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GYNAECOLOGY AND FERTILITY CENTRE

PATIENT INFORMATION

# Intra-cytoplasmic sperm injection (ICSI)

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# Intra-cytoplasmic sperm injection (ICSI)

## What is ICSI?

ICSI is when a single sperm is injected directly into the centre of the egg using a microinjection needle in order to fertilise it. Before the procedure, the eggs have their surrounding cells removed using an artificial enzyme, meaning that the sperm do not have to penetrate any of the barriers normally surrounding the egg.

ICSI was developed to help with fertilisation during assisted reproduction using poor quality sperm that would otherwise not be able to fertilise an egg.

## Who can benefit from ICSI?

ICSI is recommended when:

- There is a low sperm count or poor quality sperm
- Where there have been previous in vitro fertilisation (IVF) attempts but fertilisation has been unsuccessful
- The sperm have been collected directly from the testicles using surgical sperm (SSR) removal either due to a vasectomy or very low sperm count, or due to problems with ejaculation
- High levels of antisperm antibodies

## Are there any risks involved?

As with any procedure, there are some risks involved. These include:

- Some of the eggs collected during IVF may not be mature enough and therefore not suitable for injection. And if only a few eggs are collected, none may be suitable for ICSI. All eggs are assessed by the embryologist once they are stripped of their surrounding cells
- As ICSI is a very delicate and relatively invasive technique, around 10% of the eggs injected may be damaged during the procedure. If this happens, they cannot be used in treatment
- ICSI uses sperm that would not otherwise be able to fertilise an egg, therefore concern about potential risks to children born as a result of ICSI have been raised

ICSI has potentially been linked with certain genetic and developmental defects including:

- **Increased risk of cystic fibrosis carrier status:**

5-10% of men with no sperm in their ejaculate are born without their vas deferens. (This means that the tubes that carry sperm from the testes to the penis are missing). Two-thirds of these men are carriers for cystic fibrosis. Couples considering ICSI may wish to have genetic counselling before they begin treatment

- **Sex chromosome defects and inheritance of sub-fertility:**

A small number of men with very low sperm counts have some genetic material missing from their Y chromosome. Certain genes on this chromosome have been shown to be involved in the production of sperm, so deletion of these genes may be responsible for some men having few or no sperm. Consequently there may be a risk, when using this sperm, of passing this condition on from father to son.

Some studies have suggested that where ICSI is used to treat severe male factor problems, there may be an increased incidence of sex chromosomal abnormalities in the babies being born. Up to 3.3% of fathers of ICSI babies have abnormal chromosomes, whereas in the wider population this figure is 2.4%

- **New chromosomal abnormalities:**

It is not possible to detect which eggs or sperm (gametes) have chromosomal abnormalities so gametes that might not otherwise have been able to be part of natural fertilisation could therefore be used in ICSI. Babies born after ICSI have been reported to have new chromosomal abnormalities in up to 3% of cases. The rate in the wider population is 0.6%

- **Possible developmental and birth defects:**

There is no clear evidence as yet whether ICSI results in higher rates of birth defects. More studies are required to learn more about this. However, recent research using a very small number of children has given an indication of possible delays in mental development at one year. Other studies have not shown this link; further research is needed

- **Miscarriage:**

It is believed that the risk of miscarriage increases in proportion to the severity of the male infertility. With ICSI, it is possible that abnormal gametes, which would not normally be able to produce a viable embryo, could be used. This increases the chances of an abnormal embryo. Most abnormal embryos will not implant into the womb but some might, which may lead to miscarriage

- **Long term risks to children born through ICSI:**

Several large follow-up studies of children born through ICSI have now been published and the results are reassuring. However, since ICSI was only introduced into clinical practice in the early 1990s, it is a relatively new technique and the children conceived are still very young. We cannot therefore predict whether ICSI will have any effect in adult life on, for example, future childbearing

***The medical information in this leaflet is provided as an educational resource only. It is not intended to replace the advice of your GP or medical team and should not be used or relied upon for any diagnostic or treatment purposes. The information has been prepared by Dr Carole Gilling-Smith, Consultant Gynaecologist and Medical Director of the Agora Gynaecology and Fertility Centre. It was last updated in August 2014.***