Prevalence study of *Toxoplasma gondii* & cytomegalovirus (CMV) infections among a young women who upcoming to the marriage and referencing to AL-Razi health center in Tikrit.

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Abstract

There is no sanitary screening program for *Toxoplasma gondii*, and cytomegalovirus (CMV) infections for the young women who upcoming to the marriage in Tikrit so this study was conducted to determine the prevalence of these infections among these women. and to review prevalence reported from different ages (range 19-45 years) between august 2011 and January 2012 a total of 160 serum samples were tested. 70(43.8%) were positive and 90(56.25%) were negative, The prevalence of *T. gondii* infection was 34 (44.5%) , the CMV infection was 33 (40.8%) and association infections (*T. gondii* & CMV) were 3(4.0%) . The study included the prevalence of *T. gondii* and CMV by geographic area (urban & rural) of these 28 (31.8%) from urban and 42 (58.3%) were infected from rural.

Introduction

T.gondii an obligate intracellular parasite that forms cysts in mammalian tissues throughout the body [1]. The parasite is an extremely successful pathogen, responsible for significant morbidity and mortality especially in congenitally infected and immuno-compromised individuals[2] . This infection may occur vertically by tachyzoites that are passed to the fetus via the placenta, or horizontal transmission which may involve three life-cycle stages ingesting sporulated Oocysts from cats or ingesting tissue cysts in raw or under cooked meat or tachyzoites in blood products or primary offal (viscera) of many different animals, tissue transplants and unpasteurized milk[3]. *T. gondii* has a worldwide distribution in human populations infecting up to one third of the global population and a wide range of other mammalian and avian species. [4] The disease has asymptomatic progress in 90% of the patients with sound immune systems [5].

Cytomegalovirus is omnipresent virus infects more than half of general population. Prevalence of CMV antibodies increases with age. Acute infection is usually asymptomatic. This is transmitted by infected WBC's found in packed red cells or platelet components. Leukoreduction reduces the risk of CMV transmission, regardless of serological status of donor. Immunocompromised patients, CMV seronegative transplant recipients, pregnant women and neonates form the high risk group. Pre-storage leukodepletion of blood components may be as effective as the use of CMV seronegative blood components [6]. This infection often lead to mild or asymptomatic infection in the mother. However, they may result in serious congenital abnormalities, intra-uterine growth
retardation, and even death of the fetus [7].

fetal infection can occur following both primary and recurrent infection (reactivation of endogenous virus or reinfection with a new strain). Transmission rate varies between 30% and 40% after primary and 1% following secondary infection [8,9].

Although *T. gondii* and CMV are usually either asymptomatic or associated with self-limited symptoms in adults, infections in pregnant women can cause serious health problems in the fetus[10], super abounding these infections in recent years between pregnant women in the cited area, the study had been conducted.

Materials and methods

In this study it was determined that the prevalence of *T. gondii* and CMV infection among young women who upcoming to the marriage and attending AL-Razi health center in Tikrit for proceeding routine testing before marriage.

Specimen collection

A total of 160 serum samples were tested from women between 19-45 years for *T. gondii* and CMV seroprevalence. Samples were collected from AL-Razi diagnostic laboratory in Tikrit which supplied remnant sera from samples that had been submitted for routine blood groups congruence testing before marriage.

Blood specimen collected into a red top collection tube (containing no anticoagulants in Vacutainer) by veinpuncture. After the blood had been allowed to clot the serum separated by centrifugation and carefully withdrawed into a new pre-labeled tube. The samples were coded by date of birth, date of collection, sample number and geographical area urban or rural . then whole serum had been stored at -20°C until use.

Serological testing

Serum samples were tested for *T. gondii* infection using onsite

T. gondii IgG/IgM Rapid Test-Cassette (serum / plasma)(CTK Biotech, Inc.,USA) and CMV infection using CMV IgM Antibodies Rapid Test Device (serum / plasma)(ACON Labratories, Inc).

Result

A total of 160 serum samples were tested. 70(43.8%) were positive and 90(56.25%) were negative table (1) fig.(1). The total prevalence of *T. gondii* infection was 34 (44.5%), 24(27%) from 89 tested women in age group 19-28, 10(17.5%) from 57 tested women in age group 29-38 and no infection in age group 39-45.

The total CMV infection was 33 (40.8%), 27 (16.9%) from 89 tested women in age group 19-28, 6(3.8%) from 57 tested women in age 29-38 and no infection in age group 39-45.

