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Research Article

TORCH IgM seroprevalence in women with abortions as adverse reproductive outcome in current pregnancy

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ABSTRACT

Background: The aim of present study was to know the TORCH IgM seroprevalence in pregnant women with abortions as adverse reproductive outcome in current pregnancy.
Methods: A total of 63 women with abortion as adverse pregnancy event in current pregnancy and a total of 150 women with full term normal pregnancy formed our control group. IgM antibodies against TORCH agents were detected by ELISA and results were expressed qualitatively as positive and negative.
Results: Evidence of TORCH infection was seen in 66.7 % of women. Highest percentage was for HSV infection (30.10%) followed by rubella (14.2%), CMV (12.6%), and toxoplasma (9.5%). seropositivity was found highest in age group 21-25 years.
Conclusions: TORCH infections during pregnancy cause foetal loss. ELISA test continues to be a useful sensitive technique as the evidence of acute TORCH infections in pregnancy.

Keywords: TORCH, IgM seroprevalence, Abortion, ELISA

INTRODUCTION

Abortion is an issue in pregnancy wastage with its concomitant social and economic impacts. Among several other causes of foetal loss in human reproduction, TORCH agents are often responsible for abortion and the rate of spontaneous abortion from fetal infection is in range from 10-15%. Primary infection during pregnancy may cause spontaneous abortion or stillbirth.[1] Among TORCH agents, Toxoplasma gondii, globally, is the most wide spread parasite causing toxoplasmosis. It occurs during pregnancy as an acute infection. The rubella virus readily invades the placenta and fetus during gestation while CMV is the major cause of congenital infections.[2] Approximately 30%-50% fetuses of women who contract rubella during the first 3 months of pregnancy will be adversely affected by the virus.[1,2] Primary HSV infection during first half of pregnancy is associated with increased frequency of spontaneous abortions, still births and congenital malformations.[3] Infections by TORCH agents are often asymptomatic and chronic. Many sensitive and specific tests are available for eliciting serological evidence of TORCH complex. ELISA for IgM antibodies is a sensitive and reliable test for ascertaining the seroprevalence to assess the association of TORCH infections in cases of abortions in pregnancy.

METHODS

A total of 63 women admitted in Obstetrics and Gynecology ward with abortion as adverse pregnancy event in current pregnancy formed the study group. Each patient was registered at antenatal clinic and enrolled in study with informed consent. These cases were negative for any previous serological evidence for any of the TORCH agent either IgM &/or IgG. Known cases of chronic medical illness which can affect pregnancy viz. diabetes, hypertension, and chronic renal disease were

excluded from the study. Cases with other obstetrical causes likely to affect the current pregnancy viz. Rh incompatibility, eclampsia, preeclampsia, APH, uterine anomalies, or any other related illness were also excluded from the study. Pregnant females with neural tube defects including anencephaly in current pregnancy were also not included in the study because neural tube defects are known not to be due to TORCH infections. A total of 150 women with full term normal pregnancy formed our control group. Demographic characteristics were recorded. Four age groups were formed: less than 20 years, 21-25, 26-30, & 31-35 years. The minimum age taken was 18 years old, the legal age of marriage. Detailed clinical and obstetrical history, physical and obstetrical examination was performed including routine antenatal investigations and ultrasonologic examination. IgM antibodies against TORCH agents were detected by ELISA and results were expressed qualitatively as positive and negative. In case of equivocal result, test was repeated on fresh sample and if still equivocal, it was not included in data analysis. The adverse pregnancy event of abortion and TORCH serology was recorded in predesigned data collection forms.

RESULTS

Evidence of TORCH infection was seen in 66.7 % of women positive for serum IgM antibodies. Maximum percentage was for HSV infection (30.10%) followed by rubella (14.2%), CMV (12.6%), and toxoplasma (9.5%). (Table 1, Figure 1).

Among the age groups, the TORCH IgM seropositivity was found highest in age group 21-25 years - with the percent IgM antibodies 36.6% for HSV, 20% for CMV & rubella, and 13.3% for toxoplasma (Table 2, Figure 2). Based on IgM evidence, TORCH agent incidence varied from 9.5% due to toxoplasma to 30.1% by Herpes (HSV 1/2) with p values as significant (Table 3). IgM antibodies towards toxoplasma was seen with rubella in one case, toxoplasma, rubella and CMV in three, all four TORCH agents in one, rubella and CMV together in one, rubella, CMV and herpes in two, CMV and Herpes in three and rubella and herpes in one case (Table 4).

Table 1: IgM antibodies serology status of TORCH agents in 63 cases of abortions.

