

Toxoplasmosis in Iraqi Women: a Retrospective Study

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Abstract

Background: Toxoplasmosis is a relatively widespread parasitic infection, caused by the protozoan *toxoplasma gondii*, which can affect pregnancy adversely.

Objectives: To identify the cases of toxoplasmosis among pregnant women and to identify its relation to the outcome of pregnancy.

Materials and Methods: The present descriptive study of 54 female patients with toxoplasmosis, their age ranged between 16-45 years old in the period between 2006-2007 in AL-Kadhimia Teaching hospital & IVF Institute of Embryo Researches & Infertility Treatment-AL-Nahrain University –Baghdad.

Results: Pregnant woman with positive IgG and/or IgM anti-toxoplasma was considered as a seropositive case. IgG have done to all women in the study, 51(94%) were positive and only 3(6%) were negative. IgM was performed to 27(50%) women, 9(33%) were positive, 18(67%) were negative. Only (18%) of the positive IgG had history of animal contact. IgG test was positive in 82% of women with a history of abortion. IgG test was positive in 18% of women with a history of stillbirth.

Conclusions: in conclusion the presence of IgG in the blood of women in this study is not associated with abortion or stillbirth.

Introduction

Toxoplasmosis is a relatively widespread parasitic infection caused by one-celled organisms called *toxoplasma gondii*, a parasite that can be acquired from ingesting cysts from the feces of infected cats, drinking unpasteurized milk, or eating contaminated meat containing the cyst or trophozoites⁽¹⁾.

The infection is transmitted to the infant through the placenta, and can cause eye deformity, eye infections and mental retardation by invading brain tissue⁽²⁾.

The later in pregnancy the mother is infected the higher the probability that the fetus will be affected^(3, 4). Figure 1 summarizes all mechanisms mentioned above.

On the other hand, toxoplasmosis exposure early in pregnancy is more

likely to cause miscarriage or serious birth defects.

The incidence of toxoplasmosis in newborns is between 1 to 8 per 1,000 live births in the United States⁽⁵⁾.

People can ingest infected soil, or infected meat^(6,7), mild flu-like symptoms initially, then the parasite becomes dormant in the brain (or other tissues).The mechanism in brain is unknown; speculated to be elevated dopamine levels caused by altered cytokine levels (brain's local immune response against *T. gondii*)^(6,7).

There are different stages of *toxoplasma gondii*, one of these is trophozoite, is an actively growing and multiplying form which requires an intra cellular environment, the other stage of the parasite is the cyst, the parasite becomes encysted within many tissues of the body⁽⁸⁾.

The stage which is responsible for transplacental infection is called "tachyzoites" which circulating in the blood stream of the pregnant women⁽⁹⁾. Infection by the *Toxoplasma gondii* is often asymptomatic or not recognized⁽¹⁰⁾.

The main sign of this illness is lymphadenopathy, but there may be fever, anemia, anorexia, muscle pain, and sore throat⁽⁸⁾.

Active infection mainly occur only once in lifetime, followed by life long immunity. Although the parasite remains in the body indefinitely, it is generally harmless and inactive unless the immune system is compromised. Women who develop immunity to the infection before pregnancy are not in danger of transmitting it to their babies⁽¹¹⁾.

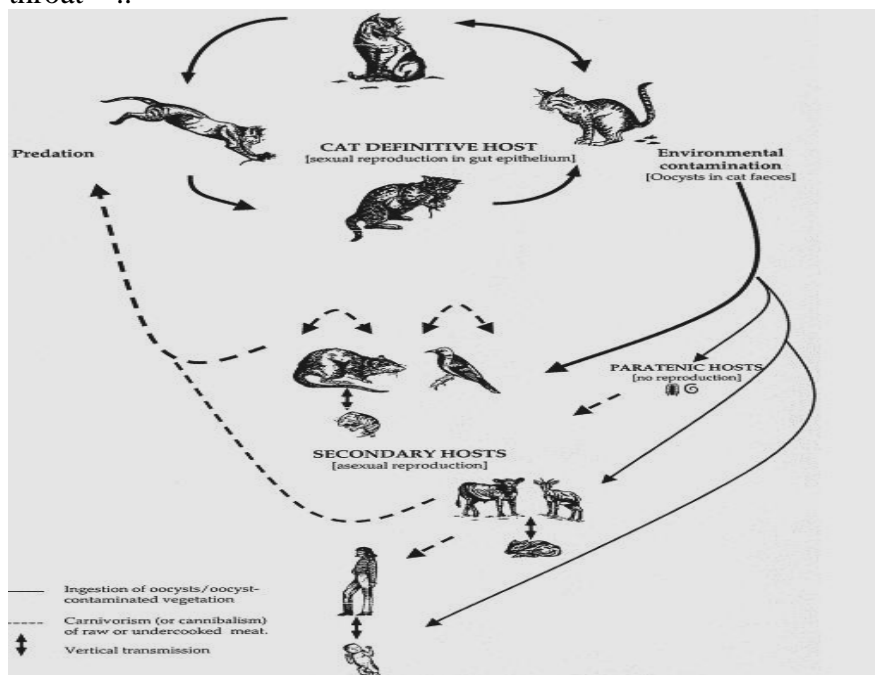


Figure 1. Different mechanisms of Toxoplasmosis Transmission.

