

Environmental Factors

Occupational or other long-term exposure to certain types of toxins and chemicals (such as herbicides and pesticides) may reduce sperm count by either affecting testicular function or altering hormone systems. Estrogen-like and hormone-disrupting chemicals such as bisphenol A, phthalates, and organochlorines are particular potential concerns. Chronic exposure to heavy metals such as lead, cadmium, or arsenic may affect sperm quality. These chemicals generally affect men who have long-term and intense exposure to them. At this time, there is no strong evidence supporting a serious harmful effect on fertility in men who have normal limited exposure to these chemicals.

Medical Conditions

Medical conditions that can affect male fertility include any severe injury or major surgery, diabetes, HIV, thyroid disease, Cushing syndrome, heart attack, liver or kidney failure, and chronic anemia. Certain types of medications can impair sperm production.

Infections in the Urinary Tract or Genitals. Infections that may affect fertility include prostatitis (inflammation in the prostate gland), orchitis (in the testicle), semino-vesiculitis (in the glands that produce semen), or urethritis (in the urethra), perhaps by altering sperm motility. Even after successful antibiotic treatment, infections in the testes may leave scar tissue that blocks the epididymis.

Cancer and Its Treatments. Birth rates among cancer survivors are only 40 - 85% of normal rates. Certain cancers, particularly testicular cancer, impair sperm production, often severely. Cancer treatments such as chemotherapy and radiation can damage sperm quality and quantity, causing infertility. The closer radiation treatments are to reproductive organs, the higher the risk for infertility. There is also some evidence that male infertility is itself a risk factor for testicular cancer.

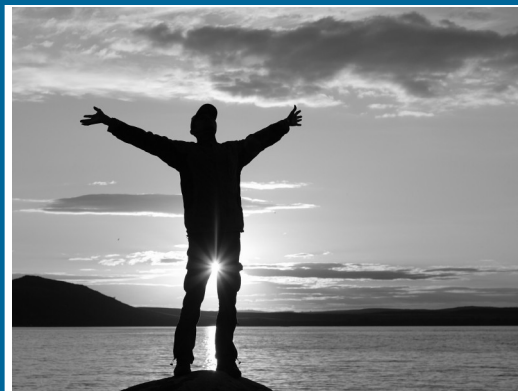
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MANSOOR MEDICAL

Male Factor Infertility The Causes ...



DR. RAYMOND MANSOOR
B Sc , MB BS , DM (O&G) FACOG
OBSTETRICIAN & GYNAECOLOGIST

TANNER ST. & CORN ALLEY
P.O. BOX 1361W
ST. JOHN'S
ANTIGUA

TEL: (268) 463 2232/3

FAX: (268) 562 8128

email : info@mansoormedical.org



Male Factor Infertility

Causes

More than 90% of male infertility cases are due to low sperm counts, poor sperm quality, or both. The remaining cases of male infertility can be caused by a number of factors including anatomical problems, hormonal imbalances, and genetic defects.

Sperm Abnormalities

Sperm abnormalities can be caused by a range of factors, including congenital birth defects, disease, chemical exposure, and lifestyle habits. (See *Risk Factors* section.) In many cases, the causes of sperm abnormalities are unknown.

Sperm abnormalities are categorized by whether they affect sperm count, sperm movement, or sperm shape. They include:

- **Low Sperm Count (Oligospermia).** A sperm count of less than 20 million/mL is considered low sperm. Azoospermia refers to the complete absence of sperm cells in the ejaculate, and accounts for 10 - 15% of cases of male infertility. Partial obstruction anywhere in the long passages through which sperm pass can reduce sperm counts. Sperm count varies widely over time, and temporary low counts are common. Therefore, a single test that reports a low count may not be a representative result.
- **Poor Sperm Motility (Asthenospermia).**

Sperm motility is the sperm's ability to move. If movement is slow, not in a straight line, or both, the sperm have difficulty invading the cervical mucus or penetrating the hard outer shell of the egg. If 60% or more of sperm have normal motility, the sperm is at least average in quality. If less than 40% of sperm are able to move in a straight line, the condition is considered abnormal. Sperm that move sluggishly may have genetic or other defects that render them incapable of fertilizing the egg. Poor sperm motility may be associated with DNA fragmentation and may increase the risk for passing on genetic diseases.

Abnormal Sperm Morphology (Teratospermia). Morphology refers to shape and structure. Abnormally shaped sperm cannot fertilize an egg. About 60% of the sperm should be normal in size and shape for adequate fertility. The perfect sperm structure is an oval head and long tail.

Retrograde Ejaculation

Retrograde ejaculation occurs when the muscles of the bladder wall do not function properly during orgasm and sperm are forced backward into the bladder instead of forward out of the urethra. Sperm quality is often impaired.

