ANTISPERMATOZOAL ANTIBODIES IN STERILITY

by

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SUMMARY

ASA were studied in the sera of 32 couples with infertility by 3 different immunological procedures. All the 3 types of ASA were not present in every test serum. This indicated that the spermatozoal antigens induced different types of antibodies in different individuals. None of the individuals of the control group showed a positive test. Fifteen (46.9 per cent) of the test subjects had ASA in the sera, and the incidence was relatively higher in females, though not statistically significant. Sperm agglutination test has been found to be the most sensitive. The commonest morphological pattern being tail-to-tail type followed by mixed and head-to-head types. Four out of the 7 males with a positive sperm agglutination test exhibited auto-agglutination of spermatozoa in their ejaculates, though it was only of the tail-to-tail type.

Introduction

Autoimmunity as a cause of infertility or sterility has found considerable but not unanimous support in literature. Since varied reports are available regarding the role of antispermatozoal antibodies (ASA) in the causation or etiopathogenesis of infertility or sterility, the present study was undertaken to study the presence of ASA in couples of explained sterility.

Material and Methods

Serum ASA were studied in 32 couples with unexplained infertility. In none of these couples, cause of infertility in females and/or males could be demonstrated by clinical and/or laboratory investigations. Semen samples of male partners were also analysed with special reference to reaction, sperm count and motility. For the control study, age matched 45 fertile males, 15 fertile females and 15 unmarried females were also studied. Individuals who had evidence of genito-urinary infection or any testicular or epididymal pathology were excluded from the study.

Serum ASA were detected by modified sperm agglutination test (Rumke and Hellinga, 1959), sperm immobilization test (Isozima and Tsuzuku, 1968) and modified

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tanned red cell agglutination test (Stavisky, 1954).

For detection of ASA in the test serum, the sperms of the individuals of the same blood group were used.

Observations and Discussion

Of the 32 couples studied, antispermatozoal antibodies (ASA) were detected in the sera of 15 (46.9%) unrelated subjects, of which 7 (21.9%) were males and 8 (25%) females. Sperm agglutination test was found to be the more sensitive (Table A). The commonest morphological pattern of agglutination was tail-to-tail type (53.3%), followed by mixed (26.7%) and head-to-head types (22.0%).

The control group of 45 fertile males, 15 fertile females and 15 unmarried females did not show evidence of ASA.

Rumke and Hellinga (1959) observed sperm agglutination antibodies in the sera of 67 out of 2015 men with sterile marriage, of which only one-third had complete or partial agglutination of the sperms. Franklin and Dukes (1964) investigated 19 infertile women and demonstrated the presence of sperm agglutination in the serum of 15 females. Fjallbrant (1968) reported sperm agglutinins in 6.8 per cent of sterile marriages and 2.6 per cent of fertile marriages.

ASA in low titres, are seen in the seminal plasma of individuals with circulating ASA. Their chemical nature is of IgG or IgM type (Schwimmer *et al*, 1967). These antibodies may cause agglutination of the sperms, thus preventing their penetration into the cervical mucus and leading to sterility. This hypothesis can be substantiated by the present observation that out of the 7 males with a positive sperm agglutination test in their sera, 4 had autoagglutination of spermatozoa in their ejaculate also, though it was only of the tail-to-tail type. Husted (1975) reported similarly that head-to-head or mixed agglutination patterns were observed in the sera, but never in the seminal plasma of the male partners of infertile couples. Different immunoglobulins may give rise to different agglutinating pattern; as IgM which causes head-to-head agglutination has not been identified in seminal plasma (Herman and Herman 1969).

Autospermagglutinins may develop as a result of mechanical obstruction to the efferent ducts, non-specific granulomatous inflammation or specific epididymitis e.g. gonorrhoea. Chronic excessive resorption of sperms could be assumed to occur in all these cases. In the present study no definite cause for production of ASA could be ascertained.

The incidence of ASA was found to be relatively higher in females than males, with unexplained sterility though not statistically significant. Schwimmer *et al* (1967)

TABLE A

Incidence of Serum Antispermatozoal Antibodies in Couples With Unexplained Infertility

Test	Male			Females		
	Sera tested	Sera +ve	% +ve	Sera tested	Sera +ve	% +ve
1. Sperm agglutination	32	7	21.9	32	8	25.0
2. Sperm immobilization	32	4	12.5	32	6	18.8
3. Haemagglutination	32	3	9.4	32	4	12.5

noted ASA in 37.5 per cent females and only in 7.8 per cent males. Koskimies (1979) studied 150 infertile couples and observed sperm agglutinins in the sera of 12 men (8 per cent) and 16 women (11 per cent). Sperm agglutinating antibodies in females could be due to sensitization after absorption of the semen through transvaginal, uterine, tubular or peritoneal routes.

Other types of antibodies like sperm immobilising and haemagglutinating antibodies were detected in cases of unexplained infertility. Sperm immobilising antibodies were detected in 12.5 per cent males and 18.8 per cent females whereas haemagglutinating antibodies were found in 9.4 and 12.5 per cent respectively. Isojima *et al* (1972), Schoenfeld *et al* (1976) and Petrunia *et al* (1976) reported a positive sperm immobilisation test in 17.2, 4.5 and 15.2 per cent respectively of the test subjects compared to the control group. They were of the opinion that sperm immobilising antibodies were more specific than sperm agglutinating antibodies in the diagnosis of infertility because the latter were present in the sera of pregnant women too. Ingerslev and Hjort (1979) feel that the agglutinating activity in pregnant women may be a non-specific response due to the presence of a high molecular weight compound with beta-mobility in electrophoresis, rather than to antibodies against spermatozoa. Haemagglutinating antibodies in cases of infertility may indicate the presence of other antigens on the surface of spermatozoa.

References

1. Fjallbrant, B.: Acta Obstet. Gynec. Scand. 47: 451, 1968.
2. Franklin, R. R. and Dukes, C. D.: Am. J. Obstet. Gynec. 89: 6, 1964.
3. Herman, W. P. and Herman, G.: Int. J. Fertil. 14: 211, 1969.
4. Husted, S.: Int. J. Fertil. 20: 113, 1975.
5. Ingerslev, H. J. and Hjort, T.: Fertil. Steril. 31: 496, 1979.
6. Isojima, S. and Tsuzuku, O.: Am. J. Obstet. Gynec. 102: 304, 1968.
7. Isojima, S., Tsuchiya, K., Koyama, K., Tanaka, C., Naga, O. and Adachi, H.: Am. J. Obstet. Gynec. 112: 199, 1972.
8. Koskimies, A. I.: Arch Androl. 5: 241, 1979.
9. Petrunia, D. M., Taylor, P. J. and Watson J. I.: Fertil. Steril. 27: 655, 1976.
10. Rumke, P. and Hellinga, G.: Am. J. Clin. Path. 32: 357, 1959.
11. Schoenfeld, C., Amelar, R. D. and Dubin, L.: Fertil. Steril. 27: 1199, 1976.
12. Schwimmer, W. B., Ustay, K. A. and Behrman, S. J.: Fertil. Steril. 18: 167, 1967.
13. Stavisky, A.: J. Immunol. 72: 360, 1954.