



RESEARCH ARTICLE



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Frequency of Rubella IgG Antibodies in Pregnant Women Attending Antenatal Clinics at Khartoum State

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Abstract

Background: infection with rubella virus in children and adults is self limited, mild disease characterized by skin rash, mild upper respiratory symptoms and lymphadenopathy. Primary infection of a pregnant women however, particularly in the first trimester of pregnancy, which may result in a high risk of fetal infection with sever complication. It is extremely important therefore to identify those women who are not immune to rubella and to immunize them. This can be achieved by screening the sera for presence of antibodies to rubella.

Objective: to determine the frequency of anti rubella IgG antibodies among pregnant women attending two antenatal clinics at Khartoum State during June 2012.

Materials and methods: this is cross sectional study, involved 80 pregnant women, who their sera samples screened for rubella immunoglobulin G, using ELISA assay as sensitive and reliable procedure.

Result: the mean age is 26.6 years old, 68.8% were in third trimester, 25% in the second, and 16.2% in the first trimester. 68.8% were IgG seropositive and 31.8% seronegative. None of them ever had rubella vaccine.

Conclusion: prevalence of rubella seromarker for previous infection is high.

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INTRODUCTION

Rubella (German measles) is acute febrile illness ⁽¹⁾ that affects children but also seen in adult ⁽²⁾.

The clinical illness characterized by rash, fever, and lymphadenopathy, and resemble a mild case of measles (rubeola) ⁽³⁾. The public health importance relates to the teratogenic effects of primary rubella infection in pregnant women ⁽⁵⁾. Maternal viremia associated with rubella infection during pregnancy may result in infection of placenta and fetus result in CRS ⁽¹⁾. Timing of fetal infection determine the teratogenic effect, however infection during the first trimester of pregnancy result in abnormalities in the infant in about 85% of cases ⁽¹⁾. From this percentage there is an approximately 50% increase risk of spontaneous abortion, CRS manifestations in surviving infants may be transient (purpura), permanent (deafness, congenital heart disease, cataract), or late emerging condition (diabetes mellitus) ⁽⁵⁾. Whereas detectable defect are 16% of infant during the second trimester, and birth defect is uncommon if maternal infection occur in the third trimester. In general, the earlier in pregnancy infection occur the greater the damage to the fetus ⁽¹⁾. Since many rash illnesses may mimic rubella infection, up to 50% of the infections may be subclinical, immunity against the virus cannot be confidently predicted from patient's clinical history of disease, and can only be documented through the determination of rubella specific antibodies ⁽²⁾. Despite the potentially devastating effects of CRS many developing countries are yet to embrace prevention and immunization program against rubella, and when such program exist the immunization rate are suboptimal consequently, rubella infection in pregnancy still occur with CRS often diagnosed in postnatal life ⁽⁴⁾.

MATERIALS AND METHODS

This is cross sectional study included pregnant women aged between 16-40 year old conducted in two antenatal clinics at Khartoum State, during June to August 2012. The data recorded in questionnaire. Collected sera were screened for rubella IgG antibodies using enzyme linkage immune sorbent assay (ELISA) technique at the virology laboratory, AL Neelain University.

Collection of specimen & processing:

Three milliliters of blood was collected under aseptic technique into plain container. The sera obtained after centrifugation were kept at -20 OC until IgG antibodies were quantified by ELISA using (DS-EIA-anti rubella - G- fast kits).

Sera samples were diluted 1:10 with sample diluents. (10 µl serum to 1 ml sample diluents). 100 µl of standard and serum specimens were placed in subsequent wells, then the wells were incubated at

room temperature for 15 minutes. Automatic washer was used, filled and aspirated the wells five times. 100 µl of enzyme conjugate was placed into each well. Then wells were incubated at room temperature for 15 minutes. Another wash was done. 100 µl TMB-substrate was placed into each well. The wells were incubated at room temperature for 5 minutes. 100 µl stopping reagent was added into each well. Color intensity of solution in each well was measured using micro well reader with 450 nm filter & calculated

RESULTS

The mean age of 80 women were 26.6 years old ranged from (16-40) years. The frequency of IgG was seropositive among 55 (68.8), while 25 (31.2%) was seronegative.

Seropositive IgG was found as most frequent between those in third trimester (n=30), followed by those in second trimester (n=15), and then those in first trimester (n=10). In this study 20 ladies were seropositive rubella & had previous skin rash compared where as 37 had lymphadenopathy & were IgG seropositive compared with 37 had arthralgia, (table 1).

Some related symptoms	Rubella IgG Abs		P value
	Positive n	Negative n	
Previous skin rash	Yes	20	0.134
	No	35	
Lymphadenopathy	Yes	35	0.704
	No	20	
Arthralgia	Yes	37	0.430
	No	18	

Table 1: The relation between rubella IgG Abs & some related symptoms

DISCUSSION

Eighty pregnant women attended to two antenatal clinics during June 2012 were screened for rubella using ELISA technique to detect the presence of anti rubella IgG antibodies. In the present the mean age was 26.6 years, compared with 25.7 years reported by Hamdan and his colleagues in West Sudan⁽⁶⁾, and 30.3 years reported by department of obstetrics and gynecology at University of Benin in Nigeria⁽⁴⁾.

In the current study 55= (68.8%) were IgG seropositive and 25= (31%) were IgG seronegative, similar to study of Hamdan and his colleagues in which they found that, out of 231 pregnant women 151= (65.3%) were IgG sero-positive and 80= (34.7%) were IgG seronegative⁽⁶⁾, and with Imam *et al* study who found that among 275 pregnant ladies 209 women contain detectable level of anti rubella IgG antibodies⁽⁷⁾.

In the present study 47= (58.8%) were in third trimester followed by 20= (25%) in second trimester

and 13= (16.2%) were in first trimester, this compared by Imam *et al* in which among their study population, 52% of women belonged to later stage of pregnancy, whereas 25% in the first trimester and the remaining in the second trimester. Timing of fetal infection determine the teratogenic effect, as earlier in pregnancy infection occur, the greater the damage to fetus done⁽⁷⁾.

The present seropositivity results indicate that in the absence of vaccination program, those women became immunized naturally.

In the current study previous skin rash, lymphadenopathy and arthralgia were not significantly associated with seropositive results. This was probably due to mild nature of the infection, and those symptoms are also indicative of several other common viral infection.

The treatment against rubella is available as intravenous immunoglobulin injections, but it doesn't protect the fetus because it is usually not given early enough to prevent viraemia⁽¹⁾. And because rubella is vaccine preventable disease, the need to provide information through the determination of serosusceptibility of rubella infection in pregnancy and feasibility of establishing an organized vaccination program against rubella as national policy to set strategies for prevention of CRS is the justification of this study.

The limitation of this study is lack of follow up for those women in order to document if they expose to rubella or not, and if they exposed to it the outcome of infection in their babies.

CONCLUSION

Facilities for routine diagnosis and vaccination are lacking, initiation of organized screening and vaccination program is limited by lack of vaccine. And because CRS has a very high estimated life time cost for both parents and governments, I recommended immunization of children and women in child bearing age as cost effective public health intervention strategy for managing the sequelae of CRS.

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