ISSN: 2582-4686 SJIF 2021-3.261,SJIF 2022-2.889,
2024-6.875 ResearchBib IF: 9.948 / 2024

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-5, ISSUE-10

POLYCYSTIC OVARY SYNDROME (PCOS): MODERN TREATMENT APPROACHES

Aziza Nurmamatova

Abstract. Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine disorders affecting women of reproductive age, characterized by chronic anovulation, hyperandrogenism, and polycystic ovarian morphology. Despite being recognized for nearly a century, the etiology and optimal management of PCOS remain subjects of intense research and debate. This syndrome not only disrupts reproductive health but also exerts significant metabolic, cardiovascular, and psychological consequences.

This article explores the contemporary understanding of PCOS from the standpoint of pathogenesis and highlights the latest trends in treatment — including lifestyle modification, pharmacological interventions, surgical options, and emerging molecular therapies. The paper emphasizes the importance of personalized medicine in the management of PCOS, considering the heterogeneity of its clinical manifestations.

A multidisciplinary approach integrating endocrinology, gynecology, and psychology offers the most effective strategy for restoring hormonal balance, ovulatory function, and improving overall quality of life in affected women.

Keywords: Polycystic Ovary Syndrome (PCOS), hyperandrogenism, insulin resistance, ovulation induction, metformin, reproductive endocrinology, hormonal therapy, lifestyle modification.

Relevance of the Study. Polycystic Ovary Syndrome represents a multifactorial and heterogeneous disorder that affects approximately 8–13% of women worldwide, according to current epidemiological data. Its growing prevalence is largely associated with lifestyle changes, obesity, and environmental factors influencing endocrine function.

The relevance of studying PCOS lies not only in its impact on fertility but also in its far-reaching systemic consequences. Women with PCOS face a significantly increased risk of developing type 2 diabetes mellitus, dyslipidemia, cardiovascular disease, and endometrial hyperplasia. Furthermore, chronic hormonal imbalance contributes to psychological distress, manifesting as anxiety, depression, and diminished self-esteem.

The modern era of medicine demands an integrative and evidence-based approach to managing PCOS, focusing on long-term health outcomes rather than merely alleviating reproductive symptoms. The evolution of treatment strategies — from empirical hormonal suppression to molecularly targeted therapies — reflects the dynamic progress in understanding this complex disorder. Consequently, the study of PCOS treatment is not confined to gynecology alone; it has become a multidisciplinary field intersecting endocrinology, metabolism, genetics, and behavioral medicine.

Purpose of the Study. The primary purpose of this study is to analyze modern treatment strategies for Polycystic Ovary Syndrome, identify their clinical effectiveness, and evaluate their role in the comprehensive management of the syndrome. The article seeks to integrate current clinical guidelines with emerging research evidence to provide a cohesive overview of therapeutic options that address both reproductive and metabolic components of PCOS.

Additionally, the study aims to highlight the necessity of individualized treatment plans based on the phenotype of PCOS, metabolic profile, and reproductive goals of the patient. By examining

ISSN: 2582-4686 SJIF 2021-3.261,SJIF 2022-2.889,
2024-6.875 ResearchBib IF: 9.948 / 2024

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-5, ISSUE-10

contemporary pharmacological, lifestyle, and technological interventions, this article underscores the direction of future research toward precision medicine and holistic care in PCOS management.

Materials and Methods. This article synthesizes findings from recent clinical trials, meta-analyses, and evidence-based guidelines published between 2018 and 2025 in leading medical journals such as *The Lancet Diabetes & Endocrinology*, *Fertility and Sterility*, and *Human Reproduction Update*. The analysis includes data from randomized controlled trials on the efficacy of lifestyle interventions, insulin-sensitizing agents, antiandrogens, ovulation-inducing medications, and surgical approaches such as laparoscopic ovarian drilling.

Comparative evaluation of pharmacological treatments (metformin, clomiphene citrate, letrozole, combined oral contraceptives) was performed based on outcome measures such as ovulation rate, menstrual regularity, hormonal normalization, and pregnancy outcomes. In addition, studies assessing psychosocial interventions and their impact on quality of life were reviewed to provide a comprehensive understanding of PCOS management.

