

# IgM Profile of Patients Suspected to Have Toxoplasmosis among Bad Obstetrics History Group Attending at Integral Institute of Medical Science & Research, Integral University, Lucknow

Dr. Manzoor Ahmad Thokar<sup>1</sup>, Alka Verma<sup>2</sup>, Dr. Arshiya Khan<sup>3</sup>

<sup>1</sup>Professor & Head Department of Medical Microbiology IIMS&R

<sup>2</sup>MSc Department of Medical Microbiology IIMS&R-Corresponding author  
Email- [thealkaverma\[at\]gmail.com](mailto:thealkaverma[at]gmail.com)

<sup>3</sup>Professor & Head- Department of OB/Gynae IIMS&R

**Abstract:** *Toxoplasmosis is caused by an obligate intracellular parasite i.e. Toxoplasma gondii. It is a pathogen of TORCH group which is responsible of congenital infection. TORCH is comprising of Toxoplasma gondii, Rubella, Cytomegalovirus (CMV), Herpes simplex virus (HSV) and other (Varicella-Zoster virus infection, Syphilis, Parvovirus B19, Hepatitis B), Aim & Objective: Detection of Toxoplasma IgM antibodies of BOH patients attending Integral Institute of Medical Sciences & Research Lucknow and to correlate present study finding with other National & International level data on IgM Toxoplasma studies. Method: Prospective cross-sectional study was conducted on pregnant female with fetal congenital malformation in present pregnancy and pregnant females with Bad obstetric history (BOH) attending Integral Institute of Medical Sciences & research using ELISA test for Toxoplasma IgM antibodies. The research was approved by institutional ethical committee. Result: In our study, the overall seroprevalence of Toxoplasma IgM antibody was 7.40% (6/81) Out of 81 majority of patients (43.20%) belonged to non-pregnant patients with BOH, followed by (32.09%) patients belonged to pregnant patients with BOH and (24.69%) patients belonged to patients who came for their first antenatal check-up. Conclusion: Our study gave us a clue about IgM status i.e. recent infection, made us wiser in formulating control measures for the prevention of Toxoplasmosis.*

**Keywords:** Toxoplasmosis, Bad Obstetrics History, Enzyme Linked Immunosorbent Assay, Recent infection

## 1. Introduction

Most extensive zoonosis is Toxoplasmosis and it's also a major human disease, particularly in children and it may cause mental retardation [1], visual or neurological impairment in them, and also associated with diversion of sex ratio towards males [2]. Toxoplasmosis is induced by the cleverest pathogen on earth, a protozoan parasite i.e. *Toxoplasma gondii*, it can cause severe congenital infection in developing fetus if the mother acquires acute infection during pregnancy [3]. With increase in gestation period the transmission rate increases while seriousness of infection decreases [4]. Manifestations of congenital infection ranges from asymptomatic to in-utero death of fetus, includes psychomotor retardation, and hearing difficulties [5]. Acute infection develops IgM type of antibodies, followed by the development of IgG antibodies hence acute infections characterized by the presence of IgM type of antibodies while chronic infection or previous infection is characterized by the presence of IgG type of antibodies. There are various serological methods available in the market to detect these antibodies from serum sample. Other congenital infections are also prevalent in India like Rubella, Herpes infections, Cytomegalovirus (CMV), Hepatitis B, syphilis, & Human immunovirus (HIV) which can transmit through transplacental route [5]. It is highly imperative to assess the status of seroprevalence of toxoplasmosis in central India, because the exact seroprevalence of toxoplasmosis is not known.

Toxoplasmosis can be transmitted through infected cats feces, contaminated vegetable fruits and milk [6]. Two hosts (cat, definitive and mice/rat, intermediate hosts) are required to complete agent's life cycle. Only cats can excrete the resistant stage of *T. gondii* (the oocyst) in faeces. Sexual cycle leads to formation of oocysts in the intestine of cat. Only asexual cycle occurs in intermediate hosts [7].

Clinical features range from mild febrile illness and lymphadenopathy in the immunocompetent host to encephalitis in the immunosuppressed host like the HIV-infected patient. Congenital infection manifests commonly as chorioretinitis, hydrocephalus, and intracerebral calcification [7].

