Regional Fertility Centre

Patient Information

In-Vitro Fertilisation (IVF & ICSI)

Contents

1.0 In-Vitro Fertilisation (IVF) & Intracytoplasmic Sperm Injection (ICSI)

IVF and ICSI (intracytoplasmic sperm injection) are both forms of assisted conception.
The treatment for both is the same, with the only difference being the method of fertilisation used in the laboratory.

Medical criteria for IVF or ICSI treatment
The decision as to whether IVF or ICSI treatment is suitable for a couple is based on certain medical criteria and best clinical practice, including the woman's BMI.

IVF

Literally translated the term 'In-Vitro Fertilisation' means 'in-glass'. This refers to the process whereby a woman's eggs are removed from her ovary and fertilised outside her body in the laboratory. The resulting embryos are then transferred back inside her womb a few days later. IVF is suitable for women with damaged fallopian tubes or men with reduced semen quality. In addition, some couples with unexplained infertility may benefit from treatment with IVF. IVF can also be used for women who are unable to produce eggs (using egg donation) or who do not have a uterus (using surrogacy).

ICSI

ICSI is similar to conventional IVF in that eggs and sperm are collected from each partner. The principal difference between the two procedures is the method of achieving fertilisation. In IVF, the eggs and sperm are mixed together in a dish and the sperm fertilises the egg 'naturally'. In order for this to occur, large numbers of actively swimming normal sperm are required. For some couples, the number of suitable sperm available may be very limited or there may be other factors preventing fertilisation.

In these cases where conventional IVF is not an option, ICSI provides an alternative. ICSI refers to the laboratory procedure in which the embryologist injects a single sperm into each egg. With this technique very few sperm are required and the ability of the sperm to enter the egg itself is bypassed. However, the ICSI procedure itself does not guarantee fertilisation as the normal cellular events of fertilisation still need to take place once the sperm is placed within the egg.

ICSI is specifically suitable in the following circumstances:

- When the man has a very low sperm count
- When the sperm are not moving well or when there is a high proportion of abnormal sperm
- When sperm are surgically retrieved from the testis
- In treatment for couples who have previously had failed fertilisation with conventional IVF.

Stages of IVF & ICSI Treatment

In general there are five stages to each cycle of IVF or ICSI treatment.

STAGE 1: Down regulation (used in the long agonist protocol)

Treatment usually starts by taking a nasal spray for approximately 14 days to temporarily switch off the hormonal messages from the brain to the ovaries. This usually starts on day 21 of a 28-30 day menstrual cycle. Daily hormone injections are then taken for ovarian stimulation. The nasal spray continues to be taken in combination with the injections in order to prevent premature release of eggs (ovulation).

STAGE 2 - Ovarian stimulation

Daily injections of follicle stimulating hormone (FSH) with or without Luteinising hormone (LH) should stimulate the ovaries to produce multiple follicles (containing eggs). The course of injections usually lasts about 12 days. The response of the ovaries to the injections is monitored by transvaginal ultrasound scans and sometimes blood tests to measure oestrogen levels. There are usually at least two scans during treatment. During treatment it may be necessary to alter the dose of the hormone injections depending on the response of the ovaries as monitored by scan and oestrogen levels.

The scans are carried out at the Regional Fertility Centre (RFC), Royal Hospital site. When the follicles reach a mature size a further hormone injection (hCG) is given to ripen the eggs and prepare them for collection approximately 36 hours later.

Antagonist Protocol STAGE 1 & 2

In patients who are considered to be at high risk of over-responding to the drugs used for ovarian stimulation a different protocol is used. This is the ***Antagonist Protocol***. In this protocol, down regulation (nasal spray) is not used and the injections for ovarian stimulation are started on day 1 or 2 of a period. A 2nd injection (antagonist) is added in after 3 or 4 days to stop premature ovulation. Hormone tablets (norethisterone) are often given from day 21 of the preceding cycle to defer the start of the period to a 'planned' date. This allows dates for starting injections and scans to be scheduled in advance.

