'Seroprevalence of Rubella in Infertile Women and the Need for Preconceptional Vaccination'.

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Abstract:

Background: When a pregnant woman gets rubella infection in early months of pregnancy, there is risk of severe and multiple fetal defects (congenital rubella syndrome), abortion and stillbirth. Screening of reproductive age women for susceptibility to rubella infection and vaccinating them can prevent this situation. **Objective:** The objective of the study was to find out the proportion of infertile women who are seronegative for rubella infection and to assess the need for vaccination against rubella before pregnancy. **Methods:** The observational study included three hundred and eighty infertile women who had their venous blood tested for anti-rubella antibodies as part of preconceptional preparation. Data was analyzed to estimate seronegativity and the need for vaccination. **Results:** A total of 55 (14.4%) women were seronegative for rubella and had to be vaccinated. The seronegativity decreased with age . The proportion of seronegativity was higher in those women who were professionals, had higher level of education and monthly income. **Conclusion:** A significant proportion of women in reproductive age does not acquire natural immunity against rubella and needs vaccination before pregnancy.

Key words: Rubella seroprevalence.

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Introduction:

Rubella is an acute exanthematous viral infection that predominantly affects children and young adults. When a pregnant woman gets the infection in early months of pregnancy, the fetus may have congenital rubella syndrome[1]. The virus can be transmitted to the fetus from the mother through the placenta and can cause serious multiple defects (congenital rubella syndrome), abortion or stillbirth. Total or partial blindness, sensorineural hearing loss, psychomotor delay, mental retardation and heart disease are commonly found in infants with congenital rubella syndrome. Sometimes the affected baby is apparently normal at birth but subsequently develop disability[2].

So rubella infection in pregnancy is a serious health hazard. This can be prevented if the women is screened for rubella immunity and the susceptible women are vaccinated before pregnancy.

Natural infection with the virus may lead to lifelong immunity and lifelong protection against rubella. There are many illnesses with rash that mimic rubella infection. Up to 50% of the infection may be subclinical. So immunity against the virus cannot be predicted from patients' clinical history. Immunity against rubella has to be detected by measurement of rubella specific antibodies. Infertile women presenting at Bangabandhu Sheikh Mujib Medical University are screened for rubella autoimmunity as part of preconceptional preparation. The women are vaccinated if seronegative for rubella. Since rubella vaccine is a live vaccine, the women are asked to defer pregnancy for three months. The study was done to find out the seropositivity of rubella in infertile women, to estimate naturally acquired immunity against rubella in

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Bangladeshi women of reproductive age and to assess the need for vaccination against rubella before pregnancy.

Methods:

It was an observational prospective study. The study population was the infertile women presenting for infertility workup at Infertility unit of Bangabandhu Sheikh Mujib Medical University. Three hundred and eighty women were included in the study. All women were of reproductive age ranging from 18-42 yrs. The women had their rubella antibody tested as part of preconceptual prepararion. Those who were seronegative for rubella were vaccinated before starting treatment of infertility. For each woman a questionnaire consisting of her age, education, occupation, residence and monthly income was completed by face to face interview. Rubella may be confused with a number of exanthematous diseases and memory cannot be considered reliably. So past history of rubella was not asked about in the questionnaire. To determine rubella serology, venous blood samples are collected. Antibodies for rubella in the serum was done by Chemiluminiscence in the Department of Virology, Bangabandhu Sheikh Mujib Medical University. Antirubella IgG <5IU/ml, 5-10 IU/ml and > 10 IU/ml values were regarded as negative, indeterminate and positive respectively. Data was analyzed manually.

Results:

A total of 380 women attending the infertility outdoor at BSMMU were included in the study. Two out of 380 women (0.52%) were IgM positive. The sera of 321 (79.88%) women were seropositive for IgG antibodies. The IgG antibodies were in indeterminate range in 20 (5.2%) women-- these women would be seropositive in a few months. So seropositivity and women who did not need vaccination were 85.6%. 14.4% women were seronegative for rubella and needed vaccination. Table I shows that seronegativity decreases with increasing age. Most women who are seronegative and requires rubella vaccination are in the age group 21-30 years.

Table II shows that the proportion of seronegative women is higher in those who have higher education and higher monthly income and who are students and professionals rather than housewives.

