IMMUNOLOGICAL FACTOR IN CAUSATION OF SUBFERTILITY

by

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The concept of immunological factors in causation of infertility is not a new one. In cases where no cause can be attributed to infertility, it is supposed that there is auto-immune reaction between husband and wife which is responsible for infertility. This auto-immune reaction may be either in the form of antispermatozoal antibodies as described by Landsteiner *et al* (1899-1900), Rumke and Helinga (1959), Nakabayshi and Tayler (1961), Franklin and Dukes (1964), and Mukerjee *et al* (1972) or in the form of ABO blood group incompatibility as shown by Matsunaga and Ioth (1958) and Behrman and associates (1960). But there is no co-relation between antispermatozoal antibodies and blood group antibodies.

The present study tries to find out how the immunological factors are responsible in cases of unexplained infertility and to co-relate the relationship of spermagglutination with ABO blood group incompatibility.

Material and Methods

One hundred and fifty cases of primary and secondary sterility were studied from outpatient and inpatient department of Kamala Nehru Hospital and 10 cases of known fertility were taken as control.

A detailed history was taken regarding age, parity, and duration of sterility. In each case proper general and systemic examinations were done. Abdominal and vaginal examinations were also carried out. In each case premenstrual endometrial biopsy and postmenstrual hysterosalpingogram were done (Table I). Whenever possible Huhner's test and cervical mucus penetration tests were also done. In cases of secondary infertility V.D.R.L. test of both husband and wife was done. Blood group and Rh typing of both the partners were also done. In ABO, incompatible couples ABO antibody titre was also estimated. A fresh sample of husband's semen, after abstinance of at least 5 days was tested and antispermatazoal antibodies were detected by the method described by Franklin and Dukes (1964).

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TABLE I
Results of Endometrial Biopsy and Hysterosalpingogram

	Total No.	Number of cases	Percentage
Type of endometrium	132	—	—
1. Proliferative endometrium	—	35	26.5
2. Secretory endometrium	—	95	72.0
3. Tubercular endometrium	—	2	1.5
Hysterosalpingogram			
1. Both tubes patent	—	86	69.3
2. Tubal block	38	—	—
Unilatral	—	22	17.7
Bilatral	—	16	12.9

Observations

One hundred and fifty cases were included in the present series. Out of these, 116 (77.33%) cases were of primary sterility and 34 (22.7%) of secondary sterility. The maximum number of cases (76%) were such where duration of sterility was between 2-10 years of active marital life. When endometrial pattern of these cases was studied it was found that in 72% cases (95 cases) the endometrium was ovulatory and in remaining cases it was either anovulatory or showed tubercular endometritis. On hysterosalpingography (total 124 cases), in 86 (69.3%) cases both the tubes were patent and rest of the cases had either a unilateral or bilateral tubal block.

Blood grouping could be done in 116 cases only, out of which 76 cases (65.5%) were found to be blood group compatable and 40 cases were found to have either anti 'A' or anti 'B' antibodies circulating in their sera in different dilutions.

Huhner's test was done in 24 cases, out of which 21 (87.5%) were positive and 3 (12.5%) had a negative test. All these negative cases were belonging to primary sterility group.

Cervical mucus penetration test was done in 16 cases and was found to be positive in 15 cases (93.75%), whereas one case of primary sterility had negative cervical mucus penetration (6.25%).

On doing the semenogram out of 150 patients, 123 (82%) were found to be normal, 18 cases (12%) had oligospermia (sperm count 40 million/cc. or below) and 9 cases (6%) were azoospermic.

On analysis of all the cases of infertility it was found that 89 cases (59.3%) were such where the infertility was unexplained whereas in 61 cases (40.7%) there was some defect either in male or in female which could be responsible for the infertility.

Sperm agglutination test was done in all the 150 couples to detect the antispermatozoal antibodies in the serum of wife (iso-agglutination) and husband (auto-agglutination). Ten couples of known fertility were taken as control. The results are shown in Table II.

