Low Sperm Count (Oligospermia) or Zero sperm count

Overview

Low sperm count means that the fluid (semen) you ejaculate during an orgasm contains fewer sperm than normal.

A low sperm count is also called oligospermia (ol-ih-go-SPUR-me-uh). A complete absence of sperm is called azoospermia. Your sperm count is generally considered lower than normal if you have fewer than 15 million sperm per milliliter of semen and you are unable to conceive. Although there is no absolute cut off according to the latest guidelines and a man with 5 million count can have natural conception and one with 25 million may not be able to.

Having a low sperm count decreases the odds that one of your sperm will fertilize your partner's egg, resulting in pregnancy. Nonetheless, many men who have a low sperm count are still able to father a child.

The main sign of low sperm count is the inability to conceive a child. There might be no other obvious signs or symptoms. In some men, an underlying problem such as an inherited chromosomal abnormality, a hormonal imbalance, dilated testicular veins or a condition that blocks the passage of sperm may cause signs and symptoms.

Causes

The production of sperm is a complex process and requires normal functioning of the testicles (testes) as well as the hypothalamus and pituitary glands — organs in your brain that produce hormones that trigger sperm production. Once sperm are produced in the testicles, delicate tubes transport them until they mix with semen and are ejaculated out of the penis. Problems with any of these systems can affect sperm production.

Also, there can be problems of abnormal sperm shape (morphology), movement (motility) or function.

However, often the cause of low sperm count isn't identified.

Medical causes

Low sperm count can be caused by a number of health issues and medical treatments. Some of these include:

- **Varicocele.** A varicocele (VAR-ih-koe-seel) is a swelling of the veins that drain the testicle. It's the most common reversible cause of male infertility. Although the exact reason that varicoceles cause infertility is unknown, it might be related to abnormal testicular temperature regulation. Varicoceles result in reduced quality of the sperm.
- **Infection.** Some infections can interfere with sperm production or sperm health or can cause scarring that blocks the passage of sperm. These include inflammation of the epididymis (epididymitis) or testicles (orchitis) and some sexually transmitted infections, including gonorrhea or HIV. Although some infections can result in permanent testicular damage, most often sperm can still be retrieved.
- **Ejaculation problems.** Retrograde ejaculation occurs when semen enters the bladder during orgasm instead of emerging out of the tip of the penis. Various health conditions can cause retrograde ejaculation or lack of ejaculation, including diabetes, spinal injuries, and surgery of the bladder, prostate or urethra.

  Certain medications also might result in ejaculatory problems, such as blood pressure medications known as alpha blockers. Some ejaculatory problems can be reversed, while others are permanent. In most cases of permanent ejaculation problems, sperm can still be retrieved directly from the testicles.
- **Antibodies that attack sperm.** Anti-sperm antibodies are immune system cells that mistakenly identify sperm as harmful invaders and attempt to destroy them.
- **Tumors.** Cancers and nonmalignant tumors can affect the male reproductive organs directly, through the glands that release hormones related to reproduction, such as the pituitary gland, or through unknown causes. Surgery, radiation or chemotherapy to treat tumors also can affect male fertility.
- **Undescended testicles.** During fetal development one or both testicles sometimes fail to descend from the abdomen into the sac that normally

contains the testicles (scrotum). Decreased fertility is more likely in men with this condition.

- **Hormone imbalances.** The hypothalamus, pituitary and testicles produce hormones that are necessary to create sperm. Alterations in these hormones, as well as from other systems such as the thyroid and adrenal gland, may impair sperm production.
- **Defects of tubules that transport sperm.** Many different tubes carry sperm. They can be blocked due to various causes, including inadvertent injury from surgery, prior infections, trauma or abnormal development, such as with cystic fibrosis or similar inherited conditions.

  Blockage can occur at any level, including within the testicle, in the tubes that drain the testicle, in the epididymis, in the vas deferens, near the ejaculatory ducts or in the urethra.

- **Chromosome defects.** Inherited disorders such as Klinefelter's syndrome — in which a male is born with two X chromosomes and one Y chromosome instead of one X and one Y — cause abnormal development of the male reproductive organs. Other genetic syndromes associated with infertility include cystic fibrosis, Kallmann's syndrome and Kartagener's syndrome.
- **Celiac disease.** A digestive disorder caused by sensitivity to gluten, celiac disease can cause male infertility. Fertility may improve after adopting a gluten-free diet.
- **Certain medications.** Testosterone replacement therapy, long-term anabolic steroid use, cancer medications (chemotherapy), certain antifungal and antibiotic medications, some ulcer medications, and other medications can impair sperm production and decrease male fertility.
- **Prior surgeries.** Certain surgeries might prevent you from having sperm in your ejaculate, including vasectomy, inguinal hernia repairs, scrotal or testicular surgeries, prostate surgeries, and large abdominal surgeries performed for testicular and rectal cancers, among others. In most cases, surgery can be performed to either reverse these blockages or to retrieve sperm directly from the epididymis and testicles.

