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Review Article

Polycystic Ovary Syndrome: Classical Unani Perspectives, Contemporary Understanding, and Therapeutic Approaches: A Narrative Review

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Abstract

Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine and metabolic disorders affecting women of reproductive age and is characterized by menstrual irregularities, hyperandrogenism, anovulation, infertility, obesity, and insulin resistance. Despite its high prevalence and significant impact on reproductive and metabolic health, the etiopathogenesis of PCOS remains complex and multifactorial. Although PCOS is not explicitly described in classical Unani literature, several of its clinical manifestations, including amenorrhoea, oligomenorrhoea, obesity, hirsutism, infertility, and acne, have been documented by eminent Unani physicians such as Rāzī, Ibn Sīnā, and Jurjānī. Unani scholars attributed these manifestations to disturbances in temperament (*Su'-i-Mizāj*), particularly the predominance of Barid wa Ratab (cold and moist) qualities and derangements of *Balghamī* humour. This review aims to explore the understanding of PCOS from both contemporary and Unani perspectives and to highlight the therapeutic potential of Unani medicine in its management. Relevant classical Unani texts and contemporary scientific literature were reviewed to examine the epidemiology, pathophysiology, clinical features, complications, and treatment approaches of PCOS. The review describes the role of *Ilāj bi'l-Tadbīr* (regimenal therapy), *Ilāj bi'l-Ghidhā'* (dietotherapy), and *Ilāj bi'l-Dawā'* (pharmacotherapy) in restoring humoral balance and improving reproductive and metabolic functions. Several medicinal plants, including ginger, liquorice, cinnamon, fenugreek, flaxseed, Nigella sativa, Tribulus terrestris, and Asparagus racemosus, have demonstrated beneficial effects on insulin resistance, hyperandrogenism, menstrual irregularities, and fertility. Classical compound formulations such as *Majūn Suparī Pāk*, *Habb-i-Mudir*, *Majūn Dabīd al-Ward*, and *Itrifal Shāhtra* may further support the management of PCOS through their emmenagogue, uterine tonic, anti-inflammatory, and blood-purifying actions. The available evidence suggests that Unani medicine offers a holistic and individualized approach to the management of PCOS by addressing both its metabolic and reproductive dimensions. Further well-designed clinical studies are warranted to validate the efficacy and safety of these traditional interventions and to facilitate their integration into evidence-based healthcare practices.

Keywords: Polycystic Ovary Syndrome, PCOS, Unani Medicine, Amenorrhoea, Hirsutism, Insulin Resistance, *Ilāj bi'l-Tadbīr*, *Ilāj bi'l-Ghidhā'*, Pharmacotherapy.

1. Introduction

Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine and metabolic disorders affecting women of reproductive age worldwide. It is a heterogeneous condition characterized by ovulatory dysfunction, hyperandrogenism, and polycystic ovarian morphology, often accompanied by obesity, insulin resistance, menstrual irregularities, infertility, acne, and hirsutism. The disorder not only impairs reproductive health but also predisposes affected women to several long-term complications, including type 2 diabetes mellitus, metabolic syndrome, cardiovascular disease, endometrial hyperplasia, endometrial carcinoma, and

psychological disturbances. Owing to its multifactorial aetiology and diverse clinical presentation, PCOS remains a significant public health concern and a leading cause of female subfertility.

The pathogenesis of PCOS involves complex interactions among genetic, hormonal, metabolic, and environmental factors, with insulin resistance and hyperinsulinaemia playing central roles in the development of hyperandrogenism and ovarian dysfunction.¹ Current management focuses on lifestyle modification, weight reduction, menstrual regulation, ovulation induction, and correction of metabolic abnormalities. However, the chronic nature of the condition and limitations of long-

term pharmacotherapy have increased interest in traditional and complementary therapeutic approaches.²

Although PCOS is not explicitly described in classical Unani literature, its clinical manifestations closely resemble conditions such as *Ihtibās al-Ṭamth* (amenorrhoea), *Qillatal-Ṭamth* (oligomenorrhoea), and symptom complexes associated with hirsutism, obesity, infertility, and menstrual disturbances. Classical Unani scholars, including Hippocrates (Buqrāt), Rāzī, Ibn Sīnā, Ibn Rushd, and Jurjānī, documented clinical features analogous to PCOS centuries before its formal recognition in modern medicine. These scholars attributed such conditions to disturbances in humoral equilibrium, particularly the predominance of *Balgham* (phlegm), altered temperament (*Su'-i-Mizāj*), impaired digestion (*Su'-i-Haḍm*), and dysfunction of the reproductive organs. According to Unani principles, a cold and moist temperament (*Barid wa Ratab Mizāj*) adversely affects ovarian function and impairs the maturation and release of the ovum, resulting in menstrual irregularities and infertility.^{3,4}

