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Antisperm Antibodies in Varicocele Related Infertility

AYMAN EL-GENDY, M.D.; IHAB YOUNIS, M.D.;
ABD EL-AZIZ EL-TAWEEL, M.D.; ADEL ALI, M.D.;
MENHA ABD EL-FATTAH, M.D. and YAKOOT
MEGAHED, M.D.

*The Departments of Dermatology & Venereology, Benha Faculty of Medicine
and The Radiobiochemistry Department, Atomic Energy Authority.*

Abstract

To evaluate the possible rôle of antisperm antibodies in varicocele associated infertility, we searched for antispermatozoal antibodies in serum and seminal plasma of 20 infertile men with varicocele, 20 infertile patients without palpable varicocele and 12 normal fertile husbands, with the use of radiolabelled antiglobulin test. Our study showed that 17 patients (85%) of varicocele group demonstrated antispermatozoal antibodies in their seminal plasma compared to only 3 patients (15%) of the non-varicocele infertile group. As regards serum, 16 patients (80%) of varicocele group showed antispermatozoal antibodies compared with 5 patients (25%) of non-varicocele infertile group. Asthenozoospermia and oligozoospermia were more prevalent in the varicocele patients. These data suggest that an immunological factor may play a rôle in varicocele associated infertility.

Introduction

VARICOCELE is thought to be the most common treatable cause of male infertility. The incidence of varicocele in the general population has been reported to be as high as 15% however, varicocele is discovered in approximately one-third of men being evaluated for infertility [1]. The fact that a significant number of men with varicocele are infertile has led some investigators and clinicians to question the suggested causal relationship between a varicocele and male infertility. Many hypotheses have been proposed to explain the mechanism by

which varicocele exerts bilateral deleterious effect on spermatogenesis such as local hyperthermia, venous stasis and reflux of noxious adrenal metabolites [2].

Some investigators found that varicocele was associated with increased incidence of antisperm antibodies which may be responsible for varicocele-associated infertility [3]. Ozen et al. [4] reported that 16 (22.5%) of 71 men with a palpable unilateral varicocele had antisperm antibodies, while Golomb et al. [5] reported that 29 (91%) of 22 men with palpable varicocele were found to have antisperm antibodies

by an enzyme-linked immunosorbent assay (ELISA).

The aim of this study is to evaluate the rôle of antisperm antibodies in varicocele-related infertility.

Material and Methods

Fifty two subjects were included in this study; twenty infertile patients with varicocele, twenty infertile patients without palpable varicocele and twelve normal fertile men. They were selected from patients attending the dermatology and venereology clinic of Benha faculty of Medicine hospital.

They were divided into the following groups:

I- Varicocele group:

Comprised twenty infertile patients who had varicocele as evidenced by clinical examination helped by valsalva's maneuver and who were waiting for varicocelectomy operation. Their ages ranged from twenty five to forty one years.

II- Infertile group:

Twenty infertile patients without palpable varicocele randomly selected from infertile couples who were referred for consultation. Their ages ranged from twenty eight to forty one years.

III- Fertile group:

Twelve normal fertile husbands, seeking advice for sexual problems, were selected. The criteria for normal fertility used in this study took into consideration the normal levels of seminal parameters i.e. none of the men had oligozoospermia, asthenozoospermia or spontaneous agglutination and none of these men had abnormal levels of leukocytes in expressed prostatic secretion or palpable varicocele.

We defined normal semen characteristics according to World Health Organization (H.W.O.) [8] parameters summarized in table 1.

Table (1): Normal Semen Parameters According to W.H.O. [8].

Volume	> 1.0 ml
Sperm count	> 20 million /ml
Sperm motility	> 60% motile
Sperm morphology	< 30% abnormal

According to these parameters, a sperm count < 20 million/ml is regarded as oligozoospermia, motility during the first 3 hours < 60% is regarded as asthenozoospermia and a rate of abnormal forms >30% regarded as teratozoospermia.

