

Seroprevalance Study of Toxoplasmosis among Males in Al-Ruasfa Institute of Management in Baghdad Province-Iraq

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Abstract: The present study was performed for the first time in AL-Rusafa Institute of Management Baghdad province to estimate the prevalence of toxoplasmosis among males. *Toxoplasma gondii* is a unique intracellular parasite, which infects a large proportion of the world, population, but clinically uncommonly causes significant disease. From 200 healthy males blood samples were collected their ages between (19 – 58) years. The results indicated that 50 % of males were exposed to positive for anti-*Toxoplasma* antibodies, 7.5% of them had IgM, 42.5 % had IgG, and statistically they were significant differences between them. The current study also showed that the highest positive percentage with *T. gondii* at age (19 – 28) years 35.29 % while the lowest percentage at age (49-58) 12.94 %. Seropositive toxoplasmosis was higher in male's inhabited rural region 84%, than in male's inhabited urban region, 16 %. Chronic and acute toxoplasmosis infection in married males included in this study was significantly higher 70 (82.35%), 12(80%) respectively than unmarried males 15 (17, 64%), 3(20%) respectively. Significant differences showed between fertile and infertile married males, by ELISA IgG and IgM respectively infected males were 30 (35.29%), 12(8%) and 55(64.70%), 3(2%). There are an association between blood group system and *Toxoplasma* infection showed in this study with highest prevalence among samples of blood group (A) 44.70% and lowest prevalence in samples of blood group O (11.76%).

Date of Submission: 26-03-2018

Date of acceptance: 09-04-2018

I. Introduction

Toxoplasmosis caused by *Toxoplasma gondii* is an obligate intracellular protozoan parasite. The only definitive host is the cat but other animals can be infected incidentally (1). Human can acquire infection by ingestion of raw or poorly cooked meat containing the *T. gondii* cysts or by ingestion of food or water contaminated with Oocysts (2). *T. gondii* can also be transmitted via blood or leucocytes from immunocompetent and immunocompromised donors rarely (3). Human may remain infected for life will stay asymptomatic unless immune suppression may occur (4), symptomatic infections usually cause low grade fever, malaise, headache and cervical lymphadenopathy. Severe manifestation such as encephalitis, myocarditis, hepatitis and pneumonia are rare but they can complication acute toxoplasmosis (5).

T. gondii are recognized by IgG, IgM, IgE and IgA antibodies in patients with acute and chronic toxoplasmosis depending on the strain and stage of the parasite (6). Toxoplasmosis is ubiquitous infection affecting 500 million people around the world, with rang incidence 12-90% increasing with age, low education, crowing, sanitary habits, socioeconomic, ethnic consideration, consumption of undercooked meat and animal contacts (7).

This study aim to evaluation and prevalence of male toxoplasmosis in AL-Rusafa Institute of management/ Baghdad by using ELISA (IgG and IgM) test

II. Material & Methods

200 blood samples were collected from healthy blood donors males age between (19 -58) years. Samples were collected from man during period from October 2015 to March 2016. Before the collection of samples an information sheet was prepared and designed according to questionnaire which covers different information. Five ml of venous blood was collected from radial vein from each person, tested for blood groups and then the serum was dispensed in to two eppendorf tubes by using micropipette and stored at -20c until used for ELISA IgG and IgM test.

Statistical analysis

Data was analyzed using statistical analysis system Statistical Package for Social Sciences (SPSS) to investigate the effect of different factors in *T. gondii* infection.

