A Serological Antibody Survey for Toxoplasma Gondil in Twin Cities of Rawalpindi and Islamabad

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Riaz Ahmed Pal, Mazhar Qayyum, Muhammad Yaseen (Department of Biological Sciences, Quaid.i.Azam University, Islamabad, Pakistan.)

Introduction

Toxoplasma gondii is one of the most prevalent intracellular parasite found in human population. Usually the organism causes mild orasymptomatic infection. However, disease occurs in immuno-compromised individuals or when the parasitic load saturates the body's immune defences[1]. Sero-logical studies establish the frequency of antibodies within a population. The rates of infection are 2-93%, USA l0-70%, Saudi Arabia 30%, Iran 55%, India 180%, Brazil 72%, Somalia 53%, Canada 41%, Egypt 44% and Taiwan 84%[2]. Prevalence of toxoplasmosis in newborns has been estimated to be as high as one in 486 births[3]. Sixty percent of 125 pregnant women in Mexico tested positive for antibodies[4]. Of these 46.6 percent showed titre greater than 1:1024, a ratio which indicates acute infection. This study reports the frequency of Toxoplasma gondii antibody in two socioeconomically distinct population groups and in-patients suspected of having this disease.

Material, Methods and Results

Of 800 scm obtained for this study, 335 were from Rawalpindi, 8225 from rural areas around Islamabad and 240 from. patients suspected of toxoplasmosis from different clinical laboratories and hospitals. Name, age, sex, place of residence and the diagnosis in the diseased group were recorded on a questionnaire card. All blood samples drawn by venipuncture were cooled to room temperature in the vacutainer and centrifuged at 1500 rpm for five minutes. Sera were transferred by micropipette to screw caped vials and frozen at -20°C until tested. Indirect fluorescent antibody (IFA) technique using bioMeriux reagents was done to detect Toxoplasma gondil antibodies. A 1:20 dilution was used for all sera and tested according to standard procedure. Positive and negative control sera were used for each slide. Slides were examined under Nikon Fluorescent microscope with ultra-violet illumination. Yel-low-green fluorescence around the entire periphery of the organism constituted as a positive reaction, while negative reactions consisted of either no visible or only polar fluorescence. Frequency of Toxoplasma antibodies remained stable upto the age of 60 years then there was a three fold increase in 6 1-80 years age group (Table I).

Table I. Frequency of Toxoplasmosis among 240 suspected patients from different clinics and hospitals of Rawalpindi/Islamabad.

Complaints	Sera tested	No. positive (%)*	Antibodies titre* >40	>80	>160	>320	>640	>1280	>2560
Obstetric history	159	28 17.6	7	3	6	2	3	4	3
Occular disease	72	9 12.5	2	- .	1	2	1	3	-
Non-specific lymphadenopathy	3	2 66.6	-	-	-	1	-	1	-
Hepato-splenomegaly	5	1 20.0	-	-	-	-	-	1	-
Post-encephalities	1	0 -	-	-	-	-	-	-	-

* Antibodies titre: >320 = High positive >130 = Positive 40-130 = Low Positive

Distributionof antibodies was similar in both sexes (Table II).

Table II. Distribution of Toxoplasma antibodies in 560 individuals belonging to Rawalpindi/Islamabad.

Location	Host Status	No. Examined	No. Positive	%*
Rawalpindi	Males	202	10	4.95*
	Females	133	7	5.26
Islamabad	Males	105	6	5.71
	Females	120	9	7.5

Table III. Distribution of Toxoplasma antibodies among 560 individuals of different age groups of Rawalpindi/Islamabad.

Age groups	No. Examined	No. Positive	%*	Antibodies titre >40	>80	>160	>320
0-20	137	8	5.83*	6	1	1	-
20-40	296	14	4.72	6	6	1	1
40-60	98	5	5.10	1	1	2	1
60-80	29	5	17.24	2	1	1	1

Table III shows the pattern of antibodies in patients with toxoplasmosis. Highest titres were found in patients of threatened abortion, repeated abortion and still births and the next group had occular disease.

Comments

Results are similar to those from previous surveys conducted in different parts of the world[1,5,6]. Geographic location and gender had little effects on prevalence rate. However, the presence of pets or stray cats and socio-economic conditions of a population plays a vital role in determining the prevalence rate. Findings have indicated that the number of seropositive rate increases with age[1,7,8]. Study support this conclusion with the exception of the slightly highpercentage rate forthe group 0-20 years of age (Table I). Although possibly caused by congenital toxoplasmosis other factor of this increase may be due to the reason that children live and play very close to contaminated soil. Inhigher age group the possible cause is the low immunity and high susceptibility to toxoplasmosis. In this case sample error should also be taken into consideration. It has been found that there is an increase in Toxoplasma gondii antibodies in rural population as compared to urban population. The higher percentage of infection in the rural area could be attributed to more frequent animal contact because in rural areas mostly population is involved in agricultural activities and they also maintain domestic animals as a part of their animal wealth[9]. In the present study high antibodies titre was found in patients having bad obstetric history. Toxoplasmosis may therefore, be considered as one of the causes of bad obstetric history in Pakistan and routine screening of women for antibodies to Toxoplasma gondii should be instituted as a part of normal prenatal care.

On the basis of the present investigation among patients suspected for toxoplasmosis and from asymptoniatic individual, it is concluded that toxoplasmosis is prevalent in sub-clinical and clinical forms in Pakistan. The diagnosis in this study is based on a single test and it could be further confirmed by other serological methods like dot-ELISA. Furthermore, the people keep cats and dogs as pet animals and in future epidemiological studies the role of pets should be studied.

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References

1. Alford, C. A.. Foft, J. W., Blankenship. W. A. eta!. Sub- clinical central nervous system disease of neonates. A prospective study of infants born with increased level of 1gM. J. Pediatr., 1969;75:1167-78
2. Feldman, H. A. A nationwide serum swvey of United States military recruits, 1962 VI. Toxoplasma antibodies. Am. J. Epidemiol., 1965;81:385-91.
3. Femandez-Torrano, M.M., Sibaja-Contreras, M. T. and Granier- Melo, A.H. Encuesta sero-epidemiologica de anticuerpos anti Toxoplasma gondii en 125 mujeres embarazadas del Estado de Tabasco. Bol. Med. Hosp. Infant. Mex., 1986;43:274-278.
4. Frenkel, J. K. and Ruiz, A. Endemicity of Toxoplasmosis in Costa Rica: Transmission between cats, soil, intermediate host and humans. Am. J. Epidemiol.. 1981;113:254-269.
5. Fulton, J. D. and Voller, A. Evaluation of immunofluorescent and direct agglutination methods fordetection ofspecific Toxoplasma antibodies. Br. Med. J., 1964;2:1173-1175.
6. Hamid, L. M., Cate, R. L. and Homer, N. V. A serological antibody survey for Toxoplasma gondii in Northern Chihuahua. Maxico. Tex. J. Sci., 1991 ;43;75-79.
7. Weinman,D. Toxoplasmosis. Ann. Rev. Microbiol.. 1952;6:281-298.
8. Wong, B., Gold, J. W., Lange, M. et al. Central nervous system toxoplasmosis in homosexual men and parental drug abusers in New York. High incidence of infection and abnormal antibody responses. Clin. Res., 1982;30:698A.