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CAUSES AND TREATMENT OF INFERTILITY

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Abstract:

This article discusses the problems, statistics of the causes of infertility in men and women and their modern solutions. Contrary to popular belief, infertility affects both women and men equally. That is, the quantitative ratio of infertile patients of each sex is approximately the same. For this purpose, modern fertility clinics have been created, which practice well-proven methods of treating infertility.

Keywords: causes, infertility, reproductology, contraceptives, reproductive tract, ejaculation disorder.

According to the World Health Organization, "... About 8% of married couples face the problem of infertility during their reproductive life" [1]. If a married couple has not conceived during a year of regular sexual life without the use of contraceptives, it is necessary to consult a specialist for examination. This fact in itself does not mean that one of the spouses is infertile, doctors in this case talk about a temporary inability to conceive a child. In most cases, this problem is successfully solved. For this purpose, modern fertility clinics have been created, which practice well-proven methods of infertility treatment [2].

If a married couple has not conceived during a year of regular sexual life without the use of contraceptives, it is necessary to consult a specialist for examination. This fact in itself does not mean that one of the spouses is infertile, doctors in this case talk about a temporary inability to conceive a child. In most cases, this problem is successfully solved. For this purpose, modern fertility clinics have been created, in which well-proven methods of infertility treatment are practiced. Infertility is also divided into primary and secondary. In primary infertility, there is no history of pregnancy at all, although there is a regular sexual life without any means and methods of contraception. A secondary pregnancy is considered to have occurred if there was at least one pregnancy (regardless of how it ended: childbirth, abortion, miscarriage, ectopic pregnancy) [3]. Contrary to popular misconception, infertility affects both women and men equally. That is, the quantitative ratio of infertile patients of each sex is approximately the same. It is absolutely wrong for one partner to put the blame on the other. Firstly, it creates strong psychological pressure, which only aggravates the situation. Secondly, the solution of the problem is possible only under the condition of full mutual support of the spouses. Thirdly, there are precedents when treatment is necessary for both partners.

Infertility can be caused by a number of different factors in both the male and female reproductive systems. However, sometimes the causes of infertility cannot be explained.

In the female reproductive system, infertility can be caused by:
tubal problems, such as obstruction of the fallopian tubes, which in turn develop as a result of untreated sexually transmitted infections (STIs) or complications of unsafe abortion, postpartum sepsis, or abdominal/pelvic surgery, abnormal conditions of the uterus, which can be inflammatory (e.g., endometriosis), congenital (e.g., septum) or benign (e.g., fibroids), pathological conditions of the ovaries, such as polycystic ovary syndrome and other follicular disorders, disorders in the endocrine system that cause an imbalance of reproductive hormones. The endocrine system includes the hypothalamus and pituitary gland. Examples of common pathological conditions affecting this system include pituitary cancer and hypofunction of the pituitary gland [4].

The relative importance of these causes of female infertility may vary from country to country, for example, due to differences in background prevalence of STIs, and depend on the age of the populations studied.

Infertility affects millions of people of reproductive age around the world and affects their families and communities. Infertility is estimated to affect between 48 million couples and 186 million people worldwide [5-6]. In the male reproductive system, infertility is most often caused by problems with ejaculation, lack of sperm or insufficient sperm count, or abnormal sperm shapes (morphology) and sperm movement (motility). In the female reproductive system, infertility can be caused, among other things,

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by a number of pathologies of the ovaries, uterus, fallopian tubes, and endocrine system [7-8].

Infertility can be primary or secondary. Primary infertility is diagnosed if a woman has never been pregnant, and secondary infertility is diagnosed if a woman has had at least one pregnancy.

Medical care for infertility includes the prevention, diagnosis, and treatment of infertility. Fair and equitable access to these services remains a challenge in most countries, especially in low- and middle-income countries. Infertility services are rarely given their proper place in the health packages provided by universal health coverage. Infertility can be caused by a number of different factors in both the male and female reproductive systems. However, sometimes the causes of infertility cannot be explained.

