ABSENCE OF SPERM IN EJACULATE

Azoospermia

The medical condition of a man whose semen contains no sperm.

♀ Symptom ♂ Male

About Absence of sperm in ejaculate

Azoospermia is defined as the complete absence of spermatozoa upon examination of the semen (strictly confirmed by the absence of spermatozoa issued in urine after ejaculation). The complete absence of spermatozoa should be confirmed with repeat testing after a long time, because many external factors (e.g., febrile episodes and some therapies) may cause transient azoospermia. Azoospermia is present in approximately 1% of all men, and in approximately 15% of infertile men.

Azoospermia may result from a lack of spermatozoa production in the testes (secretory or Non-Obstructive Azoospermia, NOA), or from an inability of produced spermatozoa to reach the emitted semen (excretory or Obstructive Azoospermia, OA).

The evaluation of a patient with azoospermia is performed to determine the etiology of the patient’s condition. The numerous etiologies for azoospermia fall into three principal categories: pre-testicular, testicular, and post-testicular.

Pretesticular azoospermia

Pretesticular azoospermia is characterized by inadequate stimulation of otherwise normal testicles and genital tract. Typically, follicle-stimulating hormone (FSH) levels are low (hypogonadotropic) commensurate with
inadequate stimulation of the testes to produce sperm. Causes of low levels of FHS include hypopituitarism (the decreased secretion of one or more of the eight hormones normally produced by the pituitary gland), hyperprolactinemia (a condition of elevated serum prolactin), and exogenous FSH suppression by testosterone.

Pretesticular azoospermia is seen in about 2% of azoospermia.

**Testicular azoospermia**

In this situation the testes are abnormal, atrophic (the partial or complete wasting away of a part of the body), or absent, and sperm production severely disturbed to absent. FSH levels tend to be elevated (hypergonadotropic) as the feedback loop is interrupted (lack of feedback inhibition on FSH). The condition is seen in 49-93% of men with azoospermia. Testicular failure includes absence of failure production as well as low production and maturation arrest during the process of spermatogenesis (the process in which sperms are produced from spermatogonial stem cells by way of mitosis and meiosis).

Causes for testicular failure include congenital issues such as in certain genetic conditions (e.g. Klinefelter syndrome), some cases of cryptorchidism or Sertoli cell-only syndrome as well as acquired conditions by infection (orchitis), surgery (trauma, cancer), radiation, or other causes.

**Posttesticular azoospermia**

In posttesticular azoospermia sperm are produced but not ejaculated, a condition that affects 7-51% of azoospermic men. The main cause is a physical obstruction (obstructive azoospermia) of the posttesticular genital tracts. The most common reason is a vasectomy done to induce contraceptive sterility. Other obstructions can be congenital (example undevelopment of the vas deferens as seen in certain cases of cystic fibrosis) or acquired, such as ejaculatory duct obstruction for instance by infection.

Ejaculatory disorders include retrograde ejaculation semen enters the bladder instead of emerging through the penis during orgasm) and anejaculation (the pathological inability to ejaculate in males, with or without orgasm); in these conditions sperm are produced but not expelled.

Other conditions of reproductive system related to azoospermia are varicocele, Y chromosome microdeletion, undescended testes and anejaculation, in some cases the origin is unknown.
Varicocele

A varicocele is an abnormal enlargement of the venous plexus in the scrotum. Varicocele is the most common cause of male infertility and is generally correctable or at least improvable by various surgical and radiological techniques. It has been estimated that 5–10% of infertile males with azoospermia had a clinical diagnosis of varicocele.

Y chromosome deletions

Y chromosome microdeletion (YCM) is a family of genetic disorders caused by missing gene(s) in the Y chromosome. Many men with YCM exhibit no symptoms and lead normal lives. However, YCM is also known to be present in a significant number of men with reduced fertility. Men with reduced sperm production (in up to 20% of men with reduced sperm count, some form of YCM has been detected) varies from oligozoospermia, significant lack of sperm, or azoospermia, complete lack of sperm.

