DETECTION OF RUBELLA VIRUS INFECTION IN ABORATIVE PREGNANT WOMEN IN AL-NAJAF GOVERNORATE

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ABSTRACT

The present study aimed to determine the immune states against rubella in women underwent abortion by detecting the levels of IgM and IgG immunoglobulins in their sera. The study included a collection of venous blood samples from three hundred women underwent abortion whose ages ranged from (15-35) years were Al-Najaf governorate.Enzyme- linked immunosorbant assay (ELISA were used to determine the immunological response against rubella virus in our samples. ELISA test reflected a new infections which was (4.6 %) positive results. Anti-rubella IgG antibodies ELISA test revealed (77%) positive result .

INTRODUCTION

Rubella (German Measles) is an infectious, generally mild viral disease. The severity of the effect of rubella virus on the fetus depends largely on the time of gestation at which infection occurs, up to 85% infants are infected in first trimester of pregnancy (CDC , 1992–1994). Rubella is of public health importance because rubella infection acquired during early pregnancy often results in fetal anomalies 'congenital rubella syndrome' (Immunise Australia Program, 2000). However, Rubella has almost been eradicated by immunization programs in many developed countries, but outbreaks amongst the unvaccinated still occur (Miller, 1991 & Reef *et al.* , 2002). . Congenital rubella syndrome (CRS) is a major complication of rubella that is of public health interest and continues to represent a problem worldwide in spite of the effective vaccination program that was introduced in 1969 (Reef *et al.*, 2002 ; Sadighi *et al.* , 2005). Estimates that 10–25% of nonimmunized women of child-bearing age are susceptible to rubella infection. WHO data showed that the reported cases of rubella virus infections in Iraq were: in 2005 reported 99 cases, 2004 were 383 cases and 2003, 2000 reported 612 cases but in 2002, 2001 and 1990 there is no reported cases. There is no reported cases of CRS in Iraq from 1980 to 2005.

MATERIALS & METHODS

Sample size and Study design:

The samples in this study included three hundred serum samples were obtained from women aged 16-43 years with abortion in Al-Najaf Governorate. In order to detect serum IgG and IgM level against rubella virus. These samples were obtained from Al-Zahraa Maternity and Children Hospitals and Al-Hakeem General Hospitals in Al-Najaf. The period of sampling was between July 2005 to April 2006.

Sampling procedures and processing:

In cases of women with abortion 5 ml of blood was obtained each time. All blood samples were subjected to centrifugation at 3000 rpm for 10 minutes; the serum was removed then stored at -70°C for further study.

Serologic studies

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Rubella virus-specific IgM antibodies were detected by indirect enzyme-linked immunosorbent assay (ELISA; Biokit ,S.A.Lisca d Amunt. Barcelona-Spain. This method was carried out according to the manufacturer's instructions.

Statistical Analysis:

Statistical analysis was performed using Chi-square testes according to (Daniel, 1988).

RESULTS

ELISA test revealed 230 (77%) positive result of Al-Najaf samples whereas the remaining 70 (23%) samples gave negative anti-rubella ELISA test. Collected data of aborted women case history revealed that 195(87%) samples of the 230 (77%) positive samples and 29 (13%) samples of the 70 (23%) negative samples were obtained from vaccinated women and the remaining 31 (40.8%) positive anti-rubella IgG ELISA test and 45 (59.2%)` negative anti-rubella IgG ELISA test were from non-vaccinated women. The study included the detection of anti-rubella IgM ELISA antibodies. The test revealed that 8 samples, one of 195 (87%) vaccinated and 7 of the non-vaccinated women, positive IgG samples were positive IgM anti-rubella ELISA antibodies.

It was found that , the majority of pregnant women with abortion are IgG seropositive and the range of IgG positively between (70.% - 85.2%) in Al-Najaf Governorate, although there were no significant differences between the IgG seropositivity , neither their no significant differences (P› 0.05) between the groups of aborted women in relation to their gestational ages. Table (1).

In case of IgM seropositivity, it was found that seropositivity (4.66%) in Al-Najaf Governorate respectively which showed the highest IgM seropositive in 3rd month of gestation (6.3%). In order to estimation the efficacy of rubella vaccination program. It was found that most of those who were previously vaccinated gave IgG seropositive (76%) in Al-Najaf and the group which showed highest IgG seropositivity after vaccination was the youngest age group (15 – 19) and (20 – 24) years.

