

REVIEW ARTICLE

PCOS; AN APPROACH TO ITS ETIO-PATHOGENESIS IN AYURVEDIC PARLANCE

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ABSTRACT

Background: Polycystic ovarian syndrome is increasing in Gyanecological disease proportions globally. PCOS is a syndrome that includes clinical conditions involved oligo-anovulation, hyperandrogenism and polycystic ovarian morphology. **Materials and methods:** In this a critical review of Ayurvedic and Modern literature regarding the problem that is Polycystic ovarian syndrome was carried out. It covered all the relevant information from ancient classics to latest treatises which was searched, compiled & analyzed systematically. **Results:** PCOS is to be under stood on the basis of Dosha dushti, involvement of Dushya, Srotas, Ama, Agni, Adhistana and Vyadhi Lakshana. As it seems that whole metabolic process is disturbed in PCOS which is considered as dhatwagni vikar in ayurveda and no any diseases in classics indicate whole specturum of PCOS. So, we can say it “Dhatwagni mandya janya beejagranthi vikar.” **Conclusion:** Various dietary, lifestyle, and psychologic factors are involved in the etiology of PCOS, particularly in relation to metabolism. The ancient Ayurvedic knowledge can be utilized to expand the current understanding of pcos features like Menstrual irregularity, anovulation, hyperandrogenism, obesity, metabolic syndrome.

Key words: PCOS, Metabolic Disorder, Dhatwagnimandya, Anovulation, Nastartav

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INTRODUCTION:

The polycystic ovary syndrome (PCOS) is a hyperandrogenic disorder associated with chronic oligo-anovulation and polycystic ovarian morphology^{i ii}. It is often associated with psychological impairments, including depression and other mood disorders and metabolic derangements, chiefly insulin resistance and compensatory hyperinsulinemia, which is recognized as a major factor responsible for altered androgen production and metabolismⁱⁱⁱ. The incidence of polycystic ovarian syndrome is 4% to 22% of women overall and 50% of women seen at infertility clinics.^{iv,v} The World Health Organization estimates that there are one out of forty newly reported cases of PCOS worldwide^{vi}.

In *ayurvedic* classics there is no direct mentioning of this disease rather, symptoms are found under various diseased conditions at various references i.e. menstrual irregularities are described under the broad heading of *Ashtoartavadushti*, *Nastartava* is another pathological condition possessing the clinical feature of pathological secondary amenorrhoea. While the description of infertility due to anovulation is scattered in classics i.e. *Pushpaghni Jataharini* mentioned in *Kashyapa Samhita*, *Revati Kalpadhyaya* bears similitude to the symptom of hyperandrogenism. Considering the pathology

i.e formation and accumulation of cyst in periphery of ovary PCOD bear similar symptom as *Granthi*. But features of metabolic dysfunction and polycystic ovarian morphology are not evident from any description. So, it may be understood on the basis of *Dosha dushti*, involvement of *Dushya*, *Srotas*, *Ama*, *Agni*, *Adhistana* and *Vyadhi Lakshana*. As it seems that whole metabolic process is disturbed in PCOS which is considered as *dhatwagni vikar* in ayurveda and no any diseases in classics indicate whole specturum of PCOS. So, we can say it "*Dhatwagni mandya janya beejagranthi vikar.*"

Etiological factors (Nidana) of PCOS:

PCOS is believed to be having multifactorial origin and interactive pathogenic processes. Many risk factors like genetic predisposition, dietary mismanagement, intolerable stress etc. have the potential in precipitating PCOS.

Samanya Nidana:

- Glancing at the nature of the disease, it is seen that dhatvagni vikriti (Hypofunctioning) plays very important role in causing pathogenesis which in turn is caused by jatharagni mandya. As the prime factor in causation of disease is Agnimandya, therefore, factors causing vitiation of agni can be

considered under nidana factors of the disease.

- As we be acquainted with that no structure of body undergoes development or atrophy independent of srotas that transport dhatus. When they get impaired, both sthayi and asthayi dhatus, also get involved with vitiation spreading from one dhatu to other, from one srotas to other. Dosha and srotodusti are always found intermingled. Primarily, dosha get vitiated affecting srotas, eventually, resulting in dushya dusti so srotodustikar factors should be taken as nidana.
- Nidana of Vimshati Yonivyapad are also nidana for PCOS.
- Vriddhi and Kshaya of Uttara Dhatu depend on Vriddhi and Kshaya of Poorva Dhatu. As Artava is the Upadhatu of Rasa Dhatu, Rasa Kshaya will result in Artava Kshaya.

