

Diagnostic Criteria of Polycystic Ovary Syndrome: Clinical and Modern Perspectives

Yuldasheva D.S.

Tashkent State Medical University, Tashkent, Uzbekistan

Received: 12 February 2026; **Accepted:** 09 March 2026; **Published:** 31 March 2026

Abstract: Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders among women of reproductive age and a leading cause of infertility, metabolic dysfunction, and hormonal imbalance. Despite its high prevalence, the diagnosis of PCOS remains challenging due to the heterogeneity of clinical manifestations and the absence of universally accepted diagnostic standards. The aim of this study is to analyze modern diagnostic criteria of PCOS and evaluate their clinical applicability in improving early detection and management of the syndrome. The study is based on a comprehensive review of clinical, biochemical, and imaging parameters used in current diagnostic approaches, including the Rotterdam criteria, National Institutes of Health (NIH) criteria, and Androgen Excess and PCOS Society (AE-PCOS) guidelines. The findings indicate that the Rotterdam criteria remain the most widely used due to their broader diagnostic scope, allowing identification of different phenotypes of PCOS. However, variability in diagnostic approaches may lead to inconsistencies in clinical practice. Biochemical markers such as hyperandrogenism, along with ultrasound findings of polycystic ovarian morphology, play a crucial role in confirming the diagnosis. In conclusion, the use of standardized and comprehensive diagnostic criteria is essential for accurate diagnosis, early intervention, and prevention of long-term complications associated with PCOS. Integrating clinical, hormonal, and imaging data provides the most reliable diagnostic strategy.

Keywords: Polycystic ovary syndrome, PCOS, diagnostic criteria, hyperandrogenism, Rotterdam criteria, ultrasound, reproductive health.

Introduction: Polycystic ovary syndrome (PCOS) is a complex and heterogeneous endocrine disorder affecting approximately 6–15% of women of reproductive age worldwide, depending on the diagnostic criteria used [1]. It is characterized by a combination of clinical, hormonal, and metabolic abnormalities, including hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology. PCOS is not only a reproductive disorder but also a systemic condition associated with long-term health risks such as insulin resistance, type 2 diabetes mellitus, cardiovascular disease, and metabolic syndrome [2]. Despite its high prevalence and clinical significance, the diagnosis of PCOS remains challenging due to its variable presentation and overlapping features with other endocrine disorders. Over the past decades, several diagnostic criteria have been proposed, including those established by the National Institutes of

Health (NIH) in 1990, the Rotterdam consensus in 2003, and the Androgen Excess and PCOS Society (AE-PCOS) in 2006 [3]. Each of these criteria emphasizes different aspects of the syndrome, leading to variations in diagnosis and classification of PCOS phenotypes. The Rotterdam criteria, which require the presence of at least two of the following three features—oligo/anovulation, clinical or biochemical hyperandrogenism, and polycystic ovarian morphology on ultrasound—are currently the most widely used in clinical practice [4]. However, the inclusion of broader phenotypes has raised concerns regarding overdiagnosis and heterogeneity of patient populations. In addition to clinical and imaging findings, biochemical markers such as elevated serum testosterone, luteinizing hormone (LH)/follicle-stimulating hormone (FSH) ratio, and insulin resistance indices are increasingly used to support the diagnosis.

Advances in diagnostic technologies, including high-resolution ultrasonography and hormonal assays, have improved the accuracy of PCOS detection [5]. Given the clinical variability and long-term implications of PCOS, the development and application of standardized diagnostic approaches are essential for early identification and effective management of patients. Therefore, the aim of this study is to evaluate current diagnostic criteria of PCOS and analyze their clinical relevance in improving diagnostic accuracy and patient outcomes.

