

Detection of Sero-positive Anti- toxoplasmosis Anti-bodies IgG among Women in Baghdad Province

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Abstract

A total of 83 serum samples were randomly collected from different centers in Baghdad province, the results recorded in this study which started in July 2018 until the end of November 2018, by using one technique, method ELISA. The results were showed increased the percentage of seropositive anti- toxoplasmosis IgG antibodies at age groups 20 – 29 years, which were 23.9% among women infected with toxoplasmosis comparative with other age groups. Also showed increase the percentage of sero-positive anti- toxoplasmosis IgG Abs in urban which were 42.9% comparative with rural, which were 8.0%. Also occur increased significantly in percentage IgG Abs in serum of affected women with toxoplasmosis in first and second month from abortion period, which were respectively 17.8% and 16.0%. So increase these antibodies (Abs) in serum of infected women with this disease in 1st trimester period comparative with other months. Therefore so it was necessary to use of early diagnosis for pregnant infected women with toxoplasmosis.

Key word: Anti-toxoplasmosis antibodies (Abs), Sero-positive, IgG, ELISA, trimester period.

Introduction

Toxoplasmosis was present in all countries and sero-positivity rates range from less than 10% to over 90% [1]. The causative agent, *Toxoplasma gondii*, has a complex life cycle and an important foodborne pathogen. Human infection can result from the ingestion or handling of undercooked or raw meat contains tissue cysts. Alternatively, infections can result from direct contact with cats or from the consumption of water or food contaminated by oocysts excreted in faeces of infected cats [2]. The infection with the protozoan parasite *Toxoplasma gondii* has a worldwide distribution. This obligate intracellular parasite could infect humans as well as virtually all warm-blooded animals, including mammals and birds. Since its first description in the gundi, a rodent from North Africa, by Nicolle and Manceaux in 1908 [3], the parasite was progressively recognized as the agent of a widespread zoonosis. However, was entire life cycle which definitively understood only in the late 1960s [4], with the discovery of the central role of the cat as a definitive host harboring the sexual parasitic cycle and spreading oocysts through faeces. In the same

period of time, it was classified in the coccidian subclass [4], phylum Apicomplexa, and the infectivity in three parasitic stages: chyzoite, cyst and oocysts were well characterized [5]. Also the *Toxoplasma* infection among pregnant women when exposure to infections risk, age and pregnancy-related risk factors [6]. The most common cause of spontaneous abortion during the first trimester is chromosomal abnormalities of the embryo/fetus [7]. But a counting for at least 50% of sampled early pregnancy losses [8]. Other causes include vascular disease (such as lupus), diabetes, other hormonal problems, infection, and abnormalities of the uterus [8]. Advancing maternal age and a patient history of previous spontaneous abortions were leading factors associated with a greater risk of spontaneous abortion [7]. A spontaneous abortion can also be caused by accidental trauma intentional trauma or stress. The cause miscarriage is considered induced abortion or feticide [9]. Therefore the aims of this study to estimate the rate of toxoplasmosis infection among women in Baghdad province to detect specific *T. gondii* Abs IgG, and their effect on the different stages of disease.

Materials and Methods

Form First of July 2018 till the end of November 2018, about 83 total blood samples were collected from females, with age ranging about 16-40 years attended to Baghdad province. Before collection of samples, an information sheet was prepared and designed according to questionnaire which covers all information; 3ml of venous blood was dawned by using disposable Syringes, and then centrifuged at 3000 for 10 minutes to get serum for serological test by ELISA technique to detect IgG. While the calculating the toxoplasmosis IgG of each determination by dividing the mean value of each sample by calibrator value.

Procedure

1- Only remove the required reagents form the refrigerator and allow them to come to room temperature for at least 30 minutes.

2- Use one TXG strip and one TXG SPR for each sample, control or calibrator to be tested. Make sure the storage pouch has been resealed after the required SPR, have been removed.

3- Type or select “TXG “to enter the test code. The calibrator must be identified by “S1” and tested in

duplicate. If the positive control is to be tested if should be identified by “C1 “If the negative control need, to be tested, it should be identified by C₂

4- Mix the calibrator, control and samples using a vortex – type mixer.

5- Pipette 100 ml of calibrator, samples or control into the sample well.

6- Insert the SPR, and strips into the instrument. Check to make sure the color tables with the assay code on the SPRs and the Reagent strips match.

7- Initiate the assay as directed in the operation’s Manual. All the assay steps are performed automatically by the instrument. The assay will be completed within approximately 40 minutes.

8- After the assay is completed. Remove the SPRs and strips from the instrument.

