REPORT ON STUDIES OF IMMUNOLOGICAL ASPECTS OF STERILITY

by

K. P. SKANDHAN,† M.Sc., H. H. AGRAWAT,* M.B.B.S.,

and

J. R. JOSHI,* M.B.B.S., P. B. ROY,@ M.D. and M. V. S. ACHAR,‡ M.D.

Antigenicity of the secretions of both male and female reproductive tracts is well known. Antibody production against the spermatozoa either in the male or in the female has aroused great interest recently, although as early as in 1900, Metchnikoff injected heterozygous semen into guinea-pigs and produced antibodies. Antigens of this type leading to the production of antibodies destroy, immobilise or agglutinate spermatozoa according to the nature of the antibody. Agglutination of spermatozoa might be head to head, neck to neck, tail to tail or mixed type, depending on the type of antigen.

Guinea-pigs and mice were immunised with homologous sperms by Edwards, Katsh, *et al*, and Mac Laren, within the past ten years. As a contraceptive measure human sperms were injected in women by Baskin in 1932.

We report our findings on sperm agglutinating and immobilising antibodies either in male or female blood and the results of micro-double diffusion test which we carried in sterile couples.

† *Junior Lecturer in Physiology,*
* *Junior Lecturer in Pathology,*
@ Professor in Pathology and
‡ *Professor in Physiology.*
M. P. Shah Medical College, Jamnagar—361 001.
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Material and Methods

Total 163 cases of sterility, which include both primary and secondary, were collected from Irwin Group of Hospitals, Jamnagar. An effort to separate patients with other known organic causes of sterility was not done. Ten fertile couples were taken as controls. Blood of both husband and wife was collected. Routine semen examination was done and fresh semen was used to find out agglutinating and immobilising antibodies.

Method described by Vaidya, *et al,* (1971) was employed to find out sperm agglutination antibodies. No attempt was made in all cases to keep the sperm count constant as centrifugation leads to clumping of sperms, which is also reported by Israelstram, (1968) and Mukherjee, M. *et al,* (1973).

To make the procedure still simpler we used isotonic saline instead of Tyrode's solution for control. The results were satisfactory in comparative study with the same cases where Tyrode's solution was used. Similar results were reported by Franklin (1964).

Cases of clumping of the ejaculate or agglutination of sperm to debris or matrix were discarded. The grade of agglutination was graded as 1+, where single agglutination in every other high power field; 2+, single agglutination in every high power field; 3+, more than single

agglutination in every high power field. Test was considered positive when it was 2+ or higher.

Immobilising antibodies were detected by using one of the methods described either by Kilbrick Bleeding and Merrill or Isojima Shina and Li Tien Shun (1967).

For Micro-double diffusion modified method of Wadsworth was employed with the pre-staining described by Katsh, (1967).

Results

One hundred and sixty-three sterile couples were investigated, out of which 89.6% were of primary and 10.4% were of secondary sterility. Two of the secondary sterility cases had undergone vaso-vasostomy. Duration of sterility ranged from 1 year and 3 months to 25 years.

Azoospermia was found in 11% of the total cases we studied and oligospermia i.e., where sperm count was less than 10 million per C.C., in 6.6%.

Out of 146 cases we studied for agglutinating antibodies, 7 (4.8%) showed presence of it in the serum of the female, and 2 (1.4%) in the serum of the male.

Out of 135 cases, 7 (5.2%) showed presence of immobilising antibodies, which included 2 in male serum.

Micro-double diffusion test was carried out in 14 cases and 2 (14.2%) proved positive between husband's serum and wife's serum.

All the 10 fertile couples were negative in all tests.

Results of our study are given in Table I.

Discussion

Antigenicity of human testis, sperm and seminal plasma is well established. Totally, six antigens were identified in human seminal plasma Leslie (1969). Specific antigens present in sperm is reported by Tyler and Tyler (1973).

In this study the percentage of sperm-agglutinating anti-bodies was found to be 4.8% in the female and 1.4% in the male. Our result is compared with the results of other authors in Table II.

TABLE II

Result of Sperm Agglutinating Antibody Compared With Other Reports

Authors	Percentage
Present study	6.2
Mathov, et al	5
Fjalibrant	6.8
Israelstram	7
Mohmed, et al	8
Tyler and Tyler	14
Vaidya and Glass	15
Boettcher et al	19
Mukherjee, et al	19.1
Glass and Vaidya	20
Franklin and Dukes	72.1

TABLE I

Results of Present Study

Test for		Number of cases studied	Number of positive cases	Percentage
Sperm agglutination	Female	146	7	4.8
	Male	146	2	1.4
Sperm immobilisation	Female	135	5	3.7
	Male	135	2	1.5
Micro-double diffusion		14	2	14.2

The variation in the percentage of positive cases given by different authors might have an importance, but technically the counting of sperm agglutination must not have been done in the same pattern by all workers. For example, Vaidya and Glass, (1971) kept the sperm count constant to 40 million per C.C. and grading of sperm agglutination was given as mentioned above. In our study we did not make all the samples to the constant number as centrifugation led to clumping. In such cases keeping the count in mind the grade was given. Where sperm count was more it was brought to 40 million and the test was performed.

Test for immobilising antibody showed 5.1% positive result, of which one was in husband.

The results of other workers for immobilising antibody is given (Table III).

TABLE III

Results of Test for Immobilising Antibodies Compared With That of Other Authors

Authors	Percentage
Present study	5.1
Isojima and Tien Shun Li	3
Vaidya and Glass	6.2
Isojima, Tien Shon Li and Ashitaka Yoshio	12

As a pilot study Precipitin test was done in 14 cases, semen against wife's serum, and 2 were positive (14.2%). Report of the detailed study will be published later.

Summary

One hundred and sixty sterility cases, both primary and secondary, were studied. Nine out of 146(6.2%) were positive for sperm agglutinating antibody test which included 2 in husbands' serum. Seven out of 135(5.2%) studied for immobilising antibody gave positive result. Two out of 14 (14.2%) cases were positive in micro-double diffusion test.

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