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Seroprevalence of *Toxoplasma gondii* among pregnant women in Baghdad province

مدى انتشـــار طفيلي التوكسوبلازما (*Toxoplasma gondii*) بين النســاء الحوامـــل في مدينة بغداد

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Abstract:

This study aimed to evaluate the prevalence of Toxoplasmosis among pregnant women, in Baghdad province. A total of 56 sera samples from pregnant women, their age ranged between 20 – 39 years, were obtained and tested.

The results exhibit high prevalence with *Toxoplasma* parasite among pregnant women that reach 75%(12\56) and also high rate of infection with increasing age, it was 64.3% in women ranged 20-26 years old, while it was raised to reach 87.5% in those ranged 33-39 years old. Among the environmental and individual factors that was studied, It was found that absence of educational level, exposure to cats and previous abortion have a great important in the increasing of infection among pregnant women, while there was no any important statistical relationship between rate of infection and any other environmental and individual factors which have been studied.

المستخلص:

تهدف هذه الدراسة إلى تقييم انتشار الخمج بطفيلي داء المقوسات (Toxoplasmosis) بين النساء الحوامل في مدينة بغداد . تم فحص 56 عينة من عينات مصل الدم للنساء الحوامل المشاركات في الدراسة والذين تراوحت أعمارهن مابين 20 – 39 عاما.

أظهرت النتائج نسبة خمج عالية بين النساء الحوامل بلغت 75% (56/42) ، كما أوضحت الدراسة أن نسبة الخمج بالطفيلي تزداد مع تقدم العمر . إذ كانت 64.3 % بين النساء من الفئة العمرية 20-26 عاما بينما ارتفعت لتصل إلى 87.5 % في الفئة العمرية 33-39 عاما . من بين العوامل البيئية والشخصية التي درست ، وجد أن انعدام المستوى التعليمي ، التعرض المستمر للقطط وحالات الإجهاض السابقة ذات أهمية كبيره في زيادة نسبة الحمج بالطفيلي بين عينة البحث في النساء الحوامل ، بينما لم تكن هنالك أي علاقة إحصائية مهمة بين نسبة الخمج في النساء الحوامل وأي من العوامل البيئية والشخصية الأخرى التي تم دراستها.

Introduction:

Toxoplasmosis is a world wide distribution zoonotic disease, and consider important disease in public health aspects , found in humans and many animal species[1][2].It is estimated that 20-90% of the world adult population, depending on the region , already have had contact with the parasite [3]. This zoonosis can be found on all of the countries and under different climatic conditions. [4] The prevalence of toxoplasmosis is related to several factors , including cultural level , nutritional habits , age and rural or urban setting [5] .There are several well-known means of transmission, these include eating row or poorly cooked meats containing bradyzoites, ingestion of oocytes from cat faeces in soil , water or food [6] . In peoples with a well functioning immunological system, the infection usually has no symptoms except for development of specific antibodies [7]. Congenital transmission occur when a woman acquires the infection for the first time during pregnancy and transmits it to her fetus [8] .Congenital infection of human fetus may cause abortion, blindness, mental retardation and other neurological diseases[9].

The previous studies concerned with prevalence of *Toxoplasma* infection among pregnant women in Iraq , include the study done by [10] in AL-Qadisya province which exhibit rate of infection about 60.86% in urban areas, study carried by [11] in Duhok which show a rate of infection about

41%, other study carried by [12] in Ninevah, show rate of infection about 39%, while [13] in Duhok found high rate of infection reach 100%. alone study only carried in Baghdad province that done by [14] which shown rate of infection with *Toxoplasma* of 49%.

Our study aimed to throw alight on rate of infection with *Toxoplasma* among pregnant woman in Baghdad province.

Materials and Methods :

Study group:

A total number of 56 pregnant woman attending Al-Yarmouk hospital, were obtained. The age of the study group ranged from 20-39 years. Thirty one (31) women have a history of a previous abortion. .

Epidemiological assessment:

Aquestionnaine sheet was designed to assess some of the main risk factors which may influence the prevalence of *Toxoplasma* infection among the expecting women volunteers .The influential risk factors considered in the study include ,maternal age educational level, owning cats , source of drinking water, eating raw or not well cooked meat, tasting raw food while cooking and previous abortion.

The samples:

A single blood sample was taken from each participant. The samples collected from March to August, 2008. Blood samples were collected in a labeled 5ml tubes , and stored at 4C° cool containers for 24 hours , then sera separated by centrifugation and stored in 0.2 ml aliguots at -20C°/ till testing .

