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**Abstract**

The study group included 100 blood samples pre-marital women in Diyala / Al-Khalis, from the period from 1/10/2015 to 1/4/2016, the blood sample of women without any clinical evidence of cytomegalovirus (CMV) infection and free from infected by HIV .we were screened for the presence of IgG and IgM antibodies against CMV by strip test.The IgG antibodies were detected in 10%, while the IgM antibodies were detected in (6%). The sero negative (control) was (90%) for IgG and (94%) for IgM. Rising in seropositivity was observed in young women in age group (25-30years) for both IgG and IgM, Seroprevalence of CMV was more in women from urban area IgG (80%), IgM(83%) with no significant result. Most of the women have higher education rising to 90% for IgG and 100% for IgM.

**Keywords:** CMV, women, age, educational level, socioeconomic level, Diyala Iraq.

تشخيص الفيروس المضخم للخلايا في النساء المقبلات على الزواج في الخالص

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### الخلاصة

تضمنت مجموعة الدراسة 100 عينة من مصل دم النساء المقبلات على الزواج في محافظة ديالى / قضاء الخالص، استمرت الدراسة للفترة من 2015\10\1 إلى 2016\4\1، حيث أخذت عينة الدم من نساء اصحاء ظاهريا والعينات التي أخذت خالية من الاصابه بفيروس نقص المناعة البشرية. تم التحري عن وجود الفيروس بواسطة الشرائط الحاويه على الاجسام المضاده للفيروس المضخم للخلايا CMV-IgG و CMV- IgM. اظهرت النتائج ان نسبه الموجبيه للأجسام المضادة نوع IgG بنسبه 10% في حين الموجبيه للأجسام المضادة من نوع IgM كانت بنسبه (6%)، بينما السلبية المصلية للـ(IgG) كانت (90%) و (94%) للـIgM. كما لوحظ ارتفاع الاستجابه المناعيه لدى الشابات ضمن الفئة العمرية (25-30) لكل IgG و IgM، كما ظهر ارتفاع معدل الانتشار المصلي لدى النساء من المناطق الريفية اكثر من تلك التي في المدن وبنسبه (80%) للـIgG و (83%) للـIgM من دون اي فرق معنوي يذكر. ارتفعت نسبه الاصابه في معظم النساء ممن لديهم التعليم عالي لتصل الى 90% IgG و 100% IgM.

**الكلمات المفتاحية:** الفايروس المضخم للخلايا، نساء، عمر، مستوى التعليم، المستوى الاجتماعي، ديالى، العراق.

### Introduction

Human Cytomegalovirus (HCMV) is a type of family Herpesviridae Betaherpesvirinae subfamily, Cytomegalovirus genus [1], these viruses its remained statically in the body throughout life of patient [2]. Cytomegalovirus (CMV) was enveloped, with icosahedral, Spherical to pleomorphic capsid with round geometries had diameter about 150-200 nanometers. Genomes are linear and non-segmented, 200kb in length [3]. Cover viral contain (Capsid) glycoproteins (Spike) was responsible for identifying the viral strain type and helps the virus to enter the cells made it targets for antibodies, virus multiplies inside the nucleus, forming nuclear intra nuclear inclusion body, white blood cells the main reservoir of the virus [4]. The virus was first time isolated from salivary glands and kidney of the bodies of two death children, the virus was registered in 1956 by Smith MG, [5].

Cytomegalovirus can transmitted from person to person by several and different ways, all of them requiring close contact with virus-bearing material and incubation period in normal older children and adults after viral exposure was 4 to 8 weeks Also CMV can be acquired by the infant from exposure to virus in the mother's genital tract during delivery and from maternal breast milk.[1] [6]

