

OUTCOME OF TOXOPLASMOSIS IGM POSITIVE PREGNANCY IN TERTIARY CARE HOSPITAL

Aaseya Hanif Baig, Sohail Shahzad*, Shahida Sheraz**, Muhammad Boota

Military Hospital/ National University of Medical Sciences (NUMS) Rawalpindi Pakistan, *Combined Military Hospital Mangla/ National University of Medical Sciences (NUMS) Pakistan, **Combined Military Hospital Abbottabad/ National University of Medical Sciences (NUMS) Pakistan

ABSTRACT

Objective: The objectives of this study were to identify the demographic characteristics of IgM positive toxoplasma patients, to determine the percentages of different outcomes of these pregnancies and their relation to the demographic characteristics.

Study Design: A descriptive cross sectional study.

Place and Duration of Study: This study was conducted at Military Hospital Rawalpindi Pakistan from Jun 2007 to Jun 2008.

Material and Methods: The patients were selected on the basis of previous bad obstetric history. Cases underwent investigations and on the bases of positive serum marker for the disease that is toxoplasma IgM antibody and demographic data were collected regarding age, maternal residence and socioeconomic status. Patients' exposure to any identified risk factors were documented and given treatment of toxoplasmosis and were followed to find out whether those ended in abortion, intrauterine deaths, fetal anomalies, an alive baby or congenital toxoplasmosis in newborn.

Results: Data were analyzed using SPSS version 10. Different outcomes were computed and it was found out that the disease was more common among patients of lower/poor socioeconomic status 64% positive for toxoplasmosis where as 36% belonged to average economical strata. This also had an effect on the outcome of pregnancy in the form of positive *Toxoplasma gondii* IgM. Chi square test showed *p*-value which was 0.000. Mean ages of the patients with toxoplasma IgM was 26.46, 66% of patients had previous 02 pregnancy losses and 18% had previous 03 losses. 10% patients had an abortion because of this and another 10% had an intra-uterine death. With this disease 60% of patients gave birth to IgM positive fetuses out of which 16% had central nervous system (CNS) changes and 2% had eye changes.

Conclusion: Toxoplasmosis is prevalent in many parts of our country but the risk factors and it's outcomes have not been studied in our population. This disease can give good outcome with proper treatment and compliance. Prevention of this disease is possible by avoidance of the risk factors and improvement in available health and housing facilities.

Keywords: Toxoplasmosis, *Toxoplasma gondii*, IgM, Pregnancy outcome.

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INTRODUCTION

Toxoplasmosis is caused by the intracellular parasite *Toxoplasma gondii*, which affects up to one-third of the world's population¹. Toxoplasmosis is the third most fatal food-borne disease in the United States. The overall seroprevalence in the United States is estimated to be 22.5% and 15% of women aged 15-44 years

are seropositive². Seroprevalence of *Toxoplasma gondii* varies among populations and correlates with eating and hygiene habits of each population³.

In Europe congenital toxoplasmosis affects between 1 and 10 in 10,000 newborn babies of whom 1% to 2% develop learning difficulties or die and 4% to 27% develop retinochoroidal lesion leading to permanent impairment of vision⁴.

In Asian countries prevalence as low as 0.8%⁵ is quoted, while prevalence as high as 41.8% to 55.4% in have been reported in pregnant

Correspondence: Dr Aaseya Hanif Baig, House # 110/B-1 Mughalabad Factory Quarters Road Rawalpindi Pakistan
Email: aaseyabaig@yahoo.com
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women in Indian⁶, Nepalese and Malaysian populations⁷. Toxoplasmosis infection is acquired by ingestion of viable tissue cyst in meat or oocyst excreted by cats that contaminate the environment. Contact with soil or vegetables or fruits contaminated with soil are a risk factor for toxoplasmosis in pregnancy and consumption of unpasteurized milk and its products is also associated with the infection⁸.

Toxoplasmosis can be transmitted to the foetus in utero transplacentally⁹. Toxoplasmosis is transmitted more frequently during later part of gestation but the disease is more severe if infection is acquired during the 1st trimester and 2nd trimester¹⁰. Probability of infection is 1% if infection occurs in preconception period, but increases to 10-23% if occurs in 1st trimester, 30-54% in 2nd trimester and 60-65% in 3rd trimester¹¹.

When toxoplasmosis infection is suspected in a woman during pregnancy or even before pregnancy the diagnosis is made primarily by serological investigations. Initial maternal serological screening relies on identification of IgG and IgM antibodies and positive IgM antibodies shows acute infection¹².

