

EFFICACY OF AYURVEDA IN THE TREATMENT OF PCOS

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ABSTRACT

PCOS poly cystic ovarian syndrome. Which means poly cysts are being formed in the ovaries. It is considered as one of the most common reproductive disorder in females. It is an endocrine disorder which is responsible for disturbing hormonal balance in female's body. The increasing trend of PCOS is predominantly seen in the age group of 15 to 30 yrs. Nearly it affects upto almost 27% of women during their childbearing years. According, to WHO data PCOS affects 1 in 5 women. Earlier it was considered as disorder(PCOD) but after gathering more information now it is called as syndrome(PCOS) because group of symptoms are responsible for affecting ovaries and ovulation. In this condition eggs in the follicles never gets mature enough to trigger ovulation. Also, the lack of ovulation alters the levels of estrogen, progesterone, FSH and LH. Estrogen and progesterone levels are lower than usual but androgen levels are higher than usual. Also hyperinsulinemia is a characteristic metabolic disturbance associated with PCOS. An alteration in GnRH results in increasing LH which leads to over production of androgens which in turn leads to insulin resistance. Medicinal plants are considered as an important helping hands from the ancient era. Plenty of herbal plants provide positive impact in the treatment of PCOS. Herbs such as Shatavari, Ashwagandha, Haridra, Guduchi, Ghrit kumari, Jatamansi, Jeevanti, Amla, Mulethi, Dal chini, Hirabol, Zanjbeel etc. possesses various actions such as phytoestrogenic, hypoglycemic, restoring hormonal balances and regulates body's function in order to treat this condition of PCOS. Majorly extracts of these plants are used for the treatment which are rich in flavonoids, bioflavonoids, phytoestrogens, immunomodulators, and antioxidants.

KEYWORDS: Flavonoids, bioflavonoids, phytoestrogens, immunomodulators and antioxidants.**INTRODUCTION**

PCOS is a major disorder which is being diagnosed by elevated levels of male hormones i.e. androgens, hirsutism and acne too. It can lead to anovulation infertility on prolong incidence of cysts. Being a curable disease it can be cured by Ayurvedic medication. These medicinal herbs includes phyto estrogenic and non estrogenic actions which helps in the treatment of poly cystic ovarian syndrome. Medicinal herbs are of immense importance in treatment of various diseases. These traditional herbs possess preventive, curative, promotive and rehabilitative actions. Also the major benefit of herbal therapy is that it is safe and with rare side effects. Also, the presence of phytochemicals provides potentiating effect towards the cure of the disease. Pcos is originally called as stein- leventhal syndrome undeveloped follicles. Insulin resistance is the major biochemical feature of Poly cystic ovarian syndrome. Phytoestrogens are the plant derived chemicals which mimic estrogens. Signs and symptoms of PCOS includes irregular or no menstrual periods, heavy periods, pelvic pain, elevated levels of LH and FSH, high levels of testosterone (male hormones), infertility, hirsutism, acne. Also associated conditions in

PCOS includes type 2 diabetes, obesity, sleep apnea, heart diseases, mood swings, endometrial cancer and depression. Histological features of PCOS includes thickened capsules, Albicantia (scarcity of corpora lutea), hyperplasia and fibrosis of ovarian stroma. Whole ovarian hypertrophy, increased number of sub capsular follicle cysts, hyperandrogenesis, hyperinsuleminia, high chloestrol levels, increased blood pressure, insulin resistance. Causes of PCOS consists of strong stimulation in adrenals in childhood, genetic predisposition, increased levels of insulin contraceptive pills, imbalances of hormones, stress i.e. higher levels of ROS (reactive oxidative species) in the body, sedmentary lifestyle, drugs etc.

