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Antisperm antibody formation following Vasectomy

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Abstract

Objective: Seeking for fertility after previous vasectomy is increasing. Vasectomy may break the blood testis barrier and in this way the level of antisperm antibody increases. It is suggested that increase in antisperm antibody decreases spontaneous pregnancy even after successful vasovasostomy. In this study we evaluated antisperm antibody formation 3 months after vasectomy.

Method: This case series was performed on 80 healthy men requesting vasectomy from eurology ward of Imam Khomeini hospital. Blood antisperm antibody was checked at the time of vasectomy and 3 months later, when they came to assure vasectomy results, using Kibrick and sensitized RBCs.

Results: Only 2 patients had antisperm antibody before surgery. Three months after vasectomy 56.49% of the patients had antisperm antibody in Kibrick Method, and 53.56% of them had antisperm antibody in sensitized RBCs.

Conclusion: Vasectomy increases antisperm antibody level. We suggest evaluation of antisperm antibody before vasovasostomy to estimate the risk of infertility after successful procedure.

Keywords: *vasectomy, antisperm antibody, vasovasostomy*

Introduction

Vasectomy is practiced worldwide to prevent unwanted fertility. It is introduced as an irreversible method of family planning. Epidemiologic studies have not revealed an increased incidence of any serious diseases in vasectomized men (1, 2).

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But in some cases accidental loss of child or children or second marriage makes them seek for vasectomy reversal. Recently, attention has turned to the potential reversibility of vasectomy because a significant number of vasectomized men now seek subsequent vasovasostomy (3, 4).

Autoantibodies to human sperm have been demonstrated in the serum of patients prior to and following vasectomy using agglutination, immobilization, and immuno-fluorescence assays (5, 6).

The prevasectomy incidence and titers of sperm-immobilizing and sperm-agglutinating antibodies are low in normal men (7, 8). A number of sera from prevasectomized patients show "natural antibodies" to antigens associated with methanol-fixed sperm (9).
This study aimed to determine effect of vasectomy on inducing antisperm antibodies.

Materials and methods

80 consecutive men who came for vasectomy to eurology clinic of Imam Khomeini hospital entered this case series from 2000 to 2001. Ten ml of blood were taken from each person before performing the operation. The blood centrifuged and the sera were separated and freezed. All the samples were checked for antisperm antibody (ASA) by Gellatin Agglutination Test (Kibrick) and with sensitized RBCs. The results were re-checked before and after vasectomy with standard MAR test (Biogenex, America). Normal semen was used as antigens. Semen analysis showed normal parameters and the sample was centrifuged and washed to assure seminal plasma and immunoglobulin eradication. Three months after vasectomy the sera were checked for ASA again but sixty nine patients completed this follow up.
The results of sensitized RBCs method were classified as Suspicious (+): when less than 10% of sperms were adhered to RBCs.
Positive (++): when more than 10% of sperms were adhered to RBCs but not exceeding 90%.
Strong positive (+++): when more than 90% of sperm were adhered to RBCs.
In Kibrick method the antibody titer was measured by serum dilution.

Results

Before vasectomy only 2 cases had suspicious (+) results for ASA in sensitized RBCs and no antibody was detected in the rest. Antibody titer was ¼ in Kibrick method in these 2 cases.
Three months after vasectomy only 69 cases came for semen analysis for assurance of azoospermia when the second blood sample was taken. Antisperm antibody was detected in 53.56% among which 9 cases (13.6%) had strong positive (+++); 21 cases (30.4%) had positive (++); and 7 cases (10.1%) had suspicious results. Nearly the same results were obtained by Kibrick method, 56.49% of cases had positive titers. 6 cases (8.69%) with ½; 10 cases (14.49%) with ¼; 8 cases (11.59%) with 1/8; 7 cases (10.14%) with 1/16; 2 cases (8.69%) with 1/32; and 6 cases (8.69%) with 1/64 positive titers were reported.
Antibody binding sites were 67.56% to acrosome, 40.8% to tail, and 21.6% to all parts of sperm in sensitized RBCs technique.

Discussion

About 60-70% of patients, who have previously experienced vasectomy, are unable to achieve fertility even after successful vasovasostomy(10, 11). The direct relation of post vasovasostomy infertility with antisperm antibody was evident in several studies (12). Although due to some reports, presence or absence of spermagglutinating and/or sperm-immobilizing antibodies in the sera of men who have undergone vasectomy reversal does not seem to interfere with subsequent fertility(3).
Anti-sperm antibodies (ASA) in men can affect fertility by various mechanisms. Some of them are mainly related to the

extent of the sperm autoimmunization (e.g., sperm-agglutination and impaired cervical mucus penetration); others are also related to immunoglobulin (Ig)-isotype (e.g., complement-mediated sperm injury through the female genital tract), or to antigenic specificity of ASA (e.g., interference with gametes interaction) (13).

Some researchers believe seminal antibody is the cause of infertility. It is shown that almost all patients with serum antibody titers more than 1/64 have seminal antibody too, and most of them are infertile (13). Antisperm antibodies are formed in all three classes of antibody (IgA, IgG, and IgM) (14). Antibodies against FA-1 (Fertilization Antigen 1) antigen are known as the most important cause of infertility. Anti FA-1 antibody appear more frequently in patients with serum antibody more than 1/64.

The unavailability of current diagnostic tests to determine the antigenic specificity of ASA, and the difficulty in quantifying the antibody density on the sperm surface make it hard to establish in each individual patient, whether, or to what extent, these interfering effects occur.

However, the rational use of current ASA-tests can be effective in screening and quantifying sperm autoimmunization relevant to infertility. The degree of sperm-autoimmunization is the only empirical (rather effective) criterion in choosing more or less invasive assisted reproductive techniques (ART) for couples. A more rational treatment strategy would be possible with the development of tests detecting ASA directed against defined fertilization-related antigens (13).

This study do not consider ASA as the only prognostic factor for pregnancy after vasectomy reversal, because other factors (10)were not considered and evaluation of fertilization rate after one or two years of follow was not accomplished.We suggest measuring a serum antibody titer before performing vasovasostomy. Those with anibody titers more than 1/64 have poor prognosis and are better to be consulted before surgery.

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