Detection of Toxoplasma Antibodies (IgG, IgM) in Pregnant Women With Bad Obstetric History

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SUMMARY

Toxoplasmosis is a zoonotic disease caused by Toxoplasma gondii. It infects 5-95% of various human population. It has been frequently incriminated in the causation of abortion, repeated abortion, premature or still birth and congenitally infected babies. Purpose of study was to find out the prevalence rate of toxoplasmosis in different areas of Pakistan as a possible cause of infection and correlate it with toxoplasma IgM and IgG antibodies in expectant mothers and their neonates. Study observed positive cases in large number of aborted women (60%) as compared to those with full term delivery where as in neonates positive cases were 23%. Prevalence rate was 50-55% in most areas of Pakistan. It may be concluded and suggested that as the prevalence rate of toxoplasmosis is quite high in Pakistan so there is a need to recognize the possible sources of this infection and take preventive measures.

Key Words: Toxoplasma gondii, Pregnancy, IgG and IgM.

INTRODUCTION

Toxoplasmosis is a zoonotic disease caused by toxoplasma gondii. It is a parasite of endothelial cells, mononuclear leukocytes, body fluids and tissue cells of host. It is found to infect 5-95% of various human population and is considered to be one of the most prevalent disease of human being which may not manifest clinically. In human infection the organisms are found in smears of exudates and in granulomatous tissue either singly, free or intracellular or in cyst like mosses. It has been frequently incriminated in the causation of abortion, repeated abortion, premature and still births and congenitally infected babies. Continued observations have proven that infection is much more frequent in man. Colonies of organisms in non nuclear or endothelial cells may almost fill the cytoplasm and appear to lie in large vacuole. Such cells are often observed in peritoneal exudates of infected animal.

Clinical character of disease varies with the organ attacked, which itself varies depending on weather the disease is congenital or acquired. Acquired form is usually seen in adults where the most common manifestation are lymphadenopathy and low grade fever. In pregnant animals fetus is commonly invaded via an initial placentitis, which may results in abortion and if fetus is carried to term, It is commonly born dead or affected with congenital toxoplasmosis. Infection during pregnancy is almost asymptomatic. Spontaneous abortion following toxoplasmosis in pregnancy occurs in <10% of patient infected during first trimester. Prevalence of antibody titers in adult population varies, depending on age, geographical location and test method used. It is more prevalent in hot climates and almost insignificant in dry and cold climates. Magnitude of disease in Pakistan is still unknown although incidence of abortion, still birth, congenital malformation and intrauterine death is quite sizeable.
PURPOSE OF STUDY

1. To find out the prevalence of toxoplasma infection as possible cause of abortion.
2. To find out the carrier rate of antitoxoplasma antibodies in pregnant women.
3. Correlate clinical signs and symptoms related to toxoplasmosis with toxoplasma IgG, IgM antibodies in expected mother.

MATERIALS AND METHODS

Total of 200 women were included in this study. Subjects were those women who attended the antenatal clinic in a period of six months. They were arranged according to the following groups.

- **Group A**: Pregnant women with abortion (n=100).
- **Group B**: Pregnant women with full term normal delivery (n=100).

Cases were collected from the department of Obstetric and Gynecology of Jinnah Hospital Karachi. 4-5 ml of blood was drawn from the subjects of group A and B. All samples were tested for specific IgG and IgM antibodies against Toxoplasma gondii using the technique of ELISA and Lab system (Lab system of Pulttide 8,00880 Finland). Only those samples were considered as positive whose CV% (Coefficient Variation) was <10%. Absorbance value of each positive sample was converted to enzyme immunoassay unit (EIU) according to formula.

\[
\text{EIU} = \frac{\text{Abs of sample}}{\text{Apc-Arb}} \times 100
\]

Arb = Mean absorbance of reagent blank
Apc = Mean absorbance of positive control

Values of EIU for IgM were considered to positive when these were in range of 25-59 and considered to be negative in a range of 10-19. The values of EIU for IgG were considered to be positive in a range of 60-130 and were negative at <20.

RESULTS

Prevalence of Toxoplasma antibodies in different groups is shown in Table 1. Positive cases were detected in higher number of women who had abortion (60%) as compared to those with full term normal delivery (46%).

