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PCOS - A REVIEW

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ABSTRACT

Polycystic ovary syndrome (PCOS), characterized by chronic anovulation and hyperandrogenism, is common in women of childbearing age. Most of these women also have insulin resistance, and insulin sensitizing agents--metformin and the thiazolidinediones--can restore ovulation and often fertility. Treatment of hirsutism and depression are important components of therapy. The increased risk for uterine cancer because of unopposed estrogen can be managed with progestin therapy. Women with PCOS are also at greater risk for both type 2 diabetes and cardiovascular disease.

INTRODUCTION: Polycystic ovary syndrome (PCOS) is the most common cause of chronic anovulation associated with hyperandrogenism. PCOS affects 5%-10% of women of childbearing age and is responsible for more than half of infertility in women.[1] although the classic paper on the syndrome[2] described an association between amenorrhea/ oligomenorrhoea, hirsutism, obesity, and polycystic ovaries, the last is no longer necessary for diagnosis. Polycystic ovaries are not found in all women with PCOS, they are found in some women with normal menstrual periods, and they can be the result of anovulation itself, regardless of the cause. In addition, PCOS can occur in lean women. Recent research has established that many patients also have insulin resistance with its compensatory hyperinsulinemia.[3]

A prominent feature of PCOS is a history of menstrual irregularities starting at puberty or very soon thereafter. Although a long period of normal menstrual function can occur before the onset of PCOS, such a history should alert the physician to search for other causes. Hirsutism may develop before puberty, during adolescence, or in the third decade of life (and in some populations, such as Asians, may not occur at all). Virilization, characterized by clitoromegaly, deepening of the voice, male-pattern baldness, and muscle hypertrophy, is very unusual but may occur in hyperthecosis, a severe form

of PCOS. If virilization is noted, another cause should be sought before ascribing it to the hyperthecosis variant of PCOS. At present infrequent menstruation is treated by hormonal therapy. This therapy may lead to obesity.[4]Herbal medicine can be of great benefit in PCOD without the negative side effect of conventional drugs. Obese woman suffers mental stress due to obesity & if she suffers from PCOD it leads to infertility. Therefore correction of menstrual disorder is important. Without physical exercise and diet therapy the treatment of obesity induced oligomenorrhoea is incomplete.[5,6] *Nidan parivarjan* i.e. treating obesity will correct PCOD.

Ayurveda describes different gynaecological disorders under the heading of *yonivayapad, aratavavyapad, beejadosha* in detail which explains the probable effect of the female's optimal health with reproduction. *Kashyapa Samhita* well accepted classics for *bala roga* discusses about *jataharinis* which influences the females during various stages of her life causing many abnormalities related to her reproductive functions. *Charaka* described about *Vandhya* as complication of *yonivyapad*. In *Sutrasthana* also he explained about *Atishthula* and *Atiloma* among the eight categories of unfit persons. Sushruta also described about *Aratava Kshyaya* and *Vandhya yoni*. Vagbhatta (A.Sangraha, A.Hrudaya) also explained about *Vandhya* and *Rajakshaya. Harita* told about 6 types of *Vandhya* among them *Anapatya* is to be disease in which there will be absence of conception.

Menstruation is the sign of womanhood in Ayurveda. The menstrual blood is having synonyms like *Artava, Raja, Shonita, Puspa, Rakta.Kashyapa* has explained *Jataharini* which produces abnormalities by afflicting the women during menstruation, pregnancy etc. and destructs *Aratava, Puspa* and *Garbha*.

In classics there is no such direct reference of PCOS but *Puspaghni Jataharini* is one among those *Jataharinis* having *lakshans* similar to the clinical features of PCOS.

PCOD though a syndrome cannot be correlated to a particular disease.

Origins of PCOS

PCOS is probably more than one disorder. The cause or causes are not known with any certainty. Normal ovarian cycles are characterized by fluctuating levels of hormones, both gonadotropins and steroids,that regulate ovulation and menses (Figure 1). In the anovulatory state of PCOS, hormonal concentrations do not fluctuate, and indeed high steadystate levels are maintained. Luteinizing hormone (LH) levels are often raised, whereas follicle-stimulating hormone (FSH) levels are usually low-normal or even low. In women with chronic anovulation, ovarian production of estrogen and androgens are stimulated by LH and thus are also increased.