Vishishta Nidana:

- Margaavarana to the Artava Pravritti (production and expulsion) either due to Vata Dosha, Kapha Dosha or both together may lead to Nashtarava.
- Specific nidana for astaartavadusti is not described, as artava is agneya and related with pitta which in turn is ashraya-ashrayi with rakta dhatu,

disorders of rakta and kshaya of Pitta may also lead to Artava Kshaya.

- Vishista nidana of rasavaha, raktavaha and medovaha srotodusti are responsible for PCOS.
- The hereditary (Bijadosha) component besides dietetic, regimomial and psychological factors in the causation of Sthaulya and prameha are also considered as nidana of PCOD.
- Etiopathological factor responsible for granthi and raktagulma may be responsible for formation of cyst and amenorrhoea in PCOD.
- Dietetic habits like Atiushna Annapana, Veerya, Artava, Beeja gets vitiated leading to anovulation.
- In short excessive intake of Aharaj, viharaj and manashik factor responsible for tridosha prakopa responsible for PCOS.

A) Mithyachara:

a) Mithya Ahara

As PCOS is a metabolic disorder, the faulty diet plays a prime role in the manifestation of the disease. *Vata* and *Kaphakara Ahara* are the basic causative factors for this disease. The disturbances in the status of the *tridosha* resulting from the dietary variations alter the normal metabolism leading to the formation of abnormal *Ahara Rasa* i.e amotpatti. As it is attributed to *Rasa*

Dhatu; Rasa Dhatu said to be *hetu* for both *Sthoulya* and *Karshya*. *Sthoulya Hetu, Karshya Hetu; Santarpanotha Hetu, Apararpanotha Hetus* are attributable to *Ahara*.

The *Dhatus* formed out of this *Sama Ahara Rasa* will be morbid. The *Dhatus* and *Srotas* to be affected depend on the *Beejabhaga Dushti*. In PCOS, the dietary factors seem to lead to *dushti* of *Rasa, Rakta*, and *Meda* in the initial stages. Such a derangement ultimately affects the *Shukra Dhatu* and *Artava*-the *Upadhatu* of *Rasa*, affecting the reproductive endocrinology and menstrual cycle resulting in anovulatory infertility.

Viruddhahara: *Viruddhahara* lead to a long term and cumulative effect on manifestation of diseases and has a bad prognosis on prolonged indulgence. It is also said to be one of the causative factor for '*Santana Dosh*' (hindrances for the capacity of procreation) which may be genetically inherited. Based on these factors, the role of *Viruddhahara* is very much appreciable in PCOD.

b) Mithya Vihara (Vyayama, Vyavaya, Nidra, Vegadharana)

The *Viharas* are generally classified into *Shareerika* and *Manasika*; though the effect of either of them cannot be isolated from the other. The sedentary life style along with malnourishment (under and over nourishment) may lead to IHD, Diabetes

Mellitus etc. Stress as well as other psychological factors also contributes to such type of ailments. eg. *Atichinta* (excess anxiety or thinking) results in *Rasavaha Srotodushti, Bhuktwa Divaswapna* may vitiate *Mamsavaha Srotas*. Lack of *Vyayama* and excessive fatty food may vitiate *Medovaha Srotas*. *Manasika Vega* i.e. *Shoka, Krodha, Matsarya, Kama* etc. lead to improper *Ahara Parinama, Amotpatti, Rasadi Dhatu Dushti*, and also *Vatadi Dosh* *Prakopa* and results in *Artavavaha Srotodushti* and *Anapatyata*.

Thus the faulty dietary habits, lifestyle and psychological factors are described as the reason for many metabolic disorders and PCOS is of no exemption. Change in biological clock is also said to effect gynecological health of women. Non observance of all *paricharya* like *Dincharya* and *ritucharya* also leads to menstrual abnormalities.

B) Pradushtartava:

Artava is considered as female sex hormone and ovum. *Pradustartava* indicate towards abnormal ovarian steroidogenesis which result in androgenic microenvironment of ovary and produce clinical manifestation of PCOS. When *Artava* is considered as ovum, *pradustartava* will result in *Abeejatwa* (Loss of reproductive function) and may also manifest as *Putraghni Yonivyapad, Asrija*, etc. In both of these condition recurrent pregnancy loss and infertility is seen as in PCOS.

C) Beeja Dosha:

The genetic or familial predisposition of PCOS though not well defined, but the studies suggest the same which may be attributed to *Sahaja Dosha* mentioned in *Ayurveda*. As per *Acharya Charaka*, defect in *Beeja*, *Beejabhaga* or *Beejabhagavayava* can cause *Sahaja* disease. *Beeja* can be correlated with ovum and sperm, *Beejabhaga* with chromosome and *Beejabhagavayava* with genetic coding. *Acharya Vagbhata* mentioned a definitive role of *Shukra artava dosha* in the aetiology of reproductive disorders.

