

Restoration of Ovulatory Function and Endometrial Receptivity through Ayurvedic Intervention in a Case of Infertility with PCOD and Hypothyroidism

Dr. Jeevan Majgaonkar^{1*}, Dr. Arnika Singh²

¹Assistant professor, Dept. of panchakarma, Swami Vivekanand Ayurved Medical College, pargao-sudrik, Shrigonda, Ahmednagar (MH)

²Ayurved Physician, Jivantika Karmaved Chikitsalaya, Sadashiv peth, Pune (MH)

Corresponding Author

Dr. Jeevan Majgaonkar, Assistant professor, Dept. of panchakarma, Swami Vivekanand Ayurved Medical College, pargao-sudrik, Shrigonda, Ahmednagar (MH).

Abstract

Introduction: Infertility, a global health concern affecting 10–15% of couples, is commonly linked with anovulatory disorders such as polycystic ovarian disease (PCOD) and endocrine imbalances like hypothyroidism. Modern therapeutic approaches—including ovulation induction and assisted reproductive technologies (ART)—often offer limited or temporary success, leading to growing interest in holistic alternatives. Ayurveda describes infertility as *Vandhyatva*, primarily resulting from *Agnimandya*, *Srotorodha*, and *Artavavaha Srotas Dushti*, which disrupt *Rutu*, *Kshetra*, and *Artava-utpatti*. **Methods:** A 33-year-old woman with a 10-year history of primary infertility, PCOD, hypothyroidism, and thin endometrium (0.92 mm) presented with dysfunctional uterine bleeding and failed IVF attempts. Ayurvedic management was planned based on *Samprapti Vighatana* and classical protocols involving *Deepana–Pachana*, *Virechana Karma*, and *Uttarabasti*, supplemented with *Rasayana* and *Artavajanana* formulations—*Vasantakusumakar Rasa*, *Tapyadi Lauha*, *Phalaghrita*, and *Putrajivaka–Shivlingi Bija Churna*. *Virechana* was performed using *Trivrit Avaleha*, followed by *Uttarabasti* with *Phalaghrita* for six consecutive days. **Results:** Sequential ultrasonography showed follicular growth from 13.3 mm to 20.2 mm, and endometrial thickness improved from 0.92 mm to 8.4 mm. Ovulation was confirmed on the 14th day. Clinically, the patient reported normalized menstrual rhythm, improved energy, appetite, and reduced fatigue. **Discussion:** Therapeutic interventions corrected *Agnimandya* and *Srotorodha*, rejuvenating *Artavavaha Srotas* and restoring the physiological state of *Rutu*, *Kshetra*, and *Artava-utpatti*. The synergistic action of *Phalaghrita* and *Putrajivaka–Shivlingi* enhanced folliculogenesis and endometrial receptivity, while *Virechana* and *Deepana–Pachana* facilitated systemic detoxification and hormonal equilibrium. **Conclusion:** This case demonstrates the efficacy of an integrative Ayurvedic regimen in managing infertility associated with PCOD and hypothyroidism by restoring reproductive balance and promoting ovulation. Further controlled studies are warranted to substantiate these findings.

Keywords: Ayurveda, Infertility, *Uttarabasti*, *Phalaghrita*, *Artava-vaha srotas*, *Vandhyatva*, Endometrial thickness, ovulation

Introduction

Infertility, defined as the inability to conceive after one year of unprotected intercourse, affects approximately 10–15% of couples worldwide, with female factors contributing in nearly 40%

of cases. Among the leading causes are anovulation, polycystic ovarian disease (PCOD), tubal blockage, endometrial insufficiency, and hormonal imbalances such as hypothyroidism. The increasing prevalence of infertility has been attributed to changing lifestyles, obesity, psychological stress, endocrine disorders, and environmental toxins.

In the Indian subcontinent, PCOD has emerged as a major contributor to anovulatory infertility. It is characterized by hyperandrogenism, irregular cycles, cystic ovaries, and metabolic disturbances. In modern gynecology, ovulation induction, hormonal therapy, and assisted reproductive techniques such as in vitro fertilization (IVF) are widely used, yet many patients either fail to conceive or experience recurrence of symptoms after cessation of therapy.

