

## Evaluation of the Infertile Couple

### Overview and Definition

Infertility is defined as the inability of a couple to fall pregnant after one year of unprotected intercourse. Infertility is a very common condition as in any given year about 15% of couples who are trying to conceive are not able to do so. Generally speaking, among all cases of infertility, in around 20% the cause can be principally traced to the male partner, 40% to the female partner and around 30% to both partners. In around 15% there is no known, readily attributable cause in either partner. It is important to realise that investigation and eventual treatment of a couple depends on the desired time course to fall pregnant, the factors involved and the length a couple is, at that time in their lives, prepared to go to in order to fall pregnant.

### Evaluation of Infertility in Men

In most cases, the evaluation of the male partner is fairly simple and begins with a medical history, physical examination and semen test. It is important that a laboratory specializing in infertility performs the semen test. I prefer semen testing to be carried out either in our Monash IVF laboratory or with Melbourne Pathology.

If there is a problem with the male partner's fertility, past health and medical history are important in the process of evaluation. I need to know about previous illnesses, infections, operations, medications, exposure to alcohol, radiation, chemotherapy or other potential toxic chemicals and the results of any previous fertility tests. Physical examination may pay particular attention to the presence of a varicocele or varicose vein in the testicle. Also note that a semen test is rarely completely "normal"- there are about ten indices reported upon, and rarely do I see each and every one of these lying within the World Health Organisation's definition of "normal" range. Also note that just because the male partner may previously have fathered a child, doesn't mean that there cannot currently be a problem, because of the large fluctuations in semen quality that may occur from time to time.

I will give you guidelines as to how the specimen should be prepared. These guidelines are also obtainable through the Monash IVF website. Generally speaking, the subject should avoid sex or for two to seven days before providing the semen sample. Ideally the semen should be produced on site at the laboratory so that deterioration of the specimen does not occur prior to examination. Most laboratories require that the specimen is produced within the window of a few hours each morning, when the laboratory will then be free to analyse the specimen straight away. Unfortunately there is no readily available, useful test for similar quality that can be performed at home.

As part of the workup prior to the commencement of IVF, I will also request blood testing for hepatitis B, C and HIV. This is because the laboratory, when handling body fluids, needs to make sure that they do not carry any infectious diseases. If sperm quality is low, I may sometimes request blood tests to measure testosterone, luteinizing hormone (LH) and follicle stimulating hormone (FSH). Sometimes genetic testing or karyotype is also requested. The laboratory then gives us an exact picture of the male partner's chromosomal makeup. It is important to realise that not every chromosomal defect can be detected as this would simply be an immense task. However, it is common to check for absent or abnormal regions of the male chromosome (Y chromosome). If there is a possibility of transmitting a genetic abnormality to a child, however subtle, genetic counselling will usually be recommended.

Occasionally, if an obstructive problem is suspected (blockage of the tubes which carry semen from the testicle to the outside) then sometimes a testicular biopsy may be recommended. This can be done under local anaesthetic although generally a general anaesthetic is recommended. The biopsy is taken by either needle aspiration or by open biopsy, which involves a small incision and taking a small sample of tissue.

## Evaluation of Infertility in Women

First and foremost, I would like to get an indication of the pattern of your cycle as defects in ovulation are a very common cause for infertility and regular occurrence of ovulation governs the rhythm of a woman's cycle. I will also ask you a series of detailed questions regarding your general health, occupational exposure, previous illnesses, surgery and symptoms that may suggest endometriosis. In some situations the family history is also important.

Physical examination generally includes general examination and gynaecological or pelvic examination where I will generally take a Pap smear and swabs to exclude an infectious cause of infertility such as Chlamydia.

Bloods tests taken are aimed at excluding the possibility of potential infectious diseases such as hepatitis B and C, HIV, checking for immunity to rubella and chicken pox (Varicella) and getting an idea of the function of your cycle. This requires an estimation of LH, FSH, prolactin, free antigen index and anti-mullerian hormone. These blood tests are best done between days two and four of a women's cycle, where the first day of bleeding is taken by definition as day one of the cycle. Occasionally a woman has no period or has very irregular periods, in which case exactly timed blood tests are not possible. I will usually also request a day 21 progesterone level, which is usually the best time to estimate whether or not a female subject is ovulating.

