TOXOPLASMA GONDII ANTIBODY IN PREGNANT WOMEN WITH AND WITHOUT HIV INFECTION

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Abstract. One thousand two hundred pregnant women were examined for *Toxoplasma gondii* antibody with the objective of identifying the prevalence and risk factors of the disease. By using Sabin-Feldman Dye test, the prevalence of IgG to *Toxoplasma gondii* was 13.2%. In this study 19 cases (1.6%) were anti-HIV seropositive. Between HIV-seropositive and HIV-seronegative pregnant women, antibody rates to *T. gondii* were 21.1% and 13.1% respectively, however, the statistical comparison could not be done due to the very few subjects in the former group (n=4).

Concerning the risk factors, among those who had no cat in their house, the prevalence of *T. gondii* antibody were significantly different between under-cooked and properly-cooked meat consumers (19.5%; and 9.6%; odds ratio=2.28, 95% confidence interval). And when under-cooked meat consumers were excluded, the antibody to *T.gondii* between two groups (having and not - having cat in the house) were also found the significantly different (31.8% and 19.3 %; odd ratio=1.96, 95% confidence interval).

In conclusion, consuming under-cooked meat and having a cat in the house, both are risk factors of transmission of toxoplasmosis. Further study with more subjects in HIV-infected pregnant women who had antibody to *T. gondii,* will be helpful for confirmation of the difference with respect to the non HIV-infected group.

INTRODUCTION

Toxoplasmosis is caused by a protozoan parasite, *Toxoplasma gondii.* It is widely prevalent in man and many species of warm-blooded animal. It is transmitted by three major modes: congenitally, through the consumption of under-cooked infected meat and ingestion of oocyst shed by cats into the environment. The populations at risk of toxoplasmosis are pregnant women, immunosuppressed patients, organ transplant recipients and animals.

Primary toxoplasmosis in pregnant women lead to congenital toxoplasmosis resulting in severe problems such as: abortion, congenital anomalies, hydrocephalus, chorioretinitis, mental retardation and hepato-splenomagaly or even no symptoms at birth, but retinitis almost always appears in adolescents who end up with blindness. The incidence of toxoplasmosis was 12.3% in the HIV-infected subjects and 2.7% in an other immunodeficient subjects (Foudrinier *et al,* 1996) . Vertical transmission of *T. gondii* from a chronically infected mother can occur in the setting of HIV infection, but this is uncommon phenomenon, especially among those without severe immunosupression (Minkoff *et al,* 1997). Another study found that latent toxoplasmosis is not reactivated in normal pregnancy, but only likely in an immunosuppressed mother when her CD4 lymphocyte count is very low. In such cases, a prophylactic treatment to prevent mother reactivation and vertical transmission of toxoplasmosis may be useful (Biedermann *et al,* 1995).

Thailand reported a few cases of toxoplasmosis previously, but now the number of cases are increasing as one of the opportunistic infection in AIDS patients. In Thailand, by the year 1996, the Ministry of Public Health estimated that there were 800,000 HIV-infected cases (Anonymous, 1996), and now the infection has spread among low risk groups of wives and girlfriends. The male to female ratio was 2.1:1 and the majority of them were younger than 40 years old, in the active reproductive life (Suktana, 1995). Ante-natal care (ANC) clinics in general hospitals found that 1.5%-2% of pregnant women were HIV seropositive. Data regarding *T. gondii* antibody in the setting of HIV infected pregnant women are not available in Thailand. Therefore, the serostudy of *T. gondii* antibody in pregnant women with and without HIV infection was designed to access the prevalence between two groups, including the risk behaviors among these study subjects.

Table 1

Demographic and obstetrical data of 1,200 pregnant women with and without HIV infection.

Variables	Positive *T.gondii* antibody (%)	Negative *T. gondii* antibody (%)	p-value
Age (years)			
<20	56 (35.7)	365 (35.0)	
21-40	97 (61.8)	661 (63.4)	0.69
>40	4 (2.5)	17 (1.6)	
Occupation			
House-wife	35 (22.3)	222 (21.3)	
Employee	114 (72.6)	749 (71.8)	
Farmer	0 (0.0)	3 (0.3)	0.90
Others	8 (5.1)	69 (6.6)	
Income			
0-4,000	115 (73.2)	699 (67.0)	
4,100-6,000	32 (20.4)	289 (27.7)	0.14
>6,000	10 (6.4)	55 (5.3)	
Education			
None	11 (7.2)	35 (3.4)	
Primary	119 (76.8)	793 (76.6)	0.02
Secondary	21 (13.5)	180 (17.4)	
Others	4 (2.5)	27 (2.6)	
Location			
Central part	52 (33.1)	345 (33.1)	
Northern part	26 (16.6)	162 (15.5)	
North-eastern part	69 (43.9)	433 (41.5)	0.34
Southern part	0 (0.0)	33 (3.2)	
East/Western part	10 (6.4)	70 (6.7)	
Gestational age			
1-12 week	39 (24.8)	280 (26.8)	
13-24 week	82 (52.2)	526 (50.4)	0.86
>24 week	36 (22.9)	273 (22.7)	
Gavida			
First pregnancy	80 (51.3)	526 (50.6)	
Others	76 (48.7)	513 (49.4)	0.26