TORCH agents	IgM seropositivity
Toxoplasma	6 (9.5%)
Rubella	9 (14.2%)
CMV	8 (12.6%)
HSV	19 (30.1%)
Total positive	42 (66.7 %)
Total negative	21 (33.3%)
Total no.	63

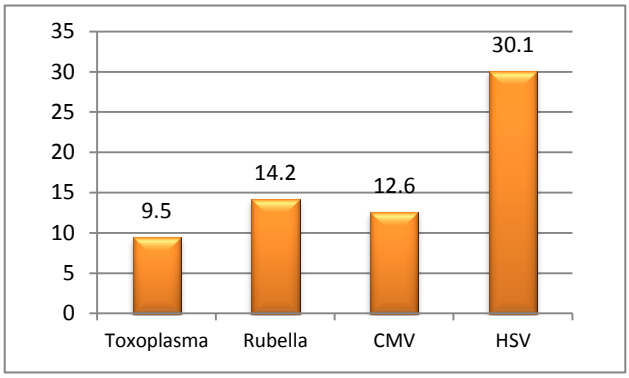

Figure 1: IgM seropositivity in 63 cases of abortions.

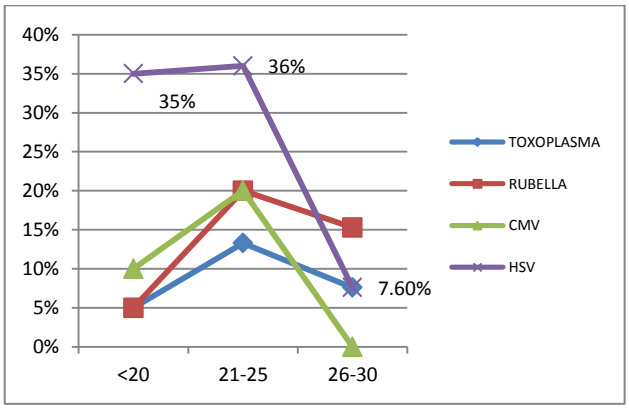

Figure 2: IgM seropositivity in 63 cases of abortions in different age groups.

Table 2: TORCH IgM antibodiesseropositivity in 63 cases of abortion in different age groups.

Age (yrs.)	Toxoplasma		Rubella		CMV		HSV	
	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve
<20* n=20	1 (5%)	19 (95%)	1 (5%)	19 (95%)	2 (10%)	18 (90%)	7 (35%)	13 (65%)
21-25, n=30	4 (13.3%)	26 (86.6%)	6 (20%)	24 (80%)	6 (20%)	24 (80%)	11 (36.6%)	19 (63.3%)
26-30, n=13	1 (7.6%)	12 (92.3%)	2 (15.3%)	11 (84.6%)	0%	13 (100%)	1 (7.6%)	12 (92.3%)
31-35, n=0	--	--	--	--	--	--	--	--

***** The minimum age was 18 years (the legal age).

Table 3: Comparative percentages of IgM antibodies to TORCH agents in sera of women with abortion as adverse reproductive outcomes in current pregnancy compared with 150 controls of women with normal pregnancy.

Parameters		Abortions (n=63)		Normal (n=150)		p value
		Number	%	Number	%	
Toxoplasma	Positive	6	9.5	3	2	0.012
	Negative	57	90.5	147	98	
Rubella	Positive	9	14.2	5	3.3	0.003
	Negative	54	85.7	145	96.6	
CMV	Positive	8	12.6	3	2	0.001
	Negative	55	87.3	147	98	
HSV	Positive	19	30.1	10	6.6	0.001
	Negative	44	69.8	140	93.3	

Table 4: TORCH IgM antibodies seropositivity for mixed TORCH infections in 63 cases of abortion.

Toxoplasma	Rubella	CMV	HSV	Total
✓	✓			1
✓	✓	✓		3
✓	✓	✓	✓	1
	✓	✓		1
	✓	✓	✓	2
		✓	✓	3
	✓		✓	1

DISCUSSION

TORCH agents are known to cause infections in utero and are often responsible for abortions. But there are considerable geographical variations in the prevalence of these agents among the women of child bearing age and are responsible for pregnancy wastage.[2]

Toxoplasma

Known to be caused by the protozoan, Toxoplasma gondii, in the present study, in abortion as a manifestation of pregnancy wastage, IgM evidence of infection was found in 6/63 i.e. 9.5% cases while in controls it was seen only in 2% cases with p value as 0.012. It indicates no significant relationship of toxoplasmosis as an underlying cause of abortion. When analyzed w.r.t. age groups, in age group <20 years (18-20 years), toxoplasma IgM was found to be present in 5% suggestive of acute infection. In age group 21-25 years, toxoplasma IgM was 13.3% in age 26-30 years, IgM was 7.6%. Statistical analysis of the same has given the p value as 1.000 (Fischer's Exact test). It is a significant finding that the age group bears no relevance to IgM seropositivity if it is considered as evidence of infection responsible for adverse reproductive outcome. Similar findings have been reported by very few workers but one study by Mohammad J et al has very clearly shown that there is no relationship of IgM antibodies evidence in cases of abortion when toxoplasmosis is considered as an underlying cause4. In an Indian study of R. Kaur, IgM antibodies were reported as 11.2%[5] while other studies across India, especially by Dar et al 1997; and Adhya et al, 1996 and abroad have reported it in the range 0.7 to 3.1%.[6] A relatively higher rate of resistance against the adverse effects toxoplasma infection appear to be due to improving environmental conditions and better personal habits, hygiene and overall improving life styles of the people. A study by Decavalas et al 1990, however, has put forth the observation and opinion that 'toxoplasma antibodies are found to be higher in women with abortion as pregnancy wastage in rural areas, where contact with soil is common regardless of cats are kept pets or not'.[7]

