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Detection Of Rubella Virus Antibodies In Women With Bad Obstetric History At A Tertiary Care Hospital In South Assam

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ABSTRACT

Rubella, a mild, self-limiting exanthematous disease characterised by fever, lymphadenopathy, rash. The etiologic agent Rubella virus is a positive sense ssRNA virus and a member of the family Matonaviridae. The teratogenic effects resulting in numerous undesirable pregnancy outcomes such as abortion, still birth, intra-uterine fetal death or congenital rubella syndrome (CRS), characterized by deafness, heart disease and cataract relates to its public health importance. Serology is the mainstay of diagnosis as typical clinical presentation is very rare. The present study was conducted on 120 women presenting with bad obstetric history. All the serum samples were tested for Rubella-specific IgM antibodies by ELISA. A seropositivity of 10% was observed among cases with bad obstetric history. Within the test group, high sero-positivity (13.2%) was observed in women with repeated abortions followed by cases of intrauterine death (5.9%). The results indicate high prevalence of rubella in our population. Routine screening of antenatal cases is therefore necessary as early diagnosis will help in proper management and improve foetal outcome.

Keywords – Rubella IgM, Bad obstetric history, CRS

INTRODUCTION

Rubella is a mild exanthematous disease associated with low-grade fever, lymphadenopathy, and a short-lived morbilliform rash[1]. Rubella was first described as a distinct disease in the early 1800s. It was also known as "German measles" or "three day measles".

The etiologic agent Rubella virus is a positive sense single stranded enveloped RNA virus and a member of the family Matonaviridae[2] and belongs to the genus Rubivirus. Rubella virus has worldwide distribution and infects humans of all ages and socioeconomic group, with no seasonal patterns of transmission.[3]

Rubella infection is normally of minor impact characterized by a mild, self-limited disease associated with a characteristic rash. A prodromal illness consisting of fever (< 39°C), malaise and mild conjunctivitis, is more common in adults.[4]The maculopapular, erythematous and often pruritic rash is preceded by post auricular, occipital and posterior cervical lymphadenopathy by 5-10 days. The rash characteristically begins on the face and spreads to the trunk and extremities and usually resolve within three days in the same order in which it appeared.

The public health importance of rubella relates to its teratogenic affects[5] resulting into recurrent pregnancy losses or bad obstetric history which is defined as the loss of three or more pregnancies prior to the age of viability[14,15] ultimately culminating in obnoxious pregnancy outcome such as abortion, still birth, intra-uterine fetal death or congenital rubella syndrome (CRS), characterized by deafness, heart disease and cataract.[4]

The extent of foetal damage is however related to the stage of pregnancy and the severity is more likely when maternal infection occurs in early pregnancy[6,7.] If maternal infections occur 9 weeks before pregnancy, risk of foetal manifestation is 85% but it is only 52% if infected between 9-12 weeks and damage is rare if after 16 weeks of gestation.

Clinical diagnosis of Rubella during pregnancy proves difficult as only a limited proportion of the infected people present with typical exanthematous skin lesion. Hence serological screening of Rubella remains the mainstay of diagnosis.

The endemicity of rubella has been well established in India neverthless there is unavailability of official data regarding the prevalence of acquired and congenital rubella infection as it is not a notifiable disease. Studies from India and abroad have found that 10-20% women in child bearing age are susceptible to rubella. About 6-12% of babies born with congenital malformations or infections have serological evidence of rubella. These studies highlight the existence of rubella leading to foetal malformation and miscarriage.

The present study was therefore undertaken to observe the rubella seroprevalence rates in antenatal women and to analyse the influence of variables like age, occupation, geographic area, previous pregnancy outcome and gestational age on seroprevalence.

AIMS & OBJECTIVES

The objectives of the present study were the following:-

1. To determine Sero-prevalance of Rubella IgM antibodies in women of Bad obstetric history attending a tertiary care hospital.
2. To determine Sero-prevalance of Rubella IgM antibodies in relation to socio-demographic factors.
3. To determine Sero-prevalance of Rubella IgM antibodies in relation to previous pregnancy outcomes and gestational age.

