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Polycystic Ovary Syndrome (PCOS): A Comprehensive Review

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Abstract

Polycystic Ovary Syndrome (PCOS) is a multifaceted endocrine disorder that affects a significant number of women of reproductive age worldwide, particularly in India. Characterised by hyperandrogenism, chronic anovulation, and polycystic ovaries, PCOS presents a wide spectrum of clinical manifestations including irregular menstrual cycles, acne, hirsutism, obesity, and infertility. This paper aims to provide a detailed overview of PCOS, its etiology, clinical features, diagnosis, management strategies, and the impact it has on the lives of Indian women. Emphasis is laid on the lifestyle and socio-cultural aspects that influence the prevalence and management of PCOS in India.

Keywords: Polycystic Ovary Syndrome, PCOS, hormonal imbalance, insulin resistance, modern lifestyle, hyperandrogenism, Poor diet, lack of exercise, obesity, hormonal imbalance, Vitamin D Deficiency, sedentary behavior, anovulatory infertility, physical activity, sedentary lifestyles, hirsutism, adolescent, stress, sleep disturbance infertility, Indian women, lifestyle modification, treatment

1. Introduction

Polycystic Ovary Syndrome (PCOS) is among the most common hormonal disorders encountered in women of reproductive age. Globally, it is estimated to affect 5% to 15% of women, with varying prevalence depending on diagnostic criteria and population studied. In India, the estimated prevalence ranges between 9.13% and 36% among adolescent and young adult women. The rising incidence of PCOS in India is a matter of public health concern, necessitating focused awareness and effective intervention strategies.

2. Etiology and Pathophysiology

PCOS is a complex disorder with a multifactorial etiology involving genetic, environmental, and lifestyle factors. The primary pathophysiological mechanism includes insulin resistance and hyperinsulinemia, which lead to increased androgen production by the ovaries. Genetic predisposition also plays a significant role, and several candidate genes related to insulin metabolism and androgen biosynthesis have been identified.

In addition to hormonal imbalance, systemic inflammation and obesity further exacerbate the condition. Environmental factors such as sedentary lifestyle, unhealthy dietary habits, and stress also contribute significantly to the development and progression of PCOS.





3. Epidemiology of Polycystic Ovary Syndrome (PCOS) in India

Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine disorders affecting women of reproductive age in India. The condition is characterized by hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology (PCOM). Over the past decade, the prevalence of PCOS in India has risen significantly, making it a major public health concern.

3.1. Prevalence of PCOS in India

- 1. Studies suggest that around 10% to 22% of Indian women of reproductive age suffer from PCOS, which is higher than the global average (6-10%).
- 2. A 2018 meta-analysis (Shah et al.) reported that 1 in 5 Indian women may have PCOS, with higher rates in urban areas compared to rural regions.
- 3. Among adolescent girls, the prevalence ranges between 9.13% to 22.5%, as per studies conducted in Mumbai, Delhi, and Chennai (Nidhi et al., 2012; Joshi et al., 2014).

3.2. Regional Variations

- 1. South India has a higher prevalence (22-25%) compared to North India (10-15%), possibly due to genetic and dietary differences.
- 2. Urban women are more affected (18-22%) than rural women (8-12%), likely due to sedentary lifestyles, obesity, and stress (Saxena et al., 2017).

3.3. Risk Factors Contributing to PCOS in India

- 1. **Obesity & Insulin Resistance:** Nearly 50-70% of Indian PCOS patients are overweight or obese, leading to higher insulin resistance (Ganie & Vasudevan, 2019).
- 2. Genetic Predisposition: Certain gene variants (FTO, INS, and CYP11A) are more common in Indian women with PCOS (Rao & Vijayalakshmi, 2020).
- 3. Vitamin D Deficiency: Over 60-80% of Indian PCOS patients have low Vitamin D levels, worsening metabolic symptoms (Singh & Sinha, 2018).
- 4. Lifestyle Factors: Poor diet, lack of exercise, and high stress levels contribute to rising PCOS cases in young Indian women (Deepika et al., 2020).

