

Human Cytomegalovirus Immunoglobulin G (IgG) and Immunoglobulin M (IgM) Seropositivity among Pregnant Women in Baghdad City and Their Relations to the Abortion Factors

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ABSTRACT

Cytomegalovirus (CMV) is DNA virus, human have only known host like other members of herpes virus family cause latent infection and infect people on all age and socioeconomic group, is the most common cause of congenital infection because it occurs after both primary and recurrent infection in pregnancy. It is a virus from herpes and chickenpox virus family is a common case of infection and illness worldwide the Infection can be congenital (present at birth) or passed from an infected pregnant woman to her baby. The aim of the study is to evaluate the Cytomegalovirus IgG and IgM seropositivity among pregnant women, in addition to studying relations to the abortion factors. A total of 100 blood samples of pregnant women were collected from the private laboratory for Pathogenesis Analyses in Baghdad which obtained during the period from 1st September 2016 till the 31st of December 2016. Data was collected by using questionnaire sheet concerning their ages of pregnant women between (16-45 years), place of residence (urban, rural), living status (good, medium, bad), a pregnancy of women (pregnant, non-pregnant), abortion (primary, recurrent). Each blood was analyzed for the presence of CMV IgG antibodies and IgM antibodies anti-cytomegalovirus in human serum or plasma by using Enzyme-linked Immunosorbent Assay (ELISA). In results this study revealed that the prevalence of anti-CMV IgG antibodies in primary aborted women 54 (88.5 %) of the cases positive while 3 (4.9 %) positive for anti-CMV IgM and the prevalence of anti-CMV IgG antibodies in pregnant women 83 (91.2%) of the cases positive while 6 (6.6 %) positive for anti-CMV IgM. The seroprevalence of anti-CMV IgG antibodies are higher in pregnant women and primary aborted women between age group (26-30) years with the medium living status which survive in urban residency.

Keywords: Cytomegalovirus, pregnant women, abortion, anti-CMV IgG and IgM antibodies, ELISA.

1. INTRODUCTION

Cytomegalovirus (CMV) is DNA virus, the human is only known host like other members of herpes virus family cause latent infection and infect people on all age and socioeconomic group [1]. Slow replicating virus from the herpes family infecting only as many as 1 % of all neonates in developed countries but demonstrating up to 90 % IgG -positivity in developing countries [2]. It is

a virus from herpes and chickenpox virus family is a common case of infection and illness worldwide the Infection can be congenital (present at birth) or passed from an infected pregnant woman to her baby [3]. Is the most common cause of congenital infection because it occurs after both primary and recurrent infection in pregnancy [4]. And congenital infection worldwide,

affecting 0.2 % to 2.4% of all live births [5, 6] . Also is now the most common viral cause of mental retardation and the hearing deficit of children in developed countries [7-9]. After primary infection with CMV, the virus becomes latent and be reactivated to produce a secondary infection particularly during episodes of immunosuppression [10]. Reproductive age women of middle and higher socioeconomic status are at higher risk for primary CMV [11]. The clinical manifestations range from asymptomatic forms (90% of cases) to severe fetal damage, and in rare cases, death due to miscarriage. Furthermore, 10 to 15 % of the children who were asymptomatic at birth may develop late sequelae, especially hearing defects, after a period of months or even years [12]. Infants with symptomatic congenital CMV infection excretes more virus in urine in the first few months of life and exhibit higher peripheral blood viral load than those with asymptomatic infection [13]. Virus infection is considered a significant public health problem because it can cause disease in unborn babies and in people with a weakened immune system [14]. Transmission of CMV occurs from person to person through body fluids a close contact with contaminated secretions because the virus not very contagious. The virus can be found in blood, urine semen, cervical secretions, saliva, breast milk and transplanted organs all these sites intermittently excrete viruses [15]. Protection provided was limited and a number of subjects contracted CMV infection despite the vaccination in one case also congenital CMV was encountered [16].

2. MATERIALS AND METHODS

2.1 Patients

A total of 100 blood samples of pregnant women were collected from the private laboratory for Pathogenesis Analyses in Baghdad. Which obtained during the period from 1st September 2016 till the 31th of December 2016. Data was collected by using questionnaire sheet concerning their ages of pregnant women between (16-45 years), place of residence (urban, rural), living status (good, medium, bad), a pregnancy of women

(pregnant, non-pregnant), abortion (primary, recurrent).

2.2 Methods

Blood sample withdrawn from each woman by professional clinical laboratory technique. Venous blood samples 5 ml was collected after disinfected of skin by 70 % alcohol and then blood was poured in plain tube and centrifugation at 3000 rpm for 5 minutes to obtain the serum. The serum was stored at – 20 ° C until analysis. Each blood was analyzed for the presence of CMV by using Enzyme-linked Immunosorbent Assay (ELISA). This test for qualitative and quantitative detection of IgG antibodies and IgM antibodies anti-cytomegalovirus in human serum or plasma using a commercial Kit (Cobas CMV IgG, CMV IgM) according to the Roche Diagnostic manufacturer's.

