

Definition

Infertility, as defined by the World Health Organization means "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse." And unlike the usual belief system that victimizes only women of being infertile, infertility is a disease that may be diagnosed among both the sexes.

Infertility In Men

A man may generally be diagnosed to be infertile depending on the quality as well as the quantity of the sperm that he ejaculates. It has been estimated that 1 in every 20 men suffer from low sperm count which eventually leads to infertility. However, it has also been estimated that only 1 out of every 100 men ejaculate no sperm at all.

Causes Of Infertility In Men

There may be several causes of male infertility as:-

- Chromosomal or genetic causes
- Undescended testes (failure of the testes to descend at birth)
- Testes infections
- Torsion (twisting of the testis in scrotum)
- Varicocele (varicose veins of the testes)
- A side effect of medicines and chemicals such as ketoconazole, spironolactone, cimetidine, nifedipine, sulfasalazine and colchicine.
- Radiation damage
- Prostate-related problems (sometimes surgery)
- Absence of vas deferens
- Vasectomy
- Retrograde and premature ejaculation
- Failure of ejaculation
- Erectile dysfunction
- Infrequent intercourse
- Spinal cord injury

- Damage to nerves
- Pituitary tumours
- Congenital lack of LH/FSH (pituitary problem from birth)
- Anabolic (androgenic) steroid abuse
- Injury or infection in the epididymis

Most of these can be treated through surgery or hormonal substitutions, however, there are a few that can not be cured with the help of medical science and may cause indefinite infertility amongst men.

Diagnosis

No obvious signs of infertility are present in most of the cases because intercourse, erections and ejaculation usually happen without any difficulty whatsoever. Even the quantity and appearance of the ejaculated semen generally appears normal to the naked eye. Therefore proper medical tests are needed to find out if a man is infertile.

The semen analysis is a common diagnosis used to analyze the number of available sperm, the shape of the sperm and its movement. Other tests for male infertility may include:

- Semen culture to look for infection
- Vital staining test to determine the number of alive sperms in a sample
- Blood test to check for abnormal hormone levels or genetic disorders
- Sonogram of the scrotum to look for blockages
- Testicular biopsy to see if sperm production is normal
- Test for sperm antibodies
- Contrast dye test of the vas deferens to check for a blockage

Infertility In Women

For women, problems with fertilization arise mainly from either structural problems in the fallopian tube or uterus or problems releasing eggs. Infertility may be caused by blockage of the Fallopian tube due to malformations, infections such as chlamydia and/or scar tissue. Endometriosis is usually more common in women in their mid-twenties and older, especially when postponed childbirth has taken place.

Causes For Infertility In Women

- Damaged fallopian tubes
- Scars form after pelvic infections, endometriosis, and pelvic surgery.
- Hormonal problems
- Thickening of the lining of the uterus.
- Cervical issues
- Uterine trouble like polyps and fibroids
- Ovulation problems (e.g. polycystic ovarian syndrome, PCOS,
- Tubal blockage
- Pelvic inflammatory disease caused by infections like tuberculosis
- Age-related factors
- Previous tubal ligation
- Endometriosis
- Advanced maternal age

All being said, for about 20% of couples who have infertility problems, the exact causes are never pinpointed.

Diagnosis

Doctors may order several tests to diagnose infertility in women that may include:-

- Blood test to check hormone levels
- Endometrial biopsy to examine the lining of the uterus.
- Hysterosalpingography (HSG)
- Laparoscopy

Treatment

GnRH Therapy

Patients suffering from hypogonadotropic hypogonadism may respond to gonadotropin-releasing hormone (GnRH therapy) or gonadotropin replacement. However, it can be only be used in those with intact pituitary function and can be effective in hypothalamic and pituitary dysfunction.

Estrogen Modulators

Estrogen modulators can also be used. As aromatase inhibitors such as anastrozole block the conversion of testosterone to estrogen, therefore increasing the serum testosterone concentration. They are especially helpful in improving semen parameters in patients with decreased testosterone:estradiol ratios.

Clomiphene Citrate

It is a weak estrogen-receptor antagonist which basically works by blocking the negative feedback inhibition of estrogen on the anterior pituitary and therefore by increasing the release of FSH and LH. This results in increased testosterone production, ultimately augmenting spermatogenesis. Clomiphene citrate is also effective in improving the semen parameters in patients with hypogonadotropic hypogonadism.

Tamoxifen

It is yet another estrogen-receptor antagonist which, in combination with clomiphene citrate increases sperm concentration, sperm mobility and pregnancy rates in males. It is used for males with idiopathic infertility.

Immunosuppression

Patients with anti-sperm antibody levels greater than 1:32 may respond to immunosuppression using cyclic steroids for 3-6 months. However, patients need to be aware of the potential side effects of steroids, including avascular necrosis of the hip, weight gain, and iatrogenic Cushing syndrome.

Imipramine or Alpha-Sympathomimetics

Imipramine such as pseudoephedrine may help to close the bladder neck in order to assist antegrade ejaculation. However, these medicines are of limited efficacy, especially for patients with a fixed abnormality.

Sperm Recovery

Sperm may be recovered from voided or catheterized postejaculatory urine to be used in assisted reproductive techniques. The urine should be alkalinized with a solution of sodium bicarbonate for optimal recovery.

Semen processing

Patients with poor semen quality or numbers may benefit from having their semen washed and concentrated in preparation for intrauterine insemination.

Lifestyle

Patients should be encouraged to stop smoking cigarettes and marijuana and to limit environmental exposures to harmful substances and/or conditions.

Moreover, a stress-relief therapy and consultation of other appropriate psychological and social professionals may be advised and infections should be treated with appropriate antimicrobial therapy.

Assisted Reproduction Techniques

Patients with severe oligospermia, azospermia, unexplained infertility, or known defects that preclude fertilization by other means are candidates for assisted reproduction techniques. These techniques use donated or retrieved eggs that are fertilized by the male partner's sperm or donor sperm. The fertilized embryos are then replaced within the female reproductive tract. These techniques result in a 15-20% delivery rate per cycle and may eventually be successful in 50% of cases.

In Vitro Fertilization

IVF involves fertilization of the egg outside the body and reimplantation of the fertilized embryo into the woman's uterus. IVF generally requires a minimum of 50,000-500,000 motile sperm. Harvesting eggs initially involve down-regulating the woman's pituitary with a GnRH agonist and then performing controlled ovarian hyperstimulation.

Follicular development is monitored by ultrasonographic examination and by checking serum levels of estrogen and progesterone. When the follicles are appropriately enlarged, a transvaginal follicular aspiration is performed. A mean of 12 eggs are typically retrieved per cycle, and they are immediately placed in an agar of fallopian tube medium. After an incubation period of 3-6 hours, the sperms are added to the medium using approximately 100,000 sperm per oocyte. After 48 hours, the embryos have usually reached the 3- to 8-cell stage. 2 to 4 embryos are usually implanted in the uterus, while the remaining embryos are frozen for future use. Pregnancy rates are 10-45% and overall, IVF is a safe and useful procedure. Risks include multiple pregnancies and hyperstimulation syndrome, as well as a slightly higher rate of major birth defects. Additionally, an increased risk of hypospadias occurs in boys (1.5% vs 0.3%), probably because of the increased maternal progesterone used for egg harvesting.

Having said all, infertility amongst both the sexes can be prevented by a merely leading a cautious life style and taking in a proper and healthy diet.