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A Review On Polycystic Ovary Syndrome

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1. Abstract

Polycystic Ovary Syndrome (PCOS) is a complex endocrine disorder that affects women of reproductive age and is a leading cause of anovulatory infertility. Its prevalence varies globally, with significant regional differences influenced by diagnostic criteria, ethnicity, and lifestyle factors. This review integrates foundational knowledge of PCOS with recent literature, highlighting its definition, etiology, pathophysiology, clinical features, diagnostic frameworks, and management strategies. It also examines epidemiological studies from India and abroad, patient experiences, and evolving therapeutic approaches. The findings underscore the importance of early detection, lifestyle interventions, and individualized treatment to reduce the burden of PCOS and improve reproductive and metabolic outcomes.

2. Keywords

Polycystic Ovary Syndrome (PCOS), Patient Satisfaction, Barriers In PCOS Management and Prescription Analysis.

3. Introduction

PCOS is among the most common endocrine disorders worldwide, with prevalence estimates ranging from 6–13% depending on diagnostic criteria [1] In India, prevalence varies widely, from 3.7% to over 70%, with pooled estimates around 10% using Rotterdam criteria [2]. Regional studies in Gujarat report rates of 12–13%, consistent with national averages [3].

Recent global analyses show that infertility attributable to PCOS has doubled between 1990 and 2019, with significant increases in age-standardized prevalence and disability burden. These findings highlight PCOS as a growing public health challenge, particularly in high-income and middle-SDI regions.

4. Definition

According to the World Health Organization (WHO), Polycystic Ovary syndrome (PCOS) is a heterogenous endocrine disorder affecting women of reproductive age, characterized primarily by ovulatory dysfunction. The WHO definition emphasizes oligo-ovulation or anovulation (irregular or absent menstrual cycles) as the central diagnostic feature, after excluding other causes of menstrual irregularities. Women with PCOS under WHO criteria often present with infertility due to chronic anovulation.[4]

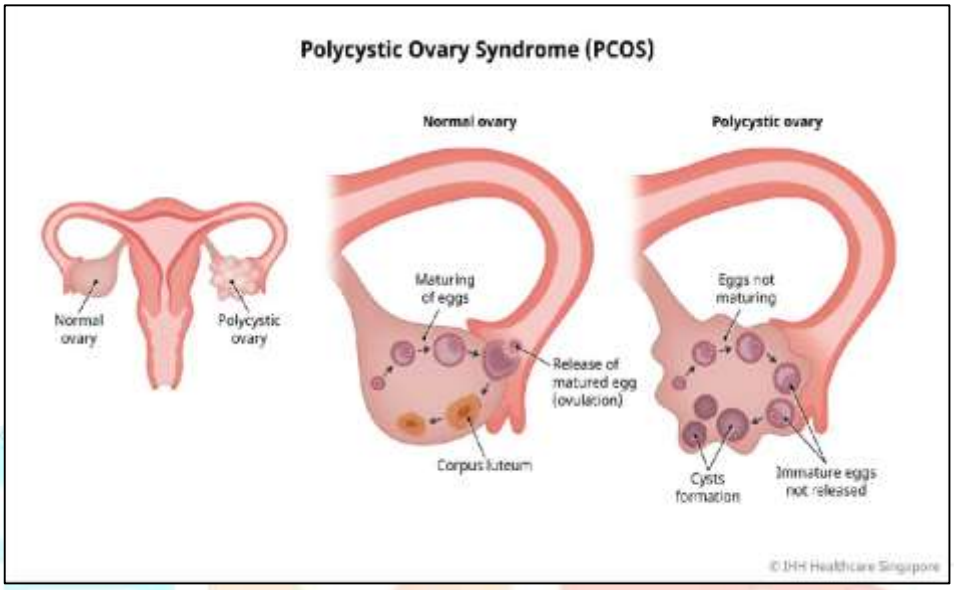

Figure:1 Normal Ovary and Polycystic Ovary

5. Types Of PCOS

PCOS is classified into four main phenotypes based on the presence or absence of its core features—polycystic ovarian morphology, ovulatory dysfunction, and hyperandrogenism[5]

- **Phenotype A (Classic):** All three features are present. This is the most common and severe form, often linked to higher metabolic risk.
- **Phenotype B (Non-PCO):** Involves hyperandrogenism and ovulatory dysfunction, but without polycystic ovaries.
- **Phenotype C (Ovulatory):** Polycystic ovaries and hyperandrogenism are present, while ovulation remains normal.
- **Phenotype D (Non-Hyperandrogenic):** Features polycystic ovaries and ovulatory dysfunction, but lacks hyperandrogenism.

6. Etiology

PCOS is influenced by several interconnected factors. Genetically, more than 200 variations in hormone-related genes have been linked to its development, with heritability seen in 20–40% of first-degree relatives and higher prevalence among South Asian women. Intrauterine exposure to excess androgens may predispose individuals to later symptoms such as hyperandrogenism, insulin resistance, and ovulatory dysfunction. Lifestyle and environmental influences, including physical inactivity, weight gain, and exposure to endocrine disruptors like bisphenol A, further aggravate metabolic and hormonal imbalances. Although obesity is not a direct cause, it is present in most cases and intensifies hyperinsulinemia and hyperandrogenism, increasing the risk of anovulation and worsening the severity of PCOS[6]

7. Pathophysiology

PCOS involves dysfunction across multiple systems[7]:

- **Pituitary dysfunction:** Altered GnRH pulsatility increases LH secretion, disrupting follicular development.
- **Ovarian androgen excess:** Theca cells overproduce androgens, impairing follicle maturation.
- **Insulin resistance:** Hyperinsulinemia worsens hyperandrogenism by reducing SHBG and stimulating ovarian androgen production.

