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## Research Article

# PCOS: The Substantial Term

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### ABSTRACT

Polycystic ovary syndrome (PCOS) is a neuroendocrine metabolic disorder characterized by irregular menstruation. The 18 to 44 age group represents approximately 5 to 10 percent of this age group. Infertility, the inability to conceive after more than one year of unprotected intercourse during the appropriate menstrual cycle, is a global problem. Female infertility accounts for 35-40 percent of all infertility cases. Therefore, more research and understanding of PCOS is needed. It is characterized by hyperandrogenism, polycystic ovaries, anovulation and insulin resistance, obesity, hypertension, dyspnea, uterine bleeding and infertility. Most patients use allopathic medicines but the results are not good. Interventions include herbal extracts of ginger (*Zingiber officinale* Roscoe), *Vitex agnus-castus* and *ocimum tenuiflorum*. Flax, clove, cohosh, licorice, nettle, Tribulus, licorice. Peony, dandelion and cinnamon. Endocrine effects include decreased levels of luteinizing hormone (LH), prolactin, fasting insulin and testosterone. There is evidence of ovulation control, improved metabolic hormone levels and increased fertility in patients with PCOS. This course aims to examine PCOS according to Ayurveda and learn about safe and effective Ayurvedic treatment of PCOS.

### INTRODUCTION

PCOS can be defined as an oligogenic disease in which a heterogeneous clinical and biochemical phenotype is determined by the interaction of many genetic and environmental factors [1]. The disease can be morphological (polycystic ovaries) or mostly biochemical (hyperandrogenaemia). Hyperandrogenism is a clinical feature of PCOS and can cause decreased follicular growth, ovarian microcysts, anovulation and menstrual changes.

The World Health Organization (WHO) states that in 2012 PCOS affected more than 116 million women worldwide. Patients with PCOS have high levels of male hormones, especially testosterone, which causes a lack of ovulation and inhibits sex hormone synthesis, causing symptoms and reproductive problems in men. PCOS is a disease of women between the ages of 18 and 44. Most are endocrine diseases. PCOS is the most common

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cause of infertility due to a lack of ovulation. According to a recent study, the prevalence of PCOS in Iran is 19.5% according to the Rotterdam criteria and 6.8% according to the NIH criteria (6). Estimates in India range from 3.7% to 22.5%. The prevalence of PCOS may be higher or lower depending on the method used, which may be the obvious reason for the differences between studies. The symptoms of this disease are diverse and include menopause, symptoms of excess androgen, obesity and infertility, alopecia, acne, insulin resistance leading to anaemia, type II diabetes, dyslipidemia, inflammation, oxidative stress and long-term complications. The prevalence of this disorder ranges from 4% to 25% depending on the definition given. For this purpose, this study aimed to investigate the effect of natural compounds and medicinal plants in the treatment of polycystic ovary.

#### **Epidemiology:**

According to the review and meta-analysis, the overall prevalence of PCOS among women in India from 2010 to 2021 is 11.34%, while other sources like Lybrate suggest that 1 in 5 women in India suffer from it. PCOS has approximately 20%. A cross-sectional study conducted in Tamil Nadu evaluated young women and found the prevalence of PCOS to be 18% [8]. A similar urban study in Mumbai found the prevalence of PCOS to be 22.5% according to the Rotterdam criteria and 22.5% according to the Androgen Excess Society criteria [9]. Only Indian studies reporting the prevalence of PCOS from 2010 to 2021 and meeting at least one of the following criteria for the diagnosis of PCOS were included in the review: National Institutes of Health (NIH), Rotterdam standards or/and Androgen Excess Society (AES). Data analysis was performed using MetaXL version 5.3 software. In a study conducted in Maharashtra, the prevalence of PCOS was found to be 22.5%. According to NIH diagnostic criteria, the

prevalence of PCOS increased from 6% to 9% in the United States, the United Kingdom, Spain, Greece, Australia, Asia and Mexico (10).

#### **Pcos Symptoms:**

Hormone deficiency and androgen excess in polycystic ovary syndrome can increase androgen levels, causing hirsutism, alopecia (hair loss), clitoromegaly, obesity, oily skin, acne, belly fat, deep skin, etc.