**Detection of Cytomegalovirus Infection in Pre-Marital Women  
in Al-Khalis City**

**Raghad Ibrahim Ahmed**

Cytomegalovirus immunoglobulin antibodies ( IgM) appearance first time as response to an infection and are measurable from 7 to 10 days after virus enters the body. These IgM antibodies are persist for 4 to 6 weeks after appear of the infection and rapidly the IgG antibody synthesis beginning; therefore, detection of IgM meaning a current infection found. IgG antibodies may be measurable at low levels for many years and in some cases for a lifetimes [7] .Human cytomegalovirus (HCMV) was found in various body fluids like urine, saliva, blood, sperm, can also transmitted through sexual contact with an infected person and possible be transmitted through breast milk and rarely spread through blood transfusions[8]. CMV have minor symptoms may occur at the beginning, with weakness in immune system leads to the activity of the virus as a result of certain illnesses such as HIV AIDS virus or hepatitis virus type C or as a result of treatment with inhibitory drug therapy [1 ,9 ], organ transplants, especially kidney infection of cancers, diabetes, nephritis [10, 11] Epidemiological studies showed that seroprevalance of CMV antibodies was a broad, and the presented rate of IgG antibodies to the virus ranges (30-97%), but the virus was lowest rate in Europe, Australia and some parts of North America, and high clearly in Africa, and the Middle East. [12, 13]. Studies have shown that the incidence of CMV infection was increased in children to (16.1%) [14], while the acute infection among newborns born was 1%, and studies had confirmed that the largest infection with CMV among females in procreation aged females 95.5% and males were 96.5% [15] For that we prepared this study to determine the ratio to of infection by CMV in the women during doing her Laboratory test before married.

**Patients, Materials & Methods & Patient1:**

**Collection of samples:** This study was conducted in the laboratories of Khalis Hospital and in laboratories of biology department of Sciences college / Diyala University as a cross section study including 100women attending this hospital during the period between 1 November 2015 to 1 of April 2016. The demographic information included age, address and educational level.

**Detection of Cytomegalovirus Infection in Pre-Marital Women  
in Al-Khalis City**

**Raghad Ibrahim Ahmed**

**Serologic studies:**

In order to determine Human cytomegalovirus by serological method, five (5) ml of venous blood were collected from 100 women who wanted to get married, their blood sample free from hepatitis virus type C & B, and free from Acquired Immune Deficiency Syndrome (AIDS). After collected the blood from women, left for 10 minutes then placed in a centrifuge for 5 minutes to separate the blood and get serum, finally the serum put in ependrophe tube and storage at frozen temperature (-20) until using strep of CMV antibody IgG & IgM.

**Methods**

We aspirated 10  $\mu$ l of women sera by micropipette and put it in the hole at the bottom of the strip and then put over a drop (30-40  $\mu$ l) of dilution solution, and then wait for 15 minutes until appearance of the result, if it was appositve result appearance of two lines, if it was negative result appearance of single line.

**Statistical analysis**

Was done using SPSS (Statistical Package of social Science) version 18 computer software. Frequency distribution and percentage for selected variable were done. The P value of <0.05 was considered significant [15].

**Results**

Blood samples were collected from 100 women living in Kalis city /Diyala province found infected with CMV, and

**Table (1) Distribution of positive results for IgG and IgM**

Result	IgG (%)	IgM (%)
Positive	10 (10%)	6 (6%)
Negative	90 (90%)	94 (94%)
Total	100 (100%)	100 (100%)
Correlations	Sig.*	Sig.

**Sig.= Significant results**

Table (1) the results revealed that ten (10%) of blood samples of women gave positive results for anti CMV- IgG , while 6 (6%) of sample gave positive for anti CMV- IgM with significant differences under Pvalue =0.01 .



Detection of Cytomegalovirus Infection in Pre-Marital Women in Al-Khalis City

Raghad Ibrahim Ahmed

Table (2) Distribution of un married women according to age groups:

Age(years)	IgG		IgM	
	Positive (%)	Negative (%)	Positive (%)	Negative (%)
15-20	0 (0%)	22 (24%)	0 (0%)	22 (34.4%)
20-25	1 (10%)	22 (24%)	1 (16.7%)	22 (34.4%)
25-30	5 (50%)	22 (24%)	3 (50%)	24 (25.5%)
30-35	3 (30%)	5 (5.6%)	1 (16.7%)	7 (7.4%)
35-40	1 (10%)	19 (21.1%)	1 (16.7%)	19 (20.2%)
Total	10 (100%)	90 (100%)	6 (100%)	94 (100%)
Correlations	Ns*		Ns*	

Ns\*=No significant

Table (2) showed the incidence of age groups women were ranged from 15- 40 years. Five (50%) infection found in age group (20-25 years) for both antibody IgG and IgM Respectively. Also infected was a high in age group (30-35years) included 3(30%) for IgG only, no significant differences were appeared.

