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SEROLOGICAL DETECTION OF *TOXOPLASMA GONDII* IN WOMEN AT WASIT PROVINCE

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Abstract

The present study aimed to identify the rate of parasitic disease of *Toxoplasma gondii* among females. A total of 200 pregnant and non- pregnant women attending to the Al- Kut and Al-Shaheed Fairoze Hospitals during October to December, 2023. The present study was used combo IgG and IgM rapid cassette for diagnosis of *T. gondii*. The questionnaire was applied by pregnant and non- pregnant women involved age and residence. The results by serological method combo IgG and IgM rapid cassette gave positive result by 27 (13.5%) and 15 (7.5%) for IgG and IgM respectively. The results of present study was appeared that women in age group (25-34) years old were higher infected of *T. gondii* 16 (8%) than other age groups. Regarding the residency, this study showed that females rural areas had higher infected of *T. gondii* compared to urban ones.

Keywords: *Toxoplasma gondii*, pregnant and non- pregnant, rapid test, IgG and IgM.

Introduction

Toxoplasmosis is a zoonotic protozoan illness produced by the parasite *Toxoplasma gondii*. *Toxoplasma* is a parasite is spreading in hot and humid countries capable to progress in a wide range of vertebrate hosts (Liu *et al*., 2012). Cats and of Felid family members are the definitive hosts (Knoll *et al*., 2019) whereas wide range of vertebrate include animals and humans act as intermediate hosts (Roberts and Janovy , 2005). Parental infections account for (2 to 3%) of all congenital Toxoplasma defects (Ocak *et al*., 2007). The ways of transmission of the parasite to human is either by eating under cooked raw of meat (Dubey and Beattie,1988), the second way of transmission by the blood transfusion and transplantation of organ , oocysts ingestion from dirty food or water (Dubey and Jones, 2008). Fecal contamination of hands is a significant risk factor and (Torrey, 2007).

During pregnancy the primary maternal *T. gondii* infection is often related with its transmission to the fetus (Pappas, 2009). The rate of transmission of maternal infection to the fetus is valued to be about 45% of these 60% are subclinical infections, 9% causing in fetus death and 30% have big harms such as intra cerebral calcification, hydrocephalus, chorio-retinitis and mental delay (Montoya and Remington , 2008). In most cases the laboratory diagnosis of acute and latent toxoplasmosis include detection of IgG and IgM antibodies. Serological tests of *Toxoplasma gondii* include the Latex agglutination test, indirect fluorescence antibody test (IFA), ELISA (Hajsoleimani, 2012) and hem-agglutination test have been used for the detection of antibodies against T. gondii in pregnant women (Kadir , 2012). *Toxoplasma gondii* levels high on the list of diseases which lead to death in patients with (AIDS) acquired immunodeficiency syndrome (Luft and Remington, 1992).

Materials and Methods

Samples collection

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A total of 200 pregnant and non- pregnant women attending to the Al- Kut and Al- Shaheed Fairose Hospital during October to December, 2023. A questionnaire form was applied by each female which included: age and residence. Blood samples were collected and serum was separated for the estimation of antibodies against *T. gondii* infection. A 5 ml of Venous blood was collected and drawn carefully then transferred into gel tube, the blood specimen was left for 15-30 min. Then centrifuged at 3000 rpm for 5 minutes to separate clear serum, the sera were tested for the estimation of antibodies against *T. gondii* infection.

Toxo IgG\ IgM Combo Rapid Test (REF R0234C)

A rapid one step test for the simultaneous detection and differentiation of IgG and IgM anti-*Toxoplasma gondii* in human serum, plasma or whole blood.

