

Serologic survey of rubella virus igG in an African obstetric population

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Abstract

Objectives: To determine the seroprevalence of rubella infection in pregnancy. **Materials and Methods:** A cross-sectional survey of 345 consecutive and consenting antenatal attendees at Aba, Southeastern Nigeria over the period 1 June – 1 September, 2012. A structured pretested questionnaire was used to collect and record data on the socio-demographic characteristics of the subjects. Blood samples were collected from the subjects and tested for rubella IgG antibodies using the QikTech™ One-Step Rubella Test (LuSys Laboratories, USA). **Results:** Sixteen (4.6%) of the 345 subjects were found to have rubella IgG antibodies in their blood. None of the subjects had been vaccinated against rubella. Maternal age, parity, educational level attained, and marital status did not show any association with rubella IgG antibodies seropositivity. **Conclusion:** Our findings imply immunity to rubella in 4.6% of the subjects. Thus, 95.4% of the subjects were seronegative and non-immune. This large pool of seronegative and non-immune population will benefit from education on the availability of vaccination, prevention, and consequences of congenital rubella.

Key words: African, Rubella virus IgG, Serologic, Survey, Obstetrics population.

INTRODUCTION

Congenital rubella infection can affect almost all organ systems in the fetus and has a high morbidity and mortality. Rubella usually is a mild, febrile rash illness in children and adults; however, infection early in a woman's pregnancy, particularly during the first 16 weeks, can result in miscarriage, fetal death, or an infant born with birth defects (i.e. congenital rubella syndrome CRS).^[1] Rubella is often not notified as many cases are not seen by a doctor or even recognized by the patient; consequently, rubella outbreaks can occur without clinical recognition. Nonetheless, studies in Central and South America, Africa, India, and The Middle and Far East suggest that rubella is widespread and endemic in

most developing countries.^[2-4] The presence of rubella-specific IgG antibody in the blood attests immunity to rubella. The knowledge of the seroprevalence of rubella IgG antibodies and the proportion of the immune and non-immune in the obstetric population will be useful in estimating the burden of non-immunity to rubella virus infection. This knowledge will assist in developing a strategy to inform and educate women about prevention and consequences of congenital rubella. Further, there is a paucity of data on the epidemiology of rubella in South Eastern Nigeria. Hence, the need for this study.

MATERIALS AND METHODS

This was a cross-sectional survey of 345 consecutive and consenting attendees at Aba, Southeastern Nigeria over the period 1 June- 1 September, 2012. A structured pretested questionnaire was used to collect and record data on the socio-demographic characteristics of the subjects.

Blood samples were collected from the subjects and tested for rubella IgG antibodies using the QikTech™ One Step Rubella Test (LuSys Laboratories, USA).

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The quick one-step test utilizes a sandwich immunoassay system and the immunochromatographic detection assay to be performed in one assay. If rubella antibody is present in the sample in concentrations above the detection, a labeled antibody-dye complex will be formed. This complex is then captured by antigen immobilized in the Test Zone of the membrane, producing a visible pink-rose color band on the membrane. The color intensity will depend on the concentration of rubella antibody in the sample. On the other hand, a color band will always appear at the control zone. The tests were performed on fresh serum samples.

Data analysis included descriptive statistics for demographic data and calculation of the seroprevalence of rubella virus IgG in the pregnant women. Association of rubella virus IgG seropositivity with maternal socio-demographic variables was determined.

Statistical analyses were performed using Epi-info version 6 statistical package. $P < 0.05$ was considered significant. Ethical approval was obtained from the research and ethical committee of Abia State University Teaching Hospital, Aba.

RESULTS

Sixteen (4.6%) of the 345 subjects were found to have rubella IgG antibodies in their blood. None of the subjects had been vaccinated against rubella. Maternal age, parity, educational level attained, and marital status did not show any association with rubella IgG antibodies seropositivity. [Table 1].

DISCUSSION

The findings of our study implied immunity to rubella in 4.6% of the African obstetric population studied. Thus, 95.4% of the subjects were seronegative and non-immune. Other studies

have shown that rubella is quite common and active among the pregnant population in Nigeria.

None of the rubella virus IgG seropositive subjects had been vaccinated against rubella and were asymptomatic. Asymptomatic carriers of 20-50% have been reported in other studies.^[5-7]

The primary purpose of rubella vaccination is to prevent congenital rubella virus infection, including the congenital rubella syndrome.^[8] Unfortunately, this large pool of existing non-immune women found in the study have none or limited access to prophylactic rubella vaccination as vaccination against rubella is not part of the Nigerian national or local immunization programs.^[9] Further, antenatal health talks in Nigeria routinely do not incorporate information on rubella infection. Preconception counseling of women of reproductive age about rubella is not routine in Nigeria.^[10]

Rubella control and prevention of CRS can be accelerated by integrating rubella into the measles case-based surveillance system, establishing CRS surveillance, and using combined MR and MMR vaccines as part of current measles elimination and global mortality activities.^[11] MMR vaccine should be offered to non-pregnant women of childbearing age who do not have evidence of immunity whenever they make contact with the healthcare system.

Vaccination of all susceptible hospital personnel who might be exposed to patients with rubella or who might have contact with pregnant women is also important. Rubella vaccination should be avoided one month before or during pregnancy because the vaccine contains attenuated live virus.^[12]

In conclusion, our findings imply immunity to rubella in only 4.6% of the subjects whilst 95.4% of the subjects were seronegative and non-immune. This large pool of seronegative and non-immune population will benefit from education on

Table 1: Relationship between maternal variables and maternal serum rubella IgG seropositivity

Variables	Maternal Rubella IgG Positive (N = 16) (%)	Maternal Rubella IgG Negative (N = 329) (%)	OR	CI	P-value
Maternal Age					
<19	0 (0)	0 (0)			
20-29	10 (62.5)	160 (48.6)	1.29	0.53-3.08	0.69
≥30	6 (37.5)	166 (50.4)	0.74	0.25-2.07	0.70
Parity					
Nullipara					
Primipara	5 (31.2)	156 (47.3)	0.66	0.21-1.96	0.57
Multipara	11 (68.8)	173 (52.7)	1.31	0.55-3.06	0.64
Maternal Education					
Primary	1 (6.2)	6 (1.8)			
Secondary	9 (56.3)	130 (39.3)	1.42	0.57-3.52	0.54
Tertiary	6 (37.5)	193 (58.8)	0.64	0.22-1.77	0.48
Marital Status					
Married	16 (100)	324 (98.8)	1.02	0.47-2.18	0.88
Single / Divorced / Widowed	0 (0)	5 (1.2)			
Separated					
Rubella IgG Test Result	?	?	?	?	?
Positive	16 (100)	329 (100)			

the availability of vaccination, prevention, and consequences of congenital rubella.

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