CRYPTOZOOSPERMIA

Cryptospermia, Low Sperm Concentration In Semen

Male infertility diagnosis characterized by extremely low concentration of sperm in semen.

Diagnosis  Male

Related Diagnoses:
Varicocele  Azoospermia  Undescended testes  Klinefelter syndrome  Oligozoospermia  Hypogonadism  Necrosperrmia  Prostatitis  Hypospermia  Obstructive azoospermia  Oligoasthenoteratozoospermia  Y-chromosome deletions

About Cryptozoospermia

Cryptozoospermia is one of a male infertility diagnosis characterized by very low sperm concentration in fresh sample. The literature usually determine the cryptozoospermia when describing the sperm concentration lower than 1x10^6 / ml or lower than 500 000 spermatozoa per ml.

Defined by World Health Organization (WHO) the cryptozoospermia is the situation that spermatozoa cannot be observed in a fresh semen sample. However, it could be found after an extended centrifugation and following microscopic search. As there is just a small number of spermatozoa present in semen, the semen analysis in general medical lab may be misleading and the semen analysis may be mistakenly presented as zero sperm count.

In case that semen analysis shows zero sperm count, usually the second seminogram (semen analysis) should be requested. It is beneficial to provide also a sequential ejaculate – to provide 2 samples for analysis. The second sample should be given to the lab approximately one or two hours later after the first one; this may contain some sperm even if the first one doesn’t as it is “ fresher”. The semen sample should also undergo the process of centrifugation – the sperm are concentrated and separated from the seminal fluid and rest at the bottom of the tube, in the pellet. The sample is then examined under the microscope.

Because it is extremely difficult to find and very easy to miss the sperm cells in semen, the condition of cryptozoospermia and the diagnosis itself is commonly confused with complete azoospermia (no presence of spermatozoa in semen) or with extremely severe oligozoospermia (one of the categories of oligozoospermia – low sperm concentration). Whilst the diagnosis of azoospermia may be deceptively presented because of the examination errors during semen analysis, the differentiation of cryptozoospermia and extremely severe oligozoospermia is more difficult. As written before, the cryptozoospermia is defined as that spermatozoa cannot be observed in fresh semen sample but could be found after an extended centrifugation and microscopic search. However, the spermatozoa could be found in part of semen samples directly under the microscopic search, but it could not be counted due to extremely low concentration – this is which may determine the diagnosis of extremely severe oligozoospermia from cryptozoospermia.

The cause of very low sperm count may be the mechanical obstruction (such as ejaculatory duct obstruction) in the seminal ducts at the some point between the testis and the penis; however the the causes of sperm production problems are most likely located at the testes.
Patients with cryptozoospermia, as well as extremely severe oligozoospermia and azoospermia are suitable for using intracytoplasmic sperm injection (ICSI) infertility treatment. Even though a man suffers from decrease quantity of sperm in ejaculate, the sperm may be isolated from the semen after the centrifugation process when the sperm is concentrated at the bottom of the tube. If the ejaculate does not contain the suitable sample of sperm (due to immotile sperm or sperm abnormal morphology etc.) for next ICSI treatment, the sperm may be obtained by testicular sperm extraction procedure (TESE).

**Associated diseases**

- azoospermia
- oligozoospermia

**Complications**

- infertility

**Risk factors**

- ejaculatory duct obstructions
- infections
- prostatitis (inflammation of the prostate gland)
- testicular trauma, former surgeries
- cystic fibrosis
- genetic defects at Y chromosome (Y chromosome microdeletions)
- Klinefelter syndrome (abnormal set of chromosomes)
- cryptorchism
- varicocele
- hypogonadism (diminished functional activity of the testes)

**Impact on fertility**

A man should have at least 15 million sperm / ml and at least one third of them should have normal motility. Once in vagina, sperm have to overcome unfavorable condition, enter the cervix and fertilize the egg. They must swim quickly enough to reach the egg as an egg can survive up to 48 hours once released from the ovary (this period days last for 4-5 days).

As the sperm have to go through the passage with unfavorable condition and full of obstacles until they reach the egg, it is necessary to have many more of them in the ejaculate. Insufficient sperm count an inability of the sperm to swim (slow, abnormal or no motility) decrease the chance to pass the way and thus to conceive naturally during the intercourse.

In the case of cryptozoospermia the sperm count and motility is affected substantialy what prevents natural conception.

However, in some conditions the spermatogenesis can be supressed temporary (e.g. due to the fewer) and the sperm values can be improved when a new spermatogenesis is restored. Therefore, repeated examinations of the sperm parameters are needed in 2 - 4 months.