Unani management of PCOS emphasizes a comprehensive and individualized approach aimed at correcting humoral imbalance, restoring normal temperament, and improving reproductive and metabolic functions.⁵ Therapeutic modalities include *Ilāj bi'l-Tadbīr* (regimenal therapy), *Ilāj bi'l-Ghidhā'* (dietotherapy), and *Ilāj bi'l-Dawā'* (pharmacotherapy). Numerous medicinal plants and classical compound formulations described in Unani literature have been reported to possess anti-inflammatory, antioxidant, insulin-sensitising, hypolipidaemic, emmenagogue, and fertility-enhancing properties, which may be beneficial in the management of PCOS.⁶

Given the increasing prevalence of PCOS and the limitations of conventional treatment modalities, there is growing interest in integrative and complementary approaches that provide holistic, individualised, and sustainable management strategies. Therefore, this review aims to critically examine the conceptual understanding of PCOS in Unani medicine, correlate classical descriptions with contemporary scientific knowledge, and evaluate the therapeutic potential of Unani pharmacotherapy and related interventions in the management of this complex disorder.

2. Overview of Polycystic Ovary Syndrome

2.1. Definition: PCOS is described as a hereditary disorder that affects many women at different stages of their lives. The clinical diagnosis of this illness varies significantly. The major characteristics of the syndrome, which have been hotly contested, include obesity, hyperandrogenism, and menstrual cycle irregularities.⁷

2.2. Epidemiology: PCOS affects approximately 5-10% of women of reproductive age. It is considered one of the primary causes of female subfertility and pregnancy complications. Major symptoms include amenorrhoea, oligomenorrhoea, dysfunctional uterine bleeding, acne, hirsutism, and obesity.

According to the diagnostic criteria and studied population, PCOS, one of the most common endocrine disorders, affects 8-13% of women⁸ and 3.4-19.6% of adolescent girls. Adolescents with Type 2 diabetes were found to have the highest prevalence (19.6%).⁹⁻¹³ According to twin studies, PCOS is also a familial illness with a 70% heritability rate.¹⁴ In 24% of teenage PCOS patients, a first-degree relative has a positive family history of PCOS; this percentage is higher in PCOS patients compared to healthy adolescents.^{15,16} Genome-wide association studies among women from various ethnic groups have found over 20 genetic loci linked to PCOS.¹⁷⁻²⁰ The chance of acquiring PCOS in daughters of women with the condition has been estimated to be five times higher.²¹ The incidence is gradually rising in India. According to a published report, PCOS is becoming "epidemic" in Bangalore due to the way of life that people have chosen to lead.²²

3. History

Although polycystic ovaries were first described in the 19th century, it wasn't until 1935 that a syndrome was discovered and named after Stein and Leventhal, who first associated polycystic ovaries with amenorrhea, obesity, and hirsutism in seven patients, leading to the initial naming of PCOS syndrome as Stein-Leventhal syndrome.²³ Young married women who were infertile and moderately fat had larger-than-normal ovaries before their research, which dates back to 1721, but it wasn't recognized at the time. Chereau described the sclerocystic alterations in the ovaries in 1844, but it wasn't acknowledged until Stein and Leventhal had comprehensive research on it. Adams and his colleagues conducted yet another study in 1985, in which they found polycystic ovaries with an abnormally high number of follicles and termed that condition multifollicularity. They define polycystic ovaries as those that have more than 10 peripherally distributed cysts that range in size from 2 to 8 mm. In women's ovaries, several small cysts are seen. This explains why it is known as polycystic ovary disease.²⁴

4. Classical Unani Perspectives on PCOS

As there is no description of PCOS in Unani literature, the following are some assertions made by our esteemed Unani scholars:

Rhazes (*Abū Bakr Muḥammad ibn Zakariyyā*, 865–925 AD) noted a combination of symptoms, in addition to monthly irregularities (oligomenorrhoea, amenorrhoea, and menorrhagia), including hirsutism, obesity, acne, hoarseness of voice, and infertility, which are suggestive of polycystic ovarian disease.⁴

Older medical records can be reviewed to learn more about PCOS. Women suffering from PCOS, although strong and possessing a decent complexion, may have a male appearance and experience periods that last less than three days or are infrequent. They do not worry about having children or getting pregnant, as noted by Hippocrates (460-377 B.C.).³

"It is also natural not to menstruate at all at times," wrote Soranus of Ephesus (98–138 A.D.). It is also common

among those with a masculine physique, and many individuals who do not menstruate tend to be quite muscular, resembling mannish and sterile women".³

In his writings, *Zakariyyā Rāzī* (865–925 AD) documented a case of a widowed woman who experienced amenorrhea, developed a beard, exhibited male-like hair growth on her chest, and had hoarseness in her voice before eventually passing away.³

Ibn Rushd (1126–1298 AD) and *Ibn Hubal Baghdādī* (1122–1213) introduced the concept of humours related to this illness. They asserted that an imbalance in the quantity or quality of phlegm causes cold and moist disorders. The most common condition resulting from this is phlegmatic swellings.³

