

## PREVALENCE OF TOXOPLASMOSIS IN HYPOTHYROIDISM CASES

GUPTA, M.K. ● SOLANKI, A. ● JOSHI, K.R. ● SHARMA, K.K.

### SUMMARY

The present study was undertaken to find out the seroprevalence of toxoplasma infection in this part of the country and to study the correlation, if any, between hypothyroidism and toxoplasma infection particularly in females of reproductive age. The sera of 50 known cases of hypothyroidism were taken randomly in the study and similar number of healthy sex matched cases were taken as controls. The results indicate that seroprevalence of toxoplasma infection in healthy population of this part of the country is 8%. Toxoplasma infection is more common in active reproductive period with Toxo-IgG & IgM antibodies positive in 41.2% and 17.6% in females and 50% and 25% in males respectively.

### INTRODUCTION

Toxoplasmosis is a zoonotic disease, caused by *T.gondii*, occurs in wide variety of mammals and birds. Both hypothyroidism and toxoplasmosis are known for their illeffects on the development of foetus. Various studies have been done in Western

(Jeannel et al, 1990; Savva et al, 1990 & Lappalailen et al, 1992) and Asian countries (Mahajan et al, 1974 & Singh and Nautiyal 1991) to determine the seroprevalence of this zoonotic disease in general population. At Dhule (Maharashtra), Singh et al (1994) reported that in grade I & II goitre (Hypothyroidism due to iodine deficiency) and controls, seropositivity was 31.89%, 46.15% and 26.53% respectively, indicating association between iodine deficiency

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*Depts. of Microbiology, Dr. S. N. Medical College,  
Jodhpur, J. L. N. Medical College, Ajmer.  
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and toxoplasma infection. The present study was undertaken to find out the seroprevalence of toxoplasma infection in this part of the country and to study the correlation, if any, between hypothyroidism and toxoplasma infection particularly in females of reproductive age.

#### MATERIAL AND METHOD

The present study was conducted in Department of Microbiology, Dr. S.N. Medical College, Jodhpur. The sera of 50 known cases of hypothyroidism (40 females and 10 males) were taken randomly in the study and similar number of healthy sex matched controls were taken. Blood samples from all these subjects were collected in container without anticoagulant. Sera were separated from clotted blood and stored at 2 to 8° C for short periods till analysed. Toxoplasma-IgG & IgM microassays were done in all the cases of hypothyroidism

and controls using ELISA kits from Sera Quest, North Miami. Test results were objective and normalised as index value or as international units (IU/ml), which are traceable to WHO, Antitoxoplasma serum, 3rd International Standard Preparation, 1994. Toxoplasma IgG antibody titres less than 30 IU/ml were considered as negative, between 30 to 199 IU/ml as positive indicating exposure to toxoplasma infection in past and above 200 IU/ml as positive indicating exposure to toxoplasma infection which is still active. Toxoplasma IgM antibodies titres of index value less than 1 were considered as negative and of more than 1 as positive.

#### OBSERVATION

It has been observed that Toxo-IgG antibodies were present in 9.7% and 41.2% of females in control and study group respectively in the age group of 20-40 years

TABLE I  
TOXOPLASMA IgG AND IgM ANTIBODIES POSITIVITY IN  
HYPOTHYROIDISM AND CONTROLS

Groups	Females				Males			
	Below 20 Years No. (%)	20-40 Years No. (%)	Above 40 Years No. (%)	Total No. (%)	Below 20 Years No. (%)	20-40 Years No. (%)	Above 40 Years No. (%)	Total No. (%)
Study n	3	17	20	40	1	4	5	10
IgG	0(0)	7(41.2)	13(32.5)	0(0)	2(50)	1(20)	3(30)	
IgM	2(66.7)	3(17.6)	3(15)	8(20)	0(0)	1(25)	0(0)	1(10)
Control n	8	31	1	40	2	4	4	10
IgG	0(0)	3(9.7)	0(0)	3(7.5)	0(0)	0(0)	0(0)	0(0)
IgM	0(0)	1(3.2)	0(0)	1(2.5)	0(0)	0(0)	0(0)	0(0)

