

Sero-prevalence of *Toxoplasmosis* in Pregnant Women with Bad Obstetric History attending a rural tertiary care Hospital in West Bengal, India

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ABSTRACT

Background:- *Toxoplasma gondii* infection in pregnancy is associated with potentially tragic outcome in the foetus and newborn worldwide, despite it being preventable. The infection is acquired via ingestion of infected, undercooked meat or contaminated food or water or close contact with infected but asymptomatic cats. Transmission to the foetus occurs almost exclusively from the infected mothers during gestation resulting in congenital toxoplasmosis. **Objective:-** Study was conducted in 80 women with BOH, attending the antenatal clinic of the Burdwan Medical College & Hospital, West Bengal, India to determine the seropositivity of Ig M & Ig G antibodies of *Toxoplasmosis*, using commercially available enzyme-linked immunosorbent assay diagnostic kit. 20 antenatal women with previous history of normal deliveries acted as the controls. **Results:-** Of the 80 BOH ante-natal mothers, the overall sero-positivity was found to be 36 (45%) for *Toxoplasma* specific IgM antibodies with maximum sero-positivity of 44.44% (16/36) among 21-25 yrs mothers. Repeated abortions was the commonest outcome (66.66%, 24/36) followed by intra-uterine deaths (16.66 %, 04/36). **Conclusion:-** Systematic education and serological screening of pregnant women are the most reliable and currently available strategies for the prevention, diagnosis, and early treatment of the infection in the offspring.

Key Words: - *Toxoplasma gondii*, BOH, Ig M & Ig G antibodies, enzyme-linked immunosorbent assay.

Date of Submission: 17-11-2018

Date of acceptance: 29-11-2018

I. Introduction

Toxoplasmosis is a zoonotic protozoal infection caused by a ubiquitous, obligate intracellular parasite, *Toxoplasma gondii*. (1) It occurs in pregnancy as an acute infection causing damage to the foetus and is one of the important causes of bad obstetric history (BOH). (2) The parasitic infection is also very dangerous in the immunocompromised causing life threatening conditions such as encephalitis, pneumonia and chorioretinitis. (3) The infection is transmitted from the cat's faeces, through contaminated vegetables, fruits and milk. The foetus is affected transplacentally or during vaginal delivery (4) resulting in serious sequelae-- spontaneous abortions, stillbirths, intrauterine growth retardation, preterm deliveries, or congenital foetal anomalies. (5)

The risk of congenital toxoplasmosis, however, depends on the timing of the mother's acute infection. The disease is usually severe when acquired in the first trimester, and the severity decreases as the gestational age advances, leading to a mild or an inapparent disease at birth. The spectrum of outcome of congenital toxoplasmosis, thus, ranges from subclinical infection to intrauterine death. (6) Various manifestations of the congenital infection includes prematurity, peripheral retinal scars, sensory deficits, developmental delay, impaired psychomotor performance, mental retardation, damages to central nervous system (the classic triad of cerebral calcification, hydrocephalus, microcephaly), chorioretinitis, low birth weight, enlarged liver and spleen, jaundice, anaemia, petechiae and eye damage. (1,7) Children who are apparently normal at birth may develop the disease later in life. (3)

The overall rate of transmission of infection to the foetus is about 45%-- 6% subclinical infection, 30% severe damage and the rest 9% death of the foetus (8).

Toxoplasmosis is, thus, a significant risk factor for bad obstetric outcome leading to a high degree of foetal morbidity and mortality. Treatment of a pregnant mother reduces the risk of foetal infection by approximately 60% (6). Therefore, early diagnosis and treatment of toxoplasmosis is essential.

Toxoplasmosis is usually diagnosed by serologically by ELISA for specific IgM and IgG antibodies. A positive IgG titre indicates that a patient has been infected with *T. gondii* while a negative IgM result excludes a recently acquired infection, unless the sera is tested so early that an antibody response has not yet developed or is undetectable (9).

In view of the above observations, the study was carried out on in antenatal women with bad obstetric history to observe the sero prevalence of toxoplasmosis in pregnant women with BOH.

II. Materials & Methods

The analytical study was carried out in the Department of Microbiology of a rural tertiary care hospital of West Bengal for a period of three months from January 2017- March 2017 after taking ethical committee clearance from the institutional ethics committee prior to the study.

Whole blood samples were collected, after taking written informed consent, from 80 antenatal mothers aged between 20-40 yrs of age attending the Gynae & Obstetrics OPD with BOH--spontaneous abortions, missed abortions, intra uterine death (IUD), preterm deliveries, still births, congenital malformations negative for any previous serological evidence of any of the TORCH agents. The rest 20 were control--mothers with previous normal pregnancies and no history of BOH.

Patients with medical illnesses--diabetes, pregnancy induced hypertension, chronic renal disease, Rh incompatibility, syphilis; APH, uterine anomaly defects, or any other illnesses were excluded from the study.

Aseptically 3ml of blood was collected by venepuncture using sterile disposable syringes and centrifuged. The serum was transferred into numbered aliquots, preserved at -20°C and screened for Toxoplasma specific IgM antibodies using commercially available (ELISA) kits manufactured by Calbiotech (Cat# TX024M & Lot#TXM4546).