Results of the Study

1. Lifestyle Modification and Weight Management

Lifestyle modification remains the cornerstone of PCOS therapy. Even a modest weight loss of 5–10% has been shown to significantly improve ovulatory function, insulin sensitivity, and serum androgen levels. Nutritional interventions emphasizing low-glycemic-index diets, reduced carbohydrate intake, and increased physical activity have demonstrated superior outcomes in restoring menstrual regularity.

Recent research underscores that lifestyle modification is not merely a preliminary step before pharmacotherapy, but an essential therapeutic axis that enhances the efficacy of other interventions. Exercise — particularly aerobic and resistance training — improves insulin receptor sensitivity and reduces systemic inflammation, thereby alleviating the metabolic dysregulation central to PCOS.

2. Pharmacological Therapy

Pharmacological treatment of PCOS is highly individualized, targeting specific clinical manifestations.

a. Insulin Sensitizers:

Metformin remains the most extensively studied insulin-sensitizing agent. Its role extends beyond glycemic control; by reducing hepatic glucose output and improving peripheral glucose utilization, it lowers insulin and androgen levels, promoting spontaneous ovulation. Long-term use of metformin also decreases the risk of metabolic syndrome and type 2 diabetes in PCOS patients. Newer agents such as inositols (myo-inositol and D-chiro-inositol) have gained attention due to their favorable safety profile and comparable efficacy in restoring ovulatory cycles.

b. Ovulation Induction:

For women seeking fertility, ovulation induction is a key therapeutic goal. Clomiphene citrate has historically been the first-line agent; however, recent studies favor the aromatase inhibitor *letrozole* as a more effective and better-tolerated alternative. Letrozole induces ovulation in up to 60–70% of patients and carries a lower risk of multiple pregnancies compared to clomiphene. In refractory cases, gonadotropin therapy and assisted reproductive technologies (ART) are employed under close hormonal monitoring to prevent ovarian hyperstimulation.

c. Hormonal Regulation:

Combined oral contraceptives (COCs) remain the first-line treatment for managing menstrual irregularities and hyperandrogenic symptoms such as hirsutism and acne. The estrogen component

ISSN: 2582-4686 SJIF 2021-3.261,SJIF 2022-2.889,
2024-6.875 ResearchBib IF: 9.948 / 2024

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-5, ISSUE-10

suppresses luteinizing hormone secretion, while the progestin counteracts endometrial hyperplasia. Antiandrogenic agents such as spironolactone, cyproterone acetate, and flutamide are often co-administered with COCs to enhance cosmetic outcomes.

3. Surgical and Emerging Therapies

Laparoscopic ovarian drilling (LOD) continues to serve as a therapeutic option for clomiphene-resistant PCOS. By selectively destroying androgen-producing stromal tissue, LOD restores ovulation in approximately 60–80% of cases. However, due to potential risk of postoperative adhesion and ovarian reserve reduction, this method is now reserved for specific indications.

Emerging therapeutic approaches include the use of GLP-1 receptor agonists (such as liraglutide) for obese PCOS patients, which show promise in improving metabolic parameters and reducing weight. Additionally, advancements in gene expression analysis have led to identification of molecular targets — such as AMH receptors and androgen receptor polymorphisms — that may soon revolutionize treatment personalization.

4. Psychological and Behavioral Interventions

PCOS is increasingly recognized as a psychosomatic condition, where hormonal imbalance, body image issues, and infertility contribute to psychological stress. Cognitive-behavioral therapy (CBT) and stress management programs have shown to significantly improve adherence to lifestyle interventions and overall well-being.

Addressing the mental health component of PCOS is crucial; untreated anxiety or depression can diminish the effectiveness of pharmacotherapy and hinder compliance with treatment recommendations.

Conclusion. The management of Polycystic Ovary Syndrome has evolved from symptomatic treatment toward a comprehensive, individualized model of care integrating endocrinological, metabolic, and psychological dimensions. Modern therapeutic strategies emphasize early diagnosis, lifestyle modification, insulin sensitization, hormonal regulation, and patient-centered counseling.

