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CASE REPORT

Reformed Hormonal Status in Hyperandrogenism through Ayurvedic Management with *Yoga* and *Prāṇāyāma* in a known case of Polycystic Ovarian Syndrome - A Case Report

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Abstract

Polycystic Ovarian Syndrome is the commonest endocrinological disorder of women in the reproductive age group. It is characterized by oligo/anovulation, hyperandrogenism, and raised Luteinizing Hormone: Follicle Stimulating Hormone ratio. Elevated levels of Luteinizing Hormone, contribute to hyperandrogenism and the altered ratio between Luteinizing Hormone and Follicle Stimulating Hormone. The present case report discusses the Ayurvedic management of altered Luteinizing Hormone - Follicle Stimulating Hormone ratio in a diagnosed case of Polycystic Ovarian Syndrome. The patient was diagnosed as having *Ārtava Kṣaya* with *Mukhadūṣikā* and was subjected to Ayurvedic management for 6 months commencing with *Śodhana* followed by *Śamana.* A remarkable improvement was obtained after the course of treatment.

Keywords: Ayurveda, Case Report, Elevated Luteinizing Hormone, Hyperandrogenism, LH: FSH, PCOS

1. Introduction

Polycystic Ovarian Syndrome (PCOS) is the commonest heterogeneous endocrine disorder that manifests as irregular menstruation, hyperandrogenism, and ovarian cysts. Globally, WHO estimates that more than 116 million women suffer from PCOS. 85-90 % of women with oligomenorrhea have PCOS, in addition to menstrual irregularities, increased volume (>10cc) of one or both ovaries, and multiple follicular cysts >12 in number measuring about 2-9 mm in diameter. An imbalance in the levels of reproductive hormones like Luteinizing Hormone (LH), Follicle Stimulating Hormone (FSH), estrogen, and testosterone causes an altered menstrual cycle. Hormonal dysregulation will affect several pathways and mechanisms in the body[1]. Hyperandrogenism is a key feature of PCOS. Presentations of hyperandrogenism include hirsutism, acne, acanthosis nigricans (skin thickening due to insulin resistance), androgen-dependent alopecia[2]. Abnormalities in gonadotropin secretion or action, ovarian folliculogenesis, steroidogenesis, insulin secretion or action, and adipose tissue function are seen in PCOS. In PCOS, LH: FSH ratio is found to be increased in the literature search. In a healthy woman, the ratio between LH and FSH lies between 1 and 2, in PCOS ratio is reversed and it may reach as high as 2 or 3. Disturbed LH: FSH often remains unnoticed in the management of PCOS clinically. A few studies addressing the issue are available to date. The Drugs used to treat PCOS are oral contraceptive pills, anti-androgen, and an oral insulin-sensitizing agent such as metformin[1].

In Ayurveda, it can be taken as *Ārtava Kṣaya* characterized by *yathocitakālādarśanam* (oligomenorrhea), *alpatā* (hypomenorrhea), *yonivedanā* (dysmenorrhea) along with presentations of *Mukhadūṣikā* (acne). The present case report discusses the management of PCOS with an elevated LH: FSH ratio.

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2. Patient Information

A 21-year-old female student attended the outpatient department on 2 February 2021 with complaints of an irregular menstrual cycle with varied intervals (maximum of 55 days and minimum of 28 days) with 3 days duration for 4 years. She started noticing blackish discoloration of the menstrual blood 10 months back.

The disease process started with dysmenorrhea 3 years after the menarche. At first, the pain was relieved by home remedies but later it started to affect her day-to-day activities and she consulted a gynaecologist and started taking tab Meftal spas as advised. She also experienced headaches on and off simultaneously, which were not associated with menstruation. She had h/o focal hyperhidrosis since childhood and has been using antiperspirant lotion since 2015. From the year 2017, she noticed varied intervals with a reduced duration of menstruation. Hair growth was noticed over the chin, upper lip, and lower abdomen. Acne was present all over the face, more on the cheeks associated with pain and itching for 2 years on and off. Onset was gradual, presented with eruptions of skin first, then progressively increasing in size and distribution. She consulted a dermatologist and was on medication for almost 1 year (intermittently) for the same. As the menstruation was prolonged up to 55 days and blackish spotting, she consulted a physician in June 2020 and was diagnosed with PCOS and took metformin for 3 months as per the medical advice. As the symptoms persisted, she visited the OPD with LMP-21/1/21. Her mother is a known case of PCOS.