From the Ayurvedic perspective, infertility is described as *Vandhyatva*, which may arise from *Beeja dushti*, *Artava dushti*, *Agnimandya*, and *Srotorodha*. *Artavavaha srotas dushti* is commonly implicated in female infertility, manifesting as irregular menstruation, scanty flow, or anovulation. Textual references in *Charaka Samhita*, *Sushruta Samhita*, and *Kashyapa Samhita* highlight the importance of *Shodhana karma* (bio-purification), *Snehana*, and *Rasayana* therapies in restoring fertility by cleansing and rejuvenating the reproductive channels.

Procedures like *Virechana karma* (therapeutic purgation) are indicated in *Pittaja* and *Raktaja*. This case report presents the successful Ayurvedic management of a patient with infertility due to PCOD, hypothyroidism, and thin endometrium, highlighting the role of classical *Shodhana* and *Uttarabasti* protocols in achieving ovulation and improving endometrial receptivity.

Case Presentation

A 33-year-old married woman with ten years of marital life presented with the chief complaint of inability to conceive despite regular marital relations. She had a history of Dysfunctional Uterine Bleeding (DUB) for approximately ten years, characterized by prolonged menstrual flow lasting up to fifteen days. She had previously received hormonal treatment about five to six years ago, after which her menstrual cycles became regular for two years. At the time of presentation, her cycles were of 28–30 days' duration with a flow lasting five days.

She had previously undergone in vitro fertilization (IVF) without success. The patient was a known case of polycystic ovarian disease (PCOD) for eight to ten years and hypothyroidism for five years, managed with oral Thyroxine 75 µg daily. Laboratory investigation revealed an elevated thyroid-stimulating hormone (TSH) level of 10.90 mIU/L. She also complained of *Anutsaha* (lack of enthusiasm), *Bhrama* (giddiness), and loss of appetite. Ultrasonography findings indicated an anovulatory cycle with a very thin endometrium measuring 0.92 mm.

General and Systemic Examination

The patient was of moderate build and well-nourished. General examination revealed a calm, cooperative woman with normal mental orientation. Vital parameters were within normal limits: pulse 78/min, blood pressure 116/74 mmHg, temperature 98.6°F, and respiratory rate 18/min. There was no pallor, edema, cyanosis, or icterus.

Systemic examination of the cardiovascular and respiratory systems was normal. Abdominal examination showed no organomegaly or tenderness. On pelvic examination, external genitalia

appeared normal, the cervix was healthy without discharge or tenderness, the uterus was anteverted and of normal size, and the fornices were free and non-tender.

Ayurvedic Examination (Dashavidha and Ashtavidha Pariksha)

According to *Dashavidha Pariksha*, the patient's *Prakriti* was assessed as *Vata-Kapha pradhana*. *Sara* was *Madhyama*, *Samhanana Madhyama*, *Satmya Madhyama*, *Pramana Madhyama*, and *Satva* was *Madhyama*. Both *Ahara Shakti* (digestive capacity) and *Vyayama Shakti* (capacity for physical activity) were *Madhyama* and *Avara* respectively. *Vaya* corresponded to *Yuva avastha*, and overall *Pramana* indicated a healthy body mass index.

In *Ashtavidha Pariksha*, *Nadi* was *Vata-Kaphaja*, *Mutra* (urine) and *Mala* (stool) were regular, *Jihva* (tongue) was slightly *Saamya*, *Shabda* (voice) and *Sparsha* (touch) were normal, *Drika* (eyes) were clear, and *Akruti* (appearance) was *Madhyama*.