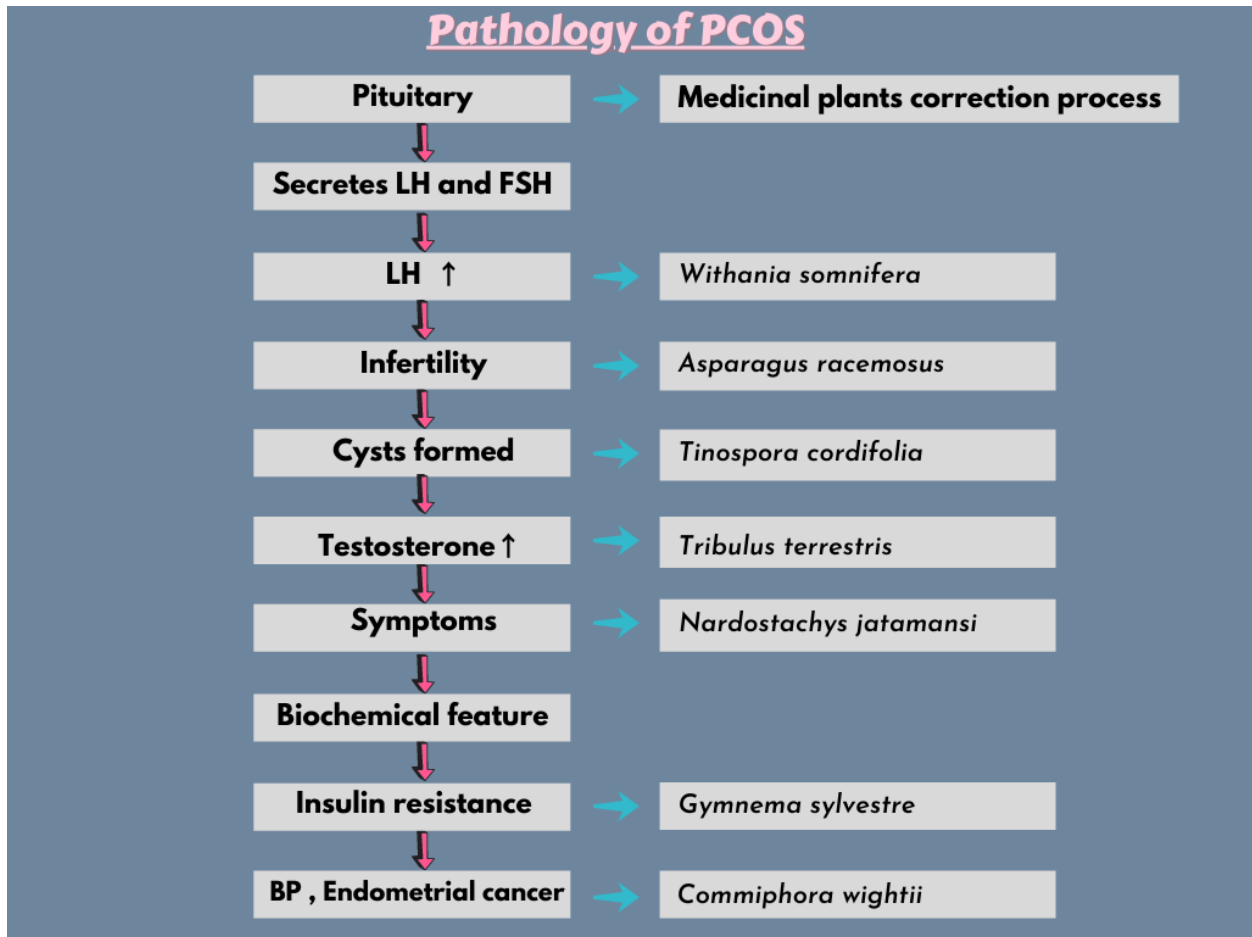
Plenty of medicinal herbs possess immense importance in treating PCOS- 1) Shatavari (*Asparagus racemosus*) 2) Ashwagandha (*Withania somnifera*) 3) Haridra (*Curcuma longa*) 4) Rbubarb (*Rheum rhabarbarem*) 5) Guduchi (*Tinospora cordifolia*) 6) Ghrit kumara (*Aloe barbadensia*) 7) Jatamansi (*Nardostachys jatamansi*) 8) Jeevanti (*Leptadenia reticulata*) 9) Amla (*Embllica officinalis*) 10) Mulethi (*Glycyrrhiza glabra*) 11) Dal

chini (*Cinnamomum verum*) 12 Zanjabeel(*Zinziber officinale*).

PATHOPHYSIOLOGY OF PCOS

Pituitary gland secretes abnormally higher amount of LH and the blood stream which in turn imbalances the normal menstrual cycle due to which follicles were unable to get mature and hence ovulation does not take place and this cascade of events can lead to anovulation. Those immature follicles which were unable to get soluble remains as fluid filled sacs i.e. cysts. Those cysts

can lead to imbalance of hormones by increasing higher amount of testosterone. These imbalances in the body can lead to acne and higher amount of facial body hair and irregular periods. In addition to this high levels of insulin is being secreted by pancreas when it gets in combination with LH and lead to overproduction of testosterone in the female body. These higher amounts of testosterone levels in the body is responsible for inhibiting ovulation and can ultimately cause infertility. Thus PCOS is considered as imbalance of female sex hormones.