Environmental causes

Sperm production or function can be affected by overexposure to certain environmental elements, including:

- **Industrial chemicals.** Extended exposure to benzenes, toluene, xylene, herbicides, pesticides, organic solvents, painting materials and lead might contribute to low sperm counts.
- **Heavy metal exposure.** Exposure to lead or other heavy metals also can cause infertility.
- **Radiation or X-rays.** Exposure to radiation can reduce sperm production. It can take several years for sperm production to return to normal. With high doses of radiation, sperm production can be permanently reduced.
- **Overheating the testicles.** Elevated temperatures impair sperm production and function. Although studies are limited and are inconclusive, frequent use of saunas or hot tubs might temporarily impair sperm count.

  Sitting for long periods, wearing tight clothing or working on a laptop computer for long stretches of time also might increase the temperature in your scrotum and slightly reduce sperm production.

Health, lifestyle and other causes

Other causes of low sperm count include:

- **Drug use.** Anabolic steroids taken to stimulate muscle strength and growth can cause the testicles to shrink and sperm production to decrease. Use of cocaine or marijuana might reduce the number and quality of your sperm as well.
- **Alcohol use.** Drinking alcohol can lower testosterone levels and cause decreased sperm production.
- **Occupation.** Certain occupations might be linked with a risk of infertility, including welding or those associated with prolonged sitting, such as truck driving. However, the data to support these associations is inconsistent.
- **Tobacco smoking.** Men who smoke might have a lower sperm count than do those who don't smoke.
- **Emotional stress.** Severe or prolonged emotional stress, including stress about fertility, might interfere with hormones needed to produce sperm.

- **Depression.** Being depressed may negatively affect sperm concentration.
- **Weight.** Obesity can impair fertility in several ways, including directly impacting sperm and by causing hormone changes that reduce male fertility.
- **Sperm testing issues.** Lower than normal sperm counts can result from testing a sperm sample that was taken too soon after your last ejaculation; was taken too soon after an illness or stressful event; or didn't contain all of the semen you ejaculated because some was spilled during collection. For this reason, results are generally based on several samples taken over a period of time.

Risk factors

A number of risk factors are linked to low sperm count and other problems that can cause low sperm count. They include:

- Smoking tobacco
- Drinking alcohol
- Using certain illicit drugs
- Being overweight
- Being severely depressed or stressed
- Having certain past or present infections
- Being exposed to toxins
- Overheating the testicles
- Having experienced trauma to the testicles
- Being born with a fertility disorder or having a blood relative, such as your brother or father, with a fertility disorder
- Having certain medical conditions, including tumors and chronic illnesses
- Undergoing cancer treatments, such as radiation
- Taking certain medications
- Having a prior vasectomy or major abdominal or pelvic surgery

- Having a history of undescended testicles

Complications

Infertility caused by low sperm count can be stressful for both you and your partner. Complications can include:

- Surgery or other treatments for an underlying cause of low sperm count
- Expensive and involved assisted reproductive techniques, such as in vitro fertilization (IVF)
- Stress related to the inability to have a child

Prevention

To protect your fertility, avoid known factors that can affect sperm count and quality. For example:

- Don't smoke.
- Limit or abstain from alcohol.
- Steer clear of illicit drugs.
- Talk to your doctor about medications that can affect sperm count.
- Maintain a healthy weight.
- Avoid heat.
- Manage stress.
- Avoid exposure to pesticides, heavy metals and other toxins.

Diagnosis

When you see a doctor because you're having trouble getting your partner pregnant, he or she will try to determine the underlying cause. Even if your doctor thinks low sperm count is the problem, it is recommended that your partner be evaluated to rule out potential contributing factors and determine if assisted reproductive techniques may be required.

General physical examination and medical history

This includes examination of your genitals and asking questions about any inherited conditions, chronic health problems, illnesses, injuries or surgeries that could affect fertility. Your doctor might also ask about your sexual habits and your sexual development.

Semen analysis

A low sperm count is diagnosed as part of a semen analysis test. Sperm count is generally determined by examining semen under a microscope to see how many sperm appear within squares on a grid pattern. In some cases, a computer might be used to measure sperm count.