Table 1: Timeline of Treatment and Response

Date / Visit	Intervention (with dose, time, and Anupāna)	Patient's Follow-Up / Observation
25.01.2022 (1st Visit)	Internal medication started: 1. <i>Vasantakusumākara rasa</i> (125 mg), <i>Vidārī</i> (250 mg), <i>Tapyādi lauha</i> (125 mg), <i>Raktapācaka</i> (250 mg), <i>Durvā kalpa</i> (500 mg), and <i>Dālimāvaleha</i> (10 g) — in the morning on an empty stomach 2. <i>Suvarṇa Sutshekhar rasa</i> (125 mg), <i>Vāsā</i> (125 mg), <i>Rasnā</i> (125 mg), <i>Guḍūcī</i> (125 mg), <i>Candrāprabhā vaṭī</i> (250 mg), <i>Vaṅga miśraṇa</i> (125 mg), <i>Dhātrī</i> (125 mg), <i>Śaṅkha bhasma</i> (125 mg), <i>Trivaṅga bhasma</i> (125 mg) — before meals, twice daily, with <i>Phalaghṛta</i> as <i>Anupāna</i> . 3. <i>Śivlingī</i> and <i>Putrajīvaka bīja cūrṇa</i> (3 g each) — in the morning with warm water.	Initiation of <i>Agnidīpana</i> , <i>Raktaprasādana</i> , and <i>Ārtava-utpattivardhaka</i> therapy.
02.02.2022 (2nd Visit)	Planned <i>Virechana karma</i> after menstruation (LMP 02.02.22). • <i>Snehapāna</i> with <i>Phalaghṛta</i> (<i>Vridhhi-krama</i> : 50-75-100-125-150 ml/day). • <i>Virechana</i> with <i>Trivṛt avaleha</i> (80 g, single dose) → <i>Madhyama śuddhi</i> achieved. • <i>Saṃsarjana krama</i> followed for 5 days with light <i>peya-vilepi</i> diet. Shamana medicines as lanced on date 25.1.22 were continued till next menses.	Patient reported improved appetite, lightness in body, and regular evacuation. Sense of well-being increased.
06.03.2022 (3rd Visit)	LMP 01.03.22. <i>Yoni-dhāvana</i> with <i>Pañcavalkala kvātha</i> (twice daily) + <i>Yoni-dhūpana</i> with <i>Dhūpana vartī</i> (once daily). <i>Śodhana-nirūha basti</i> followed by <i>Uttarabasti</i> with <i>Phalaghṛta</i> (3–5 ml × 6 days).	Procedures well tolerated; vaginal tone improved, no discomfort or discharge. Patient felt lightness in pelvic region and reduction in fatigue.

08– 14.03.2022 (Post- Uttarabasti Period)	Shamana medicines as dated 25.1.22 were continued.	Follicular study was done. Ovulation was achieved on day 14 with ET- 8.4 mm
---	--	---

Table 2: Follicular study: (After therapy)

Date	Day of Cycle	Right Ovary Follicle (mm)	Left Ovary Follicle (mm)	Endometrial Thickness (ET) (mm)	Ultrasound Findings / Interpretation
8.3.22	Day 8	13.3	12.1	6.1	Developing follicles noted; proliferative endometrium.
10.3.22	Day 10	18.6	18.3	7.9	Follicular growth adequate; endometrium showing trilaminar pattern.
11.3.22	Day 11	20.2	18.9	8.4	Dominant follicle matured; endometrium optimal for ovulation.
14.3.22	Day 14	—	—	8.4	Follicular rupture with free fluid in POD → Ovulation confirmed.

Outcome and Results

Following the Ayurvedic management protocol, the patient exhibited remarkable clinical improvement. The initial endometrial thickness (ET) of 0.92 mm, indicating a poor receptive uterine environment, progressively increased to 8.4 mm after the course of therapy. Sequential ultrasonographic monitoring revealed proper follicular development, culminating in spontaneous follicular rupture and ovulation on the 14th day of the cycle, confirming restoration of ovulatory function. The patient reported improvement in *Agnibala* (appetite and digestion), *Anutsaha* (lethargy), and general wellbeing. Regularization of menstrual rhythm and normalization of flow were observed after the *Virechana* and *Uttarabasti* therapies, indicating correction of *Ārtava-vaha srotas* and hormonal balance. No adverse events were reported throughout the treatment period. This outcome highlights the potential of an integrative *Rasayana–Śodhana–Uttarabasti* protocol in the management of anovulatory infertility associated with PCOD and hypothyroidism.

