# **Toxoplasmosis in Pregnancy: A Silent Threat**

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Toxoplasmosis is a worldwide multisystem infection caused by the protozoan parasite *Toxoplasma gondii*. If acquired during pregnancy it can cross the placenta and can lead to adverse fetal outcome. The present study was done to know the seroprevalence of toxoplasmosis among pregnant women with BOH. Over a period of one year, 94 pregnant women with BOH were screened for toxoplasma specific antibodies. Among them 35(37%) tested positive for IgG antibodies, 12(13%) were positive for IgM antibodies and 52(55.32%) were seronegative. The presence of IgM antibodies alone or in combination with IgG suggests acute infection, posing risk to present pregnancy. Confirmed seropositivity, should be combined with fetal diagnosis to enable management, thereby reducing adverse fetal outcomes. Seronegative pregnant women are at risk of acquiring toxoplasmosis; therefore need to be educated to prevent contacting infection.

Key words: Pregnancy, Fetus, Toxoplasmosis, Seroprevalence.

Toxoplasmosis is a worldwide multisystem infection caused by the protozoan parasite *Toxoplasma gondii*, which can infect all vertebrates<sup>1</sup>. It is a zoonosis, widely spread in nature and is one of the most common parasitic infections of humans<sup>2</sup>. Approximately one third of all human beings have been exposed to this parasite. If acquired during pregnancy it can cross the placenta and lead to preterm birth, still birth, miscarriage or congenital toxoplasmosis<sup>1,3</sup>. The risk of congenital toxoplasmosis depends upon the time of acquisition of acute maternal infection. Overall 10% of the babies are born with severe disease<sup>4</sup>. Fetal losses could be because of genetic, environmental factors, infections, radiation, occupational hazards or addiction habits. Association of infective causes, especially TORCH & BOH has been established. TORCH infections are considered a known causal factor which is treatable<sup>5</sup>.

Serological studies show a considerable variation in the prevalence of toxoplasma infection from 7.5% to 95% in different parts of the world, and varies between different populations within the same country<sup>6</sup>. In India, the exact seroprevalence of toxoplasmosis in humans is not known. However various studies revealed a prevalence rate ranging from 5% to 80% in adults and up to 77% women of child bearing age<sup>7</sup>.

The present study was done to know the seroprevalence of toxoplasmosis among pregnant

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women at risk for developing toxoplasmosis and contribute to the management and antenatal followup of pregnant women to reduce further complications.

## MATERIALS AND METHODS

In our study, over a period of one year 94 pregnant women with bad obstetric history (BOH), attending antenatal clinic of OBG dept, were tested for toxoplasmosis, at the Dept of Microbiology. BOH implies previous unfavorable fetal outcome in terms of two or more consecutive spontaneous abortions, intrauterine deaths (IUD), intrauterine growth retardation (IUGR), still births, preterm labor, neonatal deaths and or congenital anomalies<sup>8</sup>. Pregnant women with established cause for previous pregnancy loses were excluded. Serum samples were collected from pregnant women after obtaining informed consent. The serum samples were tested for toxoplasma specific IgM and IgG antibodies by ELISA using purified *toxoplasma gondii* antigen propagated in-vitro in HEp 2 cells. For IgM antibodies immunocapture ELISA was done. Pathozyme toxoplasma ELISA kits, supplied by Omega diagnostics were used. The assay and interpretation were done as per the manufacturer's instructions.

#### RESULTS

Over a period of one year 94 pregnant women with BOH were screened for toxoplasma specific antibodies.

Among 94 pregnant women 35 (37%) tested positive for IgG antibodies and 12 (13%) were positive for IgM antibodies.

	Abortion (%)	IUD (%)	IUGR (%)	Still births (%)	Preterm labor (%)	Congenital anomalies (%)	Total (%)
Total	60	18	1	4	5	6	94
n=94	(63.83)	(19.15)	(0.01)	(0.04)	(0.05)	(0.06)	(100%)
Seropositive	23	12	0	1	4	2	42
n=42	(54.76)	(28.57)	(0.00)	(2.38)	(9.52)	(4.76)	(44.68%)
IgG	20	9	-	1	3	2	35
n=35	(57.14)	(25.71)		(2.85)	(8.57)	(5.71)	(37%)
IgM	5	5	-	-	1	1	12
n=12	(41.67)	(41.67)			(8.33)	(8.33)	(13%)
Both	2	2	-	-	-	1	5
IgM & IgG n=5	(40.00)	(40.00)				(20.00)	(5.32)
Seronegative	37	6	1	3	1	4	52
n=52	(71.15)	(11.53)	(1.92)	(5.76)	(1.92)	(7.69)	(55.32%)

