Immunoglobulins Level of CMV and *T.gondii* Infections in Some Pregnant Women in Baghdad

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Abstract

One of the most infections constitutes a critical economic and community health issue in the wide world, especially in developing countries (Cytomegalovirus and Toxoplasmosis) infection in pregnant women. Three hundred fifty specimens of blood in total (300 infected pregnant women and 50 healthy pregnant women as control) were enrolled in this study. Determined the immunoglobulin for (IgG, IgM) of CMV and *T.gondii*. This study focused to detect the immunoglobulins level and prevalence of CMV and toxoplasmosis infection in pregnant women to raise awareness in the care of pregnant women. The IgG and IgM antibodies for CMV and Toxoplasma were detected by Enzyme linked immunosorbent assay (ELISA). Distributing patients into three age groups (15-25, 25-40 and > 40 years). The age group 15-25 years, shows positively for CMV in 63 pregnant women while 60 pregnant women for Toxoplasma in the same age group.

Keywords: Cytomegalovirus, *Toxoplasma gondii*, IgG, IgM.

مستوى الامينوكلوبيولين للمرضات *T. gondii* و فايروس Cytomegalovirus في بعض النساء الحوامل في بغداد

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الخلاصة

تعد اصابات داء المقوسات والفايروس المضخم للخلايا من المشاكل الاقتصادية والاجتماعية الرئيسة في العالم، لا سيما في الدول النامية، بما في ذلك الشرق الأوسط بسبب ارتفاع معدلات الاصابات والوفيات، ولا سيما بين النساء الحوامل. تم جمع عينات الدم بحدود 350 عينة (300 عينة من النساء الحوامل مصابات و50 عينة من النساء الحوامل غير المصابات كعينات سيطرة). هدفت هذه الدراسة إلى تحديد نسبة الامينوكلوبيولين والانتشار داء المقوسات والعدوى بفايروس المضخم للخلايا بين النساء الحوامل من أجل اجراء فحوصات دورية للمسبب. استخدمت طريقة ELISA لتحري عن اضداد IgG + IgM. تم توزيع العينات الى ثلاث فئات عمرية (15–25، 25–40، اكبر 40 سنة). تم الحصول على نسب الضدين IgG، IgM والاثنين معاً بحدود 63 من النساء الحوامل المصابة بفايروس الخلايا المضخم في الفئة العمرية (15–25 سنة) على التوالي. في حين النسب للضدين IgG، IgM والاثنين معاً بحدود 60 على التوالي من عينات النساء الحوامل المصابة بداء المقوسات في الفئة العمرية (15–25 سنة).

الكلمات المفتاحية : الاميونوكلوبيولين، داء المقوسات، فايروس مضخم الخلايا، IgG، IgM

Introduction

Cytomegalovirus (CMV) DNA virus and a member of the herpesviridae family [1]. This virus is important in blood transfusion. In patients with a compromised immune system, infection of CMV can cause lethal consequences, universally, this virus is distributed with approximately 40-100% of the world's population [2]. The virus transmits by blood transfusion and very danger in pregnant women and immune-compromised people [3][4]. Toxoplasmosis is a multi-species zoonotic disease caused by *Toxoplasma gondii* that infects up to one-third of the world's population [5]. The parasite causes stillbirth or fetal abnormality [6]. This parasite can be transmitted by oocyte, contaminated food with soil, congenital route, and blood route. Infection stages are; (acute) severe symptoms, (subacute) mild symptoms, and finally (chronic) mild or undetected symptoms [7]. Thirty to fifty percent of the world population is infected with toxoplasmosis [8]. Toxoplasma in healthy people sometimes is caused by eye infections and an untreated case is caused by blindness [9][10]. Immune-suppressed people, such as toxoplasmosis can cause seizures and life threatening illnesses such as hepatitis and brain inflammation (encephalitis) [11][12]. These infections may be caused by inapparent or weak symptoms in pregnant women but can cause much more serious damage in the embryo. The early detect is very important for prenatal care to the detection of these infections in pregnant women and her child, in addition, offered the treatment to protect them [13]. This study aimed to determine the immunoglobulin level (IgG, IgM, and IgG+IgM) of infected women (CMV and *T. gondii*) through screening of antenatal in Baghdad.

Materials and Methods

The study was carried at Madenat Al-elem University College laboratories, from January 2015 to December 2015. Accordingly, 250 patients (pregnant women) were diagnosed as having CMV and Toxoplasma infection, and their age range was 14 - 45 years (mean ± SD: 26.5 ± 4.35 years), In addition to patients, 50 apparently healthy pregnant women were included as a control sample in the study, and their age range was 14 - 45 years (mean ± SD: 27.2 ± 4.46 years). The blood specimens were collected in a volume of five ml from each participant and then serums were analyzed for detecting CMV IgM, IgG, and Toxoplasma IgM, IgG antibodies. These previous parameters were analyzed by an enzyme linked immunosorbent assay (ELISA) technique using specific kits (Biocheck, USA) depending on the instructions of the manufacturer. IgM and IgG of CMV antibody titer greater than 1.00 IU/ml were considered positive. While IgM of Toxoplasma titers are higher than a 1.00 IU/ml and IgG antibody titer higher than 8.0 IU/ml were considered positive. Statistical Analysis was given as mean ± SD, and significant differences using the SPSS software version 13.

