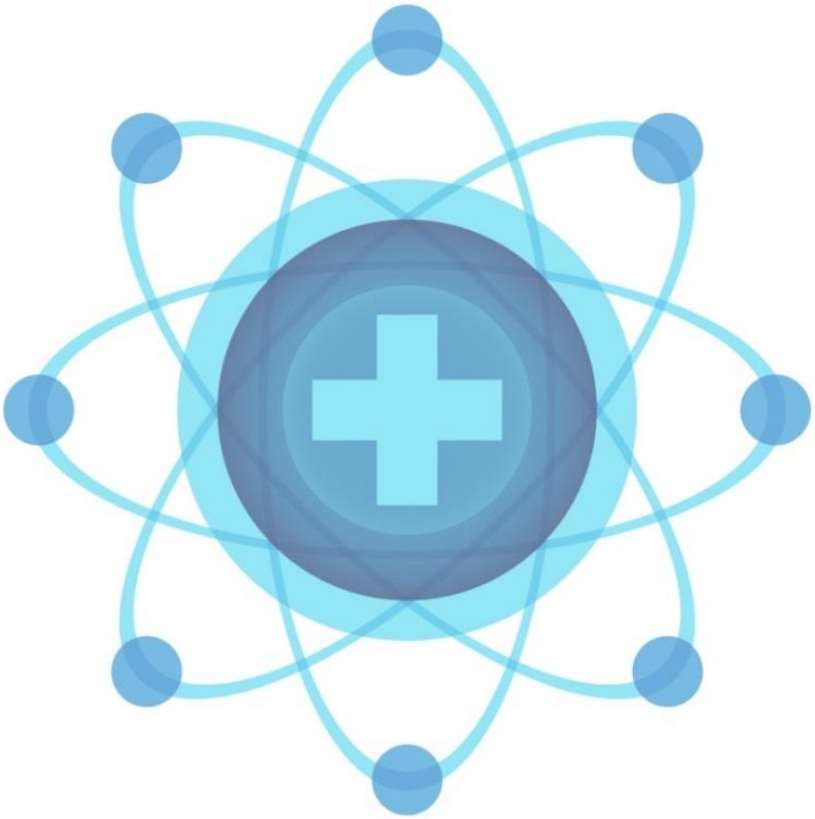

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TYPE 1 DIABETES MELLITUS A POLYCYSTIC OVARY SYNDROME IN WOMEN OF CHILDBEARING AGE IN UZBEKISTAN

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Abstract: polycystic ovary syndrome is a socially significant endocrine disease that leads to infertility, the development of depression in young women and reduces their quality of life. Over many years of studying the syndrome of polycystic ovaries, various methods for its diagnosis and treatment have been developed. Despite this, polycystic ovary syndrome still ranks leading position among the causes of endocrine infertility. Therefore, this pathology remains relevant and predetermines the need for further study and improvement of diagnostic and treatment methods. In this article diagnostic criteria for polycystic ovary syndrome in women of childbearing age.

Keywords: polycystic ovary syndrome, infertility, diagnostic criteria, anovulation, hyperandrogenism, ultrasonic changes.

Polycystic ovary syndrome is a polyetiological heterogeneous disease characterized by menstrual irregularities cycle, chronic an ovulation, hyperandrogenism, increase in size and changes in the morphological structure of the ovaries [3, 9]. Due to the big prevalence of this pathology is still considered relevant in gynecological endocrinology [3, 10]. Diagnosis of polycystic ovary syndrome can be established by the presence of two of these three manifestations: lack of ovulation, hyperandrogenism, the presence of polycystic (multifollicular ovaries) with an increase in volume ovaries according to ultrasound data [7].

Menstrual disorders are presented in the form of oligomenorrhea or primary (secondary) amenorrhea, which may alternate with metrorrhagia. Along with the violation of the menstrual cycle, the pathology of the reproductive system is a constant symptom of this endocrine disorder, predominantly primary infertility in 71-98% [5, 6, 7, 8]. Clinical and biochemical signs of hyperandrogenism include:

- normal or slightly elevated levels of testosterone, estradiol and 17-oxyprogesterone;
- normal or decreased levels of steroid binders globulins (PSSG); increased index of free testosterone;
- at the absence of the corpus luteum, progesterone corresponds to the early follicular phase;
- symptoms of hyperandrogenism: hirsutism, acne, seborrhea, alopecia and others;
- primary or secondary infertility of anovulatory genesis [1, 2].