In the female reproductive system, infertility can be caused by: problems with the tubes, such as obstruction of the fallopian tubes, which in turn develop as a result of untreated sexually transmitted infections (STIs) or complications of unsafe abortion, postpartum sepsis or abdominal/pelvic surgery; abnormal conditions of the uterus, which may be inflammatory (e.g., endometriosis), congenital (e.g., septum), or benign (e.g., fibroids); pathological ovarian conditions, such as polycystic ovary syndrome and other follicular disorders; disorders in the endocrine system that cause an imbalance of reproductive hormones. The endocrine system includes the hypothalamus and pituitary gland. Examples of common pathological conditions affecting this system include pituitary cancer and hypofunction of the pituitary gland [8-10].

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In the male reproductive system, the causes of infertility can be:

Obstruction of the reproductive tract leading to ejaculation disorders. This obstruction can occur in the way the seminal fluid enters (e.g., in the ejaculatory ducts and seminal vesicles). Obstruction usually occurs as a result of injuries or infections of the genital tract; hormonal disorders resulting in abnormalities in the hormones produced by the pituitary gland, hypothalamus, and testicles. Hormones such as testosterone regulate sperm production. Pathological conditions that lead to hormonal imbalances include pituitary or testicular cancer; Inability of the testicles to produce sperm, for example due to varicocele or as a result of therapies that deteriorate the sperm-producing cells (e.g., chemotherapy); abnormal sperm function and quality. Conditions or situations that lead to abnormal sperm shapes (morphology) and abnormal sperm movement (motility) have a negative impact on fertility. For example, the use of anabolic steroids can lead to abnormal sperm parameters such as sperm number and shape.

Environmental and lifestyle factors, such as smoking, excessive alcohol consumption, and obesity, can have an impact on fertility. In addition, exposure to environmental pollutants can be directly toxic to germ cells (eggs and sperm) and affect their number and quality, leading to infertility.

Female infertility is more multifaceted than male infertility. After all, a woman's body must not only produce an egg, but also create conditions for conception and the normal course of pregnancy. Any, even a slight malfunction of the female reproductive organs can significantly complicate conception. Among the main causes and signs of infertility in women are: problems with ovulation; hormonal problems; ovarian dysfunction; damage to the fallopian tubes, adhesions; polycystic ovaries; hormonal imbalance; scarring on the ovarian lining; cervical erosion; early menopause; disorders in the cervical canal; defects in the development and structure of the uterus; psychological causes; endometriosis; unruptured follicle syndrome, etc.

The most common causes include obstruction or absence of fallopian tubes. It is in them that the egg and sperm meet, fuse and form an embryo, which then enters the uterus. Obstruction develops mainly due to the formation of adhesions (adhesion of the walls) of the tubes as a result of their inflammation. Rarely, adhesions are caused by sterilization, in which the fallopian tubes are tied or crossed. The absence of a tube may be due to its surgical removal, performed for vital indications (local purulent process, ectopic pregnancy).

Adhesions in the pelvic area. They occur after inflammatory processes, endometriosis, surgical interventions. The adhesion is able to envelop the ovary or localize between it and the tube, making it impossible for the egg to pass through.

Endometriosis. This is a disease in which the lining of the uterus (endometrium) grows beyond its limits. Foci of growth are formed, adhesions appear between them, preventing the process of fertilization.

Endocrine, aka hormonal disorder. Endocrine disruption is observed in diseases of the ovaries, thyroid, pituitary gland, hypothalamus, adrenal glands, kidneys, and liver. It can be caused by metabolic disorders or severe mental stress, shock situation.

Psychogenic infertility. It occurs as a psychological reaction to the reluctance to get pregnant. A woman may consciously or unconsciously

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experience fear of childbirth or possible changes in appearance due to pregnancy. Sometimes the reason is the reluctance to conceive with this particular partner.