METHODS & MATERIALS

A hospital based cross sectional study was conducted in a tertiary care hospital in Southern Assam for a period of one year (June 2020-May 2021) including 120 women aged 21yrs -40yrs of varying occupation and indwelling area and presenting with bad obstetric history attending obstetrics and gynaecology department. . A pre-test proforma was used to collect all relevant information and after taking due consent from the patient, sample collection was done and testing of samples were carried out using Euroimmun IgM ELISA kit for Rubella as per manufacturer's instruction.

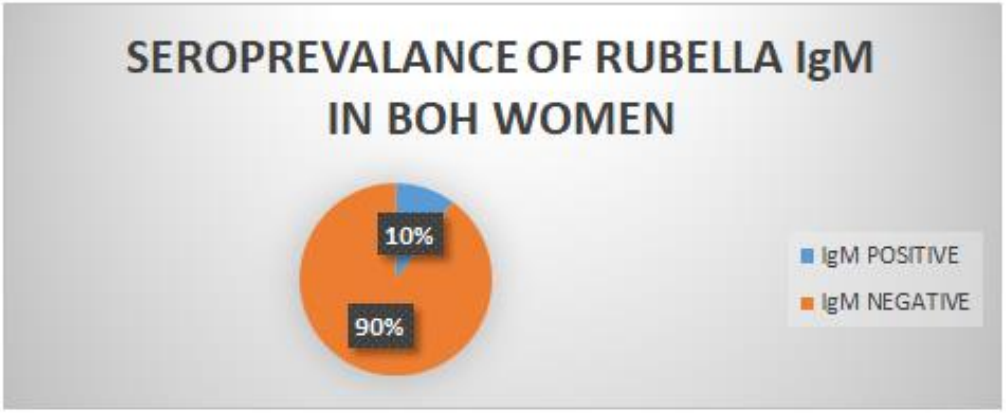
Primigravida women, women vaccinated for rubella and women with any other medical or obstetric condition were excluded from the study.

REULTS & OBSERVATION-

In the present study, the serum samples were collected from 120 suspected cases of Rubella. The study population consisted of antenatal women varying from first trimester to third trimester of pregnancy and presenting with bad obstetric history. Out of these, 12 serum samples were positive for Rubella IgM by ELISA. From these positive cases following observation were made:

1) Sero-prevalence of Rubella in women with Bad Obstetric History

It was calculated from the result of IgM ELISA that out of 120 suspected cases, 12 were reactive for IgM antibody of Rubella. Thus the sero-prevalence of Rubella at a tertiary care hospital from South Assam stands out to be 10%.



2) Association of Demographic characteristics and rubella Seroprevalence

2A) Rubella seropositivity in BOH women in relation to different geographical area