Table 1. Toxoplasma seroprevalence

#### DISCUSSION

There are only a handful of studies available from India that has estimated the incidence of toxoplasma infection during pregnancy. The most reliable information about the burden of toxoplasmosis in the general population is derived from serosurveys<sup>9</sup>. *Toxoplasma gondii* infection during pregnancy poses a serious risk to the fetus, therefore timely and accurate diagnosis is essential. Lack of knowledge about the infection, diagnosis and interpretaion of the test results is the major problem in indian context.

The present study focused on seroprevalence of toxoplasmosis in 94 pregnant women with BOH. Among them, 42(44.68%) women tested positive for toxoplasma specific antibodies. Studies in India have reported the seroprevalence of toxoplasmosis in women with abnormal pregnancies, ranging from 17.5% to 52.32%<sup>10</sup>.

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In our study 35 (37%) pregnant women tested positive for IgG. Different studies have reported IgG seroprevalence as 33%, 41.7% & 55%<sup>11,12,13</sup>. IgM seropositivity in our study was 12(13%). Other authors have reported 10.52, 18% & 40%<sup>12,10,14</sup>. A very low prevalence of 3% IgM positivity has been reported from North India. A national serological survey of *T. gondii* in India has reported higher prevalence in South India<sup>15</sup>. Five (5.32%) pregnant women were positive for both IgG and IgM antibodies in our study. Another study has reported 2.4% positivity for both IgG and IgM antibodies among pregnant women<sup>16</sup>.

The presence of IgG antibodies indicates that infection has occurred at some point, but doesn't distinguish between an infection acquired recently and one that is acquired in distant past. The presence of IgM antibodies with IgG probably indicates an acute infection within previous 3 months<sup>9</sup>. However false positive results may be obtained in IgM testing and the positivity may continue for nearly a year<sup>1</sup>.

Primary toxoplasma infection acquired during pregnancy may result in severe morbidity or even death of fetus. The diagnosis of primary toxoplasmosis is challenging because of extreme variability of humoral immune response and differences in the time of appearance and persistence of antibodies.

About 10% of prenatal infections result in abortions or neonatal deaths. Another 10% to 23% develop clinical toxoplasmosis at birth and about 67% to 80% are asymptomatic. Although these infants appear healthy at birth, they may develop late sequelae involving eyes (retinochoroiditis, strabismus, blindness), CNS (neurological deficiencies, convulsions, mental retardation) or of the ear (deafness)<sup>17</sup>. Congenital toxoplasmosis is currently attributable to 90% of retinochoroiditis discovered in infants & young children and at least 20% of adults<sup>18</sup>.

Though there is debate about the benefits and potential side effects of medical regimens, what is agreed upon so far is the value of educating pregnant women and physicians on making the best use of laboratories, before major treatment decisions are made<sup>19</sup>. Treatment of acute infections during pregnancy has been associated with approximately 50% reduction in fetal infection. Prenatal treatment of congenital toxoplasmosis reduces the risk of neurological sequelae by three quarters<sup>20</sup>.

The approach to the diagnosis and treatment of congenital toxoplasmosis has been one of the flux and debate, fuelled by lack of knowledge, lack of consensus, different methods of screening and different national policies for screening in different parts of the world<sup>19</sup>. Confirmed maternal serological screening for toxoplasmosis should be followed by fetal diagnosis, while managing BOH cases to reduce adverse fetal outcome.

55.32% pregnant women were seronegative for toxoplasma in the present study. Because of being seronegative these pregnant women are at risk for toxoplasmosis. They should be given education about the transmission of toxoplasmosis and ways to protect against infection<sup>1</sup>. Further research is required to reevaluate the literature critically, review new treatment regimens and examine costs and benefits of screening and treatment of toxoplasmosis in pregnancy.

#### CONCLUSION

To prevent life threatening sequelae which have a significant effect on the quality of life, antenatal screening and treatment as well as follow up of pregnant women for toxoplasmosis are of great importance.

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