APPLICATION OF ASSISTED REPRODUCTIVE TECHNOLOGIES IN POLYCYSTIC OVARIAN SYNDROME

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Annotation: the authors studied the features of clinical and laboratory data of 151 patients who underwent examination and treatment, as well as training for modern ART methods in the Doctor D multidisciplinary clinic in the period from 2017-2022. The results of the study showed that in patients with PCOS with primary infertility, an imbalance of the entire hormonal background is observed, and even despite the 1st degree of obesity, it leads to the appearance and development of infertility, which makes it impossible to get pregnant from the earliest period of life, while in secondary infertility there is a violation of the level of some hormones like FSH and testosterone

Keywords: polycystic ovary syndrome, reproductive age, metabolic disorders, assisted reproductive technologies

Relevance: Polycystic ovary syndrome (PCOS) is one of the most pressing problems in gynecological endocrinology. This is a heterogeneous, hereditary disease characterized by menstrual irregularities, chronic anovulation and infertility, hyperandrogenism (HA), cystic changes in the ovaries and an increase in their size [1]. PCOS mainly occurs in women of reproductive age, among whom the incidence of the disease is 4-12%. Indicators of the frequency of detection of this disease are quite variable due to the heterogeneity of clinical and endocrinological manifestations and the ambiguity of their assessment. In various European studies, the prevalence of PCOS is 6.5–8%. The disease is especially common in patients with anovulatory infertility, hyperandrogenism and associated dermatopathy [2].

The pathogenesis of PCOS seems to be extremely complex and, despite the large number of proposed theories of the development of the disease, none of them has fully revealed the causes and mechanisms of development of endocrinological and metabolic disorders in this disease [4]. There are many supporters of the hypothesis of the formation of PCOS against the background of a primary (from the pubertal period) violation of the circoral rhythm of GnRH [5,8]. During puberty, which is critical in a girl's life, many environmental factors, heredity, etc. can contribute to the development of a number of endocrinopathies [6].

According to the final document of the Rotterdam Consensus, PCOS remains a diagnosis that requires the exclusion of other known disorders that are manifested by universal clinical signs of hyperandrogenism, and therefore can “mimic” and proceed under the guise of PCOS [7]. At the same time, PCOS itself is a syndrome of ovarian dysfunction (irregular menstruation, persistent anovulation, infertility), the specific manifestations of which include not only hyperandrogenism, but also “polycystic” ovarian morphology (see Table 1) [8,9]. According to the consensus, the presence of at least two of the three approved criteria allows, after excluding other conditions, to verify the diagnosis of PCOS;

Purpose of the study: Studying the features of clinical and laboratory data of patients with polycystic testicular syndrome using modern methods of assisted reproductive technologies.

Material and research methods: a study was made of the characteristics of the clinical and laboratory data of 151 patients who underwent examination and treatment, as well as preparation for modern ART methods in the Doctor D multidisciplinary clinic in the period from 2017-2022.Oexamined patients with polycystic ovary syndrome were divided into two groups - group I, which included 107 patients with primary infertility, and group II included 44 patients with secondary infertility.

The criterion for inclusion of patients in the first group was primary infertility in women who have regular sexual relations without the use of contraception, if she has never become pregnant for a long time (12 months or more).

The criterion for inclusion of patients in the second group was secondary infertility in women with the inability to conceive a child for more than a year, who had once had a pregnancy, regardless of its outcome (delivery, miscarriage, spontaneous or medical abortion).

Results and discussions: to establish age, sex, racial and other features of the physical structure, which allows us to give a quantitative description of their variability, we used the method of anthropological research, which consists in measuring the human body and its parts.

Table 1

Analysis of anthropometric data in the studied groups

Type of infertility	The weight	Growth	BMI
1st group (n=107)	71.4±17.9	162.6±8.6	26.5±5.6
2nd group (n=44)	76.8±18.59	164.1±7.67	27.6±5.9

From table 1, it can be seen that the average weight of patients in group II, 76.8±18.59, exceeds by 5.4 kg the average weight of patients in group I, 71.4±17.9. Patients of the studied groups do not have a significant difference in the average growth values. According to the average BMI values, we found that in both groups of the study there is overweight, that is, pre-obesity, and this is associated with a hormonal imbalance, as a result of which infertility most often develops.

To study the features of clinical and laboratory-instrumental data in polycystic ovary syndrome in all patients, a general clinical collection of anamnestic data, as well as complaints made, was carried out, and in addition to this, instrumental and laboratory diagnostic methods were performed.

Table 2

Pelvic Ultrasound Data

Groups	Left ovary				Right ovary				The state of the endometrium					
	increased		without change		increased		without change		secretory		linear		three-layer	
	abs	%	abs	%	abs	%	abs	%	abs	%	abs	%	abs	%

1st group (n=107)	59	55	48	45	59	55	48	45	34	32	38	35	35	33
2nd group (n=44)	7	16	37	84	7	16	37	84	16	37	13	29	fifte en	34

The study showed that in patients of group I, the frequency of enlargement of the left ovary 59 (55%) and the right ovary 59 (55%) was 3.43 times higher than the values in comparison with group II 7 (16%) and 7 (16%), respectively. When assessing the state of the endometrium, a slight increase in the percentage of secretory 16 (37%) and three-layer 15 (34%) tissue in patients of group II was revealed compared to the values of group I 34 (32%) and 35 (33%), respectively. This is most often associated with dysfunction of the endocrine system, overweight, stressful situations, nervous strain, long-term use of hormonal drugs, hormonal changes, especially luteinizing hormone and progesterone.

