

ROLE OF TOXOPLASMOSIS IN THE CAUSATION OF FOETAL DAMAGE

by

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Foetal damage, as spontaneous abortion, neonatal death or congenital abnormalities, may be caused by various factors acting together or individually. Toxoplasmosis has recently received widespread interest in this field. Although several population surveys for toxoplasmosis have been conducted in our country, reports concerning its evaluation as a cause of foetal damage have been rather few (Rawal and Shala 1956; Hingorani *et al*, 1970; Pal *et al*, 1975; Mahajan *et al*, 1976).

There have been occasional reports denying the importance of toxoplasmosis as an important cause of foetal damage (Ruoss and Bourne, 1972). We undertook the present study to analyse the occurrence of complement-fixing (CF) anti-toxoplasma antibodies in women with complicated and normal pregnancies.

Material and Methods

During the study period between September 1977 and June 1978, a total of 293 cases of foetal damage were encountered. These patients were subjected to

comprehensive clinical and laboratory examinations to ascertain the cause of pregnancy loss (Figure). As a result of

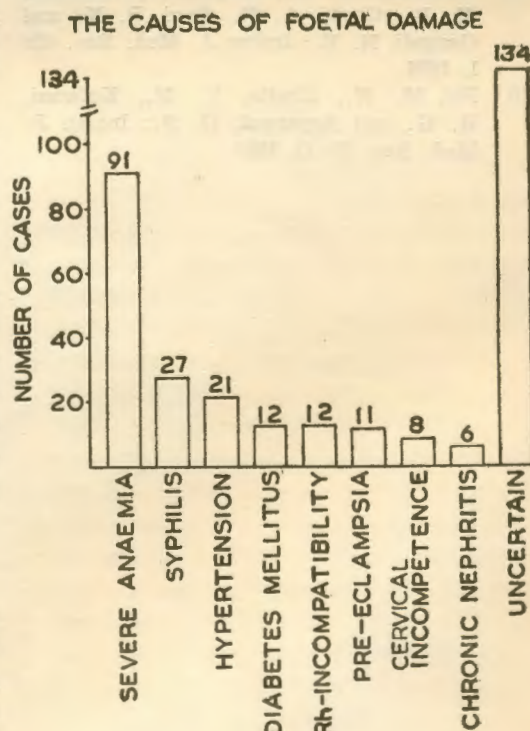


Fig. 1

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this, 134 cases, in which the etiology of foetal damage could not be established, were singled out for toxoplasma serology. Out of these, 105 patients were admitted as

cases of abortion (habitual abortion, 26, sporadic abortion, 79), while 29 patients gave history of premature labour 7, neonatal death 10, stillbirth 7 or congenitally malformed offspring 5.

For comparison of results, 45 normal pregnant women with no past history of foetal damage, were taken as controls. Mean age of cases of study group was 25.7 years (± 3.8) and that of control cases was 27.1 years (± 3.1).

Reagents for toxoplasma serology (Toxoplasma Antigen, Toxoplasma Positive Control Serum, Complement, Amboceptor) were purchased from M/s Behringwerke AG, W. Germany, Hemolysin titration, complement titration and complement-fixation test (CFT) were performed by one-fifth volume methods described by Kolmer *et al* (1969). The test results were recorded as 4+, 3+, 2+, 1+ or negative (-).

The observations were subjected to statistical evaluation by applying Chi-squared test.

Observations

The obstetrical history of 134 cases of study group showed that they had undergone a total of 397 pregnancies with varied results, as shown in Table I. The average foetal damage per patient was 2.37.

When results of toxoplasma serology were recorded, it was found that the test was positive in 2 out of 45 (4.4%) control

cases, 19 out of 105 (18.1%) cases of abortion and 7 out of 29 (24.1%) cases with other types of foetal damage. Among the controls, only 1+ and 2+ reactions were seen. Three-plus and 4+ reactions were more frequently associated with habitual abortion than with sporadic abortion cases. In the other group, 4+ reactions were seen only in patients with history of premature labour and congenitally malformed babies.

