

## A CRITICAL REVIEW TO STUDY THE EFFICACY OF BRIHAT SHATAVARI GHRITA OVER PCOS, WITH SPECIAL REFERENCE TO ARTAVA DUSHTI

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### ABSTRACT

**Introduction:** Polycystic ovarian syndrome -as the name suggest, is a collection of signs and symptoms related to ovarian dysfunction. It was originally described by Stein and Leventhal in 1935, so called as “Stien-Leventhal Syndrome”. It is a heterogeneous disorders characterized by menstrual irregularities, clinical and or biochemical hyperandrogenism and hyperinsulinemia, which ultimately leads to infertility. Since prevalence rate of PCOS now days is very high amongst women of reproductive age because of unhealthy dietary habits & life style i.e. *doshaprakopaka aharavihar*. In modern science, PCOS is treated by hormonal therapy along with symptomatic treatment and the last option is surgery (Partial oophorectomy or Drilling of the ovaries) and long term use of these drugs produces

many side effects. So, it is very essential to find out some effective Ayurvedic medicines for this condition. In this manner the critical review over *Brihat shatavari ghrita*(BSG) (described in *Charakasamhita*, *chikitsasthana* in *yonivyapadachikitsa*) may prove to be an accepted concept. **Aim & objectives:** To study the effect of Brihata shatavari Ghritha over PCOS W.S.R. Artavadushti. **Material & Methods:** PCOS and *Brihat Shatavari Ghritha* for its pharmacological action were studied from the Ayurvedic books, modern books and various research articles from different journals were referred for the research updates. **Result and Observation:** The root cause of ovarian cycle failure is due to vitiation of *Vata* and *Pitta dosha*. Drug by its *Vata Pittashamak* property, *Vata* performed its proper function by its

appropriate regulation and initiation of normal reproductive physiology. **Conclusion:** BSG can play a great role in treating the *Artavadushti* i.e PCOS by pacifying the vitiated *Vata* and *Pitta doshas*. It can also subside the other related symptoms like weight gain, insulin resistance, infection, skin problems etc.

**KEYWORDS:** PCOS, *Brihat Shatavari Ghrita*, *Artavadushti*, hyperinsulinemia, hyperandrogenism.

## INTRODUCTION

*Stree* being the root cause of progeny, utmost care should be given to protect her from any ailments that affect her motherhood. Polycystic ovarian syndrome (PCOS) is one of the conditions affecting this unique capacity of woman. The disorder is probably the most common hormonal abnormality in women of reproductive age and certainly a leading cause of infertility. Poly cystic ovarian syndrome (PCOS) is originally described in 1935 by Stein and Leventhal as a syndrome.<sup>[1]</sup> This syndrome is manifested by hyperandrogenism and obesity associated with enlarged polycystic ovaries. PCOS is the most common endocrine disorder among women b/w the ages of 18 & 44+, It affects approximately 5% to 10% of this age group. It is one of the leading cause of poor fertility (infertility).<sup>[2]</sup>

Clinical manifestation, of PCOS includes infrequent or absent menstruation, abdominal obesity, & signs of androgen excess (hyperandrogenism) which includes acne, seborrhea & insulin resistance. Long term consequences include increased risk of endometrial cancer, type 2 DM, dyslipidemia etc. etiology of PCOS is not clearly understood but it develops when ovaries are stimulated to produce excessive amount of androgenic hormone, in particular testosterone. The syndrome acquired its most widely used names due to its common sign on USG examination of multiple (poly) ovarian cysts. These cysts are not actually cysts these are immature follicles. The follicles are developed from primordial follicle but their growth has been stopped at an early stage due to the disturbed ovarian function.<sup>[3]</sup>

As the name only suggests that it's a syndrome hence, no direct reference involving the clinical spectrum of PCOS was found; instead the symptoms were explained as a part of various diseased conditions in *ayurvedic classic texts* can be co-related to this. It can be understood under the broad term *Artavadushti*. As the term *Artava* is not only limited to menstrual blood but it is referred to ovum & ovarian hormones. In *ayurveda* all menstrual disorders are considered under *Artavadushti*. 8 types of *Artavadushti* are mentioned in

ayurvedic classics and these are *vataja*, *pittaja*, *kaphaja*, *kunapagandhi(raktaja)*, *granthi(vatakapahaja)*, *putipuya(kaphapittaja)*, *ksheena(pittavataja)*, *mutra-purisha Gandhi(tridoshaja)*.<sup>[4]</sup>

As this disease is manifested due to mixed aetiological factors and presents with complex symptomatology, the treatment should also be broad spectrum. This prompts us to think that the drug which is useful to reduce circulating androgen, optimize ovarian function, regulate the menstrual cycle, and support optimal endocrine function. Keeping this hypothesis in mind and the scattered references in *samhitas*, we planned to carry out a Critical review over *Brihat shatavari ghrita(BSG)* described in *Charakasamhita*, *chikitsasthana* in *yonivyapadachikitsa*, indicated for *yonidosha*, *artavadosha*, *shukradosha*, *kshaya*, *kshata*, *unmada*, *apasmara*, *kasa*, *halimaka* etc.<sup>[5]</sup>

