

Prevalence of IgM Antibodies to Toxoplasma, Rubella and Cytomegalovirus Infections During Pregnancy

Shashi Chopra, Usha Arora, Aruna Aggarwal

Abstract

The present study was conducted to find out the prevalence of IgM antibodies to Toxoplasma, Rubella and Cytomegalovirus in women with Bad Obstetric History (BOH) in and around Amritsar. Over a period of one year, 200 serum samples were collected from pregnant women having BOH and 100 serum samples were collected from pregnant women without BOH. Out of 200 sera, from women with BOH 137 (68.5%) were positive for Toxoplasma, Rubella and CMV alone or in combination. IgM seropositivity to Toxoplasma was 42.5%, Rubella was 17.5% and CMV was 29.5%. The highest percentage of these antibodies to Toxoplasma, Rubella and CMV was in cases of abortions i.e. 71.8%, 59.9% and 61% respectively. The study shows that there is a strong association of these agents with BOH. Thus, screening and early diagnosis for these agents in women can help in proper management of these cases.

Key Words

Bad Obstetric History (BOH), Toxoplasma, Rubella, Cytomegalovirus (CMV), IgM

Introduction

Maternal infections play a critical role in pregnancy wastage and their occurrence in patients with Bad Obstetric History (BOH) is a significant factor (1). The rate of spontaneous abortion from foetal infection by the infectious agents like TORCH (Toxoplasma, Rubella, Cytomegalovirus, Herpes Simplex virus) group and others such as Treponemosa pallidum is believed to range from 10-15% (2). The maternal infection which has been considered as a significant factor in the causation of poor pregnancy outcome elsewhere has not assumed much significance in India since their prevalence and effect on pregnancy outcome have not been studied so far (3).

Most of the information on Toxoplasmosis in India is on pregnancy wastage (4,5). Rubella and (CMV)

Cytomegalovirus are reported to cause damage to the foetus if acquired during pregnancy (6,7). These maternal infections with adverse outcome are initially inapparent or asymptomatic and are thus difficult to diagnose on clinical grounds.

However, diagnosis of acute Toxoplasma, Rubella and CMV infection can be established by demonstration of seroconversion in paired sera or by demonstration of specific IgM antibodies. The prevalence of Toxoplasma, Rubella and CMV specific IgM antibodies during pregnancy in patients with BOH has not been reported from this region. The present study was therefore undertaken to study the prevalence of Toxoplasma, Rubella and CMV infections during pregnancy.

From the Department of Microbiology, Govt. Medical College, Amritsar (Punjab) India

Correspondece to: Dr. Usha Arora, 36, Anand Avenue, Amritsar, Punjab.

Material and Method

The study was conducted on 300 blood samples taken from antenatal females in the Department of Microbiology, Govt. Medical College, Amritsar over a period of one year. The cases were divided in two groups. Group-I (study group) included 200 blood samples from antenatal females in the reproductive age (15-45 years) group with history of previous unfavourable foetal outcome in terms of two or more consecutive foetal deaths, intrauterine growth retardation, still birth, early neonatal death and/or congenital anomalies. In group-II blood from 100 antenatal females without BOH were taken which served as control.

Sera were separated and stored at 4^oc until analysed from all the blood samples. Toxoplasma, Rubella and CMV specific IgM antibodies were detected by using Elitorch IgM ELISA Kits (Ranbaxy diagnostic). The tests were performed according to manufactures instructions. Optical density (OD) was read at 450nm on an ELISA reader. All the samples showing OD reading above cut off value were considered to have significant antibody titre to Toxoplasma, Rubella and CMV.

Results

In the study group 131 women (65.5%) belonged to urban, 69 (34.5%) to rural area, while in control group 60 women (60%) belonged to urban area and 40(40%) to rural area. In the study group 137 (68.5%) sera were positive for IgM antibodies against Toxoplasma, Rubella and Cytomegalovirus (CMV) alone or in combination as shown in Table-I. The seropositivity of Toxoplasma, Rubella and CMV IgM antibodies according to various obstetrics losses is shown in Table-II. In group-II (control) IgM antibodies were not detected against Toxoplasma and Rubella but 4 sera were positive for IgM antibodies against CMV.

Discussion

Toxoplasma, Rubella and CMV are known to cause infection in utero and are often responsible for abortion, still birth, premature delivery and congenital malformation. There is considerable variation in the

Table.1 Prevalence of IgM seropositivity to Toxoplasma, Rubella and CMV alone or in combination

Sr. No	IgM antibodies present alone/ combination	No. of sera positive	%age
1.	Toxoplasma IgM antibodies alone	53	39
2.	Rubella IgM antibodies alone	13	9.5
3.	CMV IgM antibodies alone	33	24
4.	Toxoplasma and Rubella IgM antibodies	12	8.5
5.	Toxoplasma Rubella and CMV IgM	4	3
6.	Rubella and CMV IgM antibodies	6	4
7.	CMV + Toxoplasma IgM antibodies	16	12
Total		137	100

Table.2 Sero prevalence of toxoplasma rubella and CMV IgM antibodies according to various obstetric losses.