5. Pathophysiology of PCOS in Unani Medicine:

There is no explanation of PCOS in Unani literature; however, since it is one of the complications that occur as a result of amenorrhea, we can understand it as follows: The temperament of the ovaries is hot and moist, due to the nourishment from the *fuḍlā khūn ḥayḍ*⁴, which is formed in the second stage of digestion. After this, the waste that remains following its *nuḍj* (concoction) takes the form of *manī* and converts this *fuḍlā* into *manī*, i.e., the ovum, which is released from the ovaries and reaches the uterus through the fallopian tubes during menstruation every month.²²

For the ovaries to function, they require *ḥarārat* and *ruṭūbat* to perform their *ṭab'ī* function and enable the process of *nuḍj*. Any deviation from their normal temperament can lead to the failure of this *manī*, i.e., the ovum, to release from the ovaries, resulting in the accumulation of this *fuḍlā* in the form of a cyst.

Consequently, either due to *sū'-i-mizāj ḥārr* or *sū'-i-mizāj bārid*, if this *fuḍlā ḥayḍ* is not produced in *ḥaḍm kabidī*, i.e., the second stage of digestion, it will not be able to provide *ghidhā'* to the ovaries properly. Therefore, the altered temperament of the ovaries causes anovulation, resulting in amenorrhea/oligomenorrhea. But according to our Unani scholars, it is more common in women having a cold and moist temperament.^{25–27}

As per conventional medicine, one of the symptoms of PCOS is hirsutism. Hirsutism is mentioned in the classical Unani literature as a complication of prolonged amenorrhea associated with other masculine features, like hoarseness of voice, male body contour, acne, and clitoromegaly.¹² **Hippocrates** (*Buqrāt* 460-370 BC) first documented the association of excess facial and body hair (hirsutism) in females with prolonged amenorrhea, obesity, and infertility. Similar observations were reported by **Galen** (*Jālīnūs* 130- 200 AD).

Avicenna (*Ibn Sīnā*, c.980–1037 AD) and **Zayn al-Din Gorgani** (*Ismā'īl Jurjānī*, c.1041–1136 AD) both provided explanations of the pathophysiology of hirsutism. The main theory regarding hirsutism was that alteration of the normal temperament of females was considered a central dogma for hirsutism. It was claimed that long-term amenorrhea alters the normal temperament of the female body, which can occur due to *sū'-i-mizāj ḥārr* or *sū'-i-mizāj bārid*. This disturbance of equilibrium results in the accumulation of unwanted material within the body that should be excreted through skin pores, contributing to the development of thick hair all over the body.^{27–29}

6. Pathophysiology in Modern Medicine:

The Pathophysiology of PCOS is complex and remains unclear. The various pathogenic mechanisms of PCOS include insulin resistance, gonadotropin release, and ovulatory dysfunction.^{30,31}

6.1. Ovary, Adrenal, and Androgen Excess:

PCOS is characterized by excessive ovarian or adrenal androgen secretion. Over 50% of patients with polycystic ovary syndrome (PCOS) demonstrate excess levels of adrenal androgens, particularly dehydroepiandrosterone sulphate (DHS). Nonetheless, the mechanism for the adrenal androgen excess remains unclear.

6.2. Insulin resistance:

Insulin resistance is the key pathogenic factor in PCOS. Insulin resistance and hyperinsulinemia are commonly detected in women with PCOS. Due to an excess level of androgen, which leads to increased insulin resistance in peripheral tissues, the insulin resistance in PCOS has been characterized in adipocytes by a post-binding defect in insulin receptor-mediated signal transduction in Skeletal muscle.³² Obesity increases hyperandrogenism, hirsutism, infertility, and menstrual irregularity complications both independently and by exacerbating the insulin resistance of PCOS.³³

6.3. Gonadotropin release and hyperandrogenism:

Neuroendocrine disorder, which affects 5% to 20% of women of reproductive age, is the leading cause of infertility.^{34,35} In PCOS, the increased stimulatory effect of Luteinizing hormone stimulation of the ovarian theca cells is increased; these cells increase the production of androgen, mainly androstenedione and testosterone. Women with PCOS require higher levels of progesterone to slow the frequency of GnRH pulse secretion, resulting in inadequate follicle-stimulating hormone synthesis and persistent Luteinizing hormone stimulation of ovarian androgens. The decreased sensitivity of the GnRH pulse generator may help to explain the genesis of PCOS during puberty. Around 60%-80% of women affected by PCOS have increased androgen levels.^{36–38}

6.4. Ovulatory dysfunction:

In PCOS, the disturbance of the follicular level in the ovaries results in increased AMH (Anti-Müllerian Hormone) production by granulosa cells. Anovulation with decreased progesterone release and increased estrogen release then increases the risk of endometrial carcinoma via endometrial hyperplasia. Lower FSH levels result in disturbed follicular development in the ovary, leading to amenorrhea and anovulation. Hypersecretion of Luteinizing hormone is a significant cause of infertility and miscarriage in women with PCOS.^{39–43}

