

## Seroprevalence study of IgG and IgM Antibodies to Toxoplasmosis among sixth class students girls in AL-Shaimaa high school in AL-Door

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### Abstract

**Toxoplasma gondii is a protozoan parasite causes Toxoplasmosis which is a preventable infection. Diagnosis and treatment can reduce the severity of infection when primary Toxoplasmosis occurs. However, despite the high averages of neonatal deaths, congenital anomalies and abortions the cost influence of such check-up programs in Iraq still not known. Detection of anti- T. gondii immunoglobulin G (IgG) and IgM is necessary for the diagnosis of Toxoplasmosis in infected women . The current study is one of the prime screening to estimating the spread rate of T. gondii among students girls who are in the age of marriage in AL-Shaimaa high school in AL-Door. A total of 120 serum samples were tested . The total prevalence of Toxo. infection was 48 (40%) and no antibodies were found in 72(60%) students. The IgM antibodies to T. gondii were found in 20 (16.7%) students , IgG antibodies were found in 8(6.7%) students and both IgM , IgG antibodies were found in 20 (16.7%), and the study found statistical significance between infected and healthy students.**

### INTRODUCTION

T. gondii infects all warm-blooded animals including humans(1) It causes morbidity and mortality in immunosuppressed individuals, and can cause many health problems in healthy adults(2).

The parasite has a complex life cycle including three stages: (1) tachyzoite—(through the acute infection), which invades and replicates within cells; (2) bradyzoite—(during latent infections), which is present in tissue cysts; and (3) sporozoite—( it is found in oocysts, which are environmentally resistant. In acute infection, Ttachyzoites invade and multiply in roughly all cell types and are found in all organs, including, heart, Spleen, liver, the central nervous system and lymph nodes. Tachyzoite form is responsible for congenital infection. Cell invasion results in death of parasitized cells and an acute stage. In human placental lesions are microscopic, but in

animals macroscopic necrosis has been reported (3).

humans can infect when they eat undercooked or raw meat containing cysts or occasionally tachyzoites. or by ingesting infective oocysts in water. In some species, T gondii can cross the placenta occasionally goats, sheep, humans and rodents. Infection transmission in transplanted organs or transfused blood rarely is possible. Cockroaches and Flies acts as mechanical vectors(4).

Non-pregnant immunocompetent women , infection with the parasite is almost asymptomatic. Severe symptoms, involving myositis, pneumonitis, myocarditis, and neurologic signs with facial paralysis, severe reflex alterations, hemiplegia and coma, are possible but rare. In teenager and young adults Ocular toxoplasmosis, uveitis, often unilateral, can be seen and this is the delayed result

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of a postnatal infection or an asymptomatic congenital infection (5,6).

### **Aim of the study**

This study result to assess the seroprevalence of IgG and IgM to *T. gondii* among students girls of AL-Shaimaa high school in AL-Door.

## **MATERIALS AND METHODS**

### **Specimen collection**

A total of 120 serum samples were tested from students for seroprevalence of IgG and IgM to *T. gondii*. It were collected from AL-Shaimaa high school in AL-Door.

Because of the large number of samples and to prevent damage, it were collected in three days and Then transferred to a nearby medical laboratory of the school to conduct the separation and freezing process.

blood specimen collected into a plane tube (with no anticoagulants in Vacutainer) by vein puncture. After the blood had been allowed to clot the serum Separated by centrifugation and Carefully withdrew into a new tube. then Whole serum had been stored at -20°C until Use.

### **Serological testing**

Samples were tested for *T. gondii* infection using onsite *T. gondii* IgG/IgM Rapid Test-Cassette (serum / plasma)(CTK Biotech, Inc.,USA).

### **Result**

A total of 120 serum samples were tested. The total prevalence of Toxo. infection was 48 (40%) and no antibodies were found in 72(60%) students table (1) Fig.(1). The IgM antibodies to *T. gondii* were found in 20 (16.7%) students, IgG antibodies were found in 8(6.7%) students and both IgM, IgG antibodies were found in 20 (16.7%) table (2) Fig.(2), and the study found statistical significance between infected and healthy students table (3).

### **Discussion**

This study is to search the prevalence of *T. gondii* infection among sixth class girls students in AL-Shaimaa high school in AL-Door.

Toxoplasmosis is an often asymptomatic worldwide publicized infection. In congenital Toxoplasmosis it may lead to fetal malformation or abortion. A medical examination during pregnancy is important to identify infective women and prophylaxis(7,8).

