

**Seroprevalence of Toxoplasmosis among women with habitual abortion in  
Thi – Qar Governorate using ELISA test**

**Ahmed H. Al-khafaji      Kawakib I.Muhsen**

**College of Sciences - university of Thi-Qar**

**Abstract**

Venous blood had been collected from seventy four women with habitual abortion from Thi – Qar Governorate cities to evaluate the prevalence of the toxoplasmosis and from fifteen healthy looking women as control.

The test performed by using ELISA method to detect the IgM and IgG antibodies in patients sample by commercial kit.

The result showed that 30 of 74 women (40.5%) had toxoplasmosis, 13 (43.3%) with IgM antibodies, 7 (23.3%) with IgG antibodies and 10 (33.3%) with both IgM and IgG antibodies.

Other women (44) although had habitual abortion but they were negative for toxoplasmosis.

## **Introduction:**

*Toxoplasma gondii* is an obligate intracellular protozoan parasite that causes toxoplasmosis. The infection is worldwide, particularly in warm and moist climates. Domestic cats are the definitive hosts of the parasite and are the main source of infection via oocysts passed in their faeces. Man, livestock and even rodents may act as intermediate hosts for the parasite. Human infection may be acquired by many routes, mainly via contact with infected cats, ingestion of tissue cysts (bradyzoites) in undercooked or raw livestock's meat, the disease may also be transmitted by blood transfusion. (Al-Qurashi *et al.*, 2001).

Toxoplasmosis during pregnancy can cause congenital infection and manifest as hydrocephalus, intracranial calcification, mental retardation and blindness in the infant. The severity of fetal disease varies inversely with the gestational age at which maternal infection occurs (Tenter *et al.*, 2000).

Habitual abortion is one of the most distressing problems in obstetrics, particularly in those who have no successful pregnancies (Howie, 1986). Habitual abortion is generally defined as three or more consecutive spontaneous abortions. Spontaneous abortion has been associated with maternal transmission of *Toxoplasma gondii* to the fetus (Gollegge & Beaman, 1990). Controversial reports have appeared regarding its role in habitual and sporadic abortion (Al-Hamadani & Mahdi, 1997)

Approximately one-third of all humanity has been exposed to this parasite. Although usually asymptomatic in immunocompetent adults, it can cause severe disease manifestations and even death in immunocompromised patients (Evengard *et al.*, 1999). Some proteins of the *T. gondii* are recognized by IgG and IgM antibodies in patients with acute and chronic toxoplasmosis depending on the strain and stage of the *Toxoplasma*. In the acute phase, IgM antibodies have shown a recognition frequency ( $f = 0.60$ ) for the 60kDa protein, and in the chronic phase the IgG antibodies have shown a recognition frequency ( $f = 0.68$ ) for the 12kDa protein.

The 12kDa protein can be a diagnostic marker of the chronic phase while protein 60kDa of the acute phase of toxoplasmosis (Decoster *et al.*, 1988)

The aim of the present study was to determine the prevalence of *Toxoplasma* antibodies in a group of women with habitual abortion.

### **Materials and Methods:**

This study was carried out on eighty nine women attending the outpatient gynecology clinics in different cities in Thi – Qar Governorate between March 2007 and December 2007. The study group consists of seventy four women with habitual abortion and fifteen women looking healthy with no history of abortion as control. Their ages ranged from 22 – 45 years. Clinical examination and laboratory investigation were carried out for those with habitual abortion in order to exclude other causes of fetal wastage such as malformation of genital tract, diabetes mellitus, renal disease, Cytomegalovirus infection or Rhesus incompatibility.

Venous blood was collected from the patients and controls, then the serum was separated by centrifugation of blood samples at 3000 rpm for 5 minutes, then the sera were stored at 4

use.

Samples were tested for *Toxoplasma* IgM and IgG by ELISA kits commercially available from Biocheck Inc. USA. Samples were tested strictly according to the manufacturer's instructions. The results read by a microwell reader compared in a parallel manner with calibrator and controls.

Interpretation: *Toxoplasma* IgM and IgG have the same index, where less than 0.90 taken as negative, between 0.90 and 1.00 is equivocal, and 1.00 or greater is positive for IgM antibody indicates the current or recent infection, while for IgG antibody indicates past or chronic infection and with both IgM and IgG indicate as recurrent infection.

### **The Results:**

Seventy four samples of women's serum had been tested for specific IgG and IgM antibodies to confirm the presence of toxoplasmosis in those women by using ELISA kit (Biocheck diagnostics Inc. USA).

The results showed that 30 of 74 women (40.5%) (Table 1) have antibodies against *Toxoplasma*, 13 (43.3%) (Table 2) of which have IgM antibody, 7 (23.3%) (Table 3) have IgG and 10 (33.3%) (Table 4) have both IgG and IgM. The other 44 of 74 women,

although they had abortion (single or repeated), they were negative for toxoplasmosis using ELISA.

On the other hand, samples from 15 healthy looking women were collected as *Toxoplasma* by using ELISA controls and tested for IgG and IgM specific antibodies for kit. The results indicated that 15 women were negative to IgG and IgM of *Toxoplasma*.