THERAPIES FOR PCOS

Shatavari (*Asparagus racemosus*)- it is majorly used to correct the hormone influence. Also, it enhances the maturity of follicles. This herb belongs to family Asparagaceae. It has been used since ages as a potent herbal medicine. It is better in taste and serve as a potential female tonic. It's dried root extracts are used for improving reproductive and hormonal health in women. It improves hormonal imbalance and thus corrects PCOS. Also reduces the symptoms of menopause. A potent vital Rasayana drug in improving women's health. During the conditions of PCOS various factors such as physical and physiological generates psychological stress which affects females reproductive health by altering hormones and physiology of the ovaries. These hormones consists of corticoids(glucocorticoids), prolactin, cortical. Increased

level of these hormones increases ROS levels in the body and also reduces the levels of estradiol- 17 beta biosynthesis in the ovary. Shatavari due to its phytoestrogenic properties can be effectively used to correct hormonal imbalance. These phytoestrogens regulates the ovarian cycle. Along with it, it also corrects PMS, dysmenorrhoea. It is known to correct LH and FSH levels in the pituitary and promotes growth & differentiation of the female body. Also, it improves dysfunction uterine bleeding(DUB) in women. It is used to normalize the physiology of the ovary by improving follicular growth and ovulation. Also, it suggests that PCOS mediated infertility can be successfully manages by Ayurvedic treatment region of shatavari (10mg/day) along with shatpuspha and guduchi for 105 days & thereafter 100mg/day of Rasayana kalpa, combination of

shatavari along with guduchi, jatamansi, & amb for 60 days.

Ashwagandha (*Withania somnifera*) – it belongs to the family solanaceae also known as Indian Ginsen. It contains withanolides, withaferins, alkaloids, amino acids, saponins etc. which improves reproductive functions and assures healthy reproductive life. In the conditions of PCOS - (*Withania somnifera*) provides positive influence on the endocrine system by possessing potent anti-stress properties. It also provides a positive impact on hormonal imbalances of Follicle stimulating hormone (FSH), Leutinising hormone (LH), Testosterone. Also, the GABA mimetic action of Ashwagandha extracts play an important role in the induction of GnRH secretion and improves hormonal imbalance. Also, it improves estrus phase and covers the duration of diestrus phase. It increases FSH and lowers LH, testosterone and estradiol in letrozole induced PCOS rats. (*Withania somnifera*) is also known to improve hypoglycemic effect by improving insulin secretions thus insulin sensitivity. Also, it improves hypolipidemic effect mediated through an increased bile acid synthesis by exerting body's cholesterol in the conditions of polycystic ovarian syndrome. Also, in A.V. Kamble et al, 2020 shows the effect of the combination of hydroalcoholic extract of Ashwagandha and *Tribulus terrestris* on letrozole induced PCOS in wistar rats. Also, they observed that this combination helps in normalizing the estrus cycle after being altered by letrozole and significant increase. It provides adaptogenic actions which is responsible for brain's function and also helps in reducing anxiety and depression by correcting the HPO axis. Along with it it provides antioxidants and anti cancer properties.

Haridra (*Curcuma longa*)- it provides wide range of biological effects such as anti-inflammatory, hypoglycemic, anti-oxidant, anti hyperlipidemic properties. In Shivam et al 2021, study were observed in wistar albino female rats. Letrozole treatment was given which created alterations in serum sex steroid profile, glucose, lipid profile, glycosylated haemoglobin levels lowers and the levels of ROS increases. But with the help of *Curcuma longa* it was able to improve all the parameters to normal and also vanishes the cysts in the ovaries. It shows beneficiary effects in the treatment of PCOS. According to study conducted in Chien, Y-J; Chang et al in 2021 (*Curcuma longa*) was able to improve more glycemic control than those taking placebo. Also, it was able to improve lipid profile, cholesterol levels, HDL. It is known to stimulate insulin mediated glucose uptake with the help of P13k (Phosphatidylinositol 3- kinase) pathways which improves translocation of glucose transporter and high glucose uptake in adipocytes. It mitigates hyperandrogenism. Pro inflammatory cytokines such as TNF- alpha are usually higher in conditions of PCOS. It stimulates serine phosphorylation of insulin receptor substrate 1. Which results in insulin resistance. Also, it promotes thecal production of androgens.

Hence, this study concluded that curcumin is potential in reduction of TNF-alpha and IL-6. Thus, improves insulin sensitivity and reduces obesity induced insulin resistance. It is responsible for upregulating the expression of PGC-1 alpha (peroxisome proliferator-activated receptor – gamma coactivator 1 alpha (PGC-1 alpha)). Thus which enhances the activity of glutathione peroxidase, thus reduces ROS↓ levels in PCOS conditions.