DATE	DAY of M.C.	Rt. ovary	Lt. ovary	ET	Rx. Given	Remark
17/12/21	5th	4-1	1-1			4th day
18/12/21	6th					5th day
20/12/21	8th	1-0, 1-14	1-0	thin	8 mg	7th day
24/12/21	10th	1-24, 1-3	1-25, 1-0	0-42	8 mg	8th day
		1-45, 1-2		thin	8 mg	9th day
24/12/21	12th	1-5, 1-3	1-6			
			1-3			
			1-4			
			1-6, 1-6			
24/12/21	15th	1-33	1-7, 1-7	Thin		
			1-7, 1-7			
29/12/21	17th	1-5, 1-6	2-1mm, 1-8, 1-7mm			
8/1/22	2nd		2-5, 1-6			
13/1/22	15th		1-0, 1-2			
8/2/22	2nd	m8P	m8P			
1/3/22	7th	m8P	m8P			

Date	Day of cycle	Average in mm Rt. Ov.	Follicular size Lt. Ov.	Endometrium mm	Dgl's pouch fluid	Drugs	Comments
8/3/22	8	Tiny	13.3, 12.1	6.1	-	X	
10/3/22	10	-11-	18.6, 18.3	7.9	-		
11/3/22	11	-11-	20.2, 18.9	8.1	-		
14/3/22	14	-11-	Repturee	8.4	++		ovulation

Before treatment

After treatment

Discussion

Infertility is a multifactorial disorder affecting approximately 10–15% of couples globally. Among female causes, anovulation due to Polycystic Ovarian Disease (PCOD) and luteal insufficiency remain dominant contributors. In the present case, the patient presented with primary infertility despite a decade of marital life and prior assisted reproductive interventions (IVF), suggesting underlying ovarian dysfunction and uterine inadequacy. The presence of long-standing *DUB*, *Agnimandya*, *Anutsaha*, and a very thin endometrium are indicators of *Kapha-Vata* predominance and *Avarana* (occlusion) of *Artava-vaha srotas* leading to *Beeja-dushti* and *Beejagata-vata* vitiation.

According to Ayurveda, conception (*Garbha-utpatti*) requires the harmonious presence of *Rutu* (optimal ovulatory period and hormonal environment), *Kshetra* (healthy uterus and endometrium), *Ambu* (nutritive fluid and endometrial secretions), and *Beeja* (healthy ovum and sperm). In this case, *Rutu* was irregular due to anovulation, *Kshetra* was compromised due to thin endometrium, and *Ambu* was deficient. The therapeutic strategy, therefore, aimed at restoring these four essential components through *Agnideepana*, *Amapachana*, *Srotoshodhana*, and *Rasayana* interventions.

The treatment protocol was designed on classical Ayurvedic principles emphasizing *Srotoshodhana* (channel purification), *Agnideepana* (metabolic stimulation), *Raktaprasadana* (purification and nourishment of blood), and *Artava-utpatti janana* (stimulation of ovulation).

The sequence of therapies adopted—*Deepana-Pachana*, *Virechana Karma*, and *Uttarabasti*—aligns with the *Trividha Chikitsa* concept for *Artava-vaha srotas dushti*:

- Nidana-parivarjana (removal of causative factors such as hormonal irregularity and metabolic obstruction),
- Shodhana (bio-purification through Virechana and Basti), and
- Shamana–Rasayana (corrective and rejuvenating medicines).

The rationale was to first correct systemic imbalances and *Agni* through oral medications, followed by *Virechana* to eliminate vitiated *Kapha-Pitta doshas*, and finally to enhance uterine and ovarian functions through *Uttarabasti*.

