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# A CRITICAL REVIEW ON POLYCYSTIC OVARIAN SYNDROME IN *AYURVEDA*

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**ABSTRACT**

Polycystic Ovarian Syndrome is one of the most common female endocrine disorders affecting approximately 5% to 10% of women of reproductive age and is thought to be one of the leading causes of female sub-fertility. The symptoms of PCOS may begin in adolescence with menstrual irregularities, infertility, high levels of masculinising hormones, metabolic syndromes. In *Ayurveda*, this condition is not explained as a single disease, but can be persuasively constructed under the headings of *Yonivyapad* and *Artavadushti*. In this study, elementary books of *Ayurveda* and modern were searched and analyzed for proper utilization in prevention and cure of PCOS. PCOS is an emerging problem among women leading to endocrine dysfunction. Treatment modalities aim at clearing obstruction in pelvis, treating *Agnimandhya* at *Jatharagni* and *Dhatwagni* level and alleviating *Srotoavarodha* and ultimately regularizing the *Apana Vata.*

**Keywords**: Polycystic Ovarian Syndrome, *YoniVyapad, Artavadushti.*

## INTRODUCTION

The term Polycystic Ovarian Syndrome (PCOS) was first described by Irving Stein and Michael Leventhal as a Triad of 'Amenorrhoea', 'Obesity' and 'Hirsutism' in 1935 when they observed the relation between obesity and reproductive disorders[1]. It is hence also known as the 'Stein-Leventhal Syndrome or 'Hyperandrogenic Anovulation' (HA) and is the most common endocrine ovarian disorder affecting approximately 5-10% women of reproductive age worldwide. PCOS is currently considered as a lifestyle disorder affecting 22-26% of young girls in their reproductive age in India[2]. It is primarily characterized by an extremely irregular menstrual cycle in which ovulation may not occur. Normal pubertal events include Oligomenorrhoea, Hirsutism, Acne and Weight gain. There are no single criterions sufficient for clinical diagnosis due to multiple etiologies and presentations[3].

**ETIOLOGY:** The etiology of PCOS remains unclear; however, it has certainly been linked to a variety of etiological factors;

**Insulin resistance:** PCOS is not just a reproductive disorder but a multifaceted metabolic disorder that shows a high association with insulin resistance leading to hyperinsulinaemia, wherein 10% show Type II Diabetes, besides, and 30%-35% have Impaired Glucose Tolerance (IGT). Scientists at the Medical College of Georgia at Georgia Regents University reported that high activity levels of a micro RNA named MiR-93 (microRNA-93) in fat cells hinders the use of glucose by insulin contributing to PCOS and also to insulin resistance[4].

**Hormonal imbalance[5]:** The imbalance of certain hormones is common in women suffering from PCOS.

i) High testosterone levels leading to signs of hyperandrogenism.

ii) High Luteinizing hormone (LH) whose excessively increased levels disrupt proper ovarian functions.

iii) Low Sex Hormone Binding Globulin (SHBG) hormone that allows the expression of hyperandrogenism.

iv) High Prolactin levels which stimulates the production of milk in pregnancy and is found to be raised in comparatively few patients.

The exact reason of these hormonal imbalances is unknown but researchers are trying to establish their link with the ovary itself, the part of the brain that governs the hormonal secretions or the other endocrine glands.

**Genetic factors[6]:** Research at the University of Oxford and the Imperial College London revealed that a gene implicated in the development of obesity is also linked to susceptibility to PCOS.

A study revealed that mothers and sisters of PCOS patients showed higher androgen levels than the control subjects. PCOS is a genetically determined ovarian disorder and the heterogeneity can be explained on the basis of interaction of the disorder with other genes and with the environment.

**Biphenyl A (BPA):** Researchers at the University of Athens Medical School in Greece have pin-pointed Biphenyl A (BPA), a common industrial compound used in dentistry, plastic consumer products and packaging to be a probable cause of PCOS.

