

## FACTSHEET

### FERTILITY INVESTIGATIONS

Most people nowadays know enough about contraception to expect a pregnancy to occur reasonably soon after contraceptive precautions are stopped. If your own fertility and that of your partner is normal, there will be roughly a 25% chance of becoming pregnant as a result of intercourse without contraception during the fertile phase of each cycle. Those women who do become pregnant without any medical assistance generally do so within two years of trying, with 80% conceiving during the first year.

For those who are experiencing difficulty, your age and the age of your partner may indicate the need for haste in carrying out basic investigations and even an early referral to an infertility clinic. More and more women are delaying their attempt to start a family well into their 30s and early 40s. Female fertility begins to decline after the age of 30 and more rapidly from the age of 35 years. Usually you are advised to try to conceive for a year before seeking medical advice, but if you are over the age of 35, have been trying to get pregnant unsuccessfully and are concerned that you have a fertility problem, it is a good idea to see your GP sooner.

#### Seeking Professional Advice

Sometimes people find it difficult to pluck up courage to see their doctor, but remember that your family doctor is a trained professional. If your doctor has an interest in infertility problems, there is a considerable amount that they can do in the way of giving advice and initiating basic investigations. If they have no particular interest in infertility, they should be able to refer you to someone who can help you.

Fertility investigations can take some time. Depending upon how the referral system works in your area, you will be referred initially either to see a consultant gynaecologist in a routine out-patient clinic, or directly to a fertility clinic.

Your partner should always be encouraged to attend the clinic with you as you are a unit and the "problem" is a joint one. The fertility specialist will be in a position to be able to discuss with both of you the different options that you have and also to explain the chances of a positive outcome.

#### History and Examination

It generally takes about half an hour to take a full history, carry out an examination, discuss the findings with you and outline a plan of action.

A normal gynaecological history is taken with particular reference to your ages, the length of your relationship and the length of time trying to conceive. Any previous pregnancies will be discussed with special regard to their duration, whether they miscarried spontaneously or were terminations of pregnancy or continued normally. The form of contraception you were using before you started trying to get pregnant will also be discussed.

Your menstrual history is of great importance. You will be asked about the frequency and regularity of your periods as this will help to determine whether or not your ovulation during each cycle is likely to be a regular and predictable event. The heaviness of the bleeding and the amount of pain are also of interest, as there are some causes of infertility where these symptoms are the main features. If your periods have become very scanty or have stopped altogether, this will also be relevant.

You will be asked if you know the best time each cycle to try and become pregnant. The majority of people are roughly aware of the fertile phase of their cycle, though not everyone knows exactly when this is. Don't ever worry about saying "I don't know". The number of times a week that intercourse takes place will be of importance so that it can be determined whether or not there is a reasonable chance to have expected a pregnancy to have already occurred.

Both of you will be asked to give details of your past medical histories. For women all abdominal operations and especially pelvic surgery are of interest. Conditions such as appendicitis are very significant if associated with peritonitis. All medicines taken on a regular basis should be mentioned. Cigarette smoking either by you or your partner can affect fertility so you will be asked about this, and probably about your alcohol consumption too. Any operations in the region of the groin and scrotum may be relevant for the male partner. Operations for undescended testicles and the ages at which they were performed are of obvious importance.

When the full history has been taken, the doctor will wish to examine you. The clinic doctors will be aware of the fact that you may be anxious about this. Their approach is always a gentle one so as to obtain your full cooperation and relaxation. Your weight and height may be checked to work out your BMI, or body mass index.

Your specialist will now decide which investigations and/or treatments are indicated in your individual case. This will, of course, be discussed with you and fully explained. If there is any aspect of these investigations that you or your husband/partner do not understand, please ask for clarification.

### **Fertility Investigations**

Fertility investigations do not follow rigid lines but are flexible and adaptable to your particular problem. For example, if your periods have stopped, measurement of the levels of certain hormones in your body will be required as an initial investigation. If on the other hand, you have a history suggesting that your tubes may be blocked, then tests to check they are open will be required as an early investigation.

There is no "routine" sequence of tests that you will need to be put through. Some of the tests will be inappropriate for your particular situation, thus only those tests which are relevant to your particular cause of infertility will be chosen.

### **Female fertility tests**

#### **Ultrasound scans**

A transvaginal ultrasound scan will be carried out to look at the woman's ovaries, womb and fallopian tubes. During the scan, a small probe is placed in the vagina so that the doctor can see if the womb, ovaries and tubes appear normal. The scan can give an initial indication of any issues and the doctor will look out for signs of problems such as endometriosis, fibroids or cysts. These ultrasound scans are painless

#### **Blood tests**

The relationship between the brain, pituitary gland and the ovaries is an extremely complex one. The chief hormones involved in the process of ovulation are follicle stimulating hormone (FSH), luteinising hormone (LH), oestrogen and progesterone. In addition, another hormone called prolactin can interfere with the normal secretion of FSH.