Sahaja Vyadhi may get manifested later in life when *Dosha*, *Dushya*, *Kala*, *Vaya*, etc. are favourable. The *Sahaja Hetu* of *Beejadushti* if considered as *Utpadaka Hetu*; then the faulty diet and behavioral factors may be considered as triggering factor for PCOS. Among women genetically predisposed to developing PCOS, an additional event like increase in insulin levels and IGF-1 activity during puberty, weight gain, life style disorders, psychological stress and environmental factors triggers the development of full-blown syndrome. Though genetic cause of PCOD cannot be scientifically established, but there are plenty of evidences especially its association with Type-2 diabetes and obesity suggest possibility of a genetic background and these diseases are considered as due to *beeja dosha* in our classics.

D) Daiva- Unknown or idiopathic cause :

In *Ayurveda*, *Vyadhi* is classified as *Doshaja*, *Karmaja* and *Dosha Karmaja* in origin. If the aetiological factors cannot substantiate the manifestation or non-manifestation of diseases, they are categorized under the term '*Doshakarmaja Vyadhi*'. In PCOD also, the aetiological factors are not sufficient to explain such a wide range of syndrome manifestation and the disease has to be classified as *Doshakarmaja* in origin. From the view point of success of treatment modalities also, *Doshaja Vyadhi* subside by particular *Dosha Chikitsa* of *Shodhana* or *Shamana*; *Karmaja* by *Karma Kshaya* but in *Doshakarmaja Vyadhi* both *Yuktivypashraya* and *Daivavyapashraya* along with *Satwavajaya Chikitsa* are essential. *Daiva* as a causative factor for PCOS suggests that there was some difficulty in tracing the etiological factors for the condition as enumerated for other disease.

Aetiopathogenesis of PCOS vis-à-vis Dhatwagnimandya janya Beeja granthi vikara in cognation to Shadkriyakala.

1. First Kriyakala (Dosha sanchayavastha)- In PCOS, *mithya Ahara-vihara*, *manasika bhavas* including stress and other etiological factors stimulate brain and commences synthesizing or liberating certain biogenic amines. Due to miscellaneous *nidana* factors, *tridosha* as well as *agni vitiation* ensues, which results in

augmentation and accumulation of *kapha* and *vata doshas*. *Kapha Sanchaya Lakshana-Gaurava, Alasya; Sanchita Vata Lakshana like Stabdha Koshtata; and Sanchita Pitta Lakshana like Mandoshmata.* ^{vii} If *Acharya Poorvaka Prakopa* takes place these may not be elicited.

2. Second Kriyakala (dosha prakopavastha) - Aforesaid certain biogenic amines stimulate hypothalamus, pituitary, thyroid and adrenal medulla etc. Due to impairment of *agni*, inopportune digestion of victuals results in engenderment of *Ama annarasa* which may further augment *vitiating kapha*. *Vata Prakopa Lakshana like Koshta Toda, Sanchara; Pitta Prakopa Lakshana like Amlika, Pipasa; and Kapha Prakopa Lakshana like Annadwesa* may be elicited. ^{viii}

3. Third Kriyakala (Prasaravastha)- Stimulation of above verbally expressed glands induce secretion of relinquishing factors or hormones in the blood and biochemical alterations get commenced results increase in GnRH and insulin resistance. *Vitiating rasa dhatu and rasagni mandya* causes *Srotodusti*. Progression of the pathological events is ensued by *uttarottara dhatvagnimandya* and *uttarottara vitiation of dhatus* and withal the *upadhatu of rasa Artava* get vitiated lead to *artava dushti*. Moreover, circulation of *Ama anna rasa* may further increase *Srotorodha*. *Vimargagamana, Atopa Lakshana of Vata;*

Arochaka, Avipaka etc. of *Kapha* may be observed. ^{ix}

4. Fourth Kriyakala (Sthanasamshrayavastha) - Aforesaid, bio-chemical alterations start inducing an organopathological changes depends upon tissue or cell susceptibility results in increase LH: FSH ratio which leads to Androgen excess in body *Vitiating rasa* and augmented *kapha* along with *vata doshas* engender *dosha dushya sammurchna*. Simultaneously *shukragni* fail to perform their work congruously which is destruction of male hormones results Androgen excess in body. In this *Poorvaroopavastha, Medogata Lakshanas like Granthi* etc. *Vata Lakshana like Angamarda, Alasya, Agnimandya, Apravritti/ Atiprapritti or Asamyak Pravritti of Rajas, Kaphaja Lakshana like Manda pravritti or Apravritti of Rajas, Sthoulya Dosha,* etc. may be observed. ^x

