



POLYENDOCRINE METABOLIC SYNDROME (PMOS): A CONCISE REVIEW OF PATHOPHYSIOLOGY, MANAGEMENT, AND AYURVEDIC PERSPECTIVE

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ABSTRACT :

Background: The condition historically termed polycystic ovary syndrome (PCOS) has undergone a crucial paradigm shift and is now recognized as **Polyendocrine Metabolic Syndrome (PMOS)**.¹ Ovarian 'cysts' represent secondary manifestations of systemic insulin resistance, hyperandrogenism, and chronic inflammation rather than a primary gynaecological pathology.^{1,2}

Objective: To review the rationale behind the update from PCOS to PMOS, synthesize its pathophysiology, present modern management strategies, and explore Ayurvedic conceptual correlates¹⁻³.

Methods: A concise review synthesizing academic literature, consensus guidelines (including ESHRE/ASRM updates), and classical Ayurvedic texts¹⁻⁵.

Results: PMOS involves hypothalamic-pituitary-ovarian axis dysregulation, hyperinsulinemia, elevated LH:FSH ratios (>2:1 or >3:1), central obesity, and follicular arrest^{1,3}. Modern therapeutics combine lifestyle interventions, COCPs, metformin, GLP-1 agonists, and letrozole^{2,4}. Ayurveda conceptualizes PMOS via *Pushpaghni Jatharini*, *Artavakshaya*, *Beejagranthi*, and *Kapha-Vata Srotorodha*⁵⁻⁷.

Conclusion: Updating the nomenclature to Polyendocrine Metabolic Syndrome (PMOS) emphasizes early screening for type 2 diabetes and metabolic risk while unifying modern metabolic therapy with Ayurvedic holistic protocols^{1,2,5}.

Keywords: Polyendocrine Metabolic Syndrome, PMOS, PCOS, Hyperinsulinemia, Artavakshaya, Pushpaghni Jatharini, Ayurveda.

1. Introduction

Polyendocrine Metabolic Syndrome (PMOS), formerly designated as polycystic ovary syndrome (PCOS), is the most common endocrine and metabolic disorder affecting 8%–13% of women of reproductive age worldwide^{1,2}. Originally described in 1935 by Stein and Leventhal as Stein-Leventhal Syndrome [3], the condition accounts for 95% of hyperandrogenism cases, 20% of amenorrhea, and up to 75% of anovulatory infertility^{1,3}.

1.1 Explanation of Name Change: Transition from PCOS to PMOS

The medical consensus updating the term 'Polycystic Ovary Syndrome' to **Polyendocrine Metabolic Syndrome (PMOS)** addresses three fundamental clinical misnomers^{1,2}:

- **Morphological Misnomer:** Ultrasonographic 'cysts' are not true fluid-filled pathological cysts, but rather arrested antral follicles (2–9 mm in diameter) halted during maturation due to high intraovarian androgen concentrations^{1,8}.
- **Systemic & Multi-Organ Pathology:** Labeling the condition as exclusively 'ovarian' minimizes its multi-system nature. PMOS involves hyperinsulinemia, dyslipidemia, pancreatic beta-cell dysfunction, and systemic low-grade inflammation^{1,3}.
- **Preventive Focus:** The term Polyendocrine Metabolic Syndrome (PMOS) prioritizes life long screening for metabolic sequelae, including metabolic syndrome, Type 2 diabetes mellitus, non-alcoholic fatty liver disease (NAFLD), and cardiovascular disease, alongside reproductive goals^{1,2,9}.

From an Ayurvedic perspective, PMOS aligns with a systemic metabolic imbalance characterized by *Agnimandya* (impaired digestive/metabolic fire), *Ama* (metabolic toxins), and *Srotorodha* (channel obstruction) within the *Artavavaha* (reproductive) and *Medovaha* (adipose) *Srotas*.⁵⁻⁷

2. Materials and Methods

A narrative review was conducted using the standard IMRAD framework. Academic clinical databases and international guidelines (ESHRE/ASRM guidelines, Rotterdam consensus) were synthesized alongside classical Ayurvedic sources (*Charaka Samhita*, *Sushruta Samhita*, *Kashyapa Samhita*)¹⁻⁷. Citations follow the standard Vancouver system.

3. Results

3.1 Clinical Presentation & Diagnostic Criteria

Diagnosis relies on the modified Rotterdam criteria (presence of at least 2 of 3 features)^{2,8}:

- **Oligo- and/or Anovulation:** Manifesting as irregular cycle length, oligomenorrhea, or amenorrhea.
- **Hyperandrogenism:** Clinical manifestations include hirsutism (modified Ferriman-Gallwey score $\geq 4-6$), acne, seborrhea, and androgenetic alopecia, alongside biochemically elevated free/total testosterone (>150 ng/dL) or DHEAS (>3400 ng/dL).
- **Morphology / Biomarkers:** Transvaginal ultrasound showing $\geq 12-20$ peripheral subcapsular follicles (2–9 mm) or serum anti-Müllerian hormone (AMH) elevation.
- **Metabolic Features:** HAIR-AN syndrome (Hyperandrogenism, Insulin Resistance, Acanthosis Nigricans), central obesity (waist circumference >88 cm or waist-to-hip ratio >0.85), and impaired post-glucose load insulin levels (>300 μ U/mL).

