INTRAUTERINE INSEMINATION

Techniques of intrauterine insemination have evolved over the past two decades from simple insertion of ejaculated semen into the cavity of the uterus at the time of natural ovulation into a sophisticated and relatively successful treatment. Modern IUI involves a combination of treatment for both partners. The woman is first treated with fertility drugs to produce development of one or two egg follicles, followed by a single injection sample is then prepared by washing and centrifugation, followed by a ‘swim up’ procedure to separate motile sperm from the remainder of the ejaculate. The prepared sperm is then injected into the uterine cavity using a soft traumatic transfer catheter.

Which couples might benefit?

IUI is one of the less stressful methods of ART, which will be offered to couples with unexplained infertility, or if there is suspicion of mild endometriosis. Unexplained infertility is still a common diagnosis, made in the absence of apparent problems with sperm production, ovulation and the reproductive organs (uterus, tubes and ovaries). Endometriosis is a common disorder, particularly in woman who have had no children. The condition occurs when tissue from the womb lining (endometrium) is found elsewhere in the reproductive tract. Women with mild endometriosis are usually treated similarly to women with unexplained infertility. IUI may also be offered if there is a mild male factor, involved in infertility, or infertility where there is a possible problem with the cervical mucus, preventing successful penetration of sperm through the cervix into the cavity of the womb after intercourse. IUI may also be performed after fertility drugs have been used to induce ovulation for women who do not ovulate naturally. In such cases, ovulation is stimulating hormone (FSH). Inseminations is timed to take place at the time of ovulation unexplained infertility, but stimulated IUI using gonadotrophins is a useful alternative to more invasive method like IVE.

Preliminary investigations

The aim tests carried out to investigate infertility is to try to define the cause for the
problem. Investigations will assess whether ovulation takes place naturally, whether the woman has a reduced ovarian reserve (has a low number of eggs remaining in the ovaries) and whether the Fallopian tubes and uterus are healthy, with patent tubes. For the male partner, a semen analysis will determine the number, motility and shape of the sperm to check whether there is a male contribution to the problem in conception. In the 1980s, a post-coital test would be performed at the time of ovulation to try to ascertain if sperm were able to pass into the cervix after intercourse. However this test has been dropped from routine investigation as research has not shown it to be useful in detecting cervical mucus problem causing infertility.

The importance of these preliminary tests when IUI is planned is to check that there are sufficient motile sperm and that the woman’s tubes are open. If the sperm quality is too poor or if the tubes are blocked then the method will not work. A special test will often be carried out on the sperm sample. This will involve a ‘dummy’ swim up and sperm separation, to check that there are sufficient motile (moving) sperm after preparation to give IUI a reasonable chance of success.

Tubal potency testing is carried out using one of three techniques. The commonest is hysterosalpingograph (HSG). This is carried out in an X-ray Department. A vaginal speculum is passed (as for a cervical smear) and a small catheter, thinner than a drinking straw, is passed into the entrance to the cervix. A tiny balloon is then inflated within the cervix to make a watertight seal, and X-ray dye is then injected. This should fill the cavity of the uterus and spill through the Fallopian tubes. X-ray pictures are taken using a camera placed above the woman’s abdomen. These can almost immediately show if there is a blockage to the tubes or if there is an abnormality of the cavity of the uterus.

The drawbacks to the test are that it has to be carried out within the first twelve days of the woman’s menstrual cycle, to avoid the possibility of exposing a very early pregnancy to X-rays. This can make timing of the test difficult. Many women will experience pain when the X-ray dye is first injected. This is often described as like moderate or severe period pain. Many clinics will advise that the woman take paracetamol or ibuprofen two hours or so before the test. There is also a small risk of introducing infection when the dye is injected. Many clinics will take a vaginal and cervical swabs a week or so before the test, and some patients may be given antibiotics to take a few hours before the HSG.