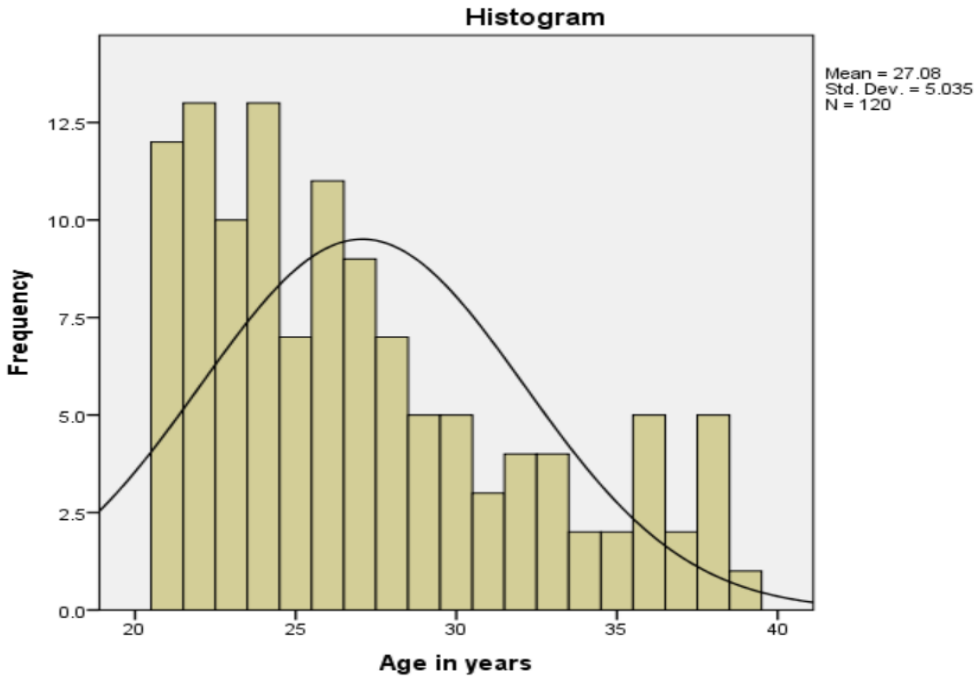
Area	Negative	Positive
Urban	77 (91.7%)	7 (8.3%)
Rural	31 (86.1%)	5 (13.9%)
TOTAL	108 (90.0%)	12 (10.0%)

Fisher's Exact test: P value -0.34

Using Fisher's exact test, seroprevalence of rubella was compared among rural and urban residents. Seroprevalence of rubella is higher in women residing in rural areas (13.9%) compared to urban areas (8.3%). However, it is not statistically significant.

(2B) Age wise Distribution of Rubella seropositive case

I. Summary of age



In this histogram, age in years is plotted in the X-axis and their frequency in number is plotted in the Y-axis. Age is distributed symmetrically where the mean (±Standard Deviation (SD)) age of the study participants was 27.08 (SD-5.03) while the median age is 26 with a minimum of 21 years and a maximum of 39 years.

II. Distribution of Rubella seropositivity in different age groups

Age group	Negative	Positive
21-25 yrs	42 (87.5%)	6 (12.5%)
26-30 yrs	34 (87.2%)	5 (12.8%)
31-35 yrs	17 (94.4%)	1 (5.6%)
36-40 yrs	15 (100%)	0
TOTAL	108 (90.0%)	12(10.0%)

Fisher's Exact test: P value -0.57
Using Fisher's exact test, seroprevalence of rubella was compared among different age groups. Seroprevalence of rubella is higher in women of age groups 21-25 (12.5%) and 26-30 (12.8%) years. However, it is not statistically significant.

(2C) Rubella seropositivity in BOH women in relation to different occupation

Occupation	Negative	Positive
Housewife	62 (88.6%)	8 (11.4%)
Working	46(92.0%)	4 (8.0%)
TOTAL	108 (90.0%)	12(10.0%)

Fisher's Exact test: P value -0.75
Using Fisher's exact test, seroprevalence of rubella was compared among different occupation groups of women with bad obstetric history. Seroprevalence of rubella is higher in women who are housewives (11.4%) when compared to women who are working (8%). However, it is not statistically significant
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3). SEROPREVALENCE IN RELATION TO PREVIOUS PREGNANCY OUTCOMES

Sl. No.	Previous pregnancy outcome	Negative	Positive
1.	Spontaneous Abortion	59(86.8%)	9(13.2%)
2.	IUD	32(94.1%)	2(5.9%)
3.	Preterm Delivery	17(94.4%)	1(5.6%)

