

## Seroprevalence of TORCH Infection in Patients with Bad Obstetric History in and around Aligarh, Northern India



### Microbiology

**KEYWORDS :** TORCH, Bad Obstetric History, Seroprevalence

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### ABSTRACT

*Primary infection with TORCH complex [Toxoplasma, Rubella, Cytomegalovirus (CMV), and Herpes simplex virus II (HSV-II)] in pregnant women can lead to adverse outcome. A total of 303 sera samples were collected at Dept. of Microbiology, J.N.M.C, Aligarh from pregnant women with bad obstetric history (BOH) and 75 pregnant women without BOH. IgM antibodies were detected by ELISA method using CALBIOTECH kits (USA). Of the 303 pregnant women with BOH, 16 (5.9%) were positive for Toxoplasma, 14(5.1%) were positive for Rubella, 7 (2.3%) were positive for CMV and 2 (0.6%) were positive for HSV. 4 (1.58%) patients were positive for both Toxoplasma and Rubella and 2 (0.79%) were positive for Rubella and CMV. In the control group 1 (2%) sample each was positive for Toxoplasma and Rubella and none was positive for CMV & HSV (P<0.05). We recommend that all antenatal cases with such history should be routinely screened for these agents.*

**Introduction:** -Bad Obstetric history (BOH) implies previous unfavorable fetal outcome in terms of two or more consecutive spontaneous abortions, early neonatal deaths, stillbirths, intrauterine fetal deaths, intrauterine growth retardations and congenital anomalies. Cause of BOH could be genetic, hormonal, abnormal maternal immune responses and maternal infections.

Maternal infection by TORCH complex is a major cause of BOH [1]. Infection with TORCH during pregnancy can produce an embryopathy characterized by limb hyperplasia, eye and brain damage, skin lesions and even fatal after effects [2]. The primary infection is likely to have more important effect on fetus than recurrent infection and may cause congenital anomalies, spontaneous abortion, intrauterine fetal death, intrauterine growth retardation, prematurity, still birth and live born infants with the evidence of disease [3]. Infections by TORCH complex in women are usually asymptomatic, chronic and difficult to diagnose on clinical grounds. Diagnosis of acute TORCH infection in pregnant women can be established by demonstration of specific IgM antibodies. TORCH screening in the antenatal period helps to identify high risk mothers and institute the required treatment for the fetus. Due to lack of a national screening programme, there is no baseline serological data regarding the seroprevalence of TORCH infection in patients with BOH.

With the above background in view, we carried out the present study to assess the seroprevalence of TORCH infection in pregnant females with BOH by detection of various specific IgM antibodies in Aligarh region of Northern India.

**Material & Methods:** - A total no. of 303 pregnant females with BOH attending the antenatal clinics at Jawaharlal Nehru Medical College, Aligarh between July 2008 to July 2013 were included in the study. Patients included in our study were those with obstetric history of still birth, habitual abortions, intrauterine growth retardation & neonatal deaths. 75 subjects with history of previous normal full term deliveries were taken as controls.

5-6 ml of blood was collected by venepuncture with prior consent of the patients. After serum preparation, the samples were stored at -20° C till processed. Serum samples were analyzed for specific IgM antibodies to Toxoplasma, Rubella, CMV and HSV

by ELISA using commercially available Cal biotech kits (Cal biotech, Inc, USA) following manufacturer's instructions. Antibody index of 1:1 or greater was considered positive for antibodies.

**Results:** -The history of 303 BOH cases consisted of abortion in 22(7.26%), premature delivery in 7 (2.3%), still birth in 6 (1.98%), congenital anomalies in 2 (0.66%) and neonatal death in 2(0.66%) as shown in Table 1.

Of 303 BOH cases, 39 (12.87%) and out of 75 healthy controls, 2 (4%) were positive for one of the TORCH infection. (Table 2).

Age distribution of seropositive cases is shown in Table 3. The maximum number (53.84%) of TORCH positive cases belonged to age group 21-25 years.

Seropositivity of Toxoplasma gondii was 16(5.9%), Rubella 14 (5.1%), CMV was 7 (2.3%), HSV was 2 (0.6%) in BOH cases, while seropositivity of Toxoplasma & Rubella in healthy controls was 2% respectively (P<0.05).

6 of the BOH cases were positive for both Toxoplasma and Rubella and 3 had co-infection of Rubella and CMV.

**Discussion:** -Primary infection with TORCH complex in pregnant women can lead to adverse outcome which is initially inapparent or asymptomatic and then difficult to diagnose on clinical grounds [4].

Out of 303 BOH cases screened for TORCH infection in the present study, 5.20% were positive for Toxoplasma, 5.1% for Rubella, 2.7% for CMV and 0.9% for HSV. Similar seroprevalence has been reported in a study from Andhra Pradesh [5] suggesting that maternal infection with these pathogens play a critical role in pregnancy wastages and their occurrence in patients with BOH is a significant factor.