**Stress and other psychological factors:** PCOS is often caused by psychological factors. Increased stress can upset the normal menstrual cycle and causes hormonal changes such as raised levels of cortisol and prolactin which affect menstruation that normally resumes after the stress subsides.

**Miscellaneous:** The sedentary lifestyle, dietary variations, lack of exercise or intensive physical exercise have also been contributory factors as also extreme weight loss, disorders of the endocrine system and various disorders of the ovaries.

**RISK FACTORS OF PCOS[7]:** Abdominal obesity (waist circumference >88cm or 35 inches)

Triglycerides >150mg/dL

HDL-C <50mg/dL

Blood pressure >130/85

Fasting blood sugar of 110-126 mg/dl and 2-h glucose tolerance test of 140-199mg/dl

**SIGNS AND SYMPTOMS OF PCOS[8]:**

The principal signs and symptoms of PCOS are:

- ❖ Related to menstrual disturbances and elevated levels of male hormones (androgens). Menstrual disturbances can include delay of normal Menstruation (primary amenorrhea), the presence of fewer than normal Menstrual periods (Oligo menorrhea), or the absence of Menstrual for more than three months (secondary amenorrhea).
- ❖ Related to elevated androgen levels include acne, excess hair growth on the body (hirsutism), and male pattern hair loss.
- ❖ Other sign and symptoms of PCOS include:
  - Obesity and Weight gain
  - Elevated insulin levels and insulin resistance
  - Infertility
  - Skin discolorations

- Multiple, small cysts in the Ovaries
- Oily skin
- Dandruff

Any of the above symptoms and signs may be absent in PCOS, with the exception of irregular or no menstrual periods. Woman who have PCOS do not regularly ovulate.

**DIAGNOSIS:** Not all women with PCOS have polycystic ovaries (PCO), nor do all women with ovarian cysts have PCOS.

- The **Rotterdam criteria** of assessment[9]

European Society for Human Reproduction and Embryology (ESHRE)/American Society of Reproductive Medicine (ASRM) consensus meeting, a refined definition of PCOS was agreed: namely the presence of two out of the following three criteria:

- Oligomenorrhoreaand or/ anovulation
- Hyperandrogenism (clinical and / or biochemical)
- Polycystic ovaries, with the exclusion of other etiologies

- Gynacologic ultrasonography
- Laproscopic examination may reveal a thickened, smooth, pearl-white outer surface of the ovary.
- Serum (Blood) levels of androgens (male hormones), including androstenedione, testosterone and dehydroepiandrosterone sulfate may be elevated.
- The ratio of LH (Luteinizing hormone) to FSH (Follicle stimulating hormones) is greater than 1:1, as on day 3 of menstrual cycle.
- Reduced Sex Hormone Binding Globulin(SHBG) levels
- Fasting biochemical screen and lipid profile.
- Prolectin to rule out hyperprolectinemia
- TSH to rule out hypothyroidism

**CONTEMPORARY TREATMENT OF PCOS:** The contemporary treatment of PCOS can be summarized as follows-If Body Mass Index is elevated, loss of at least 5-7% body weight may restore ovulation in up to 80% obese patients possibly by reducing hyperinsulinaemia and thus hyperandrogenism. This is followed by induction of ovulation (OI) with Clomiphene citrate. Subsequently, administration of insulin sensitizer with Clomiphene is advisable. Gonadotropin therapy and FSH hormone are the next option followed by Gonadotropins with insulin sensitizer. Metformin (Glucophage) is a drug of choice that increases ovulation and simultaneously reduces the problems caused by insulin resistance and regulates the excessively raised levels of the androgens. Anti androgenic therapy to reduce the masculine effects of testosterone like alopecia, hirsutism etc. and Eflornithine as a cream to retard hirsutism though it does not remove hair. Besides, electrolysis or laser hair removals are the alternatives for permanent hair removal[10].

Laproscopic Ovarian Drilling (LOD) is the surgical procedure recommended in patients who do not respond to Clomiphene therapy. It destroys the androgen producing tissues, thus correcting hormonal imbalance and restoring normal ovarian functioning. It ultimately results in the decrease of the elevated LH and Testosterone levels and an increase in the FSH levels.