The commonest condition that affects ovulation is called polycystic ovary syndrome (PCOS) where there is not only an imbalance between LH and FSH, but there is also an excess production of the male hormone testosterone. Disorders of the thyroid gland can adversely affect fertility too.

It is often essential to measure the levels of the various hormones in the body which may play a part in the control of ovulation. If, for example, your periods are very infrequent or have even stopped altogether, tests for LH, FSH, prolactin, oestrogen, testosterone and thyroid hormone levels, can be very useful in indicating the cause of your problem and thereby suggest a particular line of further investigation or treatment.

At the mid-point of the luteal phase of the cycle (between ovulation and the next period), it would be expected that your progesterone output would have reached a maximum level, and a reduced progesterone level at this time of the cycle (about day 21 of a 28 day cycle) will indicate that there is an insufficient amount of this hormone being produced by the ovary and that normal ovulation in that particular cycle had not occurred.

## **Tubal Tests**

### **Hysterosalpingography (HSG)**

A hysterosalpingogram is an X-ray of the uterus and fallopian tubes. The test is carried out in the X-ray department and usually does not require any form of general anaesthetic. It can, however, cause you to experience a moderate amount of discomfort rather like period pains. A special dye is injected into the cavity of the womb which shows up on an X-ray screen and the doctor is able to see the fluid filling the uterus and then passing along both tubes to enter the cavity of the abdomen.

If the dye fails to enter the tubes this may indicate an obstruction at the junction between the womb and the tubes or simply a temporary spasm of the tubes at this site. Sometimes the dye can be seen to enter the tubes which then become distended owing to an obstruction at their outer ends. The HSG is therefore useful in being able to demonstrate the site of any tubal obstruction and also to show the presence of any irregularity in the shape of the cavity of the womb. It is usually unable to demonstrate the presence of pelvic adhesions which may be covering the ovaries and preventing eggs from getting into the tubes.

### **Hysterosalpingo-contrast sonography (HyCoSy)**

HyCoSy uses ultrasound instead of X-rays. HyCoSy is carried out as an out-patient and does not require any form of anaesthetic. A fine tube is passed through the cervix. A vaginal ultrasound scan is carried out and the scan picture is seen on the video screen. When fluid is injected into the tube, the screen shows the fluid filling the cavity of the uterus before passing along the length of each fallopian tube. The big advantage of HyCoSy over HSG is that the test can be carried out in an out-patient clinic or assisted conception unit without requiring complex X-ray facilities. Furthermore, there is no exposure to irradiation which can be a cause of concern to some women. Like HSG, HyCoSy is relatively painless. The whole test takes about 15 minutes to perform.

### **Laparoscopy**

This is a much more complex procedure than the previous two tests and will usually require your admission to hospital, as the test is performed under a general anaesthetic. A tiny incision is made at the lower border of the tummy button and the abdominal cavity is filled with carbon dioxide gas in order to create more space to accurately view the pelvic organs. A slim telescope called a laparoscope is inserted into the abdominal cavity and the womb, tubes and ovaries are thoroughly inspected to check for pelvic problems such as endometriosis and fibroids. Dye is injected into the womb through the cervix. If the tubes are healthy, the dye can be seen passing along them and escaping through the outer openings of the tubes.

The great advantage of laparoscopy over HSG and HyCoSy is that it allows the surgeon to have a direct view of the pelvic organs and thereby permits a much more accurate assessment of any tubal or ovarian problems. The majority of patients are able to leave the hospital the same day. The tiny operation scar is eventually virtually invisible.

### **Hysteroscopy**

Hysteroscopy permits the specialist to inspect the cavity of the womb through the cervix using a fine telescope called a hysteroscope. The womb can either be distended with carbon dioxide gas or a suitable fluid. The operation may be carried out under mild sedation and local anaesthetic or under a full general anaesthetic. Hysteroscopy is a most valuable investigation when there has been a history of repeated miscarriages, or if a HSG X-ray suggests that the shape of the cavity is irregular which may be caused by fibroids. Fibroids beneath the womb lining can interfere with the implantation of an embryo. Very occasionally there can be an abnormality in the development of the womb so that there is a wall dividing the cavity. If an embryo implants on the wall a miscarriage is highly likely as the blood flow through the wall is inadequate to sustain a pregnancy to full term. After D & C operations, adhesions may sometimes form between the internal walls of the uterus, preventing implantation. If small fibroids are thought to be a significant feature in your fertility problems, they can be removed.