Serological testing:

Serum specimens were tested by latex agglutination test Each serum sample was first examined at dilutions of 1:20 and 1:40, If the latter dilution gave a positive result, further dilutions were made in order to determine the end point. The procedure includes the following steps due to [15].

1- Allow the reagents (suspension of latex particles coated with *Toxoplasma gondii* soluble antigen in buffer containing bovine serum albumin and sodium azide) to reach room temperature.
2- Place 30µl of diluted serum on one section of the slide.
3- The reagent vial was saked well and one drop of the reagent added of each drop of serum samples.
4- Both drops of reagent and serum were mixed well by strier.
5- The slide rotate for 5 minutes on a rotary shaker set at 100 rpm.
6- The samples of serum considered positive or negative depending on present or absent of clear agglutination.

Statistical analysis:

To analyze the data statistically, Chi-Square and t.test were used and appropriate $P< 0.05$ were considered significant [16].

Results:

Out of 56 sera tested, 42 samples were toxoplasmosis positive (75%).The age distributions of positive reactors were show in table- 1. The correlation of infection with age show statistically differences these settings. There was a gradual increase in sera positivity with increasing age ($P < 0.05$), reaching a peak of 87.5% in the oldest age .Also distribution of antibody titers was shown in table-1. The highest number of subjects under study had antibody titre of 1:40 (44.1%) some of risk factors were explained and shown in Table -2.

In the present study, the absence of educational level, exposure to cats and previous abortion are found as important risk factors for toxoplasmosis, indicating high positive rates ($P<0.05$, $P<0.05$ and $P<0.01$ respectively) While there was no significant associations between sera prevalence of *Toxoplasma* and other factors, Which include residence, source of drinking water, eating raw or not well –cooked meat and testing food during cooking.

Table -1- prevalence of toxoplasmosis among pregnant women in relation with age, IgG antibody titre in sera of infected cases.

Age	No. examined	No. infected	%	IgG Antibody titre							
				1:20	%	1:40	%	1:80	%	1:160	%
20-26	14	9	64.3	2	22.2	4	44.4	2	22.2	1	11.1
27-32	34	26	76.4	6	23	8	30.8	9	34.6	3	11.5
33-39	8	7	87.5	0	0	4	5.71	2	28.6	1	14.3
Total	56	42	75	8		16		13		5	

Risk factors		No. examined	No. infected	%

Educational level	Uneducation	31	26	83.9
	Education	25	16	64
Owing cats	Yes	18	15	83.3
	No	38	27	71.1
Residence	Rural	15	12	80
	Urban	41	30	73.2
Source of drinking water	Treated	43	32	74.4
	Untreated	13	10	76.5
Eating raw or Not well cooked meat	Yes	5	4	80
	No	51	39	76.5
Taste food during cooking	Yes	37	28	75.7
	No	19	14	73.7
Previous abortion	Yes	31	31	100
	No	25	11	44

Table -2- Prevalence of toxoplasmosis among pregnant women in relation with risk factors.

Discussion:

The current study is one of few studies in Baghdad to explore the prevalence of *Toxoplasm gondii* infection among one of the most important clinical categories of toxoplasmosis in immunocompetent hosts who are pregnant women.

Most previous studies in Iraq have concentrated on the prevalence of *Toxoplasma* infection only, while the current study is also one of the leading studies that evaluate some environmental and behavioral factors that may be influence the infection rate of the parasite.

The seroprevalence of the parasite obtained in this study among pregnant women by latex agglutination test (75%) considered high comparable to the previous studies in Iraq [12-11-10-14] that show rang of infection rate with the parasite between 39%-61% , while our results was in agreement with [13] that found all 187 women examined were infected .

The variation in the rate of infection from one to another province in the same country is due to variation in climate , cultural differences and feeding habits [15], cold and rainfull weather in Baghdad which enhance survival of parasite oocysts ,in addition to wide spread of stray cats, result in high prevalence of parasite in humen being.

The study shown that rate of infection with *Toxoplasma* increase with age, this result is in agreement with many previous studies [17-18], this association does not mean that older age is a risk factor predisposing to infection but explained by the older persons, are longer time being exposed to the causing agents. in our study the titre of IgG was high (1:80) in all ages studied , this mean that infection with *Toxoplasma* produce high level of IgG antibodies in the body, because the parasite continue symbiont to the patient for long time, the result was in agreement with [13] .

The result show that IgG seroprevalence tends to be lower (1\20-1\40) in educated, not owing cats and has no previous abortion participant, which in agreement with the result of [15], the absence of statistically relation ship between the prevalence of *Toxoplasme* infection among pregnant women in Baghdad and many of factors explored in the study, does not indicate that these factors have no influence on the transmission of toxoplasmosis.

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