**AYURVEDIC PERSPECTIVE OF PCOS[11]**

*Ayurveda* describes Polycystic Ovarian Syndrome to have an equal involvement of the *Dosha*, *Dhatu* and *Upadhatu*. It does not correlate the condition to a single disease or syndrome but the symptoms bear a resemblance to the terminologies defined as

'*Anartava*' (Amenorrhoea), '*Yonivyapad*' (anatomical and physiological disorders of the reproductive system) like – *Arajaska* (Oligomenorrhoea due to vitiation of *Vata Dosha*), *Lohitakshaya* (Oligomenorrhoea due to vitiation of *Vata-Pitta Doshas*), *Vandhya* (infertile), *Pushpaghni Revati* (Idiosyncratic anovulatory menstruation), *Abeejata* (anovulation), *Rajodushti* and *Ashtartava Dushti* (menstrual flow disorder due to vitiation of *Doshas*) etc.

The terms *Raja* and *Artava* have been used synonymously or otherwise in the classics. Usually *Raja* is considered as the *Upadhatu* of *Raktadhatu* whereas *Artava* as the *Saptam Dhatu* itself. Similarly their *Srotasa* (channels) are also two entirely different entities. In the present paper, *Raja* has been considered as the menstrual flow while *Artava* is indicative of the ovum.

## CORRELATION OF PCOS WITH CERTAIN AYURVEDIC TERMINOLOGIES

***ArajaskaYonivyapad*:** When *Pitta* situated in *Yoni* and uterus vitiates *Rakta*, the women becomes extremely emaciated and discolored, this condition is known as *Arajaska*[12]. *Acharya Chakrapani* has described amenorrhea as a symptom.

***LohitakshayaYonivyapad*:** The *Nidan Sevan* of *Vata-Pitta Pradhana Aahar-Vihar* causes a vitiation of these *Dosha* resulting in *Rajaksheenata* (scanty menstruation), the lady suffers from burning sensation, emaciation and discoloration. This may be presented in either of the previously discussed ways. Again a similarity to the contemporary symptom of menstrual irregularity is noted but it fails to clarify oligo/anovulation.

***VandhyaYonivyapad*:** *Sushrutacharya* quotes this type of *Yonivyapad* presenting as *Nashtartava* (loss of menstruation)[13]. *Charakacharya* states this condition to arise due to loss of ovulation. *Harita* elaborates on six types of *Vandhyayoni*, each having specific features, management and prognosis. One of them is *Anapatya Vandhya* (infertility) wherein *Dhatukshaya* is etiological factor of *Nashtartava*. Here, *Artava* is considered as the *Saptadhatu* or ovum and its loss results in infertility. However this type is incurable.

The above mentioned *Anapatya Vandhyayoni* can be fairly compared with PCOS due to the similar features of anovulation and absence/irregularity of menstruation thereby resulting in sterility. However, other clinical features tend to vary.

***Abeejata* (Anovulation):** *Sushrutacharya* states the aetiological factors of *Shukradushti*(vitiation of sperm) in males to be similar to those of *Rajodushti* in females leading to *Abeejata*. The same factors are also responsible for the vitiation of *Doshas* in females causing the vitiation of *Raja/ Artava*. Hence, just as '*Shukramabeejata*' (azoospermia) is seen as a result of vitiation of *Shukra*, a condition of '*Artavaabeejata*'(anovulation) is noted in females due to vitiation of *Artava*.

*Charakacharya* too quotes frequent or untimely coitus, over-exercise, unbalanced diet that includes *Ruksha* (dry), *Tikta* (bitter), *Kashaya* (astringent), *Atilavana* (excessively salty), *Amla* (sour) and *Ushna* (hot) *Aahar*, as also *Chinta* / *Shoka* (stress-related tension), *Bhaya* (fear), *Krodha* (anger) and *Aghata* i.e. injuries due to *Shastra* (weapon) or *Kshara* (alkali) as the causative factors of *Shukradushti*.[14]

These can be correlated with the current lifestyle changes.