Table (3) Distribution of positive result for IgG and IgM according to address

Address	Result			
	IgG		IgM	
	Positive (%)	Negative (%)	Positive (%)	Negative (%)
Urban	2 (20%)	24 (26.7%)	1 (16.7%)	25 (26.6%)
Rural	8 (80%)	66 (37.3%)	5 (83%)	69 (73.4%)
Total	10 (100%)	90 (100%)	6 (100%)	94 (100%)
Correlations	Ns*		Ns*	

Ns\*=No significant

Table (4) showed generally the number of infected women according to residence area , where the ratio of CMV-IgG in the rural 8(80%) while in the urban 2(20%),also showed the incidence of CMV-IgM according to residence of women, it found the infection was highly in rural in contrast to urban , 5(83%)of women in rural and in urban 1(16.7%)infection found without any significant differences was showed.

**Detection of Cytomegalovirus Infection in Pre-Marital Women  
in Al-Khalis City**

**Raghad Ibrahim Ahmed**

**Table (3) Distribution of positive result for IgG and IgM according to educational level.**

Educational level	IgG		IgM	
	Positive (%)	Negative (%)	Positive (%)	Negative (%)
Illiterate	0 (0%)	5 (5.6%)	0 (0%)	5 (5.3%)
Primary	0 (0%)	6 (6.7%)	0 (0%)	6 (6.4%)
secondary	1 (10%)	22 (24.4%)	0 (0%)	23 (24.5%)
College	9 (90%)	75 (63.3%)	6 (100%)	60 (63.8%)
Total	10 (100%)	90 (100%)	6 (100%)	94 (100%)
Correlations	Ns*		Ns*	

**Ns\*=No significant**

Table (4) showed the number of women according to educational level, CMV infection was the highest infection in college level, IgG was 9 (90%) and IgM was 6 (100%), and low in secondary educational level was 1(10%) for IgG only and no infected women found among in Illiterate and primary educational level, no significant difference between CMV and educational level was appear.

### Discussion

In our research 10% and 6% gave positive results for IgG,IgM respectively ,these results were not agree with result of research conducted in of Medicine city in Baghdad showed that the incidence of antibody CMV-IgG was 58 (36%) and IgM 16 (9.9%) with significant differences under  $P_v = 0.05$  [17], and also disagree with the Iraqi endemic were reported that the prevalence rates of cytomegalovirus IgM was 1%and IgG was 84% antibodies in non-pregnant women[18], and not agree results of Mohamed [19] showed CMV IgG 86 (97.73%) were seropositive in female , 2 (2.3%) female out of 88 screened students were seropositive for IgM . therefore, detection of IgM meaning a current infection was happened . IgG antibodies may be measurable at low levels for many years and in some cases for a lifetimes [7]. This study revealed a higher ratio of CMV in age group (20-25), but this results was un agree with [20] that showed that (46.6%) of infection in the age group (15-19 years) with significant differences under  $P_v=0.01$ .

**Detection of Cytomegalovirus Infection in Pre-Marital Women  
in Al-Khalis City**

**Raghad Ibrahim Ahmed**

This study showed that resident in rural more than urban, that was agree with result of Al-Azzawi who found that infection was highest in rural areas

(86%) in contrast with city (13.7) [17], also agree with [19] who found that 72 (39.8%) students were from urban areas and 109 (60.2%) from the rural areas in Diyala Province/Iraq and with higher significanty.

CMV was highest among women who living in the rural areas in contrast to with urban areas may be related to socioeconomic level.

This study showed most infected women with higher educational level ,this results un agree with study in the Norwegian showed 70.5% of CMV-IgG was found among women had low educational level [23],and agree with Yeroh [21] who mention that was no significant association between CMV infection and education level.

### Conclusions

we must doing survey study for CMV by serological examinations, such as ELISA and-making serious attempts to isolated the virus in Iraq and make study at the molecular level to the virus to determine virulence and strain type of virus .

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**Detection of Cytomegalovirus Infection in Pre-Marital Women  
in Al-Khalis City****Raghad Ibrahim Ahmed**

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**Detection of Cytomegalovirus Infection in Pre-Marital Women  
in Al-Khalis City**

**Raghad Ibrahim Ahmed**

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