MATERIALS AND METHODS

A prospective, cross-sectional study was conducted in the Ante-natal Care(ANC) clinic of Samut Sakhon General Hospital during July,1996 to December, 1996. Consecutive pregnant women who attended ANC clinic were enrolled in this study. Routine ANC check-up including HIV testing is part of an ongoing program and the following steps were performed:

1. Demographic and obstetrical data as well as history of dietary taking and keeping cats in the house were recorded in the questionnaire.

2. Venous blood was drawn for IgG antibody detection of *Toxoplasma gondii* using Sabin-Feldman dye test (Beverly *et al,* 1952).

All data were analyzed for sero-prevalence of *T. gondii* antibody in both groups of pregnant women. Sudent's *t*-test and chi-square were used for signifi-

Table 2

Comparision of *T. gondii* antibody in difference risk behaviors.

Variables	Positive *T. gondii* antibody (%)	odd ratio (95% confidence interval)
Dietary taking history *		
Unproper-cooked meat consumers	19.5	2.28
Proper-cooked meat consumers	9.6	
Keeping cat in the house **		
Yes	31.8	1.96
No	19.3	
HIV status		
Positive	21.1	can not be done***
Negative	13.1	

* Only those who had no cat in their house (n=1,132).
** Only those who took proper-cooked meat (n=349).
*** Too few subjects in HIV positive group (n=4).

cant comparison of continuous and categorical variables, respectively.

RESULTS

There were 1,200 pregnant women in this study, whom nineteen cases (1.6%) were anti-HIV seropositive. The IgG antibody to *Toxoplasma gondii* was positive in 13.2%. Table 1 shows demographic and obstetrical data of these study subjects. The majority of them were poor, low-educated employees. These subjects came from whole country, however, mostly from central and north-eastern parts. Regarding obstetrical data, half of these subjects were in their first pregnancy in second trimester. *T. gondii* antibody was not significantly different in those who had a history of abortion and who had not (12.6% *vs* 13.2%; p=0.9).

Among pregnant women those who had no cat in their house, the prevalence of *T. gondii* antibody was significantly different between properly and under-cooked meat consumers (9.6% and 19.5%; odd ratio= 2.28, 95% confidence interval). And when the unproper-cooked meat consumers were discarded, there was also a significant difference of *T. gondii* antibody between two groups keeping and non-keeping cats in their house (31.8% and 19.3%; odd ratio= 1.96, 95% confidence interval). As shown in Table 2.

In this study 19 (1.6%) women were HIV seropositive and 4 out of 19 had antibody to *T. gondii* (21.1%), while only 13.0% (153/1181) of HIV seronegative women were found positive to *T. gondii* antibody, but the statistical comparison could not be done due to too few subjects in the former group (Table 2).

DISCUSSION

Thailand, a tropical country, has a long history. Food habits are one of the strong cultural features among Thai people. Many under-cooked meat dishes recipes are spicy, delicious and favorite which are taken all over the country, especially in the north and north-eastern parts. Besides such dietary habit, most of the Thai people keep domestic animals such as dogs and cats freely in their house. This study could demonstrate a significant difference of *Toxoplasma gondii* antibody between those who were exposed to these two risk factors and who were not (cat ownership and taken under-cooked meat). The effective strategies of health education concerning the transmission of *T. gondii* should be promoted in this country to prevent primary infection in nonimmune mothers. Although

the seroprevalence of *T. gondii* antibody was low when compared to the Western world, the striking finding of HIV infection in Thai pregnant women may play an important role of reactivation of toxoplasmosis in chronically infected mothers. To prevent vertical transmission and congenital infection, the *T. gondii* antibodies (IgG, IgM or IgG avidity) should be considered in HIV seropositive pregnant women who are the population at risk and if *T. gondii* antibodies were positive the antenatal diagnosis and maternal treatment are higly recommended.

ACKNOWLEDGEMENTS

The authors would like to thank the Director, staff in ANC clinic and laboratory unit of Samut Sakhon General Hospital for their cooperation in the collection of data and blood samples. Mr Saiyood Incheng who provided mice used in our test is also acknowledged.

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