Polycystic ovary syndrome has several serious complications. 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.

During the study, an objective collection of anamnestic data was carried out to identify common symptoms in the study groups, which are shown in Table 3.

Table 3

Main objective data of patients in study groups

Groups	anovulation		hirsutism	
	abs	%	abs	%
1st group (n=107)	22	20.6	62	57.9
2nd group (n=44)	eight	18.2	21	47.7

Based on the data in Table 3, most often in patients with PCOS, symptoms such as hirsutism - excessive hair growth in the male pattern: on the chin, chest, upper back and abdomen; obesity; violation of menstruation - an excessively long or short cycle, the absence of an established cycle, heavy or scanty bleeding. Over time, the interval between periods increases and amenorrhea occurs. Symptoms of hirsutism were expressed 1.2 times more in patients of the 1st study group 62 (57.9%) in contrast to the 2nd group 21 (47.7%), the occurrence of which is associated with a violation of the hormonal background in the body of a woman. Excessive hair growth significantly interferes with a woman's daily life, and sometimes it can even cause the development of neurological diseases: neuroses, sleep disorders, etc.

The number of patients with symptoms of anovulation differed between the study groups. In group I, the number of patients with anovulation was 22 (20.6%), which is 1.6% higher than in group 2 8 (18.2). The causes of anovulation are failures in the coordinated interaction of the brain, hormones and ovaries, as well as complications of infectious and inflammatory diseases of the genital organs.

Today, obesity is not just a medical pathology, but also one of the important social problems: according to WHO, 39% of adults are overweight, and 13% have some degree of obesity. One of the main causes of obesity is metabolic syndrome, which is considered to be a combination of abnormalities such as obesity, hypertension, high blood sugar and cholesterol levels. It

should be noted that the metabolic syndrome can be the cause of infertility. Based on this, the next step in our study was to determine the body mass index (BMI), which are shown in Table 4

Table 4

Comparative analysis of body mass index in the studied groups

Groups	deficit		norm		pre obesity		I degree		II degree	
	abs	%	abs	%	abs	%	abs	%	abs	%
1st group (n=107)	2	1.87	40	37.4	35	32.7	21	19.6	9	8.4
2nd group (n=44)	0	0	twenty	45.5	9	20.5	eight	18.2	7	15.9

Table 4 shows that in the I-study group 35 (32.7%), pre-obesity is 1.6 times more common than in the II-group 9 (20.5%). The incidence of the first degree of obesity in the 1st group 21 (19.6%) exceeds by 1.4% in contrast to the 2nd group 8 (18.2%). It should also be noted that in the 2nd group of the study 7 (15.9%) the incidence of the second degree of obesity significantly prevails 1.9 times in relation to the 1st group 9 (8.4%). From these data, we can conclude that even a slight degree of obesity in women with PCOS contributes to the development of primary infertility, while the development of secondary infertility requires more severe degrees of obesity.

To identify endocrine imbalance, we conducted a laboratory analysis to determine the characteristics of the hormonal status in PCOS patients and the results are shown in Table 5.

Table 5

Comparative analysis of the hormonal background of patients

Groups	FSH	LG	testosterone	AMG	TSH	Prolactin	Progesterone
1st group (n=107)	4.5±0.4	15.1±0.8	3.4±0.4	15.1±0.9	5.8±0.5	480.2±30.5	15.1±0.6
2nd group (n=44)	3.9±0.3	12.1±0.7	3.0±0.3	9.1±0.6	5.1±0.4	385.7±25.8	6.8±0.5

From the results of the laboratory analysis, we found that the average values of the level of FSH 4.5±0.4, testosterone 3.4±0.4 and TSH 5.8±0.5 in patients of the 1st group exceed the values of the 2nd groups 3.9±0.3, 3.0±0.3 and 5.1±0.4 by almost 1.15 times. The mean values of the LH level 15.7±0.8 and prolactin 480.2±30.5 in the 1st group exceed the values of the 2nd group 12.1±0.7 and 385.7±25.8 by 1.25 times. The indicators of AMH 15.1±0.9 and progesterone 15.1±0.6 of the 1st group compared with the 2nd group 9.1±0.6 and 6.8±0.5 exceed 1.65 times and 2.2 times, respectively.

In this way, study showedthat in patients with PCOS with primary infertility, an imbalance of the entire hormonal background is observed, and even despite the 1st degree of obesity, it leads to the appearance and development of infertility, which makes it impossible to get

pregnant from the earliest period of life, while in secondary infertility, there is a violation of the level of some hormones like FSH and testosterone. Obesity of the 2nd degree in these groups of individuals is a key factor in the development of secondary infertility. Therefore, the appearance of obesity can be considered a predictor of the development of infertility in women of childbearing age, especially in PCOS.

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