- Irregular periods
- Acne
- Hair loss or hair thinning on scalp.
- Excessive bleeding during the periods.
- No periods
- Excessive facial or bodily hair.
- Eggs do not ovulate.
- Infertility or difficulty in becoming pregnant.
- Enlarged ovaries with cysts.
- Increase the sugar.
- Darkening of the skin.
- Undemeath the breasts.
- Depression
- Anxiety
- Mood swings
- Irritation

#### **Etiology/Causes:**

The cause of PCOS is unknown; approximately 20-40% of first-degree female relatives of women with PCOS will have PCOS, with a prevalence of approximately 4-6% in the general population [11]. The main drivers of PCOS are:

- Genetic predisposition
- Lifestyle
- Environment
- Increased insulin
- Increased androgens
- Increased estrogen
- Menstrual disorders
- Fatigue
- Pearl Diet
- Inappropriate Foods



- Hormonal Imbalances

### **Diagnosis of Polycystic Ovary Disorders (PCOS):**

Polycystic Ovary Disorders (PCOS) can be a confusing condition that is usually disrupted by the presence of two of the following three factors: low or absent ovulation, followed by hyperthyroidism, hypothyroidism, hyperprolactinemia, hypogonadotropin hypogonadism and ovarian failure should be excluded. Hirsutism should be contraindicated if there is adrenal hyperactivity, androgen-secreting ovarian tumors, androgen-secreting adrenal tumors, Cushing's problem and compatibility with the use of exogenous androgens [12]. Confirmation requires a special ovary and treatment of our symptoms of hirsutism, amenorrhea and dwarfism [13]. The next symptom appeared more than 30 years later, when researchers in the mid-1960s and 1970s confirmed a disruption in the hypothalamic-pituitary axis [14].

### **Lifestyle:**

Lifestyle changes that include a hypocaloric diet and physical activity are considered important in treating severe PCOS in women, especially the gastric phenotype [15]. Everyone with PCOS should adopt a healthy lifestyle that includes a healthy diet and daily exercise to manage weight gain, hormonal levels, overall health, and personal satisfaction with their lives. A weight loss goal is important (5–10% of body weight) and the basic principle is to reduce total calories. Exercise for 30 minutes every morning [16]. Clinical hyperandrogenism (e.g. hirsutism): Cosmetic options: laser hair removal, depilatory creams, hair pulling, trimming, waxing, and electrolysis. It is recommended for androgen-depleting drugs Mild hirsutism is an oral contraceptive. Spironolactone (100 mg daily) and flutamide (250 mg twice daily) are suitable for use in patients, but the evidence for their efficacy is inconclusive [17].

### **Menstrual Cycle Guide:**

Lifestyle Efforts May Improve Menstrual Consistency. The Endocrine Society recommends the use of hormonal contraceptives (e.g., oral contraceptives, skin immobilization, or vaginal rings) when primary treatment for menstruation is not possible [18]. Supplemental oral prophylaxis (COCP). COCP pills increase sex hormone binding globulin (SHBG), which reduces free androgens;

### **Metformin:**

Improves ovulation, fertility and reduces insulin levels. Exercise to lower blood sugar and prevent weight gain. Drink enough water and keep a separate schedule between taking metformin. Respond to 1 x 500mg starting, increase by 500mg per day every 2 weeks up to usual 1500mg-2000mg.

### **Fertility:**

BMI > 25 - The first line of weight loss is a 5-10% weight loss that can help control cycles and growth. Medications used to treat pregnancy include letrozole or clomiphene, but more importantly, metformin can be started before growth and the woman is warned not to do so. Therefore, metformin can be used. Metformin improves insulin blockade, thus increasing the chance of ovulation. Letrozole: Letrozole (femoral) can cause ovulation when used with a class of drugs called aromatase inhibitors, which work similarly to clomiphene.