Regards the IgG seropositivity in non-vaccinated women in this study, it was shown that those with IgG positive serum were lower than those with IgG negative 31 versus 45 in Al-Najaf. Table (2). The incidence of IgM seropositivity among those pregnant women underwent abortion who were IgG seropositive and IgG seronegative in Al-Najaf Governorate was also studied, It was found that the rate of IgM positive sera in those who were IgG positive are very few 4/230 (1.7%) . While the IgM seropositivity rate among those who were IgG negative shown to be more or relatively higher. They were 10/60 (14%). Table (3). The IgM seropositivity among vaccinated and non a vaccinated pregnant woman that underwent abortion, in Al-Najaf and was also studied. It was shown that the incidence of IgM positivity was very little among those who were vaccinated in Governorate. 3/224 (1.3 %) in Al-Najaf , while the incidence of IgM seropositivity among non-vaccinated women was differ , it was 11/65 (14.4 %) . Table (4)

DISCUSSION

The incidence of IgG and IgM seropositivity was studied in aborted women in relation to the gestational age at which abortion occurred, it was found that there was no significant differences (P › 0.05) between the groups with abortion in relation to other gestational age when IgG seropositivity is taken. By taking consideration IgM seropositivity, it was found that the overall number of IgM seropositive women with in Al-Najaf 14. Although there were some IgM positive women who had IgG positive serum at the same time (Tang *et al.*, 2003) , yet the majority of IgM positive women with abortion were IgG negative, and this reflects the incidence of the new seroconversion (a new infection with

rubella virus) while those who showed IgG positive sera with negative IgM, reflects those vaccinated or previously infected individuals, which constituted the majority of the studied populations at the two governorates, these results are in agreement with what was found by (Atreya *et al.*, 2004 ; Hahne *et al.*, 2005) who stated that the majority of IgG positive women whether pregnant or not had a positive history of previous vaccination, while those with IgG and IgM positive at the same time either they were previously vaccinated but had re-infection because of a low IgG titer , or because they were newly infected with rubella virus in a period of not less than 6 weeks (Tang *et al.*, 2003) .The relationship between IgG seropositivity and history of vaccination with rubella vaccine was studied in table (3). It was found that most of those who were previously vaccinated gave IgG positivity (76%-87%) in Governorate and the group which showed highest IgG seropositivity after vaccination was the youngest age (20–24) years.

In regards to the IgG seropositivity in non-vaccinated women in this study, it was shown that those with IgG positive serum were lower than those with IgG negative 31 versus Al-Najaf. It was shown from both tables (3) that the immunity states (IgG) level for rubella virus after vaccination decline over time, to below the productive level, as it was shown the highest level of IgG was found in the youngest age group (20–24) years in comparison to other age groups. This could be explained by the effect of multiple factors like diseases, drugs, malnutrition, to which the mother could be exposed during her life, and it agreed with other studies conducted by (Broadbent *et al.*, 1980; Al-Muslih *et al.*, 1988; Yaseen, 1992; Aboudy *et al.*, 2000). A pregnant women with no or low immunity needs to be vaccinated immediately after delivery and antibody status checked after 3 months.It important that vaccination not be given in the three months following administration of immunoglobulin. National Health and Medical Research, 1997 reported that a pregnant women has had contact with an illness that might be rubella, clinically should be encouraged to check immune states and look for evidence of acquire infection.Table (4) showed that women with abortion who gave IgM positive test were usually of IgG negative sera 10/70 (14%) in Al-Najaf while those who were IgG positive , showed only lower incidence of IgM positive sera 4/230 (1.7%). These results reflected the highest risk of rubella virus infections, as those who were IgG positive, are less susceptible to infection in contrast to those who were IgG negative, in which they have more susceptible to rubella infection. This results are similar to that which was found by (Miller *et al.*,1982 & Cooper,1985) in which similar figures were reported in other developing countries such as Pakistan (23% of pregnant women were IgG negative (Azmi *et al.*, 1987) Brazil and Chile (20)% were IgG negative. And among IgG negative women there was 15-20% chance of being infected (Dowdle *et al.*, 1970 & Bhaskaram *et al.*, 1991).

The incidence of IgM positive pregnant women (Tables 5) were studied in relation to their past history of vaccination against rubella infection, it was shown that those who were vaccinated previously had very little chance of getting IgM positive serum during pregnancy 1.3% in Al-Najaf. While those who were non vaccinated had more chance of getting IgM seropositivity 14.4% in Governorate. The differences were significant (P › 0.05). These results were suspected, because those who were previously vaccinated had a persistent, life – long IgG positive serum against rubella vaccines. Similar results were found by (Miller, 1991 & Lutwick, 1997), who were stated that vaccination or infection with a virus confers a life – long immunity, and those who were infected after those two incidences either had a failure of vaccination or the serum were vanished or decreased by the effect of

many factors like time, energy response, miss recording, cold change, disease and drugs (Pullen *et al*., 1986; Yaseen, 1992; Bottigur & Jensen, 1997). The reason for the continuing occurrences of such cases is that a small proportion of pregnant women is still susceptible to rubella either because they have not been offered or have refused vaccine prior to pregnant, have failed seroconvert after vaccination or had a frailer vaccination (Rager-Zisman *et al.*, 2003).Australian Bureau of Statistics, 1996 stated that infectious encountered are more likely to be reinfections, generally seen in those with low post vaccination antibody titers. Atreya *et al*., 2004 estimated that 10-25% of non-immunized women of child bearing age are susceptible to rubella infection.