8. Clinical Features

❖ Signs[8]

- Hirsutism, acne, androgenic alopecia
- Obesity, acanthosis nigricans
- Polycystic ovaries on ultrasound

❖ Symptoms[9]

- Menstrual irregularities (oligomenorrhea, amenorrhea)
- Infertility due to anovulation
- Pelvic pain, weight gain, mood disturbances
- Fatigue and poor sleep quality

❖ Diagnosis

Three major diagnostic frameworks exist[10]

- **NIH 1990:** Requires both hyperandrogenism and chronic anovulation.
- **Rotterdam 2003:** Any two of three—hyperandrogenism, ovulatory dysfunction, or PCOM.
- **AE-PCOS 2006:** Hyperandrogenism plus ovarian dysfunction, excluding other causes.

Recent studies emphasize the need for standardized diagnostic protocols and improved early detection, particularly in resource-limited settings.[11]

Table:1 Diagnostic Parameters [12]

Features	Diagnostic characteristics	Normal Range
Ovulation		21–35 days normal
Clinical hyperandrogenism	Hirsutism, acne, alopecia	Ferriman–Gallwey ≤8 normal
Biochemical hyperandrogenism	↑ Testosterone, DHEA-S	T: 0.2–0.8 ng/mL
Ultrasound (PCOM)	≥20 follicles or ovarian volume >10 mL	FNPO <12 normal
LH/FSH ratio	>2:1 abnormal	1:1 normal
AMH	>4.7–5.6 ng/mL abnormal	1–4 ng/mL normal
Insulin resistance	HOMA-IR >2.5 abnormal	≤2.5 normal
Obesity/adiposity	BMI >25, WHR >0.85	BMI 18.5–24.9
Exclusions	Thyroid, prolactin, Cushing's, CAH, tumors	Specific hormone ranges

9. Management

➢ Non-Pharmacological

- Lifestyle changes form a central part of managing PCOS, with diet, exercise, and yoga working together to improve outcomes. Yoga contributes by promoting hormonal balance and improving metabolic health[13]. Regular physical activity is especially valuable, as it enhances insulin sensitivity, supports weight control, and helps regulate ovulation[14]. Dietary approaches, such as adopting low-glycaemic index foods and including polyunsaturated fatty acids (PUFAs), further strengthen metabolic and reproductive function[15]. Alongside these strategies, naturopathic practices—such as herbal remedies and nutritional supplements—are often explored as supportive options, offering a more holistic framework for care[16].

➢ Pharmacological

❖ Combined oral contraceptive pills (COCPs) are generally recommended as the primary treatment for women with PCOS who experience menstrual cycle disturbances or symptoms of excess androgens. Metformin is often prescribed to enhance insulin sensitivity, support weight reduction, and encourage ovulation. Inositol, another insulin-sensitizing agent, has been explored as a therapeutic option, though current evidence for its effectiveness remains limited. For individuals struggling with obesity, medications such as Orlistat and GLP-1 receptor agonists may assist in weight management[17]. Antiandrogen therapy, particularly with spironolactone, can help reduce hirsutism, but its use requires careful monitoring due to

potential risks. In cases of severe obesity associated with infertility, bariatric surgery may be considered to improve both reproductive outcomes and overall metabolic health[18].

❖ **Alternatives** [19]

- Trials exploring herbal medicine in women with PCOS indicate that combining lifestyle changes with herbal therapies can support improvements in menstrual patterns and certain metabolic measures. Despite these findings, systematic reviews consistently point out that the overall evidence for nutritional supplements remains weak, with only modest benefits observed for agents such as inositol and omega-3 fatty acids. Beyond treatment options, patient-centred research from the UK and Canada highlights broader priorities, including the need for stronger physician training, expanded access to specialist care, and more reliable diagnostic approaches to ensure timely and effective management of the condition[19].

10. Patient Satisfaction in PCOS

Studies from multiple countries reveal that women with PCOS often feel dissatisfied with the healthcare they receive. Common concerns include long delays before receiving a diagnosis, limited or unclear information at the time of diagnosis, and weak communication from healthcare providers. As a result, many women turn to online sources for guidance, which can be empowering but also overwhelming due to inconsistent quality of information. Levels of satisfaction are shaped not only by medical care but also by broader social, cultural, and economic influences, as well as the ease of accessing healthcare services. Addressing these challenges requires earlier and more accurate diagnosis, the use of standardized clinical protocols, stronger patient education, and supportive doctor–patient relationships that respond to both medical needs and emotional wellbeing[20]

11. Barriers in PCOS Management

Figure:2 Barriers in Management of PCOS

12. Prescription Analysis [21]

Studying prescription patterns in women with PCOS provides valuable insight into both the medications commonly used and the level of awareness about the condition. Such analysis helps identify the prevalence of key symptoms, including menstrual irregularities, obesity, hirsutism, alopecia, and severe acne. Conducting research-based evaluations of prescriptions, patient knowledge, and symptom distribution is an effective strategy for early detection of PCOS. This approach encourages timely treatment, reduces the risk of infertility, and helps prevent long-term complications associated with the syndrome[21]

13. Conclusion

PCOS is a multifaceted disorder with significant reproductive, metabolic, and psychosocial implications. Global and regional studies reveal rising prevalence and substantial comorbidity burdens. Patient experiences highlight diagnostic delays and unmet informational needs.

Effective management requires individualized strategies combining lifestyle interventions, pharmacological therapy, and psychosocial support. Future research should focus on phenotype-specific risks, culturally tailored interventions, and long-term outcomes to improve care quality and patient satisfaction.

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