### **Male Fertility tests**

The basic fertility screening test for the male is the semen analysis. In general, the lower the sperm count and the poorer the sperm quality, the longer it will take and the more difficult it may be for a pregnancy to occur.

## **Semen Analysis**

An analysis of the semen is the most basic test that can be carried out on the male. He will be asked to produce a sample by means of masturbation directly into a special sterile container. The sample should not be collected by withdrawal at intercourse in case some of the initial part of the ejaculate is lost. Some specialists will request that there should be several days of abstinence from intercourse before a sperm sample is produced. However, others feel that it is better to follow your normal pattern of intercourse. It is important that the semen sample is kept warm and is brought to the laboratory for testing within one hour of production.

After the sample volume has been measured the following calculations are carried out

- The number of sperm per millilitre (ml).
- The percentage of sperm moving and the graded quality of movement ranging from good motile sperm down to completely non-motile sperm.
- The percentage of abnormal sperm.
- The number of white cells in the sample is noted as this may indicate infection.

There can be considerable fluctuation in the results between different samples from your partner, so a reduced semen analysis will always be checked with one or two repeat tests. Furthermore, the sperm count and motility can reflect changes in his general health 10 weeks before the sample was produced. For example a flu-like illness can reduce both the count and motility in a sample produced 10 weeks later, as this is the time taken for sperm to reach maturity. A repeat sample tested after an additional two to three months could very well be normal.

If the sperm count is low (known as oligospermia) or if there are no sperm at all in the semen sample (azoospermia), repeat samples will be tested and the clinic will wish to see your partner to take a more detailed history and to examine him.

In his history specific questions will be asked about any past condition that may have affected the testicles:

- Has he had any operations for undescended testicles in childhood or any operations in the groin area, e.g. hernia repairs?
- Is there a history of any major injury or infection involving the genital area? Infected semen can be a cause of infertility.

Other factors potentially affecting sperm production include:

- Heat is a major enemy to normal sperm production. For this reason the testicles are outside the body in the scrotum rather than in the abdomen like the ovaries. Gross obesity can overheat the testicles if there is an overhanging apron of fat. Men whose jobs involve long hours of sitting, such as long distance lorry-drivers, or those who work in hot areas such as chefs may have fertility problems due to the increased heat to the genital area.
- Alcohol can significantly reduce both the production of sperm and the male hormone testosterone.
- Cigarette smoking has been shown to reduce both the sperm count and the sperm motility.

## **Examination**

The examination of the external genitalia in the male is often completely normal. However, sometimes one or both testicles are very small or may even be absent. Additionally there may be congenital absence of each vas deferens; the ducts through which sperm pass from the testicles to the female at intercourse.

Other factors which may contribute to lowered fertility, and which can be identified on examination include:

- The presence of varicose veins around the testicle and vas deferens, known as a varicocele. Where varicoceles are present they increase the blood flow and temperature around the testicle. A varicocele may affect sperm production.
- The presence of excessive fluid around the testicle, known as a hydrocele.
- There can occasionally be anatomical defects in the development of the penis, which means that during intercourse and ejaculation the sperm cannot be deposited within the vagina very easily. Very rarely it can be found that some men ejaculate backwards into the bladder. This retrograde ejaculation may result from earlier surgery to the urethra (the outflow tube from the bladder) and is sometimes found in diabetics.
- The prostate gland may be a source of chronic infection. This can be assessed by rectal examination.

If the testicles are very small it is worthwhile to carry out a chromosome investigation. Usually, a female is born with two X chromosomes (XX) and a male with one X and one Y (XY), but occasionally men can have a condition called Klinefelter syndrome, where a boy is born with an extra X chromosome (XXY) and this can lead to fertility problems.

In cases of azoospermia, the absence of sperm is either due to an obstruction in the outflow system from the testicle, in the epididymis or vas deferens, or due to a failure in sperm production.

Hormone disorders are rare causes of male infertility, but it may sometimes be helpful to check his FSH LH, testosterone (male hormone), prolactin and thyroid hormone levels.

If there are excessive white blood cells in the semen sample, an infection may be reducing the ability of the sperm to fertilise an egg. The semen sample should then be cultured to determine the type of infecting bacterial organism.

When the volume of seminal fluid is high, the sperm count per ml may be very diluted. In these cases investigation of split-ejaculate semen analysis can be very helpful.

An ejaculation is made up of several components. In 90% of patients, the first part of the ejaculate is made up of most of the sperm and fluid from the prostate gland, the remainder of the ejaculate being seminal fluid from the seminal vesicles with a low sperm content. A semen analysis of the first part of the ejaculate should reveal a sperm count much higher than for the normal total semen sample.

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