Often hormonal disorders in polycystic ovary syndrome accompanied by impaired insulin function (insulin resistance) and its excess production. This leads to the fact that polycystic syndrome ovaries is accompanied by a complex of symptoms called

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metabolic syndrome and is manifested by obesity, arterial hypertension, elevated cholesterol and impaired glucose uptake. With absence with appropriate treatment, type 2 diabetes mellitus develops over time, coronary heart disease, etc., which is the main cause of death along with oncological diseases [3, 4].

As a rule, the examination of a woman begins with an ultrasound examination of the pelvic organs. The presence of polycystic ovaries is one criteria for polycystic ovary syndrome, but for the diagnosis not one, but two.

Ultrasound changes in polycystic ovary syndrome include:

- detection of 8-12 follicles and more, having a diameter of 2-10 mm;
- increase in ovarian volume> 9-10 cm3;
- detection of an enlarged ovarian stroma, occupying more than 25% of the volume ovaries [7, 9].

There are two types of polycystic ovaries on ultrasound [2, 9]. In type I, a diffuse arrangement of follicles is observed, and in type II - the peripheral location of the follicles in relation to the stroma. Ultrasound is a non-invasive method. Invasive methods include laparoscopic and morphological signs of PCOS.

Laparoscopic signs of PCOS include:

- enlargement ovaries are mostly bilateral;
- smooth, shiny, dense or thickened the membrane of the ovaries;
- pronounced vascular pattern on the surface of the shell ovaries;
- multiple subcapsular cysts that show through shell and are clearly visible in the section [9, 10].

Pathological signs of PCOS include:

- an increase in the number of primordial, maturing and cystic-atretic follicles by 2-5 times;
- absence of yellow and white bodies; sclerosis and thickening of capillaries [9, 10].

Polycystic ovary syndrome (PCOS) is an endocrine disorder primarily associated with elevated levels of male sex hormones, especially testosterone. PCOS occurs in 5-10% of women of reproductive age - as you can see, a very urgent problem.

- The reason for the development of PCOS is unknown to science, but it matters: Genetic predisposition (sisters and daughters of women with PCOS get sick more often);
- Insulin resistance and, as a result, increased production of insulin in the body: insulin promotes the production of testosterone by the ovaries, in addition, it increases the proportion of active testosterone in the blood;
- Excess production of luteinizing hormone (LH) in the pituitary gland: LH also stimulates the production of testosterone by the ovaries.
- Polycystic ovary syndrome can manifest itself with the following symptoms: Absence or scanty and irregular menstruation Difficulties in pregnancy or infertility
- The appearance of hair in unexpected places: on the face, chest, abdomen Hair loss from the head Acne Obesity (deposition of fat mainly in the abdomen)

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- If suspecting doctor will perform an examination with PCOS, which includes - a pelvic ultrasound will show the presence of ovarian cysts: despite the name, only 20% of women with PCOS have cysts - fluid-filled blisters that form when multiple follicles merge.

As a result, the process of rupture of the follicle and the release of the egg from it, the process of ovulation, is disrupted. Free testosterone blood test Additional tests and studies may be needed, such as a blood test for female sex hormones (LH, FSH, progesterone, estradiol) to rule out other causes of menstrual irregularities and infertility. Remember that the level of sex hormones depends on the phase of the menstrual cycle and blood tests for them must be taken strictly on the days determined by doctor.

The relationship between PCOS and type 2 diabetes has long been known and proven, given that in both cases an important role is played by a decrease in tissue sensitivity to insulin and an increase in its production by the pancreas. One in three women with PCOS has impaired glucose tolerance and one in ten develops type 2 diabetes before the age of 40. Therefore, any woman with PCOS should have a glucose tolerance test (GTT). In addition, PCOS is twice as likely to develop gestational diabetes mellitus, an important risk factor for type 2 diabetes in the future. As it is known, forewarned is forearmed. Weight management and regular exercise (at least 30 minutes of walking every day) can reduce insulin resistance, reduce the risk or improve control of type 2 diabetes. In the case of type 1 diabetes, in 2016 Diabetes Care, a major diabetes journal, published an article urging physicians to pay attention to the high risk of developing PCOS in women with type 1 diabetes. According to researchers, about 25% of women with this disease also have PCOS. Although the exact reasons for the association between the two conditions remain to be elucidated, and diagnostic tests for PCOS are not included in the standard for testing girls with type 1 diabetes, it is useful to know about this now. In addition to type 2 diabetes, PCOS has an increased risk of: Heart disease High blood cholesterol levels Endometrial cancer (the inner lining of the uterus).