Guduchi (*Tinospora cordifolia*) it belongs to family Menispermaceae. It is known to provide anti-inflammatory action. It provides overall nourishment of the body in PCOS by improving metabolism and reducing insulin resistance and inflammation. Thus reduces ovarian cysts.

Jatamansi (*Nardostachys jatamansi*) study conducted by Sandeep, Bovee et al in 2014 it showed that *Nardostachys jatamansi's* extracts were capable of managing serum levels of progesterone and estradiol. It helps in reduction of testosterone, estradiol and progesterone levels. Also, which are capable of altering ovarian steroidogenesis at an enzymatic levels. Thus, it improves follicular growth. Also, phytochemicals obtained from it were capable of blocking transcriptional activity of an androgen receptor. It blocks the physiological response of androgens. Jatamansi is also known to improve the number of corpora lutea and estrous cycles. When (*Nardostachys jatamansi*) is given in combination with TT; known to lower down the quantity of follicular cysts. NJ reduce steroid hormone levels by normalizing estrous cycling which was dose dependent and helps in improving overall ovarian dynamics. Along with that jatamansi is known to provide anti-stress and neuroprotective action too.

Amla (*Emblica officinalis*) it helps in detoxification and manages the cholesterol levels in the body. Being rich in antioxidant it shows free radical scavenging activities and helps in lowering down inflammation. Thus helps in restoration of hormonal balance in the female's body.

Ghrit kumara (*Aloe barbadensis*) – extract of aloe vera (sap) is known to provide favorable effects on synthesis of estrogens due to its phytoestrogenic action. Aloe vera contains beta-sitosterol which is responsible for providing phytoestrogenic action. Also, it helps in improving estrogen levels. Aloe vera or *Aloe barbadensis* has been majorly known for its hypoglycemic, anti-inflammatory, lipid-alteration and antioxidant properties. Also its gel is responsible for altering estrous cyclicity and thus helps in improvement of steroidogenic activity. *Aloe barbadensis* gel contains polyphenols which helps in altering enzyme activities. Phytophenols and phytoestrogens obtained from this plant helps in restoration of estrous cycle to normal levels and along with that these are responsible for providing hypoglycemic effect. Aloe b. helps in prevention of ovarian cysts and ovarian hyperplasia. Its

phytochemicals are responsible for maintaining secretions and metabolism of insulin. Thus, helps in reducing body weight too. It manages plasma triglycerides levels, scavenges cholesterol from the liver and improves HDL cholesterol levels. It maintains lipid homeostasis by increasing the activity of HMG-CoA activity. It is considered as well established hypoglycemic agent.

Jeevanti (*Leptadenia reticulata*) it helps in management of pre ovarian office(POF).

Mulethi (*Glycyrrhiza glabra*) it belongs to leguminosae family. It possess anti-hyperglycemic properties. It contains phytoestrogens such as liquiritin, isoliquiritin, liquiritigenin, isoliquiritigenin, glabedin and glabrene. (*Glycyrrhiza glabra*) also consists of bioactive compounds and phytoestrogens are responsible for selection of oestrogen receptor ligand and also helps in reduction of weight. It is responsible for the treatment of hirsutism which is one of the major symptoms in the conditions of PCOS and improves anti-androgenic activity.

SUMMARY

From the above description we summarized that PCOS poly cystic ovarian syndrome which means poly cysts are being formed in the ovaries. It is considered as one of the most common reproductive disorder in females. PCOS is a major disorder which is being diagnosed by elevated levels of male hormones i.e. androgens, hirsutism and acne too. In this condition eggs in the follicles never gets mature enough to trigger ovulation. Also, the lack of ovulation alters the levels of estrogen, progesterone, FSH and LH. Higher amounts of testosterone levels in the body are responsible for inhibiting ovulation and can ultimately cause infertility. Thus PCOS is considered as imbalance of female sex hormones. Also hyperinsulinemia is a characteristic metabolic disturbance associated with PCOS. An alteration in GnRH results in increasing LH which leads to over production of androgens which in turn leads to insulin resistance. Medicinal plants are considered as an important helping hands from the ancient era. Plenty of herbal plants provide positive impact in the treatment of PCOS. Herbs such as Shatavari, Ashwagandha, Haridra, Guduchi, Ghrit kumari, Jatamansi, Jeevanti, Amla, Mulethi, Dal chini, Hirabol, Zanjbeel etc. possesses various actions such as phytoestrogenic, hypoglycemic, restoring hormonal balances and regulates body's function in order to treat this condition of PCOS. These traditional herbs possess preventive, curative, promotive and rehabilitative actions. Also the major benefit of herbal therapy is that it is safe and with rare side effects. The presence of phytochemicals provides potentiating effect towards the cure of the disease.

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