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SEROPREVALENCE STUDY OF RUBELLA VIRUS INFECTION AMONG BAD OBSTETRIC HISTORY AND PRIMIGRAVIDA PREGNANT WOMEN IN IRAQ

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ABSTRACT

This study was designed to investigate Rubella infection among pregnant women in relation with age and trimester of pregnancy. Venous blood was collected from 170 aborted women from different private laboratories during the period between December 2014 to march 2015. The randomly selected serum samples was tested for specific anti Rubella antibodies (IgM & IgG) using a commercial ELISA kit (Human Germany), the Series of 170 patients that had bad obstetric history and 80 pregnant women had primigravida that aborted in different times(1st, 2nd, and 3rd trimester of pregnancy). The results showed that the anti Rubella IgM among group I, was (48.9%) 44 out of 90 was higher than group II which was (36.25%) 29 out of 80 women and anti Rubella IgG in group II 57 out of 80 which was (71%) higher than in group I, which was 63 out of 90 (70%). So, anti Rubella antibodies IgM, IgG were 33 out of 90 (57.9%) in group I and (42.11%) 24 out of 80 in group II. The total of 170 women patients with mean age 27-7 years ranged between (16-42) years consisted of 61% aged between 16-30 years, 38.9% aged between 31-42 years for group I, and 62.5% within 16-30, 37.5% between 31-42 years. The gestational periods for group I were 55.56%, 35-56%, 8.9% in the first, second and third trimester, 48-75%, 25%, 13.75% for group II in the first, second and third trimester of pregnancy. It could be concluded from this study that seroprevalence of Rubella infection among pregnant women and the high percentage of infection among those patients who extremely high level of ignorance about the disease so, every pregnant women should be tested for Rubella serological status.

KEYWORDS: Rubella virus, bad obstetric history, primigravida, pregnant women.

INTRODUCTION

Rubella is a mild self limiting viral infection that causes illness worldwide.[1] It is transmitted by respiratory droplets and causes disease characterized by rash and fever.[2] It is also known as German measles or 3 day measles. Rubella virus an enveloped positive stranded ribonucleic acid virus that is a member of the family Togaviridae.[3,1] Rubella infection in women during early pregnancy may cause fetal death or congenital rubella syndrome in the infant[2] . Maternal rubella infection during the first trimester is associated with an increased risk of intrauterine death and spontaneous abortion.[4] Congenital rubella syndrome is a significant cause of deafness, congenital heart disease, blindness and mental retardation.[5] Transmitted in airborne droplets when infected people cough, rubella is an acute, usually mild disease traditionally affecting susceptible children and young adults worldwide.[6,7,8]

According to the world health organization (WHO) estimates 110000 children are born annually with CRS worldwide and occur each year in developing countries.[2,9,10]

There is no specific therapy for maternal or congenital rubella infection.[4] Rubella is a vaccine preventable the primary objective of rubella control programs is prevention of congenital rubella virus infection.[11,12] The live attenuated rubella vaccine has been available for use since 1969.[4]

Many developed countries able to use the vaccine effectively reducing the prevalence of rubella to preventing the consequences of CRS.[13]

Two specific antibodies are associated with rubella, Immunoglobulin (IgM) antibody which indicates a recent infection and (IgG) antibody which indicates an old infection and immunity.[14]

MATERIALS AND METHODS

Blood samples collection

The blood collected from 170 pregnant women with age ranged between 16 - 42 years, all of those patients had abortion. They were collected from different private laboratories.

From ninety women had bad obstetric history and eighty patients had primigravida. Ten ml of venous of blood samples were collected randomly from each woman, during the period of

time between December 2014 and march 2015. The samples of blood were centrifuged on 4000 rpm for 5 minute, to separate serum from blood and then to test for Rubella virus (IgG and IgM) by using of ELISA commercial Kit (Human. Germany).

Preparathion the samples

The samples were prepared by diluting 10 µL of patients serum with 1 ml of sample diluent in the test tube and then mixed gently for five minutes, covering with adhesive strips and incubated for 30 minutes. at room temperature after that washed 4 times with washing solution, then 100 µL of conjugate was added to each well. Covered and incubated at room temperature for 30 minutes. Washed the wells five times with washing solution and added 100 µL of substrate then covered and incubated for 30 minutes, adding 50 µL of stop solution, finally measure the absorbance at 450 nm within 30 minutes.

RESULTS

This study was designed to investigate Rubella virus infection among pregnant women in association with age of patients and the trimester of pregnancy. The total of 170 pregnant woman were analyzed for rubella IgG and IgM antibodies by using ELISA technique.

Our studied group of patients with mean age 27.7 years ranged between 16-42 year. The present study found the age and gestational age of pregnancy was related in highly significant association with rubella infection at ($P < 0.01$).

As shown in table (1) a total of 170 patients divided into two groups, ninety women had bad obstetric history (BOH) in their first, second and third trimester (55.56 %), (35. 56 %) and (8.89 %) respectively and eighty women had primigravida that aborted in first, second and third trimester (48. 57 %), (25 %) and (13.75 %) respectively. However, as seen in table (2) the seroprevalence of recently infection of rubella IgM positive in Group 1 was 44 (48.89 %) whereas, in Group II was 29 (36.25 %) statically it was highly significant association at ($P < 0.05$).