Some previous research studies shown its effect on *artavakshya* (oligomenorrhoea)<sup>[6]</sup> & infertility.<sup>[7]</sup> Also the main content of *BrihatShatavariGhrita* '*shatavari*' is a best known drug for correction of hormonal imbalance in females as previous study on *shatavari* conducted by Pradeep Kinage & DeepikaChaudhari has concluded that *shatavari* is useful in various female health issues like polycystic ovarian diseases, Dysmenorrhea, Premenstrual syndrome, Infertility and Menopause. Along with this, it is also used as diuretic, antispasmodic, rejuvenating, galactagogue, nervine tonic.<sup>[8]</sup> Also *jivaniyagana dravyas* are having properties like *artavajanana*, *vrushya*, *garbhashthapana*, *shukrajana*, *shothahara*, *lekhana*, etc. Because of these properties of different components of *Brihat Shatavari Ghrita* it would be helpful in correcting hormonal imbalance in body, maturation of follicle & may reduce the cysts from ovaries.

Since prevalence rate of PCOS now days is very high amongst women of reproductive age because of unhealthy dietary habits & life style i.e. *doshaprakopaka aharavihar*. In modern science, PCOS is treated by hormonal therapy along with symptomatic treatment and the last option is surgery (Partial oophorectomy or Drilling of the ovaries) and long term use of these drugs produces many side effects. So, it is very essential to find out some effective Ayurvedic medicines for this condition. We hope this preliminary study may prove to be an accepted concept in coming years.

## AIM AND OBJECTIVES

To study the effect of Brihata shatavari Ghrita over PCOS W.S.R. Artavadushti.

## MATERIAL AND METHOD

PCOS and Brihat Shatavari Ghrita for its pharmacological action were studied from the Ayurvedic books, modern books and various research articles from different journals were referred for the research updates.

## PCOS

### PATHOPHYSIOLOGY

The polycystic ovary is the result of functional derangement, not a specific central or local defect. However, various biochemical abnormalities have been described; associations and linkages of one another have been established. Many of these abnormalities reinforce each other in vicious circles. The hyperandrogenism and anovulation that accompany PCOS may be caused by abnormalities in four endocrinologically active compartments.<sup>[9]</sup>

- The hypothalamus-pituitary compartment,
- The ovaries,
- The periphery,
- The adrenal glands.

### PATHOLOGY

The polycystic ovary is the result of a 'vicious cycle', which can be initiated at any one of many entry points. Altered function at any point in the cycle leads to the same result: the polycystic ovary.

A more accurate concept is that the polycystic ovary is a consequence of the loss of ovulation and the achievement of the steady state of persistent anovulation. The characteristics of the ovary reflect this dysfunctional state.<sup>[10]</sup> The surface area is doubled, giving an average volume increase of 2.8 times.

1. The same number of primordial follicles is present, but the number of growing and atretic follicles is doubled. Each ovary may contain 20-100 cystic follicles.
2. The thickness of the tunica (outermost layer) is increased by 50%.
3. A one-third increase in cortical stromal thickness and a 5-fold increase in subcortical stroma are noted (hyperthecosis). The increased stroma is due to both to hyperplasia of thecal cells and to increased formation subsequent to the excessive follicular maturation and atresia.

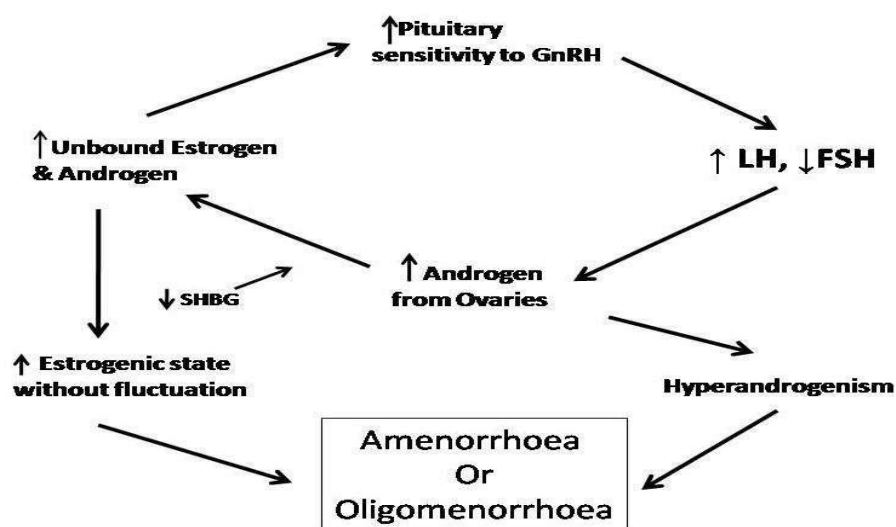
The functional picture that emerges (arrested granulosa cells and very active theca cells) corresponds to the morphologic histology of underdeveloped granulosa and hyperplastic and

luteinized theca. There is striking difference comparing polycystic granulosa cells with granulosa cells from atretic follicle. Granulosa cells from polycystic ovaries are very sensitive to FSH; granulosa cells from atretic follicles are not. Thus, the granulosa cells from the follicles in polycystic ovaries are not apoptotic (atretic), but simply arrested in development. The follicles are unable to successfully change their micro environment from androgen dominance to oestrogen dominance, the change that is essential for continued follicular growth and development.

