



## Frequency of antisperm antibody in individuals with unexplained infertility

Dr. Hassan Adnan AL-Janabi<sup>1</sup>, Dr. Baraa Wael Taha<sup>2</sup>

<sup>1,2</sup> AL-Karkh Health Directorate, Baghdad, Iraq

### Abstract

The assessment of sperm immunity must take into account the primary role of antibodies in local genital tract fluids rather than in serum, and the observation that antibody level may fluctuate markedly with time. Therapy for sperm antibodies in the female partner is complicated by their multiple potential sites and modes of action, and by our incomplete understanding of their clinical significance. Thus, if present in serum as well as in cervical mucus, their effects are unlikely to be overcome by intrauterine insemination, since the serum antibodies are likely to be represented in tubal fluid by transudation. Moreover, even when they are manifest solely at a cervical level (in mucus), there is little evidence of effectiveness either for this method of treatment or for others, including occlusion (condom) therapy to 'remove the immunogenic stimulus', antibiotics to eliminate any adjuvant effects of cervical infection and mild immuno-suppression.

**Keywords:** condom, therapy, suppression

### Introduction

#### Antisperm antibody

The assessment of sperm immunity must take into account the primary role of antibodies in local genital tract fluids rather than in serum, and the observation that antibody level may fluctuate markedly with time <sup>[1]</sup>.

#### Etiological considerations

Therapy for sperm antibodies in the female partner is complicated by their multiple potential sites and modes of action, and by our incomplete understanding of their clinical significance. Thus, if present in serum as well as in cervical mucus, their effects are unlikely to be overcome by intrauterine insemination, since the serum antibodies are likely to be represented in tubal fluid by transudation. Moreover, even when they are manifest solely at a cervical level (in mucus), there is little evidence of effectiveness either for this method of treatment or for others, including occlusion (condom) therapy to 'remove the immunogenic stimulus', antibiotics to eliminate any adjuvant effects of cervical infection and mild immuno-suppression <sup>[2]</sup>.

#### The Sites of antisperm antibodies

The sites of antisperm antibodies are:

- a- Sperm antibody sites in the body.
  - i- Sperm surface
  - ii- Seminal fluid
  - iii- Blood serum
- b- Sperm antibody site in the sperm.
  - i- Tail: The presence of antisperm antibody in the tail has more effect on movement of sperm <sup>[3]</sup>.
  - ii- Head: The presence of sperm antibodies on the head and in middle piece prevents sperm penetration to the ovum <sup>[4]</sup>.

### Materials & Methods

#### Materials

1. Serum sample
2. Seminal plasma

3. Phosphate buffer saline solution pH=7.2 from company of (BDH).
4. Donor seminal fluid.
5. Liquid paraffin from company of (BDH).
6. Physiological solution for dilution.
7. Micro-titer plates from company of (Falcon -USA).
8. Terassaki plates from company of (Falcon -USA).
9. Hamilton micro-syringe 25  $\mu$ L from company of (Behring).

#### Methods

In all suspected cases, whether having a high number of sperm count but low active sperm, or with any number but low active sperm, seminal fluid were collected for analysis and examination, Then, the semen was centrifuged for semen plasma collection to detect antisperm antibody and also blood serum was collect to detect antisperm antibodies in male and female.

#### Results

The total number of infertile patients in Tikrit governorate whose age ranges between 19-47 years during the study period was 294 in both rural and urban areas. Antisperm antibodies were laboratory diagnosed in 94 (31.91 %) patients with unexplained infertility. These cases were distributed in urban and rural area, of them 66 (70.2%) cases in rural areas while 28 (29.8%) were in urban areas. Thus the disease was more prevalent in rural than urban. The above difference was statistically significant ( $P < 0.01$ ). The cases were found to be more among males 74 (50.3%) than females 20 (13.6%). The prevalence rate of antisperm antibodies was more in males than in females. The above difference was statistically significant ( $P < 0.01$ ). The antisperm antibodies were more predominant in (20-35) years age group. Of the 74 male affected, 63 (85.1 %) were in (20-35) years age group and 11 (14.9%) in (36-47) years age group. Regarding the 20 females, 17 (85%) were in (20-35) years age group and only 3 (15%) in (36-47) years age group. The differences were statistically not significant between males and females

