Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 6, Issue, 01, pp.4586-4588, January, 2014

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

PREVALENCE OF *TOXOPLASMA GONDII* SPECIFIC IGG AND IGM ANTIBODIES AMONG YOUNG WOMEN OF REPRODUCTIVE AGE GROUP - A STUDY CONDUCTED IN KERALA, INDIA

***[1]Deepthy, B. J., [2]Sarman Singh, [3]Raman Muthuswami and [4]Ravindran, P. C.**

[1]Department of Microbiology, DM Wayanad Institute of Medical Sciences, Wayanad, Kerala, India
[2]Department of Laboratory medicine, All India Institute of Medical Sciences, New Delhi, India
[3]Department of Veterinary Parasitology, Madras Veterinary College, Chennai. India
[4]School of Heath Sciences, Kannur University, Palayad, Kannur, Kerala, India

ARTICLE INFO

Article History:
Received 19th October, 2013
Received in revised form
20th November, 2013
Accepted 05th December, 2013
Published online 26th January, 2014

Key words:

Toxoplasmosis, *Toxoplasma gondii*, Toxoplasma IgG & IgM antibodies, *Toxoplasma* ELISA.

ABSTRACT

The study was aimed to detect the prevalence of *Toxoplasma* specific antibodies in young women at their reproductive age. This will help to identify and screen the risk groups, thereby reducing the chances of vertical transmission and to prevent congenital deformities. A total of 198 serum samples were collected from young women attending the gynaecology clinics. Blood samples collected were tested for Anti- *Toxoplasma* specific IgG and IgM antibodies using Enzyme Linked Immunosorbent Assay (ELISA). Out of the 198 serum samples tested *Toxoplasma* specific antibodies were positive for 9 (4.54%) among these 7 were showing only IgG antibodies and 2 come positive for both IgG and IgM. The highest numbers of positive were noted in the age group of 30 to 39 years (58.6%). The data obtained from this study showed a moderate prevalence of Toxoplasmosis among women of child bearing age. An overall anti *Toxoplasma* antibodies 4.54% was recorded. The study reveals that Toxoplasmosis is endemic in Kerala and the details collected from the study participants also reveals that there is an extremely high levels (85%)of ignorance about the disease.

INTRODUCTION

The protozoan *Toxoplasma gondii* is an obligate intracellular parasite responsible for zoonotic infections in humans and other mammals cat is acting as the definitive host. Klevar (2007) Humans become infected post-natally by ingesting tissue cysts from undercooked meat, consuming food or water contaminated with oocysts or by accidentally ingesting oocysts from the environment. Devada *et al.* (1998) The three forms of the parasite are tachyzoites, bradyzoites and sporozoites among these Tachyzoites and bradyzoites forms produce Toxoplasmosis in humans. Merck (2008) Diagnosis of toxoplasmosis can be made by direct and indirect methods. Direct methods include Polymerase Chain Reaction (PCR) for the detection of T. gondii DNA from samples of body fluids, demonstration of the organism through mouse inoculation or cell culture Montoya and Remington (1996) and Indirect diagnosis is mainly made by serological methods. The most commonly used serologic tests to detect the presence of anti-T gondii IgG and IgM antibodies are the ELISA technique Montoya and Remington (1996).

Objectives

The study was conducted to find out the prevalence and incidence of T.gondii infection among women at their reproductive age and to assess the association between Seroprevalence and selected variables of interest. By identifying the positive cases in the early phase of pregnancy will help to reduce vertical transmission and congenital deformities.

***Corresponding author: Deepthy, B. J.** Department of Microbiology, DM Wayanad Institute of Medical Sciences, Wayanad, Kerala, India.*

MATERIALS AND METHODS

A total of 198 serum samples were collected. The study population comprised of women, aged between 19 to 45 years. The study was carried out in south Kerala during the period of 16 months starting from September 2010 to December 2011. Before collecting serum samples a written consent forms were collected from each participants after educating them about the disease and study objectives. General and specific data were collected which included details regarding handling of meat, how often they handled or ate the meat, they were also asked if they owned cats in their house or immediate surroundings. The serum samples were tested for Toxoplasma specific IgG & IgM antibodies by Indirect Enzyme Linked Immuno-sorbent Assay (Kit supplied by Euro Immune).

RESULTS

Out of the 198 serum samples collected, Toxoplasma specific antibodies were positive for 9 (4.54%) cases. Among these 7cases came positive only by IgG ELISA and 2 showed positive for both IgG & IgM. The highest numbers of positivity

were noted in the age group of 30 to 39 years (58.6%). The detailed Proforma collected from the study participants revealed that all the 9 positive cases were identified as nonvegetarian and were handling meat regularly, Three of them were keeping cats at their house. Direct or indirect exposure to cat faeces was reported by all 9 positive cases.