### Looking to the Symptoms

1. Menstrual irregularities in form of amenorrhoea or oligomenorrhoea
2. Anovulation causing Infertility
3. Obesity
4. Hyperandrogenic symptoms are hirsutism, acne and male pattern baldness.

### MENSTRUAL ABNORMALITY<sup>[11]</sup>



**AYURVEDIC VIEW:** Though the word *artava* refers to menstruation, ovum and ovarian hormones, *Ashtoartava dushti* indicates only menstrual disorders probably indicating interwoven 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*'.<sup>[12]</sup>

- आर्तवमपि त्रिभिदोषैः शोणितचतुर्थैः पृथक्द्वैद्वै समस्तैश्च उपसृष्टं अबीजम् ॥ (सु.शा. २/५)

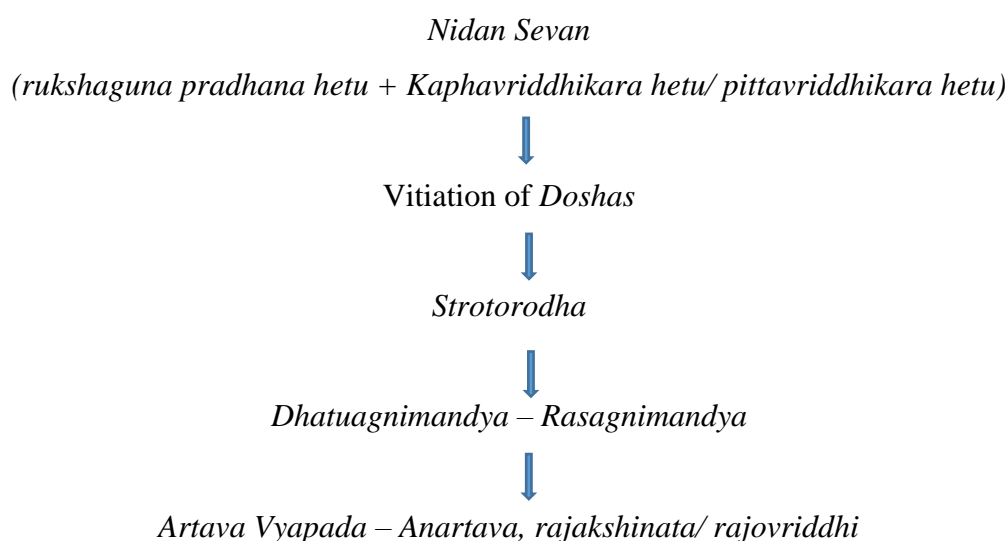
The pathophysiological mechanism indicates that the aetiology is multifactorial. Since a thorough search through classical text books failed to find a clinical condition, that can be directly correlates with PCOS, the alternate left was to postulate the etiopathogenesis or *samprapti* of PCOS by analyzing the symptoms, status of *doshas*, *dhatu*, *agni*, *srotasa*, etc. It is probable that PCOS is occurring by *kapha* vitiation, leading to *srotorodha* and subsequently *vata* vitiation. *Agneya guna* of *pitta* is depleted at *dhatu* level. The reasons for *Vata* vitiation are *Srotorodha*, *Avarana* of *Vata* by *Pitta*, *Dhatukshaya* causing *Poshana Abhava*, they may be the major in the pathogenesis of *Artava dushti* or increase in immature follicles in PCOS.

### ***Margavarodha: Srotorodha***

*Apana Vayu* is said to be the governing force of the *Artavapravriti*. Here *Artava* is taken as *raja* or follicles / ovum. So if any obstruction is there, it hampers the normal function of *Apanavayu*, resulting in decreased maturation of follicles and delayed or less ovulation.

***Avarana:*** Acharya *Sushruta* has mentioned the presence of *Avarana* in *Vandhyatva*.<sup>[13]</sup> Observing the mixture symptomatology of *Pitta* and *Vata*, there may be mixed covering of other *Vata* (except *Apanavayu*) and *Pitta* over *Apana Vayu*. In such case *Avarana Dosha* suppress the normal function of *Avrita Dosha (Apanavayu)* and inhibits its normal *Pravriti* i.e. hinder the ovulation.

### ***Samprapti***



## PATHOLOGY

Looking to the pathology i.e. cyst formation and accumulation in periphery of ovary, some learned *ayurvedic* gynaecologists compare the condition PCOS with ‘*Granthibhuta Artavadushti*’.

In *Ayurveda*, *acharya* Sushruta is the only one who had given the description of ‘*Granthi*’ as–

- वातादयो मांसमस्कृ च दुष्टाः सन्दूष्य मेदश्च कफानुविद्धम् ।

वृत्तान्तं विग्रथितं तु शोफं कुर्वन्त्यो ग्रन्थिरिति प्रदिष्टः ॥ (सु.नि. ११/३)

When the deranged *vata* etc. vitiates the *mamsa*, *shonita* & *meda* mixed up with *kapha*, they produce circular, raised & knotted inflammatory swelling called ‘*Granthi*’.<sup>[14]</sup> In this chapter, circular knotted inflammatory swelling has been defined as ‘*granthi*’.<sup>[15]</sup> This type of glandular swelling has been compared with the modern terminology ‘cyst’<sup>[16]</sup>, which means an abnormal closed epithelium- lined cavity in the body, containing liquid or semisolid material. In PCOS, development of follicles has been arrested at one or any level & remained as it is. The cysts are follicles at varying stages of maturation & atresia. So, these cysts are not destined to ovum. Thus, this pathology is compared with *granthibhuta artava dushti*. The learned people say that the term ‘*artava*’ is used for ovum too. So in *granthibhuta artava*, the *artava* (ovum) becomes *granthibhuta* i.e. cyst, as in PCOS the follicles becomes cysts instead of developing up to mature ovum.

