Int J Biol Med Res.2016;7(2):5492-5494

Contents lists available at BioMedSciDirect Publications

International Journal of Biological & Medical Research

Journal homepage: www.biomedscidirect.com

Original Article

Is screening of TORCH worthwhile in women with bad obstetric history: An observational study from Himalayan Hospital

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ARTICLE INFO

Keywords:
Bad obstetric history,
Case-control study,
Pregnancy wastage,
TORCH screening

ABSTRACT

Aims : To evaluate the incidence of TORCH infections in pregnancy wastage in women with bad obstetric history (BOH).Methods: The study included 70 women with bad obstetric history and 35 clinically normal women with previous normal full term deliveries. Serological evaluation for TORCH infections was carried out by IgM ELISA method over a period of eight months.Results: Seropositivity of cytomegalovirus was 21.42%, Toxoplasma 15.71%, Rubella and HSV were 8.57 %, while in control group, seropositivity for Toxoplasma and Cytomegalovirus was 2.85% and for HSV 5.71%. The highest seropositivity in cases of repeated abortions was seen with Cytomegalovirus (23.33%), followed by Toxoplasma gondii (20%). In intrauterine growth retardation, Toxoplasma and Cytomegalovirus showed highest seropositivity (37.5%). In intrauterine death and preterm labour , cytomegalovirus showed highest seropositivity 38.88% and 50% respectively.Conclusion: Seropositivity is significantly higher (p=0.00002) in women with BOH than that in controls. A previous history of pregnancy wastage and the serological reaction for TORCH infections during current pregnancy must be considered while managing BOH cases so as to reduce the adverse fetal outcome.

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1. Introduction

Bad obstetric history(BOH) implies previous unfavourable fetal outcome in terms of two or more consecutive spontaneous abortions, history of intrauterine fetal death, intrauterine growth retardation, still birth, early neonatal death and/or congenital anomalies.[1] The causes of BOH may be genetic, hormonal, abnormal maternal immune response and maternal infections.[2] Infections caused by TORCH[toxoplasma gondii, rubella virus, cytomegalovirus(CMV), herpes simplex virus(HSV)] and other agents like chlamydia trachomatis, treponema pallidum, neisseria gonorrhoeae, HIV etc are major causes of BOH. [2,3] They are a group of viral, bacterial and protozoan infections that gain access to the fetal bloodstream transplacentally via the chorionic villi. These pathogens usually cause only asymptomatic or mild infection in mother, but can cause much more serious consequences in fetus.[4] The social and reproductive maladjustment because of repeated pregnancy wastages, cost of treatment and morbidity caused to the infant make the TORCH group of infections a major concern. The prevalence of these infections varies from one geographical area to another.[5]

A recent study from Chandigarh reports rising seropositivity to toxoplasma in women with BOH.[6] Sero-epidemiological studies have shown that 10-20% of women in child bearing age in india are susceptible to rubella infection. Infection with rubella during pregnancy may lead to congenital malformation in 10-54% of cases.[3] Maternal CMV is the commonest viral infection in perinatal period and is the leading cause of congenital CMV infection.[7] The incidence of congenital CMV ranges from 0.5-3.0% in all live births.[8] Primary HSV infection during first half of pregnancy is associated with increased frequency of spontaneous abortion, still birth and congenital malformation.[9] ELISA for IgM antibodies against these infections is highly sensitive and specific.[10]. Hence an observational study was designed to find the infections due to TORCH agents in women with BOH and clinical outcome in such cases.

Materials and methods

This case-control study was carried out over a eight month period in the department of obstetric and gynaecology at a tertiary referral hospital (Himalayan Institute of Medical Science) in Dehradun. A total of 105 women were investigated including 70 with BOH and 35 clinically normal ones with previous normal full term deliveries.

Inclusion criteria: Cases were included in the study group depending on previous history of having 2-3 pregnancy wastages, intrauterine death, preterm deliveries, intrauterine growth retardation, unexplained early neonatal death and congenitally malformed children.

