

SEROPREVALENCE OF TORCH INFECTION IN PATIENTS ATTENDING A TERTIARY CARE HOSPITAL WITH BAD OBSTETRIC HISTORY

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ABSTRACT

Background : Bad obstetric history (BOH) can be defined as unfavourable foetal outcome such as two or more consecutive spontaneous abortions, early neonatal death intrauterine foetal death, intra uterine growth retardation, still birth, and/or congenital anomalies. **Aims and objectives :** To see the prevalence of TORCH infections in women with Bad Obstetric History. **Material and methods :** The present study included 250 female patients of child bearing age (18-35 years) having bad obstetric history attending three hospitals in Jaipur city namely Zenana Hospital, Mahila Chikistalaya and ESI hospital for the period of March 2005 to March 2006. Serum was subjected to ELISA for the detection of igm and igg antibodies against TORCH group of organisms. **Result :** Out of 250 cases of bad obstetric history included in the study, 180 were having history of abortions, 15 of preterm delivery, 14 of still birth and 27 were of the mothers of congenitally abnormal children. 14 were cases having more than one of the above conditions. Maximum positivity (62.5%) was found in 21-25 years of age. **Conclusion :** Screening of TORCH organism in women with bad obstetric history as well as in babies with congenital anomalies should be done on routine basis to avoid the fatal outcome and to show the extended picture of TORCH infections.

Keywords : Bad Obstetric History (BOH), TORCH Infection, IgM, IgG, Mixed infection

INTRODUCTION

Bad obstetric history (BOH) implies previous unfavourable foetal outcome in terms of two or more consecutive spontaneous abortions, intrauterine foetal death, intra uterine growth retardation, still birth, early neonatal death and/or congenital anomalies. Causes of BOH may be

genetic, hormonal, abnormal maternal immune response and maternal infections (13). Infections may occur at any stage of gestation period and caused by various micro-organisms including protozoa (*Toxoplasma gondii*), virus (Rubella virus, Cytomegalovirus, Herpes simplex virus,

HIV) and bacteria (Chlamydia trachomatis, Treponema pallidum). TORCH group (Toxoplasma gondii, Rubella virus, Cytomegalovirus and Herpes simplex virus) of organisms are important in women with BOH as these organisms are capable of crossing placental barriers and causing foetal infections and abnormalities. In mother these infection may be asymptomatic but cause damage in the foetus however the degree of severity may vary with gestational age at the time of infection, virulence of the organism, damage caused to the placenta and the severity of the maternal infection (1)

Toxoplasma infection is a worldwide zoonotic disease and foetus can acquire it through transplacental route causing abortions, stillbirths, congenital malformations. (2) The infection may also present late onset of disease in an adolescent e.g. development of chorioretinitis with congenital Toxoplasmosis. (3) Previous studies have shown that 10-20 percent of women in childbearing age in India are susceptible to Rubella infection. (4) Infection with Rubella during pregnancy is reported to be a cause of congenital malformation in 10-54 percent of cases. (5) Rubella infection is reported to cause miscarriage, stillbirth, or multiple congenital rubella syndrome, characterized by cataract, patent ductus arteriosus, septal defects, pulmonary artery stenosis, sensorineural deafness, meningoencephalitis, Intrauterine growth retardation (IUGR), and osseous changes. (6) Cytomegalovirus infections are also acquired through transplacental passage and have been

associated with congenital birth defects. Maternal infections with Cytomegalovirus play a critical role in pregnancy with bad obstetric history and ultimately in the loss of foetus. (7) Primary HSV infection during first half of pregnancy is associated with increased frequency of spontaneous abortion, still birth, and congenital malformation. (8) The mother is the usual source of transmission of HSV to the foetus or newborn. TORCH infections are asymptomatic but cause unfavourable foetal outcome. These infections are difficult to diagnose only on clinical grounds hence this retrospective study was carried out to see the prevalence rate of TORCH infections in women with Bad Obstetric History.

MATERIALS AND METHODS

The present study included 250 female patients of child bearing age (18-35 years) having bad obstetric history attending three hospitals in Jaipur city namely Zenana Hospital, Mahila Chikistalaya and ESI hospital for the period of March 2005 to March 2006. Cases with history of spontaneous/ recurrent abortions, premature delivery, still births or congenital anomalies were included in the study. Cases with other possible causes of bad obstetric history like anatomical anomalies of genital tract, syphilis, diabetes mellitus, Rh incompatibility, renal disease, abnormal thyroid profile and abnormal semen analyses were excluded from the study. A control group consisting of 25 individuals having normal obstetric history with at least two previous normal deliveries and without any late sequel of

these infections in children up to the age of 10 years were also included. Detailed clinical history was taken. Cases without proper clinical details or history were excluded from the study. 5 ml of venous blood was drawn and serum was separated. Samples having inadequate volume, lipemic or haemolysed aseptically drawn samples were excluded from the study. Separated serum was subjected to ELISA for the detection of IgM and IgG antibodies against TORCH group of organisms using commercially available kits from Human Diagnostics as per manufacturer's protocol.

