CLINICAL FOCUS

Your guide to key clinical issues in primary care

Subfertility part 2

Overall key points

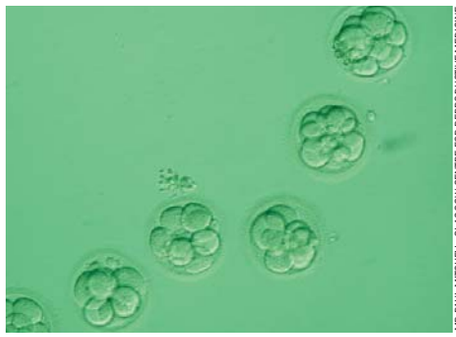
- Infertility units comprise a multidisciplinary team of doctors, nurses, embryologists and biochemists.
- The most common cause of anovulatory infertility is polycystic ovarian syndrome.
- Ovulation induction with intra-uterine insemination can be used in anovulatory/unexplained subfertility.
- IVF can be used where this fails or in women who have severe pelvic disease.
- Intracytoplasmic sperm injection has revolutionised male factor subfertility.

Part 1 An extended role for nurses

Infertility units comprise a multidisciplinary team of doctors, nurses, embryologists, biochemists and administrative staff. Nurses have developed an enhanced role, which includes performing the screening visit, when couples are just about to embark on treatment and require a comprehensive explanation of the processes, and obtaining consent for treatment, including the mandatory Human Fertilisation and Embryology Authority consent forms.

Testing for blood-borne viruses such as hepatitis B and C, and HIV is mandatory; these too can be performed by a nurse.

Once the treatment cycles are under way, the appropriately trained nurse can take blood for oestrogen assays and perform ultrasound scans for follicular tracking.[1] The British Fertility Society (BFS) runs training courses that lead to certification in pelvic ultrasound for infertility (see resources).



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Embryos: transfer can now be done by nurses

Intrauterine insemination and embryo transfer is increasingly being performed by nurses in various units in the UK.[2] Again, the BFS runs a training course for certification in embryo transfer.

As the whole IVF process takes about a month, nurses provide continuity of care and, importantly, they are also a source of tremendous psychological support.[3] All IVF units have an independent counsellor but psychological support provided by the nurses is invaluable as the diagnosis of 'infertility' and its treatment thereafter is emotionally very challenging for the couple.

The nurse's role

- Performing the screening visit and explaining treatment processes.
- Obtaining consent for treatment.
- Testing for blood-borne viruses.
- Taking blood for oestrogen assay.
- Performing ultrasound scans for follicular tracking.
- Intrauterine insemination; embryo transfer.
- Supporting patients.

Part 2 Treating subfertility

As with all aspects of medicine, treatment is dependent on cause. The treatment of infertility has been revolutionised by various assisted reproduction technologies (ART).

The most common cause of anovulatory infertility is polycystic ovarian syndrome which is characterised by a hormonal profile of excess androgens and insulin resistance. It affects approximately 5 per cent of Caucasians, but a greater proportion of Asian women.[4]

Weight loss through diet and exercise is the most effective management, but recently there is an increasing body of evidence for the role of metformin, an insulin sensitising agent.[5]

Ovulation induction agents such as clomiphene citrate are also commonly used, but this carries a 10 per cent risk of a multiple pregnancy and a theoretical risk of ovarian cancer in later life. Therefore in the UK, it is recommended that it be used for no more than 12 cycles.

SPL

Endometriomata (black cyst): surgery helps

Surgical treatment may be possible if tubal damage is found but there is an increased risk of subsequent ectopic pregnancy and, because pregnancy rates using IVF are better, most specialists would advocate IVF for tubal factor infertility.

Surgical treatment of endometriosis may be associated with increased fertility, both in terms of spontaneous conception and also with ART, especially if there are endometriotic cysts on the ovaries (endometriomata).

Surgery may help to improve the egg yield in a cycle of IVF or, more subtly, alter the ovarian micro-environment resulting in better quality oocyte development and fertilisation.[6]

Using gonadotrophins

- Ovulation induction with intra-uterine insemination (OI/IUI) using gonadotrophins may be used for anovulatory subfertility and unexplained infertility.
- It is essentially the same protocol as for IVF, but uses lower doses of gonadotrophins.
- Because the Fallopian tubes are patent, sperm can be inseminated directly into the uterine cavity.

Part 3 IVF and intracytoplasmic sperm injection

Essentially IVF involves taking over a woman's menstrual cycle by down-regulating the pituitary gland using gonadotrophin-releasing-hormone agonists such as buserelin. The patient self-injects gonadotrophins.