The incidence of spermagglutination was further studied according to type of infertility and the results are shown in Table III.

The incidence of blood group incompatibility was further Co-related with the cases having antispermatozoal antibodies in their sera and the results are shown in the Table IV.

TABLE II

Incidence of Spermagglutination in the Sera of Infertile Couples and in Control Group of Known Fertility

Test Tubes	Total No.	Spermagglutination test			Percentage
		Negative	Positive		
			+	++	
Undiluted sera of wife	150	140	6	4	6.6%
1:10 dilution of wife sera	150	149	—	1	0.66%
Auto-agglutination	150	149	1	—	0.66%
Control (Saline)	150	149	1	—	0.66%
Donor's semen	76	76	—	—	—
Control group of known fertility	10	10	—	—	—

TABLE III

Incidence of Circulating Antispermatozoal Antibodies According to Type of Infertility

	Unexplained infertility	Infertility due to organic cause	Total	Control
No. of patients	89	61	150	10
No. of patients with antibodies	9	3	12	Nil
Percentage of patients with antibodies	10.1%	5%	8%	—

TABLE IV

Relation Between ABO Blood Group Incompatibility and Sperm Agglutination in Infertile Couples

Type of infertility	No. cases with positive sperm agglutination test	ABO in compatible		ABO compatible	
		No. of cases	Percentage	No. of cases	Percentage
1. Unexplained infertility					
(a) Primary	6	1	16.7	5	83.3
(b) Secondary	3	—	—	3	100.0
2. Organic cause	3	1	33.4	2	66.66
Total:	12	2	16.7	10	83.3

Discussion

One hundred and fifty cases of infertility were studied in the present series, out of which 77.33% (116 cases) were of primary sterility and 22.7% (34 cases) were of secondary sterility. Spermagglutination test was done in all the 150 cases, out of which 89 cases (59.3%) were such in whom no cause could be attributed to the infertility and 61 cases (40.7%) showed some defect either in the male or the female. In the present series sperm agglutination was prsent in 10.1% cases of unexplained infertility and in 5% cases in which some organic cause was also found. While Franklin and Dukes (1964) gave the incidence of 78.9%, Mukherjee *et al* (1967) found it to be 19% cases of unexplained infertility. Ten cases of known fertility were taken as control in the present series and none of them showed antibodies.

Franklin and Dukes (1964) found antispermatozoal antibodies in 11.8% of their control group while the other workers did not find it in their control group. Three cases (5%) of infertility due to organic cause also showed antispermatozoal antibodies.

The cases were also analysed for the presence of isoagglutination and autoagglutination. Isoagglutination was present in 7.33% cases and autoagglutination was present in 0.66% cases. Nakabayshi and Tayler (1961) found isoagglutination in 10.8% and 9.09% cases of two separate samples of their study. Mukerjee *et al* (1972) gave the incidence of isoagglutination in 16.3% and autoagglutination in 3% cases.

ABO blood grouping could be done only in 116 cases, out of which 76 cases (65.5%) were found to be blood group compatible and 40 cases (34.5%) were ABO incompatible. Behrman *et al* (1960) showed that 87.3% cases of infertility were incompatible regarding their blood group. Mukerjee *et al* (1972) found ABO incompatibility in 75.3% of cases. Out of 10 cases of control group in the present series 2 (20%) had incompatible blood group. Behrman *et al* found incompatibility in 38.6% of their cases of control group.

Huhner's test was performed in 24 cases only, out of which 21 (87.5%) had positive and 3 (12.5%) had a negative test. Rumke (1959) did postcoital examination of vaginal secretion only in one case and found only a few motile spermatozoa in the cervical mucus.

Summary

In present study 150 cases of infertility were studied. On analysis 59.3% had unexplained infertility and only 40.7% cases had a defect either in the husband or in the wife which could have been responsible for the infertility. Twelve cases had positive sperm agglutination. This shows that immunological factor though rare is a cause of infertility but not the main cause.

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