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HASSAN S.O. ABDULJABBAR, MD, FRCSC

Diplomat, American Board of Obs/Gyne

Consultant & Associated Professor

HISHAM M. RAMADANI, MBBS, FRCSC.,

SHARIFA AL SIBIANI, MBBS. ABOG.,

NISMA MANSOURI, MBBS. ABOG and NAWAL AL SENANI. MBBS.

Department of Obs/Gyne,

King Abdulaziz University Hospital

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Hassan S.O .Abduljabbar, MD, FRCSC
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Hisham M. Ramadani, MBBS, FRCSC., *Sharifa Al Sibiani*, MBBS. ABOG., *Nisma Mansouri*, MBBS. ABOG. and *Nawal Al Senani.* MBBS.
Department of Obs/Gyne,
King Abdulaziz University Hospital

ABSTRACT

Objective : is to determine the percentage of seropositive toxoplasmosis IgG and IgM antibodies and to calculate the disease specific rate and to evaluate the perinatal outcome in maternal toxoplasma infection during pregnancy.

Patients & Methods : In a prospective study of 1074 pregnant patients, selected from 3 different hospitals in Jeddah, Saudi Arabia, clinical data were collected and blood were obtained from each patient, for determination of toxoplasma IgG and IgM antibodies. Positive IgM mother were follow up till delivery and the newborns were evaluated at delivery until one year of age.

Results : 274 out 1074 patients studied were toxoplasma IgG positive and 16 were IgM positive 4 newborn of infected mothers had congenital toxoplasmosis.

Conclusion : The seropositive IgG toxoplasma antibodies in the population studied were 25.5%. 1.5% were infected and 25% of newborn of those infected mothers had evidence of congenital toxoplasmosis.

Introduction

Despite the fact that serologic testing is available and the frequency of occurrence of toxoplasmosis in pregnant women is greater than either rubella or syphilis infections, routine antenatal testing for antibodies for toxoplasmosis is not done in current obstetric practice. Toxoplasmosis is a disease that is neglected and misunderstood by practicing ob-

stetricians. The damage it causes to the newborn is serious although often insidious. The mother, who acquires the infection during pregnancy, is usually asymptotic. Although occasionally the infected newborn has an obvious manifestation of disease, the usual picture is a normal baby who subsequently develops the serious consequences of infection. These sequelae often require years to develop, and the pediatrician rather than the obstetrician sees the end result. (1,2,3,4).

The study was undertaken to determine the percentage of Toxoplasma seropositive in the population studied, to calculate the disease specific rate and to evaluate the perinatal outcome of maternal infection during pregnancy.

Patients and Methods

A total of 1074 pregnant patients were studied, and selected from three different hospitals. The age in years, the gravidity, parity, number of abortions, and the gestational age at the time of testing were recorded.

5 mls of blood were obtained from each patient, and send to the laboratory for determination of toxoplasma IgG antibody titer , and toxoplasma IgM antibody (5,6,7).

If IgM was positive Patients were treated by SPIROMYCIN for three weeks. Then follow up of newborn is done by obtaining cord blood for IgM. Clinical examination immediately after delivery and at 3, 6, and 12 months of age is performed.

The data were entered into a PC data base and the statistical analysis were done using a SPSS program and t-test for comparing the mean in each group.(8)

Results

1074 pregnant patients were studied, the age ranged from 16 to 42 with a mean of 27.9 and a standard deviation of 5.4, the gravidity ranged from 1 to 14 with a mean of 3.56 and a standard deviation of 2.6, parity ranged from 0 to 12 with a mean of 2.1 and a standard deviation of 2.2 and number of previous abortion ranged from 0 to 7 with a mean of 0.5 and standard deviation of 0.96. 59.6%, 21.3%, and 19.1% were tested in the first, second and third trimester consecutively.

Out of 1074 patients 274 had positive IgG toxoplasma antibody (25.5%), and 74.5 % were seronegative. only 1.5% were positive IgM toxoplasma antibody (N = 16). Four newborns were affected, only two had major anomalies. When the mean of age, gravidity, parity, and number of previous abortions were compared between those with negative results for toxoplasma IgG, and those with positive results, using t-test, none of these were found to be statistically significant. Table (I).

Table (II) showed the number of patients who had positive IgG and its titer reporting as 1:64, 1:128, 1:256... until 1:8192, and the number of patients who had a positive IgM and its relation to the IgG titer.

Table (III) showed the total number of patients tested and their results of positive IgG and IgM and their percentage in relation to the trimester of pregnancy. The IgG positive cases were about 25% of the total at any of the trimester, and IgM positive cases were less 2%.

Table (IV) and (V), showed the IgG titer and its relation to the trimester of pregnancy, and the positive IgM cases.

Four newborns were affected, all of them were IgM Positive and the titer of IgG were 1:512 in one patient diagnosed in the first trimester, 1:1024 in one patient diagnosed in the second trimester, and two patients diagnosed in the third trimester with a titer of 1:64 and 1: 8192 . All the four affected newborns had +ve IgM in the cord blood.

