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ORIGINAL PAPER

A Study on 'Sero-prevalence of Rubella in Pregnancy' Giving Special Emphasis to its Clinical Presentation

Das Dipak Kumar[1], Biswas Samrat[2]

ABSTRACT

Rubella is one of the frequent causes of intra-uterine acquired infection in females. The present study was under taken with a purpose to study the sero-prevalence of rubella in pregnant woman and to examine its relation with socio-economic status. The present study was carried for a duration of one year taking up a total of 81 pregnant women admitted or attending the outdoors of Obstetrics and Gynaecology departments in Gauhati Medical College & Hospital, Guwahati, having different ethnic backgrounds, after approval of the Institutional Ethical Committee. Among the total of 81 samples, sero-positivity of rubella virus was seen using IgG as the serological marker. The cases were studied in three age groups as '21-30' years, '31-40' years and '16-20' years. Six type of clinical presentations were taken for the study as "pre term labour", "bleeding per vagina", "still birth", "spontaneous abortion", "intra uterine growth retardation" and "asymptomatic". The clinical presentation of the study group was evaluated. The data recorded was analysed statistically using Student's T-test. P value ≤ 0.05 is considered as statistically significant. Such a study may be useful in prevention and treatment of rubella virus.

Keywords: Rubella, Sero-positive, Clinical presentation

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INTRODUCTION

Rubella or German measles is a exanthematous fever characterized by transient macular rash and lymphadenopathy. In itself, the disease is trivial but rubella in the pregnant woman may lead to congenital malformation in the baby.[1] But in the world, half a million pregnant women die each year, many from such infection. Rubella virus infection acquires a special significance in pregnant women as the virus may enter the fetal circulation through the placenta.[2] Unfavourable outcome to pregnancy has become a serious problem in the society. Rubella virus infection during pregnancy can be a serious threat to the fetus with possible loss of pregnancy and diseases of newborn of which, encephalitis, hepatomegaly, neuritis, orchitis, thrombocytopenic purpura are the hallmarks of infection. Infection during pregnancy has been documented since the writings of Hippocrates. Obstetrics practice in western world does not reflect what happens elsewhere.[3] The infection is transmitted during passage through contaminated uterine cervix during birth, by transplacental transmission, from human milk by breast feeding or from banked milk, transmitted from other children in the newborn nursery and in day-care centers, transmitted through blood, through sexual contacts and through contacts with urine and other body secretions like saliva, semen etc.[4] Primary maternal rubella infection during the first semester of pregnancy causes high risk for the development of congenital rubella with malformations of heads, eye and ear.[5,6,7,8,9,10,11]

OBJECTIVES

1. To study sero-prevalence of rubella in different ages of pregnant female.

2. To find out whether there is any co-relationship of sero-positive rubella cases with different clinical presentation.

MATERIALS AND METHODS

Materials: 5 ml of venous blood was collected aseptically in a sterile vial. The vial was left at room temperature and the blood was allowed to clot. The serum was separated by centrifuging the whole blood in a centrifuge machine at 3,000 revolutions per minute for 5 minutes. The separated serum was then transferred to a sterile vial, labelled and stored at 2 degree to 8 degree centigrade till the assay was done. The serum was separated by centrifuging the whole blood in a centrifuge machine at 3,000 revolutions per minute for 5 minutes. The separated serum was then transferred to a sterile vial, labelled and stored at 2 degree to 8 degree centigrade till the assay was done. Serum samples were tested by Enzyme Linked Immuno Sorbent Assay for IgG to rubella virus using the commercially available kit (NOVATEC IMMUNDIAGNOSTICA GMBH) manufactured by Germany with lot no.RUBG-013.

Method: The present study was carried for a duration of one year taking up a total of 81 pregnant women admitted or attending the outdoors of Obstetrics & Gynaecology departments in Gauhati Medical College & Hospital, Guwahati.

Selection of Cases: In the present study 81 cases of pregnant women were selected. Amongst them some were Primi gravidae; some were multiparous women with bad obstetric histories like recurrent spontaneous abortion, threatened abortion, missed abortion, intrauterine growth retardation, intrauterine death, congenitally malformed foetus & neonatal death. The clinical presentations of both control and the study group were evaluated according to the clinical history given by the patients.