Otherwise, seroprevalence of rubella IgG latent infection in group 1 was 63(70 %) and in group II was (71.25 %) statistically there is no significant correlation.

The positive combination presence of specific anti rubella antibodies IgG and IgM was 33 (57.89 %) for group I, 24 (42.11 %) for group II respectively.

Table 1: Distribution of age and trimester of pregnancy in relation with (group I) of BOH and (group II) primigravida women

The factor	Group 1 Total no. = 90	Group 2 Total no. = 80	P-value
Age 16-30 31-42	55 (61.11 %) 35 (38.89 %)	50 (62.50 %) 30 (37.50 %)	0.013 $\chi^2 = 9.277$ **
Trimester of Pregnancy First Second Third	 50 (55.56 %) 32 (35.56 %) 8 (8.89 %)	 39 (48.75 %) 20 (25.00 %) 11 (13.75 %)	 0.0109 $\chi^2 = 9.807$ **

** highly significant at p< 0.01

Table 2: frequency distribution of Rubella infection IgM and IgG antibodies using ELISA test in (BOH) and (primigravida)

The factor	BOH Group I 90	primegravida Group II 80	P – value χ^2 test
Positive (IgM)	44 (48.89 %) 73 (42.94%)	29 (360.25%) 73 (42.94%)	0.0416 $\chi^2 = 4.712$ *
Negative (IgM)	46 (51.11 %)	51 (63.75 %)	0.0447 $\chi^2 = 3.983$ *
Positive (IgG)	63 (70.00 %) 120 (70.58%)	57 (71.25 %) 120 (70.58%)	0.955 $\chi^2 = 0.368$ NS
Negative (IgG)	27 (30.00 %)	23 (28.75 %)	0.764 $\chi^2 = 0.633$ NS
Positive IgG + IgM	33 (57.89 %) 57 (33.5%)	24 (42.11 %) 57 (33.5 %)	0.0379 $\chi^2 = 4.640$ *

*significant at p < 0.05, NS: non- significant.

DISCUSSION

Rubella is the viral infection caused illness worldwide it's a member of Togaviridae family.[1] Rubella can be disastrous in early gestation and can affect all organs and cause different congenital defects.[14]

The results in our study shows that the 170 aborted women were divided into two groups ninety women had bad obstetric history and eighty women had primigravid. Approximately half of pregnant women aborted in their first trimester (55.56 %) and (48.75 %) for group I

and II respectively. This finding results is agreed with another previous study[15] and[16] which showed that the highest prevalence in the first trimester of their pregnant women. But disagree with[17] who found more than half of pregnant (51.2 %) were in the second trimester and[18] which also showed the highest prevalence of pregnant women in their second trimester.

It suggested that the highest occurrence observed in the first trimester because of most pregnant women presented in the hospital in their second and third months of pregnancy.

There is 90 % chance of passing the virus to the fetus when rubella infection occurs during early stage of pregnancy, so, rubella infection during the first trimester of pregnancy can increased the spontaneous abortion and congenital rubella syndrome.[4]

In current study the serprevalence of recently infection of rubella virus IgM positive in group I were 44 out of 90 (48.89 %), furthermore in group II were 29 out of 80 (36.25 %), statistically it was significant correlation.

IgM antibodies indicate for acute infection because of these antibodies are not usually in acquired immunity and it's very rare in chronic infections. Whereas, seroprevalence of latent infection IgG in group I was 63 out of 90 (70%) and for group II, 57 out of 80 (71.25 %) and statistically there is no significant association.

This fining results disagreed with[19] who reported that IgG seropositivitey in primgravid woman was 96.1 % and in bad obstetric women was 76% and statistically there is significant difference.

Analysis of results showed a seroprevalence of 73 out of 170 (42 - 94 %) and 120 out of 170 (70.58%) for rubella IgM and IgG and this was in agreement with[17] which reported 38.8 % and 93.1 % for IgM and IgG respectively. It is suggested that the majority of pregnant patients may previously exposed to rubella virus, It's also approach to other reporter[15] and[20] who found the seroprevalence of rubella virus infection antibody IgG was (68.5 %) and (76 %) respectively.

The double positive results for specific antibodies IgM and IgG is 57 out of 170(33.5 %) in group I and II was 33 (57.89 %) and 24 (42.11 %) respectively.

This finding confirmed with other previous study[17] who reported that 59 (39.6%) were positive combination for both rubella specific IgG and IgM antibodies.

It is suggested that the way of this testing is not completing beneficial for the current pregnant women, it is recommended for all women in childbearing age should be screened for rubella virus infection, in case of they do not have an immunity from their childhood vaccination.[21]

CONCLUSION

Detection of specific immunoglobulin IgM and IgG antibodies by enzyme linked immune sorbent assay ELISA is useful to diagnosis the rubella infection and helpful for determining the causative role of rubella in abortions and still births.

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