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.

HOW TO CITE THIS ARTICLE: Das B, Urhekar AD, Singh N, et al. Prevalence of toxoplasmosis in pregnant women and its clinical correlation. J. Evid. Based Med. Healthc. 2016; 3(68), 3689-3693. DOI: 10.18410/jebmh/2016/791

INTRODUCTION: Toxoplasmosis is caused by coccidian parasite Toxoplasma gondii.(1) The route of transmission are-ingestion of food or water contaminated with oocysts shed by cats, by eating meat containing infective tissue cysts and via transplacental transfer, when mother becomes infected for the first time during pregnancy.(2)

Financial or Other, Competing Interest: None.
Submission 25-07-2016, Peer Review 12-08-2016,
Acceptance 21-08-2016, Published 25-08-2016.
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DOI: 10.18410/jebmh/2016/791

It can cause mortality in developing foetus if the mother acquires acute infection during pregnancy. Transmission rate to foetus increases from 15-65% with increasing gestational age. However, severity of congenital disease decreases with increasing gestational age.(3) The spectrum of outcome of congenital toxoplasmosis ranges from subclinical infection to intrauterine death. There may be damage to central nervous system (Cerebral Calcification, Hydrocephalus, Microcephaly), choroidoretinitis, low birth weight etc. Children who are apparently normal at birth may develop the disease later in life.(4,5) Seroprevalence average of Toxoplasma gondii infection in India has been reported to be 24.3%, lowest being in the northern part of India and

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).

Antibody	No. of Samples	No. of Positive Samples	Positivity Percentage (%)
IgG	217	60	27.7 %
IgM	217	32	14.8 %

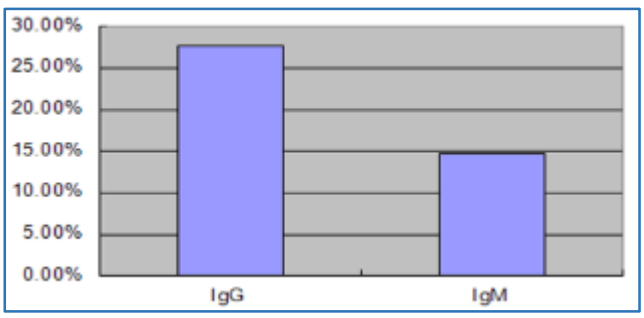

Table 1: IgG positivity is 27.7% and IgM positivity is 14.8%

Age Distribution	No. of. Samples	No. of. Positive Samples		Positivity Percentage (%)	
		IgG	IgM	IgG	IgM
18-20 yrs.	44	10	5	22.72%	11.40%
21-25 yrs.	123	34	17	27.64%	13.80%
26-30 yrs.	42	12	7	28.57%	16.70%
31-35 yrs.	7	3	2	42.90%	28.60%
36-40 yrs.	1	1	1	100%	100%