In the Previous study shows total infection 48(40%) from 120 tested students girls of the scientific and literary branch for sixth class who are attending AL-Shaimaa high school in AL-Door, The current results almost fit within the ranges of reported seroprevalences in pregnant women with previous adverse pregnancy outcome had been shown by Mousa et al it was (44.%) (9), Ghasemian et al who reported(45.2%) (10). However, Figure lower than these were shown by Majeed who reported (55%) Among women of childbearing age (11), Shashi et al it was (68.5%) in women during pregnancy(12) and Al-Marzoqi et al showed (55.5%) (13) while the present study revealed higher than Ulrich et al who showed (31%) (14), Differences between present study results and the others might be due to small number of tested female included in our study, the regional variations from one to another country or even within the same country.

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In this study, 20(16.7%) ( $X^2=92.6^{**}$ ,  $P=0.0003$ ) of the students had positive IgM, the result is roughly similar to Srirupa and Nibedita it was (17.5%) (15), Jamshaid and Khalid were reported (13.8%) (16), Al-Nahari and Al-Tamimi it was (11.88%) (17). However the seroprevalence of IgG in this study is 8(6.7%) ( $X^2=30.8^{**}$ ,  $P=0.0008$ ), this results were roughly asymptotic to Sadik et al who record toxoplasmosis in patient of bad obstetric history in age 19-24 years (8.13%) (18). different prevalence rates were also reported in some studies like Al-Harathi et al who showed IgM(5.6%) and IgG (29.4%) (19), Al-Qurashi who

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reported prevalence rate of anti-Toxoplasma IgG (25%) and IgM (5%) in the Eastern region of Saudi Arabia kingdom(20), Sundar et al it was (3.6 %) for IgM antibodies and (20.3%) for IgG(21).

Seroprevalence rate of IgM & IgG in this study was 20(16.7%) (  $X^2=92.6^{**}$ ,  $P=0.0003$ ) Different studies reported different avidity; Lopes-Moria et al reported (1.3%)(22), Walle et al gave the value( 2.97%)(23), uysal et al it was (0.3%), (1%), (2.2%) for the age groups respectively (15-24), (25-34), (35-44)(24).

Various serological test may produce different results because of the inherent sensitivity differences among the serological tests(25).

Sources of *T. gondii* infection for these students are unknown. Most possible way of transmission is probably through handling of raw contaminated meat, vegetables or fruits during food preparation. either sheep or goat meat might become contaminated with oocysts due to poor hygiene observed handling of meat from slaughter house to kitchen, tasting food while cooking. In addition, lack of drinking water chlorination, farming and animal rearing, stray cats are widely spread in AL-Door, especially in resent years may also contribute to the high rates.

### **Conclusions**

- 1- The Previous study reported total infection 48(40%) from 120 tested students girls and no antibodies were found in 72(60%) students.
- 2- In the current study, 20(16.7%) of the students had positive for IgM, seroprevalence of IgG was 8(6.7%) and both IgM , IgG antibodies were found in 20 (16.7%).
- 3- The study found statistical significance between infected and healthy students, it was ( $X^2=92.6^{**}$  , $P=0.0003$ ) for IgM, ( $X^2=30.8^{**}$  , $P=0.0008$ ) for IgG and (

$X^2=92.6^{**}$ , $P=0.0003$ ) for both IgM & IgG.

### **Recommendations**

- 1- Education of a population to understand *T. gondii* and sources, pathogenesis of infection as well as preventive measures such as wash hands after cleaning animals barns and before eating , handling raw meat and boiling drinking water.
- 2- Proceeding sanitary screening program for *Toxoplasma gondii* infection among students girls in the schools and a young women who upcoming to the marriage and referencing to health centers for routine test before marriage..
- 3- Control stray cats.
- 4- Protective vaccination if available.

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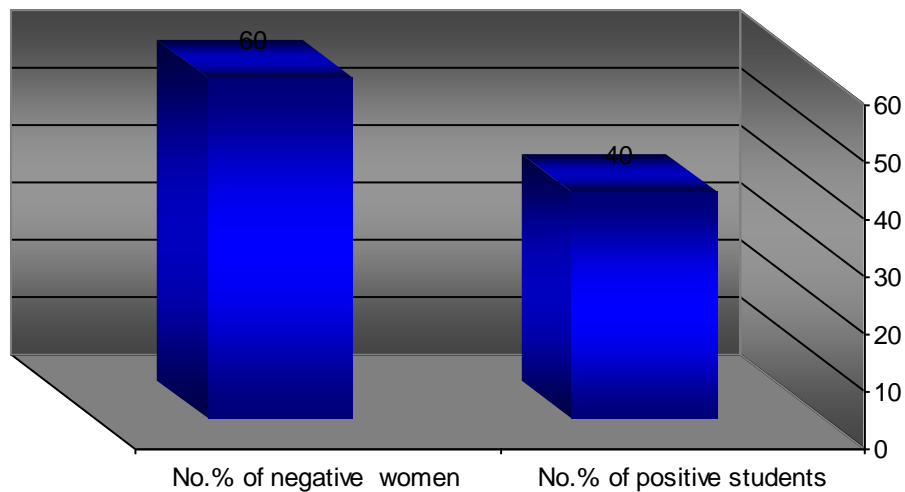
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**Table (1):- No. tested students with no. of positive and negative students**