OBSERVATION AND RESULTS

The results and observations of the present study is tabulated and graphed as follows:

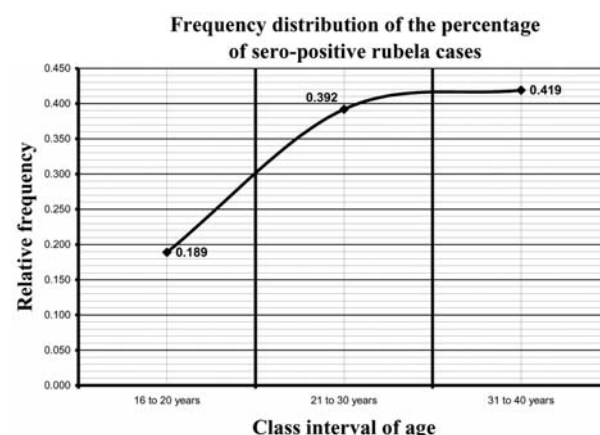**Table 1** Sero-positive cases of rubella in different age group

Age group	Total cases	Percentage of sero positive cases
16-20	10	10
21-30	53	20.8
31-40	18	22.2
SUM	**81**	**53**
MEAN	**27.00**	**17.67**
S D	**±22.869**	**±6.676**
SEM	**±13.203**	**±3.854**

For three different age groups, it is seen that the percentage of sreo-positive cases of rubella ranges from 10 to 22.2 with a mean value of 17.67, Standard Deviation ±6.676 and Standard Error of Mean ±3.854 as evident from **Table 1**.

Table 2 Frequency distribution of the percentage of sero-positive cases

Class interval of age group	Percentage of sero-positive rubella cases	
	f(frequency)	fr(relative frequency)
16 to 20 years	10	0.189
21 to 30 years	20.8	0.392
31 to 40 years	22.2	0.419
Sum	**53**	**1.000**

Table 2 shows that highest percentage of rubella cases are found in the class interval of '31 to 40' years with a relative frequency of 0.419 and simple frequency of 22.2. The lowest percentage of rubella cases are found in the class interval of '16 to 20' years with a relative frequency of 0.189 and simple frequency of 10 as evident in **Figure 1**.

Figure 1 Relative frequency

Table 3 Sero-positive cases of rubella in different clinical presentation

Clinical presentation	Total number of cases	Percentage of sero-positive cases
Pre term labour	30	26.7
Bleeding per vagina	25	8
Still birth	8	25
Spontaneous abortion	5	20
Intra uterine growth retardation	10	30
Asymptomatic	0	0
SUM	**78**	**109.7**
MEAN	**13.000**	**18.283**
S D	**±11.832**	**±11.800**
SEM	**±4.580**	**±4.810**

For six different type of clinical presentation, it is seen that the percentage of sreo-positive cases of rubella ranges from 0 to 30 with a mean value of 18.283, Standard Deviation ±11.800 and Standard Error of Mean ±4.810 as evident from **Table 3** and **Figure 2**.
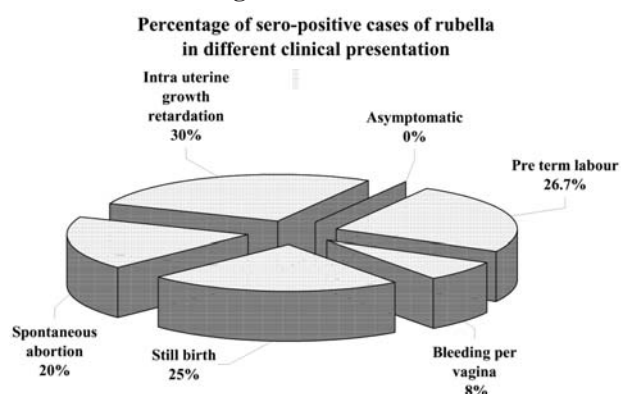

Figure 2 Percentage of sero-positive rubella cases

Table 4 Frequency distribution of the percentage of sero-positive cases

Class interval of clinical presentation	Percentage of sero-positive rubela cases	
	f (frequency)	fr (relative frequency)
Pre term labour	26.7	0.243
Bleeding per vagina	8	0.073
Still birth	25	0.227
Spontaneous abortion	20	0.183
Intra Uterine Growth Retardation	30	0.273
Asymptomatic	0	0.001
Sum	**109.7**	**1.000**

