

A Systematic Review: Ayurvedic Herbal Medicine for Women with Polycystic Ovary Syndrome [†]

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Abstract: The endocrine disorder polycystic ovarian syndrome (PCOS) is complicated. In India, two out of every ten women have PCOS. PCOS can also be identified by polycystic ovary morphology and an ovulatory hyperandrogenism. Polycystic ovarian syndrome (PCOS), one of the most common female endocrine diseases, affects about 20–25% of women of reproductive age and is thought to be one of the primary causes of female infertility. Metabolic abnormalities, irregular periods, hypertension, and increased insulin levels are more prone to occur in women with PCOS. Increased production of androgens like testosterone from the ovaries; more sub-follicular cysts. Low vitamin levels in PCOS women place them at a high risk for developing severe COVID 19, a risk that may be increased by limited sun exposure brought on by COVID 19 quarantine measures. Therefore, there is a greater need public awareness for PCOS. PCOS is a treatable illness that can be treated with safe and effective natural remedies, including the use of various herbs and seeds. To decrease the cost, length, and side effects of current treatments, polyherbal formulations must be developed based on the aforementioned variables. By altering a woman's diet, exercising, doing yoga asanas, and altering her lifestyle, PCOS can be controlled. An effort has been made to review utilization of natural remedies for PCOS treatment.

Keywords: Pcos; hyperandrogenism; herbs; seeds; yoga asanas

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1. Introduction

According to the WHO (World Health Organization), 116 million women worldwide, or approximately 3.4 percent, have PCOS [1]. Polycystic ovarian syndrome (6.5–6.7%) is the most common endocrinopathy condition diagnosed in premenopausal women. The polycystic ovarian syndrome, first identified by Stein and Leventhal in 1935, is linked to chronic oligoanovulation, polycystic ovarian morphology, as well as psychological and metabolic abnormalities [2]. Acne, alopecia, hirsutism, obesity, and other related illnesses are frequently seen in women because of the high levels of androgen in their bodies [3]. Observe the many physiological changes in women's ovaries after current research, say researchers, According to American studies, type 2 diabetes mellitus (type 2 DM) affects 15% of women and cardiovascular illness, but with time it developed signs of pcos during their reproductive years [4]. According to twin and genomic research, PCOS, especially hyperandrogenism, is highly heritable. The most trustworthy PCOS gene candidate is a member of the TGF- β superfamily that codes for the extracellular matrix protein fibrillin 3 is the most reliable pcos gene candidate [5]. Traditional herbal remedies are

receiving a lot of attention in discussions about global health. Promotional, preventative, curative, and rehabilitative roles for traditional medicine have been established [6–8]. The advantage of herbal therapy over conventional therapy is that it is safer with fewer side effects, and the presence of multiple active compounds in medicinal herbs provides a potentiating effect [9,10]. Newer rat PCOS models have since been developed and validated. These studies provide novel insights into the nature of chronic anovulation and polycystic ovary. Animal models of chronic anovulation and PCOS, on the other hand, may not fully replicate the reproductive events seen in the human syndrome [11]. The goal of this study was to analyse the mechanism of action of plants that have various pharmacological effects relevant to PCOS complications in order to increase their therapeutic acceptability and explore some common herbal and polyherbal formulations for PCOS.

1.1. Types

The PCOS is hormones related disorder and this affect the irregular periods. The PCOS are categorised into 4 main type-

1. Insulin resistant of PCOS
2. Inflammatory PCOS
3. Post-pill PCOS
4. Hidden cause of PCOS

1.2. Organs Involved in PCOS

1. Ovary—The Female Gonad Organ Presents at Either Side of Uterus
2. Adrenal Gland—The Gland Which Are Placed Just above the Both the Kidney
3. Pancreas—Gland That Produces Insulin in Our Body
4. Pituitary Gland—The Gland Just below the Brain, Which Is Responsible for the Hormonal Controlled

The ovaries are producing more ANDROGEN, which inhibits the maturation of ovarian follicles. Anovulation results from an improperly formed and unreleased ovum. Therefore, if a woman has PCOS, she will have trouble getting pregnant because her ovum is unavailable [12].

1.3. Symptoms [13–15]

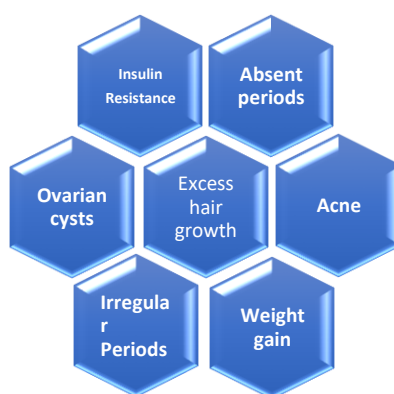


Figure 1. Symptoms of PCOS.