<table>
<thead>
<tr>
<th>Groups</th>
<th>Total Tested</th>
<th>Seropositive</th>
<th>% Of Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Aborted)</td>
<td>100</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>B (Normal delivery)</td>
<td>100</td>
<td>46</td>
<td>46</td>
</tr>
</tbody>
</table>

Table 2 shows the prevalence of Toxoplasma antibodies in different groups according to permanent place of residence. Majority of cases belonged to Karachi followed by those who came from Punjab and had a stay in Karachi from 2-3 years. In cases from NWFP and Sindh, the positivity rate was also 50-55%. Baluchistan group was the exception which might be due to the vary small number (n=5) included in this study.

<table>
<thead>
<tr>
<th>Group According To Residence</th>
<th>Total Tested</th>
<th>Seropositive</th>
<th>Total % of Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karachi</td>
<td>110</td>
<td>88</td>
<td>50.8</td>
</tr>
<tr>
<td>Other part of Sindh</td>
<td>20</td>
<td>11</td>
<td>55.0</td>
</tr>
<tr>
<td>Punjab</td>
<td>40</td>
<td>21</td>
<td>50.0</td>
</tr>
<tr>
<td>N.W.F.P</td>
<td>25</td>
<td>14</td>
<td>48.2</td>
</tr>
<tr>
<td>Baluchistan</td>
<td>05</td>
<td>05</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>139</td>
<td>51.6</td>
</tr>
</tbody>
</table>
Levels of IgM and IgG specific antitoxoplasma antibodies is shown in Table 3. There were most more positive cases of IgG as compared to IgM in abortion and normal delivery cases but the difference was not valuable. Pregnant undelivered cases were more in IgM category.

### Table 3: Comparison of toxoplasma IgG and IgM antibodies cases (n=100) and controls (n=100).

<table>
<thead>
<tr>
<th>Toxoplasma antibodies</th>
<th>Group A (n=100)</th>
<th>Group B (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IgG +ve</td>
<td>48%</td>
<td>31%</td>
</tr>
<tr>
<td>IgM +ve</td>
<td>42%</td>
<td>29%</td>
</tr>
<tr>
<td>Both +ve</td>
<td>29%</td>
<td>14%</td>
</tr>
<tr>
<td>Both -ve</td>
<td>40%</td>
<td>52%</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Study observed an overall positivity rate (55%) of toxoplasma in women (including aborted and normal pregnant). It was observed that almost whole of the population belonged to low socioeconomic status and more than one third of the subjects had abortion which may give an idea that both low socioeconomic status and abortion are known to contribute to high Toxoplasma prevalence.

Reported figure in different parts of Pakistan during the last 10 years for toxoplasma infection tend to be low. Comparing our results with reported figure in literature the prevalence rate is higher when compared to London (rate 22%)

Egypt (25%);

and Saudi Arabia (31.2%). However this rate tend to be low when compared to prevalence of 58% in Kuwait and 84% in France. Prevalence rate of toxoplasmosis from different parts of Pakistan was reported by a number of workers who reported a prevalence rate of 15-16% in Peshawar.

43% in Lahore and 50-53% in Karachi. In present study it was observed that titer of IgG antibodies were more in all groups of women as compared to the titer if IgM antibodies. This shows that IgG antibodies play an important role in toxoplasmosis as compared to IgM antibodies but IgM antibodies may contribute in infection of toxoplasmosis along with IgG antibodies.

Out of 100 women who aborted or gave still birth, 60% were found to have antitoxoplasma antibodies as compared to 46% of those who gave full term delivery. This indicates that toxoplasmosis was probably a significant contributory factor in abortion. Our findings are in confirmation of other reports. In 100 normal pregnancy cases (full term normal delivery) 31% had IgG. IgM was present in 29% of these women. According to a report approximately 40% of the pregnant women who acquire Toxoplasma infection the parasite invades the placenta and may cause abortion, still birth or congenital disease.

**CONCLUSION**

It may be concluded that prevalence of toxoplasmosis is quite high in Pakistan and it plays a significant role in abortion, repeated abortion and possibly in congenital malformation in the form of mental retardation, speech and hearing defects etc. There is a need to recognize possible sources of infection are recognized so that therapeutic measures are adopted well in time.

**REFERENCES**


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