Results and Discussion

Distributing patients into three age groups (15-25, 25-40 and > 40 years) revealed differences between patients. The age group 15-25 years was 68 (27%), the age group 25-40 years was more frequent in patients than other patients groups 156 (62%), while an opposite picture was drawn in the age group > 40 years 26 (11%) Figure(1).

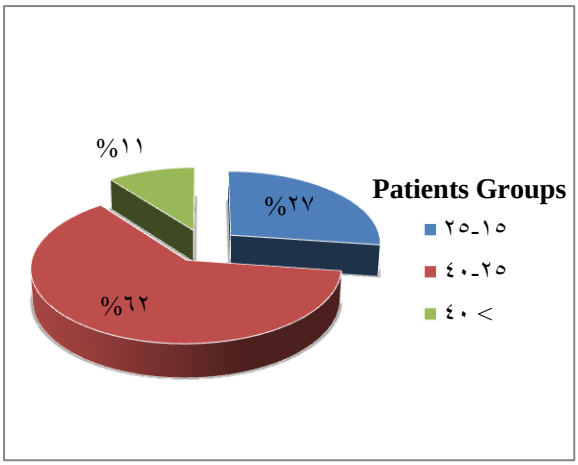

Figure (1): Distribution of patients age groups

The sero-positivities of pregnant women according to age groups (15-25, 25-40 and > 40 years) for anti-CMV, IgG was 63 (50.4%), 67 (46.5%) and 14 (45.1%) respectively, while, positivity for anti-Toxoplasma IgG antibody was 60 (44.7%), 63 (45.3%) and 13 (48.1%) respectively. Pregnant women with sero-positivities for IgM of CMV was 52 (41.6%), 63 (43.7%) and 13 (41.9%), respectively. IgM of Toxoplasma in these subjects were 50 (37.3%), 51 (36.6%) and 6 (29.6%), respectively. Tables (1 and 2) showed the rates of sero-positivities for CMV and Toxoplasma antibodies: (IgG, IgM and both IgG+IgM).

Table (1): Sero-positivity of anti-CMV antibodies in pregnant women

Age Groups (years)	Total Patients	Number of CMV IgG	Percentage CMV IgG %	Number of CMV IgM	Percentage CMV IgM %	Number of IgG+IgM	Percentage IgG+IgM %
15-25	125	63	50.4	52	41.6	10	12.5
25-40	144	67	46.5	63	43.7	14	9.7
> 40	31	14	45.1	13	41.9	4	12.9
Total	300	144	48.0	128	42.6	28	9.3

Table (2) Sero-positivity of anti-Toxoplasma antibodies in pregnant women

Age Groups (years)	Total Patients	Number of Toxo IgG	Percentage Toxo IgG %	Number of Toxo IgM	Percentage Toxo IgM %	Number of IgG+IgM	Percentage IgG+IgM %
15-25	134	60	44.7	50	37.3	24	17.9
25-40	139	63	45.3	51	36.6	25	18.0
> 40	27	13	48.1	8	29.6	6	22.2
Total	300	136	45.3	107	35.6	55	18.3

Discussion

Cytomegalovirus and Toxoplasma gondii characterized by asymptomatic or some time mild infection to pregnant women but can have much more danger for the embryo [14]. Many illnesses such as congenital and intrauterine infections that caused some abnormalities for the fetus and ended to fetal death due to in both social and economic concerns [15]. One of the most important stages during the prenatal period that the detection of these infections in the mother and her fetus. Recently, prenatal routine lab screening for these infections carries out during the first period of pregnancy (trimester) because pregnant women who are sero-negative can show a primary disease, which can be transmitted to the fetus vertically [16]. Prevalence of *T. gondii* infection in the world is limited depending on many factors such as nutritional status, immune status, and socio-geographic conditions. Many

researchers reported that the sero-prevalence of these infections (*CMV* and *T. gondii*) such as in the UK was 9%, in Spain was 19% and 45% in India [17][18][19].

The greatest percentage of both infections were recorded at age group (25-30) years, whereas the age of (> 40) years recorded a low level of infection. These findings may be due to a varied in the immune status of pregnant women during the period of specimens collected and this finding compatible with Ocak et.al., (2007) [20].

CMV infection prevalence is high in our country (Iraq). The results of this study compatible with other previous studies focused on the sero-prevalence of CMV and Toxoplasma infection in investigating pregnant women, the Sero-positivity was reported between 84.7% and 99.5% in Iraq [21][22][23].

Our findings, the sero-positivities of the infection pregnant women with CMV (IgG, IgM and both IgG+IgM) in all age groups were high similar than other country such as United State of America 33%, 56%, Ireland 36, 84%, Australia 35, 30%, Turkey 85% and 94%, Spain 37%, Canada 67% and 100% in Thailand [24][25]. Standard Precautions for CDC of pregnant women include hand hygiene. Safe injection practices (i.e., an aseptic technique for parenteral medications). Sterile instruments and devices. Disinfected and clean environmental surfaces.

High rates of Sero-positivity detected for CMV and *Toxoplasma* infection, the recommended the vaccination against sero-negative women, especially during their reproductive period. On the other hand, these infections will cause critical congenital infections. Test screening for CMV and Toxoplasma and education of women about transmission ways of these infections are important.

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