Exclusion criteria was other causes of congenital malformation, IUGR, IUD and perinatal loss. The study was approved by the institutional ethics committee and informed consent from participants were obtained. Detailed examinations

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and conventional laboratory investigations were carried out in both groups. From each woman 3ml of venous blood was collected in a vacutainer with strict aseptic precautions. The serum was used for serological evaluation for TORCH infections. IgM antibodies for these infections were detected by ELISA test kit (Euroimmune diagnostics, Netherlands).

Results

The history of the 70 BOH cases consisted of abortion in 30 (42.86%), intrauterine death in 18 (25.71%), oligohydroamnios in 10 (14.29%), intrauterine growth retardation in 8 (11.43%) preterm labour in 2 (2.86%), congenital malformations in 2 (14.29%) and early neonatal death in 1 (1.43%). Out of 70 BOH cases, 38 (54.28%) and out of 35 healthy control 4 (11.42%) were serologically positive for one of the TORCH infections. Seropositivity rate in women with BOH is significantly higher than in normal healthy controls (p= 0.00002) with Odd's ratio 9.2 (95% C I 2.70-34.56).

In BOH cases, the seropositivity for cytomegalovirus was 21.42%, toxoplasma 15.71%, Rubella and HSV were 8.57%, while in control group, seropositivity for toxoplasma and cytomegalovirus was 2.85% and for HSV 5.71%. The difference in seropositivity of cytomegalovirus between BOH cases and control group was statistically significant. (p=0.012*)

Table 1

The highest seropositivity in cases of repeated abortions was seen with cytomegalovirus (23.33%), followed by toxoplasma gondii (20%). In intrauterine growth retardation, toxoplasma and cytomegalovirus showed highest seropositivity (37.5%). In intrauterine death and preterm labour , cytomegalovirus showed highest seropositivity 38.88% and 50% respectively. In oligohydroamnios, seropositivity with toxoplasma and CMV was highest (20%). In 70 cases of BOH, only one case was of early neonatal death and two cases of congenital malformation in which IgM TORCH was negative.

Table1. The Seropositivity of TORCH agents

Torch agent	Cases (BOH) (n=70)		Healthy controls (n=35)		P value
	No.	%	No.	%	
Toxoplasma	11	15.71	1	2.85	0.050
Rubella	6	8.57	0	0	0.175
Cytomegalovirus	15*	21.42	1	2.85	0.012*
Herpes simplex	6	8.57	2	5.71	0.715
Total	38	54.28	4	11.42	0.00002

Table 2

The number of seropositivity for IgM antibodies against T. gondii, Rubella, CMV and HSV-2 for either a single organism or in combination were 24 (34.29%). It was observed that, antibody positivity was highest for CMV (29.17%) followed by HSV and combination of Rubella, Toxoplasma and CMV (16.67%).

Table 2. Prevalence of TORCH infections with different presentation in BOH cases

	Toxoplasma		Rubella		Cytomegalovirus		Herpes simplex	
	No.	%	No.	%	No.	%	No.	%
Abortion (n=30)	6	20	3	10	7	23.33	3	10
Intrauterine growth restriction (n=8)	3	37.5	1	12.5	3	37.5	0	0
Intrauterine death (n=18)	3	16.66	2	11.11	7	38.88	0	0
Preterm labor (n=2)	0	0	0	0	1	50	0	0
Early neonatal death (n=1)	0	0	0	0	0	0	0	0
Congenital malformation (n=2)	0	0	0	0	0	0	0	0
Oligohydroamnios (n=10)	2	20	1	10	2	20	1	10

Table 3. Prevalence of TORCH infection in single and/ combinations

TORCH infections	No. of positive cases	(%)
Toxoplasma	2	8.33
Cytomegalovirus	7	29.17
Herpes simplex	4	16.67
Rubella	2	8.33
Toxoplasma and CMV	3	12.5
Toxo and herpes	1	4.16
Toxo+herpes+CMV	1	4.16
Rubella + Toxo + CMV	4	16.67
Total	24	100