Retrograde ejaculation can result from several conditions:

- Surgery to the lower part of the bladder or prostate (the most common cause of

Male Factor Infertility

retrograde ejaculation)

- Diseases such as diabetes and multiple sclerosis
- Spinal cord injury or surgery
- Medications such as alpha blockers used for enlarged prostate glands, tranquilizers, certain antipsychotics, or blood pressure medications may also cause temporary retrograde ejaculation.

Structural Abnormalities

Any structural abnormalities that damage or block the testes, tubes, or other reproductive structures can affect fertility.

Cryptorchidism. Cryptorchidism is a condition usually seen in newborn infants in which the testicles fail to descend from the abdomen into the scrotum. Cryptorchidism is associated with mild to severe impairment of sperm production.

Hypospadias. This is a birth defect in which the urinary opening is on the underside of the penis, can prevent sperm from reaching the cervix if not surgically corrected.

Blockage in the Tubes that Transport Sperm. Some men are born with a blockage or other problems in the epididymis or ejaculatory ducts that later affect fertility. Some men lack the vas deferens, the tube that carries sperm from the testicles out through

the penis. Low semen levels in ejaculate may be associated with structural abnormalities in the tubes transporting the sperm.

Hormonal Deficiencies

Hypogonadism is the general name for a severe deficiency in gonadotropin-releasing hormone (GnRH), the primary hormone that signals the process leading to the release of testosterone and other important reproductive hormones. Low levels of testosterone from any cause may result in defective sperm production.

Hypogonadism is uncommon and is most often present at the time of birth. It is usually the result of rare genetic diseases that affect the pituitary gland. These conditions may include selective deficiencies of the hormones FSH and LH, Kallman syndrome, or panhypopituitarism, in which the pituitary gland fails to make almost all hormones. Hypogonadism can also develop later in life from brain or pituitary gland tumors or as a result of radiation treatments.

Genetic Disorders

Certain inherited disorders can impair fertility. Examples include:

- Cystic fibrosis can cause missing or obstructed vas deferens (the tubes that carry sperm).
- Polycystic kidney disease, a relatively common genetic disorder that causes large cysts to form on the kidneys and other organs during adulthood, may cause infertility as the first symptom if cysts develop in the reproductive tract.
- Klinefelter syndrome is marked by two X and one Y chromosomes (the norm is one X and one Y), which leads to the destruction of the lining of the seminiferous tubules in the testicles during puberty, although most other male physical attributes

are unimpaired.

Kartagener syndrome, a rare disorder that is associated with a reversed position of the major organs, also causes impaired sperm motility.

Risk Factors

Varicocele

A varicocele is an abnormally enlarged and twisted (varicose) vein in the spermatic cord that connects to the testicle. Varicoceles are found in about 15% of all men and in about 40% of infertile men, although it is not clear how much they affect fertility or by what mechanisms. They can raise testicular temperature, which may have effects on sperm production, movement, and shape.

Age

Age-related sperm changes in men are not abrupt, but are a gradual process. Aging can adversely affect sperm counts and sperm motility (the sperm's ability to swim quickly and move in a straight line). The genetic quality of sperm declines as a man ages.

Sexually Transmitted Diseases

Repeated *Chlamydia trachomatis* or gonorrhea infections are the sexually transmitted diseases most often associated with male infertility. Such infections can cause scarring and block sperm passage. Human papilloma viruses, the cause of genital warts, may also impair sperm function.

Lifestyle Factors

Nearly any major physical or mental stress can temporarily reduce sperm count. Some common conditions that lower sperm count, temporarily in nearly all cases, include:

Emotional Stress. Stress may interfere with certain hormones involved with sperm production.

Testicular Overheating. Overheating, such as from high fevers, saunas, and hot tubs, may temporarily lower sperm count.

Substance Abuse. Cocaine or heavy marijuana use can temporarily reduce the number and quality of sperm. Chemical compounds in marijuana that may impair the sperm's ability to swim and also inhibit their ability to penetrate the egg. Anabolic steroid use can shrink testicles and decrease sperm production. Heavy drinking may also impair fertility.

Smoking. Cigarette smoking may affect sperm quality.

Obesity. Obesity may impair hormonal levels and adversely affect fertility.

Bicycling. Bicycling may affect erectile function. Pressure from the bike seat may damage blood vessels and nerves that are responsible for erections. Mountain biking, which involves riding on off-road terrain, exposes the perineum (the region between the scrotum and the anus) to more extreme shocks and vibrations and increases the risk for injuries to the scrotum. A padded or contoured bike seat set at the proper height and angle can help reduce this risk.