### **Measure the board:**

The important thing is not to gain weight and to achieve a weight loss of no less than 5-10% if you are overweight. Make a change - Prioritize health, family support, lifestyle and exercise to set small, achievable goals. The calories needed to lose weight are less than 500-750 calories per day (e.g. 1200-1500 calories per day) and no one likes to eat. Weight loss requires 250 minutes of exercise per week or 150 minutes of exercise per week [16]. There is limited information on the effect on uncomplicated pregnancies. Weight loss should be



achieved through lifestyle changes through calorie restriction and increased physical activity. It has been suggested that a calorie reduction of 500-1000 kcal per day is possible and can lead to a loss of 7-10% per year. 6. Daily exercise patterns should be participated in for 30 minutes or more [19]

### **Herbs That Increase FSH and Decrease LH Secretion:**

A common problem in PCOS is increased LH levels and decreased FSH levels. Therefore, medications that increase FSH levels and decrease LH concentrations are effective in treating PCOS. Herbs such as fennel, ginseng, and cohosh have this effect; therefore, they can be used to treat PCOS.

### **Vitex agnus-castus L:**

The dry, ripe fruit of *Vitex agnus-castus* L. (VAC) (Lamiaceae, formerly Verbenaceae), commonly known as chaste tree, is a food that loves to grow crops. number of drugs used to treat premenstrual syndrome (PMS) (Upton, 2001). Premenstrual syndrome is defined as emotional, behavioral, and physical disturbances occurring during the last 5-10 days of the luteal phase of menstruation. Symptoms include melancholic mood, irritability, anxiety, confusion, breast tenderness (mastodynia), bloating, fatigue, headache, etc. (Mortola, 1996) [20.] *Vitex agnuscastus*, also known as chastity berry, is a plant belonging to the Verbenaceae family. It has been used in herbal medicine for the last 2,000 years. It is a large tree in Europe and is also common in the southern United States. Inadequate estrogen levels are the result of menstrual irregularities and premenstrual disorders such as luteal insufficiency, cyclic mastalgia and postmenopausal hot flushes. The main components of the whole oil are sabinene (16.6-31.2%), 1.8-cineole (4.4-14.5%), (E)- $\beta$ -farnesene (4.8-9.9%),  $\alpha$ -pinene (0.4 - 10.2%) and  $\beta$ -caryophyllene (1.4-6.0%). The results range from 0.15% to 1.0%. The effect of crushing the

fruit before distillation was investigated and the results showed that the amount of sesquiterpenes in the oil obtained from the whole fruit was slightly lower, but the concentration of monoterpenes increased. The oil obtained by experimental distillation for commercial production was also studied [21].

### **Ginger:**

Ginger, commonly known as Ginger, belongs to the Zingiberaceae family. Ginger essential oil contains about 60-65 compounds. The major phytochemicals are geraniol, gingerol, curcumin,  $\alpha$ -curcumin, geranial, neral, borneol, linalool,  $\beta$ -sesquiphellandrene, afarnesene, Sabinene, camphene, gamma-terpinene, and terpinen-4-ol. The resinous components of ginger include paradol, gingerol, zingiberene, zingiberone, shogaol, ascorbic acid,  $\beta$ -carotene, p-coumaric acid, and caffeic acid [22,23]. Ginger also contains flavonoids and phenolics. Ginger is known for its significant antioxidant (El-Ghorab, Nauman, Anjum, Hussain, & Nadeem, 2010), anti-inflammatory, antidiabetic (Afshari et al., 2007), and anticancer activities (Shukla & Singh, 2007). It is acceptable and has many colors. Diarylheptane compounds and gingerol-related compounds have been identified as the main pungent compounds in ginger (Policegoudra, Kumar, & Aradhya, 2007). Pharmacological studies have shown that ginger and its pungent extract have chemo preventive and chemotherapeutic effects on various cancers and animal models (Chen et al., 2009, Lee et al., 2008) [24, 25, 26, 27]. Ginger also contains flavonoids and phenolics that are beneficial in polycystic ovary syndrome. Ginger increases fertility index, serum testosterone level, testicular and seminal vesicle weight, increases male sperm motility and sperm count. Flavonoids and phenolic compounds in ginger can regulate the balance of estrogen and progesterone and have pharmacological and physiological effects. They also regulate sex



hormones in the blood. Phytoestrogens in ginger balance the ratio of estrogen to progesterone, making it effective in the treatment of polycystic ovaries.