5. Fifth Kriyakala (Vyaktavastha) - Organopathological changes start developing their various signs and symptoms in different systems of the body i.e. anovulation, poly cystic ovary, hirsutism, acne, alopecia etc. *Doshadushya sammurchna*, if not treated, leads to manifestation of *rupa of Vyadhi* designates as *nastartava, prameha, vandhyatwa, yuwanpidika, khalitya* and *sthaulya*. ^{xi}

6. Sixth Kriyakala (Bhedavastha) - Progression of disease untreated with manifestation of

complications results *Dirghakala Anubandha Lakshana*.^{xii} eg. Infertility, inordinate corpulence diabetes etc.

Samprapti Ghataka

Dosha:

Doshas are the basic factors responsible for health and disease. *Vata* is the prime *Dosha* enumerated as causative factor for *Yoni Roga*. *Kapha* in *Prakritavastha* is said to be *Bala*, and in *Vikrutavastha* as *Mala*. By analysing all the symptoms mentioned in the modern literature, all the three *Doshas* have involvement in PCOD, the range may vary.

Vata- In pcod involvement of all the five *vayu* *vitiations* is seen. Firstly *Saman vayu* and *Apan vayu* is *vitiated*.

- As **saman vayu karma** is to give energy to *pachakagni* and all *dhatwagnis* and helps in proper digestion. Also it carry *dosha, mala, sukra and artava*.^{xiii} Its *vitiations* result in *agnimandya*, indigestion, constipation, feeling of fullness in abdomen, flatulence, *gulma* (*raktaj gulma-* amenorrhoea) and *dhatwagnimandya* at different level.
- **Apan vayu** responsible for proper upcoming of *artava* and *grbha*. It is also liable for rupture of ovum from ovarian wall and movement of fimbriae to pick up ovum into fallopian tube. Its *vitiations* lead to anovulation and polycystic appearance of ovary,

oligomenorrhoea, amenorrhoea and excessive and frequent menstruation due to anovulation. If pregnancy occur than sometime abortion take place due to its *vitiations*.

- **Vyan vayu karma** is to give doorway to *sukra* in uterus and sweating from apocrine glands. Its *vitiations* lead to infertility and black heads.
- **Pranavayu karma** is to stable the thoughts, due to its *vitiations* irritability, unstable mind is seen.
- **Udan vayu karma** is to established *vakpravritti, prayatna, oja, bala, varna*^{xiv} its *vitiations* result in loss of confidence, forgetfulness, depression, moodswings, decreased libido and discolouration of skin.

2. Pitta

- **Pachak pitta** is responsible to give strength to *dhatwagni* its *vitiations* result in *dhatwagnimandya*. As *Pitta* is also responsible for *Mardava, Prabha, Varna* etc. it seems to be *Ksheena*^{xv} which causes *Arthavakshaya, Prabhahani, Angaparushya* or loss of feminine characters. *Pitta vitiations* at the level of *bhrajak pitta* and *ranjak pitta* manifest as acne, greying of hair and hirsutism.

3. Kapha

- In PCOD mainly *kledak kapha* is *vitiated*. *Kledaka kapha* helps in digestion of food, its *vitiating* result in formation of *ama*. As the *kapha* is responsible for growth of follicle during ovarian cycle its accumulation result in the formation of multiple cyst in ovary, weight gain, central obesity, felling of heaviness in body, diabetic tendency.
- Many associated diseases or complaints found along with PCOD such as *Prameha*, *Kushta*, *Amadosha*, *Klaibhya*, *Atisthoulya* etc. are included in *Santarpanajanya Vyadhi*. Symptoms like *Gurugatrata*, *Malaadhikya*, *Dhamani-pratichaya*, *Atisthoulya* are mentioned along with the *Nanatmaja Roga of Kapha*^{xvi}. This indicates the

greater involvement of *Kaphadosha* in the aetiopathogenesis of PCOD.

The status of *Doshas* seems to be

- ✓ *Vata Dushti* (either due to *Dhatukshaya* or *Margavarana*)
- ✓ *Kapha-Vridhi*
- ✓ *Pitta-Kshaya*(*Guna Karmatah*)

Dushya:

The specific symptoms of any disease evolve only when the *vitiating Doshas* gets localised in the *Dhatu*s or their *Srotas*.

