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RUBELLA IgG ANTIBODY IN WOMEN OF CHILD-BEARING AGE IN OYO STATE.

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ABSTRACT

230 females of childbearing age from four different towns in Oyo State were screened for rubella specific IgG antibody using a sandwich ELISA test kit. Rubella IgG was detected in 215 (93.5%) of the females. 96% of the non-pregnant, 87.5% of the primigravida and 76% of the multigravida screened positive to the antibody. Ogbomoso, Ibadan, Oyo and Iseyin respectively had 96.1%, 94.2%, 90.5% and 88.2% of their samples positive for the rubella IgG antibody in them. It is imperative for the government to ensure that rubella vaccine is made available and routine so as to avert the risk of congenital rubella syndrome.

INTRODUCTION

Rubella is a universally endemic mild febrile disease difficult to diagnose clinically because of its mild symptoms and similarity to other diseases such as measles, scarlatina, infectious erythema, infectious mononucleosis and drug rash. Though of a worldwide distribution, clinically recognized disease occurs less frequently in tropical regions than in temperate zones (1). Humans are the only host of the virus and infection is by contact with nasopharyngeal secretions of infected persons, droplets spread or direct contact with patients.

Gregg (2) discovered the teratogenic nature and the possibility of vertical transmission of rubella. When infection is in the first trimester, it is potent to produce a range of permanent congenital defects like deafness, mental retardation, cardiac abnormalities, and congenital cataracts (3). These conditions are collectively known as congenital rubella syndrome (CRS). Diabetes, thyroid disease and progressive rubella panencephalitis have been reported as late effects of CRS (4).

Incidence rates of rubella was reportedly high in children 5-9 years of age in 1969 (5) while in recent times, it has shifted to young adults and adolescents (6). Rubella surveillance based on clinical reports is not specific because of its mild nature and relatedness to some other viral infections (7). So, it is better done during rubella epidemic. Studies have been tending towards using other body fluids apart from sera for the screening. Laboratory diagnosis using saliva (7), urine (8) and low avidity IgG and IgA tests (9) have been found to be reliable for the diagnosis of rubella infection.

MATERIALS AND METHOD**(a) Study Population**

Two hundred and thirty females of childbearing age consisting of 169 married and 61 non-married women from Ibadan, Oyo, Iseyin and Ogbomoso in Oyo State had their sera screened for rubella IgG antibody. 2ml venous blood samples were collected from each of the woman after ethical approval and

informed consents were obtained. The sera were frozen at -20⁰ C until analyzed.

(b) Method

Rubella Specific IgG antibody in serum was detected with an enzyme linked immunosorbent assay (ELISA) kit (Human Gasellschaft for Biochemica and Diagnosdtica, mbh, Germany). The kit is a sandwich enzyme immunoassay designed to be used on serum samples of 100µl added to microtiter strip wells as a solid phase coated with purified rubella virus antigen (RVAg). Microplate incubation was at 37⁰ C for 30 minutes, followed by washing, incubation for an additional 30 minutes with 100µl anti IgG conjugate, washing and development with substrate tetramethyl benzidine (TMB) for 15 minutes. The reaction was then stopped and the results read within 30 minutes.

RESULTS

215 (95.5%) of the females screened had detectable rubella specific IgG while 15 (6.5%) did not. In terms of age distribution, all the 11 females of ages 40-45 years screened positive to the rubella IgG. This is closely followed by ages 35 – 39 years where 28 (91.3%) of the 69 samples from females of ages 25 – 29 years were seropositive to the rubella IgG (Table 1). Ibadan, Ogbomoso, Oyo and Iseyin were used for the study. Table 2 shows the prevalence of rubella in the towns of study.

Of significance to this study are the 3 (4.9%) out of 61 spinsters screened, 9 (6.8%) out of 133 pregnant women and 4 (4.12%) out of 97 non- pregnant women who had no detectable rubella IgG in them.

Table 1: Age Distribution of rubella IgG antibody

Age (Years)	Total Sample	Number –ve (%)	Number +ve (%)
15-19	13	1 (7.7)	12 (92.3)
20-24	48	2 (4.2)	46 (95.8)
25-29	69	6 (8.7)	63 (91.3)
30-34	60	5 (8.3)	55 (91.7)
35-39	29	1 (3.4)	28 (96.6)
40-45	11	0 (0)	11 (100)
Total	230		

Table 2: Rubella IgG antibody Distribution in the study Towns

Towns	Total Sample	Number –ve (%)	Number +ve (%)
Ibadan	120	7(5.8)	113 (94.2)
Ogbomoso	51	2 (3.9)	49 (96.1)
Oyo	42	4 (9.5)	38 (90.5)
Iseyin	17	2(11.8)	15 (88.2)

DISCUSSION

The role of antibody prevalence surveys in immunization programme development and refinement is now being generally appreciated. Such surveys are important for identifying target age groups for measles vaccination (10), providing data on the burden of disease from congenital rubella syndrome (11) and monitoring their respective control programmes. It has been a source of motivation and challenge for both the government and biomedical scientists to work towards prevention rather than curing certain viral infections.

The absolute risk of CRS among children born to mothers infected during pregnancy varies widely in different studies. Miller *et al* (12) found the risk of congenital infection to be 81% and that of malformation 69% after confirmed maternal rubella in the first trimester.

The seropositivity of 93.5% of the female subjects screened is more likely to be due to their exposure to the virus and reinfection rather than rubella vaccination as all the women screened knew nothing about rubella vaccine probably because it is not included in the routine immunization programme in Nigeria. There is an increase in the percentage of women with detectable rubella IgG antibody when the results of this study are compared with what Odelola (13) obtained where 70% of the women screened were seropositive for the rubella IgG antibody. This is likely due to increase in population and overcrowding.

If the risk of congenital rubella infection is 81% and that of malformation is 69% (10), it implies that there is a high risk of CRS among the 4.9% negative

spinsters, 6.8% pregnant women and 4.12% non pregnant women. The same is true of the multigravids who are still in their active reproductive stages with their ages ranging from 25 – 34 years if they are infected in the first trimester of the next pregnancy. Also, the pregnant seronegative women who are mostly in their second trimester stand a 20% chance of infecting their fetuses with rubella if infected. The increasing detection of rubella IgG antibody in married women suggests that rubella virus is still in circulation in Oyo state. Considering the potential dangers of CRS, it is important that rubella vaccine be included in the routine immunization programme of the country as it confers a lifelong protection against the virus in women and children who are the ones really affected.

As at 2002 when this work was done, the available data about the prevalence of rubella IgG in Nigeria were (13, 14, 15) all revealed that the virus was circulating then but now with this study, there is an increased seropositivity. This may be due to increasing population, poor hygiene, poverty and overcrowding. It is hoped that the virus will not mutate some day to become more virulent than it is today. If this happens, children and females will suffer for it. To avoid this, it is necessary to concentrate on sparsely populated areas where the dwellers are more seronegative than in densely populated areas and schoolgirls for routine rubella vaccination. The vaccine should also be made available and mandatory for all pregnant women in their antenatal clinics. Coupling strengthened immunization programme with regular surveillance and sensitization of the women about the virus will go a long way to help curtail the risk of CRS.

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