9- Dispose of the used SPRs and strips into an appropriate recipient.

The Results

In figure (1) the results recorded highly significant difference ($p < 0.001$) of age groups (20-29) years, which were 39 (23.9 %) from 83 examination samples, comparative with other age groups: figure (1).

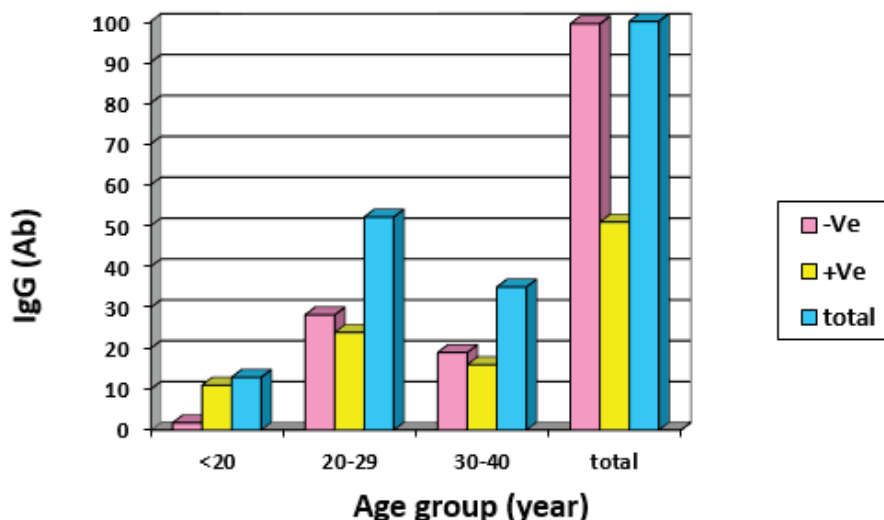


Figure (1): The Relationship between Age groups and IgG antibodies (Abs)

But the relationship between residency and anti-toxoplasmosis IgG Abs was highly significant differences ($P > 0.05$), because the results in the figure (2) recorded high infection them in urban and rural, which were 70 (42.9%) and 13 (8.0 %) respectively.

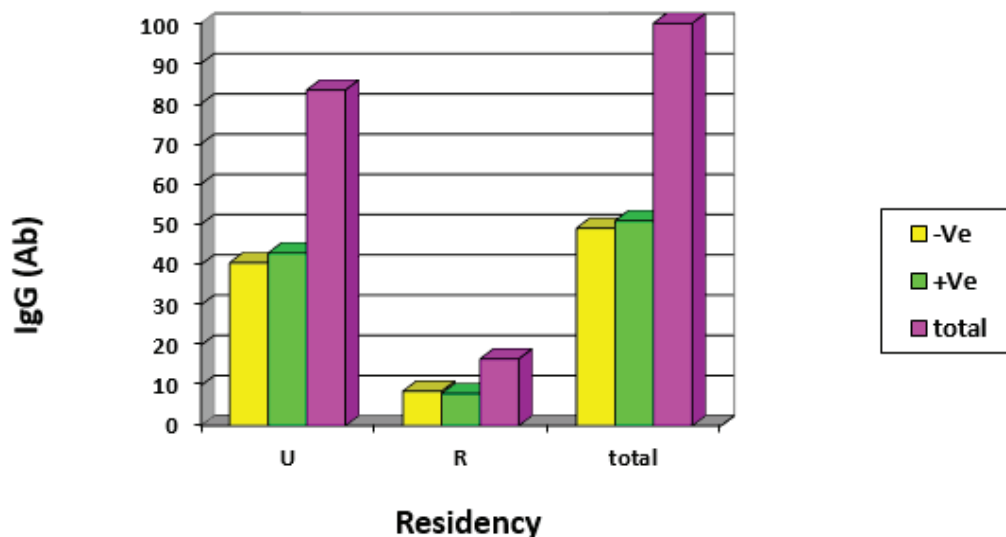


Figure (2): The Relationship between residency and IgG antibodies (Abs)

The figure (3), showed the relationship between gestational period and sero- positive anti toxoplasmosis IgG Abs among normal and abnormal in Baghdad province , this relationship was non-significant difference ($P.V.=0.5$), but high percentage was recorded for non-pregnant women, which were 75(46.0%) from 83 (total number) as an examination samples.