**Prevention**
There is no mentioned prevention of cryptozoospermia.

Symptoms

Problems to conceive naturally, semen analysis with the result of zero sperm count, pain in testes / scrotum, infection processes, other symptoms determining other connected diseases.

Therapies

Self therapy

The acupuncture treatment has shown positive results on sperm count in semen if organic (testicular, ejaculatory duct obstruction etc.) anomalies are excluded.

Conventional medicine

At the diagnosis of cryptozoospermia, the surgical therapy is more suitable depending on the origin problem. However, the ART treatment is more recommended.

Pharmacotherapy

In case of infection, the antibiotics are used to treat the inflammatory processes. Other medical approaches to treat cryptozoospermia include mostly tamoxifen or hormone therapy.

Surgical therapy

Surgical treatments of ejaculatory duct obstructions, varicocele or cryptorchism may achieve positive results in increasing the sperm count.

Ejaculatory duct obstruction

To treat ejaculatory duct obstruction, the method of Transurethral Resection of the Ejaculatory Ducts (TURED) is used and it has become a standard procedure in this diagnosis. The resection may vary depending on severity of the conditions of the obstruction. It may vary from incising the cyst to relieve extrinsic compression on the ducts to deep resection along the ducts in cases of long post-inflammatory obstruction. Extensive resection of ejaculatory ducts may end by opening ejaculatory ducts into the urethra followed by urinary reflux to the vasa; thus the extensive resection should be under taken with caution.

Varicocele surgery

Varicoceles are abnormally dilated testicular veins in the scrotum. Because of that the testicular function is progressively declined and thus the semen parameters, such as sperm motility, concentration or morphology, may deteriorate. Varicocele repair is the most common operation for the treatment of male infertility.

During the operation, a small incision is made in the abdomen close to the place where testicles originally descended through the abdominal wall. The veins that produce the varicocele are identified and cut. This eliminates the blood flow to the varicocele.

Cryptorchism surgery

Cryptorchism is the failure of one or both of the testes to descend into the scrotum. An improperly developed testis may not leave the abdomen and this it may not produce the hormones and cannot produce the sperm cells.

Surgery treatment of cryptorchism is called orchepex. It is not particularly serious operation and it is usually successful. With the increasing age of patient, the operation may involve more risk to the cells that produce sperm cells.

Assisted reproduction
If conservative medical treatments fail to achieve a full term pregnancy, the physician may suggest the patient undergo in vitro fertilization (IVF). IVF and ART generally start with stimulating the ovaries to increase egg production. Most fertility medications are agents that stimulate the development of follicles in the ovary. Examples are gonadotropins and gonadotropin releasing hormone. After stimulation, the physician surgically extracts one or more eggs from the ovary, and unites them with sperm in a laboratory setting, with the intent of producing one or more embryos. Fertilization takes place outside the body, and the fertilized egg is reinserted into the woman’s reproductive tract, in a procedure called embryo transfer.

Intracytoplasmic sperm injection (ICSI) is beneficial in the case of male factor infertility where sperm counts are very low or failed fertilization occurred with previous IVF attempt(s). The ICSI procedure involves a single sperm carefully injected into the center of an egg using a microneedle. With ICSI, only one sperm per egg is needed. Without ICSI, you need between 50,000 and 100,000.

Men who ejaculate no sperm, because of blocked tubes in their testes, or because of a genetic condition that prevents their sperm being released, require some form of surgical sperm retrieval to enable ICSI to take place. In case of cryptozoospermia, testicular sperm obtained by surgical excision (TESE) or percutaneous aspiration (TESA) are used in ICSI treatment. Alternatively, the retrieved sperm can be cryopreserved for use in future sperm injection attempts. If all efforts to extract vital sperm cells fail, then donated ones may be recommended.

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](http://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](http://www.fertilitypedia.org/therapy/diag/azoospermia)

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

**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](http://www.fertilitypedia.org/therapy/diag/klinefelter-syndrome)

**Oligozoospermia**
Semen with a low concentration of sperm and is a common finding in male infertility.
Learn more at: [www.fertilitypedia.org/therapy/diag/oligozoospermia](http://www.fertilitypedia.org/therapy/diag/oligozoospermia)

**Hypogonadism**
A medical term which describes a diminished functional activity of the gonads – the testes and ovaries.
Learn more at: [www.fertilitypedia.org/therapy/diag/hypogonadism](http://www.fertilitypedia.org/therapy/diag/hypogonadism)

**Necrosperrmia**
Necrosperrmia is a condition in which spermatozoa in semen are either immobile or dead
Learn more at: [www.fertilitypedia.org/therapy/diag/necrosperrmia](http://www.fertilitypedia.org/therapy/diag/necrosperrmia)
Prostatitis
An inflammation of the prostate gland.
Learn more at: www.fertilypedia.org/therapy/diag/prostatitis