RESULTS

Out of 250 cases of bad obstetric history included in the study, 180 were having history of abortions, 15 of preterm delivery, 14 of still birth and 27 were of the mothers of congenitally abnormal children. 14 were cases having more than one of the above conditions (Table 1).

Table 1- Distribution of 250 cases on the basis of obstetric history

S.No.	Obstetric History	No. Studied (%)
1	Abortions	180 (72%)
2	Still Birth	14 (5.6%)
3	Preterm delivery	15 (6%)
4	Mother of congenitally abnormal children	27 (10.8%)
5	Cases with more than one of above conditions	14 (5.6%)

The maximum number of samples was received in the age group of 21-25 years and the maximum positivity (62.5%) was also found in the same followed by 26-30 years, 31-35 years and below 20 years respectively (Table 2).

Table 2- Relation of Sero-positivity with different age group

S.No.	Age Group (years)	Percentage of women positive
1	< 20	7%
2	21-25	62.5%
3	26-30	23%
4	31-35	7.5%

The samples were tested in two groups (Table 3). In the control group no IgM antibodies were detected where IgG antibodies were detectable against *Toxoplasma gondii* in 2/25 (8%), Rubella in 20/25 (80%) and CMV in 22/25 (88%) of cases. No IgG antibodies were detected against HSV in the control group. Among the 250 cases of test group *Toxoplasma* IgM antibodies were detected in 55 (22%) cases, *Toxoplasma* IgG antibodies in 100 (40%) cases and both *Toxoplasma* IgM and IgG antibodies were detected in 25 (10%) of cases. Nineteen cases (7.6%) were found positive for Rubella IgM antibodies and 48 (19.2%) for CMV IgM antibodies however Rubella IgG antibodies were seen in 217/250 (86.8%) cases and CMV IgG antibodies in 247/250 (98.8%) cases. Though no HSV-II IgM or IgG cases were found in the control group but among 86 (34.8%) IgM positive cases found in the test group, 61 were primary infections (only IgM positive) and 25 were having recurrent infections (IgM and IgG

both positive). Around 38% cases in the test group showed IgG antibodies (72, 28.8% cases).

Table 3- Comparative Seroprevalence of TORCH organisms in test and control group

S.No.	Organisms	Control group (n=50)			Test Group (n=250)		
		Pos IgM	Pos IgG	Both Pos	Pos IgM	Pos IgG	Both Pos
1	Toxoplasma	0	2/25 (8%)	0	55/250 (22%)	100/250 (40%)	25/250 (10%)
2	Rubella	0	20/25 (80%)	0	19/250 (7.6%)	217/250 (86.8%)	17/250 (6.8%)
3	CMV	0	22/25 (88%)	0	48/250 (19.2%)	247/250 (98.8%)	48/250 (19.2%)
4	HSV Type II	0	0	0	86/250 (34.8%)	72/250 (28.8%)	25/250 (10%)

Mixed infections were also observed in the study (Table 4). Total 74/250 (29.6%) cases showed the presence of IgM antibodies against more than one organism of TORCH group.

Table 4- Co-infection of TORCH Organisms

S.No.	Co-infection (IgM antibody)	No. of positive
1	Toxoplasma + Rubella	6 (2.4%)
2	Toxoplasma + CMV	13 (5.2%)
3	Rubella + CMV	5 (2%)
4	Rubella + HSV II	8 (3.2%)
5	CMV + HSV II	30 (12%)
6	Toxoplasma + Rubella + CMV	2 (0.8%)
7	Toxoplasma + Rubella + HSV II	4 (1.6%)
8	Rubella + HSV II + CMV	4 (1.6%)
9	Toxoplasma + Rubella + HSV II + CMV	2 (0.8%)

DISCUSSION

Maternal infection during pregnancy is one of the major causes of foetal damage in women with bad obstetric history. TORCH complex is a group of protozoan, viral and bacterial organisms that are capable to cross the placenta causing various forms of BOH. These infections are initially asymptomatic and difficult to diagnose on clinical grounds but critical for taking preventive measures.