3.2 Pathophysiology

- **Neuroendocrine HPO Axis Dysregulation:** Increased GnRH pulse frequency preferentially stimulates pituitary LH production over FSH, leading to an elevated LH:FSH ratio ($>2:1$ or $>3:1$).
- **Ovarian Steroidogenesis:** LH overstimulation and dysregulation of the cytochrome P450c17 enzyme augment ovarian theca-cell androgen synthesis.
- **Hyperinsulinemia & SHBG Suppression:** Insulin resistance triggers compensatory hyperinsulinemia, which directly acts on theca cells to amplify androgen production while simultaneously inhibiting hepatic synthesis of Sex Hormone-Binding Globulin (SHBG), thereby elevating free circulating testosterone.

3.3 Modern Management

- **Lifestyle & Dietary Interventions:** First-line therapy for all phenotypes. A 5%–10% weight loss restores ovulatory cycles in up to 50% of overweight/obese women. Recommendations include whole grains, high-fiber vegetables, healthy fats, and restriction of high-glycemic foods and stimulants.
- **Pharmacotherapy:** Combined Oral Contraceptive Pills (COCPs, e.g., ethinyl estradiol with cyproterone acetate) manage cycle regularity and hirsutism; Metformin (500–1500 mg/day) and GLP-1 receptor agonists enhance insulin sensitivity; Letrozole or Clomiphene Citrate serve as primary ovulation induction agents.

3.4 Ayurvedic Conceptualization & Therapeutics

Ayurveda views PMOS as a complex multi-systemic clinical entity.⁵⁻⁷

- **Classical Correlations:** *Pushpaghni Jatharini* (characterized by regular menses but anovulation, obesity/*Sthula*, and facial hair/*Lomashagandi*), *Artavakshaya* (oligomenorrhea), and *Beejagranthi* (follicular cystic stagnation)⁵⁻⁷.
- **Pathomechanism (Samprapti):** *Kapha-Vata* vitiation impairs *Dhatwagni* (metabolic fire), creating *Ama* (metabolic waste). *Ama* causes *Srotorodha* (obstruction) in *Artavavaha* and *Medovaha Srotas*, culminating in follicular stagnation and insulin resistance⁵⁻⁷.
- **Purification (Shodhana) & Herbal Therapy (Shamana):** Panchakarma remedies (*Vamana*, *Virechana*, *Erandamooladi Basti*, *Uttarbasti*) clear obstruction and restore ovulation. Medicinal herbs like *Kanchanara Guggulu* (granthihara), *Varunadi Kashaya* (insulin sensitivity), *Sukumara Kashaya*, and *Rajahpravartini Vati* restore metabolic harmony⁵⁻⁷.

Table 1. Multidisciplinary Clinical and Etiological Mapping of PMOS

Domain	Modern Pathophysiology & Features	Ayurvedic Correlation
Reproductive	Oligo/anovulation, LH:FSH elevation, subfertility	Artavakshaya, Anartava, Artavavaha Sroto-sanga
Androgenic	Hirsutism, acne, hyperandrogenemia	Pushpaghni Jatharini (Lomashagandi), Pitta-Rakta dushti
Metabolic	Insulin resistance, obesity, acanthosis nigricans	Agnimandya, Ama, Medovaha Srotodushti
Ovarian	Arrested 2–9 mm antral follicles, elevated AMH	Beejagranthi (Kapha-Meda granthi)
Management	Lifestyle modification, COCPs, Metformin, Letrozole	Panchakarma (Shodhana), Udvartana, Kanchanara Guggulu

4. Discussion & Conclusion

Updating the nomenclature from PCOS to Polyendocrine Metabolic Syndrome (PMOS) provides a clearer clinical framework that aligns modern endocrinology with systemic pathophysiology. By emphasizing hyperinsulinemia and metabolic risk over downstream ovarian follicle arrest, PMOS encourages earlier multi-systemic screening and intervention. This paradigm directly reflects Ayurvedic principle of correcting central *Agni* and *Medovaha Srotorodha* to restore *Artavavaha* function. Combining modern metabolic regulators (Metformin, GLP-1 RAs) with Ayurvedic bio-cleansing (*Panchakarma*) and bio-herbal formulations provides an effective, integrative model of care^{2,5}.

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