

Endocrine Infertility Causes and Treatment

Posted on October 10, 2019

Endocrine infertility – a complex of hormonal disorders leading to irregular ovulation or its absence in women and impaired sperm quality in men. It can be based on disorders of the thyroid gland, gonads, and hypothalamic-pituitary regulation. Treatment of endocrine infertility is to eliminate its cause, correct existing disorders, and maintain a normal hormonal background. Normalization of impaired functions leads to the onset of pregnancy in 70-80% of cases of endocrine infertility. In other cases, at present, the elimination of endocrine infertility by the method of IVF is considered promising.

- Causes of endocrine infertility
- Symptoms of endocrine infertility
- Diagnosis of endocrine infertility
- Treatment of endocrine infertility
- Prognosis for endocrine infertility
- Prophylaxis of endocrine infertility
- Treatment prices

Endocrine Infertility

Endocrine infertility – a complex of hormonal disorders leading to irregular ovulation or its absence in women and impaired sperm quality in men. It can be based on disorders of the thyroid gland, gonads, and hypothalamic-pituitary regulation. Normalization of impaired functions leads to the onset of pregnancy in 70-80% of cases of endocrine infertility. In other cases, at present, the elimination of endocrine infertility by the method of IVF is considered promising. In every third infertile woman, the cause of infertility lies in the pathology of the endocrine system.

The concept of “endocrine infertility” is a collective, including various violations of the mechanisms of hormonal regulation of the menstrual cycle: on the hypothalamic-pituitary-ovarian level, in the systems of the thyroglobulin-thyroid gland, ACTH-adrenocortical cortex, etc. Regardless of the causes of endocrine infertility, abnormal ovarian function is manifested by persistent anovulation (absence of ovulation) or irregularity.

Causes Of Endocrine Infertility

Anovulation can occur in the interest of the central nervous and immune systems, endocrine glands, and reproductive organ targets. Anovulation leading to endocrine infertility can develop as a result of:

Hypothalamic-Pituitary Dysfunction

It is usually observed after traumatic brain injuries and chest injuries, with tumours of the hypothalamic-pituitary region and is accompanied by hyperprolactinemia. Increased secretion of prolactin leads to inhibition of cyclic production of LH and FSH by the pituitary gland, oppression of ovarian functions, rare menstruation (by the type of oligo and opsoniformes), the development of persistent anovulation and endocrine infertility.

Hyperandrogenism Of Ovarian Or Adrenal Origin

The presence in the body of a woman a small amount of androgens – male sex hormones is necessary for puberty and the proper functioning of the ovaries. The increased secretion of androgens can be carried out by the ovaries or adrenals and sometimes by both glands simultaneously. Most often, hyperandrogenia in women is accompanied by a syndrome of polycystic ovaries, causing endocrine infertility, obesity, hirsutism, bleeding, oligo- and amenorrhea, and bilateral ovarian damage with a change in their morphological structure.

Adrenal hyperandrogenism often develops as a result of hyperplasia of the adrenal cortex with secondary involvement of the ovaries (secondary polycystic ovary).

Thyroid Dysfunction

The course of hypothyroidism and diffuse toxic goitre is often accompanied by anovulation, secondary hyperprolactinemia, endocrine infertility, miscarriage, and fetal abnormalities.

Deficiency Of Estrogens And Progesterone (In Case Of Luteal Phase Insufficiency)

The lack of female sex hormones causes inferior secretory transformation of the endometrium, changes in the function of the fallopian tubes, and prevents the attachment of the fetal egg to the uterine cavity. This leads to miscarriage or endocrine infertility.

Severe somatic pathologies (cirrhosis, hepatitis with severe damage to liver cells, tuberculosis, autoimmune and systemic connective tissue diseases, malignant tumours of various locations, etc.).

Obesity Or Lack Of Adipose Tissue

Fat tissue in the body also performs endocrine function, affecting the metabolic processes in the tissues, including the reproductive system. Excess fatty deposits cause hormonal imbalance, a violation of menstrual function and the development of endocrine infertility. At the same time, limiting the consumption of fat or a sharp loss of body weight disrupts the normal functioning of the ovaries.

Syndrome Of Resistant Ovaries (Savage Syndrome)

At the heart of the syndrome is the violation of the pituitary-ovarian communication – insensitivity of the ovarian receptor to gonadotropins, stimulating ovulation, which is manifested by amenorrhea, endocrine infertility with normally developed sexual characteristics and a high level of gonadotropic hormones. Damage to the ovaries can cause infection with rubella viruses, influenza, pathology of a previously developing pregnancy, vitamin deficiency, starvation, and stressful situations.