STAGE 3 - Egg Collection

Egg collection is performed in the RFC, Royal Hospital site. Using a transvaginal ultrasound probe to which a needle is attached, the fluid within each follicle is gently sucked out into a test tube via a special pump attached to the needle. The female patient is sedated during the procedure. Her husband/partner/friend should be available to provide transport home as it is not permissible to drive within 24 hours of having had the sedation. Once the egg collection is finished, patients are taken to the recovery room and are usually discharged after 1-2 hours.

On the morning of egg collection the partner will be asked to provide a semen sample (unless frozen sperm or donor sperm is being used).

Egg collection - what are the risks involved?

A small amount of vaginal bleeding can occur for up to a day afterwards and some discomfort in the lower abdomen may persist for 12-24 hours. There is a very small risk of the needle touching a blood vessel or the bowel but the scan helps to avoid this rare problem. In less than 1 in 300 cases, ovarian infection may occur. If this happens, pain in the lower abdomen and a raised temperature may be noticed in the days following the procedure. Treatment with antibiotics is usually adequate to clear this up although admission to hospital may be required. Very occasionally a serious infection can occur and an operation is necessary.

STAGE 4 - Insemination

In IVF treatment the sperm and eggs are incubated overnight in a special culture fluid that provides them with all the right nutrients to allow fertilisation to occur. In ICSI treatment the eggs are injected with individual sperm before being incubated overnight. The following morning, the eggs are checked for signs of fertilisation. The embryos (fertilised eggs) are allowed to develop for between two and six days before transfer back into the womb (uterus).

On the evening of the day of egg collection the woman starts using a vaginal gel/pessary containing the hormone progesterone. This is continued every evening for two weeks and longer if you become pregnant.

After the egg collection procedure patients are given a time to contact the embryologist the next day to be advised about the fertilisation and most likely day for embryo transfer.

STAGE 5 - Embryo transfer

On the day of embryo transfer the embryologist will select the best embryo(s) to transfer. Embryos may be transferred on the second, fifth or sixth day after egg collection. The decision regarding the day of transfer usually depends on the number of embryos that are available. If there are a large number of embryos, culture is usually extended to day 5 or 6 in anticipation of obtaining blastocysts.

As not all embryos will continue to develop to the blastocyst stage this extended culture will help the embryologist select the best quality embryo(s) for transfer. In order to reduce the chance of a twin pregnancy usually only one blastocyst is transferred. If a couple have only 1 or 2 embryos it may be best to transfer these at an earlier stage. When embryos are not of the optimum quality, transfer of 2 may be considered to improve the chance of a pregnancy occurring. The embryo transfer is carried out in the RFC, Royal Hospital site. The procedure usually only takes a few minutes to perform and does not require pain relief. A speculum is inserted into the vagina to visualise the cervix (similar to having a cervical smear test carried out) and the embryo(s) are transferred into the uterus by passing a fine catheter through the cervix.

Following the embryo transfer patients can resume normal activities. Two weeks after embryo transfer of 'day 2' or 'day 3' embryos, or 11 days after transfer of a blastocyst, a pregnancy test is carried out.

After embryo transfer, spare embryos judged to be of suitable quality may be frozen for later use.

2.0 Problems That Can Occur During Treatment

Failed Stimulation
Unfortunately not all patients respond to the drugs used for ovarian stimulation and sometimes it may be necessary to stop the treatment when no mature eggs have developed. Women at particular risk of this happening are older women and those with a low level of Anti Mullerian Hormone (AMH)

Over Stimulation
Some patients' ovaries may over respond to the drugs. Sometimes this excessive response requires treatment to be stopped prior to egg collection to prevent the development of Ovarian Hyperstimulation Syndrome (OHSS). On other occasions treatment may continue to egg collection but all embryos are frozen and embryo transfer takes place at a later date, when the ovaries have returned to normal. The reason for deferring the embryo transfer is because OHSS in a patient who is pregnant is more severe and prolonged. Occasionally despite precautionary measures having been taken OHSS can still develop and in severe cases may require admission to hospital. Women who have a very high level of AMH may be considered at risk of developing OHSS. In these women a different drug regime is used (Antagonist Protocol) with lower doses of FSH and more intensive monitoring to minimise the risk.