Table (1): Incidence of anti-rubella IgG and IgM seropositivity in pregnant women underwent abortion in Al-Najaf Governorate

Gestational Age (Month)	IgG		Total	IgM		Total
	+ve *	-ve		+ve	-ve *	
1	٣١ (70%)	١٣ (29.6%)	٤٤	----	٤٤ (100%)	٤٤
٢	٦٥ (74.7%)	٢٢ (28.3%)	٨٧	٥ (5.7%)	٨٢ (94.3%)	٨٧
٣	٧١ (74.7%)	٢٤ (28.3%)	٩٥	٦ (6.3%)	٨٩ (93.7%)	٩٥
٤	٤٠ (85%)	٧ (15%)	٤٧	٢ (4.3%)	٤٥ (95.7%)	٤٧
٥	٢٣ (85.2%)	٤ (14.8%)	٢٧	١ (3.7%)	٢٦ (96.3%)	٢٧
Total	٢٣٠ (77%)	٧٠ (23%)	٣٠٠	١٤ (4.66%)	٢٨٦ (95.3%)	٣٠٠

*** P < 0.05**

Table (2): Relationship between anti-rubella IgG seropositivty and the history of vaccination against rubella virus in Al-Najaf Governorate

Age group (year)	Sample	Vaccinated		Total	Non Vaccinated		Total
		IgG * +	IgG -		IgG +	IgG * -	
١٥ _ ١٩	٦٧	٤٧ (89%)	٦ (11%)	٥٣	5 (36%)	9 (64%)	١٤
٢٠ _ ٢٤	١٢٠	86 (94.5%)	٥ (5.5%)	91	١٥ (48%)	١٦ (52%)	٣١
٢٥ _ ٢٩	٩٣	55 (81%)	١٣ (19%)	68	٩ (39%)	١٤ (61%)	٢٣
٣٠ _ ٣٥	٢٠	٧ (58.3%)	٥ (41.7%)	12	٢ (25%)	٦ (75%)	٨
Total	٣٠٠	١٩٥ (87%)	٢٩ (13%)	٢٢٤	31 (40.8%)	45 (59.2%)	٧٦

*** P < 0.05**

Table (3): Incidence of anti-rubella IgM seropositivity among pregnant women with abortion in relation to anti-rubella IgG results in Al-Najaf Governorate

Age group (year)	Sample	IgG +		Total	IgG -		Total
		IgM +	IgM * -		IgM +	IgM * -	
١٥ _ ١٩	٦٧	٢ (3.6%)	٥٤ (96.4%)	٥٦	---	١١ (100%)	١١
٢٠ _ ٢٤	١٢٠	1 (1%)	98 (99%)	99	3 (14.2%)	18 (85.8%)	٢١
٢٥ _ ٢٩	٩٣	١ (1.5%)	٦٥ (98.5%)	٦٦	5 (18.5%)	22 (81.5%)	٢٧
٣٠ _٣٥	٢٠	---	9 (100%)	9	2 (18%)	9 (82%)	١١
Total	٣٠٠	4 (1.7%)	226 (98.3%)	٢٣٠	10 (14%)	60 (86%)	٧٠

*** P < 0.05**

Table (4): The rate of anti-rubella IgM seropositivity among vaccinated and non vaccinated pregnant women against rubella virus in Al-Najaf Governorate

Age group (years)	Samples No.	Vaccinated		Total	Non Vaccinated		Total
		IgM +	IgM * -		IgM +	IgM * -	
١٥ -١٩	٦٧	---	٥٣ (100%)	٥٣	٢ (14.2%)	١٢ (85.8%)	١٤
20 - 24	١٢٠	١ (1.1%)	٨٨ (98.9%)	٨٩	٥ (16%)	٢٦ (84%)	٣١
25 - 29	٩٣	٢ (2.8%)	٦٨ (97.2%)	٧٠	٣ (13%)	٢٠ (87%)	٢٣
30 - 35	٢٠	---	١٢ (100%)	١٢	١ (12.5%)	٧ (87.5%)	٨
Total	٣٠٠	٣ (1.3%)	٢٢١ (98.7%)	٢٢٤	١١ (14.4%)	٦٥ (85.6%)	٧٦

*** P < 0.05**

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تحديد الحالة المناعية ضد فايروس الحصبة الألمانية للنساء الحوامل المجهضات في محافظة النجف

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الخلاصة

الدراسة الحالية تهدف إلى تحديد الحالة المناعية ضد فايروس الحصبة الألمانية للنساء الحوامل المجهضات من خلال تشخيص النوعين من الأجسام المضادة الـ (IgM وIgG) في أمصالهن. الدراسة تضمنت جمع عينات دم وريدي من ثلاثمائة امرأة مجهضة واللاتي تراوحت أعمارهن من (١٥- ٣٥) سنة في محافظة النجف. الفحص المناعي الأنزيمي الممتز تم استخدامه لتحديد الاستجابة المناعية ضد فايروس الحصبة الألمانية . فحص الاليزا اظهر إصابات جديدة وكانت (٤,٦%) نتيجة موجبة. فحص الأجسام المضادة لفيروس الحصبة الألمانية نوع IgG أعطى نسبة (٧٧%) نتيجة موجبة.

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