

# TOXOPLASMA I H A ANTIBODIES IN REPRODUCTIVE DISORDERS

by

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## Introduction

Toxoplasmosis is one of the most prevalent disease of man caused by the protozoan, *Toxoplasma gondii*. It has got protean manifestations (Schanche, 1971). In cases of reproductive disorders although the parasite has been isolated in sporadic cases, still its role is uncertain because of the conflicting reports (Sabin *et al*, 1952; Remington *et al*, 1964; Jones *et al*, 1969; Eckerling *et al* 1968; Kimbal *et al*, 1971 and Southern, 1972). Reports from this country are a few. The present study was undertaken to find out the role of toxoplasma infection in various reproductive disorders and compare with cases of normal pregnancy.

## Material and Methods

A total of 602 sera were collected from indoor and outdoor patients of medical college, Rohtak. The study included cases of habitual and sporadic abortion (94), had obstetrical history (BOH—30), primary sterility (15), congenital ab-

normal children (32), mothers of congenital abnormal children (17), normal pregnancy (179), normal neonates (94) and healthy controls (141). An attempt was made to exclude other possible etiological factors in these cases.

Sera were stored at—20°C till used. Antigen was water soluble lysate of RH strain of *Toxoplasma gondii* harvested from the peritoneal exudate of infected mice. Indirect haemagglutination (IHA) test was done by the method of Prakash (1966) in four fold dilution by tube method. The test was repeated, if positive, in neonates after treatment with 2-mercaptoethanol.

## Results

Table I depicts the titres of toxoplasma antibodies in various groups of cases.

In cases of abortion, 16 sera were positive for toxoplasma antibodies with significant titre (1:256 or more) in 2 cases only, whereas in BOH cases only 6 were positive with only 1 showing significant titre. In the sterility group only 1 case showed presence of antibodies in insignificant titres. In the group of congenitally abnormal children, 10 were having antibodies and out of these 2 had a titre of 1:256. On the other hand 3 mothers of these children had a titre of 1:256 each. Normal pregnancy, neonates and healthy

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Accepted for publication on 1-8-79.

TABLE I  
Results of IHA Test in Groups of Subjects

Group	Total No. examined	Number positive	Titre				
			1:16	1:64	1:256	1:1024	1:4096
Abortion	94	16	9	5	—	2	—
BOH	30	6	3	2	1	—	—
Primary sterility	15	1	1	—	—	—	—
Congenital Anomalies	32	10	—	8	2	—	—
Mothers of above	17	3	—	—	3	—	—
Normal pregnancy	179	25	12	10	1	2	—
Normal neonates	94	3	1	1	1	—	—
Healthy controls	141	6	—	2	3	—	1
Total	602	70	26	28	11	4	1

control groups had 25, 3 and 6 positive cases respectively. Their respective significant titres were present in 3, 1 and 4 cases.

#### Discussion

The best laboratory investigation of microbial disease is isolation of causative agent. But in toxoplasma this procedure is very cumbersome. Alternative approach thus is the immunological techniques. IHA test is now preferred both for epidemiological and routine diagnosis by most of the workers because it is sensitive, specific and easy to perform (Walls *et al.*, 1967). This test was utilised in our study.

As the haemagglutinating antibodies last long, so their detection in a patient means that either the patient is suffering from or had suffered from the disease. In our study of 141 controls, the positive incidence was 4.2 per cent. Reports from other workers in India vary from 1.5% to 21% (Kalra, 1957; Rawel, 1959).

In cases of abortion, BOH, primary sterility, still-births and other miscellaneous reproductive disorders, the various

reports from India are summarised in Table II.

The incidence as reported by these workers varies from 3.6% to 37.1% with most of the workers using IHA techniques. These reports lack in one fundamental respect i.e. the uniformity of minimum significant titres to label a particular case as positive. In the present study in the groups of abortion, BOH and primary sterility we had a positive incidence of 17, 20 and 6.6 per cent respectively. The results in first two conditions are significant as compared to normals.

In cases of children with congenital anomalies e.g. mental retardation, hydrocephalous, cerebral palsy, we had positive incidence of 31.2%. We could examine 17 mothers of these children and 16.6% had toxoplasma antibodies. Of these 3 positive mothers, 2 children had a titre of 1:64 and third was negative. The parasite is known to invade the placenta and the foetus and produce congenital infection. In our cases there seemed some correlation as far as the prevalence of antibodies in the mother and their congenitally anomalous



TABLE II  
Prevalence of Toxoplasma Antibodies in reproductive disorders in India — Summary of published work

Worker	No. examined	% positive	Test	Titre of positive	Place	Type of cases
1. Hingorani (1966)	90	16.3	IHA	1:16	Delhi	Abortion, still birth
2. Prakash (1966)	146	13	IHA	1:16	Delhi	Abortion (Misc.)
3. Prakash (1969)	100	26	IHA	1:16	Delhi	Abortion, still birth and others
4. Kamla (1974)	106	14	ID	—	Delhi	Infertility
5. Bhatia (1974)	25	9.43	IHA	1:16	Delhi	Abortion
6. Pal et al (1975)	109	12	IHA	1:256	South India	Abortion and other conditions
7. Mahajan et al (1976)	175	3.6	IHA	1:25	Delhi	Habitual and Sporadic abortion
8. Singh et al (1978)	72	19.4	IHA	1:128	Chandigarh	Abortion
9. Panigrahi et al (1978)	143	8.3	IHA	1:16	Haryana	BOH, abortion, still birth
10. Pal and Aggarwal (1979)	67	37.1	IHA	1:18	Delhi	Abortion
11. Present study (1979)	139	27.3	IFA	1:8	Delhi	Abortion, BOH, sterility
		1.4	IHA	1:256	Delhi	
		16.5	IHA	1:16	Haryana	

children is concerned but nothing more could be ascertained.

In cases of normal pregnancy we had a positive incidence of 14%. This incidence is higher than the normal cases but less than the BOH and abortion group and majority of the cases (12.4%) had insignificant titres. Three neonates of these mothers had passively acquired antibodies as there was no fall in the titres after treatment with 2-mercaptoethanol. The titres in mothers were 1:64, 1:256 and 1:256 and the respective titres in children were 1:16, 1:64 and 1:256.

Our findings thus are suggestive of toxoplasma as an etiological factor in various reproductive disorders and are in line with the reports from India and abroad. Chhabra *et al* (1979) have obtained an excellent correlation between the serology and isolation. Even then if these serological studies are supplemented with isolation of the organism from the infected tissue then this becomes all the more strong case for instituting therapy.

#### Summary

Six hundred and two sera were examined to find out the role of toxoplasmosis in reproductive disorders by using IHA test. The test was positive in 4.2 per cent of 141 control sera. The corresponding figures for various groups of subjects were: abortion (17%), BOH (20%), primary sterility (6.6%), congenital anomalous children (31.7%), mothers of these children (16.6%), normal pregnancy (14%) and normal neonates (3.2%). The results were significant in BOH and abortion cases as compared to normal controls, thus incriminating toxoplasma as important etiological factors in reproductive disorders.

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