A study from Delhi showed the prevalence of 11.2% [6]. Other workers from India & abroad have reported 0.7-3.1% seropositivity [7,8].

In this study, the anti Toxo IgM prevalence rate was 5.28%. In a

study from Kolkata seroprevalence of IgM was found to be 18% in women with BOH. The seroprevalence of Toxoplasma gondii ranges between 0.4% in Turkey, 9.1-7.7% in UK [9], 4-9% in China [10].

Persistence of encysted forms of toxoplasma in chronically infected uteri, and their subsequent rupture during placentation lead to infection of the baby in the first trimester and often to recurrent miscarriages. Congenital transmission of toxoplasma is known to occur during the acute phase of maternal infection and the IgM antibodies are evaluated in the maternal sera.

Enhanced education in the women before pregnancy should be undertaken to avoid the chance of Toxoplasma infections. For pregnant women, avoiding raw or undercooked meat and unpasteurized goat milk, keeping away from cats may be the best approach to prevention.

Rubella is a mild viral illness in children but can occasionally infect adults. Primary virus infection during pregnancy may cause fetal damage. If the mother is infected with Rubella virus within the first 20 weeks of pregnancy, the child may be born with congenital rubella syndrome (CRS), which entails a range of serious incurable illnesses. Spontaneous abortion occurs in up to 20% of cases [11]. In this study, anti Rubella Virus IgM was found in 4.6% of BOH cases which is similar to other Indian studies [1, 12]. Singh et al (2003) have reported higher positivity (10.4%) in women with adverse pregnancy outcome as compared with those with normal obstetric performance (3.6%) [13]. Thus pre-pregnancy screening for Rubella is necessary because a demonstration of high immunity puts a woman at relatively no risk of infection during pregnancy. It also enables prescription of vaccination 1-3 months before conception in seronegative women thereby further reducing the incidence of congenital rubella syndrome.

Primary CMV infection in pregnancy has a higher incidence of symptomatic congenital infection and fetal loss. This infection, being asymptomatic in adults, is difficult to diagnose clinically. Demonstration of IgM antibodies is indicative of primary infection. CMV infection is one of the most common congenital infections. The prevalence of congenital CMV infections varies widely among different populations (0.2-3.0%). Due to lower seroprevalence of CMV in industrialized countries and higher socioeconomic groups, congenital infection are actually more common than in developing countries, where women of child-bearing age are already seropositive. In this study, prevalence of CMV infection was found to be 2.31% which is lower to those found in earlier studies [12,14]. A positivity of 8-27% in women with BOH and other obstetric problems has been reported previously [15].

Neonatal Herpes is a severe infection associated with a high morbidity and mortality and it can be caused by HSV type 1 or 2. HSV type 1 is easily transmitted from mother to newborn, both at primary infection and with recurrences [16]. Primary HSV type 2 infection has been associated with preterm birth and is less easily transmitted to newborn than HSV type 1 [16].

Primary infection with HSV type 2 is acquired by women during pregnancy accounts for half of the morbidity and mortality from HSV type 2 among neonates. The other half results from reactivation of old infection. In our study the prevalence of anti HSV IgM was 0.66% among pregnant females which is much lower as reported from other studies from Nagpur & Delhi [17, 18] Prevalence of 10.6% has been reported from China [11] and 11% from Iraq. This may indicate low prevalence of this virus in this part of India.

**Conclusions:** - The present study demonstrates a strong association between TORCH infection & poor pregnancy outcome. It is therefore recommended that all antenatal cases with such history should be routinely screened for these agents. This study also emphasizes the need for immunization in prospective months and adolescent girls who have not received MMR vaccine in childhood.

**Conflict of interest:** - The Authors declare no conflict of interest.

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**Table 1:- Seroprevalence of TORCH agents with different presentation of BOH**

	Toxoplasma	Rubella	CMV	HSV	Total
Abortions	9	8	3	2	22
Premature delivery	3	2	2	-	7
Still birth	2	3	1	-	6
Congenital anomalies	1	1	-	-	2
Neonatal death	1	-	1	-	2
	16	14	7	2	39

**Table 2:- Seropositivity of TORCH agents**

Seropositivity BOH (n=303)			Seropositivity of controls (n=75)	
	No. of Positive	Percentage %	No.	%
Toxoplasma	16	5.28%	1	2%
Rubella	14	4.62%	1	2%
CMV	7	2.31%	0	0%
HSV	2	0.66%	0	0%
Toxoplasma+Rubella	6	1.98%	0	0%
Rubella+CMV	3	0.99%	0	0%
Total	48	15.84%	2	4%

**Table 3:- Seroprevalence of Toxoplasma, Rubella, CMV & HSV by age among pregnant women.**

	Toxoplasma	Rubella	CMV	HSV
16-20 Years	2	1	1	-
21-25 Years	9	7	5	-
26-30 Years	3	5	1	1
31-35 Years	-	1	-	-
>36 Years	2	-	-	1
Total	16	14	7	2

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