**Brihat Shatavari Ghrita:** it is having *Shatavrai*, *ksheera*, *ghrita*, *jivaniyavarga*(*meda*, *mahameda*(*Shatavari*), *kakoli*, *ksheerakakoli*(*Ashwagandha*), *jivaka*, *rishbhaka*(*Vidarikanda*), *mudgaparni*, *mashaparni*, *jivanti*), *madhuka*, *mrudvika*, *parushaka*, *priyala*, *yashtimadhu* as its active ingredients. *Madhu*, *pippali* & *sharkara* as *prakshepa dravyas*.

**Table No. 1: properties of ingredients of Brihat Shatavari Ghrita according to Ayurved.**

Ingredient	Botanical name	Rasa panchaka	Karma
<i>Shatavari</i> <sup>[17]</sup>	<i>Asparagus racemosus</i>	<i>Rasa : Madhura, Tikta</i> <i>Guna : Snigdha, Guru</i> <i>Virya : shita</i> <i>Vipaka : Madhura</i>	<i>Vrishya, Shukraja</i> <i>Rasayana, Kaphavataghna</i> <i>Pittahara</i> ’ <i>Vatahara</i> <i>Agnipushtikara, Shothahara</i>
<i>Ashwagandha</i> <sup>[18]</sup>	<i>Withania somnifera</i>	<i>Rasa : Tikta, Kashaya</i> <i>Guna : Laghu</i> <i>Virya : Ushna</i> <i>Vipaka : Madhura</i>	<i>Vatakaphapahahara, Balya,</i> <i>Rasayana, Vajikarana</i>



<b>Vidarikanda</b> <sup>[19]</sup>	Pueraria tuberosa	<b>Rasa:</b> Madhura <b>Guna:</b> Snigdha, Guru <b>Virya:</b> Shita <b>Vipaka:</b> Madhura	Vatahara, Pittahara, Stanyada, Shukrala, Mutrala, Jivaniya, Rasayana, Balya
<b>Mudgaparni</b> <sup>[20]</sup>	Phaseolustrilobus	<b>Rasa :</b> Tikta, Madhura <b>Guna :</b> Ruksha, Laghu <b>Virya :</b> shita <b>Vipaka :</b> Madhura	Shukradoshahara, Kaphahara, Pittahara Shukrala, Rasayana Garbhasthapana
<b>Mashaparni</b> <sup>[21]</sup>	Teramnuslabialis	<b>Rasa :</b> Tikta, Madhura <b>Guna :</b> Laghu, Ruksha <b>Virya :</b> Shita <b>Vipaka :</b> Madhura	Vatapittashamaka, Kaphavardhaka, Grahi, Balya, Vrishya, Shukrala.
<b>Jivanti</b> <sup>[22]</sup>	Leptadeniareticulate	<b>Rasa :</b> Madhura, Kashaya <b>Guna :</b> Laghu, Snigdha <b>Virya :</b> Shita <b>Vipaka :</b> Madhura	Rasayana, Balya Vrisya, Vishaghna Tridosahara
<b>Mridvika</b> <sup>[23]</sup>	Vitisvinifera	<b>Rasa:</b> Madhura, Kashaya <b>Guna:</b> Guru, Sara, Snigdha <b>Virya:</b> Shita <b>Vipaka:</b> Madhura	Brinhana, Chakshushya, Vrishya, Vatapittahara
<b>Parushaka</b> <sup>[24]</sup>	Greviaasciatica	<b>Rasa :</b> Madhura, Amla <b>Guna :</b> Laghu <b>Virya :</b> Shita <b>Vipaka :</b> Madhura	Brinhana
<b>Priyala</b> <sup>[25]</sup>	Buchananialanzan	<b>Rasa:</b> Madhura <b>Guna:</b> Guru, Snigdha, Sara <b>Virya:</b> sheeta <b>Vipaka:</b> Madhura	Vatahara, Pittahara, Dahahara, Raktaprasadana
<b>Yashtimadhu</b> <sup>[26]</sup>	Glycyrrhizaglabra	<b>Rasa :</b> Madhura <b>Guna :</b> Guru, Snigdha <b>Virya :</b> Shita <b>Vipaka :</b> Madhura	Vatapittajit, Raktaprasadana, Balya, Varnya, Vrishya,
<b>Pippali</b> <sup>[27]</sup>	Piper longum	<b>Rasa :</b> Katu, Tikta, Madhura <b>Guna :</b> Snigdha, Laghu <b>Virya :</b> Anushna <b>Vipaka :</b> Madhura	Vatahara, Kaphahara, Dipana, Ruchya, Rasayana, Hridya, Vrishya, Tridosahara, Rechana
<b>Madhu</b> <sup>[28]</sup>	-	<b>Rasa:</b> Madhura, Kashaya <b>Guna :</b> Laghu (Sushruta), Guru (Charak), Ruksha, Picchila, Yogavahi <b>Virya :</b> Shita <b>Vipaka :</b> Katu	Agnidipana, Chakshushya, Pittaprashamana, Prasadana, Ropana, Sandhana, Sleshmaprashamana, Shodhana, Tridoshaprasamana , Vatapittaghna, Vishaghna
<b>Sharkara</b> <sup>[29]</sup>	-	<b>Rasa:</b> Madhura <b>Guna :</b> Snigdha <b>Virya :</b> Shita <b>Vipaka :</b> Madhura	Dhatuwardhaka, Hridya, Pittahara, Vatahara, Varnya
<b>Ksheera</b> <sup>[30]</sup>	-	<b>Rasa-</b> Madhura <b>Guna-</b> Guru, Snigdha <b>Virya-</b> Shita <b>Vipaka-</b> Madura	Brinhana, Vajikarna, Rasayana, Balya , Vrishya, Ojovardhaka, Medhavardhaka, Shukrajanaka, Agnideepaka,