Ovarian production of androstenedione is particularly elevated and converted to testosterone in peripheral and target tissues, raising testosterone concentrations beyond those produced by the ovary. In women, about 70% of circulating testosterone is bound to sex hormone-binding globulin (SHBG), which is produced in the liver; 25% is bound to albumin; and 5% is free. This contrasts with men who have much higher testosterone and lower SHBG levels. In men, about 44% of testosterone is bound to SHBG, 54% is bound to albumin, and 2% is free. Albumin-bound testosterone

can dissociate within the capillary bed, however, and is available for tissue uptake so that the biologically active fraction in women is about 30% of total testosterone (equal to the sum of the free and albumin-bound fraction). Although the mechanism is unclear, adrenal production of androgens in women with PCOS is also elevated. Thus, raised dehydroepiandrosterone sulfate (DHEAS) concentration, which is seen in about half of women with PCOS, is almost all of adrenal origin.

Liver production of SHBG is decreased by testosterone and by hyperinsulinemia, thus allowing more free testosterone to exert its effects. Our current, albeit incomplete, understanding of the pathogenesis of PCOS is illustrated in Figure 2. Hyperinsulinemia in conjunction with abnormal LH secretion stimulates the ovary to produce more androgens. The androgens, in turn, together with increased insulin concentrations, reduce hepatic production of SHBG, leading to more free testosterone at the tissue level. This hyperandrogenism, along with disordered LH/FSH secretion, results in anovulation. Although many more details need to be worked out, such as the mechanisms behind the abnormal gonadotropin secretion and the insulin resistance, this is how hyperandrogenism and anovulation are thought to produce PCOS.

PCOS according to Kashyapa

The available portion of Kashyapa Samhita presents a unique chapter in its *Kalpa Sthan* named *Revati Kalpadhyaya*. In this chapter, thirty different types of *Revatis (Jataharini)* producing various abnormalities by affecting the women during her various stages i.e., menstruation, pregnancy etc. are described. These are considered as causative factors. *Puspaghni, Andagni, Drudara, Kalaratri jataharni* are curable. Among them *Puspaghni Jataharini* having the *lakshans* similar to the clinical picture of PCOD.

Jatharani Nirukti :- *Jataharini means* = *Jata* + *Harini*

Jata = the word meaning of *Jata* is born.

Harini = Means distructing, killing.

तस्माज्जातहारिणी पुष्पं हन्ति वपुश्चहन्ति गर्भांश्च हन्ति जायमानश्च।
जनिष्यमाणांश्च हन्ति, यद्भवत्यासुरमधार्मिकाणामपत्यधर्मोपहतं विशेषेण।।

(का. स. क. 6/17)

Jataharini causes disappearance of *Puspa* (menstruation) destructs *vapu, garbha, jata/ jayamana* creatures specially *asuras, adharmika* person or their children.

Pusphaghni Jataharini

Rupa - वृथा पुष्पं तु या नारी यथाकालं प्रपश्यति।
स्थूललोमशगण्डा वा पुष्पघ्नी साऽपि रेवति।।

(का. क. 6/33-34)

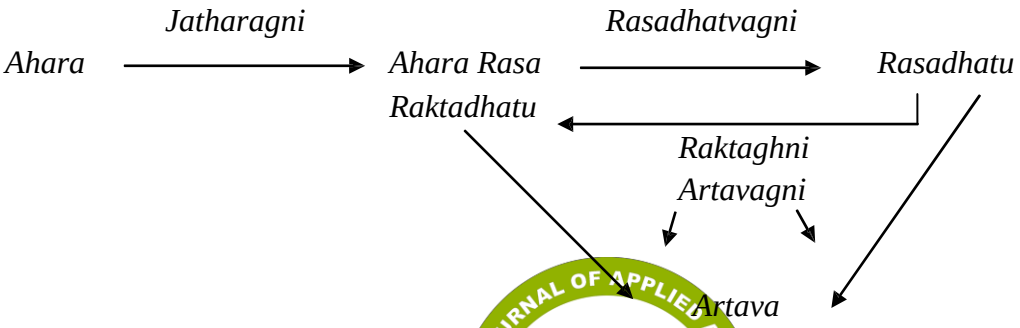
Vrutha Pushpam - Anovulation, fruitless/ without conception.
Yathakalam Prapashyati - Menstruating regularly.
Sthula – Obesity.
Lomsha ganda – Hairy chin/ Hirsutism.

Among the *Jataharini*, *puspaghni* is one of them which causes trouble the women. *Puspaghni* presents with triad of typical features that includes destruction of *puspa* with regular menstruation, appearance of facial hair and obesity.

Physiological activity of Artava

Ritu = Particular period or specific time.
Bhavam = To occur.
Thus *artava* is substance of body which flows out in a specific period of time or

Utpatti of Artava [7,8]



So *artava* is main sign of woman hood and physiological function of female depends upon *artava*. The *artava* has got two aspects depending upon its function and named as

1) *Antahpushpa* [9] 2) *Bahirpushpa.*

Bahirpushpa is that part of Artava which clear the uterus and vagina and prepares the reproductive organ for fertilization.