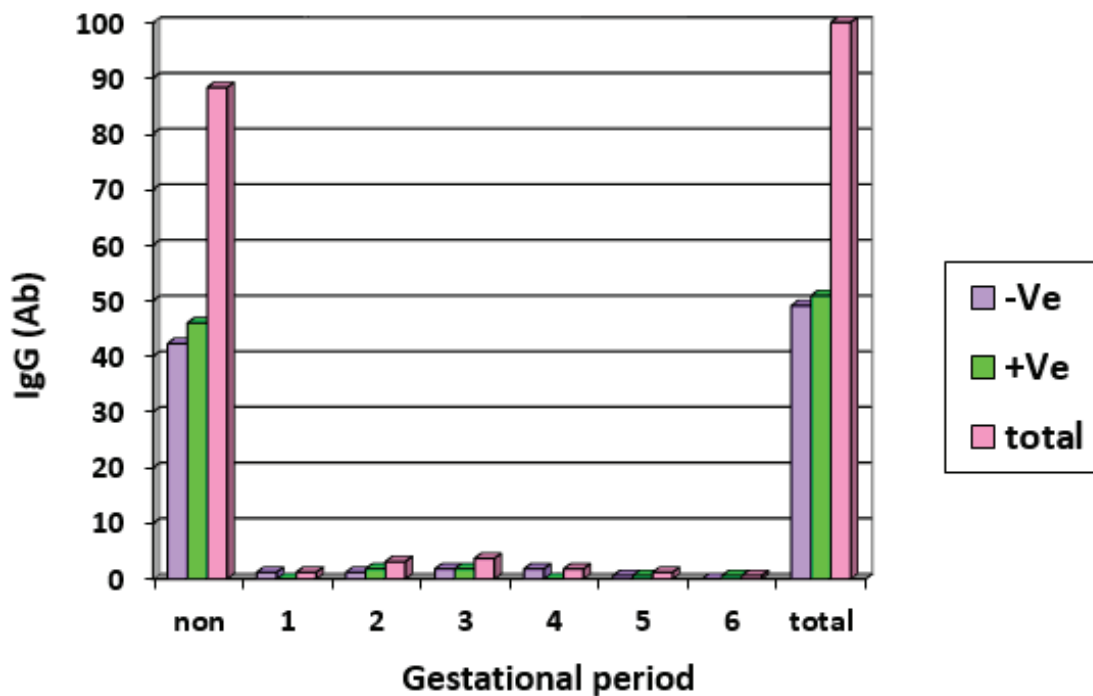


Figure (3): The Relationship between gestational period and IgG antibodies (Abs)

But the figure (4), showed non-significant differences ($P.V.=0.5$) for relationship between habitual abortion period among normal and abnormal women with sero-positive anti-toxoplasmosis IgG Abs (infection with toxoplasmosis), but the high infection them with toxoplasmosis was recorded 29 (17.8%) and 26(16.0%) respectively for 1st trimester period comparative with other months.

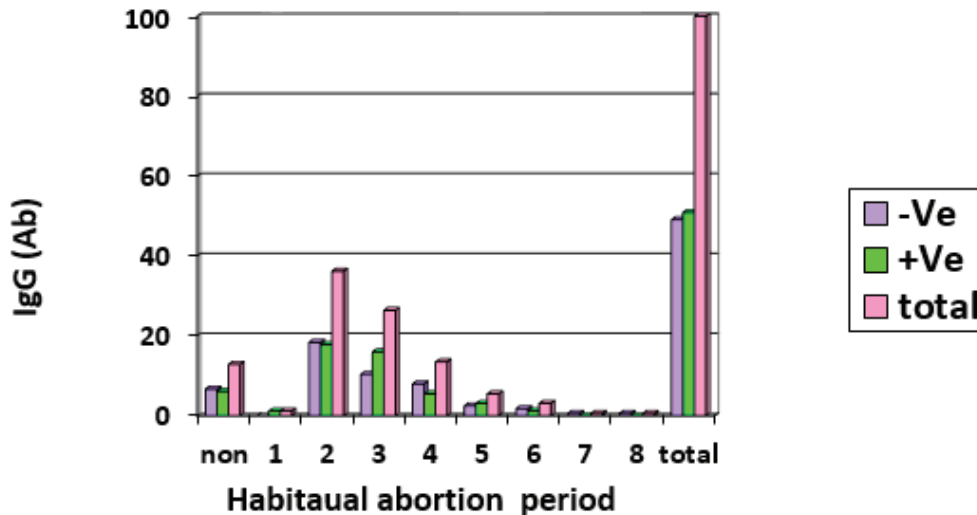


Figure (4): The Relationship between habitual abortion period and IgG antibodies (Abs)

In the other hand this study pointed high significant differences ($P.V.=0.5$) for relationship between habitual pregnant period and sero-positive anti- toxoplasmosis IgG Abs in infection women, hence recorded high number and percentage for IgG Abs in 1st trimester period, which were in the first month 28 (17.2 %), 2nd month 21 (12.9%) and 3rd month 13 (8.0%). figure (5).

