

Results of anti-*Toxoplasma gondii* IgG, IgM, IgA and IgG Avidity testing in pregnant women in Rome, Italy

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Risultati della ricerca di IgG, IgM e IgA anti-*Toxoplasma gondii* e test per l'avidità delle IgG in donne in gravidanza a Roma, Italia

SUMMARY

To evaluate the incidence of *Toxoplasma gondii* infection, the detection of specific IgG, IgM, IgA and IgG avidity was performed on 1424 pregnant women referred to the "L. Spallanzani" Hospital in Rome (Italy). Of the 1424 women screened, 20 (1.40%) were likely to have been recently infected (presence of IgM/IgA, and/or low IgG avidity), 29 (2.04%) had positive IgM coupled with high IgG avidity, 7 (0.49%) had an unspecific result for IgM alone, 1339 (94.0%), were negative for both IgG and IgM, 29 (2.04%) showed evidence of past infection (IgG positive, IgM negative, high IgG avidity). In Conclusion our results underscore the importance of efficient ante-natal screening and appropriate treatment for *Toxoplasma* infection in Italy.

INTRODUCTION

Toxoplasmosis, a cosmopolitan zoonotic disease caused by the intracellular parasite *Toxoplasma gondii* (*T. gondii*), is usually acquired through the ingestion of raw or undercooked meat containing viable tissue cysts or by exposure to soil, food, or water contaminated with oocysts excreted in the feces of cats or other felines infected with the parasite (3). The infection can also be transmitted vertically from an infected woman to a fetus during pregnancy (1, 2, 11, 13, 14). An acute infection in pregnant women is associated with a range of outcomes from subclinical infection to intrauterine death. The severity of disease depends on the gestational age at transmission: the earlier the infection is, the more severe is the damage to the unborn child (8, 9). Damage to the

central nervous system (cerebral calcification, hydrocephalus, microcephaly) and choroidoretinitis accounts for most of the nonfatal morbidity. The newborn often has a low birth weight, enlarged liver and spleen, jaundice, anemia, petechiae, and eye damage evidenced by inflammation of the retina. Children who are apparently normal at birth may subsequently develop toxoplasmosis-associated injuries (15).

The prevalence of *Toxoplasma* infection in humans is related to several factors, including nutritional habits, contact with soil, age, and rural or urban settings. In this study, we evaluate the incidence of *T. gondii* infection in a population of 1424 pregnant women referred to the "L. Spallanzani" Hospital in Rome (Italy), for serological screening.

Table 1. Serological results for serum samples from pregnant women referred to the "L. Spallanzani" Hospital in Rome (Italy).

Patient (n=1424)	IgG titer (equivocal range:7.2-8.8 IU/mL)	IgM titer (equivocal range:6-8 AU/mL)	IgA titer (equivocal range:4.0-16.0 AU/mL)	IgG Avidity index (equivocal range:0.30-0.40)	Interpretation
20	≥8.8	≥8	>16.0	Low	<16 weeks
29	≥8.8	≥8	≤4.0-16.0	High	>16 weeks
7	<7.2	6.0-≥8	<4.0	ND	Unspecific IgM
29	≥8.8	<6	<4.0	High	Past infection
1339	<7.2	<6		ND	Negative

MATERIALS AND METHODS

Serological screening for *Toxoplasma* infection was performed on 1424 pregnant women from October 2010 to October 2011.

Samples were analysed by use of a chemiluminescence assay (CLIA) for the detection of IgG, IgM and IgG avidity

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(LIAISON® *Toxoplasma gondii*, Diasorin, Saluggia, Italy), and a capture ELISA for detecting IgA antibodies. Clinical and demographic data such as age, time of pregnancy, and nationality were recorded for each patient.

RESULTS

Of the 1424 women screened, 20 (1.40%) were likely to have been recently infected with *T. gondii* (presence of IgM/IgA, and/or low IgG avidity), 29 (2.04%) had positive IgM coupled with high IgG avidity, 7 (0.49%) had an unspecific result for IgM alone, 1339 (94.0%) were negative for both IgG and IgM, while the remaining patients (29, 2.04%) showed evidence of past infection (IgG positive, IgM negative, high IgG avidity). Following the first test, 7 patients with an IgM-positive test result were followed-up over the following months, and results did not show evidence of IgG seroconversion. Eight of the 20 women recently infected were in the first trimester of pregnancy, their median age is 36 years (range 28 - 42 years) and all women were born in Italy, except two. The remainder were on the second month of pregnancy.

DISCUSSION

In Europe, congenital toxoplasmosis affects between 1 and 10 in 10 000 newborn babies (4) of whom 1-2% develop learning difficulties or die and 4-27% develop retinochoroidal lesions leading to permanent unilateral impairment of vision (5, 7). The prevalence of previous *Toxoplasma* infection in pregnant women ranges from 10% in the United Kingdom to around 55% in France and Greece; in many countries it has declined sharply over the past three decades (2). The decline in prevalence of infection reflects that a woman during pregnancy might be more conscious about avoiding potential sources of infection, such as eating undercooked meat and contact with contaminated soil. Our results show that a total of 5.47% (78 out of 1424) of pregnant women screened at our hospital showed evidence of past or present *Toxoplasma* infection, underscoring the importance of efficient ante-natal screening and appropriate treatment for *Toxoplasma* infection in Italy.

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