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Original Article

Primary rubella infection: Prevalence and relationship to pregnancy wastage

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Abstract

Objectives : To evaluate the prevalence of primary rubella infection in women with pregnancy wastage. *Methods :* The study included 150 pregnant women with obstetrical losses (Group 1) and 150 pregnant women without any obstetrical losses (group II). Serological evaluation for IgM antibodies was carried out by IgM ELISA method. *Results :* Seropositivity for rubella was 8.67% in group I and 2% in group II. Seropositivity was found to be associated with abortions (2.67%), congenital malformations (14.28%), still birth (10%), intrauterine death (7.69%), Preterm delivery (25%) and intrauterine growth retardation (33.33%). *Conclusions :* Seropositivity in women with obstetrical losses is statistically significant ($p<0.05$) as compared to those without any obstetrical losses. So routine screening of all pregnant women should be a part of antenatal check up.

Key words : rubella, IgM, pregnancy wastage.

Introduction

Primary rubella infection during pregnancy carries a significant risk of fetal infection and has been demonstrated to be an important cause of abortions, congenital malformations, stillbirth and other pregnancy wastages[1-4]. Acquired rubella infection is followed by high degree of immunity. Reinfection can occur but usually it is asymptomatic and it is rarely associated with fetal infection [5].

As rubella infection presents atypically, clinical diagnosis is unreliable and serological tests are of great value in the diagnosis of rubella. The present study was undertaken to find out the role of rubella as a major fetopathogen associated with pregnancy wastage and thus to identify one of the preventable causes of fetal loss.

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Materials and Methods

This study was carried out on 300 pregnant women from October, 2004 to February 2006. They were divided into two groups.

Group I (Study group): Comprised of 150 women with two or more obstetric losses in terms of abortions, stillbirth, congenital malformations and preterm delivery.

Group II (Control group): Comprised of 150 women without any obstetric losses.

Detailed history was taken and special investigations were carried out to rule out the other possible causes

of pregnancy wastage. Specific IgM antibodies to rubella were detected by ELISA using rubella IgM ELISA kit (Diagnostic system lab). For performing this test sera were obtained from all women and stored till analyzed. All tests were performed according to manufacturer's instructions in the kit. Cut off optical density (OD) values were calculated. All sera with OD value above cut off value were considered to have rubella IgM antibody.

Results

Rubella IgM antibodies were demonstrated in 13 (8.67%) cases in study group whereas three (2%) cases were positive for IgM antibodies in control group as shown in Table 1. Seropositivity of rubella among group I was found to be statistically significant ($P<0.05$). Seropositivity of rubella in the different age groups, geographical area and trimester of pregnancy is shown in Table II.

Table 1. Seropositivity of Rubella IgM antibody among two groups.

Groups	Total number Tested	Seropositive cases
Group I	150	13 (8.67%)
Abortions	150	4 (2.67%)
Congenital malformation	14	2 (14.28%)
Stillbirth	20	2 (10.00%)
Intra uterine death (IUD)	13	1 (7.69%)
Preterm delivery	12	3 (25.00%)
Intra uterine growth retardation (IUGR)	3	1 (33.33%)
Group II	150	3 (2.00%)

Table 2. Seropositivity of rubella in different age groups, geographical area and trimester of pregnancy.

Groups	Group I Total number tested	Group II Seropositive cases	Total number tested	Seropositive cases
Age group (yrs)				
16-20	4	-	2	-
21-25	57	4 (7.01%)	70	-
26-30	64	6 (9.37%)	58	1 (1.72%)
31-35	21	2 (9.52%)	18	2 (11.11%)
36-41	4	1 (25.00%)	2	-
Geographical area				
Urban	80	8 (10.00%)	87	2 (2.29%)
Rural	70	5 (7.14%)	63	1 (1.58%)
Trimester of pregnancy				
First	81	9 (11.11%)	76	2 (2.63%)
Second	49	3 (6.12%)	57	1 (1.75%)
Third	20	1 (5.00%)	17	-

Discussion

In the present study, seropositivity for rubella specific IgM antibody in Group I and Group II was 8.67% and 2% respectively which is consistent with the findings of Singla et al [6] who have reported a seropositivity of 10.38% in adverse pregnancy outcome and 3.55% in women with normal obstetric history from the same area. However, other authors have reported seropositivity ranging from 4.66% to 17.77% in females with bad obstetrical history (BOH) and 1.33% to 9% in the control group [7,8]. This difference of seropositivity might be due to different immunization rates from one geographical area to another. IgM response certainly indicates primary infection and risk of spread to fetus. Apparent absence of IgM does not necessarily exclude primary infection since the response may be missed if specimen is not taken at the right time.

In the current study, association of rubella has been seen with abortions, congenital malformations, stillbirths, IUFD, preterm delivery and IUGR. Other authors have also reported association of rubella with pregnancy wastage [1,2,3,7,9]. In the present study a rise in seropositivity was observed with increasing age reaching to maximum at age ranging from 36-41 years in the study group and 31-35 years in the control group respectively. Similarly other authors have reported increased seropositivity and attack rate with increasing age [1,10].

Analysis regarding geographical distribution revealed that the seropositivity was found to be higher in urban area in both groups. These findings are in accordance with other studies[11,12]. It might be because maximum women who participated in the study were from urban population and overcrowding conditions in the urban areas put the individuals to an increased risk of primary viral infection.

Maximum seropositivity (11.11% and 2.63%) for rubella was seen in the first trimester in both groups. Other workers have also reported seropositivity during first trimester[13,14]. The clinical manifestation of congenital rubella varies depending on the timing of maternal infection and stage of fetal development. The fetus is particularly susceptible during the first 3 months of pregnancy. After the first trimester and particularly during the fourth months of pregnancy the risk of serious fetal damage declines.

It is concluded that rubella infection is responsible for some of the obstetrical losses. Hence routine screening of all pregnant women should be a part of antenatal check up. Rubella vaccination should be included in routine immunization program and there is need to strengthen the rubella immunization amongst the adolescent girls and seronegative women in the postpartum period to avoid obstetrical mishap due to this potentially preventable cause of fetal wastage.

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