Premature Menopause (Syndrome Of Exhausted Ovaries)

Secondary amenorrhea, which occurs in young women up to 35 – 38 years, causes changes in the climacteric syndrome and leads to endocrine infertility.

Diseases Associated With Mutations Of Sex Chromosomes

In diseases caused by chromosomal abnormalities, there is a lack of female sex hormones, sexual infantilism, primary amenorrhea and endocrine infertility (Marfan and Turner syndromes).

Symptoms Of Endocrine Infertility

The main manifestations of endocrine infertility are the impossibility of pregnancy and abnormalities in the menstrual cycle. Menstruation can occur with delays of varying severity (from a week to six months), accompanied by soreness and abundant secretions or absent altogether (amenorrhea). Often, there is spotting in the intermenstrual period.

In 30% of patients with endocrine infertility, menstrual cycles are of an anovulatory nature and in their duration correspond to the normal menstrual cycle (21-36 days). In such cases, it is not about

menstruation but about menstrual bleeding.

Patients have pain in the lower abdomen or lower back, discharge from the genital tract, dyspareunia, and cystitis. There may be tension and heaviness in the mammary glands and galactorrhea (discharge of colostrum from the nipples) associated with an increase in the level of prolactin. The syndrome of premenstrual tension is characterized by deterioration of the condition on the eve of menstruation. With hyperandrogenia, accompanying endocrine infertility, acne, hirsutism or hypertrichosis, alopecia develops. There are fluctuations in blood pressure, the development of obesity or weight loss, and the formation of striae on the skin.

Diagnosis Of Endocrine Infertility

When collecting anamnesis in patients with endocrine infertility, the time of the onset of menstruation, their profuse, painfulness, the presence of menstrual irregularities in the history (including the mother's patient), the presence and duration of the absence of pregnancies, and the presence and outcome of complications of pregnancies are specified. It is necessary to find out whether earlier gynaecological operations and manipulations, type and duration of contraceptive use have been carried out.

The general examination includes an evaluation of the patient's growth (less than 150 cm or more than 180 cm), the presence of obesity, virilism, development of the mammary glands and secondary sexual characteristics. A gynaecologist is consulted, during which the shape and length of the vagina and the uterus, the condition of the cervix, and the parameter and appendages are determined by gynaecological examination. According to the data of general and gynaecological examinations, causes of endocrine infertility, such as sexual infantilism, polycystic ovary, etc., are elucidated. Estimation of the hormonal function of ovaries and the presence of ovulation with endocrine infertility is determined using functional tests: the construction and analysis of the basal temperature curve, urinary ovulation test, ultrasound Monitoring the maturation of the follicle and controlling ovulation.

According to the basal temperature chart, the presence or absence of ovulation is determined. The basal temperature curve reflects the level of postovulatory ovarian development of progesterone, which prepares the endometrium of the uterus for the implantation of a fertilized egg. The basal curve is based on the parameters of the morning temperature, measured daily at the same time in the rectum. In the ovulatory cycle, the temperature profile is biphasic: on the day of ovulation, the rectal temperature drops by 0.2-0.3 ° C, and in the second phase of the cycle, lasting from 12 to 14 days, it rises in comparison with the temperature of the first phase by 0.5-0, 6 ° C. The anovulatory menstrual cycle is characterized by a monophasic temperature curve (steadily below 37 ° C), and the luteal phase deficiency is manifested by shortening the second phase of the cycle for less than 11-12 days.

Confirm or disprove the fact that ovulation is possible by determining the level of progesterone in the blood and pregnaniol in the urine. In the anovulatory cycle, these parameters are extremely low in the

second phase, and in the case of an insufficient luteal phase, they are reduced in comparison with the ovulatory menstrual cycle. Conducting the test for ovulation allows us to determine the increase in the concentration of LH in urine 24 hours before ovulation. Ultrasonic monitoring of folliculogenesis makes it possible to trace the maturation in the ovary of the dominant follicle and the release of the egg from it.

The state of the endometrium of the uterus serves as a reflection of the functioning of the ovaries. In scraping or a biopsy of the endometrium, taken 2-3 days before the expected menstruation, with anovulation and endocrine infertility, hyperplasia of varying severity (glandular-cystic, glandular, polyposis, adenomatosis) or secretory insufficiency is found.