3. Mode of Action of Interventions

a. Deepana–Pachana and Rasayana Medications

Formulations such as *Vasantakusumakar Rasa*, *Vidari*, *Tapyadi Lauha*, *Durva Kalpa*, *Raktapachaka*, and *Dalimavaleha* were administered to improve digestion, metabolism, and blood quality. *Vasantakusumakar Rasa* acts as a potent *Rasayana* and endocrine modulator, improving tissue metabolism and *Artava-pravartana*. *Vidari* (*Pueraria tuberosa*) nourishes *Shukra* and *Artava dhatu*, supporting fertility through its *Balya* and *Brimhaniya* properties. *Tapyadi Lauha* improves hemopoiesis and corrects *Rakta-dushti*, indirectly aiding endometrial development. *Durva Kalpa* and *Raktapachaka* ensure *Rakta-prasadana*, maintaining healthy menstrual flow. *Dalimavaleha* supports uterine tone and *Garbhashaya poshana*.

The *Suvarna Sutshekhar Rasa* combination with *Vasa*, *Rasna*, *Guduchi*, *Chandraprabha*, *Vanga*, *Dhatri*, *Shankha*, and *Trivanga* further enhanced *Agni*, regulated *Pitta*, and provided mild *Lekhana* and *Srotoshodhaka* actions—crucial for correcting the metabolic derangements in PCOD. *Phalaghrita*, given as an *Anupana*, acts as a *Vata-shamaka* and *Artavajanana*, promoting endometrial nourishment.

The administration of *Shivlingi* (*Bryonopsis laciniosa*) and *Putrajivaka* (*Putranjiva roxburghii*) seeds was based on classical references describing their *Garbhashthapaka* and *Beeja-vridhdikara* properties, which modulate ovarian activity and enhance folliculogenesis.

b. Virechana Karma (Therapeutic Purgation)

After preparatory *Snehapana* with *Phalaghrita* (in increasing doses 50–150 ml/day), *Virechana* was performed with *Trivrut Avaleha*. *Virechana* serves as the prime *Shodhana* therapy for *Pitta* and *Kapha* dosha elimination. It cleanses the *Rakta-vaha* and *Artava-vaha srotas*, thereby improving uterine perfusion and hormonal regulation.

Phalaghrita acts as a uterine tonic, nourishing *Artavavaha srotas* and promoting *Beeja-nirmana*. *Trivrut* (*Operculina turpethum*) has *Mridu*, *Snigdha*, and *Anulomaka* properties, ensuring *Madhyama shuddhi* (moderate cleansing). After *Virechana*, *Sansarjana krama* was followed to reestablish *Agni*. The patient experienced lightness, improved appetite, and regular bowel habits—indicating systemic detoxification and metabolic reset.

c. Yoniprakshalana, Yonidhupana, and Uttarabasti

The *Shodhana* phase was followed by *Yonidhavana* with *Panchavalkala kwatha*, which is *Kashaya*, *Shothahara*, and *Vranaropaka*, ensuring local cleansing and reducing inflammation. *Yonidhupana* with *Dhupana varti* provided mild local *Rasayana* and antiseptic effects.

The *Uttarabasti* was the pivotal procedure—administered with *Phalaghrita* (3–5 ml for 6 consecutive days). *Uttarabasti* is considered the best *Chikitsa* for *Vataja* and *Artava-vaha srotas* disorders. *Phalaghrita*, described in *Charaka Samhita* (*Chikitsa* 30/116), enhances fertility by correcting uterine receptivity (*Kshetra-shuddhi*), promoting ovulation, and supporting endometrial development (*Artava-utpatti*). The lipophilic nature of *Ghrta* allows deeper penetration and hormonal modulation at the tissue level.