7. Clinical Features

Common clinical manifestations of PCOS include hirsutism, characterized by excessive body hair growth, irregular or absent menstrual cycles, heavy menstrual bleeding, acne, oily skin, scalp hair loss or thinning, insulin resistance, fertility problems, and weight-related issues.⁴⁴ But these features do not rely on whether a patient may have polycystic ovaries or may have PCOS. In 2003, a meeting was held by experts, and they revised their concern about PCOS, which later on they got their work published in

2004, concluding: 'PCOS is a syndrome of ovarian dysfunction, and its basic features include hyperandrogenism and polycystic morphology'.²⁵

8. Complications:

PCOS is a major health concern because patients with PCOS are at increased risk of infertility, pregnancy loss, obesity, cardiovascular disorders, diabetes mellitus, obstructive sleep apnea, depression, nonalcoholic fatty liver disease, endometrial hyperplasia, and endometrial carcinoma, etc. Infertility occurs in 75% due to anovulation. Metabolic syndrome, like diabetes, occurs in up to 43.6%, depression in 40%, increased risk of early spontaneous abortion, preterm delivery, hypertensive disorders, gestational diabetes, and perinatal mortality in 30-50%, and increased risk of multiple gestations from infertility treatment.⁴⁵

9. Therapeutic Approaches in Unani Medicine for PCOS

The treatment is categorised under the following headings:

9.1. Ilaj bit Tadbeer (Regimenal Therapy):^{15,17}

Ilaj bi'l-Tadbir constitutes an integral component of PCOS management in Unani medicine and focuses on correcting underlying metabolic and humoral imbalances through lifestyle modification and specific regimenal procedures. Patients are advised to adopt healthy lifestyle practices, including dietary regulation, brisk walking, and regular physical exercise to promote weight reduction, improve insulin sensitivity, and restore menstrual regularity. In obese individuals, weight management is further supported through *Ḥammām* (steam bath) and *Dalak* (massage), which help enhance metabolism and facilitate the elimination of morbid humours. Regimenal procedures such as *Hijāmah bi'l-Sharṭ* (wet cupping) over the calf

muscles and *Faşd* (venesection) of the saphenous vein are traditionally employed to divert blood flow towards the uterus and induce menstruation in cases of amenorrhoea and oligomenorrhoea associated with PCOS.

9.2. Ilaj bil Ghidha (Dietotherapy):⁴⁶

Dietotherapy constitutes a fundamental component of the Unani management of polycystic ovary syndrome (PCOS), as dietary habits play a crucial role in maintaining humoral equilibrium and regulating metabolic and reproductive functions. According to Rāzī, obesity is associated with a predominance of *Barid* (cold) temperament, resulting in the aggravation of *Balghamī* humour. Therefore, therapeutic interventions should focus on restoring balance through *Ḥārr Yābis* (hot and dry) regimens, encompassing appropriate dietary modifications, pharmacotherapy, and physical activity. Foods possessing cold and moist qualities are considered detrimental, as they may exacerbate humoral imbalance, impair digestion (*Su'-i-Haḍm*), and contribute to menstrual irregularities, obesity, and infertility.

Patients with PCOS are advised to consume light, nutritious, and easily digestible foods, maintain adequate fluid intake, and incorporate fibre-rich foods, green leafy vegetables, and fresh fruits and vegetables into their daily diet. Traditional dietary practices, such as the intake of *Sirka Kanjī* on an empty stomach, are also recommended to improve digestion and metabolism. Conversely, cold items, heavy and late-digestible foods, full-fat dairy products, and foods with cold and moist qualities should be avoided. Dietary recommendations in Unani medicine are tailored according to the quality of *Mizāj* (temperament), with preference given to foods possessing *Ḥārr Yābis* properties and restriction of those with *Barid Ratab* qualities.

Table 1: Recommended and Restricted Foods for PCOS

S. No.	Recommended Foods (<i>Ḥārr Yābis</i> – Hot and Dry)	Restricted Foods (<i>Barid Ratab</i> – Cold and Moist)
1	Chicken, fish, prawns, and small bird meat	Radish
2	Eggs	Cucumber
3	Mustard oil	Soybeans
4	Red and green peppers	Full-fat milk
5	Chilli sauce	Buttermilk
6	Cashew nuts	Lettuce
7	Hazelnuts	Okra
8	Onions	Pear
9	Lemon	Kiwi fruit
10	Chickpeas	Brown rice
11	Garlic	Ice cream
12	Bitter melon	Figs
13	Grapes	Carrots

The dietary recommendations outlined above aim to correct the underlying *Su'-i-Mizāj Barid wa Ratab*, reduce *Balghamī* predominance, improve digestion and

metabolism, facilitate weight reduction, and restore menstrual and reproductive health in women with PCOS.