To determine the causes of endocrine infertility, levels of FSH, estradiol, LH, prolactin, TSH, testosterone, T3, T4, DEA-C (dehydroepiandrosterone sulfate) are determined on the 5th-7th day for several menstrual cycles. Conducting hormonal samples allows you to clarify the state of the various links of the reproductive system with endocrine infertility. The mechanism for carrying out these samples is to measure the level of the patient's own hormones after taking certain stimulating hormonal drugs.

If it is necessary to clarify the causes of endocrine infertility, an x-ray of the skull, ultrasound of the thyroid gland, ovaries, and adrenals, diagnostic laparoscopy is performed. The diagnosis of endocrine infertility is established only after the male factor of infertility has been eliminated (normal spermogram is present), as well as pathologies from the uterus, immunological and tubal forms of infertility.

Treatment Of Endocrine Infertility

The first stage of treatment of endocrine infertility includes the normalization of impaired functions of the endocrine glands (correction of diabetes mellitus, obesity, adrenal activity, thyroid gland, removal of tumours, etc.). In the future, hormonal stimulation of the maturation of the dominant follicle and ovulation is carried out. To stimulate ovulation, a drug called clomiphene citrate is prescribed, which causes an increase in pituitary glandular follicle-stimulating hormone. Of pregnancies that occurred after stimulation with clomiphene citrate, 10% are multiple (more often twins and triplets). (American Society for Reproductive Medicine, n.d.)

In the absence of pregnancy, during six ovulatory cycles, clomiphene citrate is used to treat gonadotropins: CHMG (human menopausal gonadotropin), p-FSH (recombinant follicle stimulating hormone), and hCG (human chorionic gonadotropin). Treatment with gonadotropins increases the incidence of multiple pregnancies and the development of side effects.

In most cases, endocrine infertility is amenable to hormonal correction, while others show surgical intervention. In the syndrome of polycystic ovaries, resort to their wedge-shaped resection with laparoscopic method or laparoscopic thermal cauterization. After the laparoscopic thermal

cauterization, the highest percentage of pregnancies is observed – from 80 to 90% of cases, because the formation of adhesions in the small pelvis is excluded.

In endocrine infertility, burdened with a tubal peritoneal factor or a decrease in sperm fertility, an in vitro fertilization (IVF) method is performed with transplantation of embryos ready for development into the uterine cavity. Achieving the onset and bearing of pregnancy in women with endocrine infertility is possible only with a comprehensive solution to this problem.

Prognosis For Endocrine Infertility

Today, endocrine infertility is not a verdict. Up-to-date gynaecology and endocrinology together successfully cure 80% of patients using only medical methods. If there is a recovery of ovulation and there are no other factors of infertility, more than 50% of women become pregnant during the first six cycles of stimulating hormone therapy. Less favourable results from drug therapy for endocrine infertility caused by dysfunction of hypothalamic-pituitary regulation.

Immediately after the onset of pregnancy, careful monitoring of its development is established, and hospitalization of the patient is performed with signs of spontaneous abortion. Often, discoordination and weakness of labour are noted.

Prophylaxis Of Endocrine Infertility

Care for the prevention of endocrine forms of infertility is necessary from childhood. Reduction and prevention of childhood infections, chronic tonsillitis, rheumatism, influenza, and toxoplasmosis in childhood and adolescence will avoid violations of ovarian function and processes of hypothalamic-pituitary regulation.

Preventive value has the correct emotional and physical education of girls because the function of the ovaries often suffers from mental overstrain and psychological and sexual trauma. It is undeniable that often endocrine infertility develops after pathological birth, interruption of pregnancy, intoxication, inflammatory infections of the female reproductive sphere, therefore attention should be paid to the prevention of these conditions. (World Health Organization, n.d.)

Proper management of pregnancy and the wise use of certain medicines, especially hormones during pregnancy, will help to avoid congenital hypofunction of the ovaries and hyperplasia of the adrenal cortex in girls.

References

World Health Organization. (n.d.). Infertility.
<https://www.who.int/news-room/fact-sheets/detail/infertility>

American Society for Reproductive Medicine. (n.d.). Infertility: An overview.

<https://www.reproductivefacts.org/news-and-publications/patient-fact-sheets-and-booklets/infertility-a-n-overview/>