***Ashtartava Dushti*:** *Vagbhatacharya* states that like *Shukra*, *Artava* can too be vitiated by the *Doshas* resulting in eight types of *Artavadushti*. Such vitiation leads to *Abeeja-*

*ta.*[15]

Once again a similarity to PCOS is noted as anovulatory menstruation only.

***Rajodushti*: This terminology, put forth by *Sushrut acharya* is a result of the vitiation of *Raja* by the *Dosha*, primarily *Vata* and *Pitta* resulting in its *Ksheenata* (Oligomenorrhoea). The other clinical features of PCOS are however not observed.

Considering all the above mentioned types of conditions/diseases quoted in the classics it can be noted that neither of them bears a complete resemblance to the current diagnostic criteria of PCOS. Hence, on the basis of the contemporary pathogenesis of PCOS, an *Ayurvedic* counterpart can be put forth. Here, the obese or lean physical feature of the patient has also been taken into consideration.

Thus it can be inferred that none of the above said terminologies can be perfectly correlated to PCOS. Each one shows congruence in only one or more criteria and hence a probable pathogenesis needs to be defined.

***Apatarpanottha Samprapti*: (Probable Pathogenesis of PCOS in lean patients)**

The current unbalanced diet and lifestyle cause the vitiation of *Kaphadosha* which leads to *Jatharagni mandya*, thereby resulting in *Aamotpatti* and is responsible for an increase in the *drava* property of *Pitta* which in turn reduces the *Agneya* property of *Artava*. However, the vitiated *Pitta* hampers maturation and rupture leading to anovulation or *Artavakshaya*. A subsequent *Dhatvagni Mandya* especially so of the *Rasadhatu*, causes the formation of a *Saumya Gunatmak Poshak Rasadhatu* having qualitative and quantitative *Heen Saarata*. It also results in an increase in the *Mala Rupi Kapha* and consequently in the poor formation of the subsequent *Dhatus* further causing *Dhatukshaya*. Thus, *Dhatvagni mandya* and *Dhatukshaya* together cause *Anartava* or *Rajakshaya*.

***Santarpanottha Samprapti*: (Probable Pathogenesis of PCOS in obese patients)**

The above stated aetiological factors give rise to *Jatharagni* and *Dhatvagni Mandya* along with *Aamotpatti* resulting in *Medoroga* viz. *Sthaulya* (obesity). *Aamotpatti* and *Agnimandya* cause an improper nourishment of the consecutive *Dhatus*. *Artava*, being the *Saptam Dhatu* thus becomes *Ksheena* (under-nourished).

*Sthaulya* is synonymous with the vitiation of *Kapha* that causes a prolongation in the *Rutukala* (first phase) of the *Rutuchakra* (menstrual cycle). This in turn impedes the effect of *Pitta* thus hampering maturation and rupture of the follicles. The end result is once again *Artavakshaya* (anovulation). The bulky appearance of the *Antaphala* (ovaries) can be attributed to their vitiation by *Kapha* and *Meda* thus leading to an increase in the ovarian volume.

Thus, it can be stated that *Kapha* predominance manifests as obesity, sub fertility, hirsutism, diabetic tendencies and hypothermia. *Pitta* predominance manifests as alopecia, acne, dysmenorrhoea with clots and cardiovascular disorders whereas *Vata* predominance manifests with dysmenorrhoea, oligomenorrhoea and severe menstrual irregularity.

**AYURVEDIC MANAGEMENT OF PCOS[16]**

The management approach to PCOS should concentrate on treating *Agnimandhya* at *Jatharagni* and *Dhatwagni* level and alleviating *srotavarodhana* and ultimately regularizing the *Apana Vata*.