An alternative which is similar to HSG uses a form of dye that can be seen on ultrasound scan. This test, Hysterosonocontrast sonography (HyCoSy) in only offered in a few clinics in UK. The advantages include the ability to scan the uterus and ovaries with ultrasound at the same time as the test of tubal patency, and the test avoids use of X-rays. However the test may not always be able to tell whether tubes are blocked, if a
clear ultrasound picture is not obtained.

The third method for testing tubal patency is by laparoscopy and dye test. Laparoscopy is a surgical procedure which involves a small incision beneath the umbilicus (belly button), through which a camera system can be inserted. This allows a visual inspection of the uterus, tubes and ovaries, and dye can be injected through the cervix to see if the tubes are open. Simple surgical treatments, for example to release adhesions around the tubes, can be performed at the same time if necessary. Drawbacks to laparoscopy include the small but significant risk of anaesthesia and surgery, and the need for several days off work recover from the procedure.

At the same time as laparoscopy, a scope may be inserted into the womb (hysteroscopy) through the cervix to check that the cavity of the womb is normal. **Methods of intrauterine insemination**

The objective of IUI is to introduce a quantity of prepared motile sperm into the woman’s uterus at the time of ovulation, improving the chances of fertilization and pregnancy.

**How the technique works**

IUI works best when insemination coincides with ovulation induced by fertility drugs. IUI without the stimulatory drugs has been shown to be no better than placebo (dummy treatment) for cases of unexplained infertility. Therefore, following investigations, the first steps in IUI treatment are similar to those used in other ART methods in that ovulation is stimulated by injected gonadotropins (superovulation), but in lower doses than usually used in IUI fertility drugs are used induce growth of more than one egg during qa single menstrual cycle. Hence monitoring is important during superovulation to ensure that side effects of treatment is carried out by measuring hormone concentrations in blood samples and by tracking the development of follicles by ultrasound. If several egg follicles are seen on ultrasocound, or if there are high levels of estrogen hormone in a blood test, this indicates the production of multiple eggs in the ovary,. Since these may all ovulate before IUI, this increases the risk of multiple pregnancy. The usual aim in IUI is to generate no more than three eggs (and preferably two). Ovaries stimulation in IUI differs from that in IVF: IUI stimulation aims to produce a larger number of eggs, often six or more, which will be fertilized in the laboratory. The chance of multiple pregnancy IUI the chance of multiple pregnancy depends entirely on the number of follicles that were present at the time of ovulation.

When two or three follicles have reached their target size, the woman is given a single injection of the hormone Human Chronic Gonadotropin (Hcg). Ovulation will then occur about 36 hours later. At about this time, a sample of fresh or frozen semen is
prepared and placed into the uterus of the female partner through a fine catheter. This requires use of a vaginal spexulum (as for a smear test) but is otherwise painless.

**IUI with donor Sperm**

Under normal circumstances, IUI uses sperm from the male partner. However, IUI can also be used for donor insemination (DI). This uses screened sperm samples from a donor. IUI-DI is reserved for cases of male infertility where the male partner’s own sperm is severely abnormal—with a very low (or zero) sperm count, or if the male partner is a carrier for a genetic disease that might affect his offspring. Couples will always be asked to see a counselor to explore all the implications of having a child using donor sperm before treatment takes place. Alternative treatment using IVF with intracytoplasmic sperm injection (ICSI) can sometimes offer an alternative to DI which may be more acceptable to some couples.

**Step by step in IUI**

1. Drug treatment, to encourage two or three eggs mature, usually using injected gonadotropins to simulate the growth of follicles and cause ovulation.
2. When ultrasound scanning shows the largest follicle to have reached a diameter of around 18 millimeters, a final injection (of HCG) is given to ensure ovulation.
3. Approximately 36 hours later, a sperm sample is produced by masturbation, washed and prepared with isolation of the rapidly moving sperm for insemination.
4. IUI is performed using a vaginal speculum to give access to the cervix, with a fine plastic tube used to place the sperm sample into the cavity of the uterus.
5. Pregnancy testing is performed two weeks later. Early pregnancy is monitored with blood tests and ultrasound.