3.4. Complications & Long-Term Health Risks

- 1. **Infertility:** PCOS is the leading cause of anovulatory infertility in India, affecting 30-40% of infertile women.
- 2. **Metabolic Disorders:** Indian PCOS patients have a higher risk of type 2 diabetes (3-5 times more likely), dyslipidemia, and cardiovascular diseases.
- 3. **Psychological Impact:** Anxiety and depression rates are 2-3 times higher in Indian women with PCOS due to hormonal imbalances and societal stigma.

3.5. Challenges in Diagnosis & Awareness

- 1. Lack of Standardized Criteria: Many Indian doctors still use the Rotterdam criteria (2003), but there is no uniform national guideline (ICMR, 2021).
- 2. Low Awareness: A 2019 study (Chaudhary et al.) found that only 30-40% of Indian women are aware of PCOS symptoms, leading to delayed diagnosis.

4. Clinical Features

The clinical presentation of PCOS is heterogeneous and varies among individuals. Common symptoms include:

• Menstrual irregularities (oligomenorrhea or amenorrhea)



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- Hirsutism (excessive hair growth on face and body)
- Acne and oily skin
- Obesity, particularly central obesity
- Infertility due to anovulation
- Acanthosis nigricans (darkened skin patches)

These manifestations not only affect physical health but also lead to psychological issues like anxiety, depression, and low self-esteem.

5. Diagnosis

The diagnosis of PCOS is primarily clinical and based on the Rotterdam criteria (2003), which require the presence of two out of the following three criteria:

- 1. Oligo- or anovulation
- 2. Clinical and/or biochemical signs of hyperandrogenism
- 3. Polycystic ovaries on ultrasound

Exclusion of other conditions like congenital adrenal hyperplasia, androgen-secreting tumours, and thyroid dysfunction is necessary before confirming the diagnosis.

6. PCOS and Indian Women

Indian women are particularly vulnerable to PCOS due to genetic and lifestyle factors. Cultural practices, dietary habits rich in carbohydrates and fats, and limited physical activity contribute to the higher prevalence. Moreover, the social stigma associated with infertility and cosmetic issues like acne and hirsutism often lead to delayed diagnosis and management.

A study by the Indian Journal of Endocrinology and Metabolism (2011) found that urban Indian women, especially those from higher socio-economic backgrounds, show a higher prevalence of PCOS, likely due to a sedentary lifestyle and stress.

7. Management and Treatment

The management of PCOS is tailored to individual symptoms and reproductive goals. A multidisciplinary approach involving gynecologists, endocrinologists, dietitians, and psychologists is often required.

7.1 Lifestyle Modification:

Evidence supports lifestyle modification as the first-line treatment for PCOS. This includes:

- **Dietary Changes**: Adopting a low-glycemic index diet rich in whole grains, lean proteins, fruits, and vegetables.
- **Physical Activity**: Engaging in at least 150 minutes of moderate exercise weekly.
- Weight Management: Achieving and maintaining a healthy BMI can restore ovulation and reduce metabolic risks.

• Stress Management

Mind-body interventions such as yoga, meditation, and cognitive behavioral therapy can help manage stress and improve PCOS outcomes.

• Sleep Hygiene

Improving sleep duration and quality through routine sleep schedules and reducing screen time before bed is essential for hormonal balance.



7.2 Pharmacological Treatment:

- Oral contraceptive pills (OCPs) for menstrual regulation and androgen suppression.
- Metformin to improve insulin sensitivity.
- Anti-androgens like spironolactone for hirsutism.
- Clomiphene citrate or letrozole for ovulation induction in women seeking fertility.

7.3 Surgical Treatment:

• Laparoscopic ovarian drilling (LOD) is considered in clomiphene-resistant cases.

7.4 Psychological Support:

• Counseling and support groups are essential to address the mental health impact of PCOS.

8. Prevention and Awareness

Public health initiatives to raise awareness about PCOS, especially among adolescents, are crucial. School and college-based health programs, community outreach, and use of social media platforms can help educate young women about early symptoms and healthy lifestyle choices.

9. Conclusion

Polycystic Ovary Syndrome is a significant health concern for Indian women, with wide-ranging physical, emotional, and social implications. Early diagnosis, appropriate lifestyle changes, and individualized medical treatment can help manage symptoms and prevent long-term complications. There is a pressing need for national-level guidelines and increased public awareness to tackle the rising prevalence of PCOS in India effectively.