Results and Discussion:

Table 1. Results of the Rapid test for *T. gondii* in pregnant and non-pregnant women

Individual	No. of samples	No. of positive	%
Pregnant	100	22	11%
Non-Pregnant	100	20	10%
Total	**200**	**42**	**21%**

Table 2. Results of the Immuno chromatographic test for *T. gondii* IgG and IgM antibodies

Anti- T. gondii antibodies results	No. positive	%
IgG	27	13.5%
IgM	15	7.5%
Total	42	21%

The results showed 27(13.5%) for IgG and 15(7.5 %) IgM this results because the body first produced measurable IgM antibodies in the blood one to two weeks after infection, a few months later the IgM became un detectable and is replaced by IgG antibodies that will be present for longer time. The IgM antibodies may re-appear if the infection is reactivated or the infection is chronic. Detection of *T. gondii* is particularly important in pregnancy time because of the high risk (30-40)% of transmitting the infection to the fetuses causes which numerous complication or may lead to death. The results of the present study were in agreement with a survey done in New Zealand in which 500 aborted women were tested using ELISA. They found that 2.5% and 33% of 500 women were seropositive for IgM and IgG anti-*Toxoplasma* antibodies respectively. Also, the current results were in agreement in the relation of IgG antibodies with the results prepared in Cameroon in which 100 pregnant women were tested by using ELISA and 70% of them had positive IgG which demonstrated great rates of past infection. The higher prevalence of *Toxoplasma* infection might also be because of the geographical location, low hygienic, low

education levels, large increasing of stray cats ,and low socioeconomic status (Hassani and Zghair, 2010).

Table 3. Comparison of mean age of women

Age groups (years)	No. of positive	%
15-24	14	7%
25-34	16	8%
35-44	8	4%
> 44	4	2%
Total	**42**	**21%**

Table 4. Comparison of frequency distribution of women according to the residence

Residence	No. of positive	%
Urban	12	6%
Rural	30	15%

Regarding the residency, our study showed that females living in farms had high prevalence of *T. gondii* compared to urban ones, This result may be due to the consumption of raw vegetable and high usage of water that might have been contaminated with *T. gondii* oocyst. Lack of knowledge increased the risk of infection, for instance, lack about the disease and its relation with undercooked meat and as being the source of infection. Additionally, lack of knowledge about the risk of meat undercooked or tasting it during cooking. This unawareness was estimated as a high risk factor, association of *T. gondii* infection with soil, unwashed vegetables and fruits all at risk of *T. gondii* on fetus.

References:

Dubey JP, Beattie CP, (1988). Toxoplasmosis of Animals and Man, CRC Press, Boca Raton, FL.

Dubey JP, Jones JL. (2008). *Toxoplasma gondii* infection in humans and animals in the United States. Int. J Parasitol. 38:1257-78.

Hajsoleimani F, Ataeian A, Nourian AA, Mazloomzadeh S. (2012). Seroprevalence of *Toxoplasma gondii* in pregnant women and bioassay of IgM positive cases in Zanjan, Northwest of Iran. Iranian J Parasitol. 7(2): 82-86.

Kadir M A, Ghalib AK, Othman NF, Ahmed IS. (2011). Seroprevalence of *Toxoplasma gondii* among pregnant women in Kirkuk / Iraq. Journal of Kirkuk University – Scientific Studies, l 6(2):1-5.

Liu Q, Singla LD, Zhou H. (2012). Vaccines against *Toxoplasma gondii*: status, challenges and future directions. Hum Vacc Immunother. 8:1305–8.

Luft BJ, Remington JS. (1992). Toxoplasmic encephalitis in AIDS. Clin. Infect. Dis, 15:211-222.

Montoya JG, Remington JS. (2008). Management of *Toxoplasma gondii* infection during pregnancy. Clin Infect Dis. 47:554-66.
Ocak S, Zeteroglu S, Ozer C, Dolapcioglu K, Gungoren A. (2007). Seroprevalence of *Toxoplasma gondii*, rubella and cytomegalovirus among pregnant women in southern Turkey. Scand J Infect Dis, 39(3):231-4.
Pappas G, Roussos N, Falagas ME. (2009). "Toxoplasmosis snapshots: global status of *Toxoplasma gondii* seroprevalence and implications for pregnancy and congenital toxoplasmosis.". Int. J parasitol. 39 (12): 1385–94.
Roberts LS and Janovy J. (2005). Foundation of Parasitology. 7th. Ed. P.135-137. McGraw Hill Higher Education, Boston, New York.
Torrey EF, Bartko JJ, Lun ZR, Yolken RH, (2007). Antibodies to *Toxoplasma gondii* in patients with schizophrenia: a metaanalysis. Schizophr. Bull, 33:729-736.