On analysing the symptoms mentioned in PCOS the *dhatu*'s involved can be traced. *Kapha* if *vitiating* and localized in *Medodhatu* causes *Sthoulya*, *Prameha* etc.; if in *Koshta* causes *Adhmana*, *Avipaka*, *Chardi* etc. Here the symptoms of PCOS are being tried to be classified according to the affected *Dhatu*

Table:1 Dushya in PCOS (*Dhatwagnimandyajanya Beejgranthi Vikara*)

Rasa	<i>Srotorodha, Khlaitya, Agnimandya, Akala Palita</i>
Rakta	<i>Asrugdara, Neelika, Pidika, Tilkalak</i>
Mamsa	<i>Udaragourava, Mamsa Vridhi, mamsakeela</i>
Medas	<i>Atisthoulya, Yauvanapidaka, Poorvarupa of Prameha</i>
Asthi	<i>Kesha, Loma, Smashru Dosh</i>
Shukra	<i>Vandhyatwa</i>
Artava	<i>Vandhyatwa, Artavanasha</i>

Mala:

The proper formation of *Dhatumala* indicates ideal *Dhatu* transformation. Any impairment of the corresponding *Dhatwagni* also may lead to the abnormal increase (*Vridhi*) of the respective *Dhatu*, depending

on which *Dhatumala* is also produced or expelled abnormally.

Upadhatu:

Upadhatu do not possess regenerative qualities to generate other *Dhatu*, they are supportive in function and not nutritive. If

Artava is considered the *Upadhatu* of *Rasa Dhatu*; *Rasapradoshaja Vikaras* may have their impact on *Artava* also. *Sweda* and *Loma Vriddhi* in PCOD may be attributed to impaired *Medodhatu* and *Asthidhatu* due to respective *Dhatwagnimandya*.

Agni:

In a healthy individual, the food consumed is being properly digested and assimilated in the body by the functioning of *Agni*. Status of *Agni* denotes the sum total of all the transformations taking place in the body. The normal status of *Agni* decides the *Ayu*, *Bala*, *Varna*, *Swasthya* and even the *Ojas* of the body^{xvii}. The normal functioning of *Agni* maintains the homeostasis while the altered performance is the beginning of any pathological process. During the process of normal digestion, the formation of *Dosha* takes place in the *Koshta*. Any alteration in *Agni* may affect the status of *Dosha* which may lead to various ailments.

Pitta is termed as *Agni* while it performs functions like digestion, assimilation, metabolism etc. *Agni* acts in the body at different levels of *Jataragni*, *Dhatwagni* and *Bhutagni*. There is a chance of *Agni* impairment at any of these levels. Maintenance of *Agni* is hence a major part of the treatment to keep the ailments aside. Presence of *Agnibala* can hinder the manifestation of any disease by preventing the

Dosha-Doosha *Sammurchana* even though the other factors are favourable for manifestation of *Vyadhi*.

The disturbance in *Bhutagni* results in the diminution of the respective structure of the body as it arises from the five *bhutas*. Each *Dhatwagni* digest and metabolize the nutrients required for nourishing the respective *Dhatu*. Accordingly the health and ill health of *Dhatus* and their respective *Srotas* depends on the respective *Dhatwagni*.

Ama:

Ama is the result of impaired metabolism at *Koshta* or *Dhatu* level or accumulation of metabolic bye products due to *Agnimandya*. *Ama* at cellular level may lead to improper sensitization of cells to hormonal stimulation or abnormal neuro-endocrinal mechanism as found in PCOD. The various exo as well as endotoxins are also classified under *Ama*. It is considered as the initial stage of any type of pathology and is one of the primary factors to be considered while framing treatment protocol. In PCOD *Ama* is due to *Jataragni* and *Dhatwagnimandya*.

Srotas:

Srotas represent the internal transport system of the body, structure as well as the function of *Srotas* is normal depends on that of the *Doshas*, *Agni* and *Dhatus*. If any one or all of the above undergo abnormal changes the *Srotas* also become abnormal (*Khavaigunya*).

