

OLIGOASTHENOZOOSPERMIA IS NOT ASSOCIATED WITH SPONTANEOUS ABORTIONS FOLLOWING IN VIVO PREGNANCIES CONTRASTING WITH IN VITRO FERTILIZATION DATA

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Previous data showed an association between low motile density (<10 million motile/mL) and spontaneous abortion (SAB) following in vitro fertilization-embryo transfer (IVF-ET). The purpose of this study was to determine if the same association existed following intrauterine insemination (IUI). A retrospective review of IUI pregnancies was conducted. Patients with antisperm antibodies, a low hypo-osmotic swelling (HOS) test score (<50%), or those using donor sperm were excluded. A total of 52 couples were enrolled in the study: 34 in the normal motile density (MD) group and 18 in the low MD group. The SAB rate in the normal group was 29.4% and in the low group was 27.8%. Thus, these data fail to corroborate the conclusions reached after evaluation of IVF pregnancies that low MD is a cause of SAB. However, since there is a large difference in the number of sperm that come in contact with the oocyte following IVF versus IUI, it may be that the implantation defect is not evident until the oocyte is exposed to a certain number of abnormal sperm.

Keywords male factors, miscarriage

Oligoasthenospermia is a cause of spontaneous abortion (SAB) following in vitro fertilization (IVF) with conventional insemination of oocytes [5]. Interestingly, the SAB rate was 0% following intracytoplasmic sperm insemination (ICSI) [5]. Some sperm abnormalities, e.g., hypoosmotic swelling (HOS) scores [2, 4], and subnormal stress test scores [1], cause implantation defects. These problems with implantation seem to be overcome by ICSI [3]. These data are consistent with the hypothesis that the supernumerary sperm attached to the zona pellucida, under some circumstances, may impair embryo implantation. Some abnormal protein or cytokine may be involved in the mechanism for causing implantation disorders since treatment with a mild protein digestive enzyme (chymotrypsin) can correct the HOS abnormalities, resulting in pregnancy [3].

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The study presented herein evaluated whether oligoasthenozoospermia is associated with an increase in the SAB rate with pregnancies achieved without IVF.

MATERIALS AND METHODS

A retrospective review of pregnancies achieved by intrauterine insemination (IUI) was conducted, with patients being classified according to their motile density on the day of their IUI. Patients were considered to have a low MD if there was <10 million motile sperm/mL. Couples whose specimens were teratozoospermic (<4% normal forms, strict criteria), were positive for antisperm antibodies, or had a low HOS test score (<50%) were excluded. Patients using donor sperm were also excluded. Sperm concentration and motility were determined using the Micro-Cell counting chamber (Conception technologies, La Jolla, CA). Samples were prepared for insemination using a Percoll density gradient.

Intrauterine insemination was typically performed for male or cervical factor. Male factor, using SART criteria, was defined as a sperm concentration of less than 20 million/mL or a motility of <50%. Cervical factor was defined as poor-quality mucus at the time of mature follicle (i.e., a follicle with a diameter of 18–24 mm in conjunction with a serum estradiol (E2) > 200 pg/mL). IUI was performed in either a natural cycle if the patient attained a mature follicle or a stimulated cycle if the patient was anovulatory or had a luteal phase defect resulting from oocyte release from immature follicles. Ovulation inducing drugs used included clomiphene citrate or low-dose gonadotropins (usually starting at 75 IU per day for the first week). The IUI was performed 40 h after human chorionic gonadotropin (hCG) injection, or 36–44 h after spontaneous rise of luteinizing hormone (LH), determined by measuring urinary LH every 4–5 h once a follicle with a 17-mm average diameter was obtained. If the follicle had not collapsed at the time of IUI, the IUI was generally repeated 8–12 h later.

The SAB rate was defined as the percentage of involuntary losses following establishment of a clinical pregnancy (ultrasound evidence of a gestational sac in the uterus). Chi-square analysis was used to compare the SAB rates by presence of low MD. A *p* value of .05 was considered significant.

RESULTS

A total of 52 pregnant patients who conceived following IUI were included in this study. There were 18 couples in which the MD was <10 million/mL; the age of these women ranged from 25 to 39 with a median of 33 years. There were 34 couples for which the MD was ≥10 million/mL; the age of these women ranged from 27 to 38 with a median of 33.5. The distribution of count, motility, and motile density is presented in Table 1. The SAB rate for patients with a normal MD was 29.4% (10 of 34) and in the low MD group the SAB was 27.8% (5 of 18) (*p* = NS).

Table 1. Distribution of sperm parameters in the two groups

	Low MD (<10 million/mL)	Normal MD (≥10 million/mL)
Count (millions)	(3.5–20) 10.7	(22–118.2) 45
Motility	(21.8–61) 38	(26–88) 50
Motile density (million/mL)	(1.08–7.92) 3.99	(10.9–104) 25.6

DISCUSSION

In contrast to the previous study with IVF, oligoasthenozoospermia was not associated with an increased SAB rate following in vivo pregnancies. These new data might raise the question as to whether the IVF results were merely fortuitous. However, another possibility could explain why there may be an increased SAB rate with pregnancies following in vitro fertilization but not in vivo pregnancies when oligoasthenozoospermia is present. Since there are many more sperm coming in contact with the zonā pellucida following oocyte insemination with IVF than natural fertilization, there may well be a higher level of exposure during IVF with this hypothesized toxic factor for implantation.

This new study makes it very important to design a prospective randomized study comparing the affects of conventional oocyte insemination versus ICSI for patients undergoing IVF-ET to evaluate if SAB rate is increased in the former versus the latter.

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