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## POLYCYSTIC OVARY SYNDROME: A MODERN VIEW ON THE PROBLEM

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### ABSTRACT

The author of this article presents a modern understanding of the problem of polycystic ovary syndrome (PCOS). PCOS is a multifactorial, genetically determined pathological condition, in the pathogenesis of which an important role belongs to disorders of gonadotropic regulation, hyperandrogenism, insulin resistance, adipose tissue dysfunction and other factors. Obviously, PCOS is a socially significant gynecological pathology of early reproductive age, which requires optimization of the diagnosis and management of such patients from adolescence.

In adolescents, PCOS is diagnosed in the presence of clinical hyperandrogenism and an irregular menstrual cycle, while ultrasound criteria are not always reliable. For an individual approach and choice of treatment tactics, it is extremely important to verify the diagnosis of PCOS in a timely manner, determine the clinical phenotype and take into account the reproductive plans of the patient.

## KEYWORDS

Hyperandrogenism, anovulation, infertility.

## INTRODUCTION

According to the European Society of Human Reproduction and Embryology, American Society for Reproductive Medicine (ESHRE/ASRM), PCOS is one of the most common forms of endocrinopathy, occurring in 5–10% of women of reproductive age. In the reproductive period with PCOS, there is an increased risk of anovulation and infertility. Thus, according to the data, the frequency of PCOS in the reproductive period is 11%, in cases of endocrine infertility it reaches 70% [1, 2]. Of particular difficulty are the issues of early diagnosis and management of such patients in adolescence.

According to the Russian Society of Obstetricians-Gynecologists and Endocrinologists, the prevalence of this syndrome in the general population of the female population of reproductive age ranges from 8 to 21% [3]. The purpose of this work is to study the analysis of the main diagnostic criteria for PCOS, as well as modern possibilities of therapy.

## MATERIALS AND METHODS

The analysis of modern scientific publications devoted to the problem of PCOS was carried out. The search was carried out in domestic and foreign databases - PubMed, Medline, with an emphasis on the

recommendations of international evidence-based guidelines for the assessment and treatment of the authors' own observations. Main part. Etiopathogenesis. PCOS is a polyetiological endocrine disease caused by both hereditary factors (genetic and epigenetic) and environmental factors [4,5]. The pathophysiological basis of PCOS is ovarian hyperandrogenism, which occurs as a result of impaired neuroendocrine regulation of pubertal reactivation of the hypothalamic-pituitary-gonadal axis. The risk of developing this pathology increases by 30–50% in patients with a family history of PCOS [6].

In recent studies, it has been established that hyperinsulinemia can be the pathogenetic basis for increased endogenous production of androgens. At the same time, two mechanisms have been described that explain the relationship between high insulin concentration and hyperandrogenemia [7,8]. First, insulin is able to directly stimulate the expression of the ovarian enzymes P450c17 and P450sc, thereby increasing androgen production. Hyperinsulinemia directly increases the frequency and amount of gonadotropin-releasing hormone release. The LH / FSH ratio increases, and as a result, the follicles do not mature, persist for a long time at the primary and

secondary stages, which leads to the formation of cystic atresia in the ovaries - small follicular cysts, ranging in size from 2 to 6 mm. [9].

The second mechanism is indirect, when GI in the liver reduces the production of proteins that bind two types of insulin-like growth factors (IGF-1). As a result, the level of free androgens in the blood increases: the levels of IGF-1 and free biologically active testosterone increase, which leads to disruption of menstrual function and folliculogenesis in the ovaries [10,11]. In addition to the mainstream theories, a number of studies suggest an association of low vitamin D levels with the development of PCOS. Vitamins of group B (B2 and B3) have a hormone-like effect and perform a number of biological functions through endocrine and intracrine mechanisms [12].

**Diagnostic criteria** Diagnosis of PCOS is based on the assessment of complaints, medical history, menstrual, ovulatory function, the results of clinical and laboratory manifestations of hyperandrogenism, as well as an assessment of ovarian function using ultrasound of the pelvic organs. The classic diagnostic criteria for PCOS, formulated in 1990 by a group of experts from the NIH (National Institutes of Health), USA, were recognized as clinical hyperandrogenism and/or hyperandrogenemia and chronic anovulation. According to the recommendations of the International evidence-based guideline for the assessment and management of polycystic ovary syndrome, approved in 2018, experts supported the Rotterdam diagnostic criteria for PCOS in adult women after excluding comorbidities. [13].

**Features of the diagnosis of PCOS in adolescence** It is well known that physiological changes in puberty can be characterized by transient hyperandrogenism and insulin resistance. So, during the formation of the reproductive system, there are significant changes in

the quantity, daily rhythm, and the ratio of a number of hormones. In some young women, the anovulatory menstrual cycle may persist up to 5-6 years after menarche. So, according to M. Hickey et al. (2011), anovulatory cycles in the first year after menarche were 85%, in the third year - 59%, after 6 years - 25% of girls [14]. Thus, the difficulty of diagnosing PCOS at a young age lies in the need to differentiate physiological (transient) changes in hormonal secretion in puberty with the onset of PCOS. In 2017, international consensus proposed criteria for the diagnosis of PCOS in adolescence. Mandatory criteria are: irregular menstrual cycle or oligomenorrhea; confirmed hyperandrogenism: progressive hirsutism, increased levels of total and free testosterone. According to Hickey M et al. (2011), anovulatory cycles in the first year after menarche were 85%, in the third year - 59%, after 6 years - 25% of girls. [15].

## CONCLUSION

According to sources, the patterns of inheritance of this disease have not been fully studied, however, taking into account clinical and laboratory heterogeneity, this syndrome probably has a polygenic or multifactorial type of inheritance. Further study of the problems in PCOS will make it possible to learn about the etiopathogenesis, risk factors, improve the diagnostics necessary for early detection and timely treatment of both ovarian dysfunction and reproductive dysfunction, as well as manifestations of hyperandrogenism, associated metabolic disorders and psychological disorders.

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