

Seroprevalence and risk factors of *Toxoplasma gondii* infection in premarital daughters in Yazd, Iran

Ali Fattahi Bafghi*¹, Farzaneh Mirzaei²

1- Associate professor, medical Parasitology & Mycology department, school of medicine, Shahid Sadoughi University of medical Sciences, Yazd, Iran.

2- PhD student of medical Parasitology, school of paramedical, Shahid Sadoughi University of medical sciences, Yazd, Iran

ABSTRACT

Introduction: Toxoplasmosis is one of the most common parasitic infection, Pathogen agent, Toxoplasma gondii, is a coccidian protozoa. Toxoplasmosis can cause congenital, neurologic, ocular, and mild or asymptomatic infection. Congenital toxoplasmosis results from maternal primary infection during pregnancy, with gestational age increase the rate of mother- fetus transmission. This study was performed in order to Seroprevalence and risk factors of Toxoplasma gondii infection in premarital daughters in Yazd, Iran. Materials & Methods: Two hundreds before marriage daughters (aged 14-20 y) from various parts of Yazd city were screened randomly for Toxoplasma specific antibodies, using random number table. Based on our estimate and to obtain 25% correct estimation with 6% accuracy, 200 pregnant women were enrolled in this study. Sera that obtained from the subjects were examined by total IFA test (IgG). Results: A total of 200 sera samples, 114 cases (57 %) were negative and 86 cases (43%) were positive for TG antibodies (titer $\geq 1:20$). Among positive cases 36 (18%) had titer of 1:10, 26 (13%) titer of 1:100, 18 (9%) titer of 1:200 and 6 (3%) titer of 1:400 of TG IgG antibody. Just 2.4% of positive cases suffered from acute toxoplasmosis. Conclusion: The preventive ways against toxoplasmosis are related to seroprevalence of infection with gestational age and health equipment. Regarding to the result, about half of the married women in the present study were at risk of infection with T. gondii, so preventive method should be considered.

Keywords : Toxoplasmosis, before marriage, Seroprevalence, Yazd.

INTRODUCTION

Toxoplasmosis is one of the most common parasitic infection, is spread worldwide appears to be 33%, although in some countries studies have determined the Toxoplasmosis prevalence between 4% to 93% , an estimated 4,000 cases of congenital Toxoplasmosis occur each year in the United States (1 and 2). in Iran its prevalence rates is vary, among inhabitants of the Caspian sea area is relatively high(57%). In immunocompetent individuals, acute infection is usually asymptomatic and spontaneous recovery is the rule (3, 4 and 5). However, primary infection during pregnancy

constitutes a great diagnostic challenge, by predisposing the offspring to the risk of congenital Toxoplasmosis. Pathogen agent, toxoplasma gondii (TG), is a coccidian protozoa that is transmitted through tachyzoite, bradyzoite and oocysts shed in infected cats faeces and also transmitted by three ways acquired: consumption of contaminated unwashed/unpeeled vegetables, fruits, unpasteurised milk and raw or undercooked infected meat, Congenital and probable:transfusion and transplantation. Toxoplasmosis can cause congenital, neurologic, ocular, and mild or asymptomatic infection. Congenital Toxoplasmosis results from maternal primary infection during pregnancy, with gestational age increase the rate of mother- fetus transmission. When a pregnant woman is infected for the first time, usually remain asymptomatic although she can transmit the infection to her fetus, congenital Toxoplasmosis may be clinically apparent in the neonate in the first months, later during infancy, childhood, adolescence with severe consequences, including mental retardation, blindness, seizures, and dead (6,7 and 8). This study was performed in order to Seroprevalence and risk factors of *Toxoplasma gondii* infection in premarital daughters in Yazd, Iran.

MATERIALS AND METHOD

Based on our estimate and to obtain 25% correct estimation with 6% accuracy two hundreds before marriage daughters (aged 14-25 y) from various parts of yazd city were screened randomly for TG specific antibodies, using random number table. Sera that obtained from the subjects were examined by total Indirect Fluorescence Antibody test (IFA), The screening for *Toxoplasma*-specific IgG antibodies was performed by indirect fluorescent antibody test using a commercial kit (was obtained from Pasteur Institute of Iran). Data on age, contact with cat, education status, history of abortion, habit of undercooked meat ingestion or unwashed/unpeeled vegetables or fruits were obtained using a questionnaire. Sera at titers 1:20 or more were considered positive and evidence of previous exposure to TG. Statistical significance was tested by chi-square test. We determined the prevalence of TG antibodies in before marriage daughters randomly selected from health houses in yazd city. The relationship between positivity and some risk factors was assessed. Data were collected by questionnaire and blood samples examined for TG antibodies by indirect fluorescent antibody test.

RESULTS AND DISCUSSION

A total of 200 sera samples, 114 cases (57 %) were negative and 86 cases (43%) were positive for TG antibodies (titre $\geq 1:20$). Among positive cases 36 (18%) had titer of 1:10, 26 (13%) titer of 1:100, 18 (9%) titer of 1:200 and 6 (3%) titer of 1:400 of TG IgG antibody. Just 2.4% of positive cases suffered from acute toxoplasmosis (Fig 1 and 2).

