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SEROPREVALENCE OF TOXOPLASMA IG G IN NORMAL POPULATION OF CALICUT, KERALA

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ABSTRACT
Infection with Toxoplasma Gondii can cause severe illness when contracted congenitally or when reactivated in immune suppressed persons. Different studies are reporting varying geographical prevalence. The geographical prevalence is unknown in Kerala. This study was conducted to determine the prevalence of Toxoplasma Gondii in a representative sample of adult population of North Kerala. This was a prospective observational study, conducted in the community. Sera collected from 250 healthy adults and an IgG antibody was detected by ELISA method. The sample population was not suffering from any disease and there was no past history of any blood transfusion. They belonged to both rural and urban areas, and having different occupations. Out of 250 samples 68 showed value >15.95 iu/ml which is mentioned as upper limit of normal (27.2%). Among the positive cases there were 59% males and 41% females, age varied from 20-70.There was no evidence of rising antibody titer in parallel with rising age. Since the prevalence is high, two vulnerable groups namely pregnant ladies and immune suppressed population should be given proper health education to minimize chance of infection.

KEYWORDS: Toxoplasmosis, Toxoplasma IgG, Seroprevalence, North Kerala.

INTRODUCTION
Toxoplasmosis is a parasitic disease caused by T.gondii, sporozoan protozoa in the genus of Toxoplasma. It is an obligate intracellular parasite, ubiquitous in nature and worldwide in distribution. The organism exists in 3 forms, the oocyst, tachyzoite, and tissue cyst. All three forms occur in cats and other felines which are the definitive hosts. The disease is usually self limiting, but can have serious fatal effects on fetus whose mother first contracts disease during pregnancy. The infection caused by the parasite can be classified in to 4 groups.

1. Those acquired by immunocompetent individuals.
2. Those acquired by reactivation of the disease in immunocompromised individuals
3. Ocular toxoplasmosis
4. Congenital toxoplasmosis

The disease is transmitted by 1. Ingestion of oocyst excreted in the faeces of infected cats contaminating soil and water, 2. Consumption of tissue cyst in undercooked or uncooked meat, 3. Through blood or blood products, 4. Transplacental transmission and 5. rarely by organ transplants.

There is a close relationship between the incidence of toxoplasmosis and the Seroprevalence of toxoplasma antibodies within a population. Infection with the parasite occurs among all age groups and as a consequence, serological evidence of it increases with increasing age. The sero prevalence varies widely in different regions and depends on socio economic status, environmental factors and meat cooking habits. It is estimated that between 30-65% of all people worldwide are infected with toxoplasmosis[1]. An epidemiological survey has revealed that in most areas of the world, the presence of cats is primary importance for the transmission of the parasite[2] Toxoplasma infection is less frequent areas where the environment is unfavorable for oocyst such as higher altitudes and extremes of temperature. However there is an overall prevalence ranging 30-65%, worldwide.[1]

The prevalence varies among different geographical areas and among individuals within areas and within a given population. These differences depend on a variety of factors, including culinary habits and cleanliness of surroundings. Indian studies of prevalence showed a wide variation and one study reported as high as 77% in women of reproductive age group. The prevalence of toxoplasmosis in Indian pregnant women is 7.7%[3] Serological methods, histological methods, and molecular methods help in diagnosis.[4] Clinical signs are

not helpful for a clear diagnosis. Serological methods are widely used; Ig M is first produced and confirms presence of acute infection. Ig G then appears and can be used to diagnose past infection or immunity. IgG G ELISA method is widely used.

AIM OF THE STUDY

To identify the prevalence of Toxoplasma Ig G positivity among healthy normal population of Calicut

MATERIALS AND METHODS

This was an observational study. Initially an awareness session was given to a group of immunosuppressed people regarding the disease, testing and personal care to be taken. The healthy relatives who were listening and volunteered for the test were included in the study. Blood samples were collected from 250 healthy individuals who were willing to co-operate with the study. This sample populations was not suffering from any disease, there was no past history of jaundice, or any blood transfusion. Nobody remembered a past history of fever with rash or fever with Lymph node enlargement. None of the females gave a history of abortion. They belonged to both rural and urban areas and having different occupations. Almost all were having cats in the house or vicinity. The study group included 250 people. (127 males and 123 females). Age group varied from 20-70.