Immunological infertility. It occurs when there are antibodies to sperm in the female body, which interferes with the fertilization process. Under the influence of antibodies, spermatozoa become inactive, making it difficult for them to pass through a woman's body [10].

In men, infertility is manifested by one single symptom - the inability to conceive. Unlike women, the symptoms of male infertility are practically non-existent. This fact gave rise to the myth that men suffer from infertility much less often than women. The key factors that provoke male infertility are: inferiority of sperm cells (impaired sperm motility and viability); a sharp decrease in their number; complicated movement of spermatozoa through the vas deferens and their ejection to the outside [11-12].

Male infertility can be caused by:

Varicocele; congenital anomalies of the genital apparatus (hypospadias, absence or obstruction of the vas deferens);
isolated abnormalities in seminal fluid;
infectious and inflammatory diseases of the genitourinary system;
surgical intervention (groove hernia, hydrocele, bladder surgery, etc.);
systemic diseases (cirrhosis of the liver, tuberculosis, diabetes, infectious mumps with orchitis complication, chronic renal failure);
sexual and ejaculatory disorders;
psychogenic factors;
necrozoospermia;
obstructive azoospermia;
endocrine (hormonal) disorders.

Additional causes include: alcohol and nicotine abuse, exposure to radiation, scrotal injury. Reproductive function is adversely affected by working in difficult and harmful occupational conditions, for example, at too high or low temperatures, or in a toxic environment. Separately, there are factors that can provoke a decrease in the number of sperm cells: stress, malnutrition (lack of proteins and vitamins in the diet), chronic sleep deprivation.

Diagnosis of infertility in men. Just like a woman, a man must undergo general clinical tests, a blood test for hormones, and examinations aimed at detecting infection. An ultrasound of the scrotum and prostate gland is prescribed, during which they are examined visually. In the process of diagnosing male infertility, the main point is to find out the fertility of the sperm, that is, the ability to fertilize. The key test at this stage will be a semen analysis. This is a complete detailed analysis of sperm, in which its physical parameters, chemical and cellular composition are examined. The examination allows you to find out the following characteristics:

sperm concentration (must be more than 15 million per 1 ml);
their mobility (over 40%);
the number of normal forms of sperm (at least 4%);
viability (more than 58%);
ejaculate volume (1.5 ml or more);
total sperm count (39 million or more).

In addition to these indicators, attention is certainly paid to the color of the semen, color, smell, acidity, and the content of leukocytes. The spermogram also determines the presence or absence of antisperm antibodies produced in the immunological form of infertility - the MAR test. To pass a spermogram, the patient must adhere to several medical requirements. For two weeks before the test, you should not drink alcohol and take antibiotics, visit a sauna or steam bath. It is necessary to abstain from sexual intercourse for 4-7 days.

Often, at the same time as the spermogram, a sperm maturity test (HBA test) is performed. The test detects the binding of sperm to hyaluronic acid, an important component of the environment surrounding the egg. This parameter is extremely important for fertilization. A mature sperm usually connects to hyaluronic acid with special receptors, while an immature sperm is unable to connect. Normally, sperm maturity should be 60% or higher, otherwise natural conception is impossible. As an additional examination, the doctor may prescribe a testicular biopsy, which allows you to find out the presence of sperm and the condition of the tissues. This procedure can also be used for therapeutic purposes.

Methods of treatment of male and female infertility. The tactics of infertility treatment are determined by a fertility specialist based on the collection of patients' anamnesis and the results of a comprehensive diagnosis. Treatment methods are divided into traditional (medical, surgical) and assisted reproductive technologies (ART). It should be understood that in the process of treatment even of one of the partners, the second partner is also directly involved. Therefore, the methods described below for the treatment of female and male infertility are relevant for both spouses.