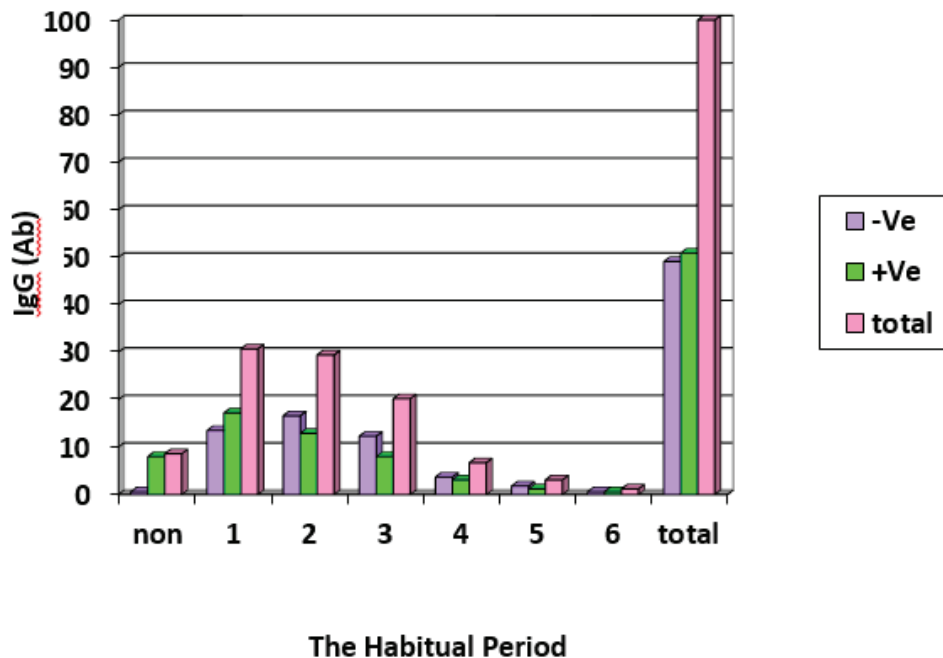


Figure (5): The Relationship between habitual pregnant period and IgG antibodies (Abs)

In figure (6) showed the relationship between previously abortion periods. This study to infection women with this protozoan parasites and IgG Abs was non-significant differences.

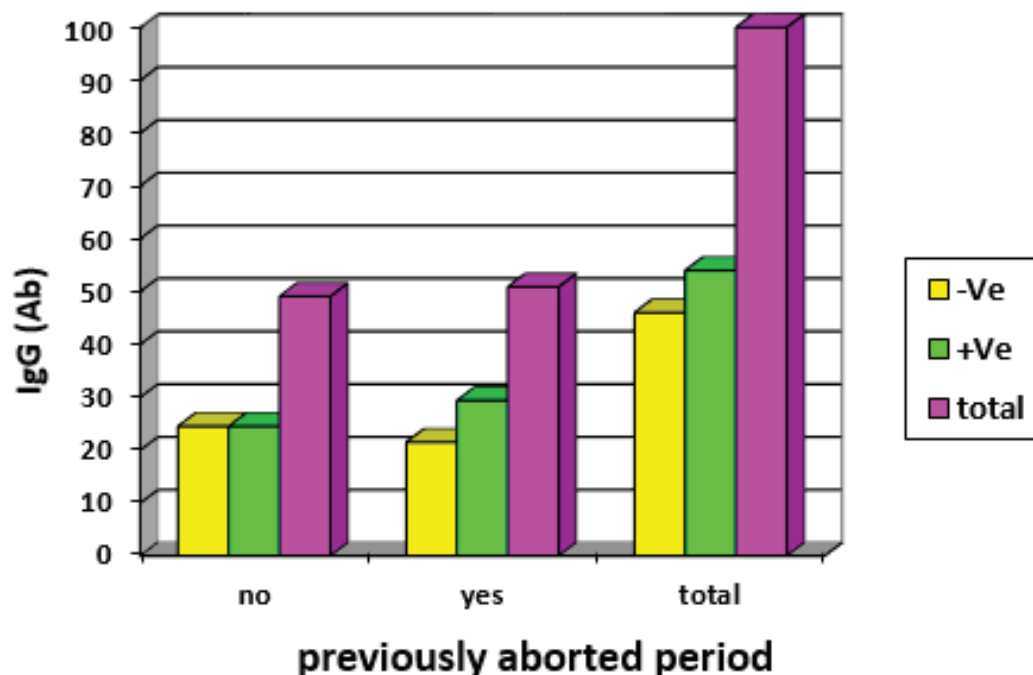


Figure (6): The Relationship between previously aborted period and IgG antibodies (Abs)