III. Results

The overall sero-positivity for IgM antibodies was 36 (45%) in the 80 bad obstetric history (BOH) ante-natal mothers and 02 (10%) in the control group. [TABLE 1]

TABLE I: - SEROPOSITIVITY IN THE STUDY & CONTROL GROUPS

GROUP	TOTAL NO. OF CASES	IgM POSITIVE	PERCENTAGE (%)
STUDY	80	36	45
CONTROL	20	02	10

Age group-wise prevalence for IgM antibodies showed maximum sero-positivity of 44.44% (16/36) in the 21-25 yrs age mothers and was closely followed by 26-30 yrs mothers (33.33%, 12/36) which decreased with age reaching 8.33% (03/36) in the age group > 30years. [TABLE 2]

TABLE II:- AGE-WISE SEROPOSITIVITY IN STUDY & CONTROL GROUPS

AGE in years	SERA TESTED		IgM positive		PERCENTAGE (%)	
	STUDY	CONTROL	STUDY	CONTROL	STUDY	CONTROL
≤ 20	11	2	05	0	6.25	0
21-25	35	10	16	1	20	5
26-30	21	06	12	1	15	5
>30	13	02	03	0	3.75	0
Total	80	20	36	2	45	10

The pregnancy outcomes among the BOH mothers with positive IgM sero-positivity are shown in TABLE 3. Our study showed that repeated abortions was the commonest outcome (66.66%, 24/36) followed by intra-uterine deaths (16.66 %, 04/36). In the control group, though 2 mothers showed positive IgM sero-positivity, both of them had normal pregnancy outcome with babies having no defects.

TABLE III:- OUTCOME PERCENTAGES IN THE STUDY GROUP

TYPE OF BAD OBSTETRIC HISTORY	SEROPOSITIVE (n=36)	PERCENTAGE (%)
ABORTION	24	66.67
IUFD/STILLBORN	06	16.67
PREMATURITY	04	11.1
CONGENITAL DEFECTS	02	5.56
TOTAL	36	100

IV. Discussion

Toxoplasma is an important cause of foetal loss in women. In our study, out of 80 cases in the study group, 36 (45%) were sero-positive for Toxoplasma specific IgM antibodies which is comparable to the observations made by Yasodhara et al., in 2001 who reported a seropositivity of 18.3% for Toxoplasma specific IgM antibodies. (10) Similar observations were also recorded by Chintapalli S et al in 2013-- 16/80 (20%) sero-positive for Toxoplasma specific IgM antibodies. (2) A study in Manipur however recorded a seropositivity of

2.32% for IgM [11] and Borkakoty et al. in 2007 also observed an IgM seroprevalence of 5.9% (12) in the same age group.

Out of 36 sero-positive cases in the study group, the highest incidence of toxoplasmosis was observed in the age group 21-25 years--16 cases (44.44%). It was observed that the seropositivity for Toxoplasma specific IgM antibodies increased from the age group <20 years 13.88% (05 out of 36) to 44.44% (16 out of 36) in 21-25 year age group similar to the observation of Mittal et al., who in their study revealed that the lowest rate of antibody level was in the age group 15-20 years which increased with increase in age. (13) Spalding et al. also observed a higher prevalence among people aged 20-30 years. (14). Borkakoty et al. (15) and Chintapalli S et al in 2013 (2) also found the same prevalence. This increased prevalence of infection in the older age-groups is probably because of increased probability of an individual coming into contact with the transmission routes increases as her age increases (1).

In our study, abortions (66.66%, 24/36) constituted the major outcome of pregnancy closely followed by the IUD--six still births (16.66%). This was in concordance with the observations recorded by Sarkar et al. (1) who also reported abortion (51.92%) was the commonest outcome followed by stillbirths/intrauterine foetal deaths (36.53%). Surpam et al., however, found that though abortions (27.27%) were the commonest, it was followed by preterm labour (18.18%). (16) Bachhiwal et al. reported that abortion was the commonest (85.45%) form of pregnancy wastage, followed by congenital anomalies. (17).

The observation of Saxena et al however differed. According to them, congenital malformations (33.3%) were the commonest outcome followed by premature labour, abortions, and stillbirths (18).

V. Conclusion

There is evidence that active Toxoplasma infection persists and may become the cause of repeated abortions or still births. (19) Illiteracy, poverty, overcrowding, lack of hygiene and associated environmental factors play a crucial role for the high incidence of Toxoplasmosis and thus the socio-epidemiological aspects of the infection play an important contributing factor for the spread of the disease.

As Toxoplasmosis is amenable to treatment, early detection with repeated serological examination and treatment in all pregnancies have an effective role in reducing the transmission of infection from mother to baby [20] thus reducing the hazard substantially.

Acknowledgement

We would like to thank the Principal of Burdwan Medical College for allowing us to conduct the study.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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Sero-prevalence of Toxoplasmosis in Pregnant Women with Bad Obstetric History attending a rural ..

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Dr. Saswati Chattopadhyay. , ““Sero-prevalence of Toxoplasmosis in Pregnant Women with Bad Obstetric History attending a rural tertiary care Hospital in West Bengal, India.”.” ” *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 17, no. 11, 2018, pp 29-32.