

Tests and Treatments for Men



Traditionally infertility has been thought of as a female problem; however, this is far from the truth. A male problem can be identified in nearly half of all couples who have difficulty achieving conception. The term 'infertility' is used when the ability to fall pregnant is diminished or absent. It does not mean that you are unable to have children but that you may require treatment or assistance to achieve a pregnancy. For men the infertility problem may involve the sperm, the testes, the ducts that lead out from the testes, or it may be a functional problem in relation to sexual activity.

One of the most important tasks is to establish the cause of a man's infertility. While it is often difficult to diagnose the cause, it is important in the indication of the best method of treatment.

The most common causes of infertility for men are:

- Damage to sperm production – affects two thirds of infertile men
- Obstruction to the ducts leading out from the testes
- Functional problems
- Hormonal problems
- Genetic problems

Sperm Production Problems

One of the most common causes of infertility in men is damage to the production of sperm resulting in a low sperm count (oligospermia). This can also be associated with reduced sperm movement and abnormally shaped sperm. A severe case of this results in azoospermia which means the total absence of sperm in the ejaculate. Common causes of damage to sperm production are testicular injury, undescended testes, a twisted testes, cancer treatments, varicocele and genetic problems.

Obstruction

Obstruction occurs when the fine tubes in the epididymis become blocked preventing the sperm from reaching the penis. Obstruction can be caused by infection, congenital disorders, vasectomy and other surgery.

Functional Problems

Function problems can cause or be due to the following:

- Impotence – the ability to maintain an erection sufficient for sexual intercourse
- Failure to ejaculate or retrograde ejaculation (ejaculating backwards into the bladder)
- Side effects of prostate surgery
- Multiple sclerosis
- Anti-sperm antibodies – where the man's immune system makes antibodies that hinder the activity of the sperm

Hormonal Problems

Low testosterone levels in men can result in the inability to produce sperm. Endocrine disorders can cause a drop in the sperm count. These disorders include thyroid disease, diseases of the pituitary gland, hereditary haemochromatosis, sickle cell anaemia and thalassaemia.

Genetic Problems

Approximately one-half of all infertility is caused by sperm abnormalities. Many sperm disorders are due to a chromosome abnormality such as aneuploidy or a structural chromosome abnormality. Men who carry a balanced translocation chromosome are at risk of producing sperm with a structural chromosome abnormality. Couples with infertility due to male factor should consider chromosome analysis of the male's sperm prior to IVF.

Y chromosome deletions are found in approximately 5 to 20 percent of males with a very low sperm count. These deletions appear to impair normal sperm development. While these deletions do not appear to cause any genetic disease, they appear to decrease the chance of men with a low sperm count to successfully fertilise eggs in a normal way.

Genetic diseases, most of which are either directly or indirectly associated with sperm abnormalities:

Cystic fibrosis. An inherited condition that typically involves the lungs and pancreas, but that can present also as a cause of infertility with or without mild sinus problems. Most men who have cystic fibrosis have obstructive azoospermia, because they were born without a vas deferens. This results in male infertility.

Noonan syndrome. An inherited condition that can occur in either males or females. In males, this syndrome can cause abnormal gonadal (testicular) function.

Myotonic dystrophy. An inherited condition with progressive multisystem involvement, resulting in infertility (underdeveloped testes and abnormal sperm production) in some cases.

Hemochromatosis. An inherited condition affecting iron storage. Eighty percent of men with hemochromatosis have testicular dysfunction.

Sickle cell disease. An inherited condition affecting the normal production of hemoglobin.

Sex reversal syndrome. A male who has the sex chromosomes of a genetic female (XX, instead of XY), resulting in azoospermia and other characteristics.

Androgen receptor gene mutations. An inherited condition in which a man is genetically male (46,XY), but has infertility due to a defect in receptors for testosterone.

Chromosomal abnormalities. Men with an extra X sex chromosome, known as Klinefelter syndrome, often do not produce sperm or produce very low quantities of sperm.

Chromosome rearrangements. In some persons, there are the usual number of chromosomes (46) in the nucleus (center) of cells, but rearrangements in the chromosome material, where a piece of a chromosome has exchanged places with another, has taken place. Men with either azoospermia or oligospermia have a higher frequency of chromosome rearrangements than is found in the general population.

Deletions in the Y chromosome. In some persons, there are the usual number of chromosomes (46) in the body cells, but small sections of the Y chromosome are missing or deleted. A small percentage of men with either azoospermia or oligospermia have deletions in the Y chromosome.

It is important to understand that men who have genetic problems that cause their infertility, such as a deletion in the Y chromosome, can pass this problem to their sons, who would also have infertility, if they elect to use their own sperm in achieving a pregnancy.