The study was carried out in two group; control and test group. The test group consisted of 250 cases of bad obstetric history among which maximum number were cases of abortions. Current study showed the presence of various microorganisms from TORCH group in the women of child bearing age having bad obstetric history. Infection with more than one organism was also detected. Co-infection of CMV with other TORCH organisms was found in highest number of cases.

In the present study the maximum affected age group was of 21-25 years while other studies reported an older age group. (9, 10, 11) This may be due to pregnancy at a younger age group in Rajasthan region due to poor literacy rate and early marriages.

Toxoplasmosis is zoonotic disease showing no obvious symptoms in healthy adults and infection may occur by ingestion of contaminated food. Transmission in foetus may occur through placenta and leads to foetal damage. Toxoplasma is capable of persistence in encysted forms in uterus which may rupture during placentation leading to infection of the foetus in the first trimester of the pregnancy. (10, 12, 13) In the present study no acute infection of Toxoplasma was found in the control group while only 2 (8%) of Toxoplasma IgG antibody positive cases were found. This indicated lesser prevalence of Toxoplasma in the study population. However in the study group recurrent infection with Toxoplasma was observed in 10% with the incidence of 22% acute infections. Forty percent cases were found positive for IgG antibodies against Toxoplasma indicating that infection with Toxoplasma in the past could be the reason of the bad obstetric history in the patient. Sadik et al. (2012) reported 6.97% positivity from Hyderabad, (11) Turbadkar et al. (2003) 10% positivity from Mumbai (13) and Padmavathy et al. (2013) 5.8% positivity from Bangalore (10) for Toxoplasma IgM which were quiet lower than our study.

Rubella is a benign viral infection in adults but cause devastating manifestations in the foetus when contracted by pregnant women in early weeks of pregnancy. In the present study high Rubella IgG positivity and no IgM positive cases were found in the control group indicating high immunity against Rubella infection in the study population due to inclusion of MMR (Measles,

Mumps and Rubella) vaccine as per Universal programme of immunisation. However in the test group total 19 (7.6%) cases were found positive for Rubella IgM antibody also reported by Surpam et al. (2006) from Nagpur (14) which correlates with our study while others reported a higher incidence of Rubella infection such as Turbadkar et al., 2003 reported 26.8% from Mumbai (13) and Sebastian D et al, 2008 reported 11.3% from Kerala. (15)

In adults the infection with CMV is asymptomatic but the infection during pregnancy may be more complex due to the possibility of reactivation of the virus during the child-bearing years and the transmission to the foetus despite maternal immunity. In the present study 88% CMV IgG positive cases were detected among the control group and 98.8% in the test group indicating the higher exposure of the study population to CMV. Similar observations have been reported by Mukundan et al. (1977), (16) Turbadkar et al., (2003) (13) and Thapliyal et al. (2005). (17) However previous immunity to CMV infection does not prevent recurrence of the infection. Current study showed 19.2% women positive for CMV IgM antibody in the test group. Similar observations were reported by Kaur et al. (1999) (18) and Thapliyal et al. (2005) (17) i.e. 20.8% and 26.7% respectively. However lower incidence has been reported by Mookherji et al. 1995 (8%) (7) and Turbadkar et al., 2003 (8.42%) from Mumbai. (13) The difference may be attributed to the fact that the prevalence of infection varies widely in various regions. Moreover, all the 48 CMV IgM positive cases in the study group were also sero-positive for CMV IgG. These results indicate the possibility of recurrent infection or reactivation of latent CMV infection or re-infection with a different viral strain.

HSV-II is one of the most common cause of genital ulcer. One of the major causes of neonatal herpes is the contact with genital secretions at the time of delivery. However both primary infection and reactivation of old infection during infection is reported to increase the frequency of foetal damage. **(8, 13)** In the present study the control group showed no HSV-II IgG or IgM cases indicating very lower exposure of the study population. Among the test group 33.97% cases were found positive for HSV-II IgG suggesting it to be the cause of bad obstetric history which is line agreement as report by Turbadkar et al., 2003. **(13)** We noted 34.8% IgM positive cases while other studies of Padmavathy et al., 2013, Turbadkar et al., 2003 and Surpam et al., 2006 reported lower incidence which does not correlated with our study. **(10, 13, 14)**

CONCLUSION

Screening of TORCH organism in women with bad obstetric history should be done on routine basis to avoid the fatal outcome, also screening of TORCH organisms in babies with congenital anomalies to be done to show the extended picture of TORCH infections. Infections other than TORCH organisms should also be detected to understand the causes of BOH and potential threats in women in their child bearing age that will be helpful in preventing foetal damage.

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