

## Seroepidemiology of *Toxoplasma* Infection in the Pregnant Women in Zahedan, Southeast of Iran

\*Sharifi –Mood B. MD, \*Hashemi-Shahri M. MD, Salehi M. MD, \*Naderi M. MD,  
\*\*Naser-poor T. PhD

\*Dept. of Infectious Diseases, School of Medicine, Zahedan University of Medical Sciences, Iran

\*\* Dept. of Microbiology, School of Medicine, Zahedan University of Medical Sciences, Iran

### Abstract

**Background:** Congenital transmission, prenatal mortality and abortion, are major problems in most countries with high prevalence of *Toxoplasma gondii* infection and study of seroepidemiology of this infection among the pregnant women, could provide applicable approaches to preventive measures. In order to determine the seroepidemiology of *Toxoplasma* infection in the pregnant women, this study was carried out.

**Methods:** In this cross-sectional and descriptive study, a total of 200 cases were selected randomly from pregnant women who, were referred to health center clinics in Zahedan province (Southeast of Iran). Obtained sera were examined for *Toxoplasma* antibodies by indirect fluorescent antibody test (IFAT). A titer of 1:20 was considered as positive for *Toxoplasma* infection.

**Results:** The studies showed that, a total of 54 samples (27%) were positive at titers 1:20 or more. Frequencies of different titers in positive subjects were as follows: 1:20, 20%; 1:100, 32.2%; 1:200, 40%; and 1:400 or more, 7.8%. The highest rate of infection was observed in the uneducated mothers (44.4%). Seropositivity was higher in pregnant women, who aged 15 to 30 (78.5%). We found a significant correlation between education status, unwashed/unpeeled vegetables and seropositivity ( $P < 0.05$ ).

**Conclusion:** Regarding to this study and other studies in North of Iran (western and eastern parts of Caspian Sea), this area has a relatively lower seropositivity in this group. However, there is a need for further in-depth studies to understand the significance of infection in women with history of repeated foetal wastage, congenital malformation in her infant, especially in the women of uneducated group.

**Keywords:** *Toxoplasmosis, seroepidemiology, pregnant women, Zahedan, Iran*

### Introduction

Toxoplasmosis is usually an asymptomatic disease, but often takes a severe course in fetuses and immunocompromised hosts (1). Toxoplasmosis is transmitted through oocysts shed in infected cats faeces and also transmitted by consumption of contaminated unwashed/unpeeled vegetables, fruits, unpasteurised milk and raw or undercooked infected meat (1, 2).

The prevalence rates vary from one region to

another. The importance of toxoplasmosis is primarily in the pregnant women. Acute infection during pregnancy is usually subclinical and the diagnosis is by serology (1, 3). Vertical transmission to the foetus occurs by transplacental transfer of organisms from the mother usually following acute maternal infection (1, 2). Several studies have been conducted about seroepidemiology of toxoplasmosis during pregnancy and in the women in childbearing age in Iran (3-6) and other countries (1, 7, 8), but there was not any report of *Toxoplasma* in-



fection in this area previously. However, there is a need to do a study in pregnant women in Zahedan, to estimate the burden of problem in this area.

## Materials and Methods

Two hundreds pregnant women (aged 15-48 y) from various parts of Zahedan 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&IgM). Polyvalent anti-human conjugated serum and serum controls, purchased from Behring, Germany and antigen 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 *T.gondi*. Statistical significance was tested by chi-square test.

## Results

A total of 54 serum samples were positive by IFAT at titers 1:20 or more, which indicated a

seroprevalence of 27%. Frequency of different titers in positive subjects was as follows: 1:20, 20%; 1:100, 32.2%; 1:200, 40%; 1:400 or more, 7.8%. Education status, occupation group and habit of undercooked or unwashed vegetables and age are shown in Tables 1-3, respectively. The highest infection rate was found in the age group of less than 30 years. Also the highest infection rate was observed within the housewives group as well as in the women who, had habit of unwashed/unpeeled vegetable and uneducated group. A significant difference was found between individuals with history of ingestion of unwashed vegetables, uneducated women and seropositivity ( $P<0.05$ ). Seven cases who were infected, had history of abortion. There was a history of contact with cat, or presence of cat in /or around the house in almost all of infected pregnant women.