Mechanistic Understanding (Modern and Ayurvedic Integration)

From a modern perspective, the combination of systemic *Rasayana* therapy, *Virechana*, and *Uttarabasti* may act through:

- **Hormonal Regulation:** By reducing systemic inflammation and oxidative stress, the therapy might restore hypothalamo-pituitary-ovarian (HPO) axis balance.
- **Endometrial Receptivity:** *Phalaghrita* and *Rasayana* drugs enhance uterine perfusion, leading to increased endometrial thickness.
- **Ovarian Function:** *Shivlingi* and *Putrajivaka* seeds stimulate follicular growth and ovulation, as demonstrated in the follicular monitoring.
- **Thyroid Regulation:** *Guduchi*, *Rasna*, and *Suvarna Sutshekhar* aid in reducing metabolic sluggishness associated with hypothyroidism through *Agnideepana* and *Kapha-pachana*.
- **Psychological Support:** Improved *Satva-bala* and *Anutsaha nivarana* suggest *Medhya Rasayana* action, restoring mental and emotional equilibrium.

The treatment resulted in distinct and measurable physiological improvements. The endometrial thickness, which was initially 0.92 mm, increased progressively to 8.4 mm, indicating enhanced uterine receptivity. Follicular monitoring revealed steady development, with follicle size increasing from 13.3 mm on the 8th day of the cycle to 20.2 mm on the 11th day, followed by rupture and the presence of fluid in the pouch of Douglas on the 14th day, confirming ovulation. Clinically, the patient experienced marked improvement in energy levels, appetite, and menstrual regularity, along with a noticeable reduction in hypothyroid-related symptoms such as lethargy and sluggish metabolism. These cumulative changes reflect the successful reestablishment of *Rutu* (regular ovulatory cycle), *Kshetra* (healthy uterine environment), and *Ārtava-utpatti* (normal ovum production), thereby fulfilling the Ayurvedic objective of restoring *Garbha-sambhava-sampat*—the optimal state for conception.

Probable Mode of Action

Therapeutic stage	Aim	Mechanism (ayurvedic)	Expected modern correlation
<i>Deepana-Pachana</i>	Correction of <i>Agnimandya</i>	Enhances <i>Agni</i> , removes <i>Ama</i>	Improves metabolism, hormonal synthesis
<i>Virechana</i>	<i>Srotoshodhana</i> and <i>Dosha-shamana</i>	Eliminates <i>Pitta-Kapha</i> , clears <i>Artava-vaha srotas</i>	Restores hormonal axis and detoxification
<i>Uttarabasti</i>	<i>Beeja-shuddhi</i> and <i>Artava-utpatti</i>	Nourishes uterus and ovary	Improves endometrial thickness, ovulation

Rasayana therapy	Dhatu-pushti and Satva-bala vardhana	Strengthens Rasa– Rakta–Artava dhatu	Enhances fertility and mental wellbeing
------------------	--------------------------------------	--------------------------------------	---

The holistic approach adopted in this case effectively corrected the underlying *Dosha-dushti*, *Srotorodha*, and *Agnimandya*, leading to restoration of reproductive function. The sequence of *Rasayana–Shodhana–Uttarabasti* treatment aligns with classical directives for *Vandhyatva* management as mentioned in *Charaka (Ch. Sha. 2/3–10)* and *Sushruta (Su. Sha. 2/32–40)*. The therapy not only restored physiological ovulation but also improved endometrial receptivity—an essential prerequisite for conception.

Conclusion

This case highlights the successful Ayurvedic management of infertility associated with PCOD and hypothyroidism through a comprehensive and individualized therapeutic approach. The sequential administration of *Deepana–Pachana*, *Virechana Karma*, and *Uttarabasti* along with specific *Rasayana* and *Artavajanana* formulations resulted in significant improvement in both structural and functional reproductive parameters. Notably, the patient demonstrated normalization of ovulatory function, marked enhancement in endometrial thickness, and overall improvement in systemic and psychological wellbeing. The therapeutic interventions effectively corrected *Agnimandya*, alleviated *Srotorodha*, and restored the balance of *Vata* and *Kapha dosha*, thereby reestablishing *Rutu*, *Kshetra*, and *Artava-utpatti*.