9.3. *Ilaj bid Dawa* (Pharmacotherapy):

Unani pharmacotherapy for Polycystic Ovary Syndrome (PCOS) encompasses both single drugs (*Mufrad Advia*) and compound formulations (*Murakkab Advia*) aimed at correcting the underlying humoral imbalance, improving reproductive function, regulating menstruation, reducing metabolic disturbances, and restoring overall health. A number of medicinal plants traditionally used in Unani medicine have demonstrated beneficial effects on insulin resistance, hyperandrogenism, menstrual irregularities, obesity, and infertility associated with PCOS. In addition, several classical Unani compound formulations are prescribed according to the patient's temperament (*Mizāj*), predominant symptoms, and associated pathological conditions.

I. Ginger (*Zingiber officinale*):

Zingiber officinale, commonly called ginger, belongs to the family of *Zingiberaceae*. Ginger rhizomes have medicinal properties and are widely used for various purposes. It is mostly used for Pharmacological reported activity, antimicrobial, anticancer, antiviral, analgesic, antidiabetic, antioxidant, nephron-protective, sedative, hepato-protective, anti-inflammatory, and antiemetic. Different biological activities are due to active constituents of ginger such as 6-gingerol, shogal, 6-gingerol, zingiberene, zingerone, gingerenone. Insulin sensitivity and obesity are major concerns of PCOS. Ginger has a significant effect on type 2 diabetes; it increases insulin sensitivity and also reduces body weight by increasing high-density lipoproteins. Ginger can be a promising supporting therapy for patients with insulin resistance. In a few studies, it was also found that the antioxidant and anti-inflammatory properties of 6-gingerol reduce sex hormone levels and improve ovulation in Wistar rats with PCOS. Ginger can be used as an adjuvant therapy for the treatment of PCOS.⁴⁷

II. Liquorice (*Glycyrrhiza glabra*):

Liquorice (*Glycyrrhiza glabra* L.), a member of the family **Leguminosae (Fabaceae)**, is a well-known medicinal plant widely used in traditional systems of medicine, including Unani medicine, for the treatment of various ailments. It exhibits a broad spectrum of pharmacological activities, including anti-ulcer, antiviral, antifungal, anticancer, anti-allergic, antidiabetic, antioxidant, antithrombotic, antimalarial, antibacterial, and immunomodulatory effects. The major bioactive constituent of liquorice is **glycyrrhizic acid**, along with several flavonoids such as **liquiritin**, **isoliquiritin**, **liquiritigenin**, and **rhamnoliquiritin**. Among its phytochemical constituents, **glabridin** and **glabrene** possess phytoestrogenic properties and have been reported to exert favourable effects on lipid metabolism, including the reduction of low-density lipoprotein (LDL) levels. Experimental studies have demonstrated that liquorice supplementation significantly improves oocyte fertilisation rates and enhances embryonic development in PCOS-induced animal models. Furthermore, clinical evidence suggests that the co-administration of liquorice with

spironolactone may enhance therapeutic outcomes in women with PCOS, particularly through the amelioration of hyperandrogenic manifestations and hormonal imbalance.⁴⁸ Clinical studies have demonstrated that it inhibits 17 β -hydroxysteroid dehydrogenase and 17,20-lyase, thereby reducing androgen synthesis and lowering serum testosterone levels in PCOS patients.⁴⁹

III. Cinnamon (*Cinnamomum zeylanicum*):

Cinnamon belongs to the family *Lauraceae*. It is used in different types of foodstuffs, for fragrance and for clinical purposes. The active constituents of cinnamon are cinnamaldehyde, essential oils, polyphenols, and procyanidins, which possess antioxidant, anti-inflammatory, anti-microbial, and hypoglycaemic activities. It is found that polyphenols and procyanidins of cinnamon extract increase insulin sensitivity and decrease low-density lipoproteins in women with PCOS. It potentiates the activity of insulin. It shows that cinnamon can be a supporting therapy in PCOS. Supplementation of cinnamon significantly regulates the menstrual cycle and is very effective in polycystic ovary disorder.⁵⁰ In women with PCOS, cinnamon supplementation has been shown to improve insulin sensitivity and lipid metabolism by reducing fasting blood glucose, fasting insulin, HOMA-IR, LDL-C, and total cholesterol levels while increasing HDL-C, without significantly affecting body weight.⁵¹

IV. Peppermint (*Mentha piperita*):

Mentha piperita, commonly called Peppermint, has a wide variety of therapeutic uses and belongs to the family *Lamiaceae*. Peppermint is composed of essential oils such as acetaldehyde, amyl alcohol, limonene, citronellol, menthol, and some flavonoids and phenolic acids. In an animal model study, peppermint oil reduces weight and testosterone levels in PCOS conditions. Infertility is a major problem associated with PCOS, which leads to anovulation. Peppermint intake can improve ovulation. The combination of peppermint with flaxseed extract in PCOS-induced animals effectively improved endocrine hormone secretions and restored ovarian morphology. Antioxidant property: Peppermint supplementation caused improvement of ovarian cysts, necrosis, and hyperplasia of luminal epithelial cells and stromal mesenchymal cells.⁵²