1.4. Causes of PCOS [14]

- Genetic predisposition, Contraceptive pills
- Strong stimulation in adrenals in childhood, Raised insulin levels

- Raised insulin levels, Hormonal imbalance & Stress

1.5. Histological Features of PCOS

- (1) Whole ovarian hypertrophy, Thickened capsule ($>100\ \mu$)
- (2) Thickened capsule ($>100\ \mu$), Increased number of sub follicular cyst
- (3) Scarcity of corporeal lutea or albicantia, Hyperplasia and fibrosis of the ovarian stroma [16]

1.6. COVID 19 Infection in PCOS Women

Obesity, hypertension, type 2 diabetes, metabolic syndrome, ethnic minority group, high cytokine level, high androgen level, low vitamin D level are all common risk factors for PCOS severity and cardio-metabolic illnesses [36]

Vitamin D levels have been linked to the severity of several PCOS symptoms, including high testosterone, insulin resistance, and cardiometabolic disease [37,38].

Furthermore, according to statistical analysis data, vitamin D supplementation may significantly reduce total testosterone and C reactive protein circulating levels in PCOS women [38,39].

1.7. Necessity to Study PCOS

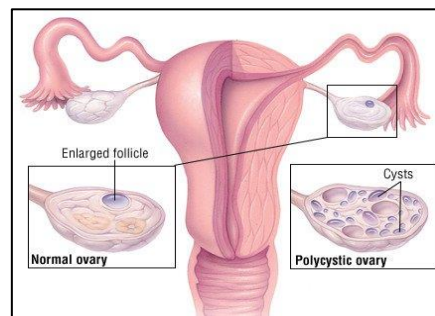


Figure 2. Polycystic ovary.

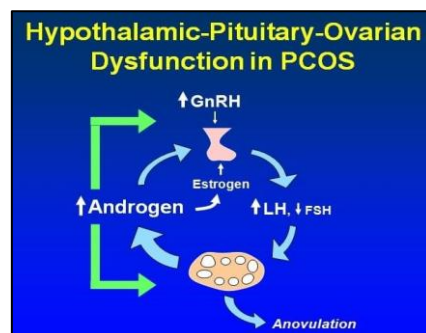


Figure 3. Hypothalamus in PCOS.

In India, two out of every ten women have PCOS, according to a study by the PCOS Society. Six teenage girls are diagnosed with PCOS out of every 10 women overall. According to a study by the AIIMS department of endocrinology and metabolism, PCOS affects 20–25% of women of reproductive age. Although 60% of PCOS-afflicted females are obese, 35–50% have fatty livers. 70% of people have insulin resistance, 60% to 70% have elevated testosterone levels, and 40% to 60% have glucose intolerance. Ayurveda and homoeopathy can be regarded as the best solution and most promising treatments with no side effects when compared to allopathy [17].

2. Genetic Propensity

There have been discussions on genes like CAPN10, Cytochrome family p450, Insulin gene, AR, FTO, and FSHR. Recent research involving over 30,000 women suggests that genetics may contribute to the development of PCOS [18].

2.1. Insulin Level

If your cells become less susceptible to the effects of insulin, your blood sugar levels may increase and your body may produce more insulin.

2.2. Excess Androgen

High levels of androgen cause high levels of hirsutism and acne, and they are produced by the ovaries [19].

3. Ayurvedic Herbal Remedies Available for Pcos

Ayurvedic medicine uses a multifaceted strategy to treat:

- correcting the hormonal imbalance
- Treatment to obesity and avoiding high cholesterol levels.
- Treatment to insulin resistance

3.1. Aloe

Synonym: Kumari mussbar

Biological source: Dried latex of leaves of various species of aloes, mainly Aloe barbadensis

Family: Liliaceae

Part use: leaves, juice



Figure 4. Aloe.

Aloe vera has been discovered to have “antimicrobial”, “anti-carcinogenic”, “anti-viral”, “immunomodulatory”, “anti-oxidant”, “anti-inflammatory”, “skin protecting”, and “wound healing” qualities, in addition to managing PCOS and being antidiabetogenic [20]

Table 1. Functional compounds of aloevera.

Compounds	Derivatives/Types
1. Vitamins	Vitamins-A, C, Thiamine's, Niacin, Riboflavin, Vitamin B12, Choline and folic acid [21]
2. Enzymes	Amylase, Lipase, Carboxypeptidase and inactivates bradykinin's [22,23]
3. Sugar	Glucose, polysaccharides and gluco-mannans, pectin's, hemicelluloses, acemannan, and mannose derivatives [24]
4. Phytosterols	Campesterol, Sitosterol and Lupeol [21]
5. Anthraquinones	Barbaloin, aloe-emodin-9-anthrone, Isobarbaloin, Anthraone-C-glycosides and chromones (8-C-glucosyl-7-O-methylalordioli, 8-C-glucosyl-noreugenin, Isoaloeresin D, iso rabaichromone, neoaloesin A) [23–26]

3.2. Cinnamon

Synonym: Cortex cinnamon, Ceylon cinnamon, Saigon cinnamon, Chinese cassia, Cinnamomum aromaticum, Cinnamomum laurus.

Biological source: Dried inner bark of the coppiced shoots of Cinnamomum zeylanicum nees.,

Family: Lauraceae.