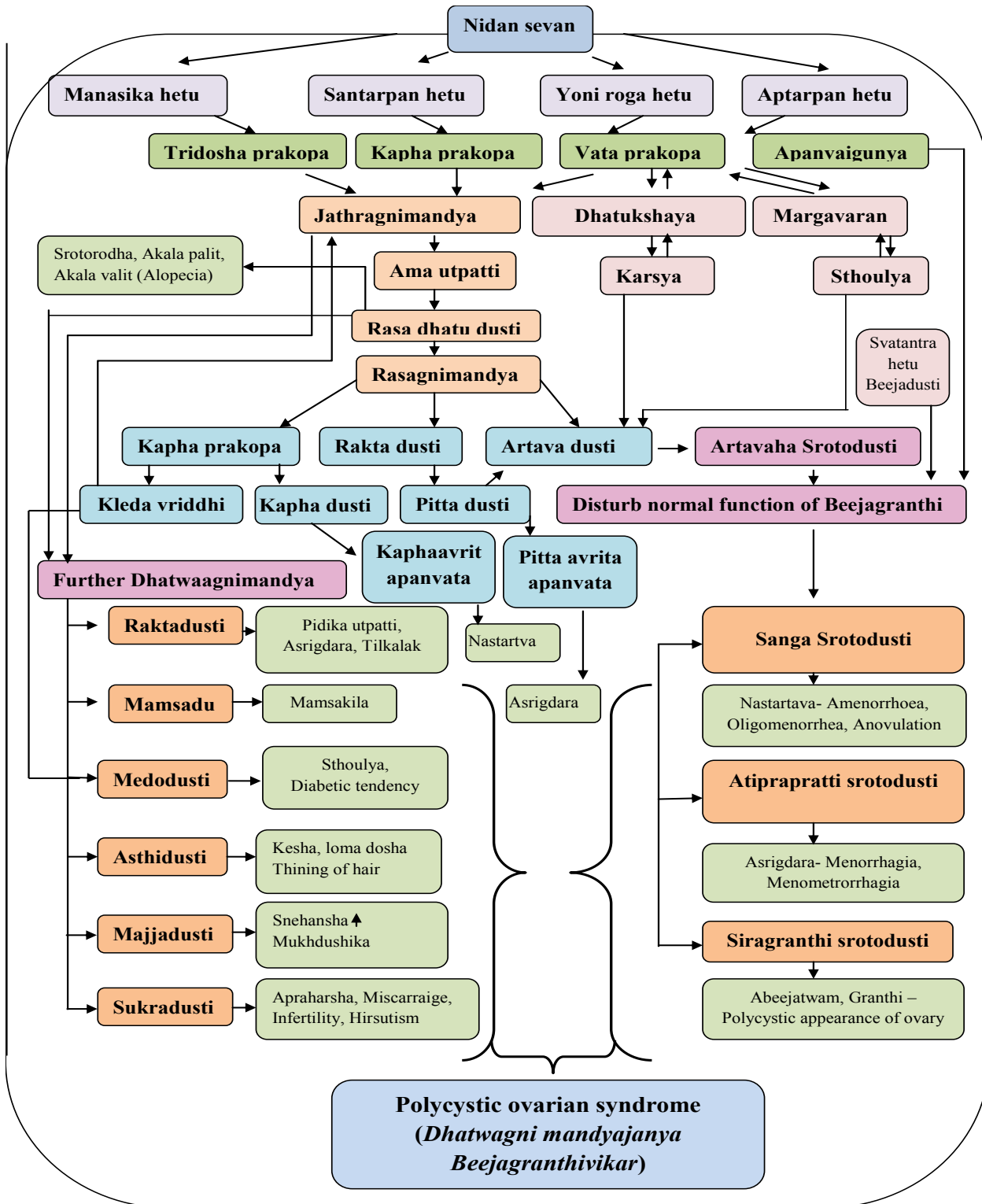
Srotodushti is of four types- *Atipravritti*, *Sanga*, *Siragranthi* and *Vimargagamana*. In *Dhatwagnimandya jyanaya beejagranthi vikar* the predominant *Srotodushti Prakara* is *Sanga*, *Sira-granthi* and *Atipravritti*. Localization of *Doshas* as well as their inter-action with the

particular *Dhatu* and *Srotas*, results in the prodromal symptoms of the disease. With further progress of the pathology, disease gets manifested. In PCOS, the *Srotas* seem to have affected are those of *Rasa*, *Rakta*, *Meda*, *Asthi*, *Shukra* and *Artava*.