V. Aloe vera (*Aloe Barbados aloe*):

Aloe vera is the most widely used plant for its medicinal activities. Phytosterols present in aloe vera successfully restored steroidogenesis. The major phytoconstituents are anthraquinones, chromones, polysaccharides, and enzymes, which have antioxidant, anti-inflammatory, and hypoglycemic activity. A woman with PCOS commonly suffers from insulin resistance; aloe vera effectively increases insulin sensitivity. A female rat was induced with PCOS using the aromatase inhibitor letrozole. Then the rat was treated orally with the formulation of aloe vera gel at a dose of 1 mL daily for 45 days. It was found that rats rehabilitate their estrus cycle and steroidogenesis. It reduces triglycerides and increases high-density lipoprotein levels. The

phytoconstituents of Aloe vera have shown protective effects against PCOS-like alterations in female rats, primarily by restoring ovarian steroidogenesis and regulating the activity of key steroidogenic enzymes.⁵³

VI. Bamboo (*Bambusabambos*) :

Bambusabambos belong to the family *Poaceae*, commonly called Indian thorny bamboo. It is widely used in Unani medicines for laxative, diuretic, and anti-inflammatory properties. It shows a reduction in blood glucose levels and decreases in low-density lipoprotein and triglyceride levels in rats. The strong antioxidant activity of bamboo seeds helps treat PCOS by restoring estrus cyclicity. It was reported that when rats fed on bamboo seeds, they become sexually active to such an extent that each female rat gives birth to as many as 800 offspring during the season of bamboo flowering.⁵⁴

VII. Fenugreek (*Trigonella foenum-graecum*):

Fenugreek (*Trigonella foenum-graecum* L.), a member of the family **Fabaceae**, is widely distributed throughout the world and is regarded as an important medicinal plant in the Unani system of medicine. Several studies have demonstrated its beneficial effects on reproductive and metabolic health, including the modulation of testosterone and estrogen levels. Fenugreek possesses a wide range of pharmacological properties, such as anti-inflammatory, antioxidant, carminative, hypoglycaemic, and hypolipidaemic activities. These properties contribute to its potential therapeutic role in the management of polycystic ovary syndrome (PCOS), a condition frequently associated with hormonal imbalance, insulin resistance, chronic low-grade inflammation, and metabolic disturbances. Clinical studies have reported that supplementation with fenugreek seeds, particularly in combination with metformin, improves menstrual regularity and sonographic features in women with PCOS. Collectively, these findings suggest that fenugreek may serve as a valuable adjunct in the management of PCOS by addressing both its metabolic and reproductive manifestations. Fenugreek has been traditionally used for pain during menstruation.⁵⁵ In PCOS, fenugreek has demonstrated therapeutic potential by improving glucose tolerance, reducing hypercholesterolaemia, and enhancing insulin sensitivity, especially in patients with concomitant diabetes and dyslipidaemia.⁴⁹

VIII. Juniper (*Juniperus communis*):

Juniperus communis L., a member of the family Cupressaceae, is an important medicinal plant used in the Unani system of medicine. Known as Abhal, it is traditionally prescribed to regulate menstrual disorders. Classified under Musakkin-e-Alam wa Dafe Tashannuj Advia (analgesic and antispasmodic drugs), it is considered effective in alleviating spasmodic dysmenorrhoea by reducing pain and uterine spasms. The therapeutic effect of Juniper in PCOS may be attributed to its emmenagogue and ovarian-regulatory actions, as evidenced by the restoration of menses and normalization of ultrasonographic findings in 12 of 19 PCOS patients in a retrospective study of oligomenorrhoea.⁵⁶

IX. Flaxseed (*Linum usitatissimum*)

Linum usitatissimum (flaxseed), one of the oldest cultivated crops, belongs to the genus *Linum* and the family *Linaceae*. In classical Unani literature, it has been described as possessing numerous therapeutic properties, including *Muħallil-i-Waram* (resolvent), *Musakkin-i-Alam* (analgesic), *Mulayyin* (laxative), *Munḍij* (concoctive), *Muqi* (emetic), *Mudirr-i-Bawl* (diuretic), *Jāli* (detergent), *Munḍij-i-Waram* (maturative of inflammation), and *Musakkin-i-Gurda wa Kamar* (relieves renal and back pain). Modern pharmacological studies have further demonstrated several biological activities of flaxseed, including antilipidaemic, laxative, demulcent, expectorant, diuretic, emollient, galactagogue, antitussive, and emmenagogue effects. These diverse pharmacological and therapeutic properties support its traditional and contemporary use in various metabolic, inflammatory, and reproductive disorders. In women with PCOS, flaxseed supplementation (30 g/day) has been associated with significant reductions in serum insulin and androgen levels (total and free testosterone), likely due to its phytoestrogen, fibre, and lignan content, which enhances insulin sensitivity and improves the hormonal profile.⁵⁷

X. Turmeric (*Curcuma longa*):

Curcuma longa Linn. (*C. longa*), popularly known as turmeric, belongs to the Zingiberaceae family. *C. longa* is said to have antitoxic, anticancer, antibacterial, anti-inflammatory, and antioxidant effects.⁵⁸ In women with PCOS, curcumin supplementation (500 mg thrice daily for 12 weeks) improved glycaemic control and hyperandrogenism, as evidenced by significant reductions in fasting blood glucose and DHEA levels, while fasting insulin levels remained unchanged.⁵⁹

XI. Khar Khask (*Tribulus terrestris*):

The genus *Tribulus* belonging to family Zygophyllaceae. Traditionally it has been used for boosting hormone production in men and women. In classical Unani literature, various actions of the plant *Tribulus terrestris* have been described such a Muddir-e-bol wa haiz, Mulaiyyan, Muhallil-eWarm, Muqqawi Bah, Muddir, Rade and Mufatitt-e- Hisa. Its decoction is used in amenorrhoea and dysmenorrhoea.⁶⁰ *Tribulus terrestris* is traditionally used in PCOS as a female fertility tonic and ovarian stimulant, with ovarian-stimulating and fertility-enhancing properties that may promote follicular development and improve reproductive function.⁶¹

XII. Kalonji (*Nigella sativa* Linn):

Nigella sativa Linn. (Kalonji), belonging to the family *Ranunculaceae*, is a widely recognized medicinal plant with diverse therapeutic properties. In Unani medicine, *Nigella sativa* is described as possessing carminative, anti-inflammatory, analgesic, diuretic, emmenagogue, galactagogue, and expectorant properties.⁶² In PCOS, *Nigella sativa* (Kalonji) may help ameliorate insulin resistance and obesity-related manifestations through the insulin-sensitising actions of its bioactive

constituents, including thymoquinone, thymol, unsaturated fatty acids, lipase, and tannins.⁶³

XIII. Neem (*Azadirachta indica*):

Azadirachta indica (Neem), belonging to the family *Meliaceae*, is an important medicinal plant renowned for its wide range of therapeutic properties. *Azadirachta indica* is rich in phytoconstituents such as terpenoids, flavonoids, coumarins, carbohydrates, proteins, fatty acids, and hydrocarbons; its root bark is traditionally employed as a *Mudirr-i-Hayḍ* (emmenagogue) in the treatment of amenorrhoea.⁶⁴

In a clinical study, *Azadirachta indica* reduced the severity of PCOS, with only 6 of 20 cases persisting after treatment, an effect that may be attributed to its anti-androgenic, hypoglycaemic, and insulin-sensitising activities.⁴⁷

XIV. Pudina (*Mentha Spicata Labiatae*):

Mentha (mint or pudina), a prominent member of the family *Lamiaceae*, is a widely used medicinal herb that has been valued for its therapeutic properties since ancient times. The plant contains a diverse range of bioactive constituents, including monoterpenes such as eucalyptol and limonene, as well as phenolic compounds and flavonoid glycosides present in its essential oil and aqueous extract. These phytoconstituents are believed to contribute to the various pharmacological activities of the plant.⁶⁵ It has demonstrated beneficial effects in women with PCOS, with randomized controlled trials

showing significant reductions in free and total testosterone levels as well as hirsutism scores. These findings suggest that its anti-androgenic activity may make it a useful natural option for managing mild hirsutism associated with PCOS.⁶⁶

XV. Shatavari (*Asparagus racemosus*):

Shatavari (*Asparagus racemosus*), a medicinal plant belonging to the family *Asparagaceae*, has been traditionally used to support female reproductive health. Various extracts of its roots, leaves, flowers, and stems have demonstrated beneficial effects in the management of reproductive disorders and the maintenance of female reproductive function.⁶⁷ *Asparagus racemosus* may be beneficial in PCOS by modulating reproductive hormones through its phytoestrogen and steroidal saponin content; in an infertility study, PCOS-like ovarian changes persisted in only 1 of 11 women following treatment.⁶⁸

In addition to single drugs, several classical Unani compound formulations are employed in the management of PCOS. These formulations act through diverse mechanisms, including regulation of menstruation, correction of humoral imbalance, enhancement of reproductive function, and improvement of associated metabolic abnormalities. The principal actions and therapeutic relevance of commonly used compound formulations are presented in Table 2.

Table 2: Compound Unani formulations used in the management of PCOS

Formulation	Principal Actions (<i>Afāl</i>)	Therapeutic Relevance in PCOS	Ref
<i>Majūn Suparī Pāk</i>	<i>Muqawwi Raḥim</i> (uterine tonic), <i>Muqawwi Gurda wa Masāna</i> (tonic for the kidneys and bladder)	Traditionally used in <i>Sailān al-Raḥim</i> (leucorrhoea); supports reproductive health, improves uterine function, and enhances conception potential (<i>Istaqrār al-Ḥaml</i>)	⁶⁹
<i>Ḥabb-i-Mudīr</i>	<i>Mudirr-i-Hayḍ</i> (emmenagogue)	Promotes menstrual flow and is indicated in amenorrhoea and oligomenorrhoea, common manifestations of PCOS	⁷⁰
<i>Majūn Dabīd al-Ward</i>	<i>Mudirr-i-Bawl</i> (diuretic), <i>Muḥallil-i-Waram</i> (anti-inflammatory)	Beneficial in <i>Waram-i-Raḥim</i> (uterine inflammation), <i>Zu'f-i-Jigar</i> (hepatic weakness), and metabolic disturbances associated with PCOS	^{69,71}
<i>Itrīfāl Shāhtra</i>	<i>Muṣliḥ-i-Fasād al-Dam</i> (corrective of blood vitiation), <i>Muṣaffī-i-Dam</i> (blood purifier)	Helps correct <i>Fasād al-Dam</i> , restore humoral balance, and alleviate associated dermatological and metabolic manifestations of PCOS	^{69,70}

PCOS: Polycystic ovary syndrome.

These compound formulations are selected based on individualized assessment and are typically used as adjuncts to *Ilāj bi'l-Tadbīr* (regimenal therapy) and *Ilāj bi'l-Ghidhā'* (dietotherapy) to address the multifactorial nature of PCOS.

10. Discussion and Conclusion

Polycystic Ovary Syndrome (PCOS) is a complex endocrine-metabolic disorder characterized by

reproductive, metabolic, and psychological manifestations that significantly affect the quality of life of women of reproductive age. Contemporary medicine recognizes insulin resistance, hyperandrogenism, neuroendocrine dysfunction, and ovulatory abnormalities as key pathogenic mechanisms underlying the syndrome. Despite advances in diagnosis and treatment, the multifactorial nature of PCOS continues to pose therapeutic challenges, necessitating

comprehensive and individualized management strategies.⁷²

Although PCOS is not described as a distinct disease entity in classical Unani literature, its major clinical manifestations, including amenorrhoea, oligomenorrhoea, obesity, hirsutism, acne, infertility, and menstrual irregularities, have been extensively discussed by renowned Unani physicians such as Rāzī, Ibn Sīnā, Jurjānī, and Ibn Rushd. Unani scholars attributed these conditions to disturbances in *Mizāj* (temperament) and humoral imbalance, particularly the predominance of *Barid wa Ratab* (cold and moist) qualities and the accumulation of *Balghamī* matter.^{5,56} The concept that prolonged menstrual disturbances and impaired reproductive function result from altered temperament and defective metabolism demonstrates a remarkable conceptual similarity to modern observations linking obesity, insulin resistance, hormonal imbalance, and ovulatory dysfunction.¹

The therapeutic approaches described in Unani medicine provide a holistic framework for the management of PCOS. *Ilāj bi'l-Tadbīr* (regimenal therapy), including physical activity, *Ḥammām*, *Dalak*, *Hijāmah bi'l-Sharṭ*, and *Faṣḍ*, aims to restore humoral equilibrium, improve metabolism, and promote menstrual regularity.⁷³ Similarly, *Ilāj bi'l-Ghidhā'* (dietotherapy) emphasizes dietary regulation according to an individual's temperament (*Mizāj*), promoting foods that support digestion, metabolism, and humoral balance while restricting those considered to exacerbate pathological states such as *Barid wa Ratab*. These principles parallel contemporary evidence-based recommendations, which advocate lifestyle modification, dietary management, and weight control as first-line interventions for the management of PCOS.^{2,74}

The review also highlights the potential therapeutic role of several single Unani drugs and compound formulations. Medicinal plants such as ginger, liquorice, cinnamon, fenugreek, flaxseed, *Nigella sativa*, *Tribulus terrestris*, *Aloe vera*, and *Asparagus racemosus* have demonstrated beneficial effects on insulin sensitivity, hyperandrogenism, menstrual irregularities, ovulatory function, lipid metabolism, and fertility. Likewise, classical compound formulations including *Majūn Suparī Pāk*, *Ḥabb-i-Mudīr*, *Majūn Dabīd al-Ward*, and *Itrīfāl Shāhtra* possess actions that may contribute to the correction of menstrual disturbances, metabolic dysfunction, and humoral derangements associated with PCOS.^{69,70} Although many of these therapeutic claims are supported by experimental and preliminary clinical studies, robust scientific evidence remains limited.

In conclusion, Unani medicine offers a comprehensive and individualized approach to the management of PCOS by addressing the disorder from both metabolic and reproductive perspectives. The integration of regimenal therapy, dietotherapy, and pharmacotherapy reflects a holistic strategy aimed at correcting underlying humoral and temperamental imbalances rather than merely alleviating symptoms. The growing

body of experimental and clinical evidence supporting the pharmacological activities of several Unani drugs suggests their potential utility as complementary interventions in PCOS management. Nevertheless, further well-designed clinical trials, standardization of formulations, and mechanistic studies are required to establish their efficacy, safety, and therapeutic role within evidence-based integrative healthcare. Such efforts may facilitate the incorporation of Unani principles and therapies into contemporary approaches for the effective management of PCOS.

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