Table-1

Seronegative women in need of rubella vaccination in different age groups

Age group (years)	No of women	No of seronegative women	Percentage of seronegative women
15-20	33	06	8.18%
21-22	138	22	15.94%
26-30	138	17	12.32%
31-35	138	06	10%
36-40	26	02	7.69%
41-45	03	0	0

Table-II

Frequancy of seronegative women in different groups regarding education, occupation and monthly income

Education	No of women	No of seronegative women	Percentage of seronegative women
Illiterate or < 5 yrs Education	77	8	10.3%
6-10 yrs of education	204	31	15.19%
>10 yrs of education	176	27	15.35%
Housewife	289	43	4.87%
Student/ profe -ssional	91	14	15.38%
low (< 10,000Tk)	102	8	7.8%
medium (>			

10,000 Tk upto 25,000 Tk)	186	13	6.9%
High (> 25,000 Tk)	90	10	11.1%

Discussion:

The study was carried out with the objective of finding out the rubella seroprevalence in the reproductive age women of Bangladesh and to estimate the need for rubella vaccination in infertile women seeking treatment. Government of Bangladesh officially launched the combined measles rubella vaccine in September 2012 as part of its routine immunization programme replacing the only measles vaccine for children. It will take years to find out any effect on reproductive age women.

The proportion of women who were positive for IgG antibodies was 80.2%. Together with the 5.25% of the women who had antibodies in indeterminate range and 0.52% who were IgM positive, the total proportion of seropositive women was 85.97%. Our study was carried out on infertile women of reproductive age group. The seroprevalance was similar to that revealed by studies carried out on antenatal women population of Bangladesh before 2,3 (85.9% and 84.33% respectively).

A study in India[4] among women of childbearing age group who were referred for rubella screening either due to bad obstetric history or possible infection during pregnancy or immunity to rubella, reported a seronegtivity of 10-15%. Another study from Tamilnaru, South India conducted among female hospital staff of three eye hospitals aged 18-40 yrs reported seronegativity to rubella in the range of 11.7—20.8%[5]. Our study showed seronegativity of 14.4% which is similar to findings in the Indian studies. It appears that quite a large proportion of women is in need of rubella vaccination before conception.

There is considerable variation in the prevalence of rubella immunity among women of childbearing age of different regions. One study in India[6] had overall seropositivity of 68.8% and studies in Turkey had seropositivity rate of 94.3% [7], 96.1% [8], 97.8%[9]. Studies in Europe (Croatia) had rubella seropositivity of 94.6%[10], in Africa 95.0%[11], in South America 93.1%[12] and 93%[13]. Most of the studies elsewhere in the world had higher rubella immunity than our women. The factors causing this variation in different population may include population density, opportunity for entry of virus, level of herd immunity at the time of introduction and ethnicity[6].

Our study shows that seronegativity or susceptibility to rubella infection decrease with age. Age specific seroprevalence in the previous studies in Bangladesh[2,3] and India[6] also shows that seroprevalence increases with age.

The present study also shows that rubella susceptibility in terms of seronegativity for rubella IgG antibodies is higher in those who have higher education. The reason may be related to socioeconomic condition. Rubella susceptibility is slightly higher in students and professionals than in housewives.

Before the introduction of rubella vaccine , the incidence of congenital rubella syndrome varied from 0.1 to 0.2 /1000 live birth during endemic periods and from 0.8-4/1000 live birth during epidemics15..There is high response to the commonly used recombitant rubella vaccine (>95%) with long term persistence of protection. Immunizing adolescent girls or women of childbearing age results in a decline in congenital rubella syndrome that is proportional to the coverage used. In high and middle income countries caring for congenital rubella syndrome cases is costly and rubella vaccination has been cost effective. The 14.4% women in our study who wants to be pregnant is also susceptible to rubella infection and the risk of congenital rubella syndrome. They reflect the need for rubella vaccination before pregnancy.

Conclusion:

Congenital infection with rubella bears tragic consequences for both infants and parents as well as for family and society. The government of Bangladesh is not yet motivated to include rubella immunization in extended

programme of immunization. In this context screening for susceptible women and vaccination is the only means to eliminate the risk of rubella. A significant proportion of women in reproductive age group does not acquire natural immunity and needs vaccination against rubella before pregnancy.

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