DISCUSSION

T. gondii is ubiquitous in nature, and toxoplasmosis is one of the most common infections of humans throughout the world. Remington *et al.* (2005) In this study a specific anti-Toxoplasma antibodies IgG and IgM were detected in 4.54% of the young women. The prevalence of recent or ongoing infections could be as a result of primary infection or a reactivated past infection which is reported to occur in immuno-compromised individuals. Antibodies, particularly IgM may not rise during reactivation of the encysted form of the parasite. Bessieres *et al.* (1992), Holliman (1995) Detection of IgG antibodies may be due to reactivation of past infection by physiological changes, stressful demands and the general hormonal imbalances associated with pregnancy, all these conditions may lower their resistance to diseases. Kaaja and Greer (2005) In this study, we found that the prevalence of antibodies were mostly seen in the age group of 30 to 39 years. Frequency of *T.gondii* infection has been reported to increase in older age groups. Bobić Branko (1998) All 9 positive cases were nonvegetarian this could be a source of the infection and there are reports which proves this statement but it cannot be ruled out since penetration of vegetative forms like tachyzoites in mucous membranes through broken skin has been reported in some countries. Centers for Diseases Control (2008) Working in a garden with bare hands and frequently eating unwashed fruits and vegetables showed no significant association with Toxoplasma infection in this study. This factor could be further investigated in an appropriate setting for a more convincing conclusion. However, exposure to contact with cats faeces by means of owning cats and having cats in the immediate surroundings was found to be associated with Toxoplasma infection. It is possible that most of the cats were infected and excreting oocyst which becomes infective after sporulation in the external environment. There are reports suggesting that Toxoplasma antibodies were more prevalent in pregnant women with cats at home than in pregnant women that did not possess cats. Al-Hamdani and Mahdi (1997) All the positive cases were non-vegetarians and were handled raw meats and it could be a reason for transmission of infection. There are so many factors which affect the prevalence of toxoplasmosis in each geographical area, like source of infection, through contaminated flesh of animals with tissue cyst of the parasite and through soil containing cat's faeces. European Food Safety Authority (2007)

Conclusion

The data obtained from this study showed a moderate prevalence of Toxoplasmosis among women of child bearing age. An overall anti-*T.gondii* antibody sero-prevalence of 4.54% was recorded. All the positive cases were advised to meet their consultant and were educated thoroughly about the importance of identifying and treating Toxoplasmosis. Those who showed acute infection were given treatment. Exposure to cat's faeces was identified as the possible risk factor but inadequately confirmed. Further focused studies should be conducted taking into consideration of relevant factors. The study reveals that Toxoplasmosis is endemic in Kerala. The detailed Proforma collected from the study participants reveals that there is an extremely high level of ignorance about the disease. This indirectly indicates that toxoplasmosis is a neglected disease in our state. This study therefore calls for (1) intensive education of the population, especially, women of child bearing age including pregnant women so preventive measures could be taken and (2) further initiation of intervention through routine testing of all pregnant women for Toxoplasma infection at pregnancy for proper management of the situation.

Acknowledgement

We are grateful to all faculties and technical staff of School of Health sciences, Palayad, Kannur, AIIMS, New Delhi and MVC, Madras for their help and support throughout during the study.

Conflicts of interest: Author (s) discloses no potential conflicts of interest.

Source of funding: Author(s) discloses no funding sources.

Informed consent: The Author(s) confirmed that this article is unique and not under consideration or published in any other publication.

Statement of Human and Animal rights: Not done any experiments using human or animal volunteers.

REFERENCES

Al-Hamdani MM, Mahdi NK. 1997. Toxoplasmosis among women with habitual abortion. *East Med Hlth J.* 3(2):310–315.

Bessieres MH, Roques C, Berrebi A, Barre V, Cazaux M, Seguela JP., 2005. IgA antibody response during acquired and congenital toxoplasmosis. *J Clin Pathol.* x 45:605–608.

Bobić Branko, Jevremović Ivana, Marinković Jelena, Šibalić Desanka, Djurković-Djaković Olgica. 1998 Risk factors for Toxoplasma infection in a reproductive age female population in the area of Belgrade, Yugoslavia. *European Journal of Epidemiology.* 14: 605–610.

Centers for Diseases Control, author. 2008

Devada K, Anandan R, Dubey JP. 1998. Serological prevalence of toxoplasmosis in chickens in Madras. *Ind J Parasitol.* 84:621–622.

European Food Safety Authority, Surveillance and monitoring of Toxoplasma in humans, food and animals Scientific Opinion of the Panel on Biological Hazards. *The EFSA Journal* 2007. 583, 1-64

Holliman RE. 1995. Congenital toxoplasmosis: prevention, screening and treatment. *J Hosp Infect.* 30:179–190.

Kaaja RJ, Greer IA. 2005. Manifestations of chronic disease during pregnancy. *J A M A.* 294(21):2751–2757.

Klevar S. 2007. Tissue cyst forming coccidia; Toxoplasma gondii and Neospora caninum as a cause of disease in farm animals. Acta Veterinaria Scandinavica 49 (Suppl. 1) S1doi:10.1186/1751-0147-49-S1.

Merck and Co. 2008. The Merck Veterinary Manual. Eighth edition p.272-79.

Montoya JG, Remington JS. 1996. Toxoplasmic chorioretinitis in the setting of acute acquired toxoplasmosis. *Clin Infect Dis.* 23:277–282.

Remington JS, McLeod R, Thulliez P, DEsmonts G. 2005. Toxoplasmosis. In: Remington JS, Klein J, eds. Infectious Diseases of the Fetus and Newborn Infant, 6th ed., Philadelphia, WB Saunders.

****