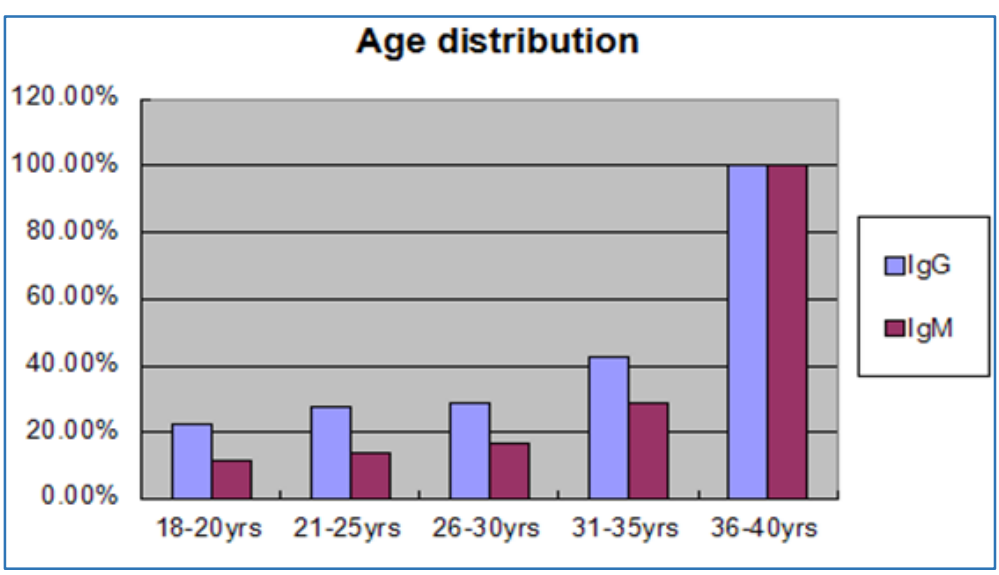

Table 2: IgG and IgM Positivity Increases With Increase in Age

Socioeconomic Status	No. of Samples	No. of Positive samples		Positivity Percentage (%)	
		IgG	IgM	IgG	IgM
High	38	13	9	34.20%	23.70%
Low	138	40	18	29.00%	13.00%
Middle	41	7	5	17.10%	12.20%

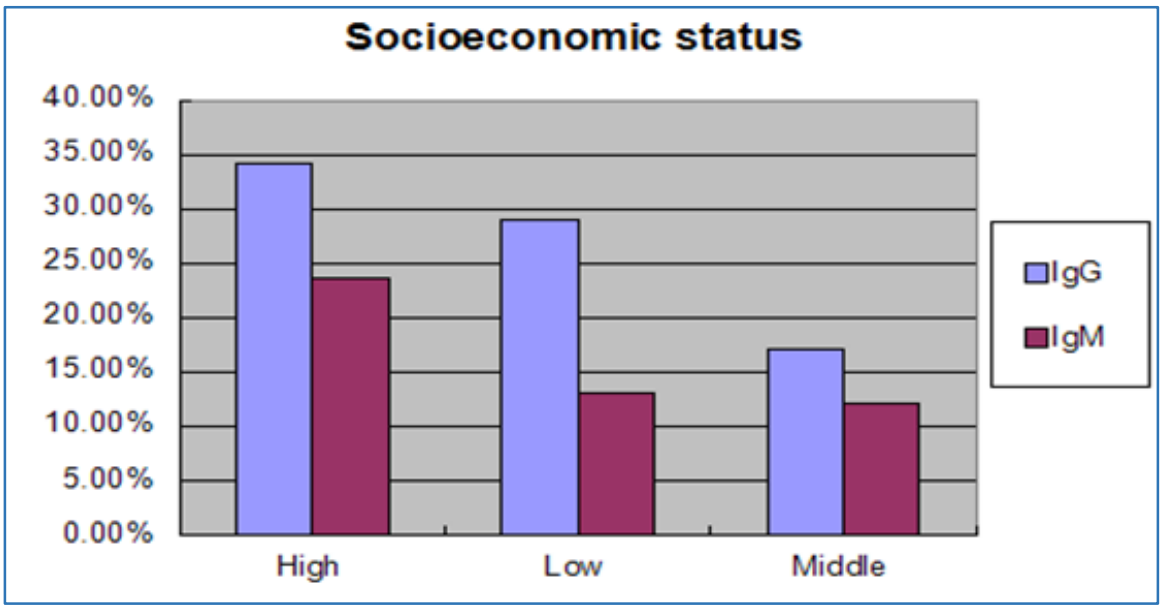

Table 3: IgG and IgM Positivity is more in High Socioeconomic Group

Animal Contact History	No. of. Samples	No. of. Positive Samples		Positivity Percentage (%)	
		IgG	IgM	IgG	IgM
Cat	33	8	3	24.20%	9.10%
Dog	33	10	4	30.30%	12.10%
No contact	151	42	25	27.80%	16.60%