III. Results & Discussions

Out of a total 200 apparently healthy males blood donors included in this study , 100 sample with seropositive for *Toxoplasma gondii* giving an incidental rate of 38.0% by ELISA test compare with 100 (62%) seronegative for toxoplasmosis. results of this study agree with regional and universal trend for toxoplasmosis infection ratio , where quarter to one third of various population showed immunity (8 , 9).The prevalence rate of our study agreement with study in different region in Iraq by AL-Ubadi,2011(10) and AL-Saadii , 2013(11), and AL-Abudy,2014 (12) , our results was more than that recorded by (13) , (14) and (15) . and lower than these obtained by Saleh,2005 (16) ; Kareem ,2007(17) and AL-Shikhly ,2010(18) .This variety and similarity in results due to several factors including cultural patterns and climatic, sample size, sampling method, types of laboratory tests and tools ,nutrition habits , target population , (19, 20) or may due to different manufacture origin of the kits used (11) . Also the seroprevalence estimated for human population varies greatly among different countries, among different geographical areas within country, even within same city (21) .

Table (1) showed high significant differences between presence of positive IgM and IgG antibodies (p<0.05) . The present result agrees with AL-Ghezy (2012),(22) ;AL-Abudy (2014),(12) and AL-Mosawi (2014) ,(14) in same province , AL-Saadi (2013) ,(13) in Baghdad and Galvain –Ramirez *et al.* , (2010),(23) in Maxico The results in current study could be explained by the fact that the group examined consisted only of healthy persons and IgG positive persons were infected with latent toxoplasmosis without a persistence of IgM antibodies after acute infection in the past(Carman *et al.* , 2006),(24)

Table 1: The Seroprevalance of Antitoxo IgG and IgM antibodies in males by Elisa

Test	Elisa Test					
	POSITIVE		NEGATIVE		TOTAL	
	NO	%	NO	%	NO	%
IgG	85	42.5	115	57.5	200	100
IgM	15	7.5	185	92.5	200	100

$\chi^2 = 49.89, df=1, p=0.00$

Table (1) showed high positive percentage samples, in seropravalence of antitoxo IgG at age group of (19 -28) years in the other side the lowest one was at the age group of (49- 58) years. While, ELISA IgM showed presence of high percentage at age group of both (19 -28) and (29 -38) years and the lowest at age group of (38 -47) years. There was a significant difference between them (p<0.05) .Table (2). The result is coincided with other results obtained by (25),(26),(11),(13) in Iraq which reported that the main age group range of seropositive toxoplasmosis was between(20-30) years ,while there discrepantly with AL-Ubaydi (2004) ,(10) and then by AL-Myahi (2011),(27) who showed that the highest percentage of toxoplasmosis infection occurred at the age group (11-20) years and (16 -19) years respectively. Other results showed no significant difference with age factor in Iraq by AL-Zihiry *et al.* ,(2007),(28);Kalil (2008),(29).

These differences between studies may be due to the differences in the specificity and sensitivity of method used for diagnosis of differences in the age of the studies groups and the response of each host to the strain of parasite ,the variation in parasite strains may play an important role in the stimulation of host immune response against the parasite (30) .

Table 2: Elisa Anti-Toxo–IgM and Anti-Toxo-IgG ratio according to age

Age Group	IgG		IgM		TOTAL	
	NO	%	NO	%	NO	%
19-28	30	35.29	6	40	36	36
29 -38	28	32.94	6	40	34	34
39 -48	16	18.82	0	0	16	16
49 -58	11	12.94	3	20	14	14
Total	85	99.99	15	100	100	100

$\chi^2 = 16.14, df=3, p=0.002$

The result showed high ratio anti-toxo in Elisa IgG + IgM in males in habited rural area compared to urban resident. There was a significant difference between them (p<0.05) .Table (3) . This study agreed with previous study (11) who found significantly higher (p= 0.01) seropositive rural than urban in Baghdad and Kawashima *et al.* , (2000) ,(31) in Philippines who found significantly higher (p=0.001) seropositive in rural than urban setting another study by Sroka *et al.* , (2010) in Poland they also showed that human living in farms had significantly greater percentage of anti- *Toxoplasma* antibodies with (59 %) compared to urban dawdlers(41%) . Other studies in Iraq (32) regarding the residency of the patients and its relation with seropositive *Toxoplasma* Abs showed no significant difference between *Toxoplasma* Abs distribution and both urban and rural areas .Because of eating of raw vegetable consumption and high usage of water contaminated with *T. gondii* Oocyst that may be increased the infection which showed in the result of this study

