SPERM AGGLUTINATING ACTIVITY IN RELATION TO ABO BLOOD GROUP INCOMPATIBILITY IN INFERTILITY

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SUMMARY

There are controversial statements about relationship of sperm agglutinating activity of cervical mucous to 'ABO' blood group incompatibility in cases of unexplained infertility. 92 infertile couples and 10 cases of known fertility studied and found poor correlation between 'ABO' blood group incompatibility and sperm agglutinating activity of cervical mucous. While it was obvious that maximum number of positive agglutination test were found in 'O' blood group females and sperm agglutination were positive in 27.17 percent cases of unexplained infertility. Thus immunological aspect of infertility is quite valuable to explain the unexplained infertility on ground of sperm agglutination and blood groups.

Introduction

Immunology has become not only one of the glamorous subject of modern medicine but it helped a lot in infertility to disclose immunologic reactions against spermatozoa as a cause of unexplained infertility which itself is a very important aspect of family welfare. Boettcher and Hay (1968) proposed that "ABO" blood group incompatibility of couple might be a possible cause of unexplained infertility and blood group antibodies in cervical mucous might cause infertility by immobilising or blocking the sperm which contained the incompatible blood group while, Schwimmer *et al* (1967) found no correlation between sperm agglutination reaction and ABO incompatibility. This controversy catalyzed this study.

Material and Methods

92 infertile couples in which no demonstrable pathology was detected and 10 couples of age matched and of known fertility were studied. For detection of sperm agglutinating antibodies in cervical mucous, microscale test technique described by Franklin and Dukes (1964 and 1984) was used in slightly modified way.

Blood group detected by rapid slide agglutination method with the help of standard anti A and anti B sera. Determination of ABO antigen on sperm de-

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pends upon agglutination inhibition and capability of secreting group substance in semen corresponding to blood group. Two tubes containing .5 ml of anti A and anti B serum taken and in these .2 ml of centrifuged semen added and kept for 30 minutes. .2 ml of this suspension of A or B mixed with red blood cells, after 2 hours inspected for agglutination. If the sperm contain 'A' or 'B' antigen agglutination was usually absent in the tubes corresponding to 'anti A' or 'anti B' serum containing tubes.

Results

27.17% cases of infertility were showing positive sperm agglutination test in cervical mucous, and mostly among 'O' blood group females. 50% of these positive test cases were of incompatible ABO blood group while in negative sperm agglutination cases 48.43%.

TABLE I

Incidence of Positive Sperm Agglutination Test in Cervical Mucous of Fertile and Infertile Women

Group	Total cases	Number of cases showing positive agglutination	Percentage
Control group	10	Nil	—
Study group	92	25	27.17
(1) Primary sterility	80	22	27.50
(2) Secondary sterility	12	3	25.00

TABLE II

Correlation of Wife's Blood Group with Positive Sperm Agglutination Test

Blood Group	Total cases	Number of cases of positive sperm agglutinating test	Percentage
O	29	12	41.37
A	22	5	22.72
B	36	8	22.22
AB	5	—	—
Total	92	25	

TABLE III

Relationship Between ABO Blood Group Incompatibility and Positive Sperm Agglutination Test

Group	Total cases	ABO incompatible couples	
		Number	Percentage
Cases showing Positive sperm agglutination	28	14	50.0
Cases showing negative test	64	31	48.43

Discussion

Antigenicity of sperm and their implication in etiology of unexplained infertility had acquired considerable importance. Sperm agglutinating activity was found in 27.17%. Parish *et al* (1967) had demonstrated almost similar results (27.27%). 'O' blood group females has a significantly higher incidence of positive sperm agglutination (41.37%) than other. Boettcher and Hay (1968), Mohanty and Saranji (1984) also observed the similar results. It was proposed that 'O' group females has have anti A and anti B thus blocking the A or B sperm but permitting only the 'O' sperm to pass. Sperm agglutinating activity and 'ABO' blood group incompatibility was not significantly related. Similar results observed by Schwimmer *et al* and Mukherjee *et al*. This poor correlation of ABO incompatibility and sperm agglutination activity may be due to the naturally occurring ABO antibodies primarily associated with macroglobulin 'IgM' and 'IgA' whereas immune antibodies are largely of 'IgG' variety. There is no sound evidence that interaction between 'ABO' antigen on sperm and ABO antibodies in cervical mucous leads to infertility as it was dependent in presence of secretor—traits of various body fluids. But it is obvious that sperm agglutinating activity and blood group has important role in immune basis of infertility.

References

1. Boettcher, B. and Hay, J.: Am. J. Obstet. Gynec. **100**: 437, 1968.
2. Franklin, R. R. and Dukes, C. D.: Am. J. Obstet. Gynec. **1**: 6, 1964(a).
2a. Franklin, R. R. and Dukes, C. D.: J. Am. Med. Assoc. **190**: 682, 1984(b).
3. Mohanty, S. L. and Saranji, R. K.: J. Obstet. Gynec. India, **36**: 721, 1984.
4. Mukherjee, M., Mukherjee, K. and Mehrotra, V. C.: J. Obstet. Gynec. India **23**: 486, 1973.
5. Parish, W. E., Carron Brown, J. A. and Richard, C. R.: J. Reprod. Fertil. **13**: 469, 1967.
6. Schiwimmer, W. B., Ustay, K. A. and Behrman, S. J.: Fertil. Steril. **18**: 167 1967.