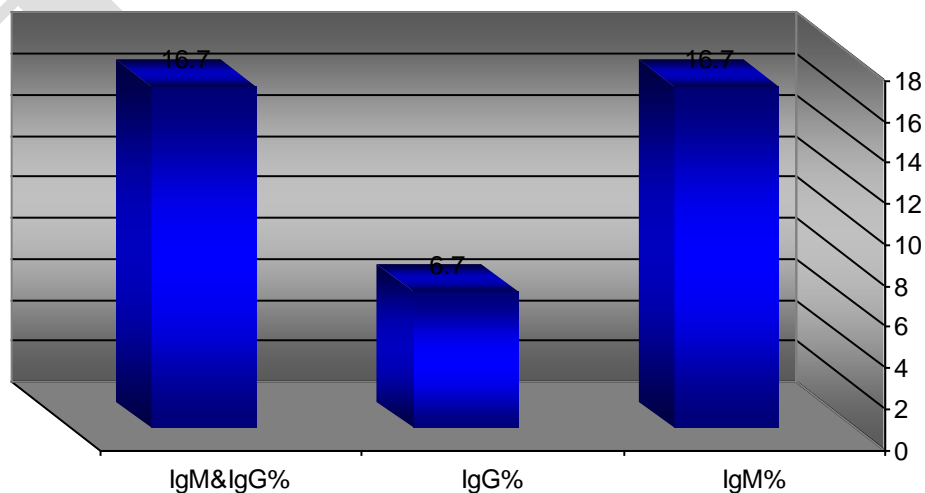
No. of tested students	No. of positive students	%	No. of negative women	%
120	48	40	72	60



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

**Table (2): The overall seroprevalences to *T. gondii***

<i>T. gondii</i>	Immunoglobulin					
	IgM		IgG		IgM & IgG	
	NO	%	NO	%	NO	%
	20	16.7	8	6.7	20	16.7



**Fig.(2):- Prevalence of serum antibodies to *T. gondii***

**Table (3): The Statistical analysis of overall seroprevalences to *T. gondii***

Immunoglobulin IgM			
	No. of positive	No. of negative	Total
Infected students	20	28	48
Healthy students	0	72	72
Total	20	100	120
X <sup>2</sup>	92.6 <sup>**</sup> P-value= 0.0003		
Immunoglobulin IgG			
	No. of positive	No. of negative	Total
Infected students	8	40	48
Healthy students	0	72	72
Total	8	112	120
X <sup>2</sup>	30.8 <sup>**</sup> P-value= 0.0008		
Immunoglobulins IgM & IgG			
	No. of positive	No. of negative	Total
Infected students	20	28	48
Healthy students	0	72	72
Total	20	100	120
X <sup>2</sup>	92.6 <sup>**</sup> P-value= 0.0003		

## الخلاصة

مقوس كوندي *Toxoplasma gondii* طفيلي ابتدائي يسبب داء المقوسات Toxoplasmosis والذي يمكن الحد من العدوى به. إن التشخيص والمعالجة يمكن أن تقلل شدة العدوى عند حدوث الاصابه الاولى. على اية حال، على الرغم من المعدلات العاليه للوفيات الوليديه والتشوهات الولاديه وحالات الاجهاض فان تأثير كلفة هكذا برامج فحص في العراق غير معروفه. ان الكشف عن كلوبيولينات المناعيه IgG و IgM ضد مقوس كوندي ضروري لتشخيص داء المقوسات في النساء المصابات. إن دراسته الحاليه هي احدى دراسات فحص أساسي لتقدير نسبة انتشار مقوس كوندي بين الطالبات اللاتي في عمر الزواج في مدرسة ثانوية الشيماء في الدور. كان الانتشار الكلي لمقوس كوندي 48 (40%) في حين لم تتواجد الاجسام المضاده في 72 (60%) من الطالبات، حيث كانت نسبة الكلوبيولينات المناعيه IgM في 20 طالبة (16,7%) و IgG كانت في 8 طالبة (6,7%) في حين وجدت كلتا IgG و IgM في 20 طالبة (16,7%)، كما بينت الدراسة وجود فروق معنويه بين طالبات المصابات وغير المصابات.

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