Table 2: Samprapti Ghataka

Dosha	
Vata	<i>Apana Vata, Samana Vata</i> and in later stages <i>Vyan vata, Udan vata, Prana vata</i>
Pitta	<i>Pachaka Pitta, Bhrajaka Pitta, Ranjak pitta</i>
Kapha	<i>Kledaka Kapha</i>
Dushya	<i>Rasa, Rakta, Meda, Shukra</i> and in later stages <i>Mamsa, Asthi, Majja</i>
Upadhatu	<i>Artava,</i>
Agni	<i>Jataragni, Dhatwagni, Bhutagni.</i> [Vishama and Manda]
Ama	<i>Jataragnijanya, Dhatwagnijanya</i>
Srotas	<i>Rasavaha, Raktavaha, Medovaha, Artavavaha</i> [Asthi&Shukra]
Srotodushti Prakara:	Sanga- to growth & development of follicle and release of ovum, and menstrual blood. Siragranthi ^{xviii} -(as <i>Sira</i> is synonymous with <i>Srotas</i>) <i>Artavavaha Srotodushti</i> as <i>Granthi</i> -Cysts in Ovaries. Atipravritti- excessive bleeding P/v at improper time as in <i>Asrigdara</i> -due to abnormal growth of endometrium).
Udbhavasthana	<i>Pakwashaya</i>
Vyaktisthana	<i>Yoni, Artavavaha Srotas</i> and <i>Sarvasharira</i>
Adhistana	<i>Artavavaha Srotas (Beeja granthi)</i>
Sancharasthana	<i>Sarvasharira</i> and <i>Yoni</i>
Rogamarga	<i>Bahya- Twak, Raktadi dhatu</i> involvement, and <i>Abhyantara-Koshta, Pakwashaya.</i>
Sadhyaasadhyatwa	<i>Kashtasadhya, Asadhya.</i>

Flow chart : *Samprapti* of PCOD (*Dhatwagnimandya janya Beejagranthivikar*)



Clinical presentation of PCOD^{xix}

Menstrual irregularity^{xx}

- A regular cycle is defined as a cycle length of 22 to 36 days with ovulatory,

luteal phase progesterone levels of > 30 n mol/l and usually biphasic BBT. Oligomenorrhea defined as fewer than eight cycles per year with a flat BBT or low progesterone.

- Menstrual irregularity usually dates back to puberty and may take the form of oligomenorrhea, amenorrhoea, or frequent periods. However, menstrual cycles may be normal. Studies show that oligomenorrhea is present in 29% to 47% of women with PCOS, amenorrhea in 19% to 51% of cases, and frequent periods in 3% of cases. Normal cycles are present in 15% to 30% of cases.

a. Amenorrhoea /Oligomenorrhoea-

Menstrual dysfunction typically occurs in PCOD, ranging from Oligomenorrhoea to amenorrhea. They manifest at the time of menarche in women with PCOD, and menarche may be delayed. *Ayurvedic texts have mentioned this condition under various headings i.e. Nastartava, Anartava, Artavakshaya, Rajakshya, and Rajaksheenata. In all these conditions, menses is delayed or produced in less quantity.*

Nashtartava: Avarana to functions of *Apana Vata* to expel the *Artava*; either due to *Vata*, or *Kapha* or both; with less

involvement of *Pitta* is the clinical feature.

Artava Kshaya: Dominant *Doshas* are *Vata* and *Pitta*. In addition irregular menstruation, scanty menstruation and pain in *Yoni* are clinical features.

Artavanash: It is one of the *lakshanas* of *vedha* of *artavavaha srotas*. Where *Acharya Sushruta* has given *srotoviddha lakshanas*, he referred to traumatic injury for the meaning of *vedha* which means any trauma to *artavavaha srotas* that is female genital tract or HPO axis leads to above said symptoms. In PCOS there is no any type of injury to female genital tract or HPO axis but, the symptom *artavanasha* found indirectly gives the sense of any type of abnormality, imbalance or incoordination in the *patha* or *marga* of *artavavaha srotas*.

b. Menorrhagia / Menometrorrhagia:

If ovulation doesn't occur, endometrium doesn't uniformly shed and regrow as in a normal menstrual cycle. So the endometrium becomes thicker and may shed irregularly, which can result in heavy and /or prolonged bleeding. Endometrial hyperplasia may also occur due to unopposed action of estrogens^{xxi}. In classics **Asrigdara** indicates the excessive and irregularity of menstruation. It is a disease caused by

vitiating of all the three *doshas*, with a clear predominance of *pitta* and manifesting as excessive amount of blood loss or long duration of blood loss or short inter menstrual period. This can be menometrorrhagia. **Apan vayu pitta sanyat**^{xxii} is a pathological condition in which *apanvayu* is covered or avrita by *pitta*, the characters like burning sensation and menorrhagia are appeared.

2. Anovulatory infertility^{xxiii, xxiv}

Infertility is defined clinically as an apparent failure to achieve conception during a period in which no contraception is used. 80 % of couples aged 18 to 25 years will conceive during this period and another 10 % during the following year.