3. Clinical Findings

The patient is of moderate built with a height of 153 cm, weight of 58 kg, and BMI of 24.7 Kg/m^2. Clinical signs and symptoms like *Yathocitakālādarśanam*, *Alpatā, Krsna varnata* of *Ārtava,* and *Mukhadūṣikā* were presented.

USG reports revealed both ovaries with polycystic appearance and her hormonal assay of LH: FSH ratio (21.68 mlU/mL:7.48 mlU/mL) was elevated and DHEA (3.3 ng/mL) was within normal limits. The timeline of the case study is mentioned in Table 1.

Table 1. Timeline of study

Year	Events
2012	Menarche Pimples over the face.
2015	Dysmenorrhoea, Headache, Dryness of skin Focal hyperhidrosis and started using antiperspirant lotion
2017	Irregular menstrual cycle with varied interval Oligomenorrhea & Hypomenorrhea The presence of acne progressively increased in size and took oral and topical medicaments.
2020	PCOS was diagnosed & took metformin for 3 months.
2021	Started Ayurvedic treatment.

4. Diagnostic Assessment

Using both subjective and objective parameters a detailed evaluation was done and diagnosed as *Ārtava Kṣaya* with *Mukhadūṣikā*.

Grade 4 acne (Acne Global Severity Scale -FDA).

The Ferriman -Gallwey score for hirsutism was 7, which was within normal limits.

5. Therapeutic Intervention

The treatment plan was *Śodhana* followed by *śamana*. After that *śamana auṣadhi* along with *yoga* and *prāṇāyāma* was followed (Table 2).

6. Follow-up and Outcomes

After the treatment, her menstrual cycle became regular with 4-5 days duration and 28-35 days intervals without any pain during menstruation. Her hormonal assay shows a reduction in the LH -FSH ratio. The severity of acne was reduced from 4 to 1 after the treatment (Table 3).

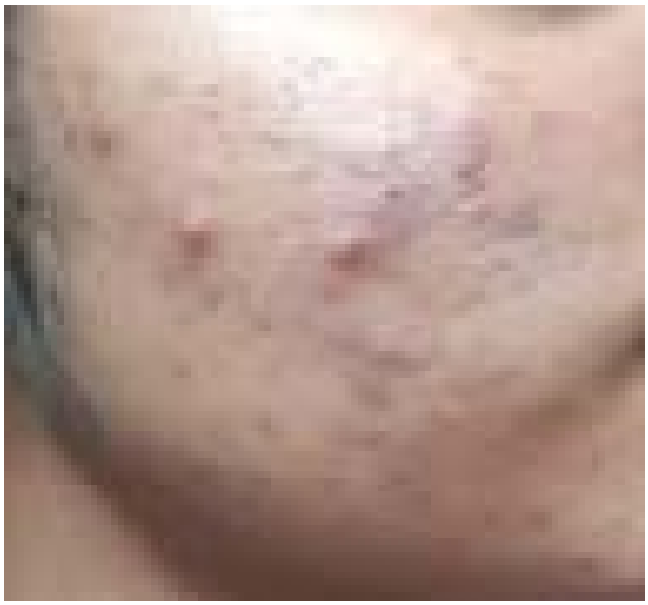

Figure 1. Before treatment.