A detailed pelvic ultrasound will also be ordered. I like this to be done at a specialised gynaecological ultrasound provider. The aim here is to get an estimate of antral follicle count or the number of follicles in a woman's ovaries which may, in the future, yield eggs. It is important to realise that this is a very qualitative estimation and does not give any real indication of a woman's fertility. However, it is reassuring to see many antral follicles in the ovaries and somewhat less reassuring to see very few.

I am often asked about the monitoring of basal body temperature. A woman's temperature usually rises by around 0.5 degrees Celsius following ovulation. However, body temperature patterns can be difficult to interpret and timed intercourse using basal body temperature as an indicator is not greatly useful to increase fertility.

## Pelvic Ultrasound

As previously indicated, a pelvic ultrasound will be obtained to get an estimate of the number of follicles within the ovaries. A detailed assessment will also be made of the structure of the uterus specifically to exclude endometrial polyps or a uterine septum, which have been shown to decrease fertility and increase miscarriage rate. The presence of fibroids or ovarian cysts may also be important. Sometimes an indication of the patency, or lack of blockage of fallopian tubes, can be indicated by a so-called saline infused sonogram or Levovist study. However generally, in my practice, assessment of tubal patency is done at the time of a laparoscopy if indicated. The advantage of a laparoscopy is that the rest of the pelvis can be surveyed and endometriosis excluded and treated if necessary. Laparoscopy is the gold standard for assessing the pelvis.

## Hysterosalpingogram (HSG)

This is an x-ray, which can be used to identify structural abnormalities of the uterus and fallopian tubes. This involves inserting a small tube through the cervix into the uterus. A liquid dye is injected which outlines the cavity of the uterus and fallopian tubes. This can be a fairly uncomfortable test. The test is done while the woman is awake and lying on an x-ray table. It frequently causes pelvic cramps like period pains which may last for five to ten minutes. The test is best performed around a week after a menstrual period.

## Hysteroscopy

Hysteroscopy is also an important test in the evaluation of the infertile woman. It is the gold standard for evaluation of the interior of the uterus, i.e., endometrial cavity. It also offers therapeutic potential as if endometrial polyps or a uterine septum is found, these may be treated. In my practice, this is generally combined with a laparoscopy whereby the pelvis is fully assessed. There is an increase in the chance of pregnancy after a hysteroscopy.

## Laparoscopy

Please see my website for further details regarding laparoscopic assessment of the pelvis and treatment of endometriosis. It is not necessarily compulsory to have a laparoscopy before commencing infertility treatment such as IVF. An important indicator as to the necessity of a laparoscopy will be found in a patient's symptoms. If there is a strong history suggestive of endometriosis, especially in combination with a family history, then a laparoscopy is indicated. The beauty of a laparoscopy is that endometriosis may be treated at the same time. There is a very difficult and incomplete relationship between endometriosis, its treatment and infertility. Some women have endometriosis and never have any trouble conceiving and conversely, others may have a small amount of endometriosis which upon treatment seems to result in an increase in fertility. Treatment of endometriosis does not always result in the perfect return to fertility. However, my own approach is that if laparoscopy is indicated and endometriosis is found, then in my hands, endometriosis is best treated. Most women are then reassured that they have been given every possible chance in order to fall pregnant spontaneously and naturally without proceeding to IVF treatment. Similarly, if several cycles of IVF have been carried out without success, then a laparoscopy is recommended in order to find undiagnosed endometriosis.

## Genetic Testing

Occasionally genetic testing may be recommended. This usually requires a blood test and should be done on both partners. The most usual indication for this is in the case of recurrent miscarriage. Occasionally a subtle genetic abnormality may be present in either parent, which in combination creates an abnormality in a developing embryo. These can be very difficult to detect and difficult to treat however in some cases, in-vitro fertilisation may be recommended. An embryo biopsy may be performed on embryos prior to transfer, which will give us a chance to implant only those embryos which have a normal chromosomal complement. However, there are various tricks and complexities to this process and things may not always be as they seem.

## Summary

The ability to fall pregnant relies on a very complex interaction between male and female partners and a variety of physical and hormonal factors. There is never any one simple answer to a couple's problems and the appropriate answer will always depend on a detailed assessment of every couple's medical situation, past history and the time course over which a couple hopes to fall pregnant. It is always better to commence investigation and treatment too early rather than too late. If you have any doubts whatsoever about your fertility or potential for fertility, then it is important to seek advice early in order to clarify and optimise your situation.