Male Infertility Tests

Presuming that the problem is male infertility we will check for:

- A good quantity and quality of male sperm. There will be a decrease in fertility if the sperm are not being produced in adequate numbers, obstructed and cannot reach the penis, not swimming very well, being attacked by antibodies from either the male himself or his female partner.
- The right balance of hormones to allow sperm development and support.

Semen Analysis

A semen analysis measures the amount of semen a man produces and determines the number and quality of sperm in the semen sample. A semen analysis is usually one of the first tests done to help determine whether a man has infertility problems. Problems with the semen or sperm affects more than one-third of infertile couples.

Tests that may be done during a semen analysis include:

- Volume. This is a measure of how much semen is present in one ejaculation.
- Liquefaction time. Semen is a thick gel at the time of ejaculation and normally becomes liquid within 20 minutes after ejaculation. Liquefaction time is a measure of the time it takes for the semen to liquefy.
- Sperm count. This is a count of the number of sperm present per millilitre of semen in one ejaculation.
- Sperm morphology. This is a measure of the percentage of sperm that have a normal shape.
- Sperm motility. This is a measure of the percentage of sperm that can move forward normally. The number of sperm that show normal forward movement in a certain amount of semen can also be measured (motile density).
- pH. This is a measure of the acidity (low pH) or alkalinity (high pH) of the semen.
- White blood cell count. White blood cells are not normally present in semen.
- Fructose level. This is a measure of the amount of a sugar called fructose in the semen. The fructose provides energy for the sperm.

A normal semen analysis will meet the following criteria:

- Volume of semen: More than 2ml
- Sperm concentration: More than 20 million sperm per ml
- Sperm motility (the ability to swim): More than 50% of the sperm are moving forward or 25% are moving forward very quickly
- Sperm morphology (shape): More than 15% have a normal shape
- White blood cells: Less than 1 million cells per ml
- Sperm antibodies: Less than 50% coated sperm

Ultrasound

An ultrasound examination of the testes and prostate can be a useful diagnostic test. An ultrasound probe is placed on the testicles to provide a picture of the testes and epididymis. It is also useful for diagnosing testicular cancer and varicocele.

Testicular Biopsy

A testicular biopsy involves the removal of a small sample of the tissue from a testicle. This allows for direct inspection of the sperm making tissue.

Treatment Options

Discovering the medical reason for your infertility and beginning treatments can be the beginning of a new and positive phase of your journey towards parenthood. Treatment options include:

- Hormonal therapy: A male hormonal disorder occurs when there is a deficiency in the luteinizing hormone (LH) and the follicle stimulating hormone (FSH) that control testicular function. Such imbalances may be successfully treated by injections of hormone preparations called gonadotrophins. Hormone treatments will cause the testes to increase in size and produce testosterone in normal amounts. Sperm should appear in the semen after several months of treatment.
- Surgery: there are a variety of surgical procedures available to treat anatomical problems, obstructions or abnormalities found in the male reproductive system.
- Varicocele repair: A varicocele is a dilation of the veins of the scrotum which may interfere with the testicle's production of sperm. Varicocele repair consists of tying or clipping the veins. This is performed through a small incision in the groin. Improvement can be seen in as little as a few months with most men achieving a significant improvement in their sperm production.
- Vasectomy reversal: A vasectomy reversal repairs a surgically removed section of the vas deferens (sperm duct) and is called a vasovasostomy. Semen analysis to note improvements in sperm count and motility can be about eight weeks after surgery. The results of a vasectomy reversal depend on how long ago the procedure was done. If 10 years or more have passed since the vasectomy, the chance of having sperm reappearing in the semen is greatly reduced.
- Testicular sperm aspiration (TESA): In TESA a fine needle is passed through the skin of the scrotum into a testicle in order to extract sperm tissue. Sperm are then retrieved from the tissue. This is usually performed a number of times in different parts of the testes until an area where reasonable sperm production is found.
- Percutaneous epididymal sperm aspiration (PESA): PESA is a simple technique to obtain sperm in men who have an obstruction of the vas deferens either due to a previous vasectomy or some other obstruction. PESA involved inserting a needle attached to a syringe into the epididymis and then gently extracting sperm-containing fluid.
- Microsurgical epididymal sperm aspiration (MESA): MESA involves opening up the ducts of the epididymis and extracting fluid or a piece of testicular tissue in order to extract live sperm rather than just extracting fluid through a fine needle as is done with PESA. MESA is usually only done when PESA has been unsuccessful.
- Testicular sperm extraction (TESE): TESE is performed when there is an absence of sperm in the epididymis or if there is no epididymis. It involves making a small incision and removing a piece of testicular tissue to obtain sperm.
- Vibrostimulation and electroejaculation: Men with spinal cord injuries, neurological disorders and ejaculation problems can use these techniques to obtain a semen sample. Vibrostimulation uses a specila vibrator applied directly to the penis to produce an ejaculation. In electroejaculation, a special probe is inserted into the rectum to stimulate the pelvic nerves and cause ejaculation.

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