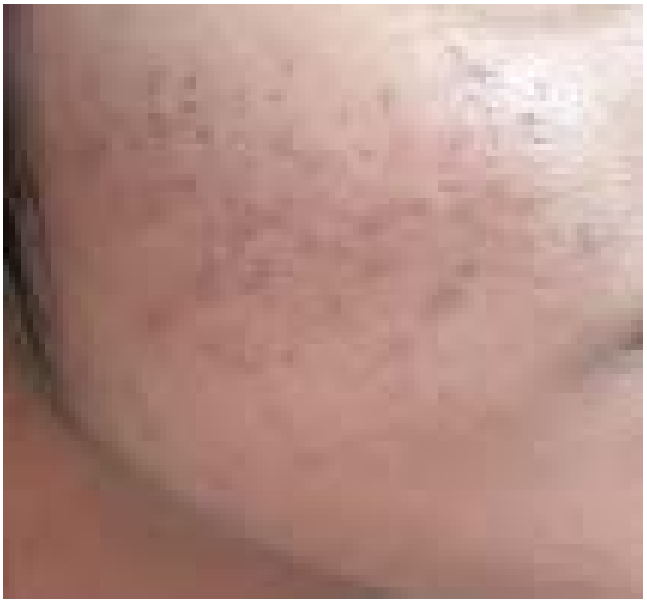

Figure 2. After treatment.

Table 2. Therapeutic intervention

Therapeutic approach	**Medicines with dose**	**Duration**
Deepana (Carminative) *Pachana* (Digestive)	*Dadimashtaka cūrṇa* and *Hinguvachadi cūrṇa* Half teaspoon each (1 tsp -0- 1 tsp) with hot water, before food	Day 1- Day 5
Snehapana	*Mahānārāyaṇa taila & Phalasarpi* (Total dose of each day-20 ml-40 ml-80 ml-160 ml-320 ml-320 ml) (Day 6- *Mahānārāyaṇa taila and Phalasarpi* 10 ml+10 ml Day 7-20 ml+20 ml Day 8-40 ml+40 ml Day 9-80 ml+80 ml Day 10-160 ml+160 ml Day 11-160 ml+160 ml)	Day 6- Day 11
Sarvanga abhyangam & Bashpa sweda	*Kṣīrabala taila*	Day 12- Day 14
Utklesana	Cooked *masha,* sesame ball x 1 day	Day 13
Vamana	*Yaṣṭimadhu Kaṣāya* obtained 9 *vega*	Day 14
Samsarjana	*Pravara shuddhi samsarjana*	Day 15-Day 19
Pratimarśa Nasya	*Aṇutaila* 4 drops -0-0 *Kṣīrabala taila* 4 drops -0-0 Treatment stopped due to menstruation for 5 days *Kṣīrabala taila* 4 drops -0-0	Day 20-Day 29 Day 30-Day 35 Day 36-Day 40 Day 41-Day 45
Śamana auṣadhi *Mukhalepa*	*Saptasara Kaṣāya* 15 ml *Kaṣāya* + 45 ml boiled and cooled water, BD, before food *Triphalā Guggulu* 1-0-1 *Yaṣṭimadhu cūrṇa* with *Kumari* pulp	2 months

Śamana auṣadhi *Mukhalepa*	*Gandhaka Rasayana* 1-0-1 *Yaṣṭimadhu cūrṇa* with *Kumari* pulp	2 months
Pratimarśa Nasya *Yoga* and *Prāṇāyāma*	*Aṇutaila* 4 drops -0-0(first 15 days) *Pratimarśa Nasya* stopped during menstruation for 5 days *Kṣīrabala taila* 4 drops -0-0 (next 10 days) *Ardha matsyendrasana, padahastāsana, Paschimottanasana, Nāḍīśudhi, Bhrāmari, Kapālabhāti(*started from July 2021)	1 month
Yoga and *Prāṇāyāma*	*Ardha matsyendrasana, padahastāsana, Paschimottanasana, Nāḍīśudhi, Bhrāmari, Kapālabhāt*i	5 months

Table 3. Pre and post hormonal evaluation

Hormonal evaluation/ Blood assay	Before Treatment 02-02-2021	After Treatment 15-01-2022
LH: FSH	21.68 mIU/mL-7.48 mIU/mL	13.4 mIU/ml:7.2 mIU/ml
DHEA	3.3 ng/ml	3.53 ng/ml