**Table 1:** Age distribution of *Toxoplasma* infection in pregnant women

Age /year	Positive Number	%
15-19	9	21.5
20-24	17	34.7
25-29	17	29.9
30-34	6	17.6
35-48	5	27.7
Total	54	27

**Table 2:** Seroprevalence of toxoplasmosis in relation to educational status and ingestion of unwashed vegetables

Education status	Number of positivity	Unwashed vegetables consumption	Number of positivity
Primary school	8	Primary school	11
Junior high school	10	Junior high school	7
High school	9	High school	5
Academic	3	Academic	0
Uneducated	24	Uneducated	31
Total	54	Total	54

**Table 3:** Seroprevalence of infection in pregnant women according to job

Job	Number	frequency%
Housewives	30	55.58
Teacher	11	20.37
Workers	8	14.81
Health care worker	5	9.24
Total	54	100



## Discussion

The prevalence of toxoplasmosis in the women with bad obstetric history is known to be significantly higher than those without it (1, 8). Some reports on congenital toxoplasmosis were issued in some parts of Iran (6). Our study showed that 27% of pregnant women were seropositive. This prevalence rate is less than those of the previous studies in the North and South of Iran. Two different studies in general population, showed that, seroprevalence of infection in western and eastern parts of Caspian basin, were 87% and 55.7%, respectively (3,5). In the North region of Iran, prevalence rate was from 6% to 23%, however, this was 9.3% to 29% in the South parts of country (3, 5, 9). There was not any report about prevalence of infection in Zahedan, a city in Southeastern of Iran. In a study in Hamadan by Rabiee et al, seroprevalence of infection in the women aged 15 to 45, was 38.9% (3). In another study in Zurich the seroprevalence of the group of women of childbearing age (between 20 to 40) was 40 % (10). The highest seroprevalence has been reported from France, both among women of reproductive age. Lower prevalence was found in North America or Oceania (3, 10). In our study as Rabiee study in Hamadan, the prevalence was higher in housewives. But in the present study, the highest prevalence rate was in the age under 30. In Riabee survey, the highest prevalence rate was in the age group over 49. In our study, the highest prevalence rate was in the women who consumed unwashed/unpeeled vegetables and also it was high in uneducated women. Therefore, pregnant women should be aware of the route of transmission of infection. Seminars should be plain for this purpose by city health services. We recommend further studies to determine the incidence of congenital toxoplasmosis in uneducated women especially in this region.

## Acknowledgments

This work was supported by financial grant of Research Department, Zahedan University of Medical Sciences, which is gratefully acknowledged. We thank Dr Dabiri for his technical assistance.

## References

1. Yasodhara P, Ramalakshmi BA, lakshimi V, et al. Socioeconomic status and prevalence of toxoplasmosis during pregnancy. *Indian J Med Microbiol.* 2004; **22**: 241-43.
2. Montoya Jose G, Remington Jack S. *Toxoplasma gondii*. In: Mandell, Bennett, Dolin. *Principles and practice of infectious Diseases*. 5<sup>th</sup> ed. Churchill- Livingstone, Philadelphia; 2000: 2859-71.
3. Rabiee S, Fallah M, Shirmohammadi A, Serpoush H. Seroepidemiology of *Toxoplasma* infection in the women aged 15 to 45 years in Hamadan, West of Iran. *J Res Health Sci.* 2003; **3**: 9-12.
4. Shahmoradi A, Sardarian K, Fallah M. Seroepidemiological survey of toxoplasmosis among the health centers referred in the Malayer city. *Shahed University Scintific J (Farsi)*. 1994; **2**: 70-73.
5. Ghorbani M, Edrisian GH, Assad N. Serepidemiologic survey of toxoplasmosis in Northern part of Iran using IFTA. *Trans R Soc Trop Med Hyg.* 1987; **72**: 369-71.
6. Ghorbani M, Farzaneh I, Voshtani H, et al. Congenital toxoplasmosis. *Iranian J Publ Health.* 1977; **6**: 1-5.
7. Koskinmiemi M, Lappalainen M, Herman L. Toxoplasmosis needs evaluation. An overview and proposals. *AJDC.* 1989; **143**: 724-8.
8. Sharma P, Gupta I, Ganguly NK, et al. Inceasing *Toxoplasma* seropositivity in women with bad obstetric history and in new born. *Natl Med J.* 1997; **10**: 65-66.
9. Sedaghat A, Ardehali SM, Sedigh M et al. The prevalence of toxoplasmosis in southern of Iran. *J Trop Med Hyg.* 1978; **81**: 204-207.
10. Zuber P, Jaquier P. Epidemiology of toxoplasmosis: World wide statue. *Schweiz Med Wochenschr.* 1995; **65**: 19-22.