We do not know the cause of PCOS, therefore, we cannot eliminate it. In each case, the treatment is selected individually, depending on the symptoms, concomitant diseases and the desire to have a baby. In clinical practice, they use: Lifestyle changes: a healthy diet and regular exercise improve carbohydrate metabolism, reduce the risk of developing type 2 diabetes and heart disease; Hormonal contraceptives normalize the balance of female sex hormones and testosterone, get rid of unwanted "hairiness" and acne, protect against the risk of endometrial cancer; Remember that hormonal contraceptives can worsen the control of diabetes and their use is possible only as prescribed by a doctor, taking into account all available indications and contraindications. Antiandrogens reduce the level of male sex hormones, also get rid of unwanted hair and acne; Metformin improves tissue sensitivity to insulin, lowers blood glucose levels in type 2 diabetes or impaired glucose tolerance and diet failure; In the case of planning a pregnancy with PCOS,

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ovulation is stimulated with the help of drugs or special surgical procedures on the ovaries.

Polycystic ovary syndrome is a clinical syndrome characterized by moderate obesity, irregular menses or amenorrhea, and signs of androgen excess (eg, hirsutism, acne). Most patients have multiple ovarian cysts. Diagnosis is based on the results of a pregnancy test, measurement of hormone levels, and imaging studies to rule out a iridizing tumor. Treatment is symptomatic. PCOS is usually defined as a clinical syndrome, independent of ovarian cystic changes. But the presence in the ovary of many 2–6 mm or large follicular cysts containing atretic cells is typical. The ovaries may be normal in size or enlarged and have a thickened and flattened albuginea. The syndrome is manifested by anovulation or ovulatory dysfunction and androgen excess of unknown etiology. However, there is some evidence that patients have a change in cytochrome P450c17 that damages 17-hydroxylase (an enzyme that limits androgen production), resulting in increased androgen production.

Polycystic ovary syndrome has several serious complications. Estrogen levels are elevated, which increases the risk of endometrial hyperplasia and eventually endometrial cancer. Androgen levels are often elevated, which increases the risk of metabolic syndrome and is the cause of hirsutism. The possible presence of hyperinsulinemia due to insulin resistance may contribute to an increase in ovarian androgen production. Prolonged hyperandrogenism increases the risk of cardiovascular disease, including hypertension and hyperlipidemia. The risk of increased androgen levels and associated complications can be as high in women who are not overweight as in those who are. Coronary artery calcification and carotid intima thickening are more common in women with PCOS, suggesting possible subclinical atherosclerosis.

Also among these women, type 2 diabetes mellitus and impaired glucose tolerance are more common, and the risk of developing obstructive sleep apnea increases. Recent studies show that PCOS is associated with low-grade chronic inflammation and that women with PCOS are at increased risk of non-alcoholic fatty liver disease. Symptoms of polycystic ovary syndrome usually appear during puberty and increase over time. Premature adrenarche, characterized by excess dehydroepiandrosterone sulfate (DHEAS), often early axillary hair growth, body odor, and microcomedonal acne are common. Typical symptoms include moderate obesity, mild hirsutism, and irregular menses, oligomenorrhea, or amenorrhea. However, about half of women with PCOS are of normal weight, and some women are underweight. Body hair may be masculine (eg, on the upper lip, chin, back, thumbs, and toes; around the nipples and along the white line in the lower abdomen). Some women have other signs of virilization, such as acne and temporary thinning of the hair. Other symptoms may include weight gain (sometimes seemingly difficult to control), fatigue, and lack of energy, sleep problems (including sleep apnea), mood swings, depression, anxiety, and headaches. Some women are infertile. Symptoms vary from woman to woman. Areas of thickened and darkened skin (black

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acanthosis) may appear in the armpits, the back of the neck, skin folds and in the finger and / or elbow folds; the cause is high insulin levels due to insulin resistance.

Serum levels of testosterone, follicle stimulating hormone (FSH), prolactin and thyroid stimulating hormone (TSH), ultrasound of the pelvic organs for screening and monitoring of comorbidities (e.g, coronary artery disease, metabolic syndrome).