The total association infections (*T. gondii* & CMV) were 3 (4.0%), 2 (2.2%) from 89 tested women in age group 19-28, 1 (1.8%) from 57 tested women in age 29-38 and no infection in age group 39-45. table (2) fig (2).

Table (1):- No. tested women with no. of positive and negative women

No. of tested women	No. of positive women	%	No. of negative women	%
160	70	43.8	90	56.25

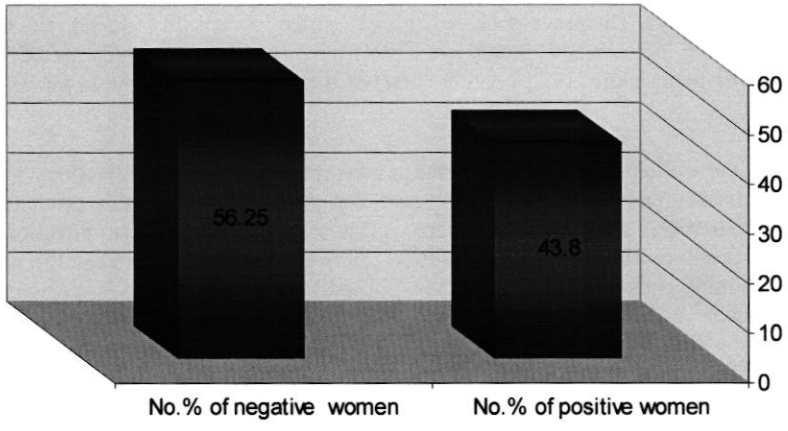

Fig. (1):No. % of positive and negative women

Table (2):- Prevalence of CMV and Toxo. by age groups from 19 to 45 years old.

Age group	No. of women tested	No. of women positive					
		No. of Toxo. Positive	%	No. of CMV positive	%	Toxo.&CMV infection	%
19-28	89	24	27	27	30.3	2	2.2
29-38	57	10	17.5	6	10.5	1	1.8
39-45	14	-	–	-	-	-	–
Total	160	34	44.5	33	40.8	3	4.0

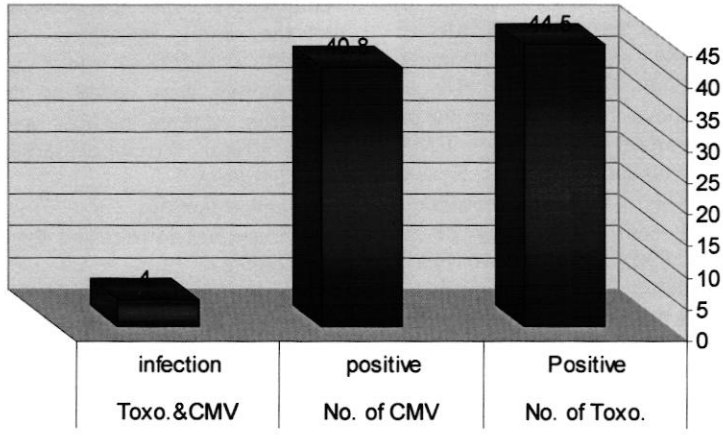

Fig.(2):- Prevalence of Toxo., CMV and association infection

the study included , 88 from the urban area:- of these, total infected women was 28(17.5) including 15 (9.4%) were infected with Toxo. 13 (9.4%) with CMV.

And 72 women were from the rural area:- Of these, total infected women was 43(26.3%) including 19 (11.9%) were infected with Toxo. 20 (12.5%) with CMV, 3(1.9%) with Toxo. & CMV. Table (3) Fig (3).

Table (3):- Prevalence of total infection by Geographical area Urban & Rural

Geographic area	No. of women tested	No. of positive women						total	No. % of positive women
		Toxo	%	CMV	%	Toxo & CMV	%		
Urban	88	15	17	13	14.8	-	-	28	31.8
Rural	72	19	26.4	20	27.8	3	4.2	42	58.3