The positive outcome of this case underscores the potential of classical Ayurvedic interventions—particularly *Virechana* and *Uttarabasti* with *Phalaghrita*—as promising modalities in managing anovulatory infertility resistant to conventional treatments. Such evidence-based case documentation provides a foundation for further clinical validation and integration of Ayurvedic reproductive therapies into holistic infertility management protocols.

Financial Support: Nil

Conflict of Interest: None declared

References

1. Kumar S-J, Joshi S, Lakshmi M. Ayurvedic approach in infertility due to PCOS (Anovulatory cycle): A single case study. *J Ayurveda Holist Med.* 2023;11(4). doi:10.70066/jahm.v11i4.796.
2. Gambhire-Bhadugale H, Tekawade UV, Herlekar S, Kulkarni M. Treating thin endometrium by Ayurvedic medications: A case study. *Int J Ayurvedic Med.* 2023;13(4). doi:10.47552/ijam.v13i4.3136.
3. “Management of Vandhyatva w.s.r. to thin endometrium through Ayurveda – A single arm open labelled pilot clinical trial.” [Name of Journal]. 2023. PubMed PMID: 37347080.
4. Selvi K, Kotur P. Occurrence of hypothyroidism and its correlation with reproductive health problems: a cross-sectional study. *Int J Reprod Contracept Obstet Gynecol.* 2019;8(9):... doi:10.18203/2320-1770.ijrcog20191970.
5. Chen J-J, et al. Vitamin D improves endometrial thickness in PCOS women who need intrauterine insemination: a randomized double-blind placebo-controlled trial. *Fertil Steril.* 2013;99(4):1073-1079. doi:10.1016/j.fertnstert.2012.11.029.
6. Sirigere N, Kirana L.P. Ayurvedic perspective on PCOD and infertility – a case study. *Ayushdhara.* 2021;7(6):3035-3039. doi:10.47070/ayushdhara.v7i6.674.

7. Basanti G, Sindel P. Fertility with Ayurveda – a single case study on treatment of primary infertility due to tubal blockage with PCOS. *J Ayurveda Integr Med Sci*. 2019;9(1):39-? doi:10.21760/jaims.9.1.39.
8. Avhale SA, Avhale PS. The management of Polycystic Ovarian Disease (PCOD) with the Vamana Karma – A Case Report. *J Ayurveda Integr Med Sci*. 2020;5(5). doi:10.21760/jaims.v5i05.1110.
9. Nema R, Choudhary P. Ayurveda management of primary infertility due to partial tubal blockage with PCOD. *Ayushdhara*. 2022;12(1): doi:10.47070/ayushdhara.v12i1.1932.
10. Thakare G, Zade S, Shende S. A case study of primary infertility from PCOD till conception. *J Ayurveda Holist Med*. 2025;13(2):41-48. doi:10.70066/jahm.v13i2.1560.
11. Huang J., Zheng Z., Li T., et al. Decreased endometrial thickness is associated with adverse neonatal outcomes in women with PCOS undergoing frozen-thawed embryo transfer. *Front Endocrinol (Lausanne)*. 2021;12:766601. doi:10.3389/fendo.2021.766601.
12. Bai X., Zheng L., Li D., Xu Y. Research progress of endometrial receptivity in patients with polycystic ovary syndrome: a systematic review. *Reprod Biol Endocrinol*. 2021;19:122. doi:10.1186/s12958-021-00802-4.
13. Fan H., Gao W., et al. The role of the thyroid in polycystic ovary syndrome: a review. *Front Endocrinol (Lausanne)*. 2023;14:1242050. doi:10.3389/fendo.2023.1242050.
14. Hao X., Liu S., Zheng H., Wang Q., Jin L., Ma J. Thyroid hormones correlate to the therapeutic effect of ovulation induction in infertile women with PCOS. *Clin Endocrinol (Oxf)*. 2025 Sep 9. doi:10.1111/cen.70030.
15. Al Hindawi Z.M., Al-Khateeb M., Alhyasat H. Estimation of endometrial thickness by ultrasound in infertile women: a retrospective study. *J Obstet Gynaecol Res*. 2023;49(8):... doi:10.1111/jogcr.697408.