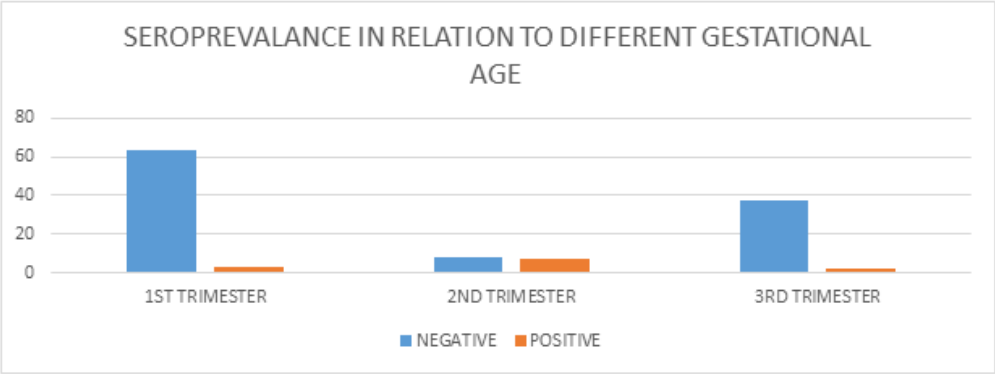
Fisher's Exact test: P value -0.4
Using Fisher's exact test, seroprevalence of rubella was compared among women who had fetal loss. Seroprevalence of Rubella was highest among women who had spontaneous abortion (13.2%) followed by IUD (5.9%) and lastly by Preterm delivery (5.6%) However, it is not statistically significant.

4) SEROPREVALENCE IN RELATION TO DIFFERENT STAGES OF PREGNANCY

	Negative	**Positive**	**P value**
1st trimester	63 (95.5%)	3 (4.5%)	<0.001
2nd trimester	8(53.3%)	7(46.7%)	
3rd trimester	37(94.9%)	2(5.1%)	
Total	108(90.0%)	12(10.0%)	

Fisher's exact test: p value: <0.001

Using Fisher's exact test, seroprevalence of rubella was compared among women of different gestational ages. Seroprevalence of rubella was higher in women of second trimester (46.7%) followed by women in third trimester (5.1%). This finding was found to be statistically significant (p value<0.001).



Out of 120 suspected cases, 66 BOH women presented in 1st trimester. 9 BOH women of 1st trimester were positive for rubella IgM antibodies. 15 BOH women presented in 2nd trimester, out of which 7 were positive revealing a seropositivity of 46.7%.39 BOH women presented in 3rd trimester, out of which 2 were positive revealing a seropositivity of 5.1%.

DISCUSSION

Several studies have showed that 10-20% of the women in the childbearing age with (BOH) have suffered from rubella infections in their lifetime.Our present study revealed sero-positivity of 10% for women with bad obstetric history. Abdolreza et al[8] and Saswati et al respectively reported an almost similar seroprevalence of 10.8% and 11% for Rubella IgM antibodies. However a lower seropositivity of 6.1% and 7.79% was reported by Al Mishaddani et al[9] and Salman et al[10] respectively.

Seroprevalance was determined in relation to different age groups, geographical area and occupation; however it was statistically insignificant.

The disastrous effect of rubella virus infection in early gestation has been well established and leads to various poor pregnancy outcomes. Seroprevalance in our study in relation to previous pregnancy outcomes indicated that abortion was the commonest outcome closely followed by intra uterine foetal deaths and preterm delivery. However it was not statistically significant.

Antibodies were found in all the trimesters of pregnancy. Our study indicated highest sero-prevalence of 46.7% in 2nd trimester. This agrees with the work of Agbede et al[11] who similarly reported highest Rubella sero-prevalence in second trimester. These reports contrast with the reports of Bamgboye et al[12] and Fokunang et al[13] which showed the highest prevalence in pregnant women in their first trimester.

CONCLUSION

Considering the devastating effects of Rubella virus in pregnancy, it is recommended that pregnant women needs to be screened for rubella and be counselled on appropriate preventive measures, Cost effective rubella vaccination of all children can achieve the goal of reduction and complete prevention of this vaccine preventable infection. Awareness should be created among the people, particularly in slum and rural vulnerable areas about rubella and its adverse effect to pregnancy outcomes.

LIMITATION OF STUDY- The present study determines sero-prevalence of acute rubella infection only. Sero-positivity of past infections was not analysed and therefore further studies determining the IgG status can be done.

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Conflict of interest: none declared
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