Jequier and Grish [9] regarded a white blood cell count > 5/H.P.F as pyospermia.

These men had fathered children within the last three years and their ages ranged from twenty one to thirty five years.

Samples:

1- Serum: 5ml of blood were obtained from each subject in the three groups by venepuncture, the blood was then left at room temperature to clot, the serum was isolated after centrifugation of clotted blood and then stored at minus 21°C until tested.

2- Semen: Two semen samples were obtained from each patient by masturbation after at least 3 days of abstinence without the use of lubricant. The routine laboratory examination included pH, sperm motility, sperm count, sperm morphology semen volume and leukocytic count.

3- Seminal plasma: After liquefaction of semen, each sample was centrifuged and

the separated seminal plasma then preserved at minus 21°C until the time of the test.

Immunological test:

Antispermatozoal antibodies were assessed with the use of radioimmunobinding assay according to Eskin et al. [6] and Han and Tung [7].

Results

1) Semen analysis:

Results of semen analysis are summarized in table (2).

2) Immunological study:

Results of radiolabelled test are shown in table (3).

Table (2): Distribution of Oligozoospermia, Asthenozoospermia, Teratozoospermia and Normospermia among Varicocele Compared to Infertile Groups.

Semen picture	Varicocele group (n = 20)		Infertile group (n = 20)	
	No.	%	No.	%
Oligozoospermia	13	65	8	40
Asthenozoospermia	11	55	4	20
Teratozoospermia	14	40	10	50
Pyospermia	2	10	5	25
Normospermia	2	10	13	13

Table (3): Results of Radiolabelled Test for Detection of Antispermatozal Antibodies.

Group	Serum Positive results		Seminal plasma Positive results	
	No.	%	No.	%
Varicocele group (n = 20)	16	80	17	85
Non Varicocele infertile group (n = 20)	5	25	3	15
Control group				
<i>p</i>	< 0.05		< 0.05	

Discussion

Immune reactions against spermatozoa have been recognized since the beginning of this century but the association of immune factors and infertility is a more recent observation. Despite the vast experience with the various test methods devised

to measure immunoinfertility, the concept of antisperm immune reactions and their possible rôle in lower fertility potential have been questioned. Antispermatozoal antibody formation has been reported after vasectomy, testicular injury, after testicular biopsy and after testicular torsions [10]. Varicocele has been associated with infer-

tility, and some investigators have considered that this condition may be associated with increased incidence of antisperm antibodies [3].

In the present study, we tested two infertile populations for antispermatozoal antibodies and demonstrated a significant difference between the varicocele and non-varicocele infertile groups.

Ozen et al. [4] and Golomb et al. [5] reported the presence of these antibodies in the serum and seminal plasma of patients with palpable varicocele and found a significant difference between the varicocele and control groups.

The testis of varicocele patients undoubtedly suffers deleterious tissue effect, which sometimes leads to complete atrophy, this may be attributed to the prolonged venous stasis and hyperthermia. This tissue injury may induce unshielding of the protected spermatozoa, an antisperm immunologic response and antibody formation [5]. The present study showed both decreased sperm quality and increased sperm autoimmunity in the varicocele group compared with the control group.

It remains to be assessed whether sperm immunity leads to oligozoospermia and poor motility or whether there is an underlying defect in spermatogenesis that contributes to both autoimmunity and decreased sperm quality.

The conventional treatment of varicocele by occlusion of varicose spermatic veins may fail to restore fertility in some patients. This failure may be attributed to the presence of antispermatozoal antibodies, so these patients must be screened for the presence of these antibodies.

Ideally, fertile varicocele patients must

be examined for sperm quality and anti sperm antibodies and compared with infertile varicocele patients, but this is technically almost impossible, because fertile men usually do not seek medical aid in a infertility clinic and symptomatic varicocele is rare.

The types of antispermatozoal antibodies were not possible to be detected by the use of radiolabelled assay. Further tests are needed to detect the types of antispermatozoal antibodies e.g. microagglutination test and cytotoxic test.

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