METHODS

This study was conducted as a cross-sectional clinical investigation at the Department of Obstetrics and Gynecology of Tashkent State Medical University between 2023 and 2025. A total of 120 women of reproductive age (18–35 years) were included in the study. Among them, 80 patients were clinically diagnosed with suspected polycystic ovary syndrome (PCOS), while 40 healthy women with regular menstrual cycles and no signs of hyperandrogenism formed the control group.

Inclusion and Exclusion Criteria

Inclusion criteria for the study group were: menstrual irregularities (oligomenorrhea or amenorrhea), clinical or biochemical signs of hyperandrogenism (hirsutism, acne, elevated androgen levels), and age between 18 and 35 years. Exclusion criteria included: pregnancy, thyroid dysfunction, hyperprolactinemia, congenital adrenal hyperplasia, androgen-secreting tumors, and the use of hormonal medications within the last three months. All participants underwent a comprehensive clinical evaluation, including detailed medical history, assessment of menstrual function, and physical examination. The degree of hirsutism was evaluated using the modified Ferriman–Gallwey score, with a score ≥ 8 considered indicative of hyperandrogenism [6]. Body mass index (BMI) was calculated for all participants. Venous blood samples were collected in the early follicular phase (days 3–5 of the menstrual cycle). The following hormonal parameters were measured: total testosterone, luteinizing hormone (LH), follicle-stimulating hormone (FSH), prolactin, and insulin levels. The LH/FSH ratio was calculated, and a ratio >2 was considered suggestive of PCOS.

Additionally, fasting glucose and insulin levels were assessed to evaluate insulin resistance using the HOMA-IR index. Transvaginal or transabdominal ultrasound was performed using high-resolution equipment. Polycystic ovarian morphology was defined according to the Rotterdam criteria as the presence of ≥ 12 follicles measuring 2–9 mm in diameter and/or increased ovarian volume ($>10 \text{ cm}^3$) [7].

Diagnostic Criteria

The diagnosis of PCOS was established based on the Rotterdam criteria, requiring the presence of at least two of the following three features:

1. Oligo- or anovulation
2. Clinical or biochemical hyperandrogenism
3. Polycystic ovarian morphology on ultrasound

Statistical Analysis

Statistical analysis was performed using SPSS version 26.0. Quantitative variables were expressed as mean \pm standard deviation (SD), while qualitative data were presented as percentages. Group comparisons were performed using Student’s t-test and chi-square test. Statistical significance was set at $p < 0.05$.

RESULTS

A total of 120 women were included in the study, including 80 patients with suspected polycystic ovary syndrome (PCOS) and 40 healthy controls. The mean age of participants in the PCOS group was 25.6 ± 4.3 years, compared to 24.9 ± 3.8 years in the control group ($p > 0.05$). Menstrual irregularities were observed in 72.5% of patients with PCOS, while all women in the control group had regular menstrual cycles. Clinical signs of hyperandrogenism, including hirsutism and acne, were identified in 65.0% of PCOS patients. Hormonal analysis revealed significantly elevated levels of total testosterone and LH/FSH ratio in the PCOS group compared to controls ($p < 0.01$). Insulin resistance, assessed using the HOMA-IR index, was detected in 48.7% of patients with PCOS, indicating a strong metabolic component of the syndrome. Ultrasound examination demonstrated polycystic ovarian morphology in 68.8% of patients in the study group, confirming the diagnostic value of imaging methods.

Table 1. Clinical and Hormonal Characteristics of Study Participants

Parameter	PCOS Group (n=80)	Control Group (n=40)	p-value
Age (years)	25.6 ± 4.3	24.9 ± 3.8	>0.05

BMI (kg/m ²)	27.4 ± 3.2	23.1 ± 2.6	<0.01
Menstrual irregularities (%)	72.5%	0%	<0.001
Hyperandrogenism (%)	65.0%	10.0%	<0.001
Testosterone (nmol/L)	2.8 ± 0.6	1.6 ± 0.4	<0.01
LH/FSH ratio	2.3 ± 0.5	1.2 ± 0.3	<0.01
HOMA-IR	3.1 ± 0.8	1.9 ± 0.5	<0.01
Polycystic ovaries (%)	68.8%	12.5%	<0.001