Rubella

Among 63 cases of abortions, rubella IgM evidence was seen in 9 i.e. 14.2% cases while in controls it was an outcome only in 3.3% cases and the p value is <0.05. It is a significant finding. In age group <20years, rubella IgM was found to be 5%, in 21-25 years age group it was 20% while in age group 26-30 years, it was 15.3%. The p value, in both the groups, is less than 0.05. It reflects that IgM serology status is very important as an evidence of primary rubella infection in pregnancy.

Primary rubella infection has been reported as 4.5% by Yasodhra et al while Surpam et al have reported IgM seropositivity 4.66%.[1,8] Erstwhile, in Indian context, seropositivity has been reported in the range 4 to 17.7%.[9,10] WHO estimates, across the globe, that more than one lac children are born with congenital rubella syndrome each year, most of them in developing countries.[11] Nearly 10-20% women in child bearing age are susceptible to rubella and primary rubella virus infection during pregnancy may cause foetal damage.[11] In India, rubella immunization is an ongoing process. In a nine year study from Israel, prevalence of rubella virus infection was found to get reduced from nearly 16% to about 7% by immunization.[20]

CMV

CMV primary infection was found to be 12.6% in 63 abortion cases while it was only 2% in controls. The p value is less than 0.05. In age group <20 years, IgM seropositivity was 10% in group 21-25 years, it was 20% in age group 26-30 years, none was positive for IgM. On statistical analysis p value is border line insignificant (0.055). IgM Seropositivity has been reported to be in the range 3-12.9%.[12,13] Primary CMV infection in pregnancy has a higher incidence of symptomatic congenital infection and foetal loss.[14] Demonstration of IgM antibodies is indicative of primary infection.[15] The transmission of CMV infection to foetus occurs in 40% of the cases with primary infection and results in the delivery of 10-15% symptomatic and 85-90% asymptomatic congenital infected newborns.[16]

HSV

For HSV our study revealed that in age group <20 years, IgM seropositivity was 35%; in group 21-25 years, it was 36.6% & in age group 26-30 years, it was 7.6%. The overall picture reflects a significantly higher seropositivity in all age groups from 20 to 35 years for HSV infection (p value 0.01). Mohammad et al have reported HSV as 73.9% suggesting a significant role in mortality and morbidity.[4] The primary HSV infection during pregnancy is responsible for half of the morbidity and mortality from HSV-2 among neonates while the other half results from reactivation of an old infection.[17] According to Deborah et al primary infection occurring in the first or second trimester caused an increase in spontaneous abortions and/or prematurity and foetal growth restriction.[18] Mixed infection as seen by IgM seropositivity was seen on 12 (19.2%) cases in our study. Similar observations have been made by other workers.[14,19]

In Indian context it is important to know that the study carried out by Singh and Nautiyal in 1991 in Kumaon region (now Uttaranchal) and later on by Singh et al in 1994 in Maharashtra states indicate that the Indian population particularly the women are highly exposed to TORCH infections especially Toxoplasma and rubella. The seroprevalence in these studies was directly proportional to the age group of the population tested, with highest prevalence of 77% by the marriage age (18-20 years).[21-23] Our study also finds that the highest incidence of TORCH is seen in the age 18-25 years.

TORCH IgM seropositivity in current pregnancy with no previous history of any such serological evidence must be considered as one of the important underlying causes for adverse reproductive outcomes, especially abortions, responsible for pregnancy wastage. It need be managed very cautiously for all future pregnancy events. The costs of the test panels are relatively high therefore the selected tests of the TORCH panel may be undertaken in individual cases there is previous history of abortion due to any reasons. The rubella immunization is advisable. Since toxoplasma infection is a preventable zoonotic infection, therefore education of the mothers during current pregnancy is important especially when there is past history of adverse reproductive outcome as evidenced by TORH IgM seropositive status-all this for reasons of family planning. Improving awareness about taking of all precautions including avoidance of ingestion of raw or undercooked food especially meat and poultry and keeping a proper hygiene remain highly significant in our Indian scenarios. Education of mothers about TORCH infections is likely to reduce the social impacts on the society including reduction in morbidity and mortality due to foetal loss attributable such infections. Although there are variations in serological evidences for TORCH, however it suggested that IgM seroprevalence may be carried out on periodic basis to augment the improving health standards and education levels in our society.

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