Undescended testes

Cryptorchidism, or undescended testis (UDT), is defined as failure of a testis to descend into a scrotal position. If this condition is on both side it can lead to atrophy of testes, with complete arrest of spermatogenesis.

Anejaculation

Anejaculation is defined as the complete absence of ejaculation. Without ejaculation, no sperms can be expelled. It is caused by failure of emission of semen from the prostate and seminal ducts into the urethra.

Idiopathic azoospermia

Idiopathic azoospermia is where there is no known cause of the condition. It may be a result of multiple risk factors, such as age and weight. For example, a review in 2013 came to the result that oligospermia (semen with a low concentration of sperm) and azoospermia are significantly associated with being overweight, obese and morbidly obese, but the cause of this is unknown.

Prognosis
Among the possible reasons for male infertility, nonobstructive azoospermia is the least treatable, because few or no mature sperm may be produced. In many cases, men with nonobstructive azoospermia typically have small-volume testes and elevated FSH. Although treatment may not completely restore the quality of semen from men with subnormal fertility, in some cases a successful pregnancy can still be achieved through assisted reproductive technology (ART).

Normal-sized testes accompanied by normal FSH and azoospermia suggest the possibility of obstruction, and a testicular biopsy is required to differentiate between obstruction and maturation arrest. If mature sperms are found in the biopsy, sperm may be cryopreserved for later use in an IVF/ICSI cycle.

Find more about related issues

Diagnoses

Varicocele
An abnormal enlargement of the pampiniform venous plexus in the scrotum.
Learn more at: www.fertilitypedia.org/therapy/diag/varicocele

Azoospermia
Complete absence of sperm in the ejaculate of a man.
Learn more at: www.fertilitypedia.org/therapy/diag/azoospermia

Undescended testes
In the case of cryptorchidism one or both testes are absent from the scrotum. It is is the most common etiologic factor of azoospermy in the adult.
Learn more at: www.fertilitypedia.org/therapy/diag/undescended-testes

Anejaculation
The pathological inability to ejaculate in males, with (orgasmic) or without (anorgasmic) orgasm.
Learn more at: www.fertilitypedia.org/therapy/diag/anejaculation

Klinefelter syndrome
The set of symptoms that result from two or more X chromosome in males.
Learn more at: www.fertilitypedia.org/therapy/diag/klinefelter-syndrome
**Kallmann syndrome**
A genetic condition where the primary symptom is a failure to start puberty or a failure to fully complete puberty.
Learn more at: [www.fertilitypedia.org/therapy/diag/kallmann-syndrome](http://www.fertilitypedia.org/therapy/diag/kallmann-syndrome)

**Non-obstructive azoospermia**
Complete absence of sperm in the ejaculate due to testicular failure.
Learn more at: [www.fertilitypedia.org/therapy/diag/non-obstructive-azoospermia](http://www.fertilitypedia.org/therapy/diag/non-obstructive-azoospermia)

**Obstructive azoospermia**
Absence of sperm in the ejaculate despite normal spermatogenesis, caused by an obstruction of the genital tract.
Learn more at: [www.fertilitypedia.org/therapy/diag/obstructive-azoospermia](http://www.fertilitypedia.org/therapy/diag/obstructive-azoospermia)

**Idiopathic male infertility**
A condition in which fertility impairment occurs spontaneously or due to an unknown cause.
Learn more at: [www.fertilitypedia.org/therapy/diag/idiopathic-male-infertility](http://www.fertilitypedia.org/therapy/diag/idiopathic-male-infertility)

**Y-chromosome deletions**
A family of genetic disorders caused by missing gene(s) in the Y chromosome.
Learn more at: [www.fertilitypedia.org/therapy/diag/y-chromosome-deletions](http://www.fertilitypedia.org/therapy/diag/y-chromosome-deletions)

### Sources

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