Obstetrical History	No. of IgM seropositivity to Toxoplasma, Rubella & CMV					
	Toxoplasma	%age	Rubella	%age	CMV	%age
Abortions	61	71.8	21	59.9	36	61.0
Abortion, Premature delivery, still births	19	22.2	8	23.0	20	33.9
Congenital Anomalies	4	4.8	4	11.4	0	0
Neonatal death	1	1.2	2	5.7	3	5.1
Total	85	100	35	100	59	100

prevalence of these agents among the women of child bearing age in different geographical areas. In the present study, Toxoplasma antibodies were found in 42.5% of samples, while other workers have reported it to be 34.5% and 13.1% respectively (1,3). A recent study from Chandigarh showed a rising sero-positivity to Toxoplasmosis in women with BOH (4). Detection and timely treatment of such infections can prevent morbidity and mortality of the infants born to such mothers. In the present study antibodies to Rubella were found in 17.5% women which is in accordance with the study of other workers (8). Whereas, Yasodhara *et al.* (3) Kishore J *et al* (9) and Turbadkar D *et al* (10) reported Rubella IgM antibodies positivity as 6.5%, 10.38% and 26.8% respectively. Incidence of 29.5% positivity for IgM antibodies against CMV in pregnant women with BOH was also quite high as compared to the study of other workers (3,7), which might be due to the different

sensitivity of various kits used. Overall positivity in the study group was 89.5% which shows that these agents do have a great role to perform in the pregnancy related complications. Thirty eight patients also had antibodies to more than one agent indicating polymicrobial infectious aetiology. Out of 38 patients of mixed infections, 12 were positive for Toxoplasma and Rubella, 16 for Toxoplasma and CMV, 6 for Rubella and CMV and in 4 samples antibodies to all the three agents were detected in significant titres. Similar observations of mixed infections have been made earlier (1).

Conclusion

The present study demonstrates a strong association between the infectious agents (Toxoplasma, Rubella and CMV) and BOH in women. It is therefore recommended that all antenatal cases with such history should be routinely screened for these agents. Early diagnosis will help in proper management of the cases. This study also emphasizes the need for immunization in prospective mothers and adolescent girls who have not received MMR vaccine in their childhood.

References

1. Mookerjee N, Gogate A, and Shah PK. Microbiological evaluation of women with bad obstetric history. *Ind J Med Res* 1995; 102: 103-07.
2. Capuzzo E, Spinillo A. Genital infections as a cause of abortions in the first trimester of pregnancy. Review of Literature Minerva. *Gynecol* 1995; 47: 557-60.
3. Yasodhara P, Ramalakshmi BA, Naidu AN, Raman L. Prevalence of specific IgM due to Toxoplasma, Rubella, CMV and C Trachomatis infections during pregnancy. *IJMM* 2001; 19 (2): 79-82.
4. Sharma P, Gupta T, Ganguly NK, Mahajan RC, Malla N. Increasing Toxoplasma Seropositivity in women with bad obstetric history and in new borns. *Nath Med J* 1997; 10: 65-66.
5. Dashore S, Dube S, Pandre V. Maternal Toxoplasmosis in cases of pregnancy wastages. *J Obstet Gynaecol India* 1991; 41: 17-20.
6. Singla N, Jindal N, Aggarwal A. Primary Rubella virus infection prevalence and relationship to pregnancy wastage. *Ind J Pathol Microbiol* 2003; 46 (4): 688-89.
7. Kapil A, Broors. Primary cytomegalovirus infection in pregnancy and non-pregnant women. *Ind J Med Microbiol* 1992; 10: 53-55.
8. Sharma JB, Buckshee K. Rubella infection: a cause of foetal wastage. *J Ind Med Assoc* 1992; 99 (7): 174-75.
9. Kishore J, Aggrawal J, Aggrwal S, Ayyagari A. Sera analysis of C. Trachomatis and S-TORCH agents in women with recurrent spontaneous abortions. *Ind J Pathol Microbiol* 2003; 46 (4): 684-87.
10. Turbadkar D, Mathur M, Rele M. Seroprevalence of TORCH infection in Bad Obstetric history. *Ind J Med Microbiol* 2003; 21 (2): 108- 10.