All the causes of the disorder mentioned in *Ayurveda* include *Sanga* (obstruction) *Vata Sankshobha* and *Dhatukshaya*. Hence, the main *Chikitsa Siddhanta* (principle of treatment) for the problem should be the drugs by which the *Sanga* is removed. Thus the drugs that are *Vatashaman*, *Deepan*, *Pachan* and *Anulomana* must be used on a priority basis. *Vagbhata charya* advocates *Basti* (enema), *Abhyanga* (oil massage), *Parisheka* (pouring of liquid), *Pralepa* (mask of herbal paste) and *Pichudharan* (medicated tampon) as the line of treatment[17].

**(a) *Antahparimarjan Chikitsa***

***Shodhan Chikitsa:*** This primarily includes selected *Panchkarma upakrama* (5 major treatment modalities) especially *Anuvasan* (enema with medicated oil), *Niruha* (enema with medicated decoction) and *Uttarbasti* (enema in the genital tract) which are more beneficial in this condition. The classics too quote *Basti* to be the modality of choice in this context due to its utility in conditions of vitiated *Vata*. Other *Panchkarma* modalities like *Vamana* (emesis), *Virechana* (purgation) are also prescribed for vitiated *Kapha* and *Pitta* respectively. *Snehana* (oleation) and *Swedana* (sudation) need to be given prior to any *Panchkarma*.

***Shaman Chikitsa:*** In the menstrual disorders caused by *Vatadi Dosha*, drugs suppressing that particular *Dosha* should be used. *Kashyapacharya* quotes the use of *Rasona* (*Alliumcepa*), *Shatapushpa* (*Anethumgraveolens*) and *Shatavari* (*Asparagusracemosus*) to be beneficial in all disorders of *Artava*. He advocates the utility of *Shatapushpa Kalpa* (a formulation of *Shatapushpa*) in the infertile woman to gain progeny.

**(b) *Bahirparimarjan Chikitsa:*** Besides these, external therapies like *Abhyanga*, *Parishek*, *Pralepa*, *Pichudharan*, *Pinda*(bolus), *Yonidhavan* (cleansing of the vagina), *Varti* (medicated pessary), *Dhoopan* (medicated smoke) are also recommended for local action.

**LIFESTYLE MANAGEMENT OF PCOS**

In view of the current lifestyle and the etiological factors of PCOS the following two regimens must be included as an integral part of the *Ayurvedic* management viz.

**Diet regimen:** An appropriately designed diet regimen that not only aims at weight management but also prevents the long-term risks of PCOS viz.T2 DM (Type II Diabetes), cardiovascular diseases etc. is the need of the hour. Insulin resistance and hyperinsulinaemia are the key etiological factors of PCOS that need to be targeted by reducing the insulin levels but improving insulin sensitivity. Hence a high fiber, low saturated fat and low glycaemic index carbohydrate diet is strongly recommended.

**Avoid:** High glycaemic index food- eg. White rice, potatoes, refined flour and bakery products. Milk-as its protein limits normal testosterone processing causing levels to rise. Soy products-as they impede ovulation. Hydrogenated and Trans fats- eg. Cooked oil, processed foods as they increase risk of T2DM, Cardiovascular diseases etc. Alcohol, Caffeine, Nicotine and other addictive agents also should be avoided.

**Consume: Whole grain**- eg. *Ragi* (*Eleusinecoracana*), *Shashtishaali* (red rice)etc., **Green leafy vegetables**-rich in minerals, vitamins and nutrients, **Low glycaemic index whole fruits**-eg. apples, pears, grapes, oranges, plums, prunes etc. that contain fibre, vitamins, minerals and phytonutrients, **Dryfruits**- dates, figs and raisins, **Bright coloured vegetables**-eg.carrots, capsicum, beet, salads etc should be use with antioxidants to reduce the oxidative stress of

PCOS. **Sprouts**-contain phyto estrogens that reduce estrogen levels **Organic-fedmeat**-reduces chances of hormonal imbalance and are pesticide free Essential fatty acids- eg. Nuts, olive oil, oily fish etc. that help weight management, hormonal balance and fertility. Carbohydrate and protein rich diet small, frequent and healthy meals with plenty of daily water intake. Vit.B12 which maintains sugar and fat metabolism, thyroid function and hormonal balance can help in prevention of PCOS.

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