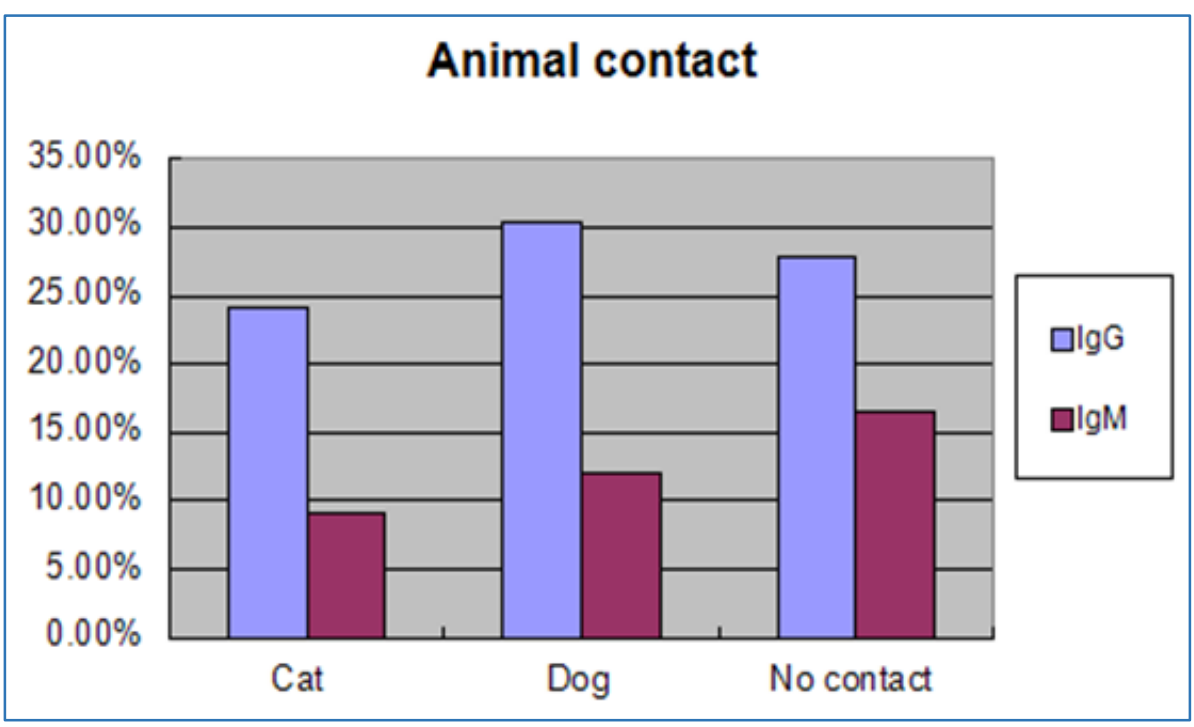

Table 4: IgG and IgM Positivity is more in Cases of H/O Contact of Dog as Compared to Cat

Duration (Trimester)	No. of. Samples	No. of. Positive Samples		Positivity Percentage (%)	
		IgG	IgM	IgG	IgM
1st	49	9	5	18.40%	10.20%
2nd	93	20	12	21.50%	12.90%
3rd	75	31	15	41.30%	20.00%