Acute infection during pregnancy may cause spontaneous abortion or serious foetal effects⁸, and is an established cause of intrauterine death¹. Long term sequelae in children infected in utero include sensory deficits, developmental delays, mental retardation, or central nervous system lesions¹³. Seventy-five percent of infants born with congenital toxoplasmosis infection are asymptomatic and 8% show severe central nervous system (CNS) impairment, which might not manifest for several years¹⁴. The classic triad of chorioretinitis, intracranial calcifications and hydrocephalus is found in fewer than 10% of infected infants. Neurological impairment may initially present as seizures, necessitating specific evaluation and treatment¹¹.

The specific maternal therapy can reduce the incidence of infection in fetus by 50%¹⁵. spiramycin or azithromycin 1g per oral (PO) q8h

or pyrimethamine (50 mg/d PO) and sulfadiazine (3 g/d PO in 2-3 divided doses) until delivery. This study was aimed to identify the demographic characteristics of IgM positive toxoplasma patients, to determine the percentages of different outcomes of the pregnancies and their relation to the demographic characteristics.

MATERIAL AND METHODS

This study was conducted at Military Hospital Rawalpindi and it was started in Jun 2007 to Jun 2008. During one year of study 50 pregnant patients were selected through non-probability purposive method. Pregnant mothers of all ages, races and belonging to any socioeconomic status with history of exposure to risk factors, abortions or pregnancy losses before 24 weeks, previous one or more pregnancy losses after 24 weeks, abnormal fetuses especially hydrocephalus, and neonatal deaths. Patients having history like diabetes mellitus and thyroid problems, and those positive for anti cardiolipin antibody were excluded. Suspected cases were diagnosed on the basis of positive serum toxoplasma IgM antibody. Demographic data were collected regarding age, race, educational status, occupation, maternal residence and socioeconomic status based on the number of persons in the house, number of rooms in the house, material of the floor of the house, availability of drinkable water, and form of elimination of excretes. Clinical data including obstetric history, gestational age, and behavioral data including animal contacts, cleaning up cat excrement, foreign travel, kind of meat consumption (lamb, beef, goat, chicken,, rabbit, deer, fish), raw or undercooked meat handling or consumption of unpasteurized milk and milk products untreated water, unwashed fruits and vegetables were collected.

Their pregnancies were followed upto find out the outcome whether ended in abortion, intra-uterine death, hydro-cephalus, intrauterine growth retardation (IUGR), oligo-hydramnios, and congenital toxoplasmosis, born alive and

healthy or neonatal death. All patients were given azithromycin or counseled. Cord blood was saved for screening for toxoplasma IgMAB. The neonatologist examined the neonates for any congenital or eye defects.

Data were analyzed using statistical package for social sciences (SPSS) version 10.0 *p*-value <0.05 was considered statistically significant. Mean \pm SD was calculated for age. Frequencies and percentage were calculated for miscarriage, intrauterine deaths, abnormal fetuses, normal babies, and babies with toxoplasmosis. Chi-square test was applied to study the association *p*-value <0.05 was considered as significant.

RESULTS

The results of this study showed that among 50 patients 31 were at or above this age group and 19 belonged to ages below this and the mean age was 26.46 ± 3.84 SD. This study has shown that this disease was found to be present in (64%)

patients did not change with age. A statistically insignificant difference (*p* value 0.054) was found between the two groups based on age and thus no relationship in outcome could be worked out.

Significantly more IgM positive babies were born to poor socioeconomic status group as compared to the average class group (*p* value <0.000). There were 6 preterm (PT) deliveries with IUGR and oligohydramnios and with no sign of congenital toxoplasmosis. There were 5 (10%) patients that ended up in miscarriages and five (10%) had intrauterine death.

Outcome of pregnancies showed that 5 (10%) had abortion, intrauterine death in 10%. Alive fetuses with IgM positive were 25 (60%), out of these 4% had eye changes and 16% had central nervous system (CNS) changes among all positive mothers as shown in table-II.

DISCUSSION

In this study, it was found that this disease

Table-I: Relationship of Socioeconomic status and outcomes.

| Socio-economic status (S/E) | Born | | Total | <i>p</i> -value |
|-----------------------------|----------------------|--------------|-------|-----------------|
| | Healthy IgM negative | IgM positive | | |
| Poor | 5 | 27 | 32 | <0.000 |
| Average | 15 | 3 | 18 | |
| Total | 20 | 30 | 50 | |

Table-II: Outcomes of toxoplasmosis IgM positive pregnancies.

| Variables | Frequency(%) |
|----------------------------------|--------------|
| Abortion | 5(10%) |
| Intrauterine death | 5(10%) |
| IgM +ve Alive fetuses | 25(60%) |
| CNS changes among IgM +ve fetuse | 8(16%) |
| IgM -ve fetuses | 15(40%) |

poor socioeconomic class.