			<i>Rasayana, Vishanashaka, Dahanashaka,</i>
<i>Ghrita</i> <sup>[31]</sup>	-	<i>Rasa: Madhura Guna: Snigdha Virya: Shita Vipaka: Madhura</i>	<i>VataPittashamaka Vishanashaka, Raktavikaranut, Balakruta, Agnivardhaka, Vrishya, Medhavardhaka, Chakshukshya, Vayasthapak and Rasayana.</i>

**Table NO. 2: properties of ingredients of Brihat Shatavari Ghrita According to Modern Point of view.**

<b>Ingredient</b>	<b>Chemical constituents</b>	<b>Action</b>
<i>Shatavari</i> <sup>[17]</sup>	Sugar, Glycosides, Saponin and Sitosterol	lowers the cholesterol, lowers the blood glucose level, antidepressive, regulates hormones(LH:FSH) <sup>[32]</sup> , treats infertility due to endometrial factor <sup>[33]</sup>
<i>Ashwagandha</i> <sup>[18]</sup>	Alkaloids and withanolides	Boosts fertility, increase testosterone in men, reduce stress & anxiety, reduces blood sugar level & cholesterol.
<i>Vidarikanda</i> <sup>[19]</sup>	Gluconic and Malic acids	Antiinflammatory, strengthens the reproductive system, promotes production of healthy semen,
<i>Mudgaparni</i> <sup>[20]</sup>	Sterols	Reduces body weight, treating oligospermia, fever, relieves swelling, antioxidant, hepatoprotective.
<i>Mashaparni</i> <sup>[21]</sup>	Glycosides	Antioxident, Treats bleeding disorders, promotes body strength, improves vigour, aphrodisiac
<i>Jivanti</i> <sup>[22]</sup>	Hentriacontanol, amyirin, stigmasterol, $\beta$ -sitosterol and flavonoids-diosmetin and luteolin.	Treats bleeding disorders, IBS, Anti-inflammatory, increase lactation, reduce swelling,
<i>Mridvika</i> <sup>[23]</sup>	Malic, Tartaric & Oxalic Acids, Carbohydrates and Tannins.	Increase male & female fertility, strengthens the reproductive system, treats ED, intestinal disorders
<i>Parushaka</i> <sup>[24]</sup>	- Citric Acid, Sugar, Vit. C	Cardiac tonic, reduce swelling, strengthens the body
<i>Priyala</i> <sup>[25]</sup>	Alkaloids, Tannins, Saponins, reducing Sugars, Triterpenoids and Flavonoids	Improves fertility, treats seminal weakness, cure skin disorders, Purifying the blood
<i>Yashtimadhu</i> <sup>[26]</sup>	Glycyrrhizin, glycyrrhizic acid, glycyrrhetic acid, asparagine, sugars, resin and starch	Manage hormonal imbalance, anticoagulant, anti-tussive, inhibits the symptoms of PCOD <sup>[34]</sup>
<i>Pippali</i> <sup>[27]</sup>	Essential Oil and Alkaloids	Manage diabetes, aids in weight loss, manage hormonal imbalance, relieves PMS
<i>Madhu</i> <sup>[28]</sup>	Carbohydrates, proteins, flavonoids, organic acids, hydroxymethylfurfural	Antioxidant, wound healing, weight loss, urinary tract disorders,

		aphrodisiac
<i>Sharkara</i> <sup>[29]</sup>		Antioxidant, reduces PMS,
<i>Ksheera</i> <sup>[30]</sup>	Protein 3.3%, Carbohydrate- 4.8% Calcium-0.12%, Phosphorus-0.09% Iron- 0.2% Calories- 65%, Vitamin A, Vitamin B, Nicotinic Acid, Riboflavin Vit. C	Improves reproductive health, strengthens the body, reduce risk of diabetes, prevents weight gain,
<i>Ghrita</i> <sup>[31]</sup>	Triglycerides , Ketoacid, glyceride Vitamin- D, Glycerylestors Vitamin-E , Free fatty acid, Vitamin-K , Diglycerides Monoglycerides, Phospholipids Steroles, Vitamin A	Reduces the risk of cancer, nutritional powerhouse, increase the production of hormones like estrogen, progesterone.