Antahpushpa is that part of *artava* which directly takes part in fertilization. *Antah puspha* is also called ovum. *Antah puspha* is attributed to *phalayoni* and all the female phenotypic characters that become apparent during reproductive age of female is depending upon this *Antah pushpa*.

So ayurvedic literatures reveals that menstruation, ovulation and female phenotypic characters are because of *artava* and these physiological function distributed in *Puspaghni* like :

i) Female have regular menstruation without *Antah pushpa*.
ii) Altered female phenotypic characters.

When we go through classical text book of Ayurveda then it reveals that reproductive age of female life is characterized by physiological activity of *artava*. Acc. to Arundatta tika (A.H Sa 1/1)

ritu. The woman is able to perform her main function of reproduction only after the regular menstrual periods containing *antah puspha* (ovum).

iii) Male characters like appearance of beard and moustache may occur.

So this illness *puspaghni* is related to *Arthavaha Srotas* in general and particularly the *phala yoni*. *Phala yoni* can be correlated with ovary. PCOS is a syndrome and related to ovary.

Anatomy of ovary

Acc to ayruveda the synonym of ovary is *i) Phala ii) Antarphala iii) Andah.*

There is no special description of ovary in old texts. But Sushruta had described and called as *Antarphala*. He described while talking about *peshis*, that as there are *peshis* surrounding testis in a male just in the same way, there are *peshi* surrounding ovary which is called as "*Antarphala*". Sushruta had described

those ovaries as *marmas* i.e vital organs. He had also described about *udvrutha phala* and *apavritta phala* these two conditions which resemble the prolapsed ovary and the undescended or twisted ovary.

In the PCOD, enlargement of ovary is the structural change observed. In the classics as such references are not there but enlargement of structure or mass lesions are referred by the name *granthi*. The mass lesions containing fluid is referred as *granthi*. The *granthi* develops due to tortuousness or abnormal vitiation of *doshas* and *dushyas*, followed by their accumulation and one place producing rounded, protuberant and glandular swelling.

Nidana

↓

Vitiation of *tridosha*

↓

Vitiation of *Srotas*

↓

Localized in the tissue

↓

Granthi

In ayurvedic classics specific description of *granthi* of reproductive system is not available. But Acharya Charaka has included this in the chapter dealing with *sotha*. Due to similarity in basic clinical feature i.e swelling or protuberance.In the treatment he has indicated enucleation of *granthi* along with its *kosa* or capsule on this basis *granthi* can be equated with cyst.[10]

Acc to Sushruta aggravated *vatadi doshas* vitiating the *mamsa, rakta, meda* of the *beeja kosa* produce rounded protuberant knotty swelling called *granthi*. [11]

Vagbhatta explained vitiated *doshas* in which *Kapha* is predominant get localized in the tissue produced a round elevated growth, compact in nature called *granthi*. On the basis of this *granthi* can be correlated with cyst.

When *sleshmaj prakruti stree* consumes the *Kapha prakopak ahara* then it vitiates the *doshas* mainly *Kapha. Kapha* vitiation will cause the *meda vriddhi* and it will lead to abnormality in *Rituchakra* (prolonged *ritukala*).Further it creates the vitiation of *tridosha* mainly *vata vikruti* both *vata* and *Kapha* causes *avarana* to *artavaha srotas* and it will leads to *artavavaha strotas dushti* in terms of *Anartava (Alpapushpa Nastapuspa)* along with this *meda vriddhi* leads to *alpa prana, alpa beeja, alpa maithuna*.

Choosing effective treatment

Treatment of PCOS can affect four outcomes: anovulation; infertility; other manifestations of androgen excess such as hirsutism; and long-term sequelae such as cardiovascular disease (CVD) and endometrial carcinoma. Since most women with PCOS are insulin resistant (obese patients more than lean ones). Weight loss of at least 5% in obese patients can reduce both insulin resistance and androgen excess, and result in ovulation and subsequent pregnancy.

CONCLUSION

PCOS is common endocrinopathy in young women that presents physicians with many challenges. Patients need to be

treated for anovulation, and many require therapy for infertility, hirsutism, depression, and obesity. On a longer-term basis, measures to prevent uterine carcinoma, CVD, and diabetes are necessary. Fortunately, available lifestyle interventions and pharmacotherapies can accomplish most of these outcomes. Appropriate management relies on knowledgeable providers and cooperative patients. Sushrut mentioned *agneyadravyas* having properties like *deepana, pachana, chedana, lekhana, medohara* pacifies *Kapha & Vata dosha* can be used to treat PCOD.[12]

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