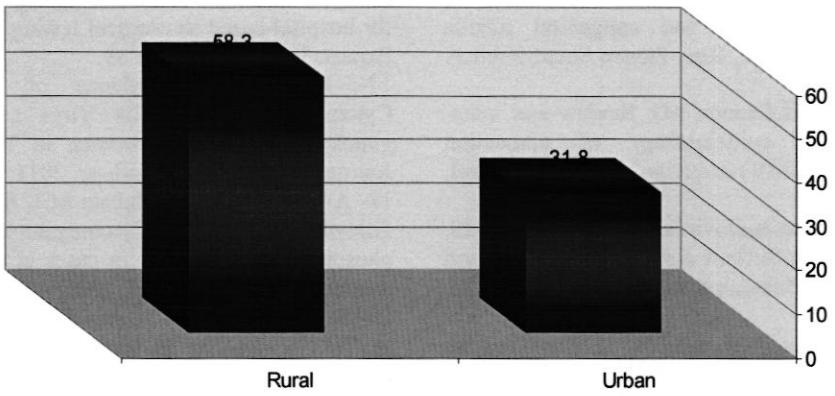

Fig.(3):- Prevalence of infection by geographic area

Discussion

Previous study reported total infection 43.8% from 160 tested women, toxoplasmosis was found as 34 (44.5%) , the result is roughly similar to Mousa et al showed (44.8%)[11]Aysun et al who record (37%)[12]. Prevalence rate of *T. gondii* In this study probably due to the lack of presence of vaccination for *T. gondii* [12], lack of drinking water chlorination in Tikrit area, increased number of stray cats especially in resent years may also contribute to the high rates and may be poor about simple protective measures such as hand washing, flushing all vegetables and fruits. As a result of the present study differs with Srirupa and Nibedita showed (26%)[13] Jeffrey et al who record toxoplasmosis in the South of U.S (22.8%), Midwest (20.5%)[14], Majeed it was reported to be (22.9%)[15] , Abu-Madi et al it was (22.9%) who recorded prevalence of *T. gondii* among children less than 1 year old[16] and Nuha who recorded prevalence (24%) [17].

CMV was 33(40.8%) this results were differed with Al-Saeed and Muhsin who recorded prevalence (18.8)[18], Sadik et al who showed (23.25%) when he detected Immunoglobulin G antibodies[19]. And Previous study reported association (*T. gondii* & CMV) infections was 3(4.0%). CMV infections are highly associated with poor hygienic conditions, communal life style [20]. A result of the present study differs with Al-Marzoqi1 et al showed (57.2%)[21], Majeed was a row (32.4%) (38.5) and (29.1%) for the years 2008, 2009 and 2010[15], and Nuha who recorded prevalence (60%)[17].

prevalence rate was also found to be more in women from rural area 42 (58.3) than those from urban area 28 (31.8), this results were roughly asymptotic to Sheevani et al[22]. Adverse living conditions, poor hygiene and closeness of contact in women of lower socioeconomic class[15].

The disparity in results may be due to the regional variations from one to another country or even within the same country. This variation has been attributed to clime, culture differences regarded hygienic and feeding habits by washing the vegetable very well . the results differ from one to another person may be according to the workers experience to detection the best results and avoid the cross reaction that may be give a false positive or negative results so this difference bring about vacillation the workers results in different studies[17].

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دراسة انتشار *Toxoplasma gondii* ، والفيروس المضخم للخلايا (CMV) بين النساء الشابات المقبلات على الزواج والمراجعات لمركز صحة الرازي في تكريت

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الملخص

لا يوجد برنامج فحص صحي لـ *Toxoplasma gondii* ،و الفيروس المضخم للخلايا (CMV) للنساء الشابات المقبلات على الزواج في تكريت لذا أجريت هذه الدراسة لتحديد مدى انتشار هذه العدوى بين هؤلاء النساء. وتم استعراض الانتشار من مختلف الأعمار (19–45 سنة) بين شهري اب 2011 وكانون الثاني 2012 . تم اختبار 160 عينة مصل. وكانت 70 عينة مصل (43,8%) إيجابية و 90 عينة (56,25%) سلبية، وكانت الاصابة بالمقوسات الكوندية *Toxoplasma gondii* 34 عينة مصابة وبنسبة مؤية (44,5%) و 33 عينة مصابة بالفيروس المضخم للخلايا (CMV) وشكلت نسبة (40,8%) وكانت 3 اصابات مشتركة بكل من (*T. gondii* و CMV) وبنسبة (4,0%). وشملت الدراسة مدى الاصابة بكل من *T. gondii* و CMV حسب المنطقة الجغرافية (الحضريةو الريفية) كانت النتيجة 28 (31,8%) من المناطق الحضرية و 42 (58,3%) من المناطق الريفية.