Discussion

This study showed the sero- prevalence of Toxoplasmosis among women at age groups (20-29) years with sero- positive anti toxoplasmosis IgG Abs, which high prevalence among women in these age groups in Baghdad province, when comparing with other age groups. This result agreement with the author from Sudan (2009), about 27 samples [10]. When was found the percentage of studied groups at (25-32) years of age groups was higher than other age ranges. But this result disagreement with the author from Pakistan (2019), about 54 samples [11]. This result agreement with authors from Iran (2019), about 146 samples [12], when was found that contact with cats is a potential risk factor for acquiring toxoplasmosis but as concerning food habits, which's exhibited that the sero-prevalence rate of toxoplasmosis was higher in blood donors who consumed raw/half-cooked meat than in other blood donors. Therefore, ingesting meat containing tissue cysts seems to be the main route of infection among the other routes. This result disagreement with search of Erbil (2017), about 92 samples [13], which found that rural populations

had lower socio-economic levels than urban ones and implementation of more hygienic lifestyle in towns and large cities. This study recorded highly number of sero-positive anti- toxoplasmosis IgG Abs among women in 1st trimester period. This result agreement with authors from United Kingdom (1998), about 13000 samples [14], when found the indicated remarkable decrease of anti – toxoplasmosis Abs (IgG) among abortion / month in 2nd trimester period (4 – 6) month in contrast to 1st trimester period (1-3) month in sudden and previously aborted women. The result in current study differenced with authors from Ghana (2009), about 294 samples [15], who's found that all stages of pregnancy have the same chance of requiring infection. This parasite is also present in contrasting host density environments, but this result disagreement with [16], when they study the IgG antibodies to *Toxoplasma gondii* were detected in, March-April 2004, in 65.8% (95% confidence interval, 60.8-70.8%) of 342 systematically sampled subjects 5-90 years of age (87.5% of the eligible) living in a rural settlement in Amazonia, with a seroconversion rate of 9% over 1 year of follow-up of 99 seronegative subjects.

Multiple logistic regression analysis identified age as the only significant independent predictor of sero-positivity at the baseline. Each additional year of age increases the odds of being seropositive by 6%, and 76.8% of the subjects are expected to be seropositive at 30 years of age. A single high-prevalence spatial cluster, comprising 11.9% of the seropositive subjects, was detected in the area; households in the cluster were less likely to have dogs as pets and their heads had a lower education level, when compared with households located outside the cluster. The challenges for preventing human toxoplasmosis in tropical rural settings are discussed. Also they found dogs as pets and their heads had a lower education level, when compared with households located outside the cluster in rural areas comparison with urban areas.

Moreover this study recorded highly prevalence with toxoplasmosis in province comparison with Baghdad province. These results agreement with [17], who's found the rate of sero prevalence, with toxoplasmosis was 36.67% among 420 infected women in Basra province. And this study recorded highly number of sero- positive anti- toxoplasmosis IgG Abs among women in 1st trimester period. This can explain by the presented of IgG Abs via 2-3 weeks of an infection and there after increased gradually for some time which may cross pound to period of 1st trimester period (1-3) month of patients then starting to decrease and remain constant in low level along the life of women who may related to period of 2nd trimester period (4-6) month of the Patients [18]. This results agreement with [13], when found the indicated remarkable decrease of anti – toxoplasmosis Abs (IgG) among abortion / month in 2nd trimester period (4 – 6) month in contrast to 1st trimester period (1-3) month in sudden and previously aborted women.

For moreover, this study recorded also a high of sero-positive anti toxoplasmosis IgG Abs among an afflicted women by using the enzyme linked immunosorbent assay ELISA technique to detection the increase of this antibodies in serum of an afflicted women, this may be involve in addition of using kits, supplied or purchased from companies with low level of quality control and different laboratory methods. Moreover nutrition, habitat economic state, procedure, in addition to geographical location, plays an important role in difference in the sero- prevalence rate of toxoplasmosis [21]. Also may

be due to differences in sensitivity and specificity of the used this technique [22]. This result agreement with [23], when found in Nether land which showed 32%. The Positive IgG Abs by using Elisa method. But this result disagreement with [24], when showed 40– 6% sero rate among aborted women by using latex test [25].

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Health and Medical Technology and all experiments were carried out in accordance with approved guidelines.

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