The gonadotrophins recruit follicles from the ovaries, each hopefully containing an egg. As the follicle grows, it produces oestrogen and the patient's response is monitored by a combination of ultrasound scanning, measuring the increasing size of individual follicles (follicular tracking), and measuring the rising plasma oestrogen concentration.

Once there are several follicles of sufficient size, the patient is given an injection of human chorionic gonadotrophin (HCG), which induces the final maturation process in follicles and oocytes.

Approximately 38 hours later the patient is sedated in theatre and the follicular fluid is aspirated transvaginally under ultrasound guidance; as the fluid is drawn off, so the oocyte is also aspirated.

Oocytes are incubated with the male partner's sperm, fertilisation occurs, and two or three days later one or two embryos are transferred into the uterine cavity.

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ICSI: a single sperm is injected directly

If pregnancy does not occur, the patient will have a period approximately two weeks later; if implantation is successful however, she will generally have a scan about five weeks after the embryo transfer to determine the viability of the pregnancy and the number of embryos that have implanted.

Intracytoplasmic sperm injection (ICSI) is essentially the same as IVF but is used for couples where there is a severe male factor problem that may make fertilisation harder (see box).

IVF and ICSI cost in the region of £3,000–£4,000 per cycle depending on the clinic (whether it is NHS or private) and carry an approximately 25 to 35 per cent pregnancy rate per cycle. As such, PCTs often give infertility treatment a low priority and there is huge variation around the country as to what is funded and which couples are eligible for treatment.

Furthermore, ART increases the chances of a multiple pregnancy occurring, with all the attendant obstetric risks (maternal haemorrhage, premature delivery, neonatal handicap and so forth) and most responsible units would transfer at most two embryos into the womb to minimise this risk.

Sperm injection

- Intracytoplasmic sperm injection (ICSI) is used if there is a severe male factor that may make fertilisation harder.
- In ICSI the woman goes through exactly the same treatment as for IVF.
- However, a single sperm is injected directly into the oocyte, rather than sperm being incubated with oocytes as is done in IVF.
- ICSI costs £3,000–£4,000 per cycle.

Part 4 Summary

Infertility is thought to affect one in seven UK couples, but it is predicted that this proportion will rise in the coming years as women delay starting their families and possibly also because sperm quality is declining.

Until 20 years ago, such couples would be condemned to a childless relationship or would have to adopt, but ART has dramatically changed that position.

OI/IUI can be used for couples with unexplained infertility or women with mild endometriosis, whilst IVF can be used in cases where OI/IUI has failed or for women with severe pelvic disease. Furthermore, ICSI has revolutionised male factor subfertility.

The downside is that ART increases the chances of a multiple pregnancy with all the attendant obstetric risks. Moreover, the technologies are extremely expensive and it is far from guaranteed that a treatment cycle will be successful.

Because of this, PCTs often give infertility funding a low priority so couples feel their only viable option is the private sector. But regardless of where treatment is carried out, nurses play a pivotal role in management and progressively their responsibilities have increased.

In many units, a nurse will now be involved right from the initial consultation, through follicular tracking to intra-uterine insemination or embryo transfer. Importantly, nurses provide tremendous psychological support in what can be an emotionally difficult time in a couple's life. The nurse's role continues to expand and for those involved in this specialty, it is a deeply rewarding practice.

Key points

- Infertility affects one in seven couples.
- Different ART can be used depending on the cause of the subfertility.
- ART increases the chances of a multiple pregnancy with all the attendant obstetric risks.
- ART is expensive and its success is not guaranteed.
- Nurses have progressed to play a pivotal role in the management of subfertile couples.

Resources

- British Fertility Society: www.britishfertilitysociety.org.uk
- NICE. *Fertility: assessment and treatment for people with fertility problems. Clinical Guideline 11*. London: NICE; 2004. Available from: www.nice.org.uk/pdf/CG011niceguideline.pdf
- Prodigy guidance on infertility: www.prodigy.nhs.uk/infertility

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3. Allan H, Barber D. Nothing out of the ordinary: advanced fertility nursing practice. *Hum Fertil (Camb)* 2004;7(4):277-84.
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5. Lord JM, et al. Metformin increases ovulation and pregnancy rates in anovulatory women with PCOS – meta-analysis. *Evid Based Obstet Gynecol* 2004;6(3):129-30.
6. Collinet P, et al. Endometriosis and infertility. *Gynecol Obstet Fertil* 2006;34(5):379-84.

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