The results of CFT in abortion cases have been analysed in Table II. Results of CFT in those cases who gave history of premature labour, neonatal death, stillbirth and delivery of congenitally malformed offspring, are shown in Table III.

Discussion

In the present study, we found that 18.1% of abortion cases showed serological evidence of toxoplasmosis, as against 4.4% of control cases, and this variation was statistically significant. Similar observations were recorded by Mahajan *et al* (1976), who found 17.7% positive cases in abortion group and 9% positive results in the control group.

Hingorani *et al* (1970) observed that toxoplasma was an etiological factor of abortion and stillbirth, particularly of habitual abortion. Our findings are in agreement with these authors. However, Pedersen and Styr (1977) did not find significant difference in the frequency of

TABLE I
Frequency of Foetal Damage

No. of patients	Total No. of pregnancies	Living children	Abortions	Other types* of foetal damage	Average foetal damage per patient
134	397	79	257	61	2.37

* Neonatal deaths, premature labour, stillbirth and congenital abnormalities.

TABLE II
Results of CFT in 105 Abortion Cases as Compared to Controls

Type of cases	No. of samples	Interpretation of CFT	
		Negative	Positive
(A) Total abortion cases	105	86	19
(B) Habitual abortion	26	17	9
(C) Sporadic abortion	79	69	10
(D) Control group	45	43	2

p-value:

(A) vs (D) <0.05.

(B) vs (D) <0.01.

TABLE III
Results of CFT in 29 Patients With Different Types of Foetal Damage

Type of cases	No. of samples	Interpretation of CFT	
		Negative	Positive
(A) Premature labour	7	4	3
(B) Neonatal death	10	9	1
(C) Stillbirth	7	6	1
(D) Congenital abnormality	5	3	2
(E) Control group	45	43	2

p-value:

(A) vs (E) <0.05.

(B) vs (E) >0.05.

(C) vs (E) >0.05.

(D) vs (E) <0.05.

positive serum reactions in habitual and sporadic abortion cases.

We have found that the incidence of toxoplasmosis is highest in premature birth. But the observations of Eckering *et al* (1968) do not support the view that prematurity is the most common abnormality of a pregnancy complicated by *T. gondii* infection.

Robertson (1960) reported high perinatal mortality in the presence of toxoplasmosis. Pal *et al* (1975) found positive serological evidence of toxoplasmosis in 20% of cases with history of neonatal deaths. We found this incidence to be 10%, but the variation from control group was statistically insignificant. Similar ob-

servation was recorded in cases with still-birth.

In our study, 2 out of 5 patients who delivered congenitally abnormal babies, gave positive test for *Toxoplasma* antibody. Krishna *et al* (1973) investigated 8 patients who had delivered malformed babies and found that significant antibody titres were present in 4 of these cases.

Different types of foetal damage may result in mothers who show serologic evidence of toxoplasmosis. It has been pointed out that foetal damage may occur in patients who may also have given birth to healthy children in the past. This may be due to the fact that the reaction of the foetus to infection depends on several

factors, notably maternal factors like proximity of pseudocyst to the implantation site (Mahajan *et al*, 1976).

Some opinions have differed as regards the importance of *T. gondii* as an etiological agent in foetal damage. Ruoss and Bourne (1972) studied 104 women who had aborted, but in no case was toxoplasmosis considered as a contributory factor.

The role of latent toxoplasmosis in mothers with complicated pregnancy in their past history, could not be firmly established by Roszkowski and Prawecka (1966). Nevertheless, they recommended prophylactic treatment in women with serologic evidence of toxoplasmosis. In view of the observations made in our study, we endorse the recommendations of these authors.

Summary

In 134 patients, where the cause of foetal damage could not be ascertained by usual tests, serologic evidence for toxoplasmosis has been sought. The results support the role of maternal toxoplasma infection in the etiology of foetal damage, particularly habitual abortion, premature labour and congenital abnormality. Prophylactic

treatment in cases with positive serology for toxoplasmosis, is recommended.

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