

THE INTRACYTOPLASMIC MORPHOLOGICALLY SELECTED SPERM INJECTION (IMSI)

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In 2002 Benjamin Bartoov et coll., showed for the first time the fine morphological analysis of sperm cells (6600X). This method was defined by the abridgment of MSOME: Motile Sperm Organelle Morphology Examination.

This technique is possible thanks to the high resolution of a inversed microscope with a phase contrast of type Nomarski's which allows the direct observation during the work of selection of the sperm cell, to detect 5 points of vital impact of gamete. The most important points to define the "best" spermatozoa concern the morphological state of different fine sub cellular organelles: acrosome, postacrosomal lamina, neck, tail and the nucleus.

When this technique was associated with the technique of microinjection in real-time (ICSI) the abridgement of the IMSI (Intracytoplasmic Morphologically Selected sperm Injection) appeared for the first time.

In this procedure we perform a selection of individual spermatozoa strictly defined with a normal nucleus for injection to the ova.

Based on this observation (MSOME), and the subsequent results of pregnancy by IMSI obtained by this team, these authors showed that only 7% of spermatozoa present an intact nucleus and the rest of spermatozoa in the ejaculate, are considering with a nucleoteratozoospermia.

The actual question concern the establishment of a spermatozoa classification for the identification to the main defect and their localisation: head, midpiece or tail ?

In our experience and to the others French teams, the main problem concern the nuclear vacuoles that have a negative effect to the embryo quality and especially on the competence of embryos to develop to blastocyste with a subsequently reduction in the pregnancy rate and an increase of early abortion.

However it is possible that morphological quality of the spermatozoon injected to the ova is a risk factor for major malformation in ICSI treatment.

In fact, the same authors confirmed in 2008, the character safe of the technique concern the major foetal malformations. Indeed, with the classic ART, we know today that the rates of congenital malformations are more important than these observed in the population when a children spontaneously conceived.

Furthermore, according to the recent studies, the ICSI, compared with the classic IVF, present a distribution of major congenital malformations of fetuses/infants in the matched ICSI and IMSI groups according to the organ system affected a twice rate of foetal malformations. When compared the results of the IMSI vs. ICSI, Bartoov et coll., showed on a troop of 206 couples / group observed during 2004-2008, a minimal twice reduction of early abortion and foetal major malformations in the IMSI group. In this study, pregnancy rate after IMSI where higher compare to ICSI (50% vs. 25%).

Finally, IMSI is a usefully technique since it produce embryos with a higher quality and higher capacity to implant. Extended culture to the blastocyste stage could provide a test by which to select more viable embryos that may reflect the quality of the gametes from which they were derived.

The indications of the IMSI can be still discussed. In our case, it seems reasonable to envisage it for the couples with high degree of spermatozoa DNA fragmentation, male defect of fertilization, bad embryonic quality, absence of pregnancy or miscarriages with repetition.