2.3 Statistical Analysis

The suitable statistical methods were used in order to analyze and assess the results, they include the following:

Descriptive statistics: Statistical tables including observed frequencies with their percentages.

Inferential statistics: These were used to accept or reject the statistical hypotheses, Persons Chi-Square test (χ^2) at level of significance 0.05.

P value < 0.05 level of significance was considered statistically significant.

3. RESULTS AND DISCUSSION

This study revealed that the prevalence of anti-CMV IgG antibodies in primary aborted women 54 (88.5 %) of the cases positive while 3 (4.9 %) positive for anti-CMV IgM and the prevalence of ant-CMV IgG antibodies in pregnant women 83 (91.2%) of the cases positive while 6 (6.6 %) positive for anti-CMV IgM these results shown in Table (1).

Table 1: Seroprevalance of anti-HCMV in the Aborted and Pregnancy women.

Women	Anti-HCMV IgG		Anti-HCMV IgM		Total
	IgG Positive No. %	IgG Negative No. %	IgG Positive No. %	IgG Negative No. %	
Aborted					
Primary	54 (88.5)	7 (11.5)	3 (4.9)	58 (95.1)	61 (100.0)
recurrent	38 (97.4)	1 (2.6)	5 (12.8)	34 (87.2)	39 (100.0)
Pregnancy					
Primary	83 (91.2)	8 (8.8)	6 (6.6)	85 (93.4)	91 (100.0)
recurrent	9 (100.0)	-----	2 (22.2)	7 (77.8)	9 (100.0)
Total	92	8	8	92	100
Persons	P=0.330		P= 0.192		
Chi-Square	S.		S.		

P-Value < 0.05

(Significant = S. , Non-significant = N.S.)

Table 2: Seroprevalance of anti-HCMV According to the Age Group in Women.

Age Group	Anti-HCMV IgG		Anti-HCMV IgM		Total
	IgG Positive No. %	IgG Negative No. %	IgM Positive No. %	IgM Negative No. %	
16 - 20	8 (66.7)	4 (33.3)	-----	12 (100.0)	12 (100.0)
21 - 25	25 (92.6)	2 (7.4)	2 (7.4)	25 (92.6)	27 (100.0)
26 - 30	37 (97.4)	1 (2.6)	2 (5.3)	36 (94.7)	38 (100.0)
31 - 35	17 (100.0)	-----	3 (17.6)	14 (82.4)	17 (100.0)
36 - 40	4 (80.0)	1 (20.0)	1 (20.0)	4 (80.0)	5 (100.0)
41 - 45	1 (100.0)	-----	-----	1 (100.0)	1 (100.0)
Total	92	8	8	92	100
Persons	P= 0.013		P= 0.459		
Chi-Square	S.		N.S.		

P-Value < 0.05
P-Value > 0.05

Table 3: Seroprevalance of anti-HCMV IgG Among Primary and recurrent Aborted Women.

Age Group	Total	Primary Abortion		Total No. %	Recurrent Abortion		Total No. %
		IgG Positive No. %	IgG Negative No. %		IgG Positive No. %	IgG Negative No. %	
16 - 20	12	8 (66.7)	4 (33.3)	12 (19.7)	-----	-----	0 (00.0)
21 - 25	27	18 (90.0)	2 (10.0)	20 (32.8)	-----	7 (100.0)	7 (17.9)
26 - 30	38	23 (100.0)	-----	23 (37.7)	14 (93.3)	1 (6.7)	15 (38.5)
31 - 35	17	3 (100.0)	-----	3 (4.9)	14 (100.0)	-----	14 (35.9)
36 - 40	5	2 (66.7)	1 (33.3)	3 (4.9)	2 (100.0)	-----	2 (5.1)
41 - 45	1	-----	-----	-----	1 (100.0)	-----	1 (2.6)
Total	100	54 (88.5)	7 (11.5)	61 (100.0)	31 (79.5)	8 (20.5)	39 (100.0)
Persons		P= 0.033			P= 0.000		
Chi-Square		S.			S.		

P-Value < 0.05

Table 4: Seroprevalance of anti-HCMV IgM Among Primary and recurrent Aborted Women

Age Group	Total	Primary Abortion		Total No. %	Recurrent Abortion		Total No. %
		IgM Positive No. %	IgM Negative No. %		IgM Positive No. %	IgM Negative No. %	
16 - 20	12	-----	12(100.0)	12 (19.7)	-----	-----	0 (00.0)
21 - 25	27	1 (5.0)	19 (95.0)	20 (32.8)	1 (14.3)	6 (85.7)	7 (17.9)
26 - 30	38	1 (4.3)	22 (95.7)	23 (37.7)	1 (6.7)	14 (93.3)	15 (38.5)
31 - 35	17	-----	3 (100.0)	3 (4.9)	2 (14.3)	12 (85.7)	14 (35.9)
36 - 40	5	1 (33.3)	2 (66.7)	3 (4.9)	-----	2 (100.0)	2 (5.1)
41 - 45	1	-----	-----	-----	-----	1 (100.0)	1 (2.6)
Total	100	3 (4.9)	58 (95.1)	61 (100.0)	4 (10.3)	35 (89.7)	39(100.0)
Persons		P= 0.201			P= 0.921		
Chi-Square		N.S.			N.S.		