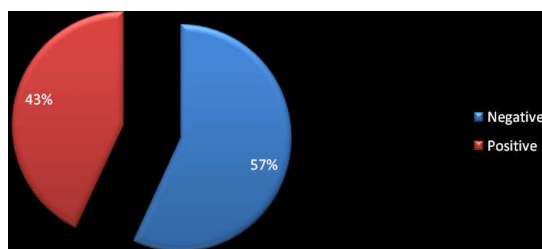


Fig 1. Pie chart representing cases of Positive and negative of *Toxoplasma gondii* in Premarital daughters in Yazd, Iran

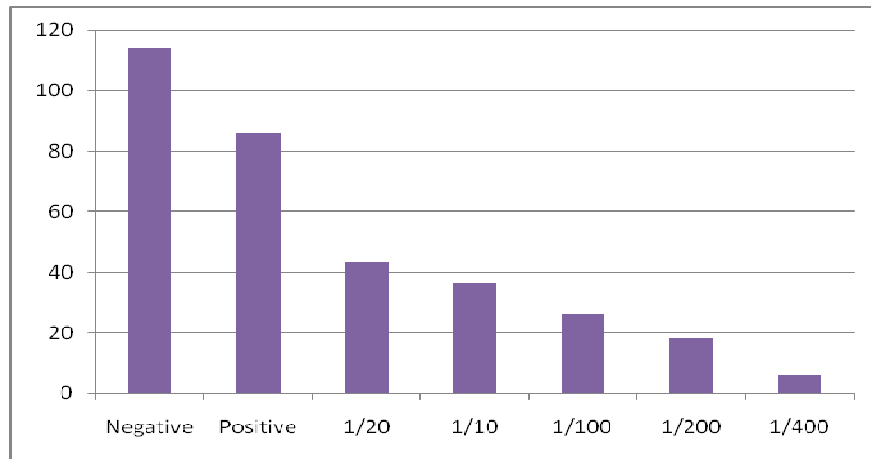


Fig 2. Bar graph representing Frequency distribution of IgG Antibody Titre to *Toxoplasma gondii* in Premarital daughters in Yazd, Iran.

Age, residence, working outside the home and frequent consumption of raw vegetables were statistically significantly associated with higher infection rates. Educational level, touching cats handling and Involving soil exposures were not associated with infection (Table 1).

Table 1 Demographic characteristics for *Toxoplasma gondii* seropositive Premarital daughters in Yazd, Iran

Characteristic	<i>Toxoplasma</i>		<i>Toxoplasma</i>		<i>P</i> -value
	No.	%	seronegative (<i>n</i> = 114)	seropositive (<i>n</i> = 86)	
<i>Age group (years)</i>					0.0001
14-17 (<i>n</i> = 116)	67	57.76	49	42.24	
18-21 (<i>n</i> =86)	31	36.04	26	63.96	
22-25 (<i>n</i> =27)	16	59.26	11	40.74	
<i>Residence</i>					0.003
Urban (<i>n</i> = 130)	83	63.85	47	35.15	
Rural (<i>n</i> = 70)	31	44.29	39	55.71	
<i>Working outside the home</i>					0.134
Yes (<i>n</i> = 72)	23	31.94	49	68.06	
No (<i>n</i> = 128)	91	71.09	37	28.91	
<i>Frequent consumption of raw vegetables</i>					0.0001
Yes (<i>n</i> = 135)	79	58.52	56	41.48	
No (<i>n</i> = 65)	35	53.85	30	46.15	
<i>Educational levels</i>					>0.5
Illiterate (<i>n</i> = 23)	14	60.87	9	39.13	
Literate (<i>n</i> = 48)	21	43.75	27	56.25	
Diploma (<i>n</i> = 54)	33	61.11	21	38.89	

Collegiate (n= 44)	29	65.91	15	34.09	
Graduate (n= 29)	17	58.62	12	41.38	
<i>Touching cats handling</i>					>0.5
Yes (n= 91)	39	42.56	52	57.14	
No (n= 109)	75	68.81	34	31.19	
<i>Involving soil exposures</i>					>0.5
Yes (n= 74)	43	58.11	31	41.89	
No (n= 126)	71	56.35	55	43.55	

The present study demonstrates that Seroprevalence and risk factors of *Toxoplasma gondii* infection in premarital daughters in Yazd, Iran. This is in agreement with results reported in studies done in some other places (9, 10 and 11). The obtained data here are lower than those of Babol and Ghaemshare city, Mazandaran (74.65), Tehran (84%) respectively, and in general from northern half of the country of Iran (12, 13 and 14). But The obtained data here are higher than those of Isfahan, Fasa where the researchers found a prevalence of 41.4%, 22.1% and 10% respectively, and in general from southern half of the country of Iran (15, 16 and 17). Seroprevalence of toxoplasmosis differs throughout the world. It varies widely between countries and often within a given country or between different communities in the same region. Low seroprevalences have been observed in North America, in South East Asia, in Northern Europe, and in Sahelian countries of Africa. Moderate prevalences have been found in countries of Central and Southern Europe, and high prevalences have been found in Latin America and in tropical African countries. In Europe, the lowest rates are found in the northern regions, while the highest rates are observed in the central and southern regions, these differences may relate to climate condition, nutritional behavior and possessing of cat but assay and sampling methods may involve in differences between seroprevalence in all countries (18, 19 and 20). The preventive ways against toxoplasmosis are related to seroprevalence of infection with gestational age and health equipment. Regarding to the result, about half of the married women in the present study were at risk of infection with *T. gondii*, so preventive method should be considered. Toxoplasmosis is that the test be performed as routine tests before marriage and if the answer is negative health advice should be taught as well as grilled meats and coddle be avoided.

ACKNOWLEDGEMENTS

We are grateful to Mrs Farzaneh Mirzaee and Mrs Mahin Ghafourzadeh the experts of laboratory technology department, school of Paramedical, Shahid Sadoughi University of Medical Sciences for their sincere cooperation.

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