( $P > 0.05$ ). Antisperm antibodies were predominant in infertile males underwent testicular biopsy. The history of testicular biopsy among affected infertiles was found in 14 patients, 12 of them (85.7%) has positive results for antisperm antibodies. Antisperm antibodies were detected in 2 from 5 (40%) infertile who were affected by mumps diseases. Antisperm antibodies were detected in 14.8% (4 from 27) who has varicocele. Antisperm antibodies occurred in infertile that underwent varicolectomy. The antibody was detected in 15 out of 20 (75%). The antisperm antibodies were present in infertile that had history of genital tract infection. The antibody was detected in 19 from 70 (27.1 %).

## Discussion

The infertile with antisperm antibodies were found more in the rural area population due to difficulty in the availability of adequate diagnostic techniques<sup>[5]</sup>. Pirino *et al.* showed that the presence of antisperm antibodies has been found equal to 19.3% of the tested sera. These results show that the incidence of antisperm antibodies is higher in the serum of male partners from infertile couples than in healthy subjects ( $P < 0.01$ ), also in a relatively segregated and pure population like the one studied<sup>[6]</sup>. This study showed a percentage (31.9%) in both rural and urban areas. This prevalence was higher due to many factors such as genital tract infection, testicular biopsy and trauma. This study also showed that the prevalence of antisperm antibodies was higher in rural than in urban areas of the study, moreover there was variation in the prevalence of antisperm antibodies in different rural area. This fact was agreed with Menge; 1982 who reported that antisperm antibodies were widely distributed in unexplained infertility and was mainly endemic in rural districts<sup>[7]</sup>. Martin and Bischof; 1997, estimated that the frequency of antisperm antibodies in rural areas was lower than in urban areas. They suggested that this might be due to complex mixture of urban and rural population<sup>[8]</sup>. The disease attacks both sex, but the attack rate as shown by different studies differs from male to female. In this study males were more commonly affected than female in a ratio of 5:1. Nabeel; 1992, reported that males were more affected than females<sup>[9]</sup>. The prevalence rate of antisperm antibodies was higher in age group (20-35) years than in age group (36-47) years with predominance of male in both age groups. Nabeel, reported the same finding but the disease was much higher in age group (20-47) years<sup>[9]</sup>. In this study antisperm antibodies were predominant in infertile underwent testicular biopsy (85.7%). Nabeel<sup>[9]</sup>, found that antisperm antibodies in 24.7% of infertile patient underwent testicular biopsy. Hjort, *et al.*; 1974 found that 17% of infertile males had antisperm antibodies underwent testicular biopsy<sup>[10]</sup>. This finding did not agree with other studies due to, multifactorial causes for these patients such as infection, truma, varicolectomy and due to small number of patients study. Antisperm antibodies were detected in 40% of infertile whom affected by mumps disease. Cimino *et al* found that 21.4% of patients with antisperm antibodies positive having mumps disease<sup>[11]</sup>. Al-Exander and Anderson, 1987 found 19.5% of patients had mumps with antisperm antibodies positive<sup>[12]</sup>. This high prevalence of antisperm antibodies to patient complained of mumps in this study may be due to many factors such as mumps cause destruction for testicular membrane barrier. Antisperm antibodies were not common in infertile that had varicocele. This study found 4 patients from 27 infertile having positive result equal to 14.8%. The presence of a varicocele was often

