

Subsequent therapeutic options and outcome in couples who fail to fertilize despite in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI)

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Summary

Purpose: Failed fertilization with ICSI in women having at least five mature oocytes retrieved is uncommon. The present study evaluated 19 such patients to determine – based on this outcome – what option they would choose next and what the outcome would be.

Methods: The study requirements included females age ≤ 43 and use of ejaculated sperm.

Results: Five of 19 women (26.3%) had severe oligoasthenozoospermia. Options chosen were 1) donor egg ($n = 3$), 2) donor embryo ($n = 1$), 3) donor sperm ($n = 1$), 4) treatment cessation ($n = 3$), 5) resuming IVF-ET and ICSI ($n = 11$). Live deliveries occurred in 1) ($n = 2$), 2) ($n = 1$), and 5) ($n = 4$).

Conclusions: When faced with failed fertilization with ICSI a small majority of women (11/19, 57.9%) chose to still try with their own gametes and some succeeded (36.3%). These data may be helpful in counseling couples who fail fertilization despite IVF with ICSI in making a decision as to their next therapeutic choice.

Key words: Failed fertilization; Intracytoplasmic sperm injection; Treatment options.

Introduction

The failure to attain any fertilized eggs in women having at least five metaphase II eggs retrieved despite intracytoplasmic sperm injection (ICSI) is uncommon [1–3]. When this happens the possible explanations include: 1) A sperm abnormality with possible deficient sperm associated oocyte activating factor (SAOAF) or other essential proteins [4]; 2) Receptors in the egg are deficient, e.g., for SAOAF; 3) The problem is related to the controlled ovarian hyperstimulation (COH) regimen (possibly the oocytes were not quite mature enough).

Based on these theoretical possibilities options that a couple could choose include: 1) donor sperm, 2) donor egg, 3) continue more IVF-ICSI cycles but maybe change COH protocols, 4) stop IVF procedures.

Materials and Methods

A retrospective review was conducted on all patients fulfilling the criteria of retrieval of at least five metaphase II eggs with failure to fertilize despite ICSI, age restricted to ≤ 43 , and the failure to fertilize was required to be their first IVF-ICSI cycle.

The reason for using ICSI was either mild or severe sperm abnormalities or unexplained infertility. Only cases using ejaculated sperm were evaluated.

Patients were excluded if they failed to fertilize and then had subsequent IVF-ICSI using the aid of high magnification (6300x) ICSI to identify sperm by normal nuclei [5].

After the identification of these patients evaluation of the subsequent chosen options was performed.

Results

There were 19 couples identified. Five of 19 had severe oligoasthenozoospermia. The other 14 had either mild male factor problems or unexplained infertility.

The options chosen by these 19 couples are shown in Table 1. Table 1 also lists the effect that these options had on achieving a successful live delivery. The majority of couples still chose to try again with their own gametes – 57.9% (11/19). Continued failed fertilization occurred in five of these 11 women (45.4%). None tried more than two more cycles. Four of the six women (66.7%) that achieved fertilization on subsequent cycles also achieved pregnancies and delivered a live baby.

Conclusions

Only one of the five couples with severe oligoasthenozoospermia chose donor sperm. One of them chose donor embryos (the female partner was age 43 with a high day 3 serum FSH), one tried again (and failed to fertilize) and two ceased fertility treatment. All three couples choosing donor eggs had female partners ≥ 41 .

Table 1. — Subsequent options chosen in couples with failed fertilization despite IVF with ICSI.

Options chosen	Number	No. of successful pregnancies	% successful pregnancies
Donor eggs	3	2	66.7
Donor embryo	1	1	100
Donor sperm	1	0	0
Fertility medication stopped	3	0	0
Continue IVF with ICSI (changed protocol)	11	4	36.3

It is not possible to determine if the reason for subsequent fertilization despite previous fertilization failure was related to changing the COH protocol or not.

Though this was only a small series, 60% of couples choose not to change the male gamete even when it seemed highly likely that the reason for failed fertilization was severe male factor.

Failed fertilization despite ICSI should not signal automatic rejection of trying with the original gametes since 36% achieved a live delivery with subsequent attempts.

References

- [1] Sousa M., Tesarik J.: "Ultrastructural analysis of fertilization failure after intracytoplasmic sperm injection". *Hum. Reprod.*, 1994, 9, 2374.
- [2] Kovaic B., Vlasisavljevic V.: "Configuration of maternal and paternal chromatin and pertaining microtubules in human oocytes failing to fertilize after intracytoplasmic sperm injection". *Mol. Reprod. Dev.*, 2000, 55, 197.
- [3] Mahutte N.G., Arici A.: "Failed fertilization: is it predictable?". *Curr. Opin. Obstet. Gynecol.*, 2003, 15, 211.
- [4] Parrington J., Swann K., Shevchenko V.I., Sesay A.K., Lai F.A.: "Calcium oscillations in mammalian eggs triggered by a soluble sperm protein". *Nature*, 1996, 379, 364.
- [5] Bartoov B., Berkovitz A., Eltes F., Kogosovsky A., Yagoda A., Lederman H. *et al.*: "Pregnancy rates are higher with intracytoplasmic morphologically selected sperm injection than with conventional intracytoplasmic injection". *Fertil. Steril.*, 2003, 80, 1413.

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