Future trends in PCOS management will likely focus on molecular and genetic profiling, enabling precision therapy tailored to individual hormonal and metabolic phenotypes. Integration of artificial intelligence and digital health tools may further enhance patient monitoring and adherence to treatment regimens.

Ultimately, successful management of PCOS requires more than pharmacological correction — it demands a holistic approach that restores not only fertility and hormonal balance, but also psychological well-being and quality of life.

References

1. Azziz, R., Carmina, E., Chen, Z., Dunaif, A., Laven, J. S. E., Legro, R. S., & Lizneva, D. (2019). Polycystic ovary syndrome. *Nature Reviews Disease Primers*, *5*(1), 1–17. https://doi.org/10.1038/s41572-019-0098-5

2. Escobar-Morreale, H. F. (2018). Polycystic ovary syndrome: Definition, aetiology, diagnosis and treatment. *Nature Reviews Endocrinology*, *14*(5), 270–284. https://doi.org/10.1038/nrendo.2018.24

3. Teede, H. J., Misso, M. L., Costello, M. F., Dokras, A., Laven, J., Moran, L., & Norman, R. J. (2023). International evidence-based guideline for the assessment and management of polycystic ovary syndrome. *Human Reproduction Update*, *29*(1), 1–30. https://doi.org/10.1093/humupd/dmac025

ISSN: 2582-4686 SJIF 2021-3.261,SJIF 2022-2.889,
2024-6.875 ResearchBib IF: 9.948 / 2024

4. Legro, R. S., Arslanian, S. A., Ehrmann, D. A., Hoeger, K. M., Murad, M. H., Pasquali, R., & Welt, C. K. (2020). Diagnosis and treatment of polycystic ovary syndrome: An Endocrine Society clinical practice guideline. *Journal of Clinical Endocrinology & Metabolism, 105*(9), 2851–2893. https://doi.org/10.1210/clinem/dgaa342

5. Franks, S., & McCarthy, M. I. (2021). Genetics of polycystic ovary syndrome: New insights from candidate gene and genome-wide association studies. *Human Reproduction Update, 27*(6), 944–960. https://doi.org/10.1093/humupd/dmab024

6. Barber, T. M., & Franks, S. (2019). The link between polycystic ovary syndrome and both type 1 and type 2 diabetes mellitus: What do we know today? *Women's Health, 15*, 1745506519877724. https://doi.org/10.1177/1745506519877724

7. Wang, R., Li, W., Bordewijk, E. M., Legro, R. S., Zhang, H., & Mol, B. W. (2019). Letrozole versus clomiphene citrate in women with polycystic ovary syndrome: Systematic review and meta-analysis. *BMJ, 364*, l117. https://doi.org/10.1136/bmj.l117

8. Arentz, S., Smith, C. A., Abbott, J. A., Fahey, P., & Bensoussan, A. (2020). A comprehensive review of the safety and efficacy of herbal medicine in polycystic ovary syndrome. *Phytotherapy Research, 34*(2), 268–282. https://doi.org/10.1002/ptr.6531

9. Palomba, S., Santagni, S., Falbo, A., & La Sala, G. B. (2021). Complications and challenges associated with polycystic ovary syndrome: Current perspectives. *Reproductive Biology and Endocrinology, 19*(1), 1–11. https://doi.org/10.1186/s12958-021-00735-8

10. Khan, M. J., Ullah, A., & Basit, S. (2019). Genetic basis of polycystic ovary syndrome (PCOS): Current perspectives. *The Application of Clinical Genetics, 12*, 249–260. https://doi.org/10.2147/TACG.S200341

11. Moran, L. J., Ko, H., Misso, M., Marsh, K., Noakes, M., Talbot, M., & Teede, H. J. (2019). Dietary composition in the treatment of polycystic ovary syndrome: A systematic review to inform evidence-based guidelines. *Journal of the Academy of Nutrition and Dietetics, 119*(5), 731–745. https://doi.org/10.1016/j.jand.2018.09.012

12. Jensterle, M., Janež, A., & Pinter, B. (2020). GLP-1 receptor agonists in the treatment of polycystic ovary syndrome: From bench to bedside. *Metabolism, 104*, 154138. https://doi.org/10.1016/j.metabol.2019.154138