## 2. Material & Methods

This prospective study was carried over a period from June 2019 to December 2019 in department of microbiology at Integral Institute of Medical Sciences and research, Lucknow. 81 serum sample from patients with bad obstetrics history and the patents who came for their first antenatal check-up was included in study. The patients were included in study from age group 20-46. Research project was cleared by departmental research & institutional ethical committee.

2.1 Inclusion Criteria

Pregnant female with fetal congenital malformation in present pregnancy and pregnant female with Bad Obstetrics History (BOH) attending Integral Institute of Medical Sciences and Research, Lucknow during June 2019 to December 2019 were included in the study.

2.2 Exclusion Criteria

Patients presenting with fetal congenital malformation caused by injuries during pregnancy and those not giving consent to participate in the study were excluded.

2.3 Sample Collection

For serological analysis, about 2ml of patient’s blood sample were collected in clean clot activator vial and blood were allowed to stand for 30 min to produce clot. When blood was coagulated, specimen was centrifuged for the separation of serum, After the serum was separated detection of Toxoplasma IgM was done by ELISA (Enzyme linked immunosorbent assay) using Calbiotech kit.

3. Observation and Result

Total 81 female patients were included in this study this bad obstetrics history (BOH) or who were came for their first antenatal check-up screened for Toxoplasmosis IgM by using Enzyme Linked Immunosorbent Assay (ELISA). It was found that maximum patients belonged to age group 26-30 i.e. 34.56% followed by age group 20-25 i.e. 28.39% age group 31-36 i.e. 25.92% least in age group belongs to 37-40 i.e.7.40% and 41-46 i.e. 3.70%(table-1,fig-1). Out of 81 majority of patients (43.20%) belonged to non-pregnant patients with BOH, followed by (32.09%) patients belonged to pregnant patients with BOH and (24.69%) patients belonged to patients who came for their first antenatal check-up(table-2). Total seroprevalence of Toxoplasma IgM in this study is 7.40% (6/81) (table-3,fig-2)

Table 1: Showing distribution of patients according to age

Age group (In years)	No of patients
20-25	23
26-30	28
31-36	21
37-40	6
41-46	3
<b>Total</b>	<b>81</b>

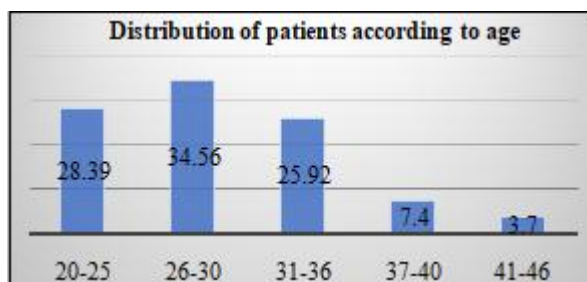


Figure 1

Table 2: Distribution of patient according to their BOH condition

BOH condition of patients	Number of Patients
Pregnant patients with BOH	26
Non pregnant patients with BOH	35
Patients came for their first antenatal checkup	20
<b>Total</b>	<b>81</b>

Table 3: Shows patients who has an acute infection

Result	Number of female patients	Percent %
Reactive	6	7.40
Non-Reactive	75	92.5
<b>Total</b>	<b>81</b>	<b>100</b>

