PREVALENCE OF TOXOPLASMOSIS IN PREGNANT WOMEN AND ITS CLINICAL CORRELATION

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ABSTRACT

CONTEXT
Toxoplasmosis is one of the cause of abortion in pregnant women. Transplacental passage of the parasite from infected mother to the child may present with blindness, neurological impairment and mental retardation in congenital toxoplasmosis. Serological screening of pregnant women for Toxoplasmosis is very important to rule out causes of abortion and congenital malformation.

AIM
To analyse the prevalence of Toxoplasmosis by evaluating Toxoplasma IgG and IgM antibodies and correlating with age and trimester of pregnancy and other predisposing factors like h/o animal contact and socioeconomic status of the pregnant women attending antenatal clinic.

SETTINGS & DESIGN
Prospective study.

MATERIAL & METHODS
Serum samples were collected from 217 pregnant women without any h/o abortion, attending antenatal clinic along with epidemiological data. ELISA test for IgG and IgM Toxoplasma antibodies done with serum samples. The study carried out over a period of two years from October 2011 to September 2013.

STATISTICAL ANALYSIS
The Chi-square test was used to evaluate the association between age, trimester of pregnancy, animal contact history and socioeconomic status.

RESULTS
Toxoplasma IgG prevalence was 27.7% and that of IgM was 14.8%. The distribution showed increase of IgG and IgM positivity with increases in age and trimester of pregnancy. Both IgG and IgM positivity is associated with high socioeconomic group and with h/o contact with dog.

CONCLUSION
Toxoplasmosis prevalence is quite high and associated with predisposing factors. Early detection in pregnant women can reduce the severity of the disease.

KEYWORDS
Toxoplasmosis, Hydrocephalus, Microcephaly, Congenital Toxoplasmosis.

highest in the south and seroconversion rate of 1.5% has been reported. On account of diversity or absence of symptoms, the detection of toxoplasma infection during pregnancy is made by serological procedures.\(^{(3)}\)

**MATERIAL AND METHODS:** The study was a prospective study carried out in the Department of Microbiology, MGM Medical College, Kamothe, Navi Mumbai over a period of two years from October 2011 to September 2013. Blood samples were collected from pregnant women attending antenatal clinic and patients admitted in antenatal ward of the hospital after taking written informed consent to perform ELISA Test for Toxoplasma IgG and IgM (Kit-RD-Ratio Diagnostics, Germany) on the serum samples. A predefined proforma was used to collect the data regarding age of the patient, gestational age (trimester) and predisposing factors like animal contacts and socioeconomic status. The result of ELISA Test was then subjected to statistical analysis.

**RESULTS:** A total of 217 cases of pregnant women without any h/o previous abortion were evaluated. The prevalence of IgG positivity was 27.7% and that of IgM positivity was 14.8% (Table 1). The age group distribution has shown that the prevalence of IgG positivity increases from 22.72 to 100% and that of IgM positivity increases from 11.40 to 100% with increasing age (Table 2). The distribution of socioeconomic status shows that the prevalence of IgG positivity is more in high socioeconomic group (34.2%) and similarly IgM positivity is also more in high socioeconomic group (23.7%) (Table 3).

Again the IgG positivity is more in patients with h/o contact with dog (30.3%) as compared to cat (24.2%). Similarly the IgM positivity is more in case of h/o contact with dog (12.1%) than cat (9.1%) (Table 4). The prevalence of IgG increases with increases in duration of pregnancy (trimester) (18.4 to 41.3%). Similarly, prevalence of IgM increases with increase in trimester (10.2 to 20.0%) (Table 5).

<table>
<thead>
<tr>
<th>Antibody</th>
<th>No. of Samples</th>
<th>No. of Positive Samples</th>
<th>Positivity Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IgG</td>
<td>217</td>
<td>60</td>
<td>27.7%</td>
</tr>
<tr>
<td>IgM</td>
<td>217</td>
<td>32</td>
<td>14.8%</td>
</tr>
</tbody>
</table>

**Table 1:** IgG positivity is 27.7% and IgM positivity is 14.8%
<table>
<thead>
<tr>
<th>Socioeconomic Status</th>
<th>No. of Samples</th>
<th>No. of Positive samples</th>
<th>Positivity Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>38</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Low</td>
<td>138</td>
<td>40</td>
<td>18</td>
</tr>
<tr>
<td>Middle</td>
<td>41</td>
<td>7</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 3: IgG and IgM Positivity is more in High Socioeconomic Group