TABLE II  
STATUS OF TOXOPLASMA IgG AND IgM ANTIBODIES IN  
HYPOTHYROIDISM AND CONTROLS

GROUPS	IgG-IgM-	IgG+IgM-		IgG+IgM+		IgG-IgM+
	0-30 IU/ml & < 1	30-199 IU/ml & < 1	> 200 IU/ml & < 1	30-199 IU/ml & > 1	> 200 IU/ml & > 1	0-30 IU/ml > 1
	(A)	(B)	(C)	(D)	(E)	(F)
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
<b>Study</b>						
Female	24 (60)	6 (15)	2 (5)	5 (12.5)	0 (0)	3 (7.5)
Male	6 (60)	3 (30)	0 (0)	0 (0)	0 (0)	1 (10)
Total	30 (60)	9 (18)	2 (4)	5 (10)	0 (0)	4 (8)
<b>Control</b>						
Female	36 (90)	3 (7.5)	0 (0)	0 (0)	0 (0)	1 (2.5)
Male	10 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	46 (92)	3 (6)	0 (0)	0 (0)	0 (0)	1 (2)

and in none of the cases of either group below the age of 20 years. However these antibodies were detected in none & in 30% cases of control and study groups respectively in the age group above 40 years. Toxo-IgG antibodies were absent in all the age groups of control males while they were present in 0%, 50% & 20% cases respectively in the age group below 20 years, 20-40 years and above 40 years. Toxo-IgM antibodies were present in 3.2% and 17.6% of females in control and study group respectively in the age group of 20-40 years. They were present in 66.7% and 15% in study females in below 20 years and above 40 years groups

respectively but none in control females of both age groups. Toxo-IgM antibodies were absent in both study and control group of males in both below 20 years and above 40 years. None of these antibodies were found in 20-40 years group of control males with 25% cases positive in study group (Table I). Status of toxoplasma infection in study and control cases is depicted in Table II. The various combinations of Toxo-IgG & IgM antibodies included Combination A, indicating no exposure to toxoplasma infection; Combination B, latent toxoplasma infection; Combination C, reactivated toxoplasma infection; Combination D,

exposure to toxoplasma infection in recent past; Combination E, reinfection and active toxoplasmosis & Combination F, fresh toxoplasma infection.

### DISCUSSION

Toxoplasmosis has been considered as an unusual infection in this part of the country. In our study, seropositivity of Toxo-IgG and IgM antibodies in controls was seen in 6% and 2% respectively. The seropositivity in healthy population reported from different regions of this country ranges from 3.7% to 26.53% (Rawal et al, 1955; Mahajan et al, 1974; Bhatia et al, 1974; Hingorani et al, 1979; Srivastava et al, 1988 & Singh et al, 1994) while in Western countries it ranges from 20% to 90% (Desmonts and Couvreur, 1974; Feldman, 1974 & Parker et al, 1992).

It has been observed that both hypothyroidic females as well as males were more or less equally infected by toxoplasma. But when we compare them with that in controls, the seroprevalence of Toxo-IgG and IgM antibodies were more in patients of hypothyroidism. It is also observed that infection is more common in reproductive age group. As such toxoplasma infection, is not going to affect the reproductive life of males whereas in females, it may cause congenital malformation and even death of foetus.

Since toxoplasma infection remains latent for very long period and reactivation of this parasitic infection can occur due to predisposing factors like immunosuppression or pregnancy (Young et al, 1986), it can be considered that cases with hypothyroidism are at high risk of having latent toxoplasma infection reactivated under

these circumstances. Since active reproductive age group is most active period of life when chances of infection by the parasite *T.gondii* may as such be common and hence seropositivity is high in this age group in both the sexes. The higher rate of seropositivity for Toxo-IgG and IgM antibodies is particularly important in this age group. Since it is known that both hypothyroidism and toxoplasma infection separately may have adverse effect on developing foetus and hence their association in pregnancy may cause more severe damage to the foetus.

It has been observed that seropositivity for Toxo-IgG antibodies increases with age upto the age group of 20-40 years and then declines specially in females. Seropositivity for Toxo-IgM antibodies decreases with age. Other studies (Alidel-Hameed, 1991; and Singh et al, 1994) also confirm our findings.

Singh et al (1994) observed relatively high sero-positivity of 35.1% and 14.43% for Toxo-IgG and IgM antibodies respectively in tribal area which is also endemic for iodine deficiency disorders. Moreover, in the present study, relatively high seropositivity of 32% and 18% for Toxo-IgG and IgM antibodies respectively was observed in patients of hypothyroidism indicating some correlation between altered iodine metabolism and toxoplasma infection. No such study is available till date in the present literature.

With the foregoing discussion, it is evident that there is strong correlation between seropositivity to toxoplasma with hypothyroidism and hence routine screening of all the patients of hypothyroidism particularly the females must be done since

pregnancy may lead to reactivation of latent infection resulting in foetal infection, deformity and even death. However to establish whether a cause & effect relationship exists between hypothyroidism and toxoplasma infection, more extensive studies are required.

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