

THE SIGNIFICANCE OF ANTISPERM-ANTIBODY TESTS IN CERVICAL MUCUS OF INFERTILE WOMEN

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SUMMARY

Agglutinating antibody is the first antibody type to appear in cervical mucus. The presence of antibodies in cervical mucus of infertile patients is influenced by the age of the patients as well as the duration of infertility. The results of this study do suggest that vaginally deposited spermatozoa can produce an antigenic stimulation resulting in local secretion of antisperm antibodies causing infertility of immunologic origin.

Introduction

Despite the apparent progress in infertility management, no discernable cause can be demonstrated in about 15 per cent of infertile females. This is the group in which an attempt was made in this study to find out the presence of antisperm antibodies in the cervical mucus.

Material and Methods

The present study was carried out in 90 infertile women with unexplained infertility (Group A), in 50 patients with organic lesions (Group B), and in 30 pregnant women (Group C) who were taken as control. After detailed history taking and careful physical examination, the patients were subjected to immunological tests besides the routine investigations like endometrial biopsy and tubal

patency test when indicated. The following immunological tests were carried out:

- (a) Modified microagglutination test (Franklin and Dukes, 1964).
- (b) Sperm immobilization test (Isojima *et al*, 1968).
- (c) Sperm cytotoxic test (Husted and Hjort, 1975).

The microagglutination test was considered positive when more than 20 per cent of the sperm cells were clumped. The immobilization test was considered positive when the immobilizing value was greater than 2. Similarly, the cytotoxic test was considered positive when the stained spermatozoa were more than double of unstained spermatozoa.

Observations

Most of the infertile women (51.10%) in group A had a period of barrenness from 5.1 to 10 years, as compared to patients in group B, who in majority (42%) presented earlier (2.1 to 5 years).

None of the patients in group A above

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the age of 40 years, showed any of the three antibodies in their cervical mucus. The agglutinating antibodies were found mostly in patients in 21-30 years age group (10%) whereas, the immobilizing and cytotoxic antibodies were found mainly in later years of life (31-40 years) (Table I).

cent of group A patients. However, none of the pregnant control demonstrated the positive antisperm antibody test (Table III). The anti-sperm antibodies in cervical mucus of group A patients were agglutinating type in 15 patients (16.66%), immobilizing type in 10 (11.11%) and cytotoxic type in 4 patients (4.44%).

TABLE I
Age of Group A Patients and Positive Antisperm Antibody Tests (n = 90)

Age (Years)	Agglutinating Ab		Immobilizing Ab		Cytotoxic	
	No.	%	No.	%	No.	%
21-30	9	10.0	4	4.44	1	1.11
31-40	6	6.66	6	6.66	3	3.33
> 40	0	0.0	0	0.0	0	0.00
Total (90)	15	16.66	10	11.11	4	4.44

The agglutination test in cervical mucus of group A patients was positive more often with 5.1-10 years of infertility (8.88%) than in patients with 2.1 to 5 years of infertile period (6.66%). After 10 years, only 1 patient showed positive test for agglutinating antibodies. Almost similar results were obtained with immobilization and cytotoxic tests (Table II).

Considering the presence of one or more than one of these antibody types as a criteria of positive reaction, the positive reaction was observed in 14 per cent of group B patients as compared to 20 per

cent of group B patients. However, none of the pregnant control demonstrated the positive antisperm antibody test (Table III). The anti-sperm antibodies in cervical mucus of group A patients were agglutinating type in 15 patients (16.66%), immobilizing type in 10 (11.11%) and cytotoxic type in 4 patients (4.44%).

TABLE III
Incidence of Positive Reaction (1 or More Than 1 Positive Reaction)

Cases	Cervical mucus	
	No.	%
Group A (90)	18	20
Group B (50)	7	14
Group C (30)	0	0.00

TABLE II
Duration of Infertility and Incidence of Antisperm Antibodies in Group A Patients

Duration (Years)	Cervical mucus (n = 90)					
	Agglutinating Ab		Immobilizing Ab		Cytotoxic Ab	
	No.	%	No.	%	No.	%
2.1- 5	6	6.66	2	2.22	1	1.11
5.1-10	8	8.88	7	7.77	3	3.33
> 10	1	1.11	1	1.11	0	0.00
(Total (90))	15	16.66	10	11.11	4	4.44

TABLE IV
Antisperm Antibodies in Cervical Mucus

Cases	Type of antibodies					
	Agglutinating		Immobilizing		Cytotoxic	
	No.	%	No.	%	No.	%
Group A	15	16.66	10	11.11	4	4.44
Group B	5	10.00	5	10.00	1	2.00
Group C	0	0.00	0	0.00	0	0.00

only one patient (2%). None of the group C patients had either of the three types in her cervical mucus (Table IV).

Discussion

Though a great deal of work has been done to find out the incidence of anti-sperm antibodies in the serum of infertile women, the studies on cervical mucus are not numerous (Friedman and Shulman, 1974; Menge and Behrman, 1979; Moghissi *et al*, 1980).

The majority of the group A patients presented later (5.1-10 years) as compared to group B patients who in majority sought for medical help earlier (2.1-5 years). This difference can be explained due to the fact that the patients with organic lesions have more distressful symptoms like abdominal pain, excessive discharge and menorrhagia rather than infertility alone.

The agglutinating antibodies showed a higher incidence in 21-30 years age group as compared to immobilizing and cytotoxic antibodies which were found more in 31-40 years age group. This probably reveals that the cytotoxic and the immobilizing antibodies take longer time to appear in cervical mucus than the agglutinating antibodies. However, it can not be so concluded due to small study group. Absence of antibodies in the cervical

mucus of patients over the age of 40 years, is probably a reflection of deterioration in the immunological competence of patients with advancing age.

There was a distinct correlation between presence of various antisperm antibodies in cervical mucus and duration of infertility. There was a higher incidence of agglutinating immobilizing and cytotoxic antibodies in cervical mucus where the duration of infertility was 5.1 to 10 years as compared to shorter duration of infertility. The immobilizing and cytotoxic antibodies, in particular, showed more significant increase with longer duration of infertility as compared to agglutinating antibodies. This observation further supports our hypothesis that the immobilizing and cytotoxic antibodies take longer time to appear as compared to agglutinating antibodies (*vide supra*). Moreover, there was marked decline in their presence in patients with infertility lasting for more than 10 years. This may again be due to deteriorating immunological competence or decreased exposure to antigens due to altered sexual habit of aged couple.

None of the fertile women in this study had antibodies in her cervical mucus. Shulman and Friedman (1975), and Moghissi *et al* (1980) also did not find antibodies in cervical mucus sample of

fertile women. The incidence of all the three antibody tests in cervical mucus was higher in group A as compared to group B. Whereas, Parish *et al* (1967) could find cytotoxic antibodies in the cervical mucus of 6.2% of infertile women (3/48), in this study the comparative figure was 4.4% (4/90). Though Friedman and Shulman (1974) found agglutinating antibodies in cervical mucus in 82 per cent (F-D method), the incidence in our study was only 16.66% using the same method. The presence of antisperm antibodies in group B patients further confirms that immunologic factors are also operative in some of the patients with organic lesions. The absence of anti-sperm antibodies in cervical mucus of pregnant women also shows the validity of the present study.

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