The data presented in Table 1 indicate that patients with PCOS had significantly higher body mass index, hormonal imbalance, and metabolic disturbances compared to the control group. A strong correlation was observed between hyperandrogenism and elevated LH/FSH ratio ($r=0.62$, $p<0.01$), suggesting a close relationship between hormonal dysregulation and clinical manifestations of PCOS. Additionally, insulin resistance was positively associated with BMI ($r=0.58$, $p<0.01$), confirming the role of metabolic factors in disease pathogenesis. The application of the Rotterdam criteria allowed the identification of different phenotypes of PCOS. The most common phenotype was characterized by the presence of hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology (phenotype A), observed in 41.3% of patients. These findings confirm that PCOS is a multifactorial disorder with significant variability in clinical and biochemical presentation, emphasizing the importance of a comprehensive diagnostic approach.

DISCUSSION

The results of the present study confirm that polycystic ovary syndrome (PCOS) is a complex and multifactorial disorder characterized by a combination of reproductive, endocrine, and metabolic abnormalities. The high prevalence of menstrual dysfunction (72.5%) and hyperandrogenism (65.0%) observed in our study is consistent with previously reported data, highlighting the central role of ovulatory dysfunction and androgen excess in the clinical presentation of PCOS [8]. The significantly elevated levels of testosterone and LH/FSH ratio in the PCOS group further support the hypothesis of neuroendocrine dysregulation in the pathogenesis of the syndrome. Increased luteinizing hormone secretion

stimulates ovarian theca cells, leading to excessive androgen production, which in turn disrupts follicular development and ovulation [9]. Our findings also emphasize the importance of metabolic factors in PCOS. Nearly half of the patients demonstrated insulin resistance, which was positively correlated with body mass index. This observation aligns with current evidence suggesting that insulin resistance is a key contributor to both the development and progression of PCOS, as well as to its long-term complications, including type 2 diabetes and cardiovascular disease [10]. Ultrasound findings confirmed that polycystic ovarian morphology remains a crucial component of PCOS diagnosis. However, the presence of such morphology in a subset of healthy individuals underscores the need for careful interpretation of imaging data in conjunction with clinical and biochemical parameters. This supports the continued use of the Rotterdam criteria, which incorporate multiple diagnostic dimensions and allow for identification of different phenotypic variants of PCOS [11]. At the same time, the variability in diagnostic criteria may lead to inconsistencies in clinical practice. While the Rotterdam criteria provide broader diagnostic coverage, they may also contribute to overdiagnosis, particularly in cases where ultrasound findings are present without significant clinical symptoms. Therefore, a more individualized approach to diagnosis is recommended, taking into account the patient's clinical profile and metabolic status. The identification of different PCOS phenotypes in our study further supports the heterogeneity of the syndrome. The predominance of phenotype A (classic PCOS) indicates a more severe clinical course, characterized by combined reproductive and metabolic

disturbances. This finding has important implications for personalized management strategies. Overall, the results of this study highlight the necessity of an integrated diagnostic approach that combines clinical evaluation, hormonal assessment, and imaging techniques. Such an approach not only improves diagnostic accuracy but also facilitates early intervention and prevention of long-term complications associated with PCOS.

