections (toxoplasmosis, rubella, cytomegalovirus and herpes simplex virus type 1 and 2) in the mother can lead to severe fetal anomalies or even fetal loss. A prospective study was designed to detect the seroprevalence of IgM antibodies to *Toxoplasma gondii*, rubella virus and cytomegalovirus and IgG antibodies to herpes simplex virus type 1 and 2. One hundred and twenty pregnant women presenting to the antenatal clinic of a tertiary health center were included in this study. Out of these 120 women 112 (93.4%) had evidence of one or more infections. Prevalence of IgG antibodies to HSV was 70%. Seropositivities for toxoplasmosis, rubella and CMV respectively were 11.6, 8.3 and 20.8%. Our data demonstrating high frequency of primary infections during pregnancy support the conclusion that routine prenatal TORCH screening is justified.

INTRODUCTION

The TORCH complex describes clinically similar congenital infections caused by *Toxoplasma gondii*, rubella virus, cytomegalovirus (CMV) and herpes simplex virus (HSV) types 1 and 2. These pathogens usually produce mild or asymptomatic infections in the mother but may result in congenital malformations and serious sequelae in the neonatal period or years after birth (Greenough, 1994). TORCH screening in the antenatal period helps to identify high risk mothers and institute the required treatment modality for the fetus. There are only a few published data from India describing the seroprevalence of specific IgM antibodies to TORCH agents in the same study population. Hence this study was undertaken to look for serological evidence of primary TORCH infections in pregnant women.

MATERIALS AND METHODS

A total of 120 women attending the antenatal clinic of LN hospital were included in this study. The subjects belonged to different social strata of both semi urban/slum and urban segments of Delhi. 5-6 ml of blood was collected aseptically in a sterile, wide mouthed vial. After serum separation the samples were stored at -20°C till processed. Serum samples were analysed for specific IgM antibodies to *Toxoplasma*, rubella and CMV using Diamedix Immunosorbent assay kit.

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Quantitative estimation of HSV 1 and 2 IgG antibodies was done by Diamedix Herpes 1 and Herpes 2 microassay. Predominant antibody type was estimated in the same serum sample using HSV-1 and HSV-2 calibrators.

RESULTS

Out of the 120 sera tested for TORCH agents, 112 were seropositive (93.4%). The age specific distribution of seropositive cases is shown in Table 1. The prevalence of IgG antibodies to HSV was 70% (84/120). Serum samples were also further tested for predominant antibody type. Seropositivity for HSV-1 was 49.2% and for HSV-2 was 20.8%. CMV IgM antibody was raised in 20% of the individuals. Seropositivity for rubella infections was 8.3% while it was seen to be 11.6% for toxoplasmosis. Sixteen women were seropositive for more than one agent. All the seropositive mothers were followed up till delivery. No fetal anomaly, co-relating to TORCH complex, could be detected ultra sonographically. At birth, all neonates were screened for TORCH infections. Five neonates tested positive :- 2 for HSV-2 IgG and 3 for CMV IgM.

DISCUSSION

CMV infection is one of the most common congenital infection (Stern, 1977). In this study, CMV-IgM antibodies were raised in 20% of the patients. Similar seroprevalence has been reported in Africa also (Bos *et al*, 1995). Another Indian study, reported IgM-CMV percentage positivity in pregnant

Table 1
Sero prevalence of toxoplasma, rubella, CMV and HSV type 1 and 2 by age among pregnant women in Delhi (India).

Age (years)	No. positive (%)				
	Toxoplasma- IgM	Rubella- IgM	CMV- IgM	HSV1- IgG	HSV2- IgG
16-20 (n=24)	2 (8.2)	4 (16.5)	06 (25.0)	12 (50.0)	2 (8.2)
21-25 (n=36)	6 (16.6)	4 (11.1)	8 (22.2)	16 (44.4)	8 (22.2)
26-30 (n=34)	30 (8.8)	2 (5.9)	7 (2.5)	19 (55.8)	7 (2.5)
31-35 (n=14)	34 (2.14)	0 (0)	1 (7.1)	2 (14.1)	8 (57.1)
>36 (n=12)	0 (0)	0 (0)	0 (0)	10 (83.3)	0 (0)
Total (n=120)	14 (11.6)	10 (8.3)	24 (20.0)	59 (49.1)	25 (20.8)

Figures in parenthesis indicate percentages

women to be 12.9% (Kapil and Broor, 1992). 80-99% of Indians are estimated to be CMV IgG seropositive (Mukundan *et al*, 1977; Mathur *et al*, 1981). The high prevalence of IgM antibodies in this population, might be an evidence of recurrent infections. Researchers indicate that recurrent CMV infections, though considered to be mild, can also produce serious damage to the fetus (Ahlfors *et al*, 1981).

Toxoplasmosis is asymptomatic in immunocompetent individuals and remains underreported. Studies from India show IgG prevalence ranging from 3-60% (Bhopale and Naik, 1992). But few Indian studies document incidence of recent infection. In our study, IgM antibodies were raised in 11.2% of the cases. Other workers from India and abroad have reported 0.7-3.1% seropositivity (Dar *et al*, 1997; Adhya *et al*, 1996).

Primary rubella infection occurred in 8.3% of women as compared to another Indian study which reported 4.5% seropositivity (Yasodhara *et al*, 1998). Although this is statistically the smallest component of the TORCH group, congenital rubella infection is entirely preventable by immunization. In a 9 year study from Israel, the prevalence of maternal rubella infection fell from 15.4% to 7% following immunization (Fogel *et al*, 1996).

Most data indicate that the neonatal HSV-2 infection is acquired through contact with infectious secretions from the maternal genital tract, while HSV-

1 infection usually occurs through non genital sources (Sullivan-Bolyai *et al*, 1983).

Despite the higher risk of transmission of HSV from mothers experiencing first episode of genital disease, most neonates (70%) are infected because of asymptomatic viral shedding and undiagnosed disease (Brugha *et al*, 1997). Both these reasons make it important to determine the predominant HSV antibody type. In our study, 49.1% cases were seropositive for HSV-1 while 20.8% were seropositive for HSV-2. Based on highly type specific serological assays, other studies have reported seroprevalence of HSV-I to be 48-68% (Brugha *et al*, 1997). Estimates of HSV-2 seroprevalence in antenatal clinics vary from 9-33% (Ades *et al*, 1989; Forsgren *et al*, 1994) HSV 2 seropositivity has been co-related to sexual behavior in different studies. Highest seroprevalence amongst prostitutes (80%) and lowest among pregnant women (7%) was reported from Japan (Hashido *et al*, 1998).

Three neonates, out of the 112 tested, had serological evidence of congenital CMV infection (2.2%). Two had raised IgG antibodies to HSV but were lost to follow up and could not be investigated further. Although, a TORCH positive mother does not necessarily signify a damaged fetus, antenatal investigation can give the pediatrician and the gynecologist timely warning of a possibly infected fetus, and, if required, appropriate treatment modalities can be instituted. Thus, it is important for health

authorities to screen all pregnant women for TORCH infections routinely. Finally, the high seroprevalence of these agents, in our society, adds further impetus to the need of immunization to be able to circumvent the otherwise inevitable fetal outcome.

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