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

Carla Nisii¹, Stefania Pane¹, Giuseppina Liuzzi², Ornella Butera¹, Roberta Chiappini¹, Daniele Khouri¹, Antonino Di Caro¹
¹ Laboratory of Microbiology and Biorepository, “L. Spallanzani” National Institute for Infectious Diseases, 00149 Rome, Italy
² Clinical Department, “L. Spallanzani” National Institute for Infectious Diseases, 00149 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 antenatal 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).

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

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.

Corresponding author: Pane Stefania
Laboratorio di Microbiologia e Banca Biologica, Istituto Nazionale per le Malattie Infettive
Via Portuense 292, 00149 Roma - Tel.: 06 55170688
E-mail: stefania-pane@inmi.it
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 unspecified 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 retinocochorial 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.

REFERENCES