AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE
Formerly The American Fertility Society
1209 MONTGOMERY HIGHWAY • BIRMINGHAM, ALABAMA 35216-2809 • TEL (205)978-5000 • FAX (205)978-5005 • E-Mail: asrm@asrm.com

FACT SHEET

INTRACYTOPLASMIC SPERM INJECTION (ICSI)

Intracytoplasmic sperm injection (ICSI) is a laboratory procedure developed to help infertile couples undergoing in vitro fertilization (IVF) due to severe male factor infertility. ICSI involves the insertion of a single sperm directly into the cytoplasm of a mature egg (oocyte) using a microinjection pipette (glass needle). ICSI has largely replaced the two previously developed micromanipulation techniques, partial zona dissection (PZD) and subzonal insertion (SUZI), because it achieves higher overall fertilization rates.

A variety of sperm problems can account for male infertility. Sperm can be completely absent in the ejaculate (azoospermia) or present in low concentrations (oligospermia). They may have poor motility (asthenospermia) or an increased percentage of abnormal shapes and forms (teratospermia). There may also be abnormalities in the series of steps required for fertilization, such as sperm binding to and penetrating the egg. Deficiencies in any of these aspects of sperm function will generally lead to lack of fertilization.

ICSI can facilitate fertilization by sperm that will not bind to or penetrate an egg. It can also be used to treat men with extremely low numbers of sperm. However, ICSI is generally unsuccessful when used to treat fertilization failures that are primarily due to poor egg quality.

INDICATIONS FOR INTRACYTOPLASMIC SPERM INJECTION

- Very low numbers of motile sperm with normal appearance.
- Problems with sperm binding to and penetrating the egg.
- Antisperm antibodies (immune or protective proteins which attack and destroy sperm) of sufficient quality to prevent fertilization.
- Prior or repeated fertilization failure with standard IVF culture and fertilization methods.
- Frozen sperm collected prior to cancer treatment that may be limited in number and quality.
- Absence of sperm secondary to blockage or abnormality of the ejaculatory ducts that allow sperm to move from the testes. In this situation, sperm are obtained from the epididymis by a procedure called microsurgical epididymal sperm aspiration (MESA), or from the testes by testicular sperm aspiration (TESA).

ICSI is not a perfect technique. Some eggs will be damaged by the ICSI process. Some eggs have plasma membranes that are difficult to pierce. In other instances, the fertilized egg may fail to divide, or the embryo may arrest at an early stage of development. Egg fertilization rates of 50 percent and cleavage rates of 80 percent or more are expected, but only 15 to 20 percent of egg retrievals produce a baby in well-selected couples. Other factors such as poor egg quality and maternal age may cause these percentages to drop.

Perinatal outcomes studies in Europe suggest that although multiple pregnancies are common in ICSI, there is to date no evidence of increased incidence of congenital malformations or abnormal karyotypes. There is no evidence that abnormalities may arise later in life to babies born as a result of ICSI, although there is also no guarantee that all babies will be normal. For example, because some causes of male infertility are unexplained and/or related to genetic problems, male offspring might have reproductive problems as an adult. Furthermore, approximately 1 in 20 individuals in the general population will have some birth defect and this risk is likely to be similar in babies born as a result of the ICSI procedure.

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