7. Discussion

The diagnosis of PCOS was confirmed by USG and biochemical assay. The severity of acne was assessed by using Acne Global Severity Scale -FDA and Grade 4 severity was obtained[10]. The patient was having the symptoms such as *Krsna varna* (blackish discoloration of the menstrual blood), *alpatā* (hypomenorrhea) of *Ārtava*, rooksatha (dryness) of skin, *sirasoola* (headache), *atisweda* (excessive sweating) and *Mukhadūṣikā* (acne) points out *Vāta pitta* and *rakta dushti* respectively which in turn leads to, *aartava dushti, as rajas is the upadhatu of raktā*.

The treatment protocol adopted here was, *Śodhana*[6] followed by *śamana cikitsā*. *Snehapana* with *Yamaka Sneha* (a combination of two oleaginous substances), was chosen on the basis of action on *granthi* considering the polycystic ovaries as well as cystic and nodular acne presented in the case. *Mahānārāyaṇa taila* and *Phalasarpi* were selected, by analyzing the specific indication of reproductive wellbeing. *In vivo* studies showed that *Phalasarpi* affects the HPO axis and thereby ovarian steroidogenesis. *Mahānārāyaṇa taila* has an action on fertility and its *Vāta śamana* property was also considered. For *śodhana*, *Mrdu Vamana* was adopted[8,9], *Yaṣṭimadhu Kaṣāya w*as the drug of choice because of its *Vāta pittaharatva*.

By understanding the suboptimal metabolic error, *Saptasara Kaṣāya* was taken in view of catalyzing the metabolism after the purification.

Gandhaka Rasayana is indicated in *Dhathuksaya Roga* and it has *Kaṇḍughna, Kushtaghna, Raktadoṣahara* properties. *Triphalā Guggulu* has *śothaghna* property[7].

Realizing the cause of *Mukhadūṣikā* as a defect in hormonal profile, *Pratimarsa Nasya* with *Aṇutaila* which is *śamana* in nature followed by *Kṣīrabala* which has *brmhana* quality was chosen as an excellent choice for *aartava dhathu poshana* through stimulating the HPO axis so that it can nullify the future progress of the disease.

Yaṣṭimadhu kumari lepa was chosen because *Yashtimadu* possesses *Varnya, Kaṇḍughna,* and *Shothahara* properties and kumārī has *Twakrogahara* and *Visphotahara* qualities.

Studies have shown the efficacy of *Yoga* and *Prāṇāyāma* in neuroendocrinological homeostasis. *Yoga* postures like *Ardha matsyendrasana, padahastāsana,* and *Paschimottanasana* promote the health of back muscles and support fertility by regulating LH levels. Studies showed that Nāḍīśudhi, *Bhrāmari, Kapālabhāti Prāṇāyāma* improved metabolism and hormonal equilibrium.

During treatment, the patient started attaining menstruation at first with an interval of 48 days after that interval was reduced to 28-35 days and 5 days of duration without any associated complaints. The color of *aartava* also regained its normalcy. LH: FSH ratio is often left less explored in PCOS management. This is the first case documentation that addresses the correction of the LH: FSH ratio. It can be taken as a key reference for the assessment of progress in PCOS management. A reassuring outcome of the present case signifies the logical selection of medicines and mode of treatment along with diet (sesame, fish, and millets were included, deep fried items and junk foods excluded) and lifestyle modification

(30 minutes of *Yoga* and 10 minutes of *Prāṇāyāma* practice daily) for the effective management of the disease in a long run.

8. Conclusion

This case report depicts the effectiveness of Ayurvedic treatment in altered LH-FSH ratio in a diagnosed case of PCOS. There was a remarkable improvement in acne. Hormonal equilibrium-based studies may bring changes in depth for the cure of PCOS. Ayurvedic management with lifestyle modifications helps in a remarkable change in LH: FSH ratio. Hence more such studies should be entertained and this may act as a stepping stone towards it.

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