P-Value > 0.05

Table 5: Seroprevalance of anti-HCMV According to the Living Status for Women.

Living Status	Anti-HCMV IgG		Anti-HCMV IgM		Total
	IgG Positive No. %	IgG Negative No. %	IgM Positive No. %	IgM Negative No. %	
Good	31 (91.2)	3 (8.8)	2 (5.9)	32 (94.1)	34 (100.0)
Medium	53 (91.4)	5 (8.6)	6 (10.3)	52 (89.7)	58 (100.0)
Bad	8 (100.0)	-----	-----	8 (100.0)	8 (100.0)
Total	92	8	8	92	100
Persons	P= 0.685		P= 0.513		
Chi-Square	N.S.		N.S.		

P-Value > 0.05

Table 6: Seroprevalance of anti-HCMV According to the Residence for Women.

Residence	Anti-HCMV IgG		Anti-HCMV IgM		Total
	IgG Positive No. %	IgG Negative No. %	IgM Positive No. %	IgM Negative No. %	
Urban	74 (91.4)	7 (8.6)	5 (6.2)	76 (93.8)	81 (100.0)
Rural	18 (94.7)	1 (5.3)	3 (15.8)	16 (84.2)	19 (100.0)
Total	92	8	8	92	100
Persons	P = 0.625		P = 0.164		
Chi-Square	N.S.		N.S.		

P-Value > 0.05

This study revealed that the prevalence of anti-CMV IgG antibodies in primary aborted women 54 (88.5 %) of the cases positive while 3 (4.9 %) positive for anti-CMV IgM and the prevalence of anti-CMV IgG antibodies in pregnant women 83 (91.2%) of the cases positive while 6 (6.6 %) positive for anti-CMV IgM, the detection of CMV IgG indicated that the pregnant women had previously been infected with CMV after CMV infection, IgG remains in the body for life and protects considerably against the next infection and a negative result of CMV indicate that the women have not been infected with the virus these result show in Table (1) the seroprevalence of CMV IgG observed in this study were similar to the result reported in Sudan by Nahla et al. [17] and Khairi et al. [18]. And no statistically significant differences was found between primary aborted women and anti-CMV IgG, IgM positive and between pregnant women and anti-CMV IgG, IgM P-value < 0.05. According to age group in women, the result showed that the highest anti-CMV IgG seropositivity rates were 37 (97.4 %) at age (26-30) years these results were compared with the recent results Yasir (18) and Al-Baiati [19]. And statistically, differences was found between age group and anti-CMV positive P-value < 0.05 also non-significant differences was found between age group and anti- CMV IgM positive cases P-value > 0.05 shown in Table (2). The seroprevalence of IgG antibodies among women with primary abortion was 54 (88.5 %) out of 61 and most of them 23 (100.0 %) at age group (26-30) years show in Table (3). The seroprevalence of IgG antibodies among recurrent abortions was 31 (79.5 %) out of 39 the total number. Most them of age group (26-30) which represent 14 (93.3 %) with significant differences between age group and primary, recurrent abortion. This agreement with Al-Baiati [19]. The seroprevalence of IgM antibodies among women with primary abortion was 3 (4.9 %) out of 61 and most of IgM antibodies among recurrent abortions was 4 (10.3 %) out of 39 the total number shown in Table (4) and no statistically differences between age group and primary, recurrent abortion. P-value > 0.05 this agreement with Yasir [18]. In Table (5) shows out of 34 women with a good living status 31 (91.2 %) were CMV-IgG positive while only 2 (5.8 %) of them were CMV-IgM. Regarding medium living status out of 58 women, 53 (91.4 %) were CMV-IgG positive while only 6 (10.3 %) of them were CMV-IgM positive result. Among women, with bad living status, 8 (100.0%) were CMV- IgG positive while zero results of CMV-IgM.

statistical analyses indicated that there were no significant differences among the three living statuses regarding the IgG and IgM seropositivity P-value > 0.05 means no any relation with CMV infection this agree with Hama and Abdurahman [20]. The seroprevalence of anti-CMV according to their residence area was clarified in Table (6) from 81 women from urban residency 74 (91.4 %) were positive for CMV-IgG antibodies and 5 (6.2 %) were positive for CMV-IgM antibodies and from 19 women from rural residency 18 (94.7 %) were positive for CMV-IgG antibodies and 3 (15.8 %) were positive for CMV-IgM antibodies. Statistical analyses indicated no significant differences among residence area. P-value > 0.05 these means have no any significant effects on the seropositivity of CMV and similar with Al-Baiati [19].

4. CONCLUSION

In this study, the seroprevalence of anti-CMV IgG antibodies are higher in pregnant women and primary aborted women between age group (26-30) years with the medium living status which survive in urban residency

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