## DISCUSSION

As this disease is manifested due to mixed aetiological factors and presents with complex symptomatology, the treatment should also be broad spectrum. This prompts us to think that the drug which is useful to reduce circulating androgen, optimize ovarian function, regulate the menstrual cycle, and support optimal endocrine function. Keeping this hypothesis in mind and the scattered references in *samhitas*, we planned to carry out a conceptual study over *Brihat shatavari ghrita* described in *Charakasamhita*, *chikitsasthana* in *yonivyapadachikitsa*, indicated for *yonidosha*, *artavadosha*, *shukradosha*, *kshaya*, *kshata*, *unmada*, *apasmara*, *kasa*, *halimaka* etc. *Sneha Kalpana* is a well known and abundantly used form of medicament in Ayurvedic therapeutics. It is popular & widely used due to its various modes of administration. *Sneha Kalpana* is a formulation in which water soluble and fat soluble bio-constituents may be achieved at a time in a single formulation, Hence it is an important formulation.

In Ayurveda, *Tridoshas* are the basic pillar of any physiology of human body. So the role of *Vata*, *Pitta* and *Kapha* must be ruled out for ovarian factors.

### Probable *Tridoshika* involvement in the ovulation

*Vata* is the precursor of every major and minor activity of body.<sup>[35]</sup> So, it is initiator of every attempted of regulating menstrual cycle. The process of new cells division and regeneration from primary follicles to secondary follicles & then to ovum is said to be due to *Vata*, as differentiation or cell division are the functions of *Vata*. Transportation of body elements is function of *Vata* so regulation of Hypothalmo pituitary ovarian axis is governed by *Vata*.

*Pitta* is responsible for all type of *Paka Karma* in the body<sup>[36]</sup>, so here, the role of *Pitta* can be understood as ovarian Steroidogenesis where two cells(theca cells and granulosa cells) produce different hormones under the influence of two Gonadotrophins(LH and FSH).<sup>[37]</sup> Change one substance into another is done by *Pitta's Paka karma*. During follicular phase under the influence of LH androgen produced in theca cells and their aromatization done in granulosa cells under the influence of FSH into estrogens. After ovulation progesterone formed in luteinised granulosa cells under the influence of LH. Thus *Pitta* is responsible for production of adequate level of hormones. The hormones formed by aromatization of *Pitta* are anabolic (having *Kaphaja* property) in nature because they are product of cholesterol (also having *Kaphaja* property).

The function of *Kapha* is *Upachaya* which means development.<sup>[38]</sup> So, here it is responsible for further development of ovum and endometrial cells by proliferative and secretory changes through estrogen and progesterone respectively.

These are the normal functioning of *Doshas* but, due to vitiation of *Vata Dosha* HPO- axis get disturbed, cells division, regeneration of new follicles from primary oocytes to secondary and more get hampered, consequence in immaturation of follicles and cysts in ovaries formed. The function of *Pitta* is somewhat suppressed by *Vata*, so there is reduced rate of ovarian steroidogenesis (*Pitta* being not enough to convert androgens into estrogens and progesterone). So, proliferation and division not occurs and follicles failed to get converted into ovum in the lack of hormonal support. Hormonal imbalance disturbs ovarian cycle as well as endometrial cycle also. However all the three *Doshas* are involved in process of oogenesis; *Vata* and *Pitta* play prime role in physiology as well as pathology regarding ovulation and regulating the hormones.

*Vata* is the foremost *Dosha* who controls the other *Doshas*. So when it got vitiated, disturbs the normal physiology of reproductive tract as the *Adhodara Pradesha* is the main site of *Vata Dosha*.<sup>[40]</sup>

On the other hand Vitiated *Pitta* causes *Apakati*-indigestion which leads to *Ama* formation which is responsible for *Srotorodha*. It also vitiates its *Ashraya Rasa Dhatu* and thus also its *Upadhatu Artava*.

Thus it can be said that *Vata* and *Pitta* are the prime cause which is responsible for folliculogenesis and ovulation.

No study has been carried out on BSG for its effects on PCOS. So, present study was selected to give a review about possible effect of BSG on PCOS. Different ingredients of BSG can play a great role to breakdown the possible *samprapti* occurs during *Artavadushti* or PCOS with their special properties and actions like-

*Shatavari* – it possess properties like *Madhura & Tikta rasa*, *Snigdha guna* and *Sheeta virya*. All these properties helps in suppressing the vitiated *Vata & Pitta dosha* also due to *Tikta rasa* it acts as *Kaphaghna*. By balancing all three *doshas* it clears the *srotorodha*(obstruction) and leads to *Artvaotpatti*. Being *agnipushtikara*<sup>[41]</sup> *shatavari* corrects the altered *dhatu agni* which leads to the nourishment of *rasadi dhatu* and ultimately produce *artava*. *Shatavari* is a great *Vrushya* durg and a *rasayana* which helps nourishing the body and cells. It contains saponins which hinder the oxytolic activity on uterine musculature, thereby maintain the spontaneous uterine motility.

The energy source for the female reproductive system is estrogen dependent glycogen. Estrogen increases the glycogen content in the uterus and any decrease in uterine glycogen would directly implicate estrogen deficiency. Its extract containing formulation was found to cause an increase in uterine weight and uterine glycogen without altering serum estrogen progesterone levels. Ultimately enhance the folliculogenesis and ovulation.<sup>[42]</sup>

On the other hand *Shatavari* also helps in lowering the blood glucose level which got impaired in PCOS.