<table>
<thead>
<tr>
<th>Animal Contact History</th>
<th>No. of Samples</th>
<th>No. of Positive Samples</th>
<th>Positivity Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat</td>
<td>33</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Dog</td>
<td>33</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>No contact</td>
<td>151</td>
<td>42</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 4: IgG and IgM Positivity is more in Cases of H/O Contact of Dog as Compared to Cat
DISCUSSIONS: The prevalence of IgG positivity was 27.7% and that of IgM positivity was 14.8%. The geographical distribution of prevalence of Toxoplasmosis in pregnant women has been evaluated by other authors. In Eastern part of India, like in Kolkata the prevalence of IgG in primigravida is 45% and that of IgM in primigravida is 17.5% (Pal S et al). In Assam, the prevalence of IgG in normal pregnant women is 36.8% and prevalence of IgM is 5.9% (Borkakoty B J et al). In northern part of India, like in Kashmir prevalence of IgG is 27% and that of IgM is 1.12% (Ahmed QI et al). In Chandigarh, prevalence of IgG is 15.33% and that of IgM is 3% (Khurana S et al). In Delhi, prevalence of IgG is 45% and that of IgM is 3.3% (Singh S et al). In our study, the IgG prevalence corresponds with other studies but IgM prevalence is slightly higher. In our study, the seroprevalence of IgG and IgM is more in high socioeconomic group. A similar study by Berno M et al showed higher prevalence of Toxoplasmosis in high socioeconomic group (SEG) as compared to low SEG. Chintapalli S et al documented high IgG seropositivity (83.87%) in LSG and high IgM seropositivity (80.0%) in HSG. In our study, the seroprevalence of IgG and IgM is more in patients with h/o contact with dog as compared to cat as pet animal. Similar to our studies, Susan S et al showed an association of dogs, rather than cats with T. gondii infection. In our study, the seroprevalence of IgG and IgM increases with increasing duration of pregnancy (Trimester). A study by Ahmed Q I et al documented 47 cases of primary toxoplasmosis out of 138 cases in first trimester, 40 cases in second trimester and 51 cases in third trimester. Deji-Agaboola A M et al observed high prevalence of IgG in 3rd trimester and that of IgM in 1st trimester. The IgG positivity signifies chronic or repeated infection while IgM positivity signifies acute infection. Both antibodies showed increased prevalence with increase in age and increase in trimester of pregnancy from first to third. This is due to persistence of IgG antibodies for a long time, whereas IgM antibodies persist for a short period. This study has shown a high seroprevalence of Toxoplasmosis in pregnant women in this region and signifies the importance of antenatal screening of Toxoplasmosis. Toxoplasmosis is a preventable disease and early diagnosis and treatment can reduce the frequency and severity of the disease.

Table 5: IgG and IgM Positivity Increases with Increase in Trimester of Pregnancy

<table>
<thead>
<tr>
<th>Duration (Trimester)</th>
<th>No. of Samples</th>
<th>No. of Positive Samples</th>
<th>Positivity Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>IgG</td>
<td>IgM</td>
</tr>
<tr>
<td>1st</td>
<td>49</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>2nd</td>
<td>93</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>3rd</td>
<td>75</td>
<td>31</td>
<td>15</td>
</tr>
</tbody>
</table>

In our study, the seroprevalence of IgG and IgM is more in high socioeconomic group. A similar study by Berno M et al showed higher prevalence of Toxoplasmosis in high socioeconomic group (SEG) as compared to low SEG. Chintapalli S et al documented high IgG seropositivity (83.87%) in LSG and high IgM seropositivity (80.0%) in HSG. In our study, the seroprevalence of IgG and IgM is more in patients with h/o contact with dog as compared to cat as pet animal. Similar to our studies, Susan S et al showed an association of dogs, rather than cats with T. gondii infection. In our study, the seroprevalence of IgG and IgM increases with increasing duration of pregnancy (Trimester). A study by Ahmed Q I et al documented 47 cases of primary toxoplasmosis out of 138 cases in first trimester, 40 cases in second trimester and 51 cases in third trimester. Deji-Agaboola A M et al observed high prevalence of IgG in 3rd trimester and that of IgM in 1st trimester. The IgG positivity signifies chronic or repeated infection while IgM positivity signifies acute infection. Both antibodies showed increased prevalence with increase in age and increase in trimester of pregnancy from first to third. This is due to persistence of IgG antibodies for a long time, whereas IgM antibodies persist for a short period. This study has shown a high seroprevalence of Toxoplasmosis in pregnant women in this region and signifies the importance of antenatal screening of Toxoplasmosis. Toxoplasmosis is a preventable disease and early diagnosis and treatment can reduce the frequency and severity of the disease.
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REFERENCES