How to improve IVF-ICSI outcome by sperm selection.


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In previous studies, a new IVF method of intracytoplasmic morphologically selected sperm injection (IMSI) was introduced, based on motile sperm organellar morphology examination (MSOME). It was concluded that microinjection of morphologically selected sperm cells with strictly normal nucleus, defined by MSOME, improves IVF-ICSI outcome. The aim of the present study was to confirm this conclusion in new, enlarged study groups. Comparison between 80 couples, who underwent an IVF-IMSI trial, with matched couples, who underwent a standard IVF-ICSI procedure, confirmed that pregnancy rate following IVF-IMSI was significantly higher, and abortion rate significantly lower than in the routine IVF-ICSI (60.0 versus 25.0%, and 14 versus 40% respectively, P ≤ 0.05). Another comparison was performed between matched IMSI groups, where embryos were obtained from microinjection by spermatozoa with a morphologically normal nucleus ('best' group, n = 70) and a 'second best' group was selected, where embryos were obtained from microinjection of spermatozoa with minimal morphological impairment, since no other sperm cells were available. It was confirmed that microinjection by 'second best' spermatozoa result in significantly lower pregnancy and delivery rates and significantly higher abortion rates than microinjection with 'best' spermatozoa (25.7 versus 58.2%, P ≤ 0.01; 17.1 versus 52.8%, P ≤ 0.01, and 33.3 versus 9.7%, P ≤ 0.02 respectively). The present study has strengthened previous conclusions.
25.9 versus 5.9+/−12.9%, F=15.8, P< or =0.01; 52.6 versus 18.4%, chi2=9.7, P< or =0.01; and 10.0 versus 57.1%, chi2=7.1, P< or =0.02, respectively). CONCLUSIONS: Implantation and pregnancy by ICSI is associated with morphological nuclear normalcy of sperm. Sperm with a morphologically abnormal nucleus usually have low fertility potential, but some with certain nuclear abnormalities may still be able to produce pregnancy following ICSI.


**Pregnancy rates are higher with intracytoplasmic morphologically selected sperm injection than with conventional intracytoplasmic injection.**


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OBJECTIVE: To verify whether microinjection into retrieved oocytes of motile spermatozoa with morphologically normal nuclei, strictly defined by high power light microscopy (x>6000), improves the IVF/ICSI pregnancy rate in couples with repeated ICSI failures. DESIGN: Comparative prospective study testing routine IVF/ICSI outcome parameters against those of modified ICSI based on morphological selection of spermatozoa with normal nuclei. SETTING: Male factor fertility laboratory and IVF center. PATIENT(S): Sixty-two couples, with at least two previous consequent pregnancy failed ICSI cycles, underwent a single ICSI trial preceded by morphological selection of spermatozoa with normal nuclei. Fifty of these couples were matched with couples who underwent a routine ICSI procedure at the same IVF center and exhibited the same number of previous ICSI failures. INTERVENTION(S): Standard ICSI and modified ICSI. MAIN OUTCOME MEASURE(S): ICSI pregnancy rate. RESULT(S): The matching study revealed that pregnancy rate after modified ICSI was significantly higher than that of the routine ICSI procedure (66.0% vs. 30.0%). CONCLUSION(S): Microinjection into retrieved oocytes of selected spermatozoa with strictly defined morphologically normal nuclei improves significantly the incidence of pregnancy in couples with previous ICSI failures.
Does the presence of nuclear vacuoles in human sperm selected for ICSI affect pregnancy outcome?

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BACKGROUND: To verify whether or not microinjection of sperm with a normal nuclear shape but large vacuoles affects IVF-ICSI pregnancy outcome. METHODS: A comparative study testing IVF outcome parameters of IVF-ICSI, based on morphological selection of spermatozoa with normal nuclei against those based on microinjection of sperm with a normal nuclear shape but large vacuoles. An experimental group, including 28 IVF-ICSI cycles, where only embryos obtained from microinjection of spermatozoa with a normal nuclear shape but large vacuoles were transferred, was matched with a control group, including 28 IVF-ICSI cycles, where only embryos obtained from microinjection of spermatozoa with a strictly defined morphologically normal nuclear shape and content were transferred. The main outcome was IVF-ICSI pregnancy rate. RESULTS: The experimental group exhibited a significantly lower pregnancy rate per cycle and significantly higher abortion rate per pregnancy compared to the control group (18 versus 50%, and 80 versus 7%, respectively, P=0.01). CONCLUSION: Microinjection of vacuolated sperm appears to reduce the pregnancy rate and appears to be associated with early abortion.

High-magnification ICSI overcomes paternal effect resistant to conventional ICSI.

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Previous studies have shown that repeated intracytoplasmic sperm injection (ICSI) failures can be caused by a paternal effect. Other studies have suggested that ICSI results are compromised if morphologically abnormal spermatozoa are injected into oocytes. This study was undertaken to evaluate the usefulness of a high-magnification optical system to select spermatozoa to be used for ICSI (high-magnification ICSI) in couples with repeated conventional ICSI failures. Couples with two or more previous conventional ICSI failures underwent an additional conventional ICSI attempt, followed by a high-magnification ICSI attempt. The outcomes of the two sequential attempts were compared. In 72 of these patients, sperm DNA integrity was assessed. In the whole group of 125 couples with repeated ICSI failures, high-magnification ICSI improved clinical outcomes (pregnancy, implantation, delivery and birth rates) without affecting biological outcomes (fertilization and cleavage rates, embryo morphology). The improvement of clinical ICSI outcomes was evident both in patients with an elevated degree of sperm DNA fragmentation and in those with normal sperm DNA status. It is concluded that high-magnification ICSI improves clinical outcomes in couples with previous repeated conventional ICSI failures.