Table (I) : Comparison of the means between the groups of negative and positive IgG toxoplasma

Variable	-ve IgG (n = 800)	+ve IgG (n = 274)	P
Age			
Mean	27.8	28.1	
St. Dev.	5.4	5.2	0.5
Gravidity			
Mean	3.5	3.9	
St. Dev.	2.5	2.9	0.05
Parity			
Mean	1.9	2.3	
St. Dev.	2.2	2.3	0.07
# of abortion			
Mean	0.5	0.6	
St. Dev.	0.9	1.1	0.13

-ve = Negative
+ve = Positive
= Number
St. Dev. = Standard deviation

Table (II) : Number of patients with +ve IgG and its titer and the number of patients with +ve IgM

(N) +ve IgG	IgG Titer	(N) +ve IgM
31	1 : 64	1
32	1 : 128	0
77	1 : 256	1
54	1 : 512	4
33	1 : 1024	4
27	1 : 2048	2
16	1 : 4096	3
4	1 : 8192	1
274		16

Table (III) : The total number of patients tested the gestational age and the number of IgG and IgM +ve cases and their %

	Number	IgG +ve	%	IgG +ve	%
First	640	165	25.8	8	1.3
Second	229	58	25.3	4	1.7
Third	205	51	24.9	4	2
Total	1074	274	25.5	16	1.5

Table (IV) The number of cases in each trimester and the IgG titer

IgG. T	0	64	128	256	512	1024	2048	4096	8192
First	475	16	16	49	39	14	16	15	0
Second	171	8	7	13	6	13	8	0	3
third	154	7	9	15	9	6	3	1	1

Table(V) 16 cases of (+ve IgM) in each trimester and their IgG titer .

IgG. T	64	256	512	1024	2048	4096	8192
First	0	0	3	0	2	3	0
Second	0	1	0	3	0	0	0
third	1	0	1	1	0	0	1

DISCUSSION

An understanding of the epidemiology and pathophysiology of toxoplasma infection is important for diagnosis, treatment and prevention. The disease is caused by Toxoplasma Gondii which is a protozoan parasite. Its definitive host is the Cat, and it has a Complex life cycle with its three forms trophozoite, tissue cyst and oocyst. Human are infected primarily in three ways ingestion of toxoplasma oocyst from cat feces that contaminate soil, Ingestion of under-cooked meat containing toxoplasma cysts and Transplacental transmission to the fetus, usually from an asymptomatic infection in the mother.(1,2,3,4).

The incidence and the prevalence of the infection varies throughout the world. Populations that consume raw or poorly cooked meat as part of their diet like frensh, or if they have meat transported refrigerated rather than frozen, like in (Scandinavia), or that have animal husbandry practices permitting cat-human transmission common among (Eskimos) will have a higher prevalence of infection.(1,2,3,4,7).

The presence of antibody to toxoplasma has been used to determine past exposure to the organism. Studies in Central America and France have found that over 90% of adults over 40 years of age are seropositive for antibodies to toxoplasma. Some reports indicate that 15 - 68 percent of adults in the United States have Toxoplasma infection (2,7). Reports from Saudia Arabia stated that 30-40% of population had positive IgG (9) while our study showed that 25.5% of pregnant women were seropositive IgG.

Transmission of Toxoplasma gondii from mother to fetus can occur only when the mother acquired Toxoplasma infection during pregnancy. It is estimated that 1 to 8 of every 1,000 women will acquire Toxoplasma infection during pregnancy. In about 40 % of cases the infection is transmitted to the fetus. The incidence of clinical disease noted at birth in the United State is 1 in 5,000 to 8,000 live births. (7,10,11). In our study, 16 out 1074 women acquired infection during pregnancy which is about 1.5 % only 4 out 16 (25%) had infected babies.

The risk of congenital infection depends primarily on the timing of maternal infection but also on whether the mother receives chemotherapy against Toxoplasma during pregnancy. Transmission of infection to the fetus occurs in 15 - 25 % of cases when maternal infection is acquired during the first trimester, 20 - 50 % of cases when infection is acquired during the second trimester and 60 - 65 % of cases when infection is acquired during the third trimester. Although the risk of infection increases with each trimester, the earlier disease occurs in pregnancy, the more severe the neonatal injury. The risk of congenital infection can be significantly reduced if the mother receives specific chemotherapy.(2,7,11).

The diagnosis of primary infection is difficult but it should known that IgM antibodies appear during the first week of primary infection and may be detected for three weeks to several months. IgG antibodies have a slower rise, often beginning in the first week of infection and peaking in one to two months. Recent maternal infection can be diagnosed by detection of Seroconversion from a negative to positive IgG antibody titer, and this need repeated IgG testing which not done in clinical practice, or by detection of A greater than fourfold increase in IgG titers and finally by The presence of IgM antibody in the setting of rising IgG titer. (10,11,12,13,14). In our study 16 patients had positive IgM four were born infected two with major anomalies diagnosed in the first and second trimester and the other two diagnosed in the third trimester had minor abnormalities.

Because IgM antibodies may be present for months or years, a single positive titer is not diagnostic and a second high IgM titer three weeks later serves to confirm acute infection. Markedly elevated IgG titers are only suggestive of recent or acute infection. However, an assay to measure the avidity with which Toxoplasma-specific antibodies bind to antigens holds promise in differentiating IgG due to primary infection from IgG due to past infection. This test may become useful when results of standard serologic tests are difficult to interpret.(12).

Recently, specific IgA antibodies have been shown to be present in acute toxoplasmosis, whereas IgM antibodies may or may not be detected. IgA antibodies appear to be highly specific for acute infection and should be used to confirm acute infection in the mother, fetus and newborn (15.16).

CONCLUSION

The seropositive IgG toxoplasma antibodies in the population studied were 25.5%. 1.5% were infected and 25% of newborns of those infected mothers had evidence of congenital toxoplasmosis.

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