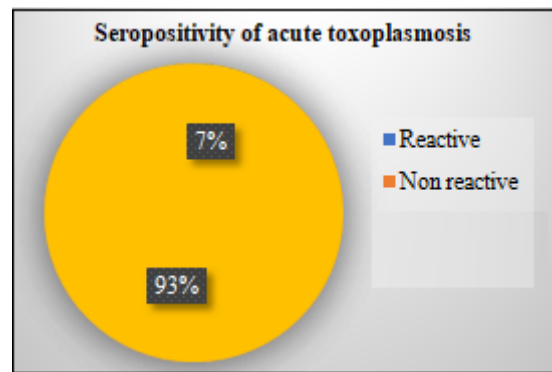


Figure 2

4. Discussion

Toxoplasmosis seroprevalence varies among different regions of the world, among them many regions showing a rising trend of Toxoplasmosis in recent years. Toxoplasmosis is present in every country and the seropositivity range varies from less than 10% to over 90%. (Pappas G et al, 2009) All over the world, the number of people infected with *Toxoplasma gondiis* over 6 billion. The global estimated incidence of congenital toxoplasmosis is 1,90,100 annual cases (95% CI: 1,79,300-2,06,300). This amounts to an incidence rate of approximately 1.5 cases per 1000 live births. The regions with the highest incidence of congenital toxoplasmosis include parts of the Middle East and some low -income countries in Africa. (Torgerson PR et al, 2013) The seroprevalence of toxoplasma in pregnancy in India is 3.3% for IgM and 45% for IgG antibodies. (Singh S et al, 2004) A study was conducted on pregnant women in the Western Region of Turkey, out of 1972 pregnant women, 8 (0.4%) were positive for the anti-Toxoplasma IgM antibody. (Tamer et al, 2009) Seroprevalence of Toxoplasma gondii, among pregnant women in Southern Turkey, out of 1652 only 9(0.54%) were positive for Toxoplasma IgM, compared to the present study is much less. (Ocak et al, 2007) In Delhi, a study report that of the 120 women seropositivity forttoxoplasmosis was 11.6% (Kaur et al, 1999) Another study was carried out to determine the prevalence of IgM antibodies to Toxoplasma infection in pregnant women for one year in the Government Medical College, Amritsar (Punjab) India, 200 pregnant women with BOH and 100 without BOH, IgM seropositivity to toxoplasma infection was 42.5%. The highest percentage of toxoplasma IgM was found in cases of abortions (71.8%) (Chopra S et al, 2004) in India on pregnant women to differentiate between Toxoplasma infection and infection more than 4 months old by IgG avidity method, the IgG

seroprevalence of toxoplasmosis was 45%. (Singh S. et al, 2004)

In our study, the Toxoplasmosis IgM seropositivity among Antenatal cases and case with BOH was (7.40%) which is having low seroprevalence in comparison to another study which was (12%) in Bhatia et al. Other having similar seropositivity ANC cases were reported as patel et al 27.94%, Anu Bansal et al 7%, MJ Gopalipur et al 7.8%.

In India, the overall seropositivity for Toxoplasma gondii antibodies varies from 9.63-41.67%<sup>4,20-24</sup>. But globally its seropositivity ranges from less than 10% to over 90%. In the present study majority of patients are from rural areas (23.80% in comparison to 15.38% in Urban areas) mentioned reasons for Toxoplasmosis are with and humid atmosphere, contaminated water supplies, poor cooking habits, lack of hygiene. (Khurana S et al)

## 5. Conclusion and Significance

This study was done to detect Toxoplasma IgM antibodies or Bad Obstetrics History Patients attending Integral Institute of Medical Sciences and Research. By using ELISA test, we found 6(7.40%) out of 81 samples reactive for Toxoplasma IgM.

The study will give us a clue about IgM status i.e. recent infection and will make us wiser in formulating control measures.

## 6. Acknowledgement

The authors wish to thank the Chairperson and Dean of the institute for providing laboratory facilities and healthy working atmosphere during the study period. The authors are also thankful to the technical staff of the institute for providing necessary helping hand during endeavour. The corresponding author would like to thank her parents for their love, encouragement and support.