### Cinnamon:

Women with PCOS have higher insulin levels than controls, with insulin levels ranging from 65% of overweight women to 95% of obese women. [29,30] Insulin resistance and hyperandrogenaemia in women with PCOS are associated with hypothalamic-pituitary-ovarian axis dysfunction, leading to anovulation and irregular menstruation. Cinnamon, a spice used since biblical times, has been shown to improve insulin sensitivity in animal and human studies. [32,33,34] Given the initial success of cinnamon in treating insulin-resistant diabetes and its use in treating PCOS as an insulin sensitizer, cinnamon has been suggested as an alternative treatment for PCOS.

### DISCUSSION:

After examining the chemical composition of medicinal plants that can be used in the treatment of PCOS, we believe that phenylpropanoids, flavonoids, and their glycosides play many important roles in the treatment of PCOS. Other plants associated with anti-PCOS include steroid saponins and steroids such as cyclohexane derivatives, terpenoids, phenols, catechins, resins, lignans, and curcuminoids. Therefore, we believe that polyherbal medicines containing a

### Survey Report of PCOS:

combination of flavonoids, amphetamines, and other ingredients with different mechanisms of action will be effective in the treatment of PCOS. A number of researchers conducted a randomized clinical trial on humans, including 361 people in total, 184 in the experimental group and 177 in the control group. Based on this, all patients in this group received luteal stimulation together with Chinese medicine treatment, while the control group received luteal stimulation only. The researchers used a randomized intervention design to conduct the meta-analysis. The composite SMD value of our study was  $\pm 2.38$  and the 95% confidence interval was  $[\pm 2.82, \pm 1.93]$ , which was significant ( $Z = 10.50, p < 0.00001$ ), indicating that the combination of traditional Chinese medicine and Western medicine can better reduce the risk of miscarriage in the blood of PCOS patients with plasminogen activator inhibitor type 1 (PAI-I) than Western medicine treatment. Similarly, polyherbal supplements containing three or more herbs in the form of tablets, capsules, or pills are also effective for PCOS. After 3 months of treatment, significant results were seen in reducing irregular menstruation, reducing the number of pregnant women, normalizing follicle growth and ovulation, and reducing fatty obesity in PCOS patients (35). Therefore, we conclude that multi-herb preparations may be more effective in reducing symptoms and better treating PCOS.

**Table no.1 Survey report of PCOS.**

Sr no.	Subtitle	Total responses, N (%)	Living in Latur, N (%)	Living Outside Latur N (%)
1]	Age (Year)	448	372	76
a)	18-24	149	102	47
b)	25-34	217	196	21
c)	>35	82	69	13
2]	BMI (Kg/M <sup>2</sup> )	448	-	-
a)	<18	40	32	7
b)	18.0-22.9	106	84	22
c)	23.0-24.9	132	96	36
d)	>25.0	278	201	77



3]	Education	216	-	-
a)	Post Graduation	32	21	11
b)	Under Graduation	87	68	19
c)	Below UG	97	73	24
4]	Occupation	216	-	-
a)	Employed	14	11	3
b)	Studying	182	139	43
c)	Unemployed	20	16	4
5]	Relationship status	448	-	-
a)	Married	183	169	14
b)	Single	265	184	81
6]	History of pregnancy	183	-	-
a)	No	102	64	48
b)	Yes	81	53	28
7]	Family history of PCOS	114	-	-
a)	No	78	51	27
b)	Yes	36	27	9

## CONCLUSION:

Polycystic ovary syndrome (PCOS) is an endocrine disease that causes women to have children. Many studies have shown that although the treatment of PCOS with herbs takes more time, herbs with minimal side effects play an important role in the treatment of PCOS. The effectiveness of herbs in the treatment of PCOS can be attributed to the strengthening of the immune system and the regulation of menstruation without changing hormonal levels.

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