Hypospermia
A condition in which a man has an unusually low ejaculate (or semen) volume.
Learn more at: www.fertilypedia.org/therapy/diag/hypospermia

Obstructive azoospermia
Absence of sperm in the ejaculate despite normal spermatogenesis, caused by an obstruction of the genital tract.
Learn more at: www.fertilypedia.org/therapy/diag/obstructive-azoospermia

Oligoasthenoteratozoospermia
Male fertility diagnosis defined as a combination of low sperm concentration, reduced motility and abnormal sperm morphology in the ejaculate.
Learn more at: www.fertilypedia.org/therapy/diag/oligoasthenoteratozoospermia

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

Organs

Testes
Male gonads which produce both sperm and androgens, such as testosterone, and are active throughout the reproductive lifespan of the male.
Learn more at: www.fertilypedia.org/edu/organs/testes

Reproductive cells

Sperm
A male reproductive cell which is able to fertilize the counterpart female gamete - the oocyte.
Learn more at: www.fertilypedia.org/edu/reproductive-cells/sperm

Spermatogonium
An undifferentiated male germ cell with self-renewing capacity representing the first stage of spermatogenesis.
Learn more at: www.fertilypedia.org/edu/reproductive-cells/spermatogonium

Biological control

Follicle-stimulating hormone
FSH is a hormone secreted by the anterior pituitary gland. It regulates the development, growth, pubertal matur and reproductive functions of the body.
Learn more at: www.fertilypedia.org/edu/biological-control/follicle-stimulating-hormone

Testosterone
Steroid hormone produced primarily in the testes of the male; responsible for the development of secondary sex characteristics in the male.
Learn more at: www.fertilypedia.org/edu/biological-control/testosterone

Reproductive functions

Fertilization
The fusion of an ovum with a sperm to initiate the development of a new individual organism.
Learn more at: www.fertilypedia.org/edu/reproductive-functions/fertilization
Risk factors

Testicular or scrotal injury
Damage of the testicles or scrotum which may be temporary or permanent.
Learn more at: www.fertilitypedia.org/therapy/rf/testicular-or-scratal-injury

Symptoms

Infertility
The failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.
Learn more at: www.fertilitypedia.org/edu/symptoms/infertility

Therapies

Egg donation
Process by which a woman donates eggs for purposes of assisted reproduction or biomedical research.
Learn more at: www.fertilitypedia.org/edu/therapies/egg-donation

ICSI
A micromanipulative fertilization technique in which a single sperm is injected directly into an egg.
Learn more at: www.fertilitypedia.org/edu/therapies/icsi

Laser-assisted immotile sperm selection
Method, which uses a laser to identify viable sperm cell, recommended in MESA/TESA IVF cycles or in patients diagnosed with sperm immotility.
Learn more at: www.fertilitypedia.org/edu/therapies/laser-assisted-immotile-sperm-selection-1

MESA
A microsurgical procedure to harvest sperm from the single epididymal tubule (epididymis), used in the case of obstructive azoospermia.
Learn more at: www.fertilitypedia.org/edu/therapies/mesa

Micro TESE
Microsurgical method used to identify areas of sperm production within the testes with the aid of optical magnification.
Learn more at: www.fertilitypedia.org/edu/therapies/micro-tese

PESA
Sperm aspiration procedure in which a needle is inserted into the epididymis in order to retrieve sperm.
Learn more at: www.fertilitypedia.org/edu/therapies/pesa

Preimplantation genetic diagnosis
Technology that allows couples with a family history of monogenic disorders, x-linked diseases and chromosomal abnormality have a healthy baby.
Learn more at: www.fertilitypedia.org/edu/therapies/preimplantation-genetic-diagnosis

Preimplantation genetic screening
The term PGS is used to denote procedures that do not look for a specific disease but to identify embryos at risk of de-novo occurring aneuploidies
Learn more at: www.fertilitypedia.org/edu/therapies/preimplantation-genetic-screening-1

Sperm donation
The procedure in which a man (sperm donor) provides his sperm for fertility treatment.
Learn more at: www.fertilitypedia.org/edu/therapies/sperm-donation
**Standard IVF**
A process in which an egg is fertilised by sperm outside the body: in vitro. Own or donated gametes may be used. Learn more at: [www.fertilitypedia.org/edu/therapies/standard-ivf](http://www.fertilitypedia.org/edu/therapies/standard-ivf)

**TESE**
Removal of a small portion of testicular tissue in order to extract a few viable sperm. Learn more at: [www.fertilitypedia.org/edu/therapies/tese](http://www.fertilitypedia.org/edu/therapies/tese)

**Sources**
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