## References

- [1] Sonar SS, Brahmhatt MN. Toxoplasmosis: An important protozoan zoonosis. *Vet World* 2010;3:436-9.
- [2] Kancova S, Sulc J, Nouzová K, Fajfrlík K, Frynta D, Flegr J. Women infected with parasite Toxoplasma have more sons. *Naturwissenschaften* 2007;94:122-7.
- [3] Garcia LS. *Diagnostic medical parasitology*. 5th ed. Washington DC: ASM press; 2007.
- [4] Khurana S, Bagga R, Aggarwal A, Lyngdoh V; Shivapriya, Diddi K, et al. Serological screening for antenatal toxoplasma infection in India. *Indian J Med Microbiol* 2010;28:143-6.
- [5] Koneman EW. *Koneman's Color Atlas and Textbook of Diagnostic Microbiology*, 2006.
- [6] Koskiniemi M, Lappalainen M, Hedman K. Toxoplasmosis needs evaluation, An overview and proposal. *Am J Dis child* 1989;143:724-8
- [7] Montoya JG, Kovacs JA, Remington JS. Toxoplasma gondii. In: Mandell
- [8] GL, Bennett JE, Dolin R, editors. *Mandell, Douglas and Bennett's Principles and Practice of Infectious Diseases*. 6th ed. Philadelphia: Elsevier Churchill Livingstone; 2005. p. 3170-93
- [9] Pappas G, Roussos N, Falagas MF. Toxoplasmosis snapshots; global status of Toxoplasma gondii seroprevalence and implications for pregnancy and congenital toxoplasmosis. *Int J Parasitol* 2009;39:1385-94
- [10] Torgerson PR, Mastroiacovo P. The global burden of congenital toxoplasmosis; a systematic review. *Bull World Health organ*, 2013;91(7):501-8
- [11] Singh S, Pandit Aj. Incidence and prevalence of toxoplasmosis in Indian pregnant women; a prospective study. *Am J Reprod Immunol*, 2004;52(4):276-83
- [12] Gulden ST, Devrim UEC. Seroprevalence of Toxoplasma gondii, Rubella and Cytomegaloviruses among pregnant women in Western Region Of Turkey. *Clin Invest Med* 2009;32(1): E43-7
- [13] Ocak S, Zeteroglu S, Ozer C, Dolapcioglu K, Gungoren A. Seroprevalence of Toxoplasma gondii, rubella and cytomegalovirus among pregnant women in southern Turkey. *Scand J Infect Disease* 2007; 39(3):231-4
- [14] Kaur R, Gupta N, Nair D, Kakkar M, Mathur MD. Screening for TORCH infections in pregnant women: a report from Delhi. *Southeast Asian J Trop Med Public Health* 1999;30(2): 284-6
- [15] Chopra S, Arora U, Aggarwal A. Prevalence of IgM antibodies to Toxoplasma, Rubella and Cytomegalovirus infections during pregnancy. *Journal of JK Science* 2004;6(4):190-192
- [16] Bhatia VN, Meenakshi K, Agrawal SC. Toxoplasmosis in South India-a serological study. *Ind J Med Res* 1974;62:1818-20
- [17] Kamlesh Kumar Patel, G. Shrivastava, G. Bhatambare, T. Bahpai. Antenatal detection of IgM and IgG antibodies to Toxoplasma gondii in a hospital from central India. *J. International Journal of health system and Disaster Management* .2014 V2;issue-3p133-135
- [18] Anu Bansal, Veenu Gupta, Sunil Juneja, Sunil Gupta. Seroprevalence of Toxoplasmosis in Pregnant women with Bad Obstetric History. *Journal of Paediatric, obs& Gynae*; Oct. 2010; Vol 1; no.10;389-392
- [19] M.J. Gopalipur, B. khodabakhshi and E. Ghaemi. Possible role of TORCH agent in congenital malformation in Gorgan, Northern Islamic republic of Iran. *East Mediat Health J*; 2009 Mar-Apr; 15(2);330-6
- [20] Sucilathangam G, Palaniappam N, Sreekumar C, Anna T. IgG-Indirect fluorescent antibody technique to detect seroprevalence of Toxoplasma gondii in immunocompetent and immunodeficient patients in southern districts of Tamil Nadu. *Indian J Med Microbiol* 2010;28:354-7.
- [21] Borkakoti BJ, Borthakur AK, Gohain M. Prevalence of Toxoplasma gondii infection amongst pregnant women in Assam, India. *Indian J Med Microbiol* 2007;25:431-2.
- [22] Singh S, Pandit AJ. Incidence and prevalence of toxoplasmosis in indian pregnant women: A

prospective study. Am J Reprod Immunol  
2004;52:276-83.

- [23] Khairul Anuar A, Nissapatorn V, Noor Azimi MA, Fong MY, Init I, Rohela M, et al. Toxoplasma antibody in pregnant women in northern Peninsular Malaysia. Diagnosis 1991;5:18-23.
- [24] Nissapatorn V, Noor Azmi MA, Cho SM, Fong MY, Init I, Rohela M et al. Toxoplasmosis: Prevalence and risk factors. J ObstetGynecol2003;23:618-24