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Analyses for men undergoing artificial insemination

The purpose of this leaflet is to provide information on the tests performed on a man before the procedure of artificial insemination.

Semen analysis

Semen analysis is one of the most important tests to evaluate a man's fertility. Semen can also be tested for the presence of bacteria (including mycoplasma and ureaplasma) and infection.

PLEASE NOTE! A normal result does not always indicate fertility, nor does an abnormal result automatically indicate infertility. The parameters may change over time, so a repeat analysis should be performed if necessary.

Before semen sample collection

For the semen analysis to provide reliable results, the patient should refrain from the following fortwo to four days before sample collection:

- ejaculation (not less than two and not more than seven days)
- alcohol consumption
- sudden temperature changes (hot sauna, bath)
- strenuous physical activity
- excessive fatigue

It is not recommended to perform a semen analysis within **one month** after an illness accompanied with high fever ($>38^{\circ}\text{C}$).

Antibacterial medication should have been discontinued for at least **two weeks**. **Steroid and hormone preparations** can also have a strong adverse effect on semen quality.

Instructions for semen sample collection

The patient collects the specimen through masturbation in a designated private room at the Centre for Infertility Treatment. Under exceptional circumstances, the sample may be collected at home. In that case, the semen should be delivered to the Centre for Infertility Treatment **as soon as possible (within one hour) and kept at body temperature**.

If you wish to collect the sample at home, avoid using a condom, as they contain substances that can damage sperm cells. The semen must be collected in a container provided by the Centre for Infertility Treatment. Ensure that all of the semen is collected in the container; otherwise, you should inform the doctor or laboratory technician.

Before masturbation:

- Wash your hands and genitals.
- Do not use a condom.
- Ensure that all of the semen is collected in the container; otherwise, inform the doctor or laboratory technician.

Normal values

Colour. Normal semen is greyish-cloudy. A yellowish colour indicates a long period of sexual abstinence (more than 10 days have passed since the last ejaculation) or a possible infection. A brownish colour may indicate the presence of blood in the semen.

Ejaculate volume. The quantity of semen is ≥ 1.5 ml.

Viscosity. Normal semen does not contain mucus. Its presence may indicate an infection.

Agglutination refers to the sticking together of sperm cells, which may indicate the presence of an infection.

Motility indicates the percentage and speed of sperm movement. According to norms, actively motile sperm should make up at least 33%.

The normal range of **leukocytes** is <1 million/ml. In healthy men's semen, a small number of leukocytes (less than 1 million/ml) may be present. An increase usually indicates infection.

Sperm concentration and total sperm count. Sperm count in 1 ml of semen is ≥ 15 million and the total count is ≥ 40 million.

Morphology or external shape of sperm. Determines the percentage of sperm with normal or ideal shape. Even the presence of 4% of sperm with ideal shape can ensure fertility.

Detection of autoimmunity (MAR test)

The presence of more than 50% of sperm antibodies in semen indicates possible immunological infertility.

The body recognises sperm cells as foreign bodies and produces antibodies against them (similar processes occur when other foreign bodies, such as harmful bacteria or viruses, invade the body).

Sample collection errors and consequences

Low ejaculate volume

If you were unable to collect all of the semen in the collection container (for example, some spilled outside, you dropped the container, the container leaks, or the semen was collected by interrupted sexual intercourse), the total volume of ejaculate may be lower than normal. A small amount of semen may also indicate pathology (sperm entering the bladder due to abnormal functioning of the urethral sphincter). Additionally, the first portion of the ejaculate may contain many sperm cells, while the last portion may contain fewer. Depending on the part of the ejaculate that was lost, the sperm count may be mistakenly determined as higher or lower than it actually is.

Changes in sperm motility

- Sperm motility may be reduced if the container contains substances that are harmful to sperm.
- A longer interval between ejaculations (over seven days) may result in a higher sperm count but reduced sperm motility. A shorter interval between ejaculations (under two days) may result in a lower sperm count but increased sperm motility.
- Sperm cells begin to die within one hour after the collection of the sample, which also reduces their motility.

Additional tests before artificial insemination

Blood tests (mandatory for various artificial insemination procedures) The tests are collected in blood collection rooms.

- Antibodies against human immunodeficiency virus types 1 and 2
- antibodies (HIV1,2 Ag+Ab)
- Treponema pallidum antibodies (T pallidum Ab)
- Antibodies against Hepatitis C virus (HCV Ab)
- Hepatitis B virus surface antigen (HBsAg)
- Antibodies against Hepatitis B virus core antigen (HBc Ab)

Urine tests performed to exclude the following diagnoses:

- Gonorrhoea (N gonorrhoeae DNA)
- Chlamydiosis (C trachomatis DNA)
- Trichomoniasis (T vaginalis DNA)
- Ureaplasmosis (U urealyticum DNA/U parvum DNA)
- Mycoplasmosis (M genitalium DNA/M hominis DNA)

If necessary, more tests are performed. The results of all tests are discussed with you at the appointment. The process of artificial insemination begins when the male patient has viable sperm and the results of all blood tests and bacterial sample tests are normal (i.e. negative for sexually transmitted infections). If abnormalities are detected, the patient should be treated first.

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