**Table 1: Prevalence of *Toxoplasma gondii* antibody using ELISA test in women with habitual abortion compared with healthy controls.**

<b>Types of Cases</b>	<b>ELISA Positive</b>	<b>ELISA Negative</b>	<b>Total</b>
<b>Abortion</b>	<b>30 (40.5%)</b>	<b>44 (59.5%)</b>	<b>74 (100%)</b>
<b>Controls (No abortion)</b>	<b>0 (0%)</b>	<b>15 (100%)</b>	<b>15 (100%)</b>
<b>Total</b>	<b>30(33.7%)</b>	<b>59 (66.3%)</b>	<b>89(100%)</b>

**Table 2: Prevalence of *Toxoplasma* IgM antibody using ELISA test in seropositive women with habitual abortion compared with healthy controls**

<b>Types of Cases</b>	<b>ELISA Positive</b>	<b>ELISA Negative</b>	<b>Total</b>
<b>Abortion</b>	<b>30 (40.5%)</b>	<b>44 (59.5%)</b>	<b>74 (100%)</b>
<b>Controls (No abortion)</b>	<b>0 (0%)</b>	<b>15 (100%)</b>	<b>15 (100%)</b>
<b>Total</b>	<b>30(33.7%)</b>	<b>59 (66.3%)</b>	<b>89(100%)</b>

**Table3: Prevalence of *Toxoplasma* IgG antibody using ELISA test in seropositive women with habitual abortion compared with healthy controls**

Types of Cases	IgG Positive	IgG Negative	Total
Abortion	7 (23.3%)	23 (76.7%)	30 (100%)
Controls (no abortion)	0 (0%)	15 (100%)	15 (100%)
<b>Total</b>	<b>7 (15.5%)</b>	<b>38 (84.5%)</b>	<b>45 (100%)</b>

**Table4: Prevalence of *Toxoplasma* IgM and IgG antibodies using ELISA test in seropositive women with habitual abortion compared with healthy controls**

Types of cases	IgM & IgG Positive	IgM & IgG Negative	Total
Abortion	10 (33.3%)	20 (66.7%)	30 (100%)
Controls (no abortion)	0 (0%)	15 (100%)	15 (100%)
<b>Total</b>	<b>10 (22.2%)</b>	<b>35 (77.8%)</b>	<b>45 (100%)</b>

## Discussion

The exposure of *Toxoplasma gondii* most commonly results in an asymptomatic infection, the clinical implication of *Toxoplasma* infection in pregnant patient are manifold. Such patients may have spontaneous abortions, still birth, premature delivery or fetal anomalies (Zargar *et al.*, 1998).

Seroprevalence of *T. gondii* infection range between 15% to 77% in different countries (Jones *et al.*, 2001).

In Iraq, studies also indicate this fact (Niazi *et al.*, 1992). In this study, the incidence of this disease was found to be relatively moderate (40.5%) in women with habitual abortions. The percentage of women with acute toxoplasmosis (with IgM class) was found to be relatively high (43.3%) and those with past or chronic toxoplasmosis (with

IgG class) was (23.3%), while those with both IgG and IgM was (33.3%). In Iraq, similar results were obtained (Abbas, 2002).

The high prevalence of this disease could be due to the high number of risk factors and many sources of infection. These include the ingestion of sporulated oocysts from cat feces that contaminates soil (e.g. during gardening), eating undercooked meat contaminated with cysts, eating unwashed raw vegetables or unpadded fruits. As one of the sources of infection, the animals that are consumed by humans were also found to be infected. A recent serological survey found the highest prevalence of *Toxoplasma*-specific antibodies in sheep (18%) followed by cattle (5%) (Kapperud *et al.*, 1996) (Tenter *et al.*, 2000).

Other studies indicate that a health program should provide a public with information regarding this disease, its risk factor, and the negative influence it can have on the fetus and regarding prevention in risk groups. Also a program should be established to allow all pregnant women to be screened in their first trimester and this will identify the individual at risk and allow for timely treatment (Studenicova *et al.*, 2006).

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التشخيص المصلي لداء المقوسات بفحص الاليزا في النساء المجهضات في محافظة ذي قار

أحمد حسن الخفاجي كواكب إبراهيم

جامعة ذي قار – كلية العلوم – قسم علوم الحياة

### الخلاصة

تم سحب عينات من الدم الوريدي لأربع وسبعين امرأة تشكو من الإجهاض المفاجئ من المدن المختلفة في

محافظة ذي قار لغرض تقييم انتشار مرض داء القطط (Toxoplasmosis) فضلا عن اختيار خمسة عشر امرأة

سليمة لا تشكو من أي نوع من الإجهاض كمجموعة سيطرة.

تم اختيار طريقة (ELISA) لتشخيص الأجسام المضادة من نوع M ونوع G باستخدام العدد الطبية المتداولة في الأسواق.

أظهرت النتائج أن نسبة الإصابة بمرض داء القطط كانت حوالي 40.5% أي إن 30 من أصل 74 امرأة كانت تشكو من

الإصابة، إذ توصلت النتائج إلى أن نسبة الإصابة الحادة من نوع M قد بلغت 43.3% أي إن 13 امرأة من أصل 30

كانت مصابة، أما نسبة الإصابة القديمة أو المزمنة من نوع G فقد بلغت 23.3% أي حوالي 7 نساء ، في حين بلغت

نسبة النساء اللواتي يحملن كلا النوعين من الأجسام المضادة (M و G) حوالي 33.3% أي 10 نساء ، أما بقية

النساء اللواتي كن يشكين من الإجهاض فقد أظهرت النتائج خلوهن من مرض داء القطط وإن هناك أسباب أخرى أدت

إلى الإجهاض.