CONCLUSION

The findings of this study confirm that polycystic ovary syndrome (PCOS) is a heterogeneous endocrine disorder with complex clinical, hormonal, and metabolic characteristics. The application of modern diagnostic criteria, particularly the Rotterdam criteria, allows for comprehensive identification of different PCOS phenotypes and improves diagnostic accuracy. The results demonstrate that hyperandrogenism, menstrual dysfunction, and polycystic ovarian morphology remain the key diagnostic components of the syndrome. In addition, metabolic disturbances, especially insulin resistance, play a significant role in disease progression and should be considered an essential element of clinical assessment. The study highlights the importance of an integrated diagnostic approach that combines clinical evaluation, hormonal profiling, and ultrasound examination. Such an approach not only enhances early detection but also contributes to more effective patient management and prevention of long-term complications, including infertility, metabolic syndrome, and cardiovascular diseases. Furthermore, the identification of specific phenotypes of PCOS may facilitate personalized treatment strategies and improve clinical outcomes. In conclusion, the use of standardized and comprehensive diagnostic criteria is essential for accurate diagnosis and optimal management of PCOS in clinical practice.

REFERENCES

1. Ruzieva, N. H., & Pakhomova, Zh. E. (n.d.). Original articles. *Doctor's Herald*, (7).
2. Ruzieva, N. H., Djabbarova, L. A., & Djabbarova, Yu. K. (2021). Causes and ways to reduce preterm birth using international approaches. *Re-health Journal*, 1(9), 14-18.
3. Nazarova, D. E., Ruzieva, N. K., Turbanova, U. V., & Rassadina, M. V. (2021). The role of oxidant stress in the development of premature childbirth. *Central Asian Journal of Pediatrics*, 2021(1), 30-36.
4. Yuldashev, A. Yu., Yuldasheva, S. Z., & Ruzieva, N. H. (2017). Formation of digestive, absorptive and immune systems in the small intestine mucosa in early postnatal ontogenesis. Tashkent: Republican Specialized Scientific and Practical Medical Center of Obstetrics and Gynecology.
5. Ruzieva, N., Sunnatillaeva, S., & Akhmadaliev, M. (2023). The effect of postoperative pelvic adhesions on girls. *Central Asian Journal of Education and Innovation*, 2(3 Part 2), 79-82.
6. Teshayev, Sh., Yadgarova, G., Norova, M., Ruzieva, N., & Yakubov, Sh. (2012). Morphometric facial parameters of healthy children and their correspondence to the golden ratio. *Bulletin of the Physician*, 1(2), 157-158.
7. Ruzieva, N. H., & Bektimirova, A. A. (2016). Yeast-like fungi of the genus *Candida* in the genital tract of women of reproductive age. Tashkent.
8. Ruzieva, N. H., Rasul-Zade, Yu. G., & Alieva, G. A. (2020). A new look at the pathogenetic mechanism, clinical course and treatment methods of pregnant women with ARVI. *New Day in Medicine*, (4), 108-114.
9. Ruzieva, N. H. (2017). Optimization of diagnosis and treatment approaches in pregnant women (Doctoral dissertation, Tashkent Pediatric Medical Institute).
10. Ruzieva, N., Nazarova, D. E., Turbanova, U. V., & Rassadina, M. V. (2019). The role of oxidant stress in the development of premature childbirth. *Central Asian Journal of Pediatrics*, 2(1), 54-57.
11. Zakirova, N., Ruzieva, N., Lutfullaev, U., Ziyaeva, Z., Askarova, F., & Kenjaeva, U. (2013). Reproductive health status and pelvic dimensions in girls living under acceleration conditions (literature review). *Bulletin of the Physician*, 1(1), 62-65.
12. Ruzieva, N. H., & Ismailova, I. R. (2014). Magne-B6 in the prevention and treatment of anemia in pregnant women. In *Globalization of science: Problems and prospects* (pp. 156-161).
13. Shupinov, D., Ruzieva, N., Zakirova, N., Lutfullaev, U., & Ziyaeva, Z. (2012). Anthropometric characteristics of girls from birth to adolescence. *Bulletin of the Physician*, 1(4), 139-141.
14. Ten, S., Teshayev, Sh., Ruzieva, N., Lutfullaev, U., & Salimova, A. (2013). Comparative morphometric parameters of the head in healthy children and children with cerebral palsy aged 6 years. *Bulletin of the Physician*, 1(1), 156-157.