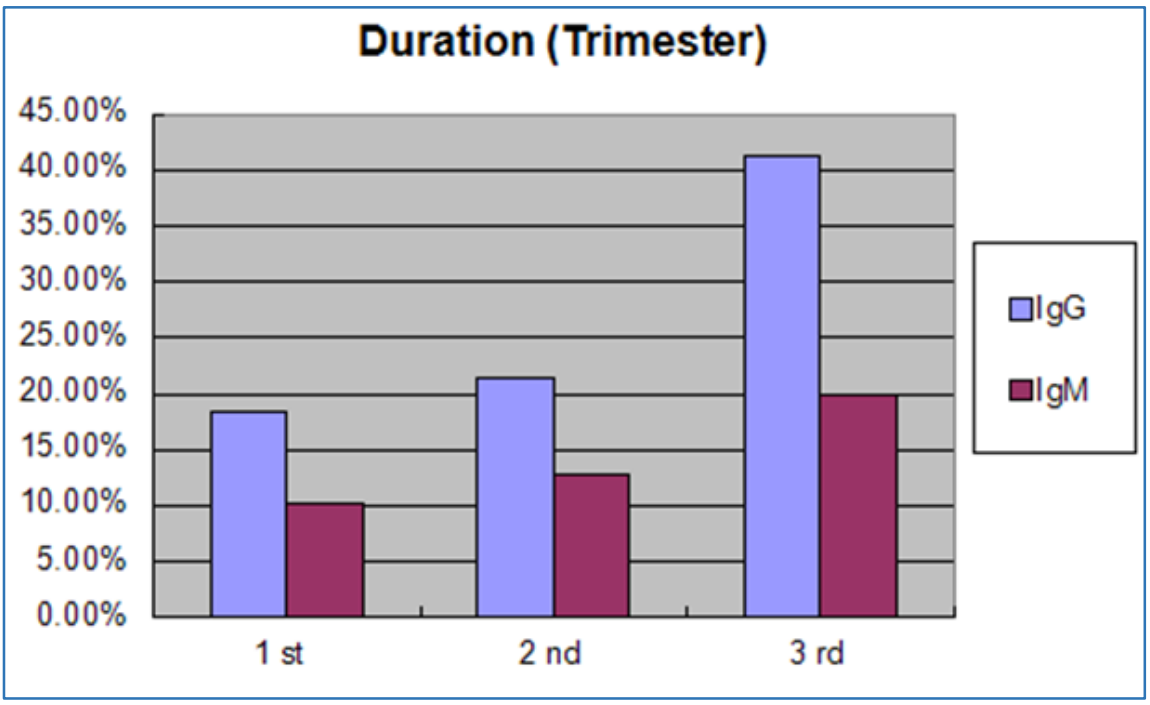

Table 5: IgG and IgM Positivity Increases with Increase in Trimester of Pregnancy

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[6]). 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[7]). In northern part of India, like in Kashmir prevalence of IgG is 27% and that of IgM is 1.12% (Ahmed QI et al[8]). In Chandigarh, prevalence of IgG is 15.33% and that of IgM is 3% (Khurana S et al[3]). In Delhi, prevalence of IgG is 45% and that of IgM is 3.3% (Singh S et al[9]). In our study, the IgG prevalence corresponds with other studies but IgM prevalence is slightly higher. In our study, the IgG and IgM positivity increases with increasing age, which may be due to repeated exposure to the infection source. There are similar studies of age group distribution like Borkakoty B J et al,[(7)] showed higher prevalence of T. gondii infection was associated with increase in age. According to Mousa D A et al[(10)], there was increase in IgG seropositivity with increase in age. In a study by Das Sarkar M et al,[(11)] there was increase in seropositivity with advancing age. The seropositivity rate varied from 25% to 60.71% in the study group and from 0% to 17.64% in the control group. Mittal V et al[(12)] showed higher prevalence in case of women aged 36 yrs. and above.

In our study, the seroprevalence of IgG and IgM is more in high socioeconomic group. A similar study by Berno M et al[(13)] showed higher prevalence of Toxoplasmosis in high socioeconomic group (SEG) as compared to low SEG. Chintapalli S et al[(14)] 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[(15)] 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[(8)] 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[(16)] 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.

ACKNOWLEDGEMENT: It is a privilege on my part to express my gratitude to Dr. A. D. Urhekar, (Head of Dept.), Dr. Harapriya Kar (Assistant Professor) and other teaching staff of Department of Microbiology, MGM Medical College, Navi Mumbai for their guidance and advice to complete this work.

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