associated with decreased semen concentration, but surgical intervention does not always lead to improvement of semen quality and pregnancy rate but increase antisperm antibodies titration. Knudson *et al* found increased level of antisperm antibodies had been demonstrated in infertile men with varicocele compared with normal fertile men<sup>[13]</sup>. The presence of antisperm antibodies was 27.1 % in infertile who had genital tract infection among affected infertiles. Micic *et al* found infertile men with history of genito-urinary tract infection had antisperm antibody in 11.9%, infertile men without infection 14.5% and fertile men in 5%, these differences were not significant. The most common causes of these infections were gram-negative organisms and chlamydia. Micic S; showed no significant relationship between genitourinary tract infection and the formation of the seminal antisperm antibody<sup>[14]</sup>. Eggert-Kruse showed the main influence of Chlamydia Trachomatis on male fertility is based on sexual transmission and negative influence on tubal function of female partners, but not on reduced sperm functional capacity<sup>[15]</sup>. Cunningham found (56%) of women with a primary episode of pelvic inflammatory disease had antisperm antibodies<sup>[16]</sup>. Witkin found (45.5%) of the men whose results were positive when tested for Chlamydia Trachomatis has positive antisperm antibodies<sup>[17]</sup>. The antisperm antibodies were more frequent in infertile that has testicular trauma. This study found that 50% of patients having testicular trauma had antisperm antibodies positive. Prado found 9% of patient had antisperm antibodies positive. These findings agreed with the theory of initiation of autoimmune process after a unilateral testicular damage, although we cannot give data to support any damage to the contralateral testes<sup>[18]</sup>. Anderson found surgical intervention, even with removal of the non-viable testes, may result in significant impairment of semen quality and increase in percentage of antisperm antibodies<sup>[19]</sup>. In this study antisperm antibodies found in 12.9% with unknown cause. Nabeel; 1992 found 8% of patient had antisperm antibodies for unknown cause<sup>[9]</sup>. Alexander found 11% of patients had antisperm antibodies for unknown cause<sup>[12]</sup>. Antisperm antibodies are very common and frequently found in unexplained infertility. This disease misdiagnosed as other infertility disorders such as abnormal semen, disturbance in host of sperm and other diseases. Determination of the prevalence of antisperm antibodies in male and female is difficult because of the available numbers of different methodology, their subjective interpretation, and different isotypes of antisperm antibodies. In the present study clinical evaluation of antisperm antibodies among affected patients have been carried and recorded. Hennery *et al* observed that antisperm antibodies can be present in the serum, semen and cervical mucus<sup>[20]</sup>. Though in this study we observed that clinical appearance of antisperm antibodies is highly variable and fortunately high titer found in semen was more common than in serum, this fact is in agreement with Nabeel<sup>[9]</sup>. Diagnosis of antisperm antibodies depends on laboratory diagnosis. Clinical judgment alone is not satisfactory since mistakes in clinical diagnosis are frequent as in most cases of infertility. Therefore, microscopic examination of direct preparation as well as indirect immunofluorescence techniques and MAT is required for an accurate diagnosis of antisperm antibodies and for evaluation of the efficacy of drugs. However, in this study the total positive cases detected by the micro-agglutination test were 94 cases of the total suspected cases (294 cases). The antisperm antibodies were

common in infertile with history of testicular trauma. The antibody was detected in 5 from 10 (50%). However, antisperm antibodies were present in 15.7% of infertile with unknown causes.

**Table 1:** Residence Distribution of Antisperm Antibodies

Residence	Number of infertile has +ve ASA	Percentage
Rural	66	70.2
Urban	28	29.8

Chi-square. =30.727 D.F.= 1 P<0.01

**Table 2:** Sex distribution of antisperm antibodies

Sex	Total Number	Number of +ve of ASA result	-ve result	Percentage
Males	147	74	73	50.3
Females	147	20	127	13.6

**Table 3:** Age Distribution for Antisperm Antibodies Positive Result

Age (years)	Number of male +ve ASA	Number of females +ve ASA
20	3	1
21	14	5
24	5	1
27	8	2
31	12	4
32	11	2
33	3	1
34	4	-
35	3	1
36	1	-
37	2	-
38	3	1
40	2	1
43	2	1
47	1	-
Total	74	20

**Table 4:** Testicular Biopsy Distribution among Patients

Number of patients	Number of patients underwent testicular biopsy	Number of patients +ve ASA after testicular biopsy
147	14	12

**Table 5:** The Role of Mumps in Antisperm Antibodies

Total number of patients	Number of patients with history of mumps	Number of patients with mumps and has ASA positive	Number of patients with mumps and has ASA negative results
147	5	2	3

**Table 6:** Varicocele Distribution among Antisperm Antibodies Positive Result

Number of patients	Number of patients have varicocele	Number of patients with varicocele has +ve ASA	Number of patients with varicocele has -ve ASA
147	27	4	23

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