

ROLE OF ANTISPERMATOZOAL ANTIBODIES IN CASES OF UNEXPLAINED INFERTILITY

by

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The immunological phenomenon as an involving factor of unexplained infertility is not a new concept. Metchnikoff, in 1900 demonstrated the production of antibody capable of agglutinating and immobilizing spermatozoa following injection of heterozygous semen into guinea-pigs. Edwards (1964), Katsh *et al* (1965) and Mc-Laren (1964 & 66) could induce infertility in female guinea-pigs and mice by immunisation with homologous sperms. Similar results were reported by Baskin (1932) on a limited scale in women injected with human sperms for contraceptive purposes. It has been amply demonstrated that materials from the reproductive tract contain antigen capable of producing antibodies detectable by the usual serological tests.

The existence of circulating antispermatozoal antibodies were reported in a small percentage of women tested by Nakabayshi and Taylor (1961).

In 1964 Franklin and Dukes observed

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the relationship of circulating sperm agglutinins to infertility. 72.1% of the infertile women showed evidence of circulating antibodies to sperms, 5.7% fertile women, however, also had sperm agglutinins in their serum. Sexual abstinence or use of condom by the husbands for a period of 2-6 months was found to lower the antibody titer. Schwimmer and Co-workers (1967) reported that 37.5% of women with primary unexplained infertility had positive sperm agglutinating antibody. Other workers have found that incidence of positive test to range between 7% to 20%. (Boettcher *et al* 1968—19%, Israelstran 1969—7%, Tyler *et al* 1967%).

This paper is presented to evaluate the usefulness of routine testing of sperm agglutinins in infertile women.

Material and Method

In the present study the cases of primary and secondary sterility were collected from Kamla Nehru Memorial Hospital and categorised as those not having demonstrable organic cause and those with a an organic cause for sterility. Patients with known fertility were taken as control. Blood was collected from both husband and wife and tested for ABO and Rh blood types. The serum

was incubated at 56 degree C for half hour to destroy complement. Fresh semen specimen was evaluated for sperm count and motility. Semen agglutinating technique was used as described by Franklin and Dukas (1964) with the exception that no attempt was made to standardize the number of sperms by concentration or dilution, since preliminary trials showed that centrifugation of spermatozoa caused some clumping (Israelstram—1969).

0.5 ml. of wife's serum was added to each of 5 serological test tubes (Table 1).

TABLE I
Testing Procedure

Test tubes	Serum (0.5 ml)	Semen (0.05 ml)
1	Wife	Husband
2	Wife dil. 1:10	Husband
3	Husband	Husband
4	Saline	Husband
5	Wife	Doner

The control tube contained only normal saline to detect any non-specific reaction. The tube containing husband's serum was used to test for autoagglutination. 0.05 ml. of semen was added to each tube if sperm count was 50 million per c.c. or more and if the sperm count was less than 30 million per c.c. 0.1 ml. was added. The tubes were incubated at 37 degree C for four hours. The readings were taken at two hours and four hours. Agglutination of any type was noted and rated as negative when there was no clumping, as + when, one clump was seen every alternate field, and as ++ when two or more clumps were noted in majority of fields. Only agglutination of mobile sperms were considered as positive reaction. Aggregates of dead sperms or living sperms at-

tached to debris were considered as non-specific.

Results

One hundred and forty infertile couples were investigated out of which 71.4% were of primary and 28.6% were of secondary sterility. Duration of sterility ranged from 3-22 years. Incompatibility in ABO blood group was found in 75.3% and Rh incompatibility was seen in 4.7% of cases. Premenstrual endometrial biopsy showed that 76.2% cases had secretory phase, 22.85% cases had proliferative and 0.95% had tubercular endometritis. Postmenstrual hysterosalpingography revealed patent tubes in 76.2% of cases and tubal block (either unilateral or bilateral) in 23.8% of cases.

Semen analysis of the husbands was done. Azoospermia was found in 7.6% of cases and oligospermia (below 10 million per c.c.) was seen in 11.4% of cases. In this series semen agglutination was done in 130 cases out of which 22 cases (16.9%) showed evidence of antispermatozoal antibodies. In 10 cases the husbands were completely azoospermic. 100 out of 130 were couples with no organic cause which could be attributed to infertility and showed antispermatozoal antibodies in 19 cases (19%). In the remaining 30 couples with associated organic cause of infertility, antispermatozoal antibodies were present in 3 cases (10%) (Table II).