3.0 Reducing Multiple Births

The single biggest risk of fertility treatment is multiple pregnancy. The increased risks associated with multiple pregnancy and birth do not just happen during late pregnancy and delivery: all stages of pregnancy have an increased complication rate.

Miscarriage - the risk of losing a pregnancy at all stages is significantly increased.

Risks to the Mother - Mothers pregnant with twins/triplets are more likely to experience problems such as high blood pressure, pre-eclampsia and pregnancy related diabetes than mothers of singletons. They are also more likely to have complications associated with delivery.

Risks to the child - The health risks for twins and triplets are greatly increased compared with those for singletons mostly because multiples tend to be born prematurely and underweight.

Prematurity can cause many problems and may even result in the death of the baby. The problems caused

by prematurity can range from those that, although serious, affect only the early stages of the child's life, to those that have a devastating and lifelong impact.

A woman is more likely to become pregnant with twins or triplets if more than one embryo is transferred. We will recommend single embryo transfer (SET), where we assess it is the best option. This will depend on factors such as age and the number and quality of embryos available for transfer.

If you are a suitable patient, you can largely remove the risk of multiple births, while maintaining your overall chance of having a baby, by having SET followed by frozen embryo transfers if necessary.

Patients should be aware of the implications of long-term storage and how, over time, circumstances can change and effect the number of embryos the clinic may be willing to transfer. If you have any concerns about this, please speak to your consultant.

For more information on SET see the 'one at a time' website: **www.oneatatime.org.uk**

4.0 Embryo Freezing

Freezing and storing embryos
Embryo freezing can be used to store (cryopreserve) unused embryos provided that they are of sufficiently good quality. The frozen embryos can then be thawed and transferred at a later date, whether or not the initial treatment has been successful. This is known as a Frozen Embryo Transfer (FET).

Your chances of becoming pregnant with a thawed frozen embryo are not affected by the length of time the embryo has been stored.

5.0 Following Treatment

Following a successful treatment an early pregnancy scan is arranged (usually 3 weeks after a positive pregnancy test)

Following an unsuccessful treatment an appointment is offered with the Doctor to discuss the treatment and any future treatment options.

6.0 Success Rates

For success rates please refer to our website – https://belfasttrust.hscni.net/services/rfc/

7.0 Counselling

Undergoing fertility treatment can be stressful and can affect your domestic, social and working life. The RFC provides a specialist counselling service which you can access at any time before, during and after treatment.

People often feel a range of confusing or unusual emotions including depression, anxiety, anger or hostility, guilt, feelings of grief and loss, problems with sleeping or eating, and difficulties coping in social and work situations which would not usually be a problem.

The role of the counsellor is to offer emotional and psychological support at a time when it is needed. The details of your appointments with the counsellor are confidential.

You can arrange an appointment with a specialist counsellor by telephoning (028) 9073 6081 on Monday – Friday between 9.00am to 4.30pm.

As infertility and treatment affects both partners it is usually more positive for couples to attend together.

The appointment takes place at the office of:
Fertility Counselling Service NI,

Ground Floor, Unit 2,
18 Heron Road,
Belfast, BT3 9LE.

Each session usually lasts for 50 minutes. The Counselling Service offers RFC patients up to 6 free sessions per treatment cycle. You can, of course, have additional counselling, however any further sessions will have a cost. (Please speak with the Counsellor about charges for additional appointments.)