*Ashwagandha*- being *Tikta*, *Kashaya* in taste, *laghu in Guna* & with its *Ushna Virya*, *Ashwagandha* suppresses the vitiated *Vata* and *Kapha doshas* which are the leading cause of *kha- vaigunya* and *artavadushti*. It is one of the herbal medicines widely used for the treatment of infertility and sexual disorders.

Being one of *uttam Rasayan & Vajikarana* *Ashwagandha* improves the body health and nourishes the *dhatu*s and improves the production of *Rajah* and *Shukra*. The extracts of *Ashwagandha* improve the luteinizing hormone and follicle stimulating hormone balance, leading to Follicle maturation and ovulation.<sup>[43]</sup> Also, it helps in maintaining blood glucose level that will help in correcting the insulin resistance.

Vidarikanda – it is a great *rasayana*. It is having properties like *Madhura* and *Snigdha guna* which helps in suppressing the *Vata dosha* may leads in correcting the *Apana Vayu dushti*, as *apana vayu* is responsible for the activities of reproductive system it will lead to *artava janana* i.e maturation of follicles and ovulation. with properties like *Sheeta virya* and *Madhura vipaka* it acts as *pittahara* which ultimately maintains the *agni*. It acts as anti inflammatory and gives strength to the reproductive system.

Mudgaparni, Mashaparni – both are *Tikta & Madhura* in taste. *Laghu* and *Ruksha guna* of both herbal drugs suppress the *kapha dosha* that helps in clearing the obstruction (*srotorodha*) also, *Tikta rasa* act as “*Amapachana*” i.e detoxification of body and “*Dipana*” i.e improves *agni* and digestive property. Both are good antioxidants, Mudgaparni helps in reducing the body weight which is the biggest problem in female having PCOS. It also relieves swelling Promotes general body health. Mudgaparni also helps in treating the oligospermia.

Jivanti – it treats bleeding disorder hence maybe helpful in treating disturbed or excessive bleeding and reduce the inflammation and the risk of infection. It reduces swelling and pain. Its *Madhura rasa* and *Snigdha guna* balance the vitiated *Vata* and *Pitta dosha* and also, *kashaya rasa* and *laghu guna* suppress the *kapha dosha*. When all *doshas* gets in their normal state they leads to correct the pathophysiology at *dushya(dhatu)* level. It is *balya* and *rasayana* hence promotes helath of the body and reproductive system and promotes the maturation of follicles.

Mridvika – it has a great property of *Brinhana* i.e. provide nourishment to the body. It increases both male and female infertility, and strengthens the reproductive system. It is *Madhura & Kashaya* in taste, its *Guru, Sara*, and *Snigdha guna*, *Sheeta virya* and *Madhura vipaka* makes it the great *Pittashamaka* drug i.e. it suppresses the vitiated *pitta* and *vata* too. It helps in correcting the impaired *agni* leads to the *pachana* of *doshas* and *poshana* of *dhatu*. *Rasadhatu* produce *Artava* i.e promotes ovulation and enhance the folliculogenesis.

Parushaka – it is having *Madhura* and *Amla Rasa*, *Laghu guna* with *Shita virya* and *Madhura vipaka*. All these properties helps in reducing the *vata* and *pitta doshas*, balanced *doshas* leads to improve the *agni*, as *Artava* is *agneya* in nature so, *Artava* production gets increased. It has *brinhana karma* which again nourish the *dhatu* and stimulates the hormones in the

body leads to ovulation. It contains citric acid and vit C<sup>[44]</sup> which gives strength to the heart and the body and increase the immunity.

Priyala – it contains saponins which again inhibit the oxytotoxicity of the urtine membrane and thereby maintain the spontaneous uterine motility and improves the fertility. It acts as blood purifier removes the toxins from the body. It also treats seminal weakness by correcting the hormones. By its properties like *Madhura rasa*, *Guru*, *Snigdha* & *Sara Guna*, *Sheeta virya* & *Madhura vipaka* it act as *Vatahara* and *Pittahara* and breakdown the pathology by balancing the vitiated *doshas*.

Yashtimadhu – it shows mild estrogenic properties similar to other phytoestrogens. It can promotes estrogen production and interfere with the effect of too much estrogen especial from the external sources. The phytoestrogenic action of liquorice root is useful for hormonal problems.<sup>[45]</sup>

The abundance of flavonoids in *Yashtimadhu*, helps the body to shed extra weight faster. Being loaded with fibers and essential nutrients, when taken regularly, it satiates the hunger pangs and prevents overeating and hence can play a pivotal role in one's weight loss regimen. It also reduces the accumulation of LDL (bad cholesterol) in the body, thereby improving metabolism and helping the body to maintain a proper weight.<sup>[46]</sup>

Being *Madhura* in taste and by having *guru*, *Snigdha guna*, *Sheeta virya* & *Madhura vipaka* it is great at balancing the vitiated *vata* and *pitta doshas*.