Although the disease has no serious consequences in adults who are exposed to, women who are infected during pregnancy, are at risk for miscarriage, still birth, or for a child with serious birth defects and/or illness. Thus, the diagnosis of toxoplasmosis is performed before or as soon as pregnancy is diagnosed to determine the mother's history of exposure to the organism. It is performed also on neonatal serum when the newborn presents with symptoms consistent with a congenitally acquired infection⁽⁴⁾.

Subjects and Methods

This study was conducted in AL-Kadhimia Teaching hospital & IVF Institute of Embryo Researches & Infertility Treatment-AL-Nahrain University –Baghdad from January 2006- to December 2007. Data were collected from Baghdad health directorate/AL-Karkh and these data were the official data documented in this directorate.

Fifty four toxoplasmic female patients were included in this study, their age range between 16-45 years. The blood samples were collected from them for serological tests.

For the purpose of the study any woman with positive IgG and/or IgM anti-toxoplasma was considered as a seropositive case.

During the period of study the 54 cases were recorded, they were interviewed to obtain the relevant data regarding demographic, socio-economic, and medical aspects.

The data were collected and statistically analyzed by using KS statistical program in computer to assess Chi-square for testing the relationship between variables, and P-value of <0.05 was considered significant.

Results

The total reported cases of seropositive women during the period of the study were 54 cases, their mean age was (24.6 ± 5.88) years, the gravida mean

was (3.2 ± 2.9) , the mean number of abortion was (2.3 ± 2.4) , and the mean number of dead child was (0.4 ± 1.1) (table 1).

IgG have done to all women in the study, 51(94%) were positive and only 3(6%) were negative (Figure 2).

IgM was performed to 27(50%) women, 9(33%) were positive (none of them had abortion or stillbirth), 18(67%) were negative.

Only (18%) of the positive IgG had history of animal contact, this method of transmission and it was statistically not significant. Although Chi-square test did not show significant relationship between IgG serology and abortion (table 2), still IgG test was positive in 82% of women with a history of abortion (table3). There was no significant relationship between IgG serology and stillbirth (table 4).

Table 1. Mean and standard deviation of age and some variables related to obstetric history.

	No. of Women	Percent (%)	Mean	S.D.*
Age	54	100%	24.6	5.88
Gravida Status	54	100%	3.2	2.9
Abortion	18	33%	2.3	2.4
Stillbirth	9	17%	0.4	1.1

*S.D. : Standard Deviation

Discussion

Our results did not show significant relationship between IgG serology and abortion.

These findings were consistent with other studies (3, 4, 14, 15). Habitual abortion rate in prospective study of 280 pregnant women did not show significant difference between seropositive & seronegative women (14, 15).

Positive IgM is the test which should be emphasized upon as an indicator for recent infection that needs treatment, furthermore IgG avidity test indicating infection of four months or more (12).

In this study most of the cases had positive IgG test (94%), IgM was done to only (50%) of cases, (33%) of them were positive, but none of them had abortion or stillbirth.

This indicates that both IgG and IgM can be detected in the same patient at the same time and this is consistent with other studies (12).

Contact with domestic or house animals which was found in one fifth of the cases is not an important method of transmission and probably the traditional method of transmission like ingestion of viable-tissue cysts in meat or by cats that contaminate the environment are the main ways and

this is consistent with results in similar studies(16).

The presence of IgG in the blood of women in this study is not associated

with abortion or stillbirth and this is similar to the results in other study (12).

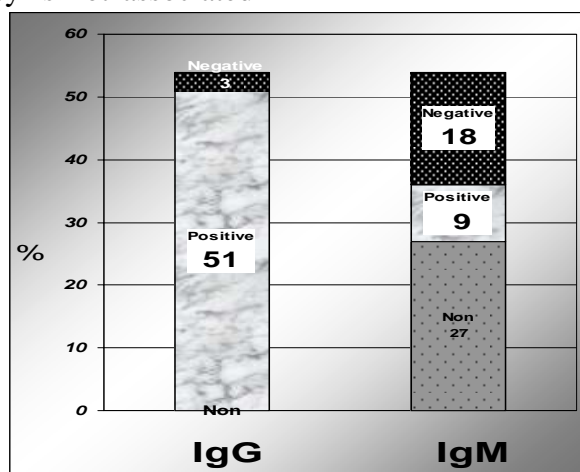


Figure 2. Distribution of the results of serological tests

Table 2. Distribution of IgG according to animal contact.

