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# Seroprevalence of human toxoplasmosis

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*Key words:* *Toxoplasma gondii*, infection prevalence, IgG antibody

## Abstract

A comparative study of the prevalence of infection by *Toxoplasma gondii* in Southern Spain in different population groups was carried out using serological markers. The presence of IgG antitoxoplasma antibodies was investigated in serum samples of several population groups. Infection by *T. gondii* was very prevalent, especially among intravenous drug users (47.6%). An IgG antibody prevalence of 49.6% was obtained from immunocompetent adults with suspected active toxoplasmosis. In infants IgG antibodies were detected in 12.2%, and in pregnant women there was 30% IgG antitoxoplasma antibodies.

## Introduction

Toxoplasmosis is currently one of the most common human parasitic illnesses. Although usually benign, it can be very serious in some population groups, e.g. immunocompromised patients and neonates. Due to the immunocompromised state of these individuals, mainly as a result of infection by HIV, it is frequently life threatening with severe visceral manifestations and especially encephalic tropism (Zufferey *et al.*, 1993; De Diego *et al.*, 1992).

In this work, a comparative study of the prevalence of infection by *Toxoplasma gondii* in Southern Spain in various population groups was carried out using serological markers.

## Materials and methods

The presence of IgG antitoxoplasma antibodies were systematically investigated in serum samples of several population groups from August 1991 to 1993. These were studied for serological control or to rule out the presence of active toxoplasmosis. The patients were in three groups. Group 1 consisted of 6,454 serum samples from pregnant women aged between 20 and 35 years in the first term of gestation. Group 2 comprised 723 serum samples from 360 infants between 2 and 4 years, and 363 adult sera from non-intravenous drug users. The latter were not infected by the human immune deficiency virus (HIV), were of similar age to group 1 but not including pregnant women and with suspected active toxoplasmosis indicated by fever and adenopathies. In group 3 there were 647 serum samples from intravenous drug users from 20 to 35 years, infected with HIV and without symptoms of toxoplasmosis.

### IgG antibody study

Indirect EIA with the antigen of the *T. gondii* strain RH coated on the well was used (Eti-ToxoK-G, Sorin, Italy). Results were expressed quantitatively

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in UI/ml by obtaining a reference curve and were classed into four groups: absence of antibodies; < 15 UI/ml; between 16 and 150 UI/ml; and > 150 UI/ml. The Chi-squared statistical test was applied to the data in order to compare the IgG antibody results of the various populations.

### Results and discussion

The results obtained are recorded in Table 1. A comparative study of the various population groups showed a statistically significant difference in group 2 (individuals with suspected clinical active toxoplasmosis) between the infants and adults ( $p < 0.0001$ ), and between group 3 (the intravenous drug users) and group 1 (pregnant women) ( $p < 0.0001$ ).

The most frequent clinical appearance of toxoplasmosis in immunocompetent adult individuals was localized asymptomatic lymphadenopathy, and in infants, localized chronic lymphadenitis, often cervical. In some series, at least 15% of adenopathies of apparently unknown origin were considered to be of toxoplasmic aetiology (Krick and Remington, 1974; Rigoli and Gussetti, 1992).

In the pregnant women (group 1), 30% had IgG antitoxoplasma antibodies. The prevalence obtained in our work was significantly lower than that in other studies both in Spain (Bengoechea *et al.*, 1992; Perez-Rendon and Lopez, 1992) and elsewhere (Logar *et al.*, 1992). This could be explained by epidemiological differences in the areas studied: sample numbers (ours were larger), and the methodology (we used ELISA techniques). Other authors have described higher prevalences (95.4%; Perez-Rendon *et al.*, 1992), or lower (36.5%; Jaqueti *et al.*, 1990) in Spanish patients with suspected active toxoplasmosis. However, in the first series there was no information on the effect of ageing.

**Table 1** Percentage of seropositivity of antitoxoplasma IgG and IgM antibodies

Group	Sample number	IgG positives:	
		Number	%
1	6,454	1,936	30.00
2 (infants)	360	44	12.22
2 (adults)	363	180	49.60
3	647	308	47.60
Total	7,824	2,468	31.54

IgG antibody prevalence of 49.6% was obtained from immunocompetent adults in group 2 with suspected active toxoplasmosis. In the infants in this group, IgG antibodies were detected in 12.2%. A difference in IgG antibody seroprevalence in these two subgroups was expected since immunity against *T. gondii* increases progressively with age.

In group 3 the results (40.9%) were similar to those of Jaqueti *et al.* (1993). The higher seroprevalence in group 1 can be explained by poor health conditions and the immunity conferred by antibodies to old antigens.

In conclusion, the seroprevalence from our geographical area is lower than that obtained by other researchers with similar population groups, excluding individuals which were seropositive against HIV. The primary infection must occur, principally, in patients older than 4 years although a large group of pregnant women may be infected. Toxoplasmosis occurs in patients seropositive against HIV, and this is favoured by the high prevalence of latent toxoplasmosis.

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