Discussion

Maternal infections play a critical role in pregnancy wastage and their occurrence in patients with BOH or complicated pregnancy is a significant risk factor. [11] All viral pathogens usually cause a primary maternal viremia which may infect the placenta and thereby the fetus with the exception of HSV-1 or 2, which causes an ascending infection via the genital tract to fetal membranes and then to the fetus. [12]

Primary CMV infection in pregnancy has a higher incidence of symptomatic congenital infection and fetal loss. This infection being asymptomatic in adults, it is difficult to diagnose clinically. Demonstration of IgM antibodies is indication of primary infection. The present study shows seropositivity rate of 21.42% for CMV IgM in women with BOH. The transmission of CMV infection to fetus occur in 40% of the cases with primary infection and results in the delivery of 10-15% symptomatic and 85-90% asymptomatic congenitally infected newborns.[13] A positivity of 8-24% in women with BOH and other obstetric problems has been reported previously. [14,15]

Congenital infection of toxoplasma is known to occur during acute phase of maternal infection and the IgM antibodies are evaluated in maternal sera. IgM antibodies were found in 15.71% of our cases. The seroprevalence of toxoplasma gondii infections range between 7.7 and 76.7% in different countries (United Kingdom 7.7-9.1%, Norway 10.9%, India 45%, Brazil 50-76% and Nigeria 75.4%). Sadik MS etal [16] and Turbadkar D etal[14] have also reported an incidence of 18% and 10.5% respectively. Janak etal [12] reported overall IgM antibody positivity of 8.3% in 60 cases of BOH. The Indian studies showed varied results ranging from 11-55%. [17] Studies have proved that persistence of encysted form of toxoplasma in chronically infected uteri and their rupture during placentation leads to infection of baby in the first trimester and often to recurrent miscarriages. [14,16]

In our study, the seroprevalence of the BOH cases for rubella IgM was 8.57% while other workers reported seropositivity ranging from 4-17.7%. [18-19] Rubella is a mild viral illness in children but occasionally infect adults. WHO estimates that, worldwide more than 1 lakh children are born with congenital rubella syndrome each year, most of them in developing countries. Nearby 50% of rubella infection is subclinical.[20] 10-20% of women in child bearing age are susceptible to rubella.

Primary infection with HSV-2 acquired by women during pregnancy accounts for half of the morbidity and mortality from HSV-2 among neonates while other half results from reactivation of an old infection. [21] Seropositivity rate for HSV IgM among BOH patients in our study was 8.57%, similar to what has been reported previously. [22]

It was observed that in our study, mixed infections were noted in nine cases of IgM, similar observation of mixed infection has been made earlier. [14]

Conclusion

This study has established that TORCH infection play a role on adverse fetal outcome. As the cost of whole TORCH panel test being very high, most general population of a developing country such as India can not comfortably afford this testing. It might be due to the fact that the numbers of controls included in the present study were half to that of cases. However, the difference between two groups was quite significant numerically. It may not be possible to screen all pregnant patients for TORCH as it is economically not possible, but all the patients with previous history of recurrent pregnancy miscarriage should be subjected to TORCH screening. In the cases where antibodies are positive, the patients should be advised and counseled about the adverse effect of the TORCH infection or the fetus, due to this the complications such as congenital malformations, abortion, stillbirth and preterm deliveries may occur and the affected female should be counseled with her husband regarding continuation of pregnancy and treatment. If an infection occurs, it needs to be treated aggressively to prevent transmission to fetus. Hence, all antenatal cases with BOH should be routinely screened for TORCH, as early diagnosis and appropriate intervention will help in proper management of these cases.

Ethical Approval

The patients consent was obtained before this study.

Conflict of Interests

The author declare that they have no conflict of interests.

Acknowledgement

The author thanks all the participants/patients who cooperated with them to undertake this study.

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