Treatment of female infertility. The method of treatment is determined by the cause of the pathology. Drug treatment is used:

in endocrine infertility, it is based on the intake of drugs containing hormones (urinary or recombinant gonadotropins, clomid);

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infertility caused by infectious diseases (antibiotic therapy: metrogil, metronidazole, ofloxacin, ciprofloxacin and other drugs);
immunological infertility (antihistamines and corticosteroids are prescribed).

Surgical treatment methods are effective for pathologies of the fallopian tubes and uterus. We are talking about minimally invasive surgeries that cause minimal harm to the patient. They are carried out in a hospital, but the rehabilitation period is short - 3-5 days. Surgical methods include laparoscopy and hysteroscopy.

Do not forget about such an important factor as the psychological state. According to statistics, about 30% of infertility problems are due to the impact of psychological factors on the patient - stress, shock, etc. Psychologists and psychotherapists are successfully fighting this problem.

In many cases, traditional methods of treatment are ineffective, so assisted reproductive technologies are resorted to in women. There are many reproductive technologies:
planned sexual intercourse;
artificial intrauterine insemination;
in vitro fertilization (IVF);
oocyte donation;
sperm injection into the egg (ICSI);
Surrogacy.

Intrauterine insemination is based on the introduction of sperm into the uterus artificially, using a catheter. Then everything happens in a natural way: sperm cells move to the egg through the fallopian tubes and fertilization occurs. A prerequisite is the integrity of the fallopian tubes. Insemination is possible with both the partner's sperm and the donor's sperm. The method is effective in case of reduced fertility of the spouse (small or absent number of spermatozoa, their weak motility), as well as if a single healthy woman wants to become pregnant.

In vitro fertilization (IVF) consists of fertilizing an egg in a laboratory, obtaining embryos and transferring them to the uterus – this is a standard technology. It is possible to perform IVF using a donor egg or donor sperm. The IVF method consists of several stages, which are quite stretched out in time. This is a complex but effective technique, it is performed by experienced fertility specialists.

Treatment of male infertility. In the treatment of the secretory form of male infertility, if possible, they try to eliminate the cause - varicocele, hydrocele, mumps, elimination of an unfavorable factor. After the elimination of the cause, a course of therapy aimed at improving the spermatogenic function of the testicles is carried out - drug therapy comes into play. The course includes taking drugs that stimulate blood supply to the scrotum, vitamin therapy, good nutrition and adherence to the regimen. Sometimes stimulating hormone therapy is required. Treatment of this form is a long and painstaking process, but not hopeless, so the patient should be patient.

Treatment of obstructive infertility in men is based on performing different types of biopsy - surgical extraction of mature sperm from the testicle and its appendages. For this purpose, special testicular biopsy techniques have been developed: with the help of puncture (testicular tissues – TESA, appendages – PESA) and small incisions (TESE and MESE, respectively). The rehabilitation period after the biopsy is 10-12 days, during which physical activity, sexual intercourse, and increased physical activity are contraindicated.

Indications for infertility treatment are the absence of pregnancy during a year of regular sexual life, when partners want a child, but it is not possible to conceive. In such cases, a timely visit to a fertility clinic significantly increases the chances of a successful birth of a child. The main contraindications in the treatment of infertility include pathologies of a somatic and mental nature, in which pregnancy and childbirth are contraindicated, oncological diseases, acute infectious and inflammatory processes of any localization.

In conclusion, we can add that every year there are more and more clinics specializing in the treatment of infertility. Sometimes it is difficult for patients to navigate, but the process of choosing a clinic will be much easier and faster if you think about the qualification of doctors and the equipment of the medical center. There are not so many real professional fertility specialists with extensive experience, knowledge and practical skills.

Infertility is a severe psychological problem for many married couples. But it is important to remember that such a pathology responds well to treatment. Only when the correct diagnosis is made, the type of problem is determined, it is possible to choose an effective correction. The specialists of our clinic will carry out the necessary diagnostics, prescribe high-quality treatment, after which such a long-awaited pregnancy will occur in your family.

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