Anovulation is not mentioned as such in our classics. There are various scattered references available of anovulation as *Beejopaghata*, *Pushpopaghata*^{xxv} and *Abeejatva*^{xxvi}, etc. There are many conditions described for *vandhya* but infertility associated with amenorrhoea is few. *Acharya Sushruta* states that in **vandhyayoni**, the *artava* is destroyed. Here, we can interpret *artava* as ovum and consider *vandhya* as anovulatory menstrual cycle. Here, *nashtartava* or

anovulation is one symptom of the *vandhya*.

Ashtoartava dushti indicates only menstrual disorders probably indicating inter-woven disorders of ovum and hormones. The woman suffering from these eight menstrual disorders becomes infertile due to *abeejatvam* as the ultimate effect of *artava vyapada* is '*Abeejatva*'.^{xxvii}

Acharya Kashyapa has mentioned **Pushpaghni jatharani** where the woman menstruates in regular interval but is unable to conceive. The other symptom is corpulent and hairy cheeks. It is incurable.

Viphala artava dusti^{xxviii} mentioned by *acharya kashyapa* shows that either menstruation bleeding is not appeared or menstrual bleeding appeared but ovulation not occur.

3. Hyperandrogenism^{xxix}

- a. Seborrhagia & acne- *Acharya susruta* stated that due to vitiating of *bhrajak pitta* & *vyan vayu* along with *kapha* and *rakta* acne formation occur^{xxx}
- b. Hirsutism- When *pitta* aggravation at the level of *bhrajaka pitta* which is located in skin responsible for hirsutism or when 5 alfa reductase activity increase in skin which convert testosterone to more active metabolite dehydrotestosterone hirsutism occur.

c. Androgenic alopecia- *Vitiated vata* along with *bhrajak pitta* causing hairfall of the scalp after this *kapha* along with *rakta* causes closure of the papilla of hair follicle so that no new growth occur & lead to *khalitya* (alopecia)

4. Obesity^{xxxii, xxxiii} Women with PCOS present with central (apple shaped) obesity as in men than pear shaped obesity they tend to have a high waist/hip ratio. In classics *medoroga* is the result of *Medodhatvagnimandya* and various *Aharatmaka, Viharatmaka, Manasika nidana sevana*, increase in *Kapha* and *Medodhatu* occur and *sthana sanshraya* takes place in *Medovaha srotas*. All these things together cause the *Medovaha srotodusti*. *Srota avarodha* of different *srotasa* is cause by increased *meda*, which affect the *poshana* of different *dhatu*s and it again leads to *medodhatu vridhhi*. Due to the less *poshana* (nutrition) of different *dhatu*s, *Ashtadosha* of *Medoroga* i.e. *Ayushohrasa, Daurbalya* etc. are produced.

5. Insulin resistance^{xxxiii} In PCOS there is hyperinsulenemia along with raised blood glucose levels as insulin is not utilised may be due to *ama* which is the result of *mandagni*. *Ama* spread throughout the body propelled by *vitiated vata* along the *rasavahasrotas* result in *dhatwaagni mandya* and in the end *sukraagni mandya*. It results in improper conversion of androgen to female hormone &

in pcos this increased level of insulin inhibit the formation of SHBG from liver, thus increasing free androgen ultimately creates clinical manifestation of PCOS. **Vyan and apan vayu dusti^{xxxiv}** as mentioned by *acharya susruta* leads to *prameha* which can be correlated with insulin resistance.

6. Blackening of skin and Acanthosis nigricans

– In PCOS patient skin become thickened, pigmented,velvety, most often found in vulva and may be present on the axilla, on the nape of the neck, below the breast, and on the inner thigh. It is acanthosis nigricans and considered as marker of insulin resistance in hirsute women.^{xxxv} *Bhrajaka pitta* is responsible for *varna* of skin. *Pitta ksaya* result in hypopigmentation or *Pitta vridhhi* result in hyperpigmentation of skin. When *vayu & kapha vitiated* along with *pitta* result in *shayava aruna varna & sukla varna* of skin. Also, *pitta vitiated rakta dhatu* result in *vaikrat varna*.

CONCLUSION

The etio-genesis and management of PCOS in conventional system of medicine is still not satisfactory and warranting newer strategies from other resources. It seems to explore an Ayurveda based process of pathogenesis and line of management. Concerning pathophysiology of disease we found that although it is an endocrine disease, it affects many systems of the body resulting in

reproductive, metabolic, and psychological consequences. All metabolic processes of the body are under the control of jatharagni, bhutagni and dhatvagni. So the cause of disease is alteration in metabolic activity which, according to Ayurveda, is vitiation of dhatvagni, so we can conclude that PCOS is caused by dhatvagni vikriti and the adhishtan

of disease is beejagranthi thus we designate the disease as Dhatvagnimandya janya beejagranthi vikara.

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