Age distribution of tested population

Age	Females	Males
20-40	58	86
>40	65	41
Total	123	127

Serum samples were examined by ELISA for Ig G antibodies. An EQUIPAR TOXO G Set which is commercially available was used. Antibody levels were evaluated by following instructions of the set manufacturers. Results were expressed in titers; borderline (cut off) titer was determined for all examined groups of antibodies. Control sera and calibration sera were not diluted. The absorbance of the samples examined was measured at 450 nanometer using photometric measurement of the color intensity and a reference wave length between 620 nm and 650 nm within 30 minutes of adding stop solution.

Interpretation of results.

Observed result	Interpretation
<13.05	Negative
13.05- 15.95	Equivocal
>15.95	Positive

A negative result indicates that there was no prior exposure to Toxoplasma Gondii. These individuals are presumed to be susceptible to a primary infection. A negative result however will not rule out recent infection because serum may be tested before the development of Ig G antibody. If recent infection is suspected serum sample may be tested for Ig M antibody.

OBSERVATION

250 patients which included 123 females and 127 males were selected for the study. The age varied between 20-62 yrs. All were asymptomatic. As per the manufacture's instruction 15.95 IU /ml was considered as cut off value, values above which was taken as positive and below this was considered as negative. Out of 250 samples, 68 showed value greater than 15.95 IU /ml. among the positive cases there were 28 females and 40 males. Maximum titer observed was 860.417IU/ml. Study group did not involve any immunocompromised, pregnant or organ transplant recipient.

Sex wise distribution of positive cases

Gender	Number	Percentage
Male	40 (out of 127)	31.5%
Female	28 (out of 123)	22.8%
Total	68 (out of 250)	27.2%

The overall percentage prevalence of Toxoplasma IgG in the community studied was 27.2%.

Age wise distribution of positive population

Age	Positive	Females	Positive	- Males
	Number	percentage	Number	percentage
<40	17	13.82	26	20.47
41-62	11	8.94	14	11.02
Total	28	22.8	40	31.5

DISCUSSION

It is generally considered that around 25-30% of human population in the world is infected by Toxoplasma. Various studies have shown different prevalence rates in different countries and it varies from 10-80%[5] Difference in prevalence may be observed between countries, even within a country from region to region or in a region among different socioeconomic classes.

The present study was done around Calicut district, Kerala. 250 randomly selected people were subjected to Toxoplasma antibody by ELISA method. Population included both males and females. Out of 250, 68 samples were positive and the seroprevalence was 27.2%. The studied male population showed a percentage prevalence of 31.5% and female population showed a percentage prevalence of 22.8%. The higher percentage positivity in males may be because more males were included in the study group. Many factors can affect the seroprevalence

in humans. Climatic factors can affect survival of oocysts in the environment there by affecting the infection rates in meat producing animals. The warm and humid climate classically seen in tropical condition as well as in this part of India favor survival of oocysts. Similarly, colder regions have low prevalence because of adverse circumstances of oocyst survival. Other factors affecting the geographical variation in prevalence rate include the difference in food habits and customs. Methods of cooking, hand hygiene, habits of cleaning vegetables, the quality of water consumed, sanitation practices etc are all associated with prevalence. However the risk factors were not raised in this study, hence prevalence cannot be linked with etiological factors.

There are two highly vulnerable groups for infection and reactivation disease namely pregnant women and immune compromised groups, especially HIV infected people. These two groups should be given proper disease awareness like wearing gloves while gardening or handling soil. Cats often use gardens and sand boxes as litter boxes, and they can pass the parasite in the faeces[6]. Hands should be cleaned with soap and water after handling raw meat, outdoor activities and gardening. Pregnant woman should not handle raw meat or should not wash cutting boards, knives or other utensils likely contaminated with raw meat. Meat should be cooked thoroughly until no longer pink color in the center. Highly vulnerable group should not keep pet cats at home or clean litter box.

CONCLUSION

In this prospective observational study, conducted in the community representing both urban and rural population the prevalence of Toxoplasmosis was found to be 27.2%. There was no evidence of rising antibody titer in parallel with rising age. Since the prevalence is high, two vulnerable groups namely pregnant ladies and immune suppressed population should be given proper health education to minimize chance of infection as acute infection during this period will lead to devastating consequences.

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