**Prakshepa dravyas:** Madhu, Pippali, and Sharkara are the prakshepa dravyas i.e to be added after self cooling of ghrita. *Prakshepa Dravya* acts as a synergizer and also attributes to the pharmacological action. They boost the patient acceptability by providing good taste, fragrance and appearance. The antioxidant and preservative properties are inherent in them. They also promote and augment the absorption of the drug by their bioenhancing activity.<sup>[47]</sup>

Pippali – Being *Katu* and *Tikta* in taste (*rasa*) with *laghu guna*, it superesses the *Kapha* and *Pippali* is *Dipana* in nature i.e improves *agni*, which helps in *amapachana* and clears the *margavrodha* and by having *Snigdha guna* and *Madhura vipaka* it suppresses the vitiated *Vata*. When the functioning of *doshas* becomes normal they stimulates the hormones and leads to ovulation. It helps in reducing excess weight, as it improves digestion, reduces the accumulation of bad cholesterol in the body. It activates the production of insulin from β-



pancreatic cells. It helps to reduce the breakdown of starch into glucose which in turn leads to low blood glucose level.<sup>[48]</sup>

Madhu- it possess properties like *laghu*, *Ruksha*, *Picchila guna*, *Sheeta virya* and *Katu vipaka* and *Madhura*, *Kashaya rasa* which makes it 'Tridoshaprashamana', *Madhu* helps in metabolism by its *Agnidipana* action.<sup>[49]</sup> It reduces the accumulation of LDL in body and helps in reducing the weight, Raw honey that contains pollen is a food rich in Vitamins, amino acids, iron, calcium and minerals. This rich nutritional food no wonder improves the effective functioning of the reproductive organs in both men and women.

Being a *yogavahi*, *madhu* speedup the absorption and action of the formulation.

Sharkara: loaded with *madhura rasa* and *snigdha guna*, *sheeta virya* and *madhura vipaka* which is why it suppresses the vitiated *pitta* & *vata* very effectively and starts metabolism in the body. It shows *Dhatuvardhaka* property leads to the nourishment of all *dhatu*s and may be the production of good *Artava* and *Shukra*.

Ksheera(milk) – it is rich in proteins, carbohydrates, phosphorus, iron, vitamins, essential aminoacids that's why it is said as complete food and provide strength to the body and reproductive system. It is *Brinhana* in nature and nourishes the *dhatu*s, the great *Vajikarana* and *Rasayana* in daily food, it is *Balya*, *Vrushya* and *Ojovardhaka* by having these properties *Ksheera* pursue its function of improving the health and balance the hormones.

Ghrita – The *rasa* of *ghrita* is *Madhura*, *guna* is *Snigdha* and it is having *Sheeta virya* & *Madhura vipaka*. *Ghrita* is *Vatapitta shamaka* in nature which are the two main responsible factor for folliculogenesis and ovulation. Most ayurvedic preparations are made with Ghee as digestion, absorption and target delivery system is crucial in obtaining the maximum benefits from any other formulation. Since active ingredients are mixed with Ghee, they are easily digested and absorbed. Lipophilic action of ghee facilitates transportation to a target organ. It facilitates the entry of formulation into cells and its delivery to the mitochondria and nuclear membrane.<sup>[50]</sup>

*Ghrita* gives nourishment to all *dhatu*s specially *Rasa dhatu*, *Shukra dhatu* and *Oja*. It is *Vrushya*, *Balavardhaka*, and *Rasayana* which enhance the immunity and strength of the body.

## RESULT AND OBSERVATION

The drugs used in the formation of Bhrihat Shatavari Ghrit having *Madhura Vipaka, Sheet virya, Madhura, Tikta* and *Kshaya rasa* so, the combined effect of all ingredients having *Vata Pitta shamak* property. The root cause of ovarian cycle failure is due to vitiation of *Vata* and *Pitta dosha*. Drug by its *Vata Pittashamak* property, *Vata* performed its proper function by its appropriate regulation and initiation of normal reproductive physiology. HPO axis works normally subsequently the process of follicular maturation beginning from primary oocyte production by proper function of *Vata*. Beside it *Pitta* also act properly by its *Paka* action so, the conversion of all hormones from their subsequent in sufficient level was achieved and when the adequate level of hormones present during follicular and luteal phase then the *Kapha* performs its proper function by secretory changes in ovarian cycle to produce mature ovum. We can understand it in a different manner also as when *Vata* and *Pitta* comes in its equilibrium stage the *Kapha* also perform its proper function due to *Tridoshasamy*. *Ahara rasa* converted into *Prasad* and *Kitta bhaga* under the influence of *Jatharagni*. *Prasad bhag* converted into *Rasa Dhatu* by proper function of *Rasa dhatvagni* through which, proper formation of its *Updhatu* named as *Artava* (*Dhatu roop Aartava* /endometrium).<sup>[51]</sup>

## CONCLUSION

from this critical review we can conclude that Brihat Shatavari Ghrita having—*Shatavrai, ksheera, ghrita, jivaniyavarga(meda, mahameda(Shatavari), kakoli, ksheerakakoli(Ashwagandha), jivaka, rishbhaka(Vidarikanda), mudgaparni, mashaparni, jivanti), madhuka, mrudvika, parushaka, priyala, yashtimadhu* as its active ingredients. *Madhu, pippali & sharkara* as *prakshepa dravyas* can play a great role in treating the *Artvadushti* i.e PCOS by pacifying the vitiated *Vata* and *Pitta doshas* and correcting the *Samprapti*, Also, by balancing the impaired *agni* and imbalanced hormones with the help of combined action of all the ingredients. BSG may not Not only enhance the follicular maturation but can also subside the other related symptoms like weight gain, insulin resistance, infection, skin problems etc.

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