Data has revealed that 33 (66%) had previous 02 pregnancy losses, (12%) that is 6 had previous 1 miscarriage, 9 (18%) had previous losses, 1 had previous 4 miscarriages as shown in figure.

The outcomes of these pregnancies with relation to age showed that the outcome of these

was more common in rural areas and in people of low socio-economic status (64%). Spalding et al in their study have concluded that low education, low income, poor housing and sanitary condition are strongly related to the incidence of this disease¹⁶.

This disease is more prevalent in the females who are house wives this is in accordance with

the results as depicted by Cosme Alvarado et al and Seema et al who have given the incidence of 68% among house wives¹⁷.

Cosmo Alvarado et al (2006) have shown in their study that there is lesser incidence of infection in low socio economic group of people because they have lesser access to utilization of meat and its products¹⁸.

In our population, there was a higher proportion of patients with age group that ranged from 21-28 years and there was no association with age. However, Kolbekova et al (2007) have shown in their study that the risk of infection increases with advancing maternal age².

There was a strong history of exposure to identified risk factors in our population. Cook et al (2000) have shown meat consumption especially undercooked meat as a major risk factor⁸. Our study has shown under cooked, grilled or fried meat as a risk factor in 65% of patients. Aspinall et al (2002) have also demonstrated 29.57% of patients with meat consumption as probable risk factor in the population under study in UK. The eating practices in our population were found to be in accordance to that reported by Elsheikha but were in contrast to those reported by Alverado-Esquivel et al¹⁹.

Kravetz et al showed that living in a house with mud floors was associated with *Toxoplasma gondii* infection as contaminated soil with the parasite as a source of infection¹⁴, than those living in a house with floors made of concrete or other materials. The contamination of the soil with cat faeces has been found in 7 out of 50 patients. Animals other than infected cats like dogs, cows, and goats and water buffaloes, may also contaminate soil floors. The presence of other such animals was found in 13 out of 50 patients. Contact with garden or fields soil is associated with *Toxoplasma gondii* infection¹⁸. As in our population the major source of income is related to agriculture, this factor is found in 19 patients, the soil may be infected with shed oocytes that could be transmitted through oral

route. Water borne toxoplasmosis has been recognized as an increasing cause of the disease²⁰.

Most of our population consumed unfiltered drinking water, this factor was present in 37 out of 50 mothers.

That study risk factors were utilization of unpasteurized milk was present in 13, eating raw eggs in 6, working in fields without gloves was acknowledged in 19 mothers.

The presence of IgM in cord blood represents congenital toxoplasmosis²¹. In our study the outcome as healthy babies with no sign

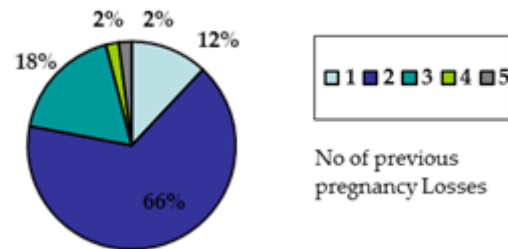


Figure: Distribution of outcomes of previous pregnancies.

of congenital toxoplasmosis was 40%. Toxoplasmosis causes miscarriages and this was shown by Marcela et al who have given 6.9% incidence, 34% by Samuel Ramrewau et al, 10% by Efrat Rorman et al and our study has given it to be in 10% of patients though *Toxoplasma gondii* infection was not confirmed by serology however, anatomical examination showed that they had fetal malformations suggestive of toxoplasmosis.

Infections are associated with premature births this was made known by Freeman et al with 12.5% incidence. 17 IUGR and oligohydramnios was seen in 5 out of 13 cases by the study of Marcela Peres et al (2007). In our study premature births were found in 06 (12%) of patients.

Intrauterine CNS manifestations were observed in 16% patients among which 06 had hydrocephalus and microcephaly was seen in 02 patients. Marcela Peres has given 31% incidence

of central nervous abnormalities with this infection. One baby (10%) had retinochoroiditis on ophthalmologic examination after birth in our study.

CONCLUSION

Toxoplasmosis is prevalent in many parts of our country but the risk factors and its outcomes have not been studied in our population. This disease can give good outcome with proper treatment and compliance. Prevention of this disease is possible by avoidance of the risk factors and improvement in available health and housing facilities.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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