Ovulatory dysfunction usually occurs during puberty, leading to primary amenorrhea; polycystic ovary syndrome is unlikely in cases where regular menses have been observed for some time after menarche. In patients with polycystic ovary syndrome (PCOS), examination usually reveals abundant cervical mucus, reflecting high estrogen levels. PCOS should be suspected if a woman has two typical symptoms. The examination includes a pregnancy test, a study of blood levels of total testosterone, prolactin and TSH; pelvic ultrasound to rule out other possible causes of symptoms. Serum free testosterone is more sensitive than total testosterone, but technically more difficult to measure (see Diagnosis of Primary and Secondary Hypogonadism Algorithm). Normal or slightly elevated testosterone levels and normal or slightly elevated FSH levels suggest PCOS.

A diagnosis requires at least 2 of the 3 following criteria:

- Ovulatory dysfunction causing irregular periods;
- Clinically and laboratory proven hyperandrogenism.

More than 10 follicles in each ovary (detected by pelvic ultrasound), usually located peripherally and resembling a string of pearls. In women with these criteria, serum cortisol levels are measured to rule out Cushing's syndrome, and early morning 17-hydroxyprogesterone levels are measured to rule out adrenal virilization. Serum DHEAS levels are measured. If the level of DHEAS is not normal, the woman is examined in the same way as for amenorrhea.

Diagnosis of PCOS in adolescents is difficult because the physiological changes during puberty (eg, hyperandrogenism, menstrual irregularities) are similar to PCOS. Thus, separate criteria for the diagnosis of PCOS in adolescents have been proposed (1): however, no consensus has been reached. These criteria require the following two conditions:

- Abnormal uterine bleeding (abnormal for age or gynecological age or symptoms that persist for 1 to 2 years);
- Evidence of hyperandrogenism (based on persistently elevated testosterone levels above adult normal, moderate to severe hirsutism, or moderate to severe inflammatory acne vulgaris as an indication for testing for hyperandrogenemia)

17-hydroxyprogesterone test is also done to detect non-classical congenital adrenal hyperplasia. Pelvic ultrasonography is usually indicated only if serum androgen levels or degree of virilization indicate the presence of an ovarian tumor. Transvaginal ultrasonography is not commonly used to diagnose PCOS in adolescent girls because it detects polycystic morphology in <40% of girls and does not by itself predict the presence or development of PCOS.

To date, there has been an idea of the role of dysfunction in the system of autonomic regulation of visceral organs and endocrine glands and their hormonal

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restructuring [43]. However, it has not yet been established which of the factors are decisive in the occurrence or progression of obesity in these critical periods of life and how this affects the morphological and functional characteristics of the reproductive system. However, these pathogenetic aspects remain insufficiently substantiated both in obese women and in their newborns.

At the same time, according to the concepts of modern pathology, all diseases, regardless of their etiology, are considered as manifestations of processes of intense adaptation or disadaptation in the body [1,7]. Obesity in combination with reproductive disorders is no exception to this situation. The mechanisms of adaptive reactions of the body, according to experimental and clinical data, are implemented by multifactorial structures from higher vegetative centers that provide the vegetative-visceral foundations of life and adaptive reactions of organisms under normal and pathological conditions to the final effectors structures at the membrane-cellular level [2,8]. The functioning of this hierarchical structure is based on a close relationship between higher vegetative centers and final effectors structures. An intermediate link between these systems of adaptive responses are hemodynamic changes, integrating all the morphofunctional systems of the body into a single integral structure, including the reproductive systems in women.

In conclusion, we can say that the diagnosis of PCOS can be as accurate as possible, put on the basis of the criteria described above, which subsequently largely will determine the effectiveness of therapy, especially in patients with impaired menstrual cycle and infertility. Based on the current provisions of general pathology, the state of obesity in women with reproductive system disorders must be considered from the standpoint of clinical vegetology, which are reflected in neurohumoral, vegetative-visceral disorders at the level of the whole organism and the functioning of the reproductive system, in particular. In this case, the woman's body is the leading link in this morphobiological system, by the feedback principle it is affected by the fetoplacental complex, which ultimately affects the state of the body of newborns, in particular, its adaptive capabilities in the early and late neonatal periods. The analyzed pathology in women cannot be considered in isolation, but only in the context of the mother-placenta-fetus-newborn system.

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