Table 3: Elisa Anti-Toxo–IgM and Anti-Toxo-IgG ratio according to resident area

Status	ELISA test	
	NO	%
Urban	16	16
Rural	84	84
Total	100	100

$X^2 = 43.63, df= 1, p =0.00$

The present result showed that there were a significant differences ($p < 0.05$) between married and unmarried males in the presence of IgG and IgM antibodies Table (4) . This result was concerned by a previous study done in Iraq by (33) who revealed that marital status was significantly associated with total *Toxoplasma* antibodies , but not with IgM *Toxoplasma* antibodies although the rate of seropositivity was higher in married than un married patient. However, AL-Saadii (2013),(11) showed that there were a significant differences ($p = 0.01$) between married and un married males in the presence of IgG and IgM antibodies . These differences between the current study and pervious gender factor may play a role especially since this study was planned on males only. Another explanation for these differences in the present study where married patients were higher than single

Table 4: the ratio Distribution of Anti- Toxoplasmosis IgG and IgM according to Marital Sta

Marital Status	IgG		IgM		TOTAL	
	NO	%	NO	%	NO	%
Married	70	82.35	12	80	82	82
Un married	15	17.64	3	20	18	18
Total	85	99.99	15	100	100	100

$X^2 = 29.99, df= 1, p = 0.00$

The present study showed that fertile males infected with chronic toxoplasmosis had a low percentage of anti *Toxoplasma* IgG antibodies while infertile males showed high percentage, there was a significant difference between them ($p < 0.05$). In contrast, fertile males infected with acute toxoplasmosis had a highest percentage of anti-*Toxoplasma* IgM antibodies in comparison to infertile. Table (5) . This result agreed with previous study by (34) in china who found that *Toxoplasma* infection in infertile human couple was higher the fertile couple and he explained that may be related to the antiserum antibodies which were higher in *Toxoplasma* infected couple. As well as (35) explored the effect of toxoplasmosis infection on male reproductive function on 140 infertile men which is evidently higher than the average infective rate of the normal . On the other hand (36) concluded that *T.gondii* infection may result in male sterility.

Table 5: Toxoplasmosis Percentage Distribution by Elisa IgG and IgM According to Fertility

Fertility Status	IgG		IgM		TOTAL	
	NO	%	NO	%	NO	%
Fertile	30	35.29	12	8	42	42
Non fertile	55	64.75	3	2	58	58
Total	85	85	15	15	100	100

$X^2 = 3.99, df= 1, p = 0.02$

There was a significant between blood group ($p < 0.05$). Table (6) . This result agrees with (36),(13) who recorded that the highest prevalence among samples of blood group A+. This result disagrees with (18) ,(14) who showed that the higher percentage result occurred in females with blood group O+ (11)who showed that the higher percentage result occurred in blood group AB+. Other studies showed no significant relation of toxoplasmosis with ABO factors (37),(38) . The present result of this study is a possibility that the parasite utilized glycoconjugates, which characterize the blood phenotypes of the ABO blood group system, as potential receptors (39). These glycosylated molecules are expressed in the gastrointestinal tract (GIT), which is also utilized as main route of *T.gondii* infection (40).

Table 6: Toxoplasmosis Percentage Distribution by ELISA IgG and IgM According to Blood Group

Blood Group	ELISA test	
	NO	%
A	38	44.70
B	20	23.52
AB	17	20
O	10	11.76
Total	85	99.98

$X^2 = 11.13, df= 3, p = 0.014$

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IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS) is UGC approved Journal with Sl. No. 5012, Journal no. 49063.

Salwa. S. Muhsin(Phd) "Seroprevalance Study of Toxoplasmosis among Males in Al- Ruasfa Institute of Management in Baghdad Province-Iraq ." IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS) 13.2 (2018): 22-26.