Table 4 shows that highest percentage of sero-positive rubella cases are found in the class interval of 'Intra Uterine Growth Retardation' with a relative frequency of 0.273 and simple frequency of 30. The lowest percentage of sero-positive rubella cases are found in the class interval of 'Asymptomatic' with a relative frequency of 0.001 and simple frequency of 0.
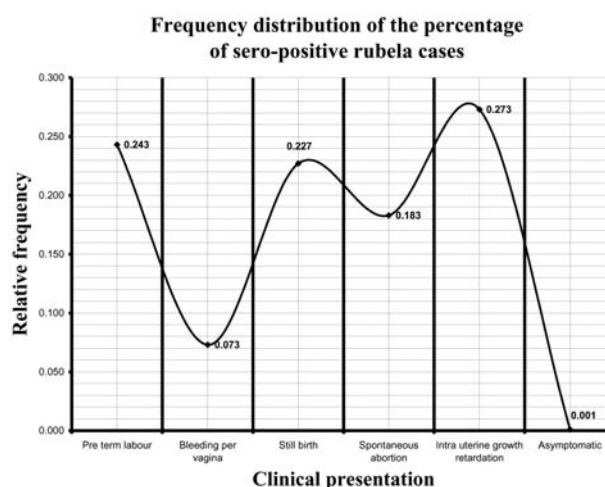

Figure 3 Relative frequency

Table 5 Frequency distribution of the percentage of sero positive cases

Class interval of socio-economic status	Percentage of sero-positive rubella cases	
	f (frequency)	fr (relative frequency)
IUGR & pre term labour	56.7	0.536
Still birth & spontaneous abortion	45	0.426
Bleeding per vagina & asymptomatic	4	0.038
Sum	**105.7**	**1.000**

Table 5 shows that highest percentage of rubella cases are found in the class interval of 'IUGR and pre term labour' with a relative frequency of 0.536 and simple frequency of 56.7. The lowest percentage of rubella cases are found in the class interval of 'bleeding per vagina and asymptomatic' with a relative frequency of 0.038 and simple frequency of 4.
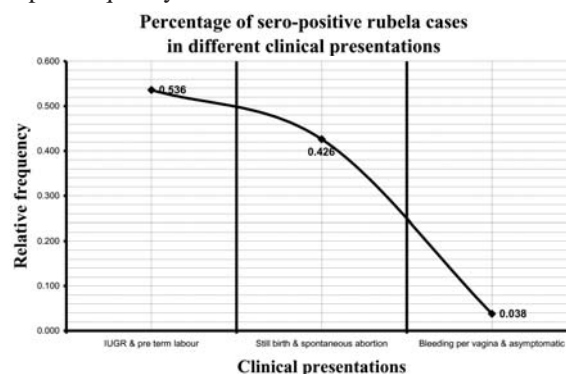

Figure 4 Relative frequency

Table 5 Level of significance of differences between the various categories

Sl. No.	Comparison of mean between percentage of	"t"	P
1	'IUGR & pre term labour' an 'still birth & spontaneous abortion'	1.953	P >0.05
2	'still birth & spontaneous abortion' and 'bleeding per vagina & asymptomatic'	6.684	P <0.01

DISCUSSION

Clinical presentations like IUGR and pre term labour are more in pregnant and non-pregnant women aged 20-40 years in lower economic groups (71.8%) compared with middle and upper socio-economic groups (50%-70%).[12,13,14] Crowded conditions in lower class population might increase the chances of exposure to rubella infection.[15] A lot of research has been conducted till date on 'rubella virus' in relation to different type of clinical presentations. Most of the studies have concluded that IUGR is one of the commonest presentations of rubella infection and there may be one or more clinical presentation at a time or even asymptomatic. Our study is consistent with this universal observation.

Difference between different type of clinical practice have been measured in matched sets of observation using the null hypothesis: Reject Ho if $P \leq t_a$ when $t_a = t_{0.05}$ setting the level of confidence at 95% probability signifying that if the differences in observation between the matched groups is significant at the level of $P < 0.05$, the hypothesis will be rejected establishing differences in type of clinical presentation between the tested groups.

CONCLUSION

The present study reveals that the percentage of sero-positive rubella cases is much lower in the age group of '16-20' years than the other two groups i.e. '21-30' years and '31-40' years.

On the other hand, sero-positive rubella cases from highest to lowest percentage in relation to different type of clinical presentation are respectively "IUGR", "pre term labour", "still birth", "spontaneous abortion", "bleeding per vagina" and "asymptomatic". When "IUGR and pre term labour" is compared with "still birth and spontaneous abortion", then the percentage of the first category is higher than the second category, but without any significance (P>0.05). But if "still birth and spontaneous abortion" is compared with "bleeding per vagina and asymptomatic" group, the first category is much higher than the second one with high significance (P <0.01).

So, we can conclude that highest percentage of Rubella incidence can be found in women of the age of third decade and above and most common clinical presentation are "intra uterine growth retardation" and "pre term labour".

Conflicts of interest: None declared.

Contribution of Authors: We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

Ethical clearance: Taken from Institutional Ethical Committee.

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