The antispermatozoal antibodies were present in undiluted serum in 11.5% cases, in 1:10 dilution in 5.3% cases, while autoagglutination and agglutination of donors semen with wife's serum was seen in 4.2% and 14.3% cases respectively (Table III). Autoagglutination was seen in semen having pus cells which may be related to infection of male genital tract.

TABLE II
Incidence of Circulating Antispermatozoal Antibodies According to Group

	Unexplained infertility	Infertility due to organic cause	Total	Control
No. of patients	100	30	130	10
No. of patients with antibodies	19	3	22	Nil
% of patients with antibodies	19%	10%	16.9%	Nil

TABLE III
Sperm Agglutination in Serum of Female Partners of Infertile Couples

Type of test	Total No.	—	—	—	%
Undil. serum	130	108	3	3	11.5
1:10 dilution	130	90	12	4	5.3
Autoagglutination	130	126	3	1	3
Control (Saline)	130	130	—	—	—
Donor's semen	35	30	2	3	14.3

In control group only 10 cases in the last trimester of pregnancy were studied. No case was positive for semen agglutination test.

The incidence of ABO incompatibility, in different groups, is shown in Table IV.

TABLE IV
Incidence of ABO Incompatibility

Infertility	No. of patients	Incompatibility	
		No.	%
Unexplained			
Primary	82	77	82.0
Secondary	21	13	61.1
Organic	37	27	72.9
Total	140	117	75.3

Seventy-seven out of 82 cases (82%) of primary unexplained infertility, 13 out of 21, 61% couples of secondary unexplained infertility and 21 out of 37, 72% couples having organic cause for infertility had ABO incompatibility.

The incidence of ABO incompatibility in semen agglutination positive and ag-

glutination negative cases is correlated in Table V.

TABLE V
Relation Between ABO Blood Group Incompatibility and Semen Agglutination in Infertile Group

Infertility	No. of patients	ABO incompatibility	
		No.	%
Positive semen agglutination test			
Unexplained			
Primary	16	12	75
Secondary	3	1	30
Organic	3	1	33.33
Total	22	14	63.6
Negative semen agglutination test			
Unexplained			
Primary	66	56	85
Secondary	18	12	66
Organic	34	26	76.5
Total	118	94	78.9

Discussion

In this study the incidence of semen agglutination in unexplained sterility was 19%. This is substantially lower than 78.9% reported by Franklin *et al* (1964) and 41.6% reported by Schwimmer *et al* (1967), while consistent with the finding of Tyler *et al* (1967) 14.0%, Boettcher *et al* (1968) 19%. But the incidence in this series is higher than 7% reported by Israelstram (1969).

In this series, 19.1% women with primary unexplained infertility had positive sperm agglutinating antibodies, while Franklin *et al* (1964), Schwimmer *et al* (1967) have reported 48%, 37.5% respectively.

Antispermatozoal antibodies in patients having an organic cause for infertility is variably reported Franklin *et al*, 1964 10.37%; Schwimmer *et al*, 1967 20%. In the present study it was 10%.

In the control group none of the patients had sperm agglutinating antibodies although the total number of control cases were only 10, while Franklin *et al* (1964) reported 11.8%. Our results of control cases is not very conclusive as the number of cases is small.

ABO incompatibility in this study was 75.3%, while Behrman *et al* (1960) reported 89% incidence in unexplained infertility. There was no significant variation in the incidence of ABO incompatibility in semen agglutination positive and negative test groups, except in organic infertility group (Table V).

Husbands of the patients who were found to have antispermatozoal antibodies were advised to use condom and to get the antibody tested every month. Three out of these 22 cases conceived

after the use of condom and one had a full term delivery. The other positive cases are under study.

Summary

One hundred and thirty couples were studied for semen agglutinating antibodies which were present in 19.0% of patients with no organic cause for infertility and in 10.0% cases with an organic cause for infertility. None of the patients with known fertility had such antibodies.

There was no correlation between positive spermagglutination test and ABO incompatibility.

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