Semen samples can be obtained in a couple of different ways. You can provide a sample by masturbating and ejaculating into a special container at the doctor's office. Because of religious or cultural beliefs, some men prefer an alternative method of semen collection. In such cases, semen can be collected by using a special condom during intercourse.

New sperm are produced continually in the testicles and take about 42 to 76 days to mature. So, a current semen analysis reflects your environment over the past three months. Any positive changes you've made won't show up for several months.

One of the most common causes of low sperm count is incomplete or improper collection of a sperm sample. Sperm counts also often fluctuate. Because of these factors, most doctors will check two or more semen samples over time to ensure consistency between samples.

To ensure accuracy in a collection, your doctor will:

- Ask you to make sure all of your semen makes it into the collection cup or collection condom when you ejaculate
- Have you abstain from ejaculating for two to seven days before collecting a sample
- Collect a second sample at least two weeks after the first
- Have you avoid the use of lubricants because these products can affect sperm motility

Semen analysis results

Normal sperm densities range from 15 million to greater than 200 million sperm per milliliter of semen. You are considered to have a low sperm count if you have fewer than 15 million sperm per milliliter or less than 39 million sperm total per ejaculate.

Your chance of getting your partner pregnant decreases with decreasing sperm counts. Some men have no sperm in their semen at all. This is known as azoospermia (ay-zoh-uh-SPUR-me-uh).

There are many factors involved in reproduction, and the number of sperm in your semen is only one. Some men with low sperm counts successfully father children. Likewise, some men with normal sperm counts are unable to father children. Even if you have enough sperm, other factors are important to achieve a pregnancy, including normal sperm movement (motility).

Other tests

Depending on initial findings, your doctor might recommend additional tests to look for the cause of your low sperm count and other possible causes of male infertility. These can include:

- **Scrotal ultrasound.** This test uses high-frequency sound waves to look at the testicles and supporting structures.
- **Hormone testing.** Your doctor might recommend a blood test to determine the level of hormones produced by the pituitary gland and testicles, which play a key role in sexual development and sperm production.

- **Post-ejaculation urinalysis.** Sperm in your urine can indicate your sperm are traveling backward into the bladder instead of out your penis during ejaculation (retrograde ejaculation).
- **Genetic tests.** When sperm concentration is extremely low, genetic causes could be involved. A blood test can reveal whether there are subtle changes in the Y chromosome — signs of a genetic abnormality. Genetic testing might also be ordered to diagnose various congenital or inherited syndromes.
- **Testicular biopsy.** This test involves removing samples from the testicle with a needle. The results of the testicular biopsy can tell if sperm production is normal. If it is, your problem is likely caused by a blockage or another problem with sperm transport. However, this test is typically only used in certain situations and is not commonly used to diagnose the cause of infertility.
- **Anti-sperm antibody tests.** These tests, which are used to check for immune cells (antibodies) that attack sperm and affect their ability to function, are not common.
- **Specialized sperm function tests.** A number of tests can be used to check how well your sperm survive after ejaculation, how well they can penetrate an egg and whether there's any problem attaching to the egg. These tests are rarely performed and often do not significantly change treatment recommendations.
- **Transrectal ultrasound.** A small lubricated wand is inserted into your rectum to check your prostate and check for blockages of the tubes that carry semen (ejaculatory ducts and seminal vesicles).

Treatment

Treatments for low sperm count include:

- **Surgery.** For example, a varicocele can often be surgically corrected or an obstructed vas deferens can be repaired. Prior vasectomies can be reversed. In cases where no sperm are present in the ejaculate, sperm

can often be retrieved directly from the testicles or epididymis using sperm retrieval techniques.

- **Treating infections.** Antibiotics can cure an infection of the reproductive tract, but this doesn't always restore fertility.
- **Treatments for sexual intercourse problems.** Medication or counseling can help improve fertility in conditions such as erectile dysfunction or premature ejaculation.
- **Hormone treatments and medications.** Your doctor might recommend hormone replacement or medications in cases where infertility is caused by high or low levels of certain hormones or problems with the way the body uses hormones.
- **Assisted reproductive technology (ART).** ART treatments involve obtaining sperm through normal ejaculation, surgical extraction(from Testis, more details in specialised services) or from donor individuals, depending on your specific situation and wishes. The sperm are then inserted into the female genital tract, or used for IVF or intracytoplasmic sperm injection.

When treatment doesn't work

In rare cases, male fertility problems can't be treated, and it's impossible for a man to father a child. If this is the case, you and your partner can consider either using sperm from a donor or adopting a child.