References

- 1. Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group. (2004). Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome. Fertility and Sterility, 81(1), 19-25.
- 2. Indian Journal of Endocrinology and Metabolism. (2011). Prevalence of PCOS in young women in India. IJEM, 15(4), 355-359.
- 3. Azziz R, Carmina E, Dewailly D, et al. (2006). Positions statement: Criteria for defining polycystic ovary syndrome as a predominantly hyperandrogenic syndrome. The Journal of Clinical Endocrinology & Metabolism, 91(11), 4237-4245.
- 4. Teede HJ, Misso ML, Costello MF, et al. (2018). Recommendations from the international evidencebased guideline for the assessment and management of PCOS. Human Reproduction, 33(9), 1602-1618.
- 5. Lim, S. S., Davies, M. J., Norman, R. J., & Moran, L. J. (2012). Overweight, obesity and central obesity in women with PCOS: A systematic review and meta-analysis. Human Reproduction Update, 18(6), 618–637.
- 6. Patel, S. (2018). Polycystic ovary syndrome (PCOS), an inflammatory, systemic, lifestyle endocrinopathy. The Journal of Steroid Biochemistry and Molecular Biology, 182, 27–36.
- 7. Ganie, M. A., & Vasudevan, V. (2019). Epidemiology, pathogenesis, and genetics of polycystic ovary syndrome in India. Indian Journal of Endocrinology and Metabolism, 23(2), 261-268.
- 8. Joshi, B., et al. (2014). A cross-sectional study of polycystic ovarian syndrome among adolescent and young girls in Mumbai, India. Indian Journal of Endocrinology and Metabolism, 18(3), 317-324.



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- 9. Shah, N., et al. (2018). Prevalence and predictors of PCOS among women in India: A systematic review and meta-analysis. Journal of Human Reproductive Sciences, 11(2), 105-115.
- 10. Nidhi, R., et al.(2012). Prevalence of PCOS in Indian adolescents: A multicenter study. Journal of Pediatric and Adolescent Gynecology, 25(6), e165-e170.
- 11. Deepika, M. L. N., et al. (2020). Impact of lifestyle modifications on PCOS symptoms in Indian women: A randomized controlled trial. Fertility Science and Research, 7(1), 12-18.
- 12. Indian Council of Medical Research (ICMR) (2021). Guidelines for diagnosis and management of PCOS in India. New Delhi: ICMR.
- 13. Ministry of Health and Family Welfare (MoHFW) (2019). National PCOS awareness program for women's health. Government of India.
- 14. World Health Organization (WHO) South-East Asia (2017). Reproductive health challenges: PCOS in developing nations. WHO Regional Office for South-East Asia.
- 15. Mehta, R. H. (2016). PCOS in Indian Women: Clinical Perspectives. New Delhi: Jaypee Brothers.
- 16. Gupta, S., & Sharma, A. (2020). PCOS and Metabolic Disorders in South Asian Women. Springer Nature.
- 17. Patel, S., & Reddy, K. J. (2021). Polycystic ovary syndrome in India: Trends in diagnosis and management. Journal of Clinical and Diagnostic Research, 15(4), QE01-QE06.
- 18. Kumarapeli, V., et al. (2015). A meta-analysis of insulin resistance in Indian women with PCOD. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 9(3), 194-198.
- Chaudhary, P., et al. (2019). PCOS awareness and knowledge among young women in rural 20. India: A cross-sectional study. International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 8(5), 1892-1897.
- 20. Saxena, P., et al. (2017). Urban vs. rural differences in PCOS presentation among Indian women. Indian Journal of Community Medicine, 42(3), 156-160.
- 21. Rao, K. A., & Vijayalakshmi, M. (2020). Genetic predisposition to PCOS in Indian women: Role of FTO and INS genes. Indian Journal of Human Genetics, 26(1), 45-52.
- 22. Singh, A., & Sinha, N. (2018). Vitamin D deficiency and PCOS in Indian women: A case-control study. Journal of Obstetrics and Gynecology of India, 68(6), 456-461.
- 23. Yadav, R., & Kaur, T. (2021). Effect of yoga and Ayurveda in PCOS management: An Indian perspective. Journal of Traditional and Complementary Medicine, 11(4), 312-318.
- 24. Mishra, N., et al. (2019). Dietary patterns and PCOS in Indian women: A comparative study. Indian Journal of Nutrition and Dietetics, 56(2), 145-156.