History of animal contact	IgG			Chi –square Fisher Exact Test p=0.466
	Positive%	Negative%	Total%	
No	42 (82)	2 (67)	44 (81)	
Yes	9 (18)	1 (33)	10(19)	
Total	51(100)	3 (100)	54(100)	

Table 3. Distribution of IgG according to occurrence of abortions.

Abortion	IgG			Chi –square Fisher Exact Test p=0.572
	Positive%	Negative%	Total%	
No	9 (18)	0 (0)	9 (17)	
Yes	42 (82)	3 (100)	45(83)	
Total	51(100)	3(100)	54(100)	

Table 4. Distribution of IgG according to occurrence of stillbirth.

Dead fetus	IgG			Chi –square Fisher Exact Test p=0.572
	Positive%	Negative%	Total%	
No	42 (82)	3 (100)	9 (17)	
Yes	9 (18)	0 (0)	45(83)	
Total	51(100)	3(100)	54(100)	

Recommendations

1- Maternal health programs in the primary health care centers should play a role in early detection of pregnant women with toxoplasmosis and prevent complications.

2- Educational program about sanitary hygiene to prevent microbial contamination especially in the rural areas, for those who work in soil, owners of domestic animals specially the cats, and the correct methods of milk pasteurization.

3- Making work sheets in all hospitals to collect data about toxoplasmosis and for all women who had repeated abortion or stillbirth

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References

1. Nokes DJ, Forsgren M, Gille E, Ljungstrom I. *Modelling toxoplasma incidence from longitudinal seroprevalence in Stockholm, Sweden*. Parasitology 1993; 107:33-40.
2. Decavalas G, Papapetropoulou M, Giannoulaki E, Tzigounis V, Kondakis XG. *Prevalence of Toxoplasma gondii antibodies in gravidas and recently aborted women and study of risk factors*. Eur J Epidemiol 1990;6:223-6.
3. "Pediatrics and Genetics: Disturbances in Newborns and Infants." In vol. II, edited by Robert Berkow, et al. Rahway, NJ: Merck Research Laboratories, 1992.
4. "Procedures: Heelstick (Capillary Blood Sampling)." In *Neonatology: Management, Procedures, On-Call Problems, Diseases, and Drugs*. 4th edition. Edited by Tricia Lacy Gomella, et al. Norwalk, CT: Appleton & Lange, 1999. Pittsburg.com. Illustrated Health Encyclopedia. <http://www.pittsburg.com/shared/adam/ency/article>.
5. Cruse, Julius M., and Robert E. Lewis. *Illustrated Dictionary of Immunology*. New York: CRC press, 1995.
6. Lafferty, Kevin D.. "Can the common brain parasite, *Toxoplasma gondii*, influence human culture?." Proceedings of the Royal Society B: Biological Sciences 273(2006): 2749-2755. <http://www.cuteoverload.com> <http://www.cricava.com>
7. Webster, Joanne P.. "Rats, cats, people and parasites: the impact of latent toxoplasmosis on behaviour." Microbes and Infection 3(2001): 1037-1045. <http://www.cuteoverload.com> <http://www.cricava.com>
8. Jacob L. *Toxoplasmosis: Epidemiology and medical importance*. J Wildlife Dis. 1970; 6:306-311.
9. Chin J.: *Control of communicable diseases manual*. An Official Report of the American Public Health Association (APHA) 17th ed.2000:P501.
10. Ho-Yen, D. O. 1992. Clinical features, P.56-78. In: Ho-Yen D O, and Joss A W L (ed), *Human toxoplasmosis*. Oxford Medical Publications, Oxford, United Kingdom.
11. Professionals and Researches: Toxoplasmosis. Available on: <http://www.marchofdimes.com/professionals/681.asp>.
12. Singh S, Pandit A J. *Incidence and prevalence of toxoplasmosis in Indian pregnant women: a prospective study*. Amer J Reprod immune 2004;52(4):276.
13. Ades AE, Nokes DJ. *Modeling age-and time-specific incidence from seroprevalence: toxoplasmosis*. Am J Epidemiol 1993;137:1022-34.
14. Qublan H S, Jumaian N, Abu Salem A, Hamadalil F Y, Mashagbeh M, Abdul-Ghani F. *Toxoplasmosis and habitual abortion*. J Obstet & Gynaec. 2002;22(3):296-298.
15. Anne Eskild, Gunn Fallas Dahl, Kjetil K. Melby, Britt-Ingjerd Nesheim. *Testing for toxoplasmosis in pregnancy: a study of the routines in primary antenatal care*. J Med Screen 2003;10:172-175.
16. Nissapatorn V, Noor Azmi MA, Cho SM, et al. *Toxoplasmosis: prevalence and risk factors*. J Obstet Gynaec 2003;23(6):618-624