Part use: Outer bark and inner bark.



Figure 5. Cinnamon.

It is commonly used in cooking even today but cinnamon has also been linked to multiple metabolic and health benefits that may be particularly beneficial for women with PCOS [28].

- Benefits of cinnamon for PCOS: [28]
- Blood sugar management, Menstrual cycle regulation.
- Cardiovascular health support, Anti-inflammatory effects.

Best types of cinnamon for PCOS:

Ceylon cinnamon powder, Ceylon cinnamon sticks, Cassia cinnamon powder, Cassia cinnamon sticks, Cinnamon extract/tincture, Cinnamon tea, Cinnamon supplement.

3.3. Liquorice

Synonym: Jethi madh, Mulethi, Glycyrrhiza

Biological source: Liquorice consist of peeled and unpeeled roots stolon stem of Glycyrrhiza glabra linn.

Family: Leuminosae

Part of use: Liquorice



Figure 6. Liquorice.

The root of the licorice plant (Glycyrrhiza glabra), used for millennia as a herbal therapy to treat a variety of ailments, licorice root now also seems to be helpful in the treatment of PCOS [29].

Benefits of liquorice root for PCOS: [29]

- Decreased androgens, Adrenal glands support
- Weight loss, Anti-inflammatory effects

Best types of liquorice root for PCOS: Liquorice root thalidomide root powder, Liquorice root extract/ tincture, Liquorice root supplement, Liquorice root hard candy (100%).

3.4. Ashwagandha

Synonym: withania root, ashwagandha, clustered wintercherry.

Biological source: It consist of the dried roots and stem bases of *Withania somnifera* Dunal

Family: Solanaceae

Part of use: Ashwagandha powder, roots, barks, leaves, fruits and seed



Figure 7. Ashwagandha.

One such ayurvedic herb that has historically been recognised as a potent adaptogen is ashwagandha powder. Adaptogen herbs assist the body in harmonising hormones, which may lessen stress and PCOS symptoms [30].

3.5. Shatavari

Synonym: Asparagu, Satmuli.

Biological source: The drug is derived from dried tuberous roots of *Asparagus racemosus* Wild

Family: Liliaceae

Part of use: Dried roots



Figure 10. Shatavari.

PCOS and Shatavari:

PCOS is caused by a hormonal imbalance in a woman's body. According to research, when women take 5 grammes of Shatavari, their hormones are balanced. Shatavari naturally boosts antioxidant levels in a woman's body. It improves menstruation while decreasing fertility.

Effect of shatavari on reproductive system:

- Shatavari is a herb that stimulates the nervous system.
- It aids in the stimulation and maintenance of hormone levels in the body.

How it is helpful in pcos:

- In the case of PCOS, we need medications that dissolve cysts, such as Kanchanaar. However, Shatavari is a herb that helps to balance the hormones that are disrupted in PCOS, maintains hormone levels, and supports the HPO axis and plexus. pre-serves ovarian Shatavari promotes menstrual cycle duration (3 to 7 days), menstrual cycle interval (28 to 35 days), and blood flow during menstruation [31].

4. Management of Pcos [32–35]

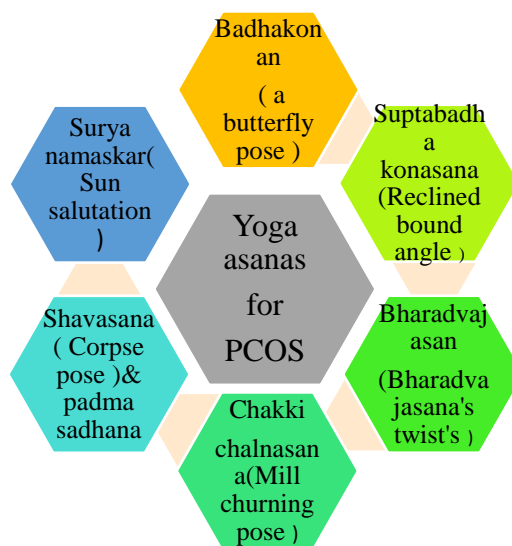


Figure 11. Yoga Asanas for PCOS.

5. Conclusions

Polycystic Ovarian Syndrome (PCOS) is a common female endocrine disorder that can result in infertility. In India two out of every ten women have pcos, 116 million women worldwide or approximately 3.4% have pcos. PCOS to be one of the main reasons of female subfertility as a result of hereditary and environmental factors, PCOS has become a major health risk for women. Common symptoms include hirsutism, acne, cystic ovaries, obesity, and hair loss. It is similar to the metabolic syndrome in several ways, including insulin resistance, obesity, and diabetes. Herbal drugs have a promising role in the treatment of PCOS because they have a consistent effect with few side effects. Herbal drugs boost the body's immunity and help to regulate the menstrual cycle without causing